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1. Technological background

What is Katolysis?

Katolysis is a process developed on basis of the well-known principles for electrolytic corrosion protection. With electrolysis, the anode is dissolved, while with Katolysis, it is the cathode, which is dissolved. The whole process takes place inside the CatoCool unit.

Guldager CatoCool protects the pipe system of the installation against rust. The CatoCool plant consists of a treatment part, an electronics unit, and a pump.

The treatment part is an enamelled or plastic coated tank with two electrodes. An aluminium cathode and an anode of titanium thread coated with noble metals. The anode is winded round the cathode in a spiral.

The electronics unit supplies current (low tension, D.C.) to the anode. As a result, the aluminium cathode is slowly dissolved as aluminate ions, which are lead into the pipe system. Along with the metal oxides from the surface of the pipes, the aluminate ions form a protective layer in the entire pipe system. The protection layer prevents rust and corrosion in the pipes.

The pump ensures a constant flow through the treatment unit and into the pipe system.

2. The Plant and its Service

The CatoCool plant must always be in service, when also the cooling plant is in service.

- Addition of chemicals
 - No addition of chemicals of any kind to the cooling water. If chemicals have been added earlier, the plant must be rinsed before the Katolysis plant is started.
 - However, it can be necessary to stop a heavy growth of bacteria or algae. This is easily done with for example hypo-chloride. Most often a 15% solution is used for a chock-chlorination, either directly added, or added by means of a dosing pump.
- Make-up water
 - The make-up water must be softened water, with hardness below 1 °dH, from a softening plant. A water meter registers the consumption of make-up water.
- De-sludge
 - A precipitation of sludge will take place, and therefore a manual de-sludge must be made on the system on regular basis. Normally, it is sufficient to do it once every two months, using 5 to 20 litres of water. We recommend you to do it, when Kato-Card is read, see point 2.2.
- Water meter
 - The CatoCool plant is equipped with an internal water meter, which controls the circulating amount of water through the plant.
- Drainage
 - Drainage of 15-20% of the added amount of make-up water must be made.
- Renovation of the anode/cathode system
 - Due to the special way the CatoCool plant has been mounted, service can be made on the unit without any inconvenience; the tank is simply replaced by Guldager or for larger plants, the Katolysis units in the tank are changed while the tank is in bypass.

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2.1 Reading

In the display the plant data are showed in a slowly running sequence.

Programme version no.	CatoCool	0.00 UK
Board no.	Plant no.:	000000

Active group	Gr.0	FLOW 00,0 m³
Voltage on the anode	00.0 V	0.000 A

Current on the anode

Gr.0	ALARM
	[TEXT]

If the plant is out of order,
an alarm is shown.
A text stating the reason is shown.

When the KatoCard is placed
in the slot, this text is shown

UPDATING
EXTERNAL

2.2 KatoCard

On regular basis, Guldager forwards a KatoCard to the plant. As soon as possible after reception, the KatoCard is placed in the slot on the front plate, and a transfer of all data from the board to the card will take place. When the text in the display has disappeared, the transfer has been completed.

The KatoCard is returned to Guldager. On the return envelope, the supervisor writes the date of the reading, along with remarks, if any, regarding the plant.

2.3 Supervising the plant

The information from the KatoCard is registered in our EDP system, along with all other information regarding the plant, as for example service reports. From these data we can follow the plant, and step in should this become necessary.

Please contact Guldager if you observe any irregularities in connection with the plant.

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2.4 Alarm

An exceeding of the programmed limit values by more than app. 10%, or a physical error in the current supply, will result in an alarm on the electrode in question. This alarm is shown by a text in the display, and the erroneous group will be disconnected.

Switching off the 230 V breaker before the board, and turning it on again after 15-20 seconds can break the alarm. If the alarm does not return again within 24 hours, nothing further is to be done. If the alarm does return, please inform Guldager as soon as possible about the error.

It is not necessary to disconnect the board, since defect groups will be disconnected automatically.

2.5 CTS

There is a built-in connection to CTS system for registration of pulses in the water meter, and alarms.

2.6 Other information

In cases where there are separate cooling circuits to some machines, with flow of cooling water from the main circuit only on occasion, you cannot expect the same corrosion protection as in the main circuit.

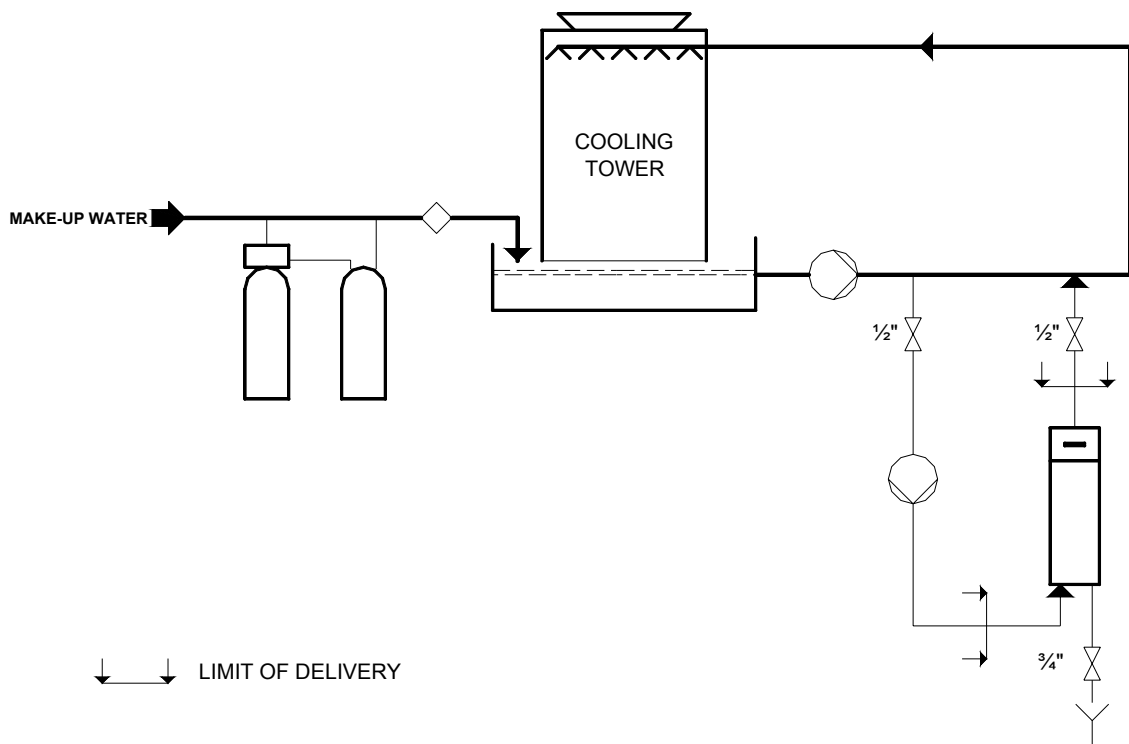
2.7 Options

- Timer, for control of amount of drainage.
- Part stream filter.

3. Mounting Instruction

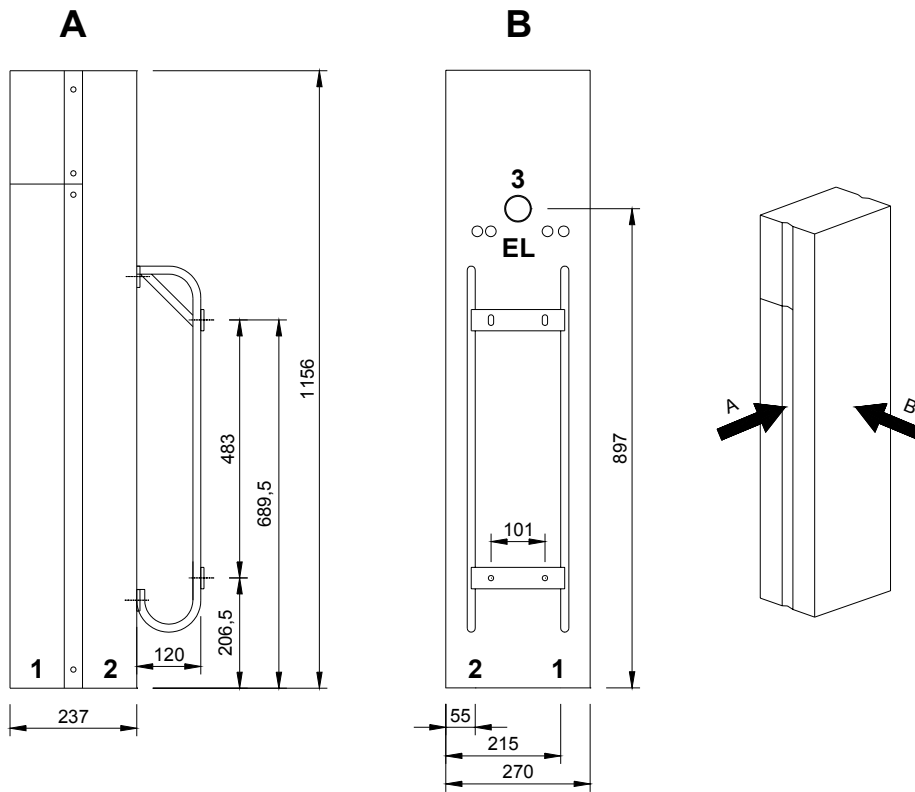
3.1 CatoCool 10 E

1. The CatoCool unit is mounted vertically on the wall or frame. See Fejl! Ukendt argument for parameter., page 8.
2. Dismount the lowest front part of the cabinet by removing the two screws in each side as well as the four screws at the bottom.
3. Now you can connect the unit (it is unnecessary to dismount the tank).
4. On the inlet to the CatoCool plant, a ball valve is mounted. It is mounted as close to the branching from the main pipe as possible.
5. On the outlet from the CatoCool plant a ball valve is mounted. It is mounted as close to the inlet to the main pipe as possible.
6. Plumbing must prevent airlocks from occurring.
7. On the bleeding a ball valve is mounted, and the pipe is led to floor drain.
8. On the inlet of make-up water to the plant a water meter is mounted (giving 1 pulse per litre. Guldager normally delivers it).
9. Do not switch on the plant. We will do that by start-up.



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3.2 Dimensioned sketch CatoCool 10 E



Dimensions

Width : 270 mm
 Height : 1160 mm
 Depth : 365 mm

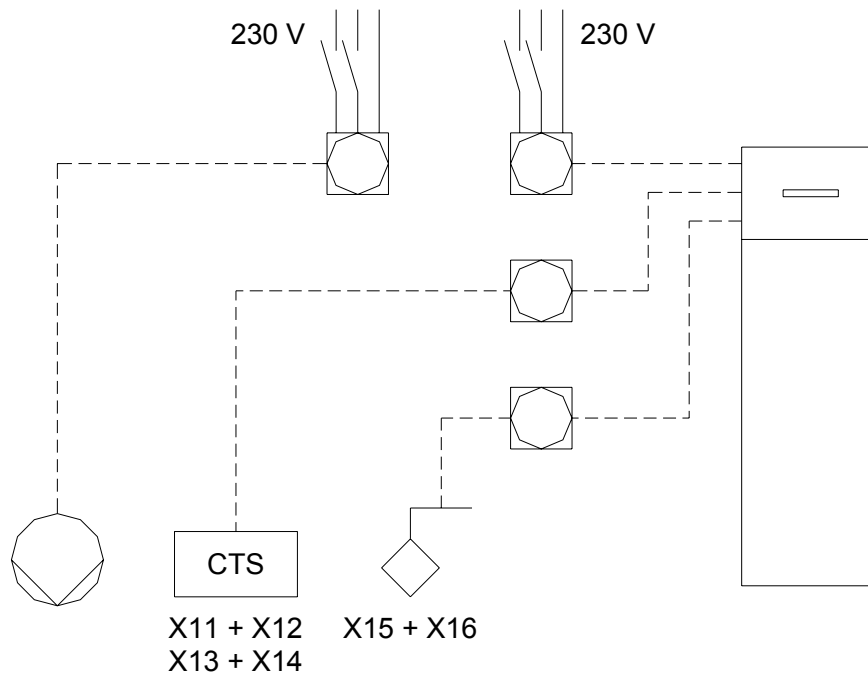
Pipe connections

Inlet (1) : 1/2"
 Outlet (3) : 1/2"
 Bleeding (2) : 3/4"

Required free space around the CatoCool unit (due to future servicing):

Top : Min. 300 mm to pipe or ceiling
 Sides : Min. 100 mm to each side
 Bottom : Min. 500 mm to floor

3.3 Circuit diagram CatoCool 10 E



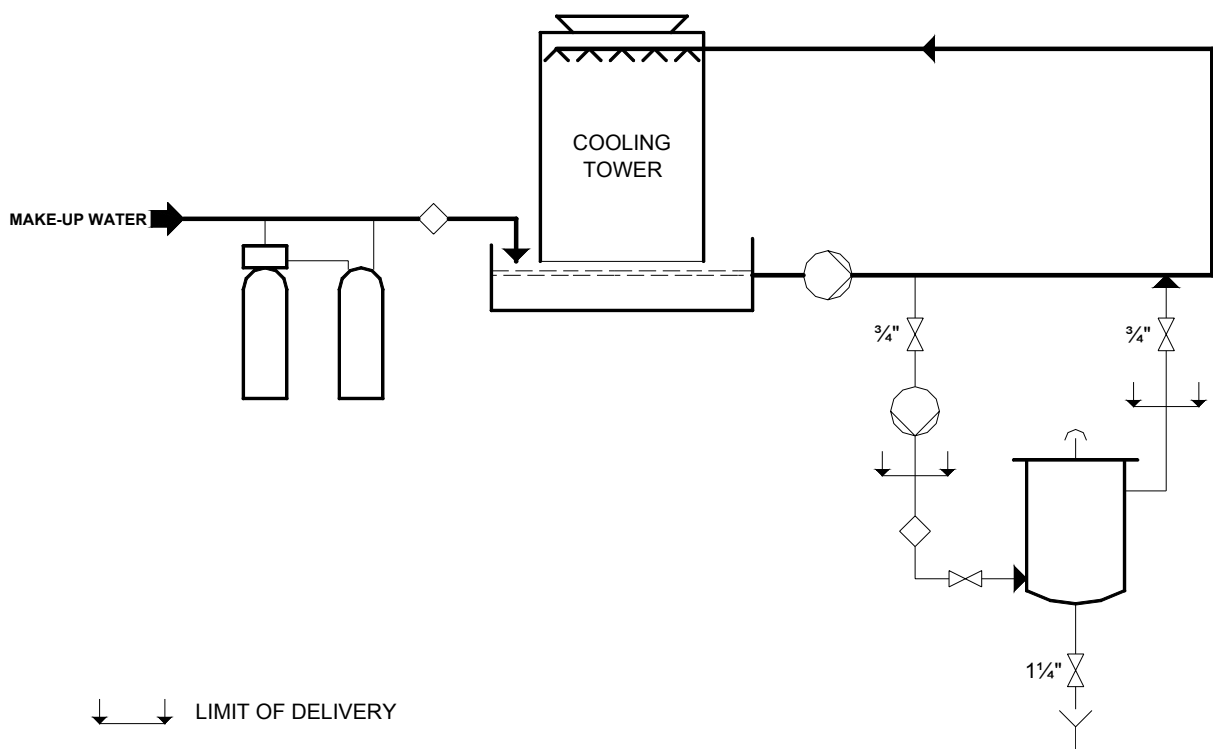
The control panel and the pump are connected to their own group, and are earthed. A switch is connected right before the control panel.

Connection at the bottom of the control panel:

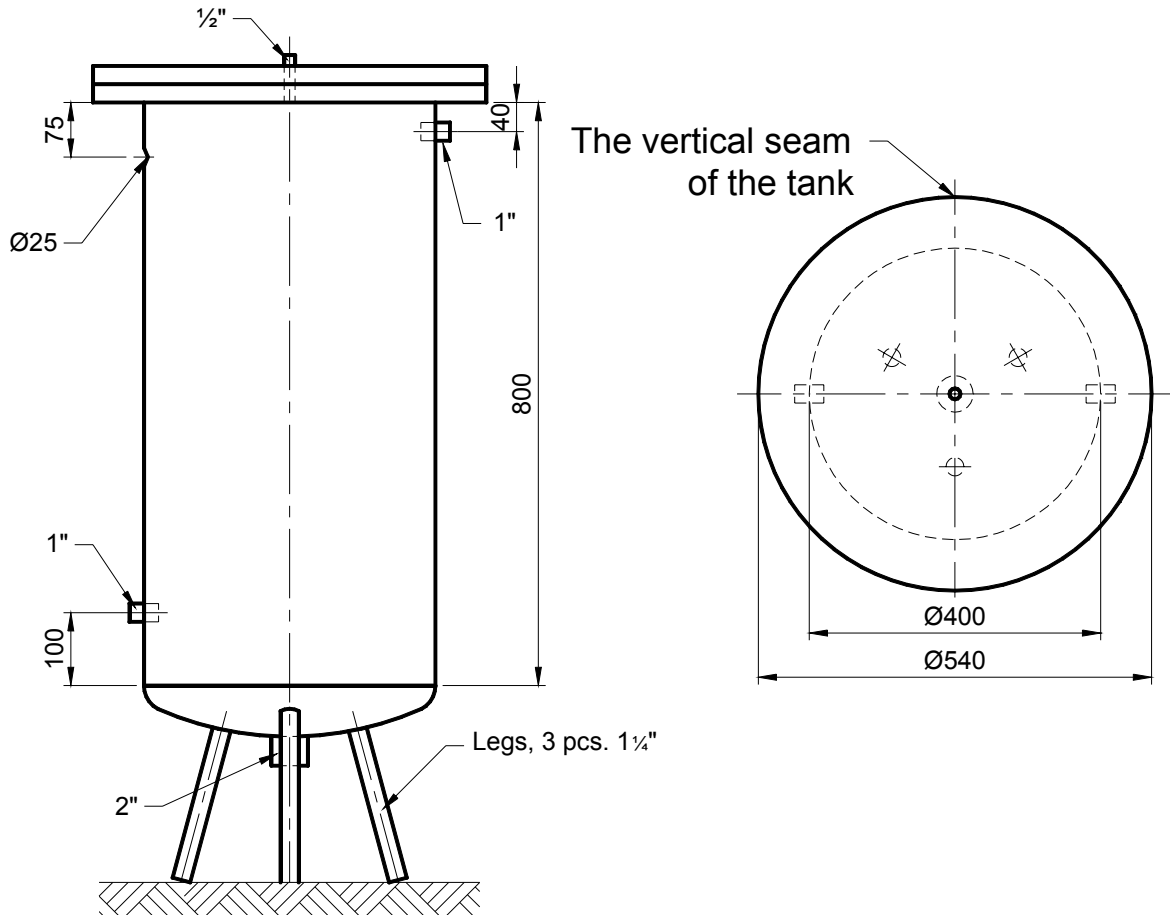
GR1		
X11	Outlet to external flow registration	Do not load CTS with more than 30 mA, 30 V
X12	Outlet to external flow registration	
X13	Outlet to external alarm registration – breaks at alarm	
X14	Outlet to external alarm registration	
X15	External water meter	0,5 mm ² cable
X16	External water meter	

3.4 CatoCool 20-40 E

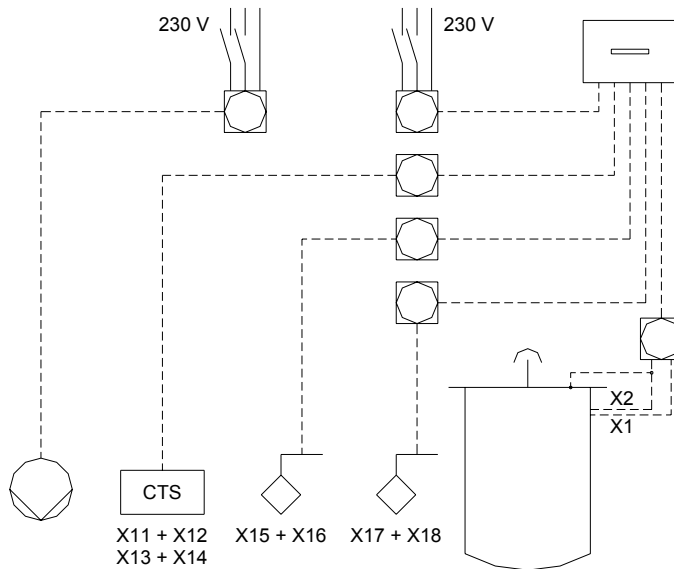
1. The control cabinet is mounted vertically on the wall. See Fejl! Ukendt argument for parameter., page 11.
2. On the inlet to the CatoCool plant a ball valve is mounted as close to the branching from the main line as possible. Pump, water meter, and control valve are also mounted here.
3. On the outlet from the CatoCool plant, a ball valve is mounted. It is mounted as close to the inlet to the main line as possible.
4. Plumbing must prevent airlocks from occurring.
5. On the bleeding a ball valve is mounted, and the pipe is led to floor drain.
6. On the inlet of make-up water to the plant a water meter is mounted (giving 1 pulse per litre. Guldager normally delivers it).



3.5 Dimensioned sketch CatoCool 20-40 E



3.6 Circuit diagram CatoCool 20-40 E



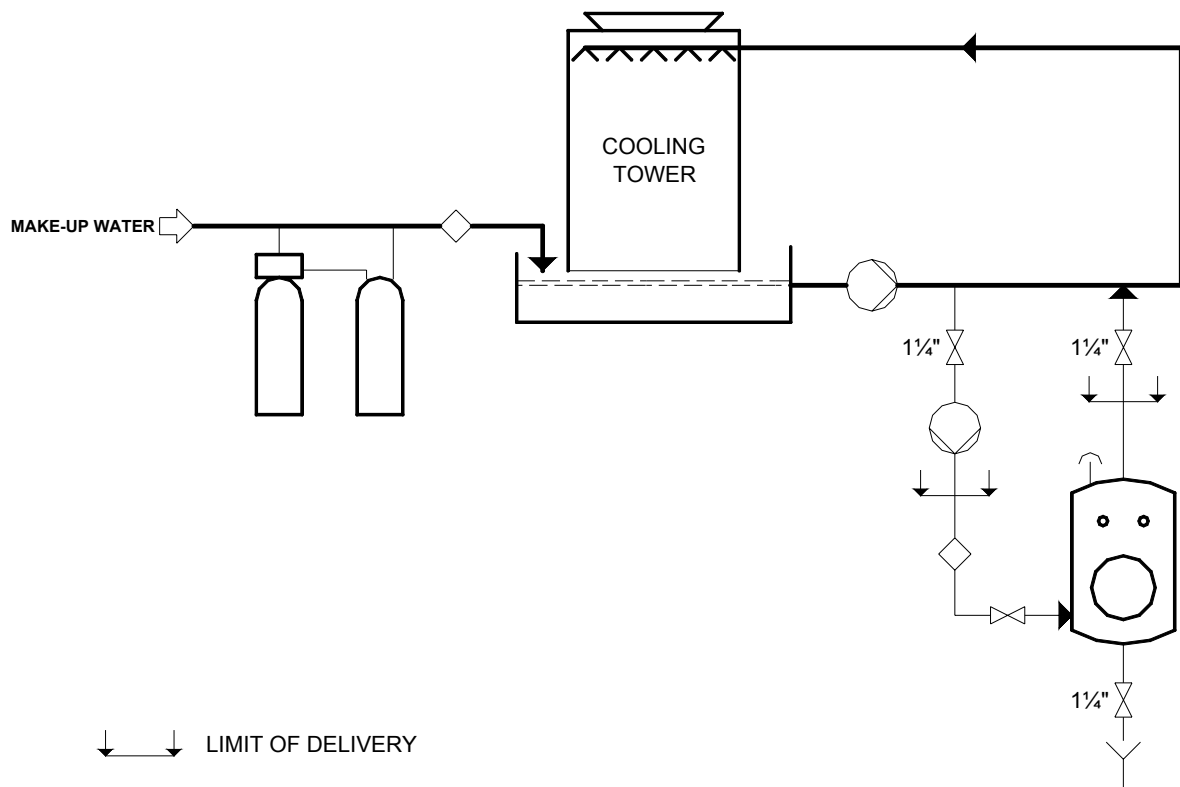
The control panel and the pump are connected to their own group, and are earthed. A switch is connected right before the control panel.

Connection at the bottom of the control panel:

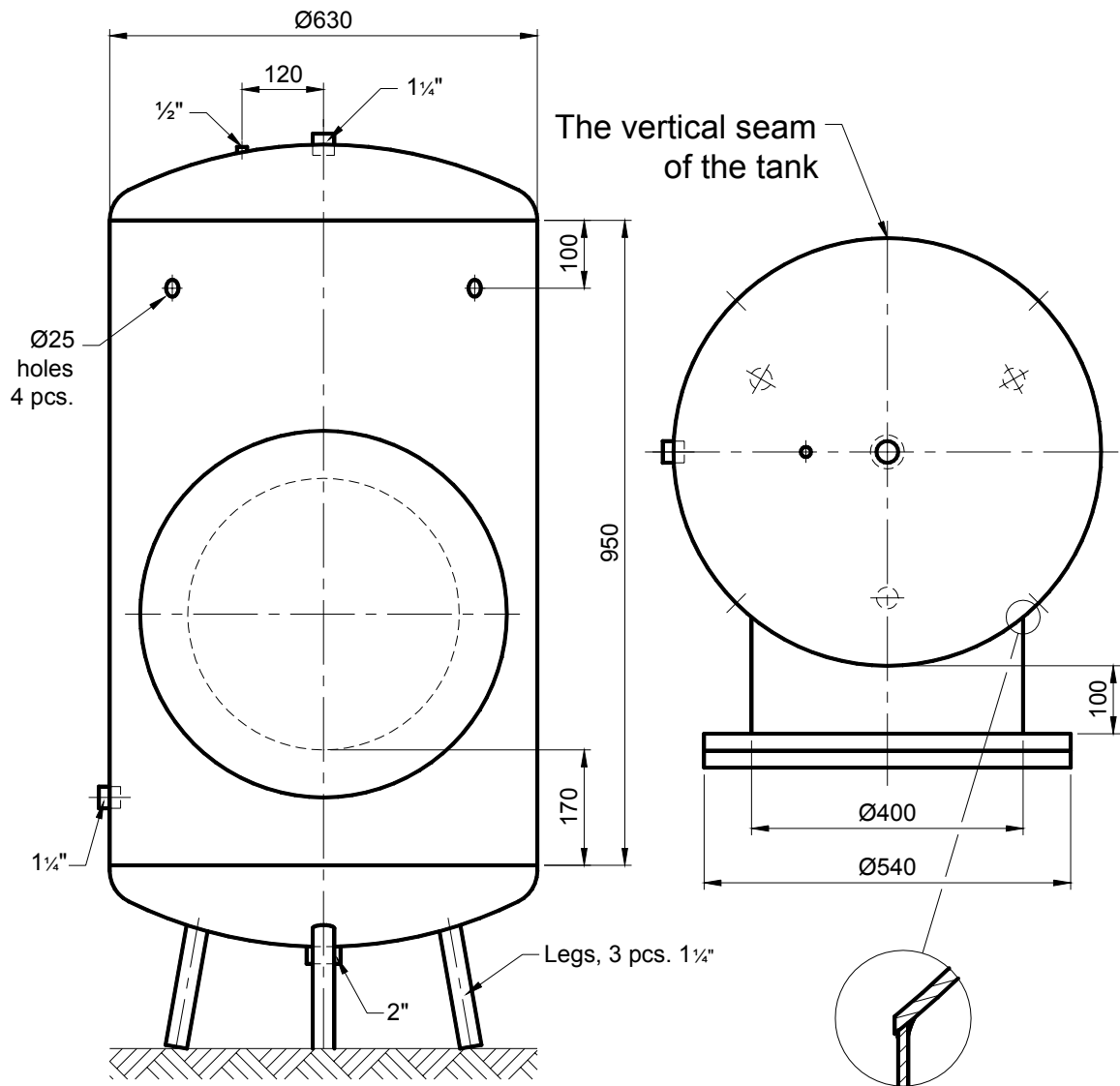
GR1		
X1	Red	If there are several lead-ins on top of the same tank, they are circuited.
X2	Blue	
X11	Outlet to external flow registration	Do not load CTS with more than 30 mA, 30 V
X12	Outlet to external flow registration	
X13	Outlet to external alarm registration – breaks by alarm	
X14	Outlet to external alarm registration	
X15	External water meter	0,5 mm ² cable
X16	External water meter	
X17	Internal water meter	
X18	Internal water meter	

3.7 CatoCool 60-125 E

1. The control cabinet is mounted vertically on the wall. See *Fejl! Ukendt argument for parameter., page 14.*
2. On the inlet to the CatoCool plant a ball valve is mounted as close to the branching from the main line as possible. Pump, water meter, and control valve are also mounted here.
3. On the outlet from the CatoCool plant, a ball valve is mounted. It is mounted as close to the inlet to the main line as possible.
4. Plumbing must prevent airlocks from occurring.
5. On the bleeding a ball valve is mounted, and the pipe is led to floor drain.
6. On the inlet of make-up water to the plant a water meter is mounted (giving 1 pulse per litre. Guldager normally delivers it).



