Operating Instructions DULCOMARIN[®] II Pool Controller Part 1: Mounting and Installation





Imprint

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Operating instructions DULCOMARIN® II Pool Controller Part 1: Mounting and Installation © ProMinent Dosiertechnik GmbH, 2004

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Device identification / Identcode

The identcode describes the entire **DULCOMARIN® II compact** unit.



Device identification / Identcode

The identcode describes the entire DULCOMARIN® II DULCO®-Net central unit.

DX	Ca	D	UL		MA	RIN	l® II	Po	ol	Co	nt	rol	ler,	eries DXC	
		Mounting type:WWall mounted (IP 65)SControl cabinet (IP 54)													
				0 2	Design:0with controls2without controls										
			_			Co	mmu	nica	tion	inter	rfac	es:			
					0 5	noi Em	ne ibedd	ed V	Veb S	Serve	ər, L	AN			
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									reset language:						
													00 DE	o controls⁴) aerman	
													EN ES	nglish Ipanish	
													FR IT	rench alian	
														Approvals:	
														The identcode describes the entire DULCOMARIN [®] II DULCO [®] -Net central unit.	
														The peripheral components mentioned in the above item list, however, are not included.	
														If modules are assigned to the central unit, the following applies:	
														Module 1 is preferably assigned as sensor module and module 2 is preferably assigned as actuator module.	
														Module 3 is always assigned as mains power module.	
														A mains power module must be provided if more than 6 external modules exist.	
														⁴⁾ only in the version: 2 without controls	
DX	Ca	↓ w	,	↓ 0	•	↓ 0	0		↓ 0	↓ P		¥ S	↓ DE	r 11	

General user information

Please read through the following user guidelines! Familiarity with these points ensures optimum use of the operating instructions.

Key points in the text are indicated as follows:

- · enumerated points
- hints

Working guidelines:

NOTE

Notes are intended to make your work easier.

and safety guidelines:

CAUTION

Characterizes a possibly hazardous situation. There is a danger of slight or minor injury if these notes are disregarded!



IMPORTANT

Characterizes a possibly endangering situation. There is a danger of damage to property if these notes are disregarded!

1 About this controller

In our times of wellness, swimming and bathing are among the most popular leisure-time activities.

Pools are used by many people at the same time. Swimming pool and bathing basin water are not allowed to pose any health risks, in particular not through pathogens.

Thus, automatically controlled dosing units according to DIN 19643 and devices for measuring free chlorine, redox/ORP, and pH value must be installed in all public swimming and bathing pools.

The DULCOMARIN® II is the ideal solution

The DULCOMARIN $^{\ensuremath{\circledast}}$ II is a measuring and control device exclusively designed for the special demands of swimming pools.

ProMinent is the first supplier using the DULCOMARIN[®] II with a standard bus system for networking the sensors and actuators and the control device for swimming pools. The device is equipped with the standardised bus system CANopen[®]. This is a system that already has a well-proven record of success in a variety of applications including elevators, motor vehicles, ships, medical equipment as well as building installations and rail vehicles. The prerequisite for all these applications is a fast and extremely reliable transmission medium.

Various types according to DIN 19643 are available to suit the most diverse applications such as exclusive private swimming pools, whirlpools and public swimming pools. Preset appropriate setpoints and limit values facilitate commissioning of the controller almost without any operating expense.

All modules are based on the plug & play principle.

A flexible system that, corresponding to specific requirements, can be configured as a compact or distributed modular system while being fully prepared for future applications. The DULCOMARIN[®] II can be configured in two ways:

The **DULCOMARIN® II compact** is used to control one single swimming pool.

The distributed modular system **DULCOMARIN[®] II DULCO[®]-Net** is designed for controlling up to 16 filtration cycles.

