

Simply enjoy the best water!

din-o-zon® V2

Compact Ozone System

Manual applicable for systems starting from device number: 486-2007

Installation and Operation Instructions



Englisch

CE

Subject to technical changes
2030-000-63 / 0905

Contents

1.	GENERAL INFORMATION	4
1.1	GENERAL	4
1.2	NOTES IN BOLD	4
1.3	GUARANTEE	4
1.4	SAFETY INSTRUCTIONS	4
1.5	TRANSPORT DAMAGE	5
2.	TECHNICAL DATA	6
3	PIPING AND CONNECTION SCHEMATIC	8
3.1	FIGURE DIN-O-ZON	9
4	INSTALLATION	11
4.1	NOTES ON INSTALLATION	11
4.2	INSTALLATION ROOM	11
4.3	SETTING UP	11
4.4	WATER WITHDRAWAL AND RETURN FLOW	12
4.5	WITHDRAWAL	12
4.6	RETURN	12
4.7	CURRENT ENTRY	12
4.8	INJECTOR	13
4	COMMISSIONING - OPERATION	14
5.1	OPERATING PROCEDURE	15
5.2	AIR VOLUME	16
6	MAINTENANCE AND CARE	17
6.1	REPLACING THE ACTIVATED CHARCOAL	17
6.2	MAINTENANCE OF THE INJECTOR (MODEL DCG06)	17
6.2.1	Cleaning the nozzle / diffusor:	17
6.2.2	Checking the double non-return valve (suction-pressure valve):	18
6.2.3	Safety membrane cut-off	18
6.2.4	Changing the piston	19
6.2.5	Changing the seat / diaphragm and checking the spring	19
7.	SPARE PARTS LIST FOR INJECTOR DCG 06 WITH DOUBLE SAFETY MEMBRANE SHUT- OFF (STARTING 2006)	21
	FURTHER PRODUCTS FROM OUR RANGE	24
	ORDER FORM	25

Operating Instructions

1. General Information

1.1 General

This technical information contains instructions for installation, commissioning, maintenance and repair of the dinotec din-o-zon system.

The safety instructions and notes in bold type are to be observed at all times!!

1.2 Notes in bold

In this technical information, the bold headings **CAUTION**, **WARNING** and **NOTE** have the following meaning:

CAUTION: This heading is used if failure to observe the operating or working instructions or prescribed procedures, or incorrect observation of such instructions and the like can lead to accident or personal injury.

WARNING: This heading is used if failure to observe the operating or working instructions or prescribed procedures, or incorrect observation of such instructions and the like can lead to damage to the equipment.

NOTE: This heading is used to draw special attention to important points.

1.3 Guarantee

The manufacturer guarantees the operating safety and reliability of the system only if the following conditions are observed:

- Installation, connection, setting, maintenance and repairs are carried out only by authorised and qualified specialist personnel.
- Only original replacement parts are used for repairs.
- The instrument / the system is used in accordance with the instructions in the technical manual on hand.
- Use of dinotec water care products (see Appendix).

WARNING: The use of concentrated hydrochloric acid in the immediate vicinity of our equipment invalidates the guarantee!

1.4 Safety instructions

The equipment has been manufactured and tested in accordance with DIN 57411/VDE 0411 Part 1, Protective Measures for Electrical Equipment, and left the factory in a safe condition. In order to maintain this condition and to ensure a continued safe operation, the user must observe the notes and warnings contained in this technical manual. If it must be assumed that a safe operation is no longer possible, the system must be switched off and taken out of service, and made safe against accidental operation.

This is the case:

- if the system shows visible evidence of damage,
- if the system is apparently no longer in working order,
- after longer periods of storage under unfavourable conditions.

Operating Instructions

1.5 Transport damage

The din-o-zon compact ozone system was carefully and properly packed for transport. check that the delivery is complete, and that all parts and the equipment are undamaged. Any damage during transport is to be notified **immediately** (to the freight carrier).

WARNING: The systems must only be transported in an upright, standing position. No liability is taken over for subsequent damage caused by non-observance of this information.

Subject to technical changes and modifications in the composition of components.

Product information:

The **din-o-zon system** can be used in public and private indoor and outdoor pools as well as in diving pools and whirlpools.

The **din-o-zon system** is supplied as complete system and can be connected to every type of pool water circulation without problems. It is suitable for treatment or conditioning of up to 150 m³ circulation capacity per hour.

Use of the **din-o-zon system** has been well proven in a wide range of applications. Together with a dinotec measuring and control system, the **din-o-zon** offers the highest degree of safety and top modern conveniences.

Procedure:

In the **din-o-zon procedure**, the advantages of ozone are used without the technical complexity and expenses that are normally required. A slip stream of the treated water is withdrawn before or after chlorination and is treated with ozone. Excess ozone is bound to activated charcoal after the gas phase. The water treated in this way is added to the main circulation flow. Possible residual quantities of dissolved ozone are reduced by dilution or reactive decomposition to such a degree that no free ozone is detectable in the pool water.