3.8 Dimensioned sketch CatoCool 60-125 E



4. Technical data

Description	CatoCool 10 E	CatoCool 20-40 E	CatoCool 60-125 E
Tank:			
Volume	app. 5 L	app. 110 L	App. 350 L
Temperature, max.	95° C	95° C	95° C
Service pressure, max.	8 bar	8 bar	8 bar
Test pressure	12 bar	12 bar	12 bar
In- and outlet	1/2"	3/4"	1 1/4"
Tap	3/4"	1 1/4"	1 1/4"
Surface, internal	Enamelled	Plastic	Plastic
Control cabinet:			
Connection	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz
Current consumption	app. 4 W	app. 4 W	app. 4 W
Display	LCD	LCD	LCD
Connections:			
Internal water meter	1 pulse/L	1 pulse/L	1 pulse/L
External water meter	1 pulse/L or 1	1 pulse/L or 1	1 pulse/L or 1
CTS	Alarm and water consumption	Alarm and water consumption	Alarm and water consumption
Pump (we can deliver):			
Manufacture	Smedegård	Smedegård	Smedegård
Type	EcoWatt 1	EV2-65-2VZ	EV2-65-2VZ

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Appendix A. General Information

Copyright

This user manual is intended solely for buyers of OxyFree plants and their staff. All copyrights belong to the company Guldager A/S.

Replication is allowed for internal use only. This permission applies for the safety directions exclusively. Copying of drawings, diagrams and spare parts lists is NOT allowed.

Guarantee and Responsibility

For a period of 12 months, Guldager A/S guarantees all the mechanical and electrical parts of the system as well as its mechanical construction. This guarantee is valid from the date of transfer. Within this period all parts that cannot be used because of faulty construction, defective material, or defective condition are repaired or replaced.

Guldager A/S cannot be held responsible for damages, caused by the delivery after the transfer:

- a. on real property or movables that occur while the delivery is in the buyer's possession.
- b. on products, which have been produced by the buyer, or on products, of which these are a part, or for damages on real property or movables, caused by these products as a consequence of the delivery.

In no case the supplier can be held responsible for loss of profits, or other financial consequential losses.

Staff Obligations

Before work is started, anyone, who has been charged with working with this system, is under the obligation to

- observe the basic instructions for working security and the prevention of accidents.
- read Appendix B.
- read the safety regulations and warnings from sub-suppliers of the plant.

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Fulfilment of CE-labelling

If Guldager A/S is to have status as producer, this system may only be installed by trained and authorized staff according to the "purposive use" of the system, in order to meet the demands in the European Parliament and Council directive no. 98/37/EF (Machine directive) and directive no. 97/23/EF (Pressurized supporting equipment). Consequently, only Guldager A/S can confirm conformity with the directives in a "Declaration of Conformity" and place the CE-label for the control purposes of the authorities.

In any other case Guldager A/S is solely producer of "the original plant", which is to be considered as single components after changes. The responsibility for the plant, including all legal consequences, is thus transferred to the company or installation business that has added the mentioned "normal application" to the plant. It is important to stress, that a new, complete technical dossier with updated risk estimation, list of components e.a. should be prepared, after changes to the plant have been carried out.

By changes of the construction, use of other components, or safety relevant components, the "Declaration of Conformity" no longer applies.

Appendix B. Fundamental Safety Regulations

Observe the Instructions in the User Manual

In order to be in a position to operate the plant in a correct and safe way, and to make sure that it will work to the utmost without interruption, you must have knowledge of the fundamental safety regulations and instructions.

This appendix lists the most important precautions for a correct and safe handling of the system. This user manual incl. its safety regulations must be observed by anyone, working with or near the plant. Safety regulations – including the company's own – that supplement these rules must also be observed.

The user manual must be stored in visible distance to the area, where the operators control the plant, and safety regulations and warnings must be placed close to the plant on a permanent and visible spot.

The Company's Obligations

The company is under the obligation to let only personnel that meet with the following demands work with and around the system, i.e. personnel that have

- been instructed in the use of the system.
- read this appendix about fundamental safety regulations.

Inspection of the Plant

On demand the employer must take care that the device undergoes a safety inspection. This, however, must be done at least once a year. The inspection is to be carried out by an expert and a report on the inspection results must be written.

An expert is defined as somebody who, based on his professional education and knowledge possesses thorough knowledge of the tool in question and who is familiar with the relevant national occupational safety regulations, regulations for the prevention of accidents, directives, safety and technical rules, which have been generally approved (i.e. DIN norms, VDE rules), to such an extent that he/she is able to estimate the safety condition of the tool. These demands

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are met by e.g. the service staff from Guldager A/S and by personnel with corresponding education.

Handling Dangers of the Plant

This plant has been constructed according to the present technological development and the present technical safety rules. In spite of this, by unskilled use, situations that are dangerous to the operator and others, and damages to the plant and other damages on material, may occur.

The plant is only to be used

- for its normal purpose
- in good and safe condition

Defects, which have an influence on safety, must be repaired immediately in a professional correct way.

Remaining Risks

In spite of all technical safety precautions, personal protective equipment, and optimum organizational precautions, damages on material or even personal damages cannot be excluded.

Should, in spite of all safety precautions, an accident occur, Guldager must be informed. In order to minimize potential remaining risks or completely eliminate these through technological progress we aim to react on even the smallest irregularity within the terms of our duty to supervise our products.

Appendix C. Declaration of Conformity

Overensstemmelseserklæring Konformitätserklärung

I henhold til maskindirektivet 98/37/EØF, Bilag II, A

According to the following directive: Machinery 98/37/EØF, Encl. II, A
gemäß den Richtlinien für Maschinen 98/37 EG, Anlage II, A

Guldager A/S
Hejrevang 1-3
3450 Allerød

erklærer på eget ansvar at følgende produkt
declare, under own responsibility, that the following product:
bestätigt unter Eigenverantwortung, dass das folgende Produkt:

Produkt: Katolyse og Elektrolyse
Type: Elektrolyse, Katorack, UniCat, OxyFree og CatoCool
Styreskab: K-skab, Microskab og Standardskab

(navn, type eller model, parti, portion eller serienummer, eventuelt kilde og antal emner)
(name, type or model, part, batch, or serial number, source, if any, and number of subjects)
(Name, Typenbezeichnung oder Modell, Partie, Portion oder Seriennummer, evtl. Quelle und Stk.anzahl)

som er omfattet af denne erklæring, er i overensstemmelse med følgende standard(er) eller andre normative dokument(er)
which is covered by this declaration, complies with the following standard(s) or other normative document(s)
umfaßt von dieser Konformitätserklärung, in Übereinstimmung mit den folgenden Richtlinien oder anderen normativen Dokumenten ist.

EN 1050, EN 292-1, EN 292-2, EN 292-2/A1, EN 1708-1, EN 418, EN 954-1, EN 60439-1, EN 60204-1
(titel og/eller nummer samt udgivelsesdato for standard eller andre normative dokumenter)
(title and/or number and date of publication of standard or other normative documents)
(Titel und /oder Nummer sowie Erscheinungsdatum für Standards oder andere normativen Dokumente)

i henhold til bestemmelserne i Direktiv: Maskindirektivet (98/37/EØF), Trykbærende udstyr (97/23/EØF),
Lavspændingsdirektivet (73/23/EØF) og EMC-direktivet (89/336/EØF)
As stated in the requirements of the following directives: Machinery (98/37/EF), Pressurised Equipment (97/23/EF), Low Voltage Electrical Equipment (73/23/EØF), and EMC (Electromagnetic Compatibility, 89/336/EØF)
gemäß den Bestimmungen der folgenden Richtlinien: Maschinen (98/37/EWG), Druckgeräte (97/23/EWG), elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (73/23/EWG) und die elektromagnetische Verträglichkeit (89/336/EG).

Leverandørerklæringer er indhentet fra vore underleverandører – alle komponenter overholder nedenstående direktiver
Statements from sub-suppliers have been asked for – all components observe the directives mentioned below
Lieferantenerklæringer wurden von unseren Zulieferanten eingeholt – alle Komponente erfüllen die nachfolgenden Direktiven.

73/23/EC, 89/336/EC, 89/392/EC, 97/23/EF
(overensstemmelseserklæring, oversigt over normative dokumenter, direktiver og standarder benyttet til konstruktion af lev. komponenter)
(declaration of conformity, review of normative documents, directives, and standards used for construction of delivered components)
(Konformitätserklärung, Übersicht über normative Dokumente, Direktiven und Standards benutzt zur Konstruktion der gelieferten Komponenten)

Allerød, 23.01.2002

Per Jensen

(udstedelsessted og dato) (navn og underskrift eller tilsvarende identifikation af bemyndiget person)
(Place, date) (name, and signature of subscriber)
(Ort, Datum) (Name und Unterschrift des Unterzeichners)

Denne overensstemmelseserklæring følger DS/EN 45 014
This declaration of conformity complies with DS/EN 45 014
Diese Konformitätserklärung befolgt DS/EN 45 014