2 Safety chapter

2.1 Proper use

The pool controller DULCOMARIN® II is exclusively designed for:

- Measuring and controlling of the pH value or the redox/ORP
- Measuring and controlling of the chlorine concentration
- Measuring of the temperature
- Dosing of flocculants
- · Displaying of the measuring values
- Creating of output signals
- The pool controller is exclusively designed for use in swimming pools!

All other uses or modifications require the prior consent of ProMinent Dosiertechnik GmbH, Heidelberg, Germany!

• The controller may not be used for applications in the open!

2.2 Notes on safety



CAUTION

- To guarantee safety, all persons coming into contact with the controller, must read and observe these operating instructions. It is only through reading and observing the operating instructions that possibly emerging risks can be minimised.
- The DULCOMARIN[®] II may only be operated by specially trained and authorised personnel!
- The devices described in this operating instructions may be only used in connection with certified third-party devices and third-party components!



IMPORTANT

- Prevent any excess dosing of hazardous material in case of sensor failure or removal. Prepare your controller for these events.
- The transparent interface cover above the LEDs (opened in fig. 11) must be re-tightened in a moisture-resistant way if ever opened. Otherwise, the degree of protection IP 65 will not be guaranteed.
- The DULCOMARIN[®] II has no on/off switch. The controller starts operating as soon as it is connected to the mains supply.

3 Storage and transport



IMPORTANT

Only store and transport the DULCOMARIN[®] II in its original packaging. Also protect the packaged DULCOMARIN[®] II against humidity and exposure to chemicals.

Environmental conditions for storage and transport:

Temperature: -10 °C to 70 °C

Relative humidity: max. 95 % relative humidity, non-condensing

4 Requirements on the installation location and planning aids

4.1 Requirements on the installation location

- Do not position the DULCOMARIN® II in the open!
- The DULCOMARIN® II must be protected against exposure to the sun and freezing!
- It must be able to secure DULCOMARIN[®] II against unauthorized access!
- A mains connection is required.

WARNING

With control of a chlorine gas dosing unit (e.g. control valve): In case of failure of the system it must be guaranteed that the chlorine gas dosing unit still operates. The mains connections must be protected separately.



IMPORTANT

It must be possible to switch on and off the socket-outlets for the mains power modules together for all mains power modules and independent of other devices.

4.2 Determination of the required cables and accessories

A complete measuring system could look as follows:



Item	Number	Designation	Order no.
2	1	M-module DXMa M W 0 S DE 01	
5	1	In-line probe DGMa 3 2 2 T 0 0 0	
6	1	Chlorine sensor CTE 1 CAN-10 ppm	1023427
7	1	Chlorine sensor CLE 3.1-CAN-10 ppm	1023426
8	3	T-distributor M12 5P CAN	1022155
11	3	Connecting cable - CAN, M12, 5P, 0.5 m	1022137
11a	1	Connecting cable - CAN, M12, 5P, 0.3 m	1024568
18	1	pH electrode PHES 112 SE	150702
19	1	ORP electrode RHES-Pt-SE	150703
20	2	Coax cable 2 m - SN6 - prefabricated	1024106
21	2	Signal lead 2 x 0.25 mm ²	725122

Accessories are enclosed with the central unit and all external modules.

Central unit DXCa:



Requirements on the installation location and planning aids

Accessories, enclosed

Number	Designation	Order no.
1	T-distributor, M12, 5P, CAN	1022155
1	Load resistor M12 coupling (male)	1022154
1	Load resistor M12 plug (female)	1022592
1	Connecting cable - CAN, M12, 5P, 0.5 m	1022137

External module DXMa:





Accessories, enclosed

Item	Number	Designation	Order no.
8	1	T-distributor, M12, 5P, CAN	1022155
11a	1	Connecting cable - CAN, M12, 5P, 0.3 m	1024568

Sensors DXUa:



Accessories, enclosed

ltem	Number	Designation	Order no.
8	1	T-distributor, M12, 5P, CAN	1022155
11	1	Connecting cable - CAN, M12, 5P, 0.5 m	1022137

- Determine the required mains power modules (see next chapter).
- Determine the required connecting cables between the external modules.
- ► Finally, determine the required retaining clamps for the connecting cables. (ASV pipe clamp, 16 mm, order no. 359904).

