

# CLEANTRACK 1000 Operations and Technical Manual.

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Draft, 2005-12-01

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### **Conditions.**

All information provided by BRANNSTROMS about this equipment is given in good faith and is based on the best knowledge available at the particular time. No responsibility is, however, assumed for possible inaccuracies or omissions.

The content of this manual may be copied as required for operational use on the vessel in which the equipment is installed. This Manual must not be copied, in full or in part, for disclosure to third part.

The software incorporated in the equipment is furnished on a strictly "as is" basis. The software is proprietary to Brännström Elektronik AB. The disclosure of the software coding is not allowed. The software may not be copied in whole or part.

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# CLEANTRACK 1000 Operations and Technical Manual.

## Chapter 1 Introduction and General Description

This chapter contains general information and description of the BRANNSTROMS CLEANTRACK 1000 equipment. The information is edited in the following subsections and paragraphs.

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# **CLEANTRACK 1000 Operations and Technical Manual.**

## **1.2 Introduction**

The CLEANTRACK 1000 Oil Content Meter is approved in accordance with the test and performance requirements for Oil Discharge Monitoring and Control Systems, as contained in IMO Resolution MEPC.108(49), adapted on 18<sup>th</sup> of July 2003. The requirements of the MARPOL Convention are that all oil tankers with a gross tonnage of 150 gross tonnage and above must have an oil discharge monitoring and control system installed, incorporating a control unit with a starting interlock and overboard discharge control.

The requirements in Res MEPC.108(49) apply for tankers which keel are laid, or which are in a similar stage of construction, on or after 1 January 2005.

Equipment installed in other oil tankers the keels of which are laid, or are in a similar stage of construction, before 1 January 2005, should comply either with the requirements contained in the Guidelines and Specifications adapted under resolutions A.393(X), A.496(XII), MEPC.13(19) and A.586(14), as applicable, or with the requirements contained in the MEPC.108(49) Guidelines and Specifications.

Normally a ship specific manual is developed, covering the complete, ship specific system as installed onboard, in order to identify and have a better access to the system.

It is required that the Ship specific manual for the oil content meter must only contain information relevant for the particular installation. This technical manual, being of general validity for a range of CLEANTRACK 1000 configurations, may then have to be adjusted by removal and/or adding of excess information.

It is recommended that the design of the complete installation and systems manual is carried out by specialist consultant engineers, or shipyards, well experienced in this particular task. BRANNSTROMS will be pleased to arrange for developing of such a ship specific manual, and for the necessary system documentation at a favourable cost level.

# CLEANTRACK 1000 Operations and Technical Manual.

## 1.3 General Description

CLEANTRACK 1000 oil content meter is certified to meet the requirements of IMO Resolution MEPC.108(49)

CLEANTRACK 1000 has a measuring range of 0 - 1000 PPM.

CLEANTRACK 1000 is robust, easy to install, easy to use and easy to maintain.

CLEANTRACK 1000 has a unique self-cleaning feature, making manual cleaning virtually unnecessary.

CLEANTRACK 1000 is a high quality product. The most exposed parts are made of stainless steel. The components of the electrical and electronic sections are designed for obtaining long lifetime.

CLEANTRACK 1000 oil content meter consists of the following main parts:

**A Computer unit** intended to be installed in the cargo control room or in an equivalent non-hazardous space. The computer unit controls and receives data from the other CLEANTRACK 1000 components. This information is treated for computing and control purposes and is documented on a printer according to the requirements of the IMO Resolutions. The computer has a NMEA connection for the GSM system providing the unit with information regarding the ships position. The other parts of the CLEANTRACK 1000 system are controlled from the computer unit.

There is also available an optional computer, having the same features and functions as the above computer, including the NMEA connection for the GPS system, but the paper printer has been replaced with a LCD-screen displaying the same information as received on paper. In addition this computer presents a general system layout, and essential parts of the operators manual available from the menu.

**A Converting unit** intended to be installed in the engine room. The Converting unit converts electrical control signals from the computer unit to pneumatic or electrical supply signals for operation of the components that are part of the CLEANTRACK 1000 equipment. The Converting unit contains electrical power supply and zener barriers for the analysing unit and for two, two wire 4 - 20 mA, flow meters. The Converting unit also contains a cleaning solution pump and a cleaning solution tank.

**An Analysing unit** intended to be installed in the pump room or other hazardous space. The analysing unit contains the oil content measuring unit and a pressure transmitter that monitors the sample flow through the measuring cell. The distance between the sampling probes and the analysing unit should be as short as possible. The installation engineer must take into account the permissible maximum transport time for the sample water. The maximum distance is normally in the range of 25 metres.

## **CLEANTRACK 1000 Operations and Technical Manual.**

**A Sample feed pump** of impeller type, to be installed close to the analysing unit and normally in the pump room.

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **1.3.1 Sample feed pump options**

The sample feed pump motor can be one of 4 kinds:

Alternative 1 is the standard alternative for applications with crude oils, "black" and "white" products and a number of oil like substances. The other three alternatives, 2, 3 and 4, are for applications with crude oils and "black" and "white" products. The last three alternatives should only be used where the standard alternative isn't applicable.

- 1) A standard electrical drive motor positioned in non-hazardous area, pump in hazardous area, driven via a bulkhead penetration with shaft seal.
- 2) An electrical explosion proof motor with an EEx d I/IB T5 approval. This motor is recommended for use in areas where this is permitted by the relevant authorities.
- 3) A pneumatic motor operated on the ship's compressed air system.
- 4) A hydraulic motor intended to operate on ship's hydraulic power system.

## **1.3.2 Measuring principle**

The measuring principle employed in the CLEANTRACK 1000 equipment is based on a combination of light scattering in three different angles. The sample water stream is homogenised in the sample feed pump and is passed through a quartz tube where it is exposed to a light beam in the light transmitted and scattered in the selected angles is dependent on the type and amount of contaminants in the water stream. Signals from non-oil contaminants can be compensated for in the computer processing of the information due to their different light scattering characteristics.

The measuring cell is flushed with clean water and a cleaning solution for a short moment once a minute during operation in order to keep the cell clean.

A pressure transmitter monitors the proper operation of the measuring cell regarding abnormal supply of sample water.

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **1.3.3 Standard Installation Arrangement**

A typical installation arrangement of CLEANTRACK 1000 equipment is illustrated in drawing. CT891213.1. The figure illustrates a standard installation with an electrically driven bulkhead penetration sample feed pump.

The computer unit is located in the control room and is connected to the valve control console for overboard valve operation/starting interlock and for valve position information.

The Converting unit is mounted in the engine room as well as armature and controls for water and air supply to the components in the pump room.

The analysing unit is mounted in the pump room side of the bulkhead above the sample pump. Small diameter bulkhead penetrations for water and control air as well as for electrical wiring of the intrinsically safe circuitry of the measuring system are arranged at a suitable location, making the connections as short as possible.

Sample probes and sample return probes are arranged in the overboard piping as required, as well as the flow meter. The sample probe valves may optionally be remote controlled from CLEANTRACK 1000, and connected to the Converting unit.

Further description of options of various installation arrangements is given in Chapter 7.

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **1.3 Technical Descriptions and Specifications**

This Section contains technical specifications and brief functional descriptions of the main components of the CLEANTRACK 1000 equipment. The components of the CLEANTRACK 1000 equipment receive information from various sources and produce various outputs as summarised in paragraphs 1.3.1 and 1.3.2 below.

### **1.3.1 CLEANTRACK 1000 Input Signals**

CLEANTRACK 1000 receives the following signals from components being part of the equipment and from other components.

- 1 4 - 20 mA analogue signal from a flow meter.
- 2 4 - 20 mA analogue signal from analysing unit pressure transmitter.
- 3 4 signals 0 - 2 mA from IR sensors in the measuring unit.
- 4 Low level signal from the cleaning solution tank.
- 5 Alarm signal from sample pump over-current relay.
- 6 Spare input in the Converting unit. Optional used as high pump temperature input in the Converting unit.
- 7 Signal from air pressure switch.
- 8 Signal from push button for running the cleaning solution pump manually.
- 9 Pulse signal from ships log.
- 10 Signal from manual override switch to control the overboard discharge valve. Purpose: To enable, in case of failure, overboard discharges independent of the CLEANTRACK 1000 equipment.
- 11 4 inputs intended to be connected to voltage free switches and to monitor valve positions. Valve versus input configuration is factory programmed.
- 12 On demand the CLEANTRACK 1000 is equipped with a temperature sensor that monitors the temperature of the sample pump shaft seal. Be aware of cable length limitations.
- 13 Signal from NMEA



# CLEANTRACK 1000 Operations and Technical Manual.

## 1.3.2 CLEANTRACK 1000 Output Signals

The CLEANTRACK 1000 equipment provides the following output signals to components included in the system and to external components.

1. An intermittent current output to the IR LED in the analysing unit.
2. Analysing valve manoeuvre air. Purpose: To enable cleaning of analysing unit.
3. 2 converting unit sample point valve control relay outputs. Its purpose is to facilitate remote control of a sample point valve. Usage is optional. This output can be configured for other purposes.
4. Converting unit spare relay output. Optional used to control the OBV. The OBV is normally controlled from the computer unit. Also optional used to control a sample pump heater. The sample pump heater has been used to avoid freezing damages.
5. Fresh water valve control relay output. External solenoid valve is included. Purpose: To facilitate automatic cleaning of the analysing unit.
6. Cleaning solution pump control. Purpose: To facilitate automatic cleaning of the analysing unit.
7. Sample feed pump forward/backward control. Purpose: To automatically control the sample feed pump during oil content monitoring and system cleaning.
8. Alarm relay output. Purpose: To activate the external alarm.
9. Warning relay output. Purpose: To activate the external warning signal.
10. 4 computer unit relay outputs intended to be used to control the OBV and other valves. Valve versus output configuration is factory programmed.
11. A printer is recording the operation of the equipment.
12. 40 characters LCD. Purpose: Communication between the computer and the operator.
13. LED's on the computer.

ON                      Computer power supply.

ALARM                One or more alarms are activated. If flickering, one or more warnings are activated.

AV                     Open analysing valve.

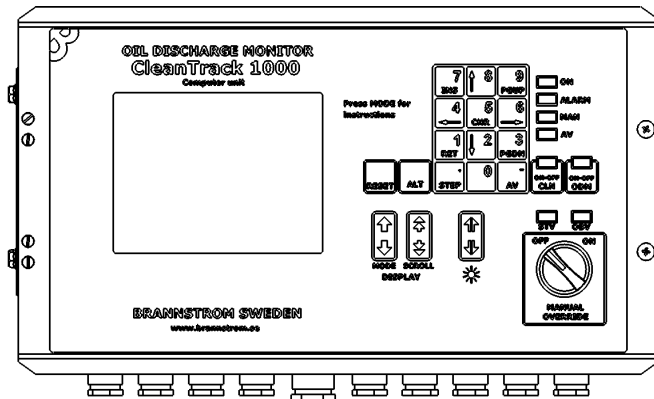
## CLEANTRACK 1000 Operations and Technical Manual.

CLN	Performing cleaning.
PF alt MAN	Lights intermittently when you enter the manual oil concentration mode. This mode is selected at line 1.1b.
OBV LED	Oil content monitoring.
ODM	Oil content monitoring.
STV LAMP	Slop tank valve open.
OBV LAMP	Overboard valve open.

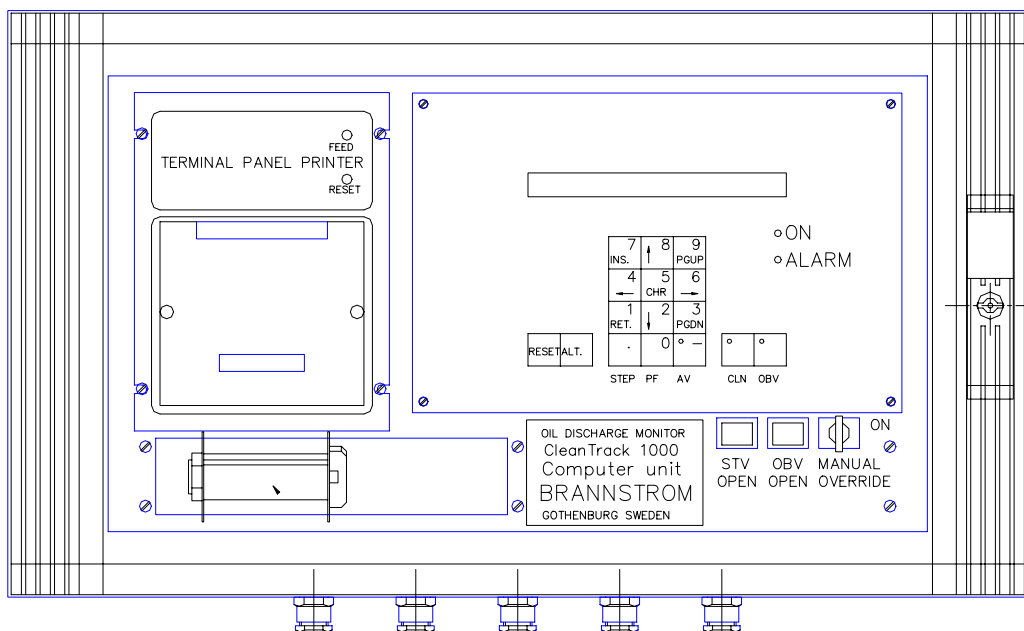
# CLEANTRACK 1000 Operations and Technical Manual.

## 1.3.3 Computer Unit Technical Description

### Computer unit with LCD printer.



### Computer unit with paper printer.



### Purpose and functioning:

The computer unit contains all facilities, necessary to carry out the computing and recording of the overboard discharge, as specified in the Convention and the related Resolutions. The computer calculates the oil content in the sample water, using information from the sensors in the analysing unit. The computer unit calculates the rate of discharge of oil and the total quantity discharged during a voyage from the oil content and flow meter input information. All calculations are identified to time and date, using a built- in time information generator. Failures and malfunctions are monitored. Alarms are given when discharge limits are exceeded and at failures. All information is printed in a durable format on a printer. Additionally the computer unit has the overall control functions of the remaining parts of the entire system.

## **CLEANTRACK 1000 Operations and Technical Manual.**

### **Computer unit with LCD printer.**

Dimensions:	200 x 370 x 100 (Height x Width x Depth) Cable glands not included.
Weight:	6 Kg
Material:	AISI304
Power supply:	220VAC/110VAC +-10 % 50/60 Hz 50VA The power supply should be equipped with a main switch or a detachable power supply connector and a fuse size of max. 6 A.

### **Computer unit with paper printer.**

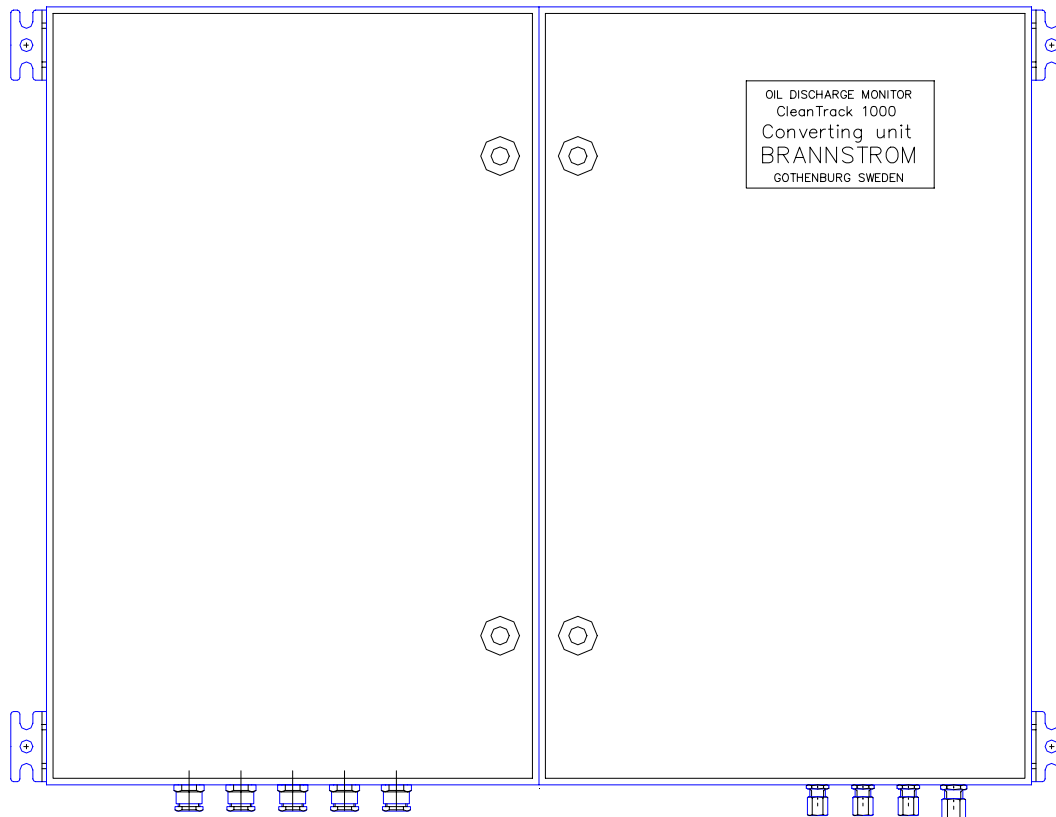
Dimensions:	345 x 600 x 420 (Height x Width x Depth) Cable glands not included.
Weight:	35 Kg
Colour code:	RAL 7032
Power supply:	220VAC/(110VAC on request) +-10 % 50/60 Hz 50VA The power supply should be equipped with a main switch or a detachable power supply connector and a fuse size of max. 6 A.

### **Computer unit with LCD/paper printer.**

Installation place:	Bulkhead mounted in cargo control room or equivalent space.
Communication:	Converting unit signal communication. 2 wire 0.5 mm <sup>2</sup> pair twisted shielded cable. Maximum cable length is 120 m.
Input signals:	Ships speedlog as a voltage free switch. Min. switch on/off time: 33 ms. Max. switch on/off rebound time: 8 ms for suppression. Pulse frequency range: 45-999 pulses/nm.
	Other input signals see chapter 1.3.1.
Output signals:	See paragraph 1.3.2 "CLEANTRACK 1000 Output Signals" at page 9.

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## 1.3.4 Converting Unit Technical Descriptions



### Installation place:

Bulkhead mounted in engine room or equivalent non-hazardous area.

Dimensions: 600 x 760 x 220 (Height x Width x Depth)  
Cable glands not included.

Weight: 44 Kg

Colour code: RAL 7032

### Physical arrangement:

The Converting unit is built into an enamel lacquer coated steel cabinet, divided in two sections. The left-hand compartment contains electrical components for external equipment, e.g. relays, transformers, Zener barriers and connection terminals. The right hand compartment contains the tank and pump for the measuring cell cleaning solution, the solenoid valves for the pneumatically manoeuvred analysing valve and the pressure switch.

### Electrical supply:

1. The standard model is designed for electrically powered pump motor and has the following supply specification:

## CLEANTRACK 1000 Operations and Technical Manual.

3 phase 440/380VAC +- 10% 60/50Hz 1200VA. The power supply should be equipped with a main switch or a detachable power supply connector and a fuse size of 3 x 10 A.

2. Units equipped to control pneumatically or hydraulically powered pump motors. Available for electric power supplies of:  
1 phase 220VAC +- 10% 50/60Hz 200VA or 1 phase 440/380VAC +- 10% 60/50Hz 200VA. The power supply should be equipped with a main switch or a detachable power supply connector and a fuse size of 6 A.

Main switch: Optionally the Converting unit can be equipped with main switch and designed for fuse sizes of 50A.

Heater: Optionally the Converting unit can be equipped with a heater output. The purpose with the heater is to avoid freezing in the sample pump.

Safety approvals: The Zener barrier module:  
II (1) [Eex ia] IIC SP03ATEX3617X  
Tamb: -20C to +60C  
Um: 250VAC/VDC

Air supply: Compressed air. 1m<sup>3</sup>/h, 4 - 6 bar clean and dry control air.

Communication: Computer unit communication. 2 wire 0.5mm<sup>2</sup> pair twisted shielded cable.  
  
Two blue marked 2 wire 0.5mm<sup>2</sup> shielded cables for signals from the analysing unit. Maximum length is 80 m.

One 6 wire 0.5mm<sup>2</sup> blue marked shielded cable for signals from the analysing unit. Maximum length is 80 m.

Pneumatic signal for controlling the analysing unit valve. Pipe dimension 6/4mm.

Inputs: Two flow meter, two wire 4 – 20 mA current signal inputs.

Pressure switch for monitoring of supplied air pressure, and in certain configurations, for monitoring of the overboard valve position.

On demand the CLEANTRACK 1000 is equipped with a temperature sensor that monitors the temperature of

## CLEANTRACK 1000 Operations and Technical Manual.

the sample pump shaft seal. Be aware of cable length limitations

### Outputs:

A sample feed pump output:

1. The Standard unit is designed to supply an electrical pump motor and has a 3-phase sample feed pump motor supply output.
2. The optional unit designed to operate with pneumatically or hydraulically powered sample feed pump motor has the following outputs:

Sample feed motor forward running output, intended to supply a pneumatic or hydraulic solenoid valve, 24VAC 0.5A.

Sample feed pump motor backward running output, intended to supply a pneumatic or hydraulic solenoid valve, 24VAC 0.5A.

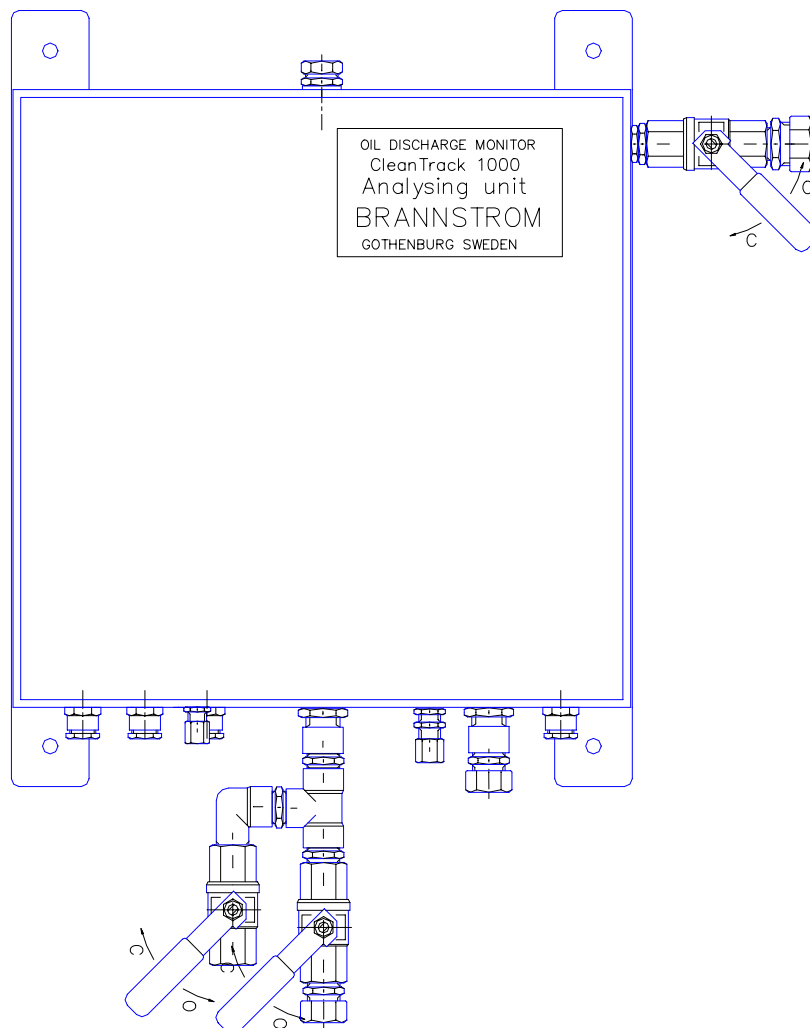
2 relay outputs optionally intended to supply 24VAC 0.5A solenoid sample point valves. See configuration information. Optionally the solenoid valves can be included in the delivery.

Cleaning water valve control output. 24VAC 0.5A.

Cleaning solution output.

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## 1.3.5 Analysing Unit Technical Description



- Installation place:** Bulkhead mounted in pump room. Maximum length of sampling piping from any sample point is 25 metres.
- Safety approvals:** The electrical components of the analysing unit have the following approvals.  
The measuring unit:  
II 1 G EEx ia IIC T4 Tamb0-60C  
SP03ATEX3616X  
The pressure transmitter:  
II 1 G EEx ia IIC T4 Ta<100C  
DEMKO 01 ATEX 127938X
- Dimensions:** 400 x 400 x 210 (Height x Width x Depth) Valves and cable glands outside the cabinet are not included.
- Weight:** 21-Kg including 3 blue marked 20 meter shielded cables.



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**Physical arrangement:** The stainless steel cabinet contains the measuring unit, mounted in the upper part of the interior space, and also the valve actuators required for changing between measuring and cleaning modes, a pressure transmitter monitor the pressure in the measuring cell.

**Communication:** Two 2 wire 0.5mm<sup>2</sup> shielded blue marked cables for signals from the Converting unit. Maximum length is 80 m.

One 6 wire 0.5mm<sup>2</sup> blue marked shielded cable for signals from the Converting unit. Maximum length is 80 m.

Control air from the Converting unit for operation of the analysing unit valve Pipe dimension 6/4mm.

**Inputs:** Sample water input:  
Sample flow 900 l/h. Temperature range 0 - 50C.

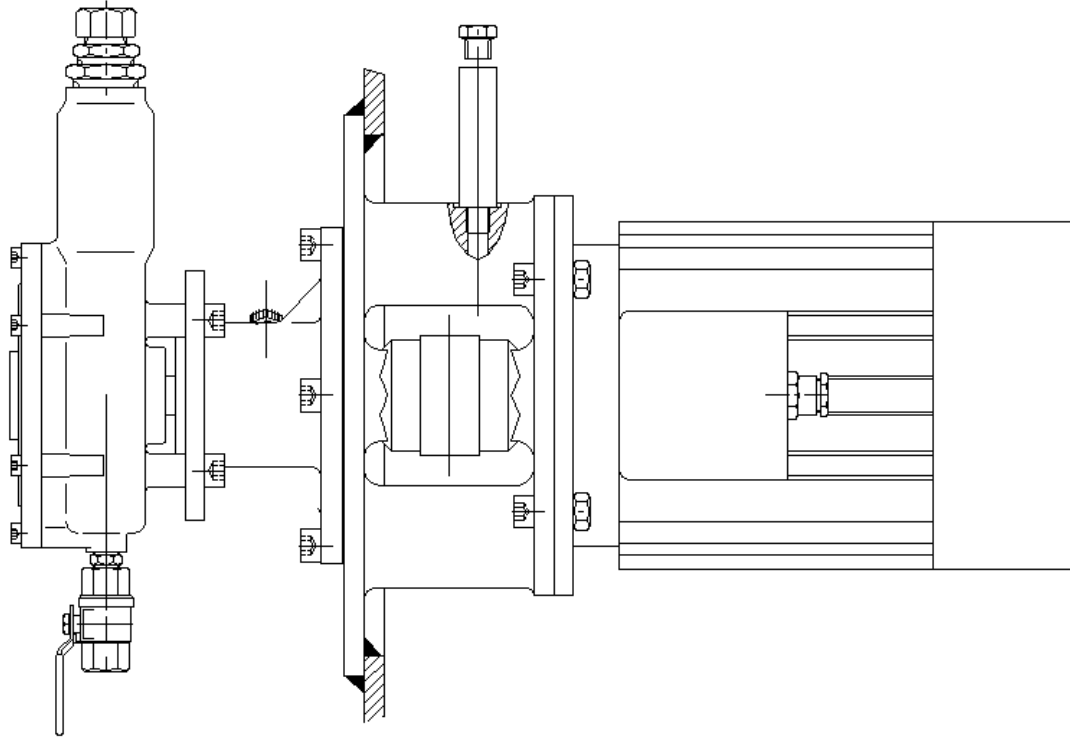
Cleaning solution input:  
Average Cleaning solution consumption is 0.1 l/h during measuring, and approx. 1 l/h during cleaning procedure.

Fresh water input:  
Average water consumption is 60 l/h during measuring and approx. 600 l/h during cleaning procedure. The temperature of the cleaning water should not exceed 45 C.

**Outputs:** Sample output;  
Grab sample output.

# CLEANTRACK 1000 Operations and Technical Manual.

## 1.3.6 Standard pump Unit technical Description



The standard alternative:

**Installation place:** Bulkhead penetration mounted, motor in engine room and pump in pump room. Maximum distance from analysing unit is to be 1 metre.

**Dimensions:** 260 x 230 x 550 (Height x Width x Depth)

**Weight:** 42 Kg (pump and electric motor)

**Physical arrangement:** The pump unit consists of a impeller pump of bronze. The motor and pump are mounted on each side of a circular bulkhead plate. Double lip seals seal the drive axis, and the intermediate space is oil filled. A transparent oil reservoir is available on the engine room side.

**Approval:** Crude oils, "black" and "white" products and oil like substances.

**Model designation** CLEANTRACK 1000 XBX XXX XXX

**Power supply:** 440/380VAC 60/50Hz 2.5kW - 2.2kW

## **CLEANTRACK 1000 Operations and Technical Manual.**

Output flow: 900 l/h.

Output pressure: 3,5 Bar.

# CLEANTRACK 1000 Operations and Technical Manual.

## 1.4 CLEANTRACK 1000 oil content meter delivery extent

The following parts are included in a standard set of CLEANTRACK 1000 equipment:

Qty	Part description.
1	Computer unit adapted according to model designation specified at order.
1	Converting unit adapted according to model designation specified at order.
1	Analysing unit.
1	Pump unit, according to model designation specified at order.
1	Sample inlet filter.
1	Inlet sample probe with sample probe valve.
1	Outlet sample stub with valves.
1	Fresh water system, comprising of a solenoid valve, a shut off valve, a check valve and a vacuum check valve.
1	Air regulator with supply shut off valve.
1	Bulkhead shut off valve for fresh water.
1	Bulkhead shut off valve for cleaning solution.
4	The CLEANTRACK 1000 Operations and Technical Manual.
1	Kit of spare fuses
2	Cleaning solution / 5 l.
2	Cleaning brush.
5	Roll of printer paper. Included in CT1000 with paper printer only.
2	Printer ribbons. Included in CT1000 with paper printer only.

# CLEANTRACK 1000 Operations and Technical Manual.

## 1.5 Fundamentals, vocabulary and abbreviations used in this manual.

The computer unit can be of two kinds, with paper printer or LCD printer. In this manual the word printer is used for both types. Parts of this manual that refer to one of the printers only are marked:

| For the paper printer with a vertical line to the right.

||| For the LCD printer with three vertical lines to the right.

Information displayed on the LCD is shown as below in this manual:

2.6 - 

Oildischarge accumulated = 90.78 l
alarm = 1000. l

The two numbers shown to the left, one before and one after the dot, are not displayed. They identify the position in the menu of the information as page and line of page.

Between the numbers and the displayed LCD information a “-“ character is shown if it is possible for the user to change any part of the information. Characters on yellow background may be changed by the user.

The computer unit is equipped with both an “OBV key” and an “OBV OPEN feedback indicator”. The OBV key indicator is called “OBV **LED**” and the “OBV OPEN feedback indicator” the “OBV OPEN **lamp**”. We use the vocabulary **lamp** in order to distinguish between the two indicators.

The “OBV OPEN lamp” is in fact a multiple LED device.

In this manual and in the computer we have used the word “over-current relay” instead of the more common “overload relay”.

Some CLEANTRACK 1000 systems are equipped with optional arrangements. The drawings showing such arrangements have a letter behind the original drawing number. In this manual such optional drawings are referred to as for instance CT920227.3x where CT920227.3 is the standard drawing. The x used in this manual denotes a letter that is specified in the documentation delivered with the particular CLEANTRACK 1000.

If such a “x” drawing is included it replaces the standard drawing. This manual might in certain contexts refer to standard drawings even if the particular system is described by a “x” drawing.

STV	Slop Tank Valve.
OBV	Overboard Valve.
ODM	Oil Discharge Monitor.
LED	Light Emitting Diode
LCD	Liquid Crystal Display
IMO	International Maritime Organisation

## **CLEANTRACK 1000 Operations and Technical Manual.**

IOPP International Oil Pollution Prevention  
MEPC Marine Environment Pollution Committee

LAN Local Area Network  
TCP/IP Transfer Control Protocol / IP  
IP Internet Protocol  
GPS Global Position System  
NMEA National Marine Electronics Association

DHCP Dynamic Host Configuration Protocol

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## Chapter 2 Operations

This chapter describes the operation, programming and servicing of the CLEANTRACK 1000. Sections 2.2 to 2.5 deals with daily operations. Sections 2.6 to 2.9 deals with certain servicing routines. Section 2.4 describes programming in detail.

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## 2.1 CLEANTRACK 1000 Computer Unit Properties

This section contains a brief description of the properties of the computer unit, including information on how to operate and use it.

The CLEANTRACK 1000 computer unit

- Controls the measuring cycle and the cleaning cycle.
- Calculates oil content in the sample water.
- Calculates the instantaneous rate of discharge of oil, expressed in litres per nautical mile.
- Calculates the total amount of discharged oil during a voyage.
- Records on a printer the oil content, the instantaneous rate of discharge of oil and total amount of oil discharged and other parameters, all related to time and date.
- Is equipped with a key for starting and stopping of cleaning.
- Is equipped with a key for opening and closing the analysing valve.
- Indicates OBV and STV feedback signals.

Use the computer keyboard and the LCD to program:

1. Automatic or Manual flow. At manual flow the valid flow value must be programmed. **NOTE** Manual mode is only for emergency or testing.
2. Automatic or Manual speed. At manual speed, the valid speed value must be programmed. **NOTE** Manual mode is only for emergency or testing.
3. Automatic or Manual position. At manual position, the valid position value must be programmed. **NOTE** Manual mode is only for emergency or testing.
4. Type of oil being monitored.
5. Alarm mode. 15ppm or 30 l/nm alarm.
6. Allowed total amount of oil that may be pumped overboard.
7. Total amount of oil to cause warning signal.
8. Rate of oil discharging that causes warning signal. The rate is to be selected in the range 0-30 l/nm.
9. Oil content (ppm) selected to cause warning signal.
10. Time of day and date.
11. Change of printer paper.

Other parameters that are required in adapting CLEANTRACK 1000 to a specific ship are pre-programmed at delivery, i.e.:

1. Flow meter parameters, i.e. type of flow meter, pipe diameter and output signal.
2. Log signal calibration. Refer to chapter 1.3.3 Computer Unit Technical Description page 11.

A detailed description of input and output signals from the equipment is contained in paragraphs 1.3.1 CLEANTRACK 1000 Input Signals at page 8 and 1.3.2 CLEANTRACK 1000 Output Signals at page 9.



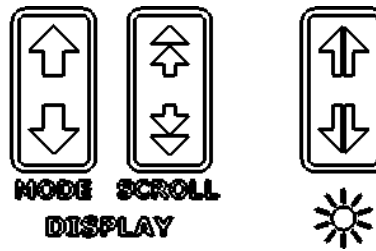
# CLEANTRACK 1000 Operations and Technical Manual.

## 2.2 Operation Procedures

This section contains the information needed for normal operation of the CLEANTRACK 1000 equipment.

### 2.2.1 Usage of display and keyboard

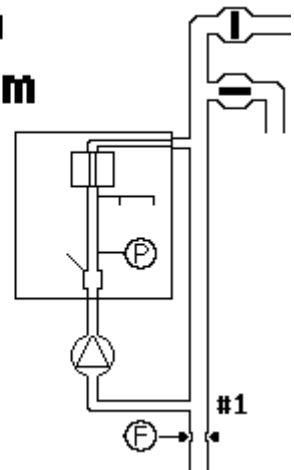
The following display modes are available.  
Use the MODE button in order to change display modes.



- 1) CLEANTRACK 1000 survey mode. This is the default mode.

```
OC      - ppm
OD      - l/nm
Σ       0 1
```

```
Pressure  0.0 bar
Flow       0.0 m3/h
Speed     0.0 kn
CT156
2005-05-23 12:27
GPS receiver timeout
```



- 2) CLEANTRACK 1000 operation and printing mode. This mode displays 2 x 40 characters at the top of the LCD. The two lines forms a number of information frames that describes the operation of the system. In this mode parameters for ODM can be changed. The frames with 2 lines of information in this manual refer to this information frame. The rest of the LCD shows the latest printouts. Periodic and oil discharge print outs during ODM in operation as well as print outs with date, time, line number and alarm condition are displayed in grey. Alarm and

```
Oc(AUTO) Flow(AUTO) GPS(AUTO) Spd(AUTO)
.000 ppm .0000 m3/h OD=.00 l/nm .000 kn
```

---

```
2005-05-30 14:21 no:2575      ALARM
ALARM      GPS receiver error
ALARM      COMMUNICATION ERROR
***** MANUAL RESET *****
2005-05-30 14:21 no:2571      ALARM
ALARM      GPS receiver error
Hardware error, refer to manual
2005-05-30 14:20 no:2568      ALARM
ALARM      COMMUNICATION ERROR
BETWEEN COMPUTER AND CONU UNIT
2005-05-30 14:20 no:2565
GPS-pos GPS receiver waiting
```

## CLEANTRACK 1000 Operations and Technical Manual.

Warning printouts as well as log print outs of operator adjustments are displayed in dark.

### 3) Printer read back mode.

This mode is used for reading old printouts. Select one of three different search modes with the STEP key.

```
Line 7056 (1-7056) TOP
2005-06-10 13:57 no:7056 ALARM
ALARM GPS receiver error
ALARM COMMUNICATION ERROR
***** MANUAL RESET *****
2005-06-10 13:57 no:7052 ALARM
ALARM GPS receiver error
Hardware error, refer to manual
2005-06-10 13:56 no:7049 ALARM
ALARM COMMUNICATION ERROR
***** MANUAL RESET *****
2005-06-10 13:56 no:7046 ALARM
ALARM COMMUNICATION ERROR
BETWEEN COMPUTER AND CONU UNIT
2005-06-10 13:56 no:7043
```

- Scroll lines to be displayed with the SCROLL button. Fast scroll lines to be displayed by with the SCROLL button while ALT is pressed.
- State a printer line index with the numeric keys. Terminate with RET. Scroll if necessary.
- State Year, Month, Day, Hour and Minute with the numeric keys of a printer line. Terminate with ret. Scroll if necessary.

### 4) Instruction mode. In this mode short form instructions are available.

The content can vary. The content can also be ship specific.

#### 2.2.1.1 A Start up check list

This paragraph gives a brief description of the normal CLEANTRACK 1000 system starting up procedure. For detailed information about programming of operational parameters, see section 2.2 "Operation Procedures", at page 25. Detailed information about the computer program and its use is given in section 2.4 "Programming of Operational Parameters" at page 42.

1. Check the level in the Cleaning solution tank and open valve pos. 34 (see drawing CT891213.1 for location). The cleaning solution consumption is approx. 0.1 l / hour. The bottom 5-cm liquid should not be counted as usable. Drain the Control air supply water trap (pos. 36). Open the Control air supply valves and check the pressure to be 4,5 - 6 bar Open the fresh water supply valves (pos. 31 and 35).
2. Open the Analysing unit inlet and outlet valves. Check that the drain valves are closed (situated at bottom of analysing unit and sample pump).

## **CLEANTRACK 1000 Operations and Technical Manual.**

3. Open the manual sample probe valves at the sample points to be used (18a, 18b, 19a and 19b for location see drawing CT891213.1 ).
4. Check Flow Meter valves VF1 and VF2 to be open and VF3 to be closed (for location see drawing CT891213.1).
5. Check and program operational parameters as described further on. An example of programming is given in chapter 2.2.1.3 “Example of programming” at page 30.

# CLEANTRACK 1000 Operations and Technical Manual.

## 2.2.1.2 CLEANTRACK 1000 keyboard

The computer keyboard has the following keys for operation and control of the equipment:

		<u>7</u>	<u>8</u>	<u>9</u>		
		INS	UP ^	PG UP		
		<u>4</u>	<u>5</u>	<u>6</u>		
		LEFT <		RIGHT >		
		<u>1</u>	<u>2</u>	<u>3</u>		
		RET	DOWN v	PG DN		
RESET	<u>ALT</u>	:	<u>0</u>	=	CLN	OBV-ODM
		STEP	PF	AV		

Underlined characters are marked with blue colour. The "blue" functions are obtained by keeping ALT pressed.

Below is a short description of the 27 key functions (15 marked with black and 12 with blue text) of the keyboard.

- INS Start of writing/changing characters to the computer. Purpose: To start a change of programmable information. After INS is pressed, information showed on the LCD that can be changed is flickering. A cursor shows the position where the next character will turn up.
- UP The line above is displayed.
- PG UP The page above is displayed. The headline of the page will be displayed.
- LEFT < Moving of the cursor towards left during writing.
- RIGHT > Moving of the cursor towards right during writing.
- RET Termination of writing. The modified line is entered into the computer. New line keys will cancel characters that were previously written without being terminated with the return key.
- DOWN v The line below is displayed.
- PG DN The page below is displayed. The headline of the page will be displayed.

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- RESET      Reset of the alarm and warning. The alarm and warning outputs are activated whilst the reset key is activated.
- STEP      Change between certain modes of operation (i.e. changing mode of speed input from AUTO to MAN).
- PF.      Paper is winded, as long as the key is activated. A printer line-feed precedes start of the paper winder. Apart from indicating paper winding the PF LED lights intermittently when the system is in manual oil concentration mode selected at headline 1.1b.
- AV      Opening and closing of the analysing valve when the unit is not used for measuring or cleaning. Purpose: To facilitate manual cleaning of the analysing unit.
- CLN      Cleaning starts. The cleaning stops automatically after the cleaning program has been carried out. Purpose: To remove any oil deposits from the walls of the sample water system.
- OBV-ODM      Oil monitoring starts or stops. Depending of system configuration the overboard discharge valve might be opened or closed.
- 01...9.-      Character writing. An INS key must precede characters in order to be accepted. Keep ALT pressed while characters are written. Pressing RET enters characters into the computer.

### **Summary:**

The keys PAGE UP, PAGE DOWN, LINE UP and LINE DOWN are used to select lines to be displayed by the LCD.

The keys INS, RET, RIGHT>, LEFT< and the numeric keys are used to enter parameters. If other keys are used the present entry is deleted.

The LCD information is changeable independent of other computer operations.

# CLEANTRACK 1000 Operations and Technical Manual.

## 2.2.1.3 Example of programming

1. Select the sample point in line 2.1 on the computer unit.

2.1 - **OBV line no: 2 (2) STRIPPING**  
**Change with INS STEP RET (STDBY only)**

This should be done even if the sample point valves aren't remote controlled in order to get a consistent record on the printer.

2. Check or select the oil Type in line 2.2 on the computer unit. See paragraph 2.4.4 "Selection of oil type" at page 43 for guidance on how to select oil type.

2.2 - **Oil quality Kerosene**  
**Change with INS <- -> RET (STDBY only)**

3. Check the discharge mode (15ppm / 30-l/nm) at line 2.3 on the computer unit. "OIL DISC. 30l/nm" indicates that the equipment is operating in the 30-l/nm mode.

2.3 - **Alarm and Warning: OIL DISC. 30l/nm**  
**Change with STEP**

4. Check or adjust the flow rate input in line 2.4 on the computer unit. A manually inserted value is shown as the first set of digits outside the parenthesis, an automatically received value is represented by the second set of digits.

2.4 - **Flow is: (AUTO). Change with STEP**  
**Manual flow = 600.0 m3/h (780.7 m3/h)**

5. Check or adjust the speed input in line 2.5 on the computer unit. The manually inserted value is shown as the first set of digits outside the parenthesis, the automatically received value is represented by the second set of digits.

2.5 - **Speed is: (AUTO). Change with STEP**  
**Manual speed = 12.2 kn (0.00 kn)**

6. Read the total quantity of oil that has been discharged and program the total quantity of oil alarm limit in lines 2.6 on the computer unit.

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2.6 - 

Oildischarge accumulated = 90.78 l
alarm = 1000. l

Reset of accumulated value to zero is only allowed at the beginning of a new ballast voyage. The information in the second line must be inserted at the beginning of each ballast voyage as 1/30000 or 1/15000 of the quantity of the previous cargo as explained in paragraph 2.4.6 “Adjust the alarm limit of permitted total quantity discharged” at page 45.

7. Check or adjust the warning limits in lines 2.7 on the computer unit.

2.7 - 

Warning oildischarge limit = 25. l/nm
Oilconcent. Limit = 10. Ppm

8. Press the RESET key on the computer unit to erase any old alarms.

9. Prepare and start the overboard pumping system.

10. Press the OBV key on the computer. The discharge or oil content monitoring is now activated and the opening or closing of the overboard valve will now be carried through.

**For more detailed information regarding programming see section 2.4 “Programming of Operational Parameters” at page 42**

### 2.2.2 CLEANTRACK 1000 Valve Operation

After a successful start up, the overboard valve opens. If any alarm appears the overboard valve will be automatically closed. If the alarm disappears the overboard valve will be opened again.

### 2.2.3 Closing down Check List

1. Press the OBV key on the computer. The OBV OPEN lamp goes off and it indicates that the overboard valve has closed. In case of manual valve operation, close the overboard valve. Check that OBV OPEN lamp goes off.
2. Stop overboard pumping.
3. The CLEANTRACK 1000 is now performing the after-cleaning procedure. Wait until the cleaning is completed or stop the after-cleaning by pressing the CLN key.
4. Close Sample Probe valves (pos. 18a, 18b, 19a and 19b, see drawing CT891213.1 for location). Close the Analysing unit inlet and outlet valves.

## **CLEANTRACK 1000 Operations and Technical Manual.**

5. Close Control Air Supply valve (pos. 30). If an air powered sample feed pump is used: Close the sample feed pump air supply.
6. Close Fresh Water Supply valves (pos. 31 and 35).

### **!!! If long intermission is expected or at risk of freezing. !!!**

1. Follow the General closing down checklist.
2. Open drain valves under analysing unit and sample pump.
3. Open AV valve by pressing the AV key at the computer. The air supply must be ON in order to open the AV.
4. Open top screw at analysing unit and clean the cell manually with the brush and concentrated cleaning solution. Rinse with fresh water.
5. Close the top screw and the AV valve.



# CLEANTRACK 1000 Operations and Technical Manual.

## 2.2.4 Manual Override

The manual override function may only be used in case it is necessary to complete an overboard discharge operation whilst the CLEANTRACK 1000 equipment or other part of the monitoring system installation has failed. The manual override switch will by-pass the monitoring function and will make opening of the overboard valve possible regardless of the computer output signal. The manual override selection will always be recorded at the printer.

Activation of manual override:  
Turn the manual override key to the right.  
The message P.11 will appear at the printer.

```
P.11 | ^  
      | ~~~~~  
      | MANUAL OVERRIDE OVERBOARD VALVE  
      |
```

Deactivation of manual override:  
Turn the manual override key to the left.  
The message P.12 will appear at the printer.

```
P.12 | ^  
      | ~~~~~  
      | MANUAL OVERRIDE OVERBOARD VALVE ENDS  
      |
```

# CLEANTRACK 1000 Operations and Technical Manual.

## 2.3 CLEANTRACK 1000 Computer Unit Program Description

This section contains a brief description of the computer program and the means of operation. The function of the keyboard is described in detail in paragraph 2.2.1.2 "CLEANTRACK 1000 keyboard" at page 28.

Below is a description of lines displayed by the LCD in short form. Item numbers to the left of the text below are used for facilitating this documentation and are not displayed on the LCD.

Number and values shown in the lines illustrate an example only.

At normal operation the lines illustrated by 1.1 are displayed on the LCD. In case of 15 ppm monitoring the LCD will look as shown in line 1.2. The details of the headlines are explained in paragraph 2.3.1 "CLEANTRACK 1000 Computer Head Line Description" at page 36.

Below is shown a list of the operational parameters, which the user can select to be displayed on the LCD. Other information that might occur on the display, for conditional reasons, is explained in section 3.1 "Alarms and alarm set up instructions" at page 58.

1	-	DISPLAY HEADLINE
1.1		Oc(AUTO) Flow(AUTO) GPS(AUTO) Spd(AUTO) 600. ppm 300.0 m3/h OD=12. 1/nm 14.0 kn
1.1a	-	GPS is: (AUTO) Change with STEP Pos: GPS receiver timeout
1.1am	-	GPS is: (MAN ) Change with STEP (8=N,2=S) Pos: 5601.****,N,01160,****,E (4=W,6=E)
1.1b	-	OILCONC is: (AUTO). Change with STEP Manual conc = 500.0 ppm (.0000 ppm)
1.1c	-	Toggle Night/Day with STEP LCD,OBV,STV intensity: 5,5,5
1.2		Oc(AUTO) Flow(AUTO) GPS(AUTO) Spd (MAN ) 15 ppm 200 m3/h 12.2 kn

# CLEANTRACK 1000 Operations and Technical Manual.

- 2 PAGE PROGRAMMING
- 2.1 - OBV line no: 2 (2) STRIPPING  
Change with INS STEP RET (STDBY only)
- 2.2 - Oil quality Kerosene  
Change with INS <- -> RET (STDBY only)
- 2.3 - Alarm and Warning: OIL DISC. 30l/nm  
Change with STEP
- 2.4 - Flow is: (AUTO). Change with STEP  
Manual flow = 600.0 m3/h (780.7 m3/h)
- 2.5 - Speed is: (AUTO). Change with STEP  
Manual speed = 12.2 kn (0.00 kn)
- 2.6 - Oildischarge accumulated = 90.78 l  
alarm = 1000. l
- 2.7 - Warning oildischarge limit = 25. l/nm  
Oilconcent. Limit = 10. Ppm
- 2.8 - High ppm limit = 1000. Ppm  
Pump temp=40.C, limit=100C Cutemp=40C
- 2.9 New paper. Paper 00056 Printout 02123  
Reset printout counter with RET
- 2.10 - Real time clock:  
Date 1997.12.30 Time: 19:27:12
- 2.11 Memory printout with STEP
- 2.11a Faultfind printout with STEP

## CLEANTRACK 1000 Operations and Technical Manual.

- 2.12 

Line 1: CARGO	->OIL KEEP
Vlv:E11 Flow:F3 SL(O/I/S):S1/_ /_	
- 2.13 

Line 2: STRIPPING	->OIL DISC
Vlv:E11 Flow:ZF2 SL(O/I/S): 2/ /	
- 2.14 

Line 3:	->OIL CONC
Vlv:None Flow:None SL(O/I/S): / /	
- 2.15 

VER(4.15) CT190 301/nm
------------------------

### 2.3.1 CLEANTRACK 1000 Computer Head Line Description

Example of headline displayed at normal operation:

- 1.1 

Oc(AUTO) Flow(AUTO) GPS(AUTO) Spd(AUTO)
600. ppm 300.0 m3/h OD=12. 1/nm 14.0 kn

Description of the most important parameters used in conjunction with the 30-l/nm mode. The LCD displays from left to right - oil content in ppm (AUTO= automatic, MAN = manual), flow rate of oil discharged overboard per nautical mile and ships speed. GPS mode is also shown.

- 1.1a - 

GPS is: (AUTO) Change with STEP
Pos: GPS receiver timeout

This line is situated one display below the headline. When the GPS is in the normal, automatic mode the second line displays the status of the GPS receiver.

- 1.1am - 

GPS is: (MAN ) Change with STEP (8=N,2=S)
Pos: 5601.****, N, 01160, ****, E (4=W,6=E)

In manual GPS mode the manually entered position is displayed. NOTE, GPS manual mode is to be used for emergency reasons only. Res. MEPC.108(49) doesn't allow manual GPS mode. CleanTrack will be in ALARM state during manual GPS mode.

- || During manual GPS mode the MAN LED will light intermittently.  
CleanTrack will return to automatic oil GPS mode after the system has been in stand by mode for a while.

# CLEANTRACK 1000 Operations and Technical Manual.

1.1b - OILCONC is: (AUTO). Change with STEP  
Manual conc = 500.0 ppm (.0000 ppm)

This line is situated two displays below the headline. By selecting "OILCONC is (MAN)" it is possible to verify that the calculation formula works. It is also possible to simulate the high ppm alarm or the exceeding of the 30 l/nm limit. If you enter manual oil concentration mode during oil discharge the overboard valve closes. In this mode the registered and displayed oil content is the highest of the measured oil content and the manual oil content.

|| During manual oil concentration mode the MAN LED will light intermittently.

| During manual oil concentration mode the PF LED will light intermittently.

CleanTrack will return to automatic oil concentration mode after the system has been in stand by mode for a while.

1.1c - Toggle Night/Day with STEP  
LCD,OBV,STV intensity: 5,5,5

This line is situated three displays below the headline. The "night mode" light intensity of the LCD, OBV and STV lamps are digits ranging from 1 to 9.

1.2 Oc (AUTO) Flow (AUTO) GPS (AUTO) Spd (MAN )  
15 ppm 200 m3/h 12.2 kn

This line displays the most important 15-ppm mode parameters.

## 2.3.2 CLEANTRACK 1000 Computer Programming Page Description

This paragraph contains a description of all the operational parameters, which can be programmed in normal operation.

2 PAGE PROGRAMMING

Page headline.

2.1 - OBV line no: 2 (2) STRIPPING  
Change with INS STEP RET (STDBY only)

Selection of overboard valve and sample point to be monitored. Value inside braces indicates total number of overboard valves or sample points installed. Selecting an overboard valve may affect the mode of "OIL CONCENTRATION"/"OIL DISCHARGE".

## CLEANTRACK 1000 Operations and Technical Manual.

2.2 - Oil quality **Kerosene**  
Change with INS <- -> RET (STDBY only)

Select Oil quality. Precede the selection by pressing the INS key, then make the selection by usage of the <- and -> keys. Press the RET key in order to terminate selection.

2.3 - Alarm and Warning: **OIL DISC. 30l/nm**  
Change with STEP

Toggle with the STEP key between 15 ppm "OIL CONCENTRATION" and 30 l/nm "OIL DISCHARGE" mode. Alarm will be given at 15 ppm and 30 l/nm respectively.

2.4 - Flow is: **(AUTO)**. Change with STEP  
Manual flow = **600.0** m<sup>3</sup>/h (780.7 m<sup>3</sup>/h)

The value inside the parenthesis displays the automatic flow, which is based on the flow meter signal. NOTE, Flow manual mode is to be used for emergency reasons only. Res. MEPC.108(49) doesn't allow manual flow mode. Cleantrack will be in ALARM state during manual flow mode.

|| During manual flow mode the MAN LED will light intermittently.

CleanTrack will return to automatic oil concentration mode after it has been in idle mode for a while.

2.5 - Speed is: **(AUTO)**. Change with STEP  
Manual speed = **12.2** kn (0.00 kn)

The value inside the parenthesis displays the automatic speed, which is based on the log signal. NOTE, Speed manual mode is to be used for emergency reasons only. Res. MEPC.108(49) doesn't allow manual speed mode. CleanTrack will be in ALARM state during manual speed mode.

|| During manual speed mode the MAN LED will light intermittently.

CleanTrack will return to automatic oil concentration mode after it has been in idle mode for a while.

2.6 - Oil discharge accumulated = **90.78** l  
alarm = **1000.** l

Total amount of oil pumped overboard. The value is programmable and should be reset to zero at the beginning of a new ballast voyage. The alarm limit is to be adjusted according to information in Res. MEPC.108(49). See also **2.4.6 Adjust the alarm limit of permitted total quantity discharged** at page 45

## CLEANTRACK 1000 Operations and Technical Manual.

2.7 - `Warning oil discharge limit = 25. l/nm  
Oilconcent. Limit = 10. Ppm`

Warning limit for high rate of oil pumped overboard. The value is programmable but we recommend it to be set to 25 l/nm.

High oil content warning limit. The value is programmable.

2.8 - `High ppm limit = 1000. Ppm  
Pump temp=40.C, limit=100C Cutemp=40C`

Highest acceptable ppm value, which the equipment can monitor. Optionally CLEANTRACK 1000 may be equipped with a type K thermoelectric sensor for measurement of sample pump temperature. State the warning "limit" temperature. The temperature inside the Converting unit is displayed after the label "CU temp".

2.9 `New paper. Paper 00056 Printout 02123  
Reset printout counter with RET`

New printer paper. Press RETURN key after installation of a new printer paper. The computer will print all operation data and reset the paper line counter.

2.10 - `Real time clock:  
Date 1997.12.30 Time: 19:27:12`

Date and GMT time. May be reprogrammed if necessary.

2.11 `Memory printout with STEP`

Documentation of the current computer program. See section 3.6 "Documentation of program in form of a Memory-print-out." at page 91.

2.11a `Faultfind printout with STEP`

Display information in order to simplify remote trouble shooting by service engineer. Snapshot the LCD after faultfind is activated and send the information to the service engineer.

2.12 `Line 1: CARGO ->OIL_KEEP  
Vlv:E11 Flow:F3 SL(O/I/S):S17_/_`

Specifications regarding overboard line 1. Functioning is specified below.

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2.13 

Line 2: STRIPPING ->OIL_DISC Vlv:EI1 Flow:ZF2 SL(O/I/S): 2 / /
---

Specifications regarding overboard line 2. Functioning is specified below.

2.14 

Line 3: ->OIL_CONC Vlv:None Flow:None SL(O/I/S): / /
---

Specifications regarding overboard line 3.

The overboard line specifications are factory programmed.

“Vlv” selects OBV configuration. “Flow” selects the flowmeter. “SL(O/I/S)” selects the sample point valve configuration with the three parameters Output/Input/Select. The three parameters are designated SL(O), SL(I) and SL(S) below. The following options are available:

<b>Vlv</b>	<b>Specification of OBV</b>
EI1	The relay connected to terminals 5 and 6 in the computer unit controls the OBV of this line. The OBV feedback signal is supposed to be connected to terminals 26 and 27.
EI2	Analogous to Vlv-EI1 but the relay is connected to terminals 9 and 10 and the feedback to terminals 29 and 30.
Man	A manually manoeuvred OBV. OBV feedback signal isn't used.
Ext	The overboard line is equipped with a STV and an OBV. Both valves have open and close feedback signals. See drawing CT891120.9.
<b>Flow</b>	<b>Specification of flowmeter</b>
None	No flowmeter.
ZF1	Flowmeter connected to ZF1
ZF2	Flowmeter connected to ZF2
F3	Flowmeter connected to the appropriate terminals in the Converting unit.
F4	Flowmeter connected to the appropriate terminals in the Converting unit. If terminals 26 and 28 in the computer units are strapped then F3 inputs signal will be used instead of F4.
<b>SL(O)</b>	<b>Specification of Sample Point Valve configuration</b>
-	CLEANTRACK 1000 doesn't control the Sample Point Valve.
1	Sample Point Valve is to be connected to terminals 13 and 14 in the Converting unit.
2	Analogous to SL( 1) but terminals 15 and 16 are used.
S1	Analogous to SL(S1) but the sample point valve is only open when the system is running.



## CLEANTRACK 1000 Operations and Technical Manual.

S2 Analogous to SL(S1) but terminals 15 and 16 are used.

### **SL(I) Specification of Sample Point Valve feedback configuration**

- No Sample Point Valve feedback is used.

c30 The feedback signal is to be connected to terminals 29 and 30 in the computer unit. The feedback contact is supposed to be closed when the Sample Point is selected.

o30 Analogous to SL(I) c30 but the contact is supposed to be open.

c31 Analogous to SL(I) c30 but the signal is to be connected to terminals 29 and 31.

o31 Analogous to SL(I) c31 but the contact is supposed to be open.

### **SL(S) Specification of Slop-tank/Residual-tank valve feedback configuration.**

If SL(S) is active the Residual tank is selected. It affects the periodic printout. The SL(S) options are analogous with the SL(I) options.

-> The code "OIL\_CONC"/"OIL\_DISC" after -> decides the mode of "OIL CONCENTRATION"/"OIL DISCHARGE" when this line is selected. The code "OIL\_KEEP" denotes that the mode of "OIL CONCENTRATION"/"OIL DISCHARGE" is not affected when the line is selected.

2.15

VER(4.15) CT190 301/nm
------------------------

Identification of installed program.

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## 2.4 Programming of Operational Parameters

### 2.4.1 Selection of sample point

The sampling point is identified together with the related overboard valve.

2.1 - 

OBV line no: 2 (2) STRIPPING Change with INS STEP RET (STDBY only)
---

Display line 2.1. Press the INS key and select the desired sample point by pressing the STEP key. Terminate by pressing the RETURN key. NOTE: this should always be done for the record, independent of the sample points being remote controlled by this command.

### 2.4.2 Select the 15-ppm mode

The 15-ppm mode for monitoring of clean ballast has less geographical limitations than the 30l/nm mode.

2.3 - 

Alarm and Warning: OIL DISC. 30l/nm Change with STEP
---

Press the keys until line 2.3 is visible on the display. If the line indicates "OIL DISC. 30l/nm" at the end, the CLEANTRACK 1000 is in 30-l/nm mode. In that case select the 15-ppm mode by pressing the STEP key. The 15-ppm mode is indicated by "OIL CONC. 15ppm".

### 2.4.3 Selection of 30 l/nm mode

The 30 l/nm mode is the normal and mandatory mode in which CLEANTRACK 1000 monitors the oil content and computes the discharge rate of oil and compares this to the permitted value of 30 l/nm. This monitoring function must be in operation at all times when discharge of oil contaminated water takes place.

2.3 - 

Alarm and Warning: OIL DISC. 30l/nm Change with STEP
---

Display line 2.3. If the line displays "OIL CONC. 15ppm" at the end, the CLEANTRACK 1000 is in 15-ppm mode. In that case select the 30l/nm mode by pressing the STEP key until the display shows "OIL DISC. 30l/nm".

# CLEANTRACK 1000 Operations and Technical Manual.

## 2.4.4 Selection of oil type

2.2 - Oil quality **Kerosene**  
Change with INS <- -> RET (STDBY only)

Display line 2.2. Begin the selection with the INS key, do the selection with the <- and -> keys. Terminate the procedure with the RETURN key.  
The following oil types are available in the standard configuration:

Sahara Blend  
Arabian Light Cr  
Nigerian Med Cr  
Bachaquero 17 Cr  
Minas Crude

Bunker C  
Kerosene  
Autom Gas (gasoline)  
DMA-ISO 8217 (diesel oil)

Oil type no 1 (According to MEPC. 108(49))  
Oil type no 2 .  
Oil type no 3 .  
Oil type no 4 .  
Oil type no 5 .  
Oil type no 6 (According to MEPC. 108(49))

The first six oil types correspond to the oil type 1 to 6 according to MEPC. 108(49). The following guidance should be used for selection oil type setting for oils of various kinds:

Oil type	Density	Viscosity	Pour Point	General description
no 1	Low	Medium	Very low	Mixed base
no 2	Medium	Medium	Low	Mixed base
no 3	High	Medium	Low	Naphthenic
no 4	Very high	Very high	low	Asphaltic
no 5	Medium	High	Very high	Paraffinic
no 6	Marine residual fuel oil – RMG 35. (ISO 8217:1996)			

### Oil origin or type

Ekofisk  
DUC  
Statfjord  
Brent

### Oil type setting

Oil type no 2  
Oil type no 2  
Oil type no 5  
Oil type no 5

# CLEANTRACK 1000 Operations and Technical Manual.

Light Arabian Gulf crude's	Oil type no 2
Light North Africa and West Africa crude's	Oil type no 2
Light USSR crude's	Oil type no 2
Marine diesel and light fuel oil	DMA-ISO8217
Heavy Arabian Gulf crude's	Oil type no 3
High paraffin content crude's	Oil type no 5
Mixed slop	Oil type no 3
Asphalt crude's	Oil type no 4
Lubrication oil	Oil type no 4
Heavy fuel oil	Oil type no 6
Kerosene and JP1 jet fuel	Kerosene
Gasoline and JP4 type jet fuels	Autom gas

## Annex 2

XYLENE

p-CYMENE

OCTANE

DIPENTENE

CYCLOHEXANE

NONANE

TOULENE

DODECANE

ETHYLCYCLOHEXANE

TETRA. NAPHTHALENE (Tetrahydronaphthalene)

ETHYLBENZENE

HEXENE

PENTANE

METHYLCYCLOHEXANE

HEPTANE

HEXANE

CYCLOPENTANE

### 2.4.5 Resetting of the total quantity of oil discharged overboard

2.6 - 

Oildischarge accumulated = 90.78 l
alarm = 1000. l

Display line 2.6. Press the INS key, and reset the total amount of discharged oil, by doing a zero setting of the upper line parameter, before a new ballast voyage. Terminate by pressing the RETURN key.

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## **2.4.6 Adjust the alarm limit of permitted total quantity discharged**

Display line 2.6. Press the INS key. Program the required alarm limit for total amount of oil allowed to be discharged. Calculate and insert the quantity, expressed in litres. Press the RETURN key.

The alarm limit should be set at the beginning of a ballast voyage. Calculate the alarm limit as 1/30000 of the previous cargo in case of a tanker defined in its IOPP Certificate as a "new ship" and to a value of 1/15000 of the previous cargo in case of a tanker, defined in its IOPP Certificate as an "existing ship".

## **2.4.7 Select AUT flow measuring mode or input MAN flow rate**

Automatic input of flow rate is required at all times according to MEPC.108(49). Use manual flow in emergency situations only, for instance in case of flow signal failure. Insert as the manual flow the flow calculated from pump curves. The manual flow must be inserted and be updated as often as any substantial change of the pumping rate is made.

2.4 - 

Flow is: (AUTO). Change with STEP Manual flow = 600.0 m <sup>3</sup> /h (780.7 m <sup>3</sup> /h)
--

Press the keys until line 2.4 is visible at the display. Select required measuring mode between MAN and AUTO by pressing STEP. If the MAN mode is used, press the INS key and program the applicable flow value. Press the RET key.

## **2.4.8 Select AUT speed measuring mode or input MAN speed values**

Automatic input of speed information must be used at all times according to MEPC.108(49). Use manual speed input in emergency situations only, for instance in case of speed signal system failure. State the speed used onboard for navigation purposes as manual speed.

2.5 - 

Speed is: (AUTO). Change with STEP Manual speed = 12.2 kn (0.00 kn)
--

Display line 2.5. Select desired mode between MAN and AUTO by pressing the STEP key. If the MAN mode is used, press the INS key and program the applicable speed. Press the RETURN key.

## **2.4.9 Select AUT GPS mode or input MAN GPS position**

Automatic GPS information must be used at all times according to MEPC.108(49). Use manual GPS input in emergency situations only, for

## CLEANTRACK 1000 Operations and Technical Manual.

instance in case of NMEA signal system failure. State the position used onboard for navigation purposes as manual GPS position.

1.1a - `GPS is: (AUTO) Change with STEP  
Pos: GPS receiver timeout`

Display line 1.1a. Select desired mode between MAN and AUTO by pressing the STEP key.

1.1am - `GPS is: (MAN ) Change with STEP (8=N,2=S)  
Pos: 5601.****,N,01160,****,E (4=W,6=E)`

In manual GPS mode state the position. In order to change N/S and E/W use keys 2, 4, 6 and 8. The number will be converted when RET is pressed.

### 2.4.10 Select AUT oil concentration mode or input MAN oil concentration

Manual oil concentration is selected in order to demonstrate open and close of the OBV.

1.1b - `OILCONC is: (AUTO). Change with STEP  
Manual conc = 500.0 ppm (.0000 ppm)`

Display line 1.1b. Select desired mode between MAN and AUTO by pressing the STEP key. In manual oil concentration mode state the oil concentration to be used for test.

### 2.4.11 Adjust the overboard discharge rate of oil warning limit

This warning feature is not mandatory and the suitable warning level may be selected as desired. 25 l/nm is suggested as a suitable warning level.

2.7 - `Warning oil discharge limit = 25. l/nm  
Oilconcent. Limit = 10. Ppm`

Display line 2.7. Press the INS key. Program the desired warning limit. Press the RET key.

### 2.4.12 Adjust the overboard discharge oil content warning limit

This warning feature is not mandatory and the oil content warning level may be selected as desired. A warning of 10 ppm is suggested as a suitable level.

## CLEANTRACK 1000 Operations and Technical Manual.

2.7 - Warning oildischarge limit = 25. l/nm  
Oilconcent. Limit = 10. Ppm

Display line 2.7. Press the INS key. Program the desired warning limit. Press the RET key.

### 2.4.13 Setting of real time clock

2.10 - Real time clock:  
Date 1997.12.30 Time: 19:27:12

Display line 2.10. Press the INS key, program the desired date and time. Press the RET key.

### 2.4.14 Adjust panel LED intensity

1.1c - Toggle Night/Day with STEP  
LCD,OBV,STV intensity: 5,5,5

Display line 1.1c. Press the INS key, program the desired light intensity during night. Press the RET key. The "night mode" light intensity of the LCD, OBV and STV lamps are set independent from each other as digits ranging from 1 to 9. Press STEP in order to toggle between night and day.

# CLEANTRACK 1000 Operations and Technical Manual.

## 2.5 Alarm, Warning and Reset Procedures

If abnormal conditions appear or certain limit values are exceeded, CLEANTRACK 1000 alerts the operator by generating an Alarm or a Warning.

An alarm is indicated by a red intermittently illuminated LED on the front of the computer unit, called alarm LED below, a sounding buzzer inside the computer unit and an activation of the alarm relay output.

The operator will understand what he is supposed to do from the alarm relay output, the alarm led and the printed messages in every circumstance. The logic of every alarm in particular is described in detail in section 3.1 "Alarms and alarm set up instructions" at page 58.

The alarm-reset procedures can be of three kinds depending on type of alarm:

1. The operator deactivates the alarm relay and the buzzer by pressing the RESET key. The computer then deactivates the alarm LED after the cause of the alarm disappears.
2. The alarm relay and the buzzer can be deactivated in two ways. By the operator pressing the RESET key or by the computer if the cause of the alarm disappears. The computer then deactivates the alarm LED after the cause of the alarm disappears.
3. According to kind 2, but the operator, for the sake of acknowledgement, has to press the RESET key in order to deactivate the alarm LED.

The following alarms are examples of type 3

3.16 HIGH ppm FAILURE

3.17 ALARM 15 ppm

3.18 ALARM 30 l/nm

When this kind of alarms are activated the computer closes the OBV. When the alarm is deactivated the computer opens the OBV.

- At power down the ALARM output is in make/ALARM position.

A red continuously illuminated LED on the front cover of the computer unit and the activation of the warning relay output indicates a Warning.

The "WARNING" procedure is similar to the "ALARM" procedure apart from 2 details:

- The buzzer is not activated.
- The warning output relay is activated instead of the alarm output relay.



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## 2.6 CLEANTRACK 1000 Printer Printout

The CLEANTRACK 1000 printer provides a permanent record of the overboard discharge of oil in compliance with the IMO requirements. This paragraph gives a summary of the standard and other available printouts and an explanation of their purposes. The printer in the computer unit prints certain information during start-up, at special events and in case of manual change of input data. During discharge a printout of stipulated data takes place at stipulated 10 minutes or shorter intervals. .

The following information is presented on the printer.

CLEANTRACK 1000 printer lines in short form.

	^
P.1	***** POWER OFF *****
P.2	***** POWER ON *****
P.3	***** MANUAL RESET *****
P.4	***** MANUAL MATH-ERROR RESET *****
P.5	***** MANUAL MEMORY-ERROR RESET *****
P.6	***** Start Oil-measuring *****
P.7	***** Converting Unit Start *****
P.8	***** Stop Oil- measuring *****
P.9	***** EXIT TESTMODE *****
P.10	***** ENTER TESTMODE *****
P.11	MANUAL OVERRIDE OVERBOARD VALVE
P.12	MANUAL OVERRIDE OVERBOARD VALVE ENDS
P.13	Previous paper had 01056 printouts.
P.14	1997.12.30 19:27 00056:00675 ALARM
P.15	OcA25.00pm 13.1 l/nm Σ13.011 OPEN #2
P.16	OcA25.00ppm OPEN #2
P.17	Arabian light cr FA780.7m3/h SpM12.2kn

# CLEANTRACK 1000 Operations and Technical Manual.

CLEANTRACK 1000 printer lines together with separate descriptions.

P.1

```
^
***** POWER OFF *****
```

The CLEANTRACK 1000 power supply has been disconnected.  
A line with time and date of the power disconnection follows this line.

P.2

```
^
***** POWER ON *****
```

The CLEANTRACK 1000 power supply has been connected.  
A line with time and date of the power connection follows this line.

P.3

```
^
***** MANUAL RESET *****
```

Manual reset of alarm supervision logic, initiated by pressing the computer reset key.  
A line with time and date of the manual reset follows this line.

P.4

```
^
***** MANUAL MATH-ERROR RESET *****
```

Reset of floating point math error was made on the time and date indicated on the following line.

P.5

```
^
***** MANUAL MEMORY-ERROR RESET *****
```

Reset of memory error was made on the time and date indicated on the following line.

P.6

```
^
***** Start Oil-measuring *****
```

Start of oil measuring, initiated by pressing the CLEANTRACK 1000 computer OBV key when the system is in stand by mode.  
A line with time and date of the oil-measuring start follows this line.

```
^
```

## CLEANTRACK 1000 Operations and Technical Manual.

P.7 | \*\*\*\*\* Converting Unit Start/Stop \*\*\*\*\* |

This line is added to P.6 if start of oil measuring was initialised from the Converting unit instead of pressing the CLEANTRACK 1000 computer OBV key.

P.8 | \*\*\*\*\* Stop Oil-measuring \*\*\*\*\* |

Stop of Oil measuring, initiated by pressing the CLEANTRACK 1000 computer OBV key when the system is in measuring mode.  
A line with time and date of the oil-measuring stop follows this line.

P.9 | \*\*\*\*\* EXIT TESTMODE \*\*\*\*\* |

Exit of test mode, initiated by pressing the CLEANTRACK 1000 computer INS key when line 8.0 is visible on the display, and the test mode was previously entered.  
A line with time and date of test mode exit follows this line.

P.10 | \*\*\*\*\* ENTER TESTMODE \*\*\*\*\* |

Test mode is entered initiated by pressing the CLEANTRACK 1000 computer INS key when line 8.0 is visible on the display.  
A line with time and date of the test mode entering follows this line.

P.11 | MANUAL OVERRIDE OVERBOARD VALVE |

Manual override initiated by turning the manual override key on the computer panel to OFF position.  
A line with time and date of manual override mode entering follows this line.

P.12 | MANUAL OVERRIDE OVERBOARD VALVE ENDS |

End of manual override, initiated by turning the manual override key on the CLEANTRACK 1000 computer panel to OFF position.  
A line with time and date of manual override mode exiting follows this line.

## CLEANTRACK 1000 Operations and Technical Manual.

```
-----  
^  
P.13 Previous paper had 01056 printouts.
```

Number of lines printed on the previous paper. This is printed at the beginning of each paper.

```
-----  
^  
P.14 1997.12.30 19:27 00056:00675 ALARM  
P.15 OcA25.00 ppm 13.1 l/nm Σ13.011 OPEN #2____  
P.16 OcA25.00 ppm OPEN #2____  
P.17 Arabian light cr FA780.7m3/h SpM12.2kn
```

This is the periodic printout during discharge.

Lines P.14, P.15 and P.17 are printed in 30l/nm mode, every 10 minutes or when the discharge rate of oil is changed by 10 l/nm.

Lines P.14, P.16 and P.17 are printed in 15ppm mode, every 10 minutes.

The following is printed:

Line P.14 showing,

Date.

Time.

Paper number and line number.

Existing ALARM and WARNING condition.

Line P.15 showing,

Oil content in ppm.

Alarm status

Discharge rate of oil in l/nm

Total amount of oil discharged.

OBV position

Sample line

The source tank. This information is optional.

Line P.16 showing,

Oil content in ppm.

Alarm status

OBV position

Sample line

The source tank. This information is optional.

Line P.17 showing,

Type of oil

Flow rate and manual or automatic mode of operation

Speed and manual or automatic mode of operation

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## 2.6.1 Printer paper loading

1. Loosen the old paper from the paper roller, by unscrewing the screw at the right hand side of the roller. Pull the loop together with the paper towards the right.
2. Open the front cover of the printer. Cut the new paper in order to get a tip in the middle. Slip the tip of the paper into the intended slot. Press at the same time the FEED key on the printer until the paper tip reaches the paper roller.
3. Mount the loop on the paper roller and fasten the new paper under the loop at the same time.
4. Close the front cover of the printer.
5. Stretch the paper by pressing the PF key on the computer.
6. Display line 2.9. Press the key PgDn/PgUp until line PAGE PROGRAMMING is visible on the display. Then press the arrow key down (↓) until you find line 2.9.

2.9

<code>New paper. Paper 00056 Printout 02123 Reset printout counter with RET</code>
--

Press the (RET) RETURN key in order to reset the printout counter.

## 2.6.2 Ribbon changing

1. Disconnect the computer power supply.
2. Open the front cover of the printer.
3. Cut the old ink ribbon with a pair of scissors. Replace the ink ribbon. Be careful not to contaminate the printer interior with ink when replacing the ink ribbon. If contaminated, immediately wipe with a cloth dampened with alcohol.
4. Close the front cover.
5. Connect the computer power supply.

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### **2.6.3 Transfer printouts to an external computer**

See paragraph 4.8.3 "TCP/IP communication via the CT1000 LAN interface." at page 102 on how to log on to the CT 1000.

Then, select "Printer" and follow the instructions on the Web page.  
"Download listing" downloads all printouts.

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## **2.7 Checking and Refilling of Cleaning Solution**

Open the right hand door of the Converting unit. Disconnect the two cables on top of the lid of the cleaning solution tank. Fill up the empty tank or replace the tank with a new one. Screw on the lid and connect the two cables. If the cleaning solution tubing is empty, press the cleaning solution pump key positioned inside the Converting unit valve part enclosure on the left gable. The pump will now work for 5 min or until the key is pressed a second time. Close the door of the Converting unit.

Note: Use only BRANNSTROM CLEANTRACK 1000 CLEANING SOLUTION to obtain the best result.

## **2.8 Manual Cleaning of the Analysing Unit**

Stop all current CLEANTRACK 1000 measuring and cleaning activity.

Open the analysing valve by pressing the AV key on the front of the computer unit. Close the analysing unit outlet and inlet valves. Open the top cover and drain valve. Clean inside the measuring unit cell with the brush provided and some CLEANTRACK 1000 cleaning solution. Remount the top cover and reset the valves to normal operating positions.

## **2.9 Sample Pump Shaft seal oil refilling**

This part does only apply to CLEANTRACK 1000 versions with bulkhead penetration sample feed pumps.

The oil reservoir is positioned in the engine room side. Remove the oil reservoir cover nut. Be careful not to unscrew the reservoir from the pump. Refill up to the thread with recommended oil type. Be careful not to harm the plastic reservoir when the cover nut is mounted. Turn the cover nut Clock Wise until it is in right position.



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## Chapter 3 Maintenance and Troubleshooting

This chapter contains instructions for fault finding and necessary corrective actions related to the computer unit and other complex parts of the system. The instructions include information about a complete functional check of the computer programme.

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## 3.1 Alarms and alarm set up instructions

The computer program contains functioning resulting in a number of warnings and alarms for internal malfunctions and abnormal operational conditions. This section gives a summary of the functioning and, where appropriate, how the alarms and warnings are used in fault finding. The information given is useful for experienced computer and electronics engineers as well as for the operator in fault finding of the entire system.

This Section contains essentially descriptive and explanatory information. Guidance to trouble shooting based on the computer alarm and warning indications is given in Section 3.2.

### 3.1.1 List of displayed Alarms and Warnings

The following information is available in the computer.

- 3.0 - 

PAGE ALARMS AND WARNINGS
--------------------------
  
- 3.0a - 

ALARM SETUP ERROR Correct settings and restart.
--
  
- 3.1 - 

ALARM MATH ERROR Check program before reset.
---
  
- 3.2 - 

ALARM MEMORY ERROR Check program before reset.
---
  
- 3.3 - 

ALARM COMMUNICATION ERROR BETWEEN COMPUTER AND CONV UNIT
---
  
- 3.4 - 

ALARM IR-REFERENCES Hardware error, refer to manual.
---
  
- 3.5 - 

ALARM OVERCURRENT OR OVERHEATING Hardware error, refer to manual.
--
  
- 3.6 - 

ALARM PRESSURE SWITCH Check air supply shut off valve.
---
  
- 3.7 - 

ALARM IR-DETECTOR FAILURE Detector data34.16 .8892 1.189 .2643
---
  
- 3.8 - 

ALARM PRINTER TIME-OUT Hardware error, refer to manual.
--

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- 3.9 - ALARM CLEANING PRESSURE = 4.00 bar  
Check water supply shut off valve.
- 3.10 - ALARM WORK PRESSURE = 1.01 bar  
Check all sample tube valves.
- 3.11 - ALARM CLEANING ERROR  
Detector data 34.16 .8892 1.189.2643
- 3.12 - ALARM FLOW MIN LIMIT  
Low flow or hardware error
- 3.13 - ALARM FLOW MAX LIMIT  
Hardware error, refer to manual.
- 3.14 - ALARM SPEED MIN LIMIT  
Low speed or hardware error
- 3.15 - ALARM SPEED MAX LIMIT  
Hardware error, refer to manual.
- 3.16 - HIGH ppm FAILURE
- 3.17 - ALARM 15 ppm
- 3.18 - ALARM 30 l/nm
- 3.19 - ALARM ACC.TOTAL
- 3.19a - ALARM GPS receiver error  
Hardware error, refer to manual
- 3.19b - ALARM MANUAL OVERRIDE
- 3.20 - OBV indicating both open and closed.  
Hardware error, refer to manual.
- 3.21 - STV indicating both open and closed.  
Hardware error, refer to manual.
- 3.22 - OBV no FEEDBACK within time-out.  
Hardware error, refer to manual.

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3.23 - STV no FEEDBACK within time-out.  
Hardware error, refer to manual

3.24 - WARNING CLEANING SOLUTION  
Refill cleaning solution

3.25 - WARNING OD 25. 1/nm

3.26 - WARNING OC 10.0 ppm

3.27 - WARNING ACC.TOTAL 90%

3.28 - WARNING PRINTER PAPER END

3.29 - WARNING HIGH PUMP TEMPERATURE

3.30 - WARNING SAMPLE SELECTION FEEDBACK

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## 3.2 Computer Alarms and Related Trouble Shooting.

This section gives suggestions of corrective actions in remedy of raised alarm conditions.

**3.0a** - **ALARM SETUP ERROR**  
Correct settings and restart.

A setup error has been encountered, probably due to data retention problems. Consult a service engineer for corrective actions.

**3.0a** - **ALARM SETUP ERROR**  
Correct settings and restart.

**3.1** - **ALARM MATH ERROR**  
Check program before reset.

A floating-point math error has been encountered, probably due to data retention problems. Probable cause: The computer PC battery is out of order.

Replace the battery. Reprogram the computer after replacement, following the instructions given in sections

3.5 "Replacing computer back up memory battery." at page 91 and

3.6 "Documentation of program in form of a Memory-print-out" at page 91.

Procedure for reset: Press RESET when the line is visible on the LCD.

**3.2** - **ALARM MEMORY ERROR**  
Check program before reset.

A computer-error has been encountered. Probably cause, Computer PC battery failure.

Replace the battery. Reprogram the computer after replacement, following the instructions given in sections

3.5 "Replacing computer back up memory battery." at page 91 and

3.6 "Documentation of program in form of a Memory-print-out" at page 91.

Reset of MEMORY ERROR: Display a line where programming is possible.  
Press INS and then RESET.

Procedure at alarm: The system is stopped

Procedure for reset: Press RESET when the MEMORY-ERROR line is displayed.

**3.3** - **ALARM COMMUNICATION ERROR**  
**BETWEEN COMPUTER AND CONV UNIT**

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Communication with "Converting unit" is defective. The Converting unit stops overboard pumping automatically if the communication is out of order.

Check the Converting unit mains.

Check the fuses located inside the electrical part of the Converting unit. See drawing CT920227.3 for fuse location.

Procedure at alarm: The system is stopped.

Procedure for reset: Press RESET.

### 3.4 - **ALARM IR-REFERENCES** **Hardware error, refer to manual.**

Voltage reference error in the Converting unit.

The Converting unit PCB has to be replaced.

Procedure at alarm: Automatic Cleaning is started

Procedure for reset: Press RESET.

### 3.5 - **ALARM OVERCURRENT OR OVERHEATING** **Hardware error, refer to manual.**

The over-current protection relay in the Converting unit or the overheating switch in the sample pump is activated.

The cause for an activated relay could be the sample pump pumping against a closed valve or a clogged pipe. The sample pump itself might be clogged.

Eliminate any abnormal pumping conditions and reset the over-current protection relay by pressing the button at the front of the relay. The relay is located in the electrical part of the Converting unit. Operating conditions that require frequent and repeated resetting of the over-current relay might harm the sample pump.

Procedure at alarm: The system is stopped.

Procedure for reset: Press RESET.

### 3.6 - **ALARM PRESSURE SWITCH** **Check air supply shut off valve.**

The air pressure that supply the analysing valve is below pressure switch set limit (min. 4 bar). Check the air supply or check and adjust the pressure switch limit.

Procedure at alarm: The system is stopped.

Procedure for reset: Press RESET.

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**3.7 - ALARM IR-DETECTOR FAILURE**  
**Detector data 34.16 .8892 1.189 .2643**

Unexpected IR-signal from measuring unit.

Probable cause: Measuring unit, Cb6 Cb7, the Zener-barrier unit or the Converting unit PC input amplifier is defective. Detector data is displayed in order to simplify trouble shooting.

Check cables Cb6 and Cb7, see drawing CT891120.9 for details. If the alarm still remains it may indicate a more severe defect, e.g. the quartz tube in the measuring unit being broken. For further trouble shooting, carry out the following checks:

Verify with respect to earth the voltage at the following Converting unit terminals:

Z1 to be +6 to +8V.

Z2 to be, intermittently, 0 to -0.5V.

Z3 to be, intermittently, 0 to -0.5V.

Z4 to be -6 to -8V.

Z5 to be, intermittently, 0 to -0.5V.

Z6 to be, intermittently, 0 to -0.5V.

Z8 to be, intermittently, -1.5V.

Z7 to be, intermittently, -0.3V.

The purpose of signals at terminals Z1, Z4, Z7 and Z8 are to supply the measuring unit.

More information regarding IR - detector failure turn to next page. The following values are expected at lines 8.4 to 8.7 on the display if the measuring unit contains clean water:

First verify the electrical reference values at line 8.5

The values at line 8.5 should be greater than:

8.5 **IR-data 4-7 (reference signals)**  
00300 00300 00300 03500

The values at line 8.5 should be less than:

8.5 **IR-data 4-7 (reference signals)**  
00500 00500 00500 05000

Name the values in line 8.4 R1, R2, R3 and R4 respectively. The difference between R1, R2 and R3 should not exceed 10.

Verify line 8.4 to be greater than:

8.4 **IR-data 0-3 (dark signals)**  
R1-100 R1-100 R1-100 R1-100

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Verify line 8.4 to be less than:

8.4	IR-data 0-3 (dark signals) R1+100 R1+100 R1+100 R1+100
-----	---

Verify line 8.6 to be greater than:

8.6	IR-data 8-11 (measuring signals) 2xR4-1000 R1-100 R1-100 R1-100
-----	--

Verify line 8.6 to be less than:

8.6	IR-data 8-11 (measuring signals) 2xR4+1000 R1+100 R1+100 R1+100
-----	--

Verify line 8.7 to be greater than:

8.7	IR-data 16-19 (cleaning signals) 2xR4-1000 R1-100 R1-100 R1-100
-----	--

Verify line 8.7 to be less than:

8.7	IR-data 16-19 (cleaning signals) 2xR4+1000 R1+100 R1+100 R1+100
-----	--

Consult your CLEANTRACK 1000 supplier in case of deviations from these values.

Procedure at alarm: Automatic Cleaning is started.

Procedure for reset: Press RESET.

<b>3.8</b>	- <b>ALARM PRINTER TIME-OUT</b> Hardware error, refer to manual.
------------	---

The busy signal from the printer is continuously activated. Transmitting from the computer to the printer is not possible.

Probable cause: Printer fuse failure. Replace the printer fuse. It is located at the printer enclosure inside the computer unit. Fuse size: 1A

Procedure at alarm: Automatic Cleaning is started.

Procedure for reset: Press RESET.

<b>3.9</b>	- <b>ALARM CLEANING PRESSURE = 4.00 bar</b> Check water supply shut off valve.
------------	---

Abnormal cleaning water pressure in the analysing unit. When this alarm is detected, measuring is stopped.



## CLEANTRACK 1000 Operations and Technical Manual.

Probable cause: In case of low-pressure failure the fresh water supply is closed.  
Probable cause: In case of high-pressure failure the analysing unit outlet valve or the sample outlet Probe valve is closed.

Check the above mentioned probable causes. If the alarm still remains, check the cable Cb4.

The voltage measured at Converting unit terminals Z9 and Z10 should be approx. +22V and 0V respectively relative to ground. The current in cable Cb4 should be 4 - 20mA.

If the pressure is zero the values LRef, HRef and Pres in line 8.2 should be greater than:

8.2	<b>Ana</b>	<b>ZF1</b>	<b>ZF2</b>	<b>Flo3</b>	<b>Flo4</b>	<b>Pres</b>	<b>HRef</b>	<b>LRef</b>
	<b>Inp</b>	0368	0000	0000	0000	0250	2000	0150

During the same conditions the values should be less than:

8.2	<b>Ana</b>	<b>ZF1</b>	<b>ZF2</b>	<b>Flo3</b>	<b>Flo4</b>	<b>Pres</b>	<b>HRef</b>	<b>LRef</b>
	<b>Inp</b>	0368	0000	0000	0000	0850	3000	0300

The Pres value should increase proportionally to the pressure, be equal to LRef at 0 bar and equal to HRef at the high end of the pressure transmitter range.

Procedure at alarm: The system is stopped.  
Procedure for reset: Press RESET.

**3.10 - ALARM WORK PRESSURE = 1.01 bar**  
**Check all sample tube valves.**

Abnormal sample water pressure in the analysing unit. When this alarm is detected, measuring is stopped.

Probable cause in case of low-pressure failure: The sample inlet probe valve is closed, the pipe between sample probe and the sample pump is clogged or the overboard discharge line is empty.

Probable cause in case of high-pressure failure: The analysing unit outlet valve or the sample outlet probe valve is closed.

Check the above mentioned probable causes. If the alarm still remains check the cable Cb4. The voltage measured at Converting unit terminals Z9 and Z10 should be approx. 22V and 0V respectively relative to ground. The current in cable Cb4 should be 4 - 20 mA.

## CLEANTRACK 1000 Operations and Technical Manual.

If the pressure is zero the values LRef, HRef and Pres in line 8.2 should be greater than:

8.2	Ana	ZF1	ZF2	Flo3	Flo4	Pres	HRef	LRef
	Inp	0368	0000	0000	0000	0250	2000	0150

During the same conditions the values should be less than:

8.2	Ana	ZF1	ZF2	Flo3	Flo4	Pres	HRef	LRef
	Inp	0368	0000	0000	0000	0850	3000	0300

The Pres value should increase proportionally to the pressure, be equal to Lref at 0 bar and be equal to Href at the high end of the pressure transmitter range.

Procedure at alarm: The system is stopped.

Procedure for reset: Press RESET.

3.11	-	<b>ALARM</b>	<b>CLEANING ERROR</b>
		Detector data	34.16 .8892 1.189.2643

Unexpected value detected, while monitoring fresh water, in the measuring unit during cleaning.

Probable cause: The measuring unit is dirty or dry. Detector data is displayed in order to simplify trouble shooting.

Clean the measuring unit according to the instruction in paragraph 2.8 "Manual Cleaning of the Analysing Unit" at page 56. The alarm remains as long as the measuring cell is dry or the sample flow is missing.

Procedure at alarm: Automatic after-cleaning procedure is started.

Procedure for reset: Press RESET.

3.12	-	<b>ALARM</b>	<b>FLOW MIN LIMIT</b>
		<b>Low flow or hardware error</b>	

This indicates low overboard discharge flow. Probable causes: The overboard discharge pump is not running. Overboard and slop tank valves are closed. Defective flow meter or flow meter cables.

Check all conditions for overboard pumping. If the alarm still remains, check the flow meter by measuring the current signal 4-20mA that appears in cable Cb3. Check the Converting unit flow-meter power supply, if a Zener supply barrier is used, by measuring the voltage between terminals ZF1/2+ to ZF1/2-. The voltage should be between 20 and 25 VDC.

# CLEANTRACK 1000 Operations and Technical Manual.

The flow-meter data is marked "ZF1/2" in line 8.2. At 4 mA (no flow), the value should be between 150 and 300 and equal to the LRef value. The value should be proportional to the input current and be equal to the HRef value at 20mA (max flow).

The flowmeter signals should be greater than:

8.2	Ana	ZF1	ZF2	Flo3	Flo4	Pres	HRef	LRef
	Inp	0150	0000	0000	0000	xxxx	2000	0150

The flowmeter signals should be less than:

8.2	Ana	ZF1	ZF2	Flo3	Flo4	Pres	HRef	Lref
	Inp	0300	0000	0000	0000	xxxx	3000	0300

Procedure at alarm: The Overboard valve, OBV, is closed.

Procedure for reset: Press RESET for acknowledgement only.

**3.13** - **ALARM FLOW MAX LIMIT**  
Hardware error, refer to manual.

This indicates a too high flow signal from the overboard line.

Probable cause: Defective flow meter or flow meter cables.

Check the flow meter by measuring the current signal 4-20mA that appears in cable Cb3.

If the flow meter is supplied via Zener barrier, ZF1 or ZF2, measure the voltage on terminals 1 and 2 belonging to the barrier in question. The voltage should be between 16 and 25 VDC. The voltage is current dependent.

0mA 24V

4mA 22.5V

10mA 20.5V

20mA 17V

If the actual system has one flowmeter, it should normally be connected to ZF1.

Independent of flow the values LRef , ZF1 and HRef in line 8.2 should be greater than:

8.2	Ana	ZF1	ZF2	Flo3	Flo4	Pres	HRef	LRef
	Inp	0150	0000	0000	0000	xxxx	2000	0150

The same signals should always be less than:

# CLEANTRACK 1000 Operations and Technical Manual.

8.2

Ana	ZF1	ZF2	Flo3	Flo4	Pres	HRef	Lref
Inp	3000	0000	0000	0000	xxxx	3000	0300

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET for acknowledgement only

3.14

- **ALARM      SPEED MIN LIMIT**  
**Low speed or hardware error**

Ship speed is too low.

Probable cause, the log-signal transmitter or cable at issue is defective.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET for acknowledgement only.

3.15

- **ALARM      SPEED MAX LIMIT**  
**Hardware error, refer to manual.**

Ships speed is too high.

Probable cause: Defect log signal transmitter or cables.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET for acknowledgement only.

3.16

- **HIGH ppm FAILURE**

This indicates measured oil content higher than 1000ppm. This is the high oil content alarm that might be encountered during operation.

Procedure at alarm: The OBV is closed.

Procedure for reset: Press RESET for acknowledgement only.

3.17

- **ALARM      15 ppm**

This indicates an oil content exceeding 15 ppm when system is in the 15 ppm mode. This is a high oil content alarm that might be encountered during operation in the 15 ppm mode.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET for acknowledgement only.

## CLEANTRACK 1000 Operations and Technical Manual.

**3.18** - 

<b>ALARM</b> 30 l/nm
----------------------

This indicates a computed rate of discharged oil, exceeding 30 l/nm. This is the 30-l/nm alarm encountered during operation.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET for acknowledgement only.

**3.19** - 

<b>ALARM</b> <b>ACC . TOTAL</b>
---------------------------------

This indicates that the permitted total quantity of discharged oil has been exceeded. This is the total quantity alarm encountered during operation.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET for acknowledgement only.

**3.19a** - 

<b>ALARM</b> <b>GPS receiver error</b> <b>Hardware error, refer to manual</b>
--

GPS receiver error ALARM is generated if the NMEA signal drops out.

Check the cable to the NMEA transponder.

The installation of the NMEA signal should be according to 4.9 "Electrical connections, general." at page 102.

**3.19b** - 

<b>ALARM</b> <b>MANUAL OVERRIDE</b>
-------------------------------------

Manual override is activated.

**3.19a** - 

<b>ALARM</b> <b>GPS receiver error</b> <b>Hardware error, refer to manual</b>
--

**3.19b** - 

<b>ALARM</b> <b>MANUAL OVERRIDE</b>
-------------------------------------

**3.20** - 

<b>OBV indicating both open and closed.</b> <b>Hardware error, refer to manual.</b>
--

This indicates that the feedback signal from the overboard valve does not correspond to the computer unit output signal. This fault is only relevant in "EXTENDED" versions.

## **CLEANTRACK 1000 Operations and Technical Manual.**

Stop overboard discharging. The overboard valve position may be in the wrong position due to malfunction in any part of the overboard discharge valve control system.

Check the 2 overboard valve output fuses.

Refer to drawing CT900105.2 regarding the fuse location. Fuse Size 1A.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET.

**3.21 - STV indicating both open and closed.  
Hardware error, refer to manual.**

This indicates that the feedback signal from the overboard valve does not correspond to the computer unit signal.

Probably cause: Same as alarm 3.20 above

Check the 2 slop tank valve output fuses.

Refer to drawing CT900831.6 regarding the fuse location. Fuse size 1A.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET.

**3.22 - OBV no FEEDBACK within time-out.  
Hardware error, refer to manual.**

The overboard valve position feedback signal has not acknowledged the corresponding output signal in time. This fault is only relevant in installations with automatic valve position feedback.

Stop overboard discharging. The overboard valve may be in the wrong position due to some part of the overboard discharge valve control or the power supply for the valve control system has failed.

If the overboard valve is controlled by the overboard valve relay output in the computer unit. Check the overboard valve output fuse or fuses.

Refer to drawing CT900831.6 regarding the fuse location. Fuse size 1A.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET.

**3.23 - STV no FEEDBACK within time-out.  
Hardware error, refer to manual**

The slop tank valve position feedback signal has not acknowledged the corresponding output signal on time. This fault is only relevant in "EXTENDED" version installations.

## **CLEANTRACK 1000 Operations and Technical Manual.**

Stop overboard discharging. The slop tank valve may be in the wrong position due to malfunction in any part of the overboard discharge valve system or the valve control mains.

Check the slop tank output fuses.

Refer to drawing CT900831.6 regarding fuse locations. Fuse size 1A.

Procedure at alarm: Overboard valve is closed.

Procedure for reset: Press RESET.

### **3.24 - WARNING CLEANING SOLUTION Refill cleaning solution**

Low level in cleaning solution tank.

Procedure at warning: None.

Procedure for reset: Press RESET.

## CLEANTRACK 1000 Operations and Technical Manual.

**3.25** - **WARNING OD 25. 1/nm**

The programmed pre-alarm warning limit concerning high rate of oil discharge is exceeded.

Procedure at warning: None.

Procedure for reset: Press RESET:

**3.26** - **WARNING OC 10.0 ppm**

The programmed oil content pre-alarm warning is exceeded.

Procedure at warning: None.

Procedure for reset: Press RESET.

**3.27** - **WARNING ACC.TOTAL 90%**

This indicates that 90 % of the programmed maximum permitted total quantity of discharged oil during the voyage is exceeded.

Procedure at warning: None.

Procedure for reset: Press RESET.

**3.28** - **WARNING PRINTER PAPER END**

CLEANTRACK 1000 expects the printer paper soon to run out. Replace the printer paper. See paragraph 2.6.1 "Printer paper loading" at page 54 and paragraph 2.6.2 "Ribbon changing" at page 54.

Procedure at warning: None.

Procedure for reset: Press RESET.



## CLEANTRACK 1000 Operations and Technical Manual.

### 3.29 - WARNING HIGH PUMP TEMPERATURE

The pump shaft seal temperature exceeds the warning limit displayed at line 2.8.

2.8 - High ppm limit = 1000. Ppm  
Pump temp=40.C, limit=100C Cutemp=40C

Consider to stop oil discharging in order to stop the sample pump. Check shaft seal oil level. See paragraph 2.9 Sample Pump Shaft seal oil refilling at page 56.

Procedure at warning: None.

Procedure for reset: Press RESET.

### 3.30 - WARNING SAMPLE SELECTION FEEDBACK

The sample selection feedback signal has not acknowledged the corresponding output signal or signals in time. This fault is only relevant in installations with automatic sample selection feedback.

Stop oil discharging. Check the sample selection signals.

Procedure at warning: None

Procedure for reset: Press RESET

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **3.3 Other Failures in the Computer Unit.**

This section covers a number of other failures related to the computer unit and their causes.

### **3.3.1 Defective Alarm Output.**

Check the alarm output fuse. Refer to drawing CT891120.7 to get the fuse position. Fuse size 1 A.

### **3.3.2 Defective Warning output.**

Check the warning output fuse. Refer to drawing CT891120.7 to get the fuse position. Fuse size 1 A.

### **3.3.3 Computer Failure.**

Check the computer fuse. Refer to drawing CT891120.7 to get the fuse position. The fuse size is 200 mA.

### **3.3.4 Starting Interlock, STV and OBV Malfunction.**

If the overboard valve is controlled by the overboard valve relay output in the computer unit, check the overboard valve output fuse. For "EXTENDED" mode there are 4 relay output fuses to check. Refer to drawing CT891120.7 to get the fuse position. Fuse size 1 A.

# CLEANTRACK 1000 Operations and Technical Manual.

## 3.4 CLEANTRACK 1000 Operation Test and check-out Procedure

A complete functional test can be made after installation or at major overhauls of the system. Following the same procