

Publishing Details: Operating Instructions DULCOMETER® DSR Measured Variable Redox © ProMinent Dosiertechnik GmbH

ProMinent Dosiertechnik GmbH Im Schuhmachergewann 5-11 69123 Heidelberg · Germany Postfach 101760 69007 Heidelberg · Germany Phone: +49 (6221) 842-0 · Fax: 842-419 info@prominent.de · www.prominent.de

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## **Identity code**



## Identity code for swimming pool controller

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#### 1 Instructions for use of manual

Please read through the following instructions carefully. Knowledge of these instructions will help you use the operating instructions manual more effectively.

Points are highlighted as follows

- Indicate step by step instructions
- Indicate enumerated points

Input menus

GUIDELINE

Guidelines are intended to make your job easier.

and safety guidelines:

## WARNING



## avoided, can endanger life or cause serious injury.



CAUTION

Could result in lesser injuries or damage to property if safety guidelines are not observed.



### TAKE CARE

Could result in damage to property if safety guidelines are not observed.

### Safety

## 2 Safety

### **Correct use**

The DSR controller is a microprocessor controlled measurement and control device for the measurement and control variable redox potential.

The device is intended exclusively for:

- · Measurement of the measured variable redox potential
- · Control of the measured variable redox potential
- Display of measured values

All other uses and/or modifications are prohibited.

## WARNING



 The device can feed mains voltage to connection terminals when connected to the mains power supply.



### TAKE CARE

- The device has no on/off switch. It is ready to operate as soon as it has been connected to the power supply.
- The device may only be assembled, installed and set up by appropriately trained and authorised personnel.
- The device may not be used outdoors without additional protection (outer housing, weatherpoof cover). The enclosure rating does not allow for water collecting around the housing seals and the housing can be damaged by direct sunlight.
- The redox probe must be checked regularly with a high-quality buffer solution to prevent incorrect metering which may prove dangerous.
- To avoid overdosing, the power supply for the DSR controller and the metering pumps must be latched to the power supply for the circulating pump, i.e. if the circulating pump stops, the DSR and the metering pumps must also be disconnected from the power supply.

## Storage/transport / Assembly/installation

## Storage/transport



3

## TAKE CARE

- Transport and store the device in its original packaging.
- Protect the unpacked device from moisture or the effects of chemicals.

Environmental conditions for storage and transport: Temperature: -10 °C to +70 °C Humidity: < 95 % relative humidity

4 Assembly/installation4.1 Assembly (mechanical)

The device can be mounted onto a wall or into a control panel.

### 4.1.1 Wall mounting

The device can be screwed directly to the wall using the bracket provided.

Assembly materials:

- 3 off Half-round head screws 5 x 45 mm (1)
- 3 off Washers 5.3 (2)
- 3 off Wall plugs Ø 8 mm, plastic (3)

Fasten the device to the wall using the bracket:

- Using the wall bracket (4) as a drilling template, mark the positions of the holes
- Drill holes (using 8 mm drill bit) depth approximately 50 mm
- Insert wall plugs (3)
- Screw on the wall bracket (4) with the screws (1), using washers (2)
- Hang the device in the top of the wall bracket (4), and push upwards until you hear an audible click.



### 4.1.2 Control panel assembly

The device can also be installed in a control panel using the wallmounting housing.

You require the "control panel" assembly set, part number 792908. Assembly materials:

- 1 off Profile seal, Ø 3 mm, foam rubber
- 6 off Zinc plated steel holding yokes
- 6 off PT tapping screws



### TAKE CARE

- The control panel must be thick enough to withstand assembly without buckling! (Minimum 2 mm thickness steel; correspondingly thicker if plastic!) Otherwise the device will not conform to enclosure rating IP 54!
- Check the measurements of the drilling/stamping template (please find in appendix)!

## NOTE

Once assembled, the device projects approximately 35 mm from the control panel.

The device is simply installed in its housing onto the control panel. Tensioning is carried out using the holding yokes.

Prepare a mounting aperture beforehand as follows:



### TAKE CARE

Allow approx. 120 mm above the device for installation purposes!

- Using the drilling/stamping template, mark the exact location of the device (e.g. with sticky tape) on the control panel.
- Mark the holes for screws through the drilling/ stamping template.
- If you do not want to punch out the mounting aperture, drill the 4 inner holes using a 12 - 13 mm drill bit.
- Pierce out sections using a piercing saw/keyhole saw as on the drilling/stamping template.



## CAUTION

Sharp edges can cause injury!

- ➤ Remove sharp edges.
- At the same time insert the profile seal (1) into the groove of the device.
- > Place the device into the mounting aperture.
- Tension the device with the control panel from the rear with the holding yokes (2) and the screws (3) (a second person may be required to assist).



### TAKE CARE

Check location of seal once more! Enclosure rating IP 54 is only achieved when assembly is carried out correctly!

## 4.2 Installation (electrical)

## WARNING

- Installation may only be carried out by specially trained and appropriately certified personnel!
- Installation may only be carried out once assembly is complete!
- The device must be disconnected from the power during installation and reconnection must be reliably prevented!
- The supply voltage must always be switched off when handling power supply leads!



### TAKE CARE

Connection changed! The power supply to the pump comes directly from XR2.

## NOTE

Pumps with integrated controller should not be controlled via the DSR.

The upper section of the device can be inserted using both guide rails into the approx. 100 mm high insert, i.e. the "parking" setting (take care that the ribbon cable is not loosened at this point). When In the parking position all fuses and terminals are easily accessible (see fig.).



The following apertures can be used when wall-mounting:

- 5 off PG 11 threaded apertures
- 4 off 12.5 mm threaded apertures for PG 7 (for Ø 3 6.5 mm) lead



### TAKE CARE

When installing in a control panel, use only the back row of threaded apertures (PG 11) which are located within the control panel.

Select the corresponding sealing ring in accordance with your lead cross section:

- 5 off sealing rings, internal Ø 9 mm (for lead Ø 8 10 mm)
- 3 off sealing rings, internal Ø 7 mm (for lead Ø 6 8 mm)
- 3 off sealing rings, internal Ø 5 mm (for lead Ø 4.5 6 mm)
- 5 off sealing rings, internal 2 x Ø 5 mm (for lead Ø 4.5 5.3 mm)
- 2 off sealing rings, internal 2 x Ø 4 mm (for lead Ø 3.5 4.3 mm)
- 2 off sealing rings, internal Ø 4 mm (for lead Ø 3.5 5 mm)

## 4.2.1 Wall mounting

- Undo the four housing screws
- > Remove the front section and put into parking position
- Break open as many thread holes on the underside of the rear section as required (see fig.).



## TAKE CARE

Use cable binders to bind together wires that are 30 mm away from the terminals. Live wires (mains voltage) must not come into contact with low voltage terminals, should they become loose.

- Remove an appropriate length of cable sheathing (depending on the length of the terminals).
- Push the threaded connector (1), the thrust collar (2) and a suitable sealing collar (3) onto the cable. Screw into the threaded bush and tighten. Sufficient cable should project into the housing to ensure that the terminal connections connot be put under strain.

- Strip approx. 7 mm insulation from the wires and attach appropriate connector sleeves.
- Connect the wires in accordance with the electrical terminal connection diagram (see Appendix). Push the wire ends into the terminals up to the start of the insulation.
- ► Tighten the terminal screws until fast.
- Remove the front section from the parking position. Place onto the back section and tight the four screws.

### NOTE

Always apply connector sleeves when working with bare wires.

Unused opened cable apertures can be closed using the stoppers (4) provided.





## 4.2.2 Control panel mounting

### NOTE

When installing in a control panel, use only the back row of threaded apertures (PG 11) which are located within the control panel.

- Unscrew the four housing screws
- > Remove the front section and place into the parking position
- Break open as many cable bushes on the underside of the back section (behind the control panel) as necessary (see fig.) with a 4.5 mm diameter screwdriver.
- > Strip the cable and attach connector sleeves as required.
- Insert the cable through the cable bushes (behind the control panel)
- Connect the cable according to the terminal connection diagram (terminal connection diagram, see Appendix).
- Remove the front section from the parking position. Place onto the back section and tighten the four screws fingertight.

## NOTE

The cable must be laid in a cable duct by the customer to prevent possible strain.



## Device overview/control elements



## 5 Device overview/control elements

The DSR controller graphical display uses the following symbols:

Symbol	Meaning
0	Stop key pressed
5	Failure
1	Redox reference value exceeded 2 point controller Oxidant metering
ŀ	Redox reference value below 2 point controller Oxidant metering
	Pulse length* (oxidant) Controller off
	Pulse length* (oxidant) Controller on

\* controls metering pump or solenoid valve

## 6 Function description

The DULCOMETER® DSR swimming pool controller is a microprocessor-controlled measurement and control device for the measured variable redox potential. It measures and displays redox potential. The DSR control functions are actuated with the corresponding control elements.

All pre-set values are stored in duplicate in an EEPROM and cannot be lost during a power failure. Values are saved on exit from a menu option using the Enter key.

In the event of a fault, the DSR screen displays a fault message.

### Start/Stop key

The process controller is activated when you press the Start/Stop key.

### NOTE

The control process begins after 2 min. (factory setting). Until then it is switched off via the metering delay to prevent overdosing. The metering delay is activated every time the system is switched on at the mains. It is also activated after calibration.

	In the input menus and permanent displays	In the menu options
"Change" key:	Toggle between the permanent display and input menus. Access menu options (Access code?)	Select an adjustable value
"Enter" key:	Used to access menu options (Access code?)	Exit a menu option and store values and access a input menu or another menu option
"Up" key:	Enter access code Priming	Change an adjustable value
"Down" key:	Enter access code	Change an adjustable value
"Start/Stop" key:	Start/stop control and metering function	Start/stop control and metering function
"CAL" key:	Return to permanent display 1	Return to input menu without saving changes

## **Function description**

## 6.1 Diagram of operating menu

The operating menu consists of

- permanent displays
- input menus
- and the settings menu options



## 6.2 Negotiating the operating menu

### NOTE

- You can exit any window of the operating menu by using the CAL key. Depending on where you are in the operating menu, you will return either to the permanent display or to the corresponding infodisplay.
- If you do not press any key within 10 minutes, the display will automatically return to permanent display 1 (does not apply to calibration menu).

### 6.2.1 Permanent displays and input menus

The individual windows in the permanent display and the input menus are accessed in turn by pressing the Change key. After having scrolled through all windows in turn, you will eventually return to permanent display 1.

### 6.2.2 Menu options

Without access code From input menus, menu options are accessed using the Enter key. The Enter key is also used to exit the menu options and simultaneously store the values selected in the menu option (see figure). If you do not want to store the value, then exit the menu option using the CAL key; you will then return to the input menu.



With access code Input menu options be accessed by entering the correct access code, if one has been set. Access to the menu options for subsequent input menus can then be gained without an access code. Once you have returned to permanent display 1, access to input menu options may only be gained by re-entering the access code.

### 6.2.3 Negotiating menu options

Once you have accessed the menu options, you will see words and figures (see figure). Adjustable values flash. You may activate another value using the Change key (value options start flashing). You may also return to a previous adjustable value using the Change key.

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### Function description / Operation and adaption

You can change an adjustable value. There are two types of adjustable value, and they are altered in two different ways:

Change word/phrase

Change numerical value

► Press the Up or Down keys to select word/expression.

Press the Up or Down keys. If you press a key briefly once, then the last figure is increased/decreased by 1. If you hold the key down, then the figure will continue to change in the direction selected. If you continue to hold the key down, the figure will change increasingly rapidly.

You can exit a menu option by pressing the Enter key or CAL key as in the operating menu.

### NOTE

Your settings become effective the moment you press the Enter key.

### 7 Operation and adaption

There are essentially two menus for the DSR:

- A restricted operating menu
- A complete operating menu

The device is delivered configured to the restricted menu. This menu contains all the necessary steps required to commission the device. The steps are as follows:

- Changing the access code
- · Changing the operating language
- Changing the reference value redox

Specialist technicians can enter or change settings in the full operating menu (access-code protected). The following options are also available:

- Switching the relay function from pulse length to two-point control
- Setting the metering delay and metering control time.

Trained personnel are thereby able to fully adapt the DSR to the process system.

## NOTE

Please read Chapter Function Description first. This gives instructions on how to negotiate the operating menu and alter values.

The operating menu comprises permanent displays and input menus with the following functions:

Permanent display 1	Monitoring Calibration (redox - chlorine allocation)
Permanent display 2	Monitoring
Priming oxidant	Priming of oxidant
Service menu	Access full operating menu
Controller settings	Set redox/xp/metering direction
Relay settings (full operating menu only)	Set controller behaviour Set to pulse length or 2 point control
General settings	Determine identity code/program version
	Set metering delay/metering monitor (full operating menu)
	Set access code
	Set language
	Activate filter/reset (full operating menu)

## **Restricted operating menu**





## Complete operating menu

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7.1 Monitoring



The device function can be monitored via permanent displays 1, 1a, 2 and 2a.

The device can display the redox value in the permanent display 1 in mV. However, it can also convert it into the chlorine concentration.



### TAKE CARE The chlorine content displayed is an approximate value only. It is by no means precise.

### 7.2 Redox-chlorine allocation (optional)

Only necessary if the device displays the chlorine content in ppm in the permanent display 1:





### TAKE CARE

- The chlorine content displayed is only an approximate value! It is not accurate.
- Redox-chlorine allocation must be carried out weekly!
- The following actions must be carried out rapidly in sequence! The chlorine content must remain constant until the redox potential has been allocated to the chlorine content!

Determine the chlorine content of the water via DPD 1 testing (see, e.g. Operating Instructions for the Photometer DT 1).

- > Remove some of the water from the pool in a clean container.
- > Determine the chlorine content with the DPD 1 test.

Allocating the chlorine content to the redox potential:

- > Press the CAL key in the first permanent display.
- In the allocation input menu, enter the determined chlorine content using the arrow keys.
- Conclude allocation with Enter key.

## 7.3 Priming

Priming of the oxidant (e.g. after changing a tank). Priming:

priming oxidant press ≜ key control stop !

> In order to prime with oxidant, use the Change key to access Settings menu, Priming, Oxidant. Press the Up key: the variable will jump to 100 % and the pump will meter for approx. 30 seconds. This also applies if you press the Stop/Start key or if metering has been switched off due to a fault message.

Stopping priming:

Press the Up key a second time.

Each time you press the Up key, the pump will prime for approx. 30 seconds.

Recommencing control functions:

► Go to permanent display 1 and press the Start/Stop key.

## 7.4 Service menu

The full operating menu is accessed when you enter the correct code number.

## 7.5 Setting controller



In this menu you can set:

- the set point for the redox potential
- the xp value



## • The set point may only be increased from a lower to a higher value.

Setting the controller:

- If the access code has been activated, enter this code using the arrow keys.
- ➤ Use the Enter key to access redox controller menu option.
- If necessary, set the redox value (flashes) via the arrow keys or the xp value (use the Change key to select).
- > Press the Enter key to exit the redox controller menu option.

## NOTE

Once you return to permanent display 1, you will have to re-enter the access code to access this menu option.



## 7.6 Relay settings

# You can select the control type in the relay settings menu.

### Pulse-length control:

If you have selected the pulse length function you can set the cycle time and the minimum making time.

### 2-point controller:

If you have selected the 2-point controller function you can set the switch hysteresis time.

You can set the active status and the pick up delay ( $\Delta t$  on) and the drop-off delay ( $\Delta t$  off) for each relay.

The relay status is indicated by the corresponding symbols in permanent display 1.

### 7.7 General settings



In the general setting menu you can:

- read off the identity code and the program version
- change the metering delay

- · adjust the metering controller
- · activate and set the access code
- select the operating language
- switch-on filtering
- reset values

### Identity code menu option

Read off the identity code and the program version:

- Access the Identity code menu option with the Enter key. Here you can read off the identity code and the program version.
- > Press the Enter key twice: permanent display 1 will appear.

### Metering delay menu option

## Metering delay

In this menu option you can set the metering delay. This will activate a delay of metering and fault processing activities after switching on the power supply (= metering delay). Use the Start/ Stop key to deactivate the delay.

### Metering monitor

In this menu option you can set the metering monitor interval. If the measured value has failed to reach the set point after this metering monitoring period, metering and control will stop. Metering and control can be restarted using the Start/Stop key only.

### Redox display menu option

The device can display the redox value in the permanent display 1 in mV or convert it into the chlorine concentration.



## TAKE CARE

The chlorine content displayed is an approximate value only. It is by no means precise.

## Selecting access code and language operating menus

Activate and set the access code or select the operating language. You can protect a settings menu with an access code. You need to activate the access code for this purpose:

- Press the Enter key twice: the access code menu option will appear
- ► If necessary, set the access code with the arrow keys
- ➤ If necessary, use the Change key to toggle to language and set the required operating language using the arrow keys.
- > Press the Enter key: permanent display 1 will appear.

### NOTE

To make it clear to users that the access code is deactivated when set to 5000, 5000 is replaced with the word "off".

### Pause 1 and 2

The pause periods are triggered by external digital isolated signals. If one of the pause inputs is activated, control is stopped and no further faults are output.

The pause periods may be individually set either as actively closed (symbol NO contact) or as actively closed (symbol NC contact). The time td determines the time after which control is activated again after deactivation of pause.

Ex-works mode is actively closed and td = 10 minutes.

The following signals may e.g. be assigned to the pause inputs:

- isolated contacts in general
- level switch contacts from suction kits
- contact from filter control
- · contact of measuring water flow sensors

### Filter

To reduce display activity, you can increase filtering of input values.

### Reset

It is possible to reset the device. This converts values back to the factory settings (see "Factory Settings" in the appendix).

### 8 Operation

### NOTE

### Please read through the chapter Function Description first in order to learn how to negotiate the operating menu and change values.

Calibration and priming must be possible during operation. For this purpose, use the corresponding chapter from "DSR settings".

### Maintenance / Repair

#### 9 Maintenance

*Maintenance* The device is maintenance-free.



### TAKE CARE Never clean the housing with solvents. Will corrode the surface!

Clean the housing with a cloth dipped in soapy water. Rub dry.

#### 10 Repair

You can only change the fuse.

## WARNING



#### Before opening the housing the system (not just • the device) must be disconnected from the power supply!

- If only the device has been disconnected from the power supply terminal XR2 may be live!
- The fuse must be replaced with an original part!

Fuse: fine fuse 5 x 20 mm 160 mA, 250 V slow to blow, Part number 71.20.48.

### Changing the fuse (see fig.):

- > Open the device and place top section in "parking position"
- > Open the bayonet fitting of the fuse holder (arrow)
- ► Replace the fuse
- ➤ Close the bayonet fitting (arrow)
- Close the device and screw together

## **Repair / Troubleshooting**



## 11 Troubleshooting

### TAKE CARE

- All failures are indicated in the display with the symbol "E" to the bottom, right. Troubleshooting must begin as soon as the "E" appears.
- If you are requested as a result to dismantle or change the probe, use the operating instructions for the probe and in-line probe housing!

## **Glossary of terms and function descriptions**

Controller "stop" means Variable = 0 % Effects:

- The pre-set metering proportion is deleted
- Relay goes into idle mode

Fault messages are given in permanent display 1a.Fault message: "check mV input ↓?"Fault: The redox probe signal is below 100 mV

Reason: The redox probe is dirty Remedy: Clean the redox probe

## Troubleshooting

Reason: Remedy:	The redox probe is faulty Replace the redox probe
Reason: Remedy:	The signal cable is faulty Check the signal cable and the plug-in probe connection as well as the device connections
Reason: Remedy:	Plug is wet Dry the plug and socket and determine and remedy the cause
<b>Fault me</b> Fault:	essage: "check mV input <b>1?</b> " The redox probe signal is above 1000 mV
Reason: Remedy:	The redox probe is dirty Clean the redox probe
Reason: Remedy:	The redox probe is faulty Replace the redox probe
Reason: Remedy:	The signal cable is faulty Remedy the fault
<b>Fault me</b> Fault:	essage: "dosing stop mV" The set mV value was not reached within the pre- determined period
Reason: Remedy:	The redox probe is dirty Clean the redox probe
Reason: Remedy:	The redox probe is faulty Replace the redox probe
Reason:	The metering pump for the oxidant/reduction agent is faulty
Reason: Remedy:	The chemical feed tank is empty Refill the tank and then reinstall from start
Reason: Remedy:	The signal cable is faulty Replace the signal cable
Reason: Remedy:	Plug is wet Dry the plug and socket and determine and remedy the cause
Reason: Remedy:	Sample water flow stopped or too low Determine the cause (circulation pump? stop valve?) and remedy

## 12 Disposal



## TAKE CARE

Observe all current locally applicable directives! (e.g. regerching electronic scrap)

## 13 Technical data

## **Electrical data**

Device:	enclosure rating II
Supply voltage:	115 V or 230 V, corresponding to details on device label
Current consumption:	max. 40 mA at 230 V; max . 80 mA at 115 V
Electrical isolation:	3750 V between the mains voltage and connecting wires
Measured variables:	mV (redox): +100 mV +1000 mV input resistance: measuring electrode: > 5 x $10^{11} \Omega$
	redox input: reference electrode: > $10^7 \Omega$
Measuring error:	$\pm 1\%$ from measurement range
Resolution:	input/output sides: 1 mV / 0.01 ppm
Display:	LCD display 100 x 32 points, measured variable character height: approx. 14 mm other characters: approx. 5 mm
Pause inputs:	Common reference potential and with RS interface but galvanically isolated from the remaining inputs and outputs.
	Insulation voltage: 500 V
Internal fuse protection:	fine fuse 5 x 20 mm 160 mA, 250 V slow to blow
Power relay output	
for switch type:	changeover, varistor-triggered
Variable output:	load capacity: 250 V AC, 3 A, 700 VA
	switch operating life: 10 <sup>6</sup> switch cycle
Enclosure ratings:	If assembled correctly, the following enclosure ratings apply: - wall mounted: IP 65 - panel mounted: IP 54

## **Environmental conditions**

Operating temperature: Storage temperature: Air humidity: -5...+50 °C -10...+70 °C < 95 % rel. humidity, non-condensing

## **Dimensions and weight**

Dimensions (W x H x D):	198 x 200 x 76 mm wall mounted version
	198 x 200 x 35 mm (W x H x $D_o^*$ ) Control panel mounted version
	198 x 200 x 38 mm (W x H x $D_i^*$ ) Control panel mounted version
Weight:	approx. 1.2 kg approx. 2.0 kg with packaging

 $^{*}D_{o}$  = outside depth, D<sub>i</sub> = inside depth

## **Material information**

Housing:	Luranyl PPE - GF10
Keypad:	Polyester film PET
Housing seal:	Foam rubber CR
Outer seal:	Foam rubber CR
Mounting devices:	Zinc plated steel
M5 screws:	A2

## **Chemical resistance**

The device is resistant to normal atmospheres in technical plant rooms.

## 14 Spare parts and accessories

### Accessories

-		
		Part. No.
•	Assembly set for control panel mounting	792908
•	Power lead	818446
•	2 m signal cable -SN6- open end with cable connector sleeves	, 1005672
•	Photometer DT1	1003473



## Table of factory settings

## Table of factory settings

Description	Factory setting	Incremental value	Min. value	Max. value	Comment
Code number	5000 (off)	1	0	9999	
Measured variable Reference value/	0.40 ppm	0.01 ppm	0 ppm	20.00 ppm	
value	700 mV	1 mV	100 mV	1000 mV	
Control parameter xp	20 %	1 %	1 %	500 %	100 % corresponds to redox range of 1000 mV
Relay 2 redox	pulse length	2-point controll pulse length	er		Relay XR2 redox
Cycle	10 s	1 s	10 s	9999 s	
Minimum time	1 s	1 s	1 s	Cycle/2	
Hysteresis	6 mV	1 mV	3 mV	100 mV	
Switch allocation	N/O	N/O N/C			
$\Delta t$ on	0 s	1 s	0 s	60 s	
$\Delta t \text{ off}$	0 s	1 s	0 s	60 s	
Metering delay	2 min	1 min	1 min (off)	30 min	on/off function
Metering control	off	1 min	1 min (off)	120 min	on/off function
Redox display	mV	mV ppm			
Language	ID code	German English French Dutch Spanish Italian			
Filter	off	1 s	1 s (off)	60 s	on/off function
Reset	no	no yes			
Pause	_/_	_/_ t_			Idle mode
td	10 min	1 min	1 min (off)	30 min	on/off function

## **Glossary of terms**

### **Redox potential**

The redox potential is dependant upon the sum of reducing and oxidising substances present in the water - or in simple terms - it is the measurement of the disinfection strength in water. The higher the concentration of oxidising substances, the higher the redox potential (oxidation = disinfection).

Hypochlorous acid is the decisive oxidant in swimming pools. The contaminants present in water reduce this level.

Temperature and pH value have the following effects on the redox value:

Rising temperature --> rising redox potential

Rising pH value --> falling redox potential.

There is no clear relationship between disinfectant concentrations and redox potential. It has been determined that at a redox potential of 750 mV, microorganisms are eradicated or deactivated in seconds. At less than 600 mV the disinfecting time can take minutes or hours.

### Control variables (Measured variable, actual value)

The control variable is the value to be measured resp. detected (e.g. redox value).

### **Reference value**

The reference value describes the value which is to be kept constant during the process.

### xp value

This value influences the proportional control relationship. Thus, an xp of 10 % at a deviation of 100 mV (= 10 % of 1000 mV) gives a variable of 100 %. If the xp value is increased by 20 % the deviation must be double that value in order to achieve a 100 % variable. If the controller overshoots, the set xp value must be doubled.

### Variable

The variable is the value (e.g. frequency of the mA signal) which the controller transmits to the control element e.g. a metering pump, in order that the set point can be reached (if the variable = 100 % the pump will run at full capacity).

## **Dosing delay**

In this menu option you can set the dosing delay. This will activate a delay of dosing and fault processing activities after switching on the power supply (= dosing delay). Use the Start/Stop key to deactivate the delay.

### **Dosing monitor**

In this menu option you can set the dosing monitor interval. If the measured value has failed to reach the set point after this dosing monitoring period, dosing and control will stop. Dosing and control can be restarted using the Start/Stop key only.

### Filter

To reduce display activity, you can increase filtering of input values.

### **Factory settings**

All factory settings are restored when a reset is carried out. These correspond to the device settings on delivery. Identity code settings are retained. Existing fault messages are deleted.

### Pause 1 and 2

The pause periods are triggered by external digital isolated signals. If one of the pause inputs is activated, control is stopped and no further faults are output. The pause periods may be individually set either as actively closed (symbol NO contact) or as actively closed (symbol NC contact).

The time td determines the time after which control is activated again after deactivation of pause.

Ex-works mode is actively closed and td = 10 minutes.

The following signals may e.g. be assigned to the pause inputs:

- isolated contacts in general
- level switch contacts from suction kits
- contact from filter control
- · contact of measuring water flow sensors

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## **Circuit diagram**



## **Conformity declaration**

	EC Declaration of Conformity
We,	ProMinent Dosiertechnik GmbH Im Schuhmachergewann 5 - 11 D - 69123 Heidelberg
hereby declare that, on the basis o circulation by us, the product speci and health stipulations laid down b Any modification to the product not	f its functional concept and design and in the version brought into fied in the following complies with the relevant, fundamental safety y EC directives. t approved by us will invalidate this declaration.
Product description :	Measurement and control system, DULCOMETER
Product type :	DSRa
Serial number :	see type identification plate on device
Relevant EC regulations :	EC - low voltage directive (73/23/EEC) EC - EMC - directive 89/336/EEC subsequently 92/31/EEC
Harmonised standards used, in particular :	DIN EN 60335-1, DIN EN 61010-1 DIN EN 50081-1/2, DIN EN 50082-1/2, DIN EN 55011 DIN EN 61000-3-2, DIN EN 61000-3-3, DIN EN 61000-4-2 DIN EN 61000-4-4
National standards and other technical specifications used, in particular :	DIN 19226 DIN IEC 38 IEC 61000-3-2, IEC 61000-3-3, IEC 61000-4-2, IEC 61000-4- VDE 0838-3-2/3-3, VDE 0847-4-2
Date/manufacturer's signature :	12th January 2001 Man Jun

**ProMinent**<sup>®</sup>

## Addresses and delivery through manufacturer:

ProMinent Dosiertechnik GmbH Im Schuhmachergewann 5-11 69123 Heidelberg · Germany

Postfach 101760 69007 Heidelberg · Germany

Telephone: +49 (6221) 842-0 Fax: +49 (6221) 842-419 info@prominent.de www.prominent.de