Arrange the mains power modules in the CAN Bus main train (DULCOMARIN® II DULCO-Net)

• Determine the required number of mains power modules (N-modules and P-modules).

Rule of thumb:

Use one mains power module for each even pool number - plus 1 mains power module (e.g. in the central unit).

Example: 5 pools

In this case, the even pool numbers are: 2 and 4 - corresponding to 2 mains power modules - plus 1 mains power module = 3 mains power modules

- Distribute the mains power modules as evenly as possible across the CAN bus train.
- The distance between the mains power modules should not exceed 15 m.
- In case of an A-module with connected recorders: Position one of the mains power modules as close as possible to the A-module.
- Make sure that a socket-outlet exists for each mains power module.

Requirements on the installation location and planning aids / Mounting and installation

Routing of the CAN bus main train



IMPORTANT

- Please also read the chapter 5.3 "CAN bus cables, installation".
- The sum of the spur lines branching off of the CAN bus main train must remain smaller than 10 m (do not forget to count the CAN cables in the DXC housings (length 0.6 m)).

NOTE

- The external modules may be positioned in any sequence in the CAN bus main train. The examples in this operating instructions show idealised sequences of external modules.
- The CAN cables are to be provided at each end with plugs and couplings such that they can be coupled for extension purposes.

Rule:

First mount and install the external modules and their peripherals, then connect the external modules and the CAN bus main train using the shortest distance possible.

List of the available CAN cables, external

Connecting cable - CAN, M12, 5P, 0.3 m	1024568
Connecting cable - CAN, M12, 5P, 0.5 m	1022137
Connecting cable - CAN, M12, 5P, 1 m	1022139
Connecting cable - CAN, M12, 5P, 2 m	1022140
Connecting cable - CAN, M12, 5P, 5 m	1022141
Connecting cable - CAN, by the meter	1022160

5 Mounting and installation

IMPORTANT

- The DULCOMARIN[®] II is resistant to normal atmospheres prevailing in the control rooms.
- The controller must be protected against rain, freezing, and direct exposure to the sun. The controller may therefore not be mounted in the open!
- The mounting location must be a freeze-protected room having an ambient temperature ranging between 0 °C and 50 °C. The atmosphere in this room must be non-condensing.
- The transparent interface cover above the LEDs (opened in fig. 11) must be re-tightened in a moisture-resistant way if ever opened. Otherwise, the degree of protection IP 65 will not be guaranteed.

5.1 Procedures for DXC housings (large)

5.1.1 Mounting (mechanical)

The DXC housing may be wall-mounted or mounted in a control panel.

5.1.1.1 Wall mounting

Mounting material (included in the scope of delivery)

- 1 x wall bracket
- 4 x PT screws 5 x 35 mm
- 4 x washer 5.3
- 4 x plugs Ø 6 mm, plastic

Please observe the following steps for wall mounting

- ▶ Remove wall bracket from the DXC housing:
 - Pull both snap-on hooks away from the controller the wall bracket is lowered a bit (fig. 1,1). Seen from the DXC housing, push the wall bracket to the bottom and lift to the top (figs. 1, 2 and 3).
- Use the wall bracket as drilling template and mark four holes.
- ▶ Drill the holes: Ø 6 mm, d = 50 mm
- Fasten the wall bracket with the screws and washers (fig. 2).
- Place the DXC housing in the bottom of the wall bracket (fig. 3, 1) and press it carefully into the top of the wall bracket (fig. 3, 2). Then check whether the controller is securely positioned at the top and press to the bottom until an audible click is heard (fig. 3, 3).



Mounting and Installation





5.1.1.2 Control panel mounting



IMPORTANT

The control panel must be of sufficient strength to prevent any deformation after mounting! (Steel must have a strength of at least 2 mm; plastics must be of greater strength!)

Otherwise, the degree of protection IP 54 will not be guaranteed!

NOTE

When mounted, the DXC housing protrudes approx. 45 mm from the front of the control panel. A drilling template is enclosed.

Fig. 4: Control panel mounting



Please observe the following steps for control panel mounting

- Use the drilling template to position the DXC housing correctly at the control panel and fix the template.
- Punch-mark the holes for the mounting screws and the holes for the recess through the drilling template.
- ▶ Use a drill of Ø 5 mm for drilling the holes.
- Either punch out the recess or drill the inner four holes with a drill of Ø 5 mm and remove the recess with a compass saw.



CAUTION

The edges created may result in injuries!

- Break off the edges.
- ► Loosen the four housing screws.
- ▶ Lift the front part and disconnect the flat cable from the P-module.
- Remove the front part.
- It is recommended to break out the threaded holes in the bottom row in this step. (nos. 1 - 10, see chapter 4.2).
- ▶ Use the enclosed PT screws to fix the rear part to the control panel.
- ▶ Re-connect the flat cable.
- Place the front part in "park position".

NOTE

First make the electrical connections of the $\textit{DULCOMARIN}^{\texttt{0}}$ II and then complete the mounting.

▶ Position the front part on the rear part of the DXC housing and tighten the screws.



IMPORTANT

Check again for a correct position of the gaskets!

The degree of protection IP 54 will only be guaranteed if the assembly was performed correctly!

5.1.2 Installation (electrical)



IMPORTANT

- The installation may only be performed by specially trained personnel!
- Please observe the relevant information in Chap. 10 "Technical Data" and the supplementary instructions DULCOMARIN[®] II, Modules DXMa.
- During the installation, the device must not be connected to the mains supply!
- On the hardware side and the software side safety measures must be taken to guarantee that the DULCOMARIN[®] II goes into a safe operating condition in the event of failure! E.g. use limit value switches, manual interlocks, ...
- In case of devices operated through system voltage ensure that the system voltage range used by the device matches the local supply!
- In case of supply of the devices with 24 V auxiliary voltage, ensure that the extra-low voltage is safely separated from other voltages!
- The signal lines of the DULCOMARIN[®] II must not be routed together with highinterference lines.
 Very large interferences may result in malfunctions of the DULCOMARIN[®] II.
- In case of mounting in a control panel, the cable must be routed in a cable conduit provided by the customer to relieve strain.
- Plan which threaded holes are to be broken out (colour desired threaded holes).
- It is recommended to remove the modules at the break-out positions (loosen the red knurled screw). The modules are thus protected against damage.

IMPORTANT

When breaking out the threaded holes make sure that the screwdriver does not penetrate the housing too deeply.

- Interior parts of the controller might be damaged.
- To break out the threaded holes, push a small or medium-sized screwdriver (blade size 3.5 4 mm) into the slot at the centre of the threaded hole and push out the material (fig. 5).
- Refinish the edges.

Fig. 5: Break-out threaded hole



- ► Re-mount the modules.
- ▶ Re-connect the flat cable to the front part and place the front part in park position.
- ► Fix the corresponding screw fittings (fig. 6, 2) with the matching fastening nuts (fig. 6, 1) and tighten securely.
- Position the multiple gaskets (fig. 6, 2) into the screw fittings depending on the used cable cross-section (see table in the terminal diagram in the annex).
- Insert the cables into the screw fittings.
- ► The further steps are described in 5.1.2.2 "Coaxial cable, connection" and 5.1.2.3 "Terminals, connection".

Please continue with the following steps:

- ▶ Tighten the union nut (fig. 6,4) of the screw fittings such that the fitting is tightly sealed.
- Position the front part onto the rear part.



IMPORTANT

Check again for a correct position of the gaskets! The degree of protection IP 65 will only be guaranteed if the assembly was performed correctly!

Tighten the housing screws finger-tight.