Due to the continuous treatment of a slip-stream of the filtered water with ozone, the effects of water treatment go far beyond the results of conditioning using only chlorine.

2. Technical data

din-o-zon compact ozonator (0610-341-90)

Compact system for an additional disinfection in swimming pools and whirlpools

Ozone generator

Ozone output: 2 g/h
Current consumption: 0.125 KW

Booster pump IN-V 2-40
Pump capacity: 4 m³/h
Current consumption max.: 4.5 A
Motor capacity: 0.55 kW

Overall electrical connection: approx. 0.8 kW

Mains connection: 220-240V, 50 Hz

Size (W x D x H): 540x 420x1280 mm

Weight: approx. 55 kg

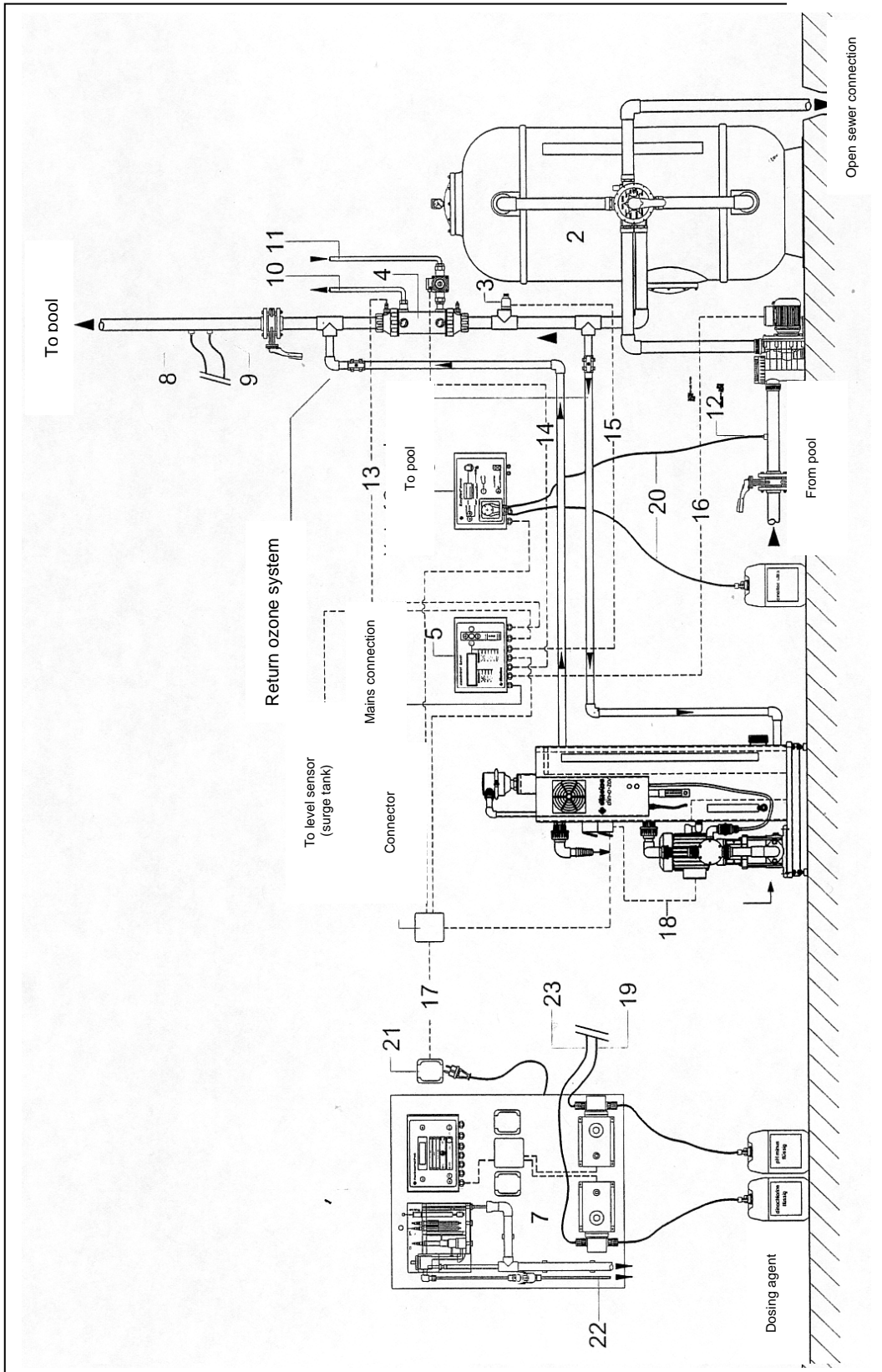
Delivery includes:

The din-o-zon compact ozonator is supplied with all required components and connection parts and comprises the following:

- * Compact system pre-assembled on skid with
 - Ozone generator
 - Booster pump
 - Injector
 - Mixing unit
 - Ozone reactor
 - Automatic ventilator
 - Residual ozone destructor (scrubber)
 - On/Off switch
 - Air-regulating valve

- * Accessory kit with
 - 2 ball valves 1" in PVC with lead-in part and hose coupling nipple
 - 5 m hose reinforced with fabric, PVC Ø 25 mm
 - Hose clamp set
 - 1 spare bag of extra activated charcoal 2.35 kg

3 Piping and connection schematic



Operating Instructions

Legend

- 1 din-o-zon compact ozonator (item no. 0610-340-00)
- 2 dinotec filter system, e.g. „DE LUXE“ 610
- 3 Flow monitor (item no. 0711-113-00)
- 4 Heat-exchanger
- 5 Filter control, e.g. Observer 230
- 6 Easyfloc
- 7 Measuring, control and dosing station
- 8 Injection valve (item no. 0284-025-00), e.g. for liquid chlorine
- 9 Injection valve (item no. 0284-025-00), pH reducer
- 10 Heating return
- 11 Heating forward
- 12 Injection valve (item no. 0284-025-00) flocculation
- 13 Pipe for temperature sensor
- 14 Supply voltage for heating circulation pump
- 15 Pipe flow monitor (3)
- 16 Supply voltage for filter pump
- 17 Supply voltage for measuring and control system
- 18 Supply voltage for din-o-zon system interlocked with filter pump
- 19 pH dosing line
- 20 Dosing line flocculation
- 21 Supply voltage for measuring and control system interlocked with filter pump
- 22 Measuring (sample) water
- 23 Dosing line disinfection