Mounting and Installation

Fig. 6: Screw fitting mounting



5.1.2.2 Coaxial cable, connection

The pH and/or redox/ORP sensor is connected through a coaxial cable

Expose the shield of the cable (reference electrode) as shown in fig. 7 (right side) and fix using the shield clip.

The liquid reference potential must not be connected for measurements under normal conditions. In case of difficult electrical conditions, an equipotential bonding pin is to be connected to terminal no. 5 or no. 6 (activate later the liquid equipotential bonding in "Configuration" and "Parameter settings").

The annex (terminal diagram) contains an overview of the connection options.

5.1.2.3 Terminals, connection

- Strip the cable ends as shown in fig. 7 (left side) and press on appropriate wire end ferrules.
- ▶ Disconnect the terminal blocks P1 through P4 for installation purposes.
- ► For the connection of the cables, insert the enclosed screwdriver completely into the square opening at the relevant terminal to be able to insert the cable end into the terminal block.
- Connect the cables as shown in the terminal diagram.
- Having connected the cables, re-connect each disconnected terminal block at its original position on the board.
- Check the entire wiring based on the terminal diagram.

NOTE

The terminal diagram is shown in the annex.

In addition, the modules are equipped with a label close to the terminals showing the data for connection.



5.2 Procedures for DXM housings (small)

Mounting and installation of the DXM housing is described in the "Supplementary instructions DULCOMARIN® II, Module DXMa".

5.3 CAN bus cable, installation

IMPORTANT

IMPORTANT

The sum of the spur lines branching off of the CAN bus main train must remain smaller than 10 m (do not forget to count the CAN cables in the DXC housings (length 0.6 m)).

5.3.1 Connections external to the housing



 Connect the individual parts of the CAN bus train one after each other starting from one side!

Otherwise, there is the possibility that at one or several positions socket may be positioned on socket or plug on plug!

- Never connect a T-distributor directly to the housing! The flush-type connector at the housing might break!
- Manually tighten the screw fittings of the CAN cables up to the stop! Otherwise, the degree of protection IP 65 will not be guaranteed.

NOTE

The CAN devices are always equipped with connectors, never with sockets.

External modules, CAN-type chlorine sensor and the DULCOMARIN[®] II are interconnected by a CAN bus train. This is normally a CAN bus cable with a load resistor each at its ends (parts on dotted line in fig. 8). The individual CAN devices are looped into this CAN bus train:

Mounting and Installation

- Connect a spur line as short as possible (e.g. 0.3 m) with a T-piece at the end (see box in fig. 8) to each module and the DULCOMARIN[®] II (DXC: flush-type connector CAN 1).
- connect the T-pieces of the CAN modules one after each to CAN cables or directly couple with each other
- fix a load resistor each at both remaining ends of the CAN bus train (1 x with connection plug, 1 x with connection socket).



Mounting and Installation



Fig. 9: Looping in of modules into the CAN bus train, DULCO®-Net version

5.3.2 Connections within the DXC housing

NOTE

In general it is not necessary to change anything at the cable connections within the DXC housing.

All CAN bus cables end at the P-module (power module) (5), see fig. 10, or the N-module

- the five wires of the flush-type connector CAN 1 (1) at (2)
- the 16P flat cable of the display and operating module (not shown) at (3)
- the 10P flat cable of the A-module (actuator module) (6) and the M-module (sensor module) (7) at (4)



1 Flush-type connector CAN 1

- 2 Cable connection to the flush-type connector CAN 1
- 3 Cable connection to the A-module and the M-module
- 4 Cable connections to the display and operating module
- 5 P-module (Power module)
- 6 A-module (Actuator module)
- 7 M-module (Sensor module)



If no P-module or N-module is located in the DXC housing:

Use a so-called L-board as distributor for the CAN bus lines (see fig. 11).

- 1 Flush-type connector CAN 1
- 2 Cable connection to the flush-type connector CAN 1
- 3 Cable connection to the A-module and the M-module
- 4 Cable connections to the display and operating module





Controller layout and controls

7 Description of functions (general)

The pool controller DULCOMARIN[®] II is designed for controlling one or several filtration cycles (depending on design).

The basic functions are assigned to the following modules (see also fig. 10)

- M-module (Sensor module)
- A-module (Actuator module)
- R-module (Cl₂-Actuator module)
- P-module (Power module)
- N-module

M-module (Sensor module)

- Measurement and control of the pH value
- Measurement and display (optional control) of the redox/ORP
- · Measurement and display of the temperature of the sample water
- Measurement and display of the circulation throughput
- · Monitoring of the sample water
- · Measurement of the temperature of the sample water
- Measurement of free chlorine
- Measurement of total chlorine
- Display of combined chlorine (optional; calculated from difference of total chlorine and free chlorine)

A-module (Actuator module)

- Control of dosing pumps for pH correction and disinfectant dosing (via 3 frequency outputs, 3 switch inputs for pump errors or monitoring of tank level)
- Output of measuring values for pH value, redox/ORP, free chlorine, total chlorine, combined chlorine, or temperature (4 analogue outputs 0/4...20 mA, user-programmable and scalable)

R-module (Cl₂-Actuator module)

 Control of an actuator with position feedback for disinfectant dosing (2 relay outputs, position feedback input)

P-module (Power module)

- · Control of solenoid valve or peristaltic pump for pH correction (via pulse length output)
- · Control of solenoid valve or peristaltic pump for disinfectants (via pulse length output)
- Control of peristaltic pump for flocculants (via pulse length output) or minimisation of combined chlorine (via relay output)
- Alarm (via relay output)
- · Supply of the CAN bus with supply voltage

N-module

• Supply of the CAN bus with supply voltage

Description of Function (general) / Maintenance and Repair



- DULCOMARIN® II
- 2 In-line probe housing DGMa
- 3 Chlorine sensor CLE
- 4 Chlorine sensor CTE
- 5 T-distributor
- 6 M12 load resistor coupling
- 7 M12 load resistor plug
- 8 CAN connecting cable
- 9 pH sensor
- 10 redox/ORP sensor

- 12 control lead 13 Dosing pump 1
- 14 Dosing pump 2
- 15 Alarm horn

8 Maintenance and repair

Maintenance

The DULCOMARIN® II is maintenance-free. It is recommended to clean the housing with a cloth dampened with soap water. Subsequently, rub dry.



IMPORTANT

Do not use any solvents! Otherwise the surfaces may be damaged!

Please return the DULCOMARIN[®] II to ProMinent for any repairs required. Repairs

9 Disposal



CAUTION

Lithium batteries may emit substances detrimental to health, they may get hot or explode if treated improperly or with force (heating up, short-circuiting, crushing, ...)!

IMPORTANT

- The lithium battery is hazardous waste! The battery must be disposed of separately from the controller! Please observe the relevant local regulations!
- Electronic waste is hazardous waste! Please observe the relevant local regulations!

The battery is located in a retainer on the back of the upper DXC housing part.

- ► Loosen the four fixing screws at the front of the upper housing part, separate the upper housing part from the lower part to gain access to the battery.
- ▶ Press onto the lug at the retainer (see fig. 14) and remove the battery from the retainer.



10 Technical data

(supplementary to modules)

11 Replacement parts and accessories

Description:	Order no.
Chlorine sensor CLE 3-CAN-10 ppm**	1023425
Chlorine sensor CLE 3.1-CAN-10 ppm**	1023426
Chlorine sensor CTE 1-CAN-10 ppm**	1023427
Chlorine sensor CGE 2-CAN-10 ppm**	1024420
T-distributor M12 5P CAN	1022155
M12 load resistor coupling	1022154
M12 load resistor plug	1022592
Connecting cable - CAN, M12, 5P, 0.3 m	1024568
Connecting cable - CAN, M12, 5P, 0.5 m	1022137
Connecting cable - CAN, M12, 5P, 1 m	1022139
Connecting cable - CAN, M12, 5P, 2 m	1022140
Connecting cable - CAN, M12, 5P, 5 m	1022141
Connecting cable - CAN, sold by the meter	1022160
Plug-CAN M12 5P, screw terminal	1022156
Coupling-CAN M12 5P, screw terminal	1022157
pH electrode PHES 112 SE	150702
Redox/ORP electrode RHES-Pt-SE	150703
Cable combination Coax 0.8 m - SN6, prefabricated	1024105
Cable combination Coax 2 m - SN6, prefabricated	1024106
Cable combination Coax 5 m - SN6, prefabricated	1024107
Signal lead, sold by the meter, 2x0,25 mm ²	725122
Buffer solution pH 4, red, 50 ml	506251
Buffer solution pH 7, green, 50 ml	506253
Buffer solution redox/ORP 465 mV, 50 ml	506240
Fuse 5x20, slow, 0.63 AT VDE	712030
Battery 3 V, approx. 190 mAh Li-battery BR2032	732829

**For diaphragm caps and electrolytes for chlorine sensors see the product catalogue

12	EC Declaration of Conformity
	EC Declaration of Conformity
We,	ProMinent Dosiertechnik GmbH Im Schuhmachergewann 5 - 11 D - 69123 Heidelberg
hereby declare that, on the basis of circulation by us, the product spect and health stipulations laid down to Any modification to the product no	of its functional concept and design and in the version brought into cified in the following complies with the relevant, fundamental safety by EC regulations. In approved by us will invalidate this declaration.
Product description :	measurement and control system DULCOMARIN II
Product type :	DXCa, DXMa
Serial number :	see type identification plate on device
Relevant EC regulations :	EC - low voltage regulation (73/23/EEC subsequently 93/68/EEC) EC - EMC - regulation (89/336/EEC subsequently 93/68/EEC)
Harmonised standards used, in particular	DIN EN 60068-2-30, DIN EN 61010-1, DIN EN 60335-1, DIN EN 50106, DIN EN 60204-1, DIN EN 60529, DIN EN 61326, DIN EN 61000-3-2, DIN EN 61000-3-3, DIN EN 50325-4, DIN EN 60746-1
National standards and other technical specifications used, in particular :	DIN 19265, ISO 11898-2
Date/manufacturer's signature :	23.03.2005 Nohle
The undersigned :	Dr. Andreas Höhler, director research and development

CAN standards and specifications complied with

The controller meets the standardised CAN specification for hardware 2.0 (ISO99-1, ISO99-2). This includes the CAN protocol (ISO 11898-1) and details about the physical application layer in accordance with ISO 11898-2 (high speed CAN to 1Mbit/sec.) and ISO 11898-3 (low speed CAN to 125kBit/sec.).

The device complies with the CAN-Open specification CIA-DS401, the basis of the European Standard EN50325-4. It complies with the controller device profile CiA-404.

(Example arrangement of the modules) X Γ __ ____ ⊘ Ξ z P-module (Power module) DXMaP <u>4</u>0 8/9 (cf. Supplementary Instructions) 00 Б 6/7 4/5 Р2 Ų E <u>ო</u> P1 < \bigcirc CAN1 000 A-module (Actuator Module) DXMaA (cf. Supplementary Instructions) 8 -56[1 2 3 4 1 81 82 6 Π ₽ E K1 + K2 + K2 9 10 1112 13 14 9 6 9 6 9 6 9 M-module (Sensor module) DXMaM (cf. Supplementary Instructions) < \Rightarrow 1 POT 2 56 ¢ |1] |1] |1] <

Terminal diagram (DULCOMARIN® compact)

Wiring of the modules within the DULCOMARIN® compact

(for example on the previous page)

		Description	Terminal descrip- tion	Terminal no.	Pol.	Function	Rec. cable diameter	Drilling hole no. / size	Remarks
		Tomporature input Pt1000 /100	ртр	1	+	Temp	d 5	1/M16	
Module DXMaM				2	-	sensor	40	1/1/10	
		ORP input 1	ORP(pH)	3	Ref.	ORP-	10/15	0 (1400	Lead cable through
				4	meas sig.	sensor	03/05	27 M20	2x5 or 2x4 mm
	Σ	Liquid reference potential 1	Pot.1	5				11 / M12	
	(Ma	Liquid reference potential 2	Pot.2	6		nH-		11 / M12	
	â			7	Ref.	sensor			Lead cable through
	gul d	pH input 2	(ОКР)рн	8	meas sig.		d3/d5	2 / M20	multiple gasket set 2x5 mm
	ŝ	Digital input 1	К 1	9	+	Error	d 4		
		Digital input i		10	-	sample water		3 / M16	Lead cable through
		Digital input 2	K 2	11	+		d 4		multiple gasket set 2x4 mm
				12	-	(backflushing)			
		Digital input 3	К 3	13	+		d 4	12 / M12	
-				1	+	Pump acid control or			
		Relay output 1	R 1	2	-	pump alkaline control	d 5	13 / M12	
		Deless esterat 0	Do	3	+	Pump chlorine control			
		Relay output 2	R2	4	-	pump acid control	d 5	14 / M12	
		Relay output 3	B 3	5	+	Pump flocculant control	d 5	d 5 15 / M12	
			no	6	-	pump chlorine control	40		
		Digital input 1	К1	7	+	Error pump or	d 4		
	aA		+	8	-			4 / M20	Lead 2 cables through
X	X	Digital input 2	K 2	9	+	Error pump or	d 4		multiple gasket set 2x4 mm
	e e		+	11	+	Error pump or			
	npo	Digital input 3	К 3	12	-	level	d 4	5 / M16	
	ž			13	+				
		Power output 0/4-20mA 1	Tout 1	14	-	Recorder connection pH	6/M162	C (M1C O	Lead 2 cables through
	ĺ	Power output 0/4 20mA 2	l out 2	15	+	Pacardar connection OPP	d4 67	6/10162	multiple gasket set 2x4 mm
		Power output 0/4-2011A 2		16	-		u 4		
		Power output 0/4-20mA 3	I out 3	17	+	Recorder connection free chlorine	d 4		
				18	-	or recorder connection temperature	7/M162	7 / M16 2	Lead 2 cables through multiple gasket set 2x4 mm
		Power output 0/4-20mA 4	I out 4	19	+	Recorder connection combined chlorine	d 4	d 4	
				20	-	Control signal-born			
		Alarm relay	P1	2			d 6.5 8 / M16	8/M16	
				3					
				4 Control solenoid valve (dulco®flex) acid or		- /			
	laP	Power relay 1	P2	5		control solenoid valve (dulco®flex) alkaline	d 6.5	97M16	
	X	Power relay 2	РЗ	6		Control solenoid valve (dulco®flex) chlorine or	d 6 5	18 / M12	
	le	T Ower relay 2		7		control solenoid valve (dulco®flex) ORP	0.0	1071012	
	lodt			8					
	Σ	Power relay 3	P 4	9		Control UV plant (ozone, activated carbon)	d 6.5	19 / M12	
				10	PE				
		Power	X 1	11	N		d 6.5	10 / M16	
				12	L(1)				
-				1	Shield				
3	ctic	OANIA hus sa "		2	24V		Plug		
CAN m conne	nne n	CAIN 1 - DUS CONNECTION	CAN 1	3	ground		(A-coding)	16 / M12	
	58			5					
			1			1			

* The detailed assignment options are described in the "Supplementary instructions DULCOMARIN® II, Modules DXMa".

NOTE

The terminal diagrams for further modules are described in the "Supplementary instructions DULCOMARIN[®] II, Modules DXMa".

Technical changes reserved.

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