3.1 Figure din-o-zon

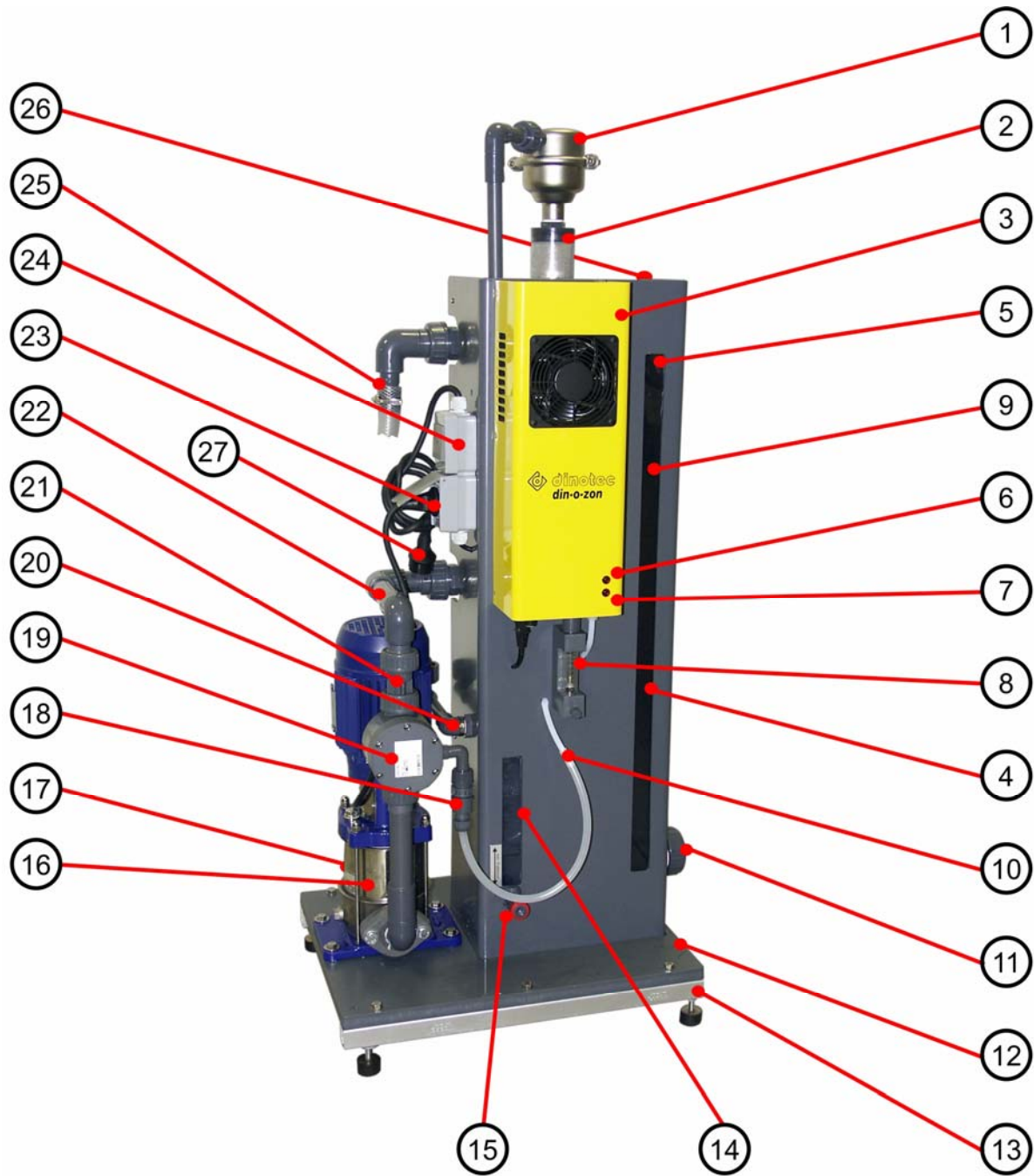


Figure approximate

Operating Instructions

Legend

- 1 Ventilation valve stainless steel
- 2 Sight glass / pre-chamber aerator
- 3 Ozone generator
- 4 Absorption chamber
- 5 Marking filling level activated charcoal max.
- 6 LED operating voltage
- 7 LED error
- 8 Measurement of air flow rate
- 9 Marking filling level activated charcoal min.
- 10 Vacuum hose
- 11 Emptying activated charcoal
- 12 PVC base plate
- 13 Steel frame zinc-coated / varnished, with adjustable feet
- 14 Sight glass water trap
- 15 Drainage water trap
- 16 Forced-pressure pump (centrifugal pump)
- 17 Suction connection (pure water)
- 18 2nd vacuum ball check-valve
- 19 Injector 4000 g/h, with membrane check valve
- 20 Water overflow (to sewer), filling nozzle for water trap
- 21 Mixing unit
- 22 Sight glass ozone addition/mixing (water vorticity/turbulence)
- 23 Power socket 230 V, 50Hz **Only** for forced-pressure pump
- 24 Main switch
- 25 Pressure connection (pure water)
- 26 Cover for activated charcoal container (masked)
- 27 Electrical feed line with earthing type plug

ATTENTION:

A new version of the injector is estimated to be used from October 2005.

Operating Instructions

4 Installation

4.1 Notes on installation

All installation works are to be carried out under observation of the relevant regulations. (Where appropriate, the German GUV 18.13 is applicable.)

4.2 Installation room

The installation room must be properly ventilated and de-aerated. The room temperature must not exceed 30°C and must not fall below 8°C.

NOTE: A sufficiently dimensioned floor drain must be available!
Water damage caused by the lack of a floor drain is not covered under the guarantee!

4.3 Setting up

The din-o-zon compact ozone system should be positioned in a location where it is protected from spray and ground water, and where it is easily accessible for maintenance works.

NOTE: The water required for the operation of the system is withdrawn/ returned after the filter system in the nozzle pipe (pure water pipe).

WARNING: Connection to an incorrect supply voltage can lead to irreparable damage to the unit. Prior to connecting the supply voltage, the power must be switched off.

NOTE: If the circulation pump of the filter system is switched off, the din-o-zon system must also be switched off, i.e. the power supply socket must be interlocked with the filter system.

NOTE: For safety reasons, a flow or pressure monitor must be installed in the pure water pipe between the heat-exchanger and the water withdrawal/dosage point, which will deactivate the din-o-zon system if the circulation pump stops (see schematic). This also ensures an automatic interruption of the production of ozone during backwashing.

4.4 Water withdrawal and return flow

Two ball valves 1" are installed in the existing PVC piping in the pure water pipe, with a distance of at least 50 cm to be maintained. The valves are used for withdrawal and return of the water to be treated.

4.5 Withdrawal

Withdrawal of the water to be treated with ozone first takes place in the direction of flow of the pure water pipe (nozzle pipe) in front of the heat exchanger. The bevel of the guide-piece must point against the direction of flow. The connection to the suction side of the booster pump is established either with the help of the PVC fabric-reinforced hose included in the delivery or by means of a permanently installed PVC pipe in DN 32/d25.

4.6 Return

The 2nd ball-valve is used for the return of the water after it was treated with ozone, i.e. in the direction of flow, after the heater. The bevel of the guide-piece must point in the direction of flow. The connection between the din-o-zon compact ozonator (reactor) and the PVC ball valve is also established with the help of the PVC fabric-reinforced hose supplied or by means of a permanently installed PVC pipe in DN 32.

WARNING: Never switch the system on when both ball valves are closed. Both ball valves must be open during operation.

4.7 Current entry

The power supply for the entire electrical supply of the din-o-zon compact ozone system and the booster pump is carried out by means of a 230 V, 50 Hz socket which is to be provided by the builder and to be interlocked with the filter system.

WARNING: The socket at the ozone system must only be used for connection of the booster pump.

4.8 Injector

The ozone-air mixture is drawn in via the injector, which is fitted with a safety cut-off membrane, which prevents water from penetrating into the ozone generator.

A second ball check-valve is installed as additional safety measure against water that is pressing backward. The valve is installed directly in front of the vacuum connection of the injector. The marking arrow on this ball check-valve must be showing straight upward, i.e. in the direction of the injector.



New injector starting from # 486

WARNING: The injector must be checked once a year and the safety shut-off device must be replaced (maintenance work). The function of the ball check-valve is to be checked; the valve is to be replaced, if required.

WARNING: If any water is found in the feed pipe for the ozone-air mixture to the injector, the system must be switched off immediately, withdrawal and return ball valves must be closed. The vacuum hose at the injector is to be unscrewed, the water drained off and the hose re-attached.

Operating Instructions

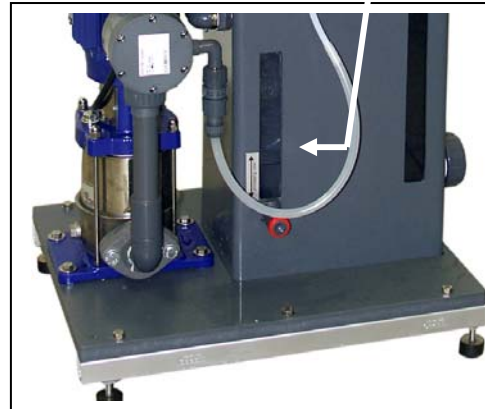
4 Commissioning - Operation

Before taking the system into operation, the water trap (siphon) must be filled - via the filling hopper (pos. 20) fixed laterally - with water up to the marking in the collecting (receiving) tank (pos. 14).

Filling hopper

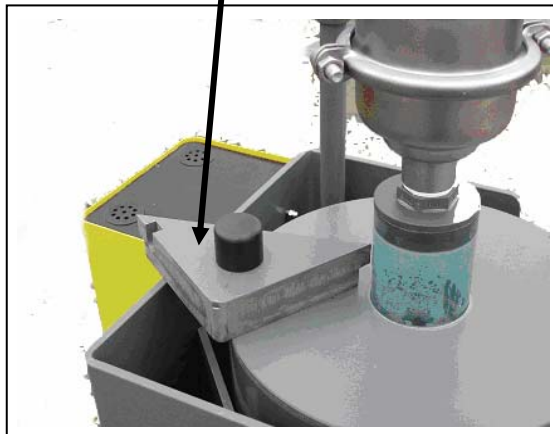


Marking



Activated charcoal has been filled in already. When the filling level reaches the „min“ marking, the activated carbon must be refilled up to the „max“ marking.

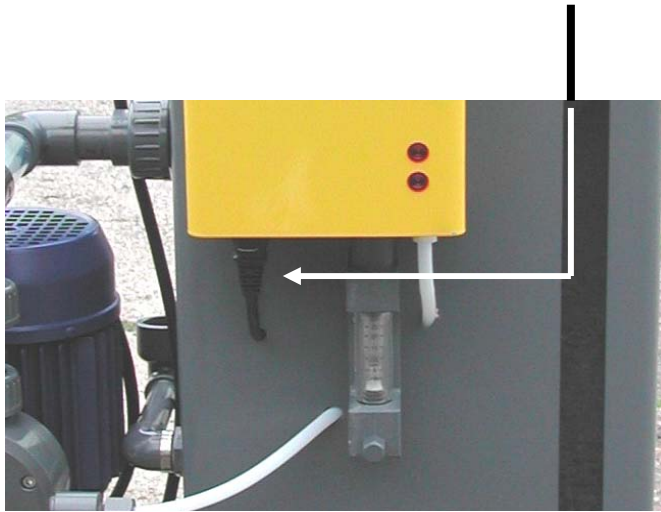
Cover of activated charcoal tank



Operating Instructions

When all parts of the system as well as the piping are installed and carried out prior to initial commissioning are completed (chapter 5.0) valve at the withdrawal point carefully (pre-condition for this is operation of the circulation system). After that, open the ball valve at the ozone feed point slowly. The reactor of the din-o-zon ozonator will fill with water, the air escapes through the aerator (pos.1). When a water flow can be detected at the sight-glass (pos. 21), the forced-pressure pump (pos. 16) can be switched on.

WARNING: The ozone production should be deactivated until the initial filling is completed in order to safeguard against any ozone leak. To do this, unplug the connector plug below the ozone generator or connect the forced-pressure pump via an external grounding receptacle 230 V.



When the ozone reactor is completely filled and water is escaping at the pressure connection (pos. 25), plug the connector(s) in again. The din-o-zon system can now be activated via the main switch (pos. 24).

WARNING: It is to be ensured that the din-o-zon system can only take up operation when the filter circulation system is in operation and when water is flowing through the pure water pipe (if required, interlock via flow or pressure monitor).

5.1 Operating procedure

A slip-stream of the pure water flow is continually drawn in by the booster pump, ozone is added, the water is fed into the reaction tank and then returned into the pure water flow.

Operating Instructions

Unused ozone and ballast air (nitrogen, carbon dioxide) are led into an charcoal filter via the automatic ventilation valve at the reaction tank ar ozone is bound to the activated charcoal.

Small residual quantities of ozone are being reduced to practically “zero” by thinning with the main flow and reactive breakdown.

CAUTION: If any ozone smell is noticed in the area of the din-o-zon compact system, the system must be switched off immediately. The function of the activated charcoal filter must be checked by a qualified specialist, and the activated charcoal must be replaced, if necessary.

NOTE: It is possible that condensed water will collect in the water collector during operation. In case of an increased formation of condensed water, the water collector will drain this water off automatically. This drain water can be discharged directly into a canal/sewer.

NOTE: The activated charcoal filling of the residual ozone destructor must be changed at least twice a year (maintenance).

5.2 Air volume

The flow of air through the ozone generator is about 12 l/min.

This flow can be read at the red marking in the air-measurement sight-glass and is indicated in l/h. If the airflow deviates from this level, it must be corrected by means of the regulating valve near the sight-glass.

NOTE: Optimum results are achieved with a permanent operation of the din-o-zon compact ozone system. If you want to operate your filter system by means of a time clock, an operating time of at least 12 hours per day (= 24 hours) should be ensured. In any case, the filter system should be switched on 1 hour before use of the pool, and during operation of the pool.

Operating Instructions

6 Maintenance and care

The din-o-zon compact ozone system is easy to maintain, but must be inspected and maintained at regular intervals by a qualified specialist firm.

6.1 Replacing the activated charcoal

The delivery of the din-o-zon compact ozone system includes the initially required amount of activated charcoal, together with a sufficient quantity for the first replacement. For one filling, about 2.25 kg of activated charcoal are required. The filling level of the activated charcoal is to be checked at regular intervals (e.g. every 6 months) at the markings (pos. 5 + 9) and to be increased, if required. The activated charcoal must be completely replaced every year or after a massive ozone leak. Emptying via the lateral cover (pos. 11, fig. 3.3). **Before reinserting the cover, the thread must be cleaned (residues).**

6.2 Maintenance of the injector (model DCG06)

The nozzle sets must be cleaned regularly, since a build-up of deposits can otherwise change the nozzle ratio such that a loss in performance can result. Never use sharp-edged objects for cleaning! Hydrochloric acid has proved to be a perfectly suitable detergent.

WARNING: *Observe the appropriate regulations when dealing with hydrochloric acid!*

The dirt-trap in front of the injector must also be cleaned from time to time.

6.2.1 Cleaning the nozzle / diffusor:

- Close the adjusting valve at the chlorination system (dosing controller).
- Wait for about 1 minute, then switch the booster pump off.
- Close the shut-off valves at withdrawal and injection point.
- Unscrew coupling nuts of injector and dismantle injector.
- Dismantle diffusor and nozzle.

If the nozzle cannot be dismantled without using force, it can be pushed out from the diffusor side with the help of a piece of wood.

- Clean both parts and re-install, observing the direction of flow – see arrow on the housing. Ensure that the O-rings are properly fitted – replace, if required.

6.2.2 Checking the double non-return valve (suction-pressur

- Demount the suction-pressure valve.
- In the direction of the arrow, flush the suction-pressure valve under a jet of water. The suction-pressure valve must open completely in the direction of the arrow (without resistance) – the valve must close 100 % in the opposite direction. If this is not the case, the valve must be completely replaced.
- Install into injector. Direction of arrow is in direction of housing.

WARNING: *The suction-pressure valve must be positioned vertically (arrow showing upward) when in the operating position.*

- Open the shut-off valves at injection and withdrawal point.
- Switch the booster pump on and check tightness and function of injector.

6.2.3 Safety membrane cut-off

The safety membrane cut-off is to be checked regularly, since piston and seat are subject to wear and tear.

Check if the closing feature is functioning properly:

The check-up is carried out with open withdrawal valve and injection point, but with deactivated booster pump.

- Close adjusting valve on dosing controller.
- Loosen coupling nut on diaphragm safety membrane cut-off and detach PE line.
- Demount the suction-pressure valve (second non-return valve) from injector.
- Close the shut-off valve after the injector (e.g. at the injection point) a few times briefly. If **no** water escapes at the suction connections, the safety membrane shut-off is functioning properly, otherwise the piston and valve seat must be renewed (see 9.2 and 9.3).
- Screw suction-pressure valve in (direction of arrow in the direction of the housing).
Re-connect the PE line.

Operating Instructions

- Booster pump:
- Adjust the required dosing output at the dosing controller. Activate the automatic dosing (at meter and controller), if it was deactivated before.

6.2.4 Changing the piston

- Deactivate the system and close the shut-off valves.
- Unscrew the cylinder screws and remove the top part.
- Replace the piston with a new one, and screw in manually.

WARNING: *Do not use tools, since they will damage the piston.*

- If required, replace the sealing of the housing (O-ring).
- Place the diaphragm plate on the piston and turn such that the holes fit with the borings on the top part. Do not loose the spring!
- Attach top part with diaphragm disk and tighten screws crosswise.

WARNING: *Do no use force, the bushings can otherwise be damaged irreparably.*

6.2.5 Changing the seat / diaphragm and checking the spring

- Deactivate the system (as described in „Changing the piston“) and remove the top part.
- Dismantle complete diaphragm with piston as described above and replace.
- If only piston and seat are to be exchanged: Unscrew diaphragm ring from diaphragm, replace valve seat and O-ring. Tighten the threaded ring such that the seat can be pushed tightly, but still slides well over the piston.
- If the spring is damaged, it must be replaced.

Check the closing function. If the safety membrane shut-off is not tight, the threaded ring in the diaphragm must be retightened until the safety membrane shut-off is closing tightly/is leak-proof.

The nozzle sets must be cleaned regularly, since a build-up of deposits can otherwise change the nozzle ratio such that a loss in performance can result. Never use sharp-edged objects for cleaning!

Operating Instructions

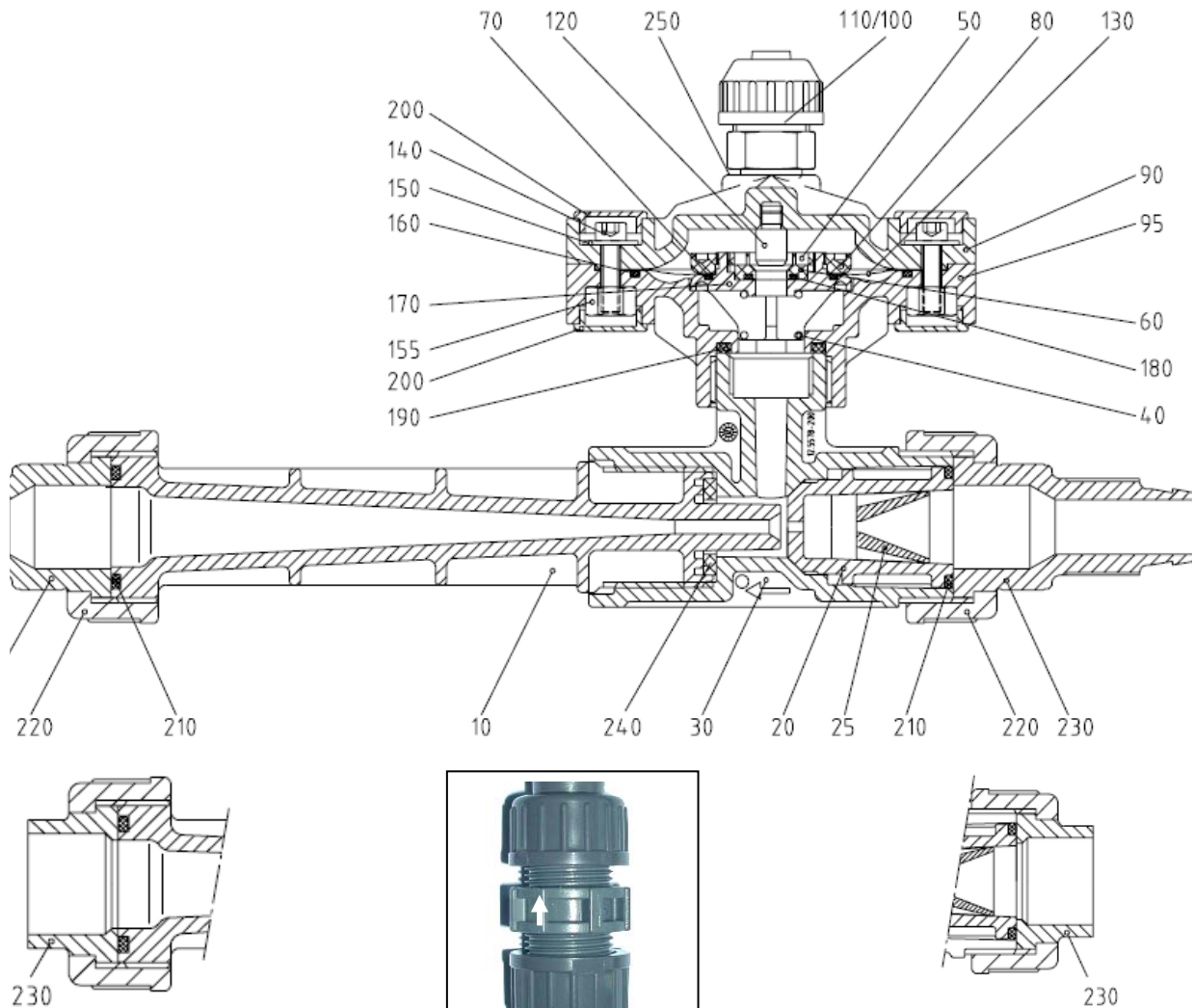
Cleaning the nozzle / diffusor:

- Shut the process water off
- Close the shut-off valve at the injection point
- Unscrew coupling nut of injector and dismantle injector
- Dismantle nozzle

If the nozzle cannot be dismantled without using force, the diffuser must be dismantled: Unscrew the cap nut from the diffuser and pull the diffuser out. (Take care not to lose the O-rings!)

It is then possible to use a small wooden stick to press the nozzle out.

- Clean both parts and re-install, observing the direction of flow – see arrow on the housing
- Open the process water supply, open the shut-off valve at the injection point and take the system back into operation.

7. Spare parts list for injector DCG 06 with double safety membra (starting 2006)


The „double safety membrane shut off“ must always be installed downwards (vertically) (the arrow on the valve points upwards!)

Operating Instructions

Pos.	dinotec no.	Item	
	0330-104-00	Injector DCG 6, 4000 g/h	
10	0330-141-00	Diffusor for injector DCG 6, 4000 g/h	1
20	0330-129-00	Nozzle for injector DCG 6, 4000 g/h	1
25	0330-111-00	Whirl nozzle	1
30	0330-114-00	Base plate for injector DCG 6	1
40	0310-249-00	Pressure spring coated	1
50	0330-155-00	Threaded ring	
60	0330-180-00	Seat	1
70	0330-165-00	O-ring 32x2, FPM	1
80	0330-150-00	Diaphragm ring	1
90	0330-112-00	Upper part for injector DCG 6	1
95	0330-113-00	Lower part for injector DCG 6	1
100	0330-118-00	Gas connection 8/11mm	1
110	0310-353-00	Coupling nut	1
120	0330-185-00	Piston	1
130	0330-190-00	Diaphragm (only foil) – do not order	
140	0320-216-00	Cylinder-head screw M5x20	6
150	0320-217-00	Washer	6
155	0320-221-00	Hex nut M5	6
160	0330-105-00	O-ring 72x2.5x77	1
170	0330-156-00	Diaphragm plate PVC	1
180	0320-165-00	O-ring 9.19x2.62x14.43	1
190	0330-176-00	O-ring 23.4x50x30.4	1
200	0330-157-00	Sealing plug PE 17.6 mm	6
210	3018-448-00	O-ring FPM for screw connection d25	2
220	3015-876-00	Cap nut PVC DN20, d25	2
230	3015-856-00	Insert PVC DN20, d25	2
240	0330-142-00	Flat gasket 15x4x27	1
	0330-140-00	Diaphragm complete	
	0330-143-00	Gasket set	
No no.	0690-348-00	Double non-return valve (spare part)	

Operating Instructions

Diverse further spare parts

Pos.	Item	Item no.:
1	Autom. aerator in stainless steel, ¾"	0984-301-00
2	Activated charcoal for din-o-zon system, approx. 2.5 kg	1000-456-90
3	Service kit for connection (flexible hose line with changeover screw connection)	0600-060-90
4	Booster pump IN-V 2-40, 0.55 kW	0281-199-00

Spare parts ozone generator

WARNING

**Works on ozone generators must only be carried out by authorised specialist service personnel.
Repairs of electrical components incl. ozone generator must only be carried out at the works.**

Operating Instructions

Further products from our range

- Measuring, control and dosing equipment / Automatic water care for public and private swimming pools as well as for central water supply systems
 - * chlorine
 - * CHLORINE-FREE
 - * with low chlorine
 - * dosage of pH and flocculant
- Water treatment with ozone
 - Split-flow ozonization with din-o-zon[®] and optoZON[®]
- UV technology for disinfection and decomposition of combined chlorine
- Electro-chlorination systems for the production of chlorine (15 – 10000 g/h) from natural salt, directly at the place of use
- Chlorox compact systems for disinfection using chlorine dioxide
- Filter systems in various versions and performance ranges / Compact systems
- Filter controllers, pool water heating, solar controllers and accessories
- Visualization systems for Dinotec installations
- Water care products
 - * Liquid dosing agents for automatic dosing
 - * Water care systems for manual dosing
 - * NOVA CRYSTAL care system – CHLORINE-FREE
 - * BIO-LINE - environmentally friendly care system
 - * POOL-IZEI system for an improved water conditioning
- Swimming pool cleaning robots
 - * for connection via the filter system
 - * electrical cleaning robots, working fully-automatic

Interested? We will be pleased to send you further information on the dinotec range. Please order any information you require free of charge, using the attached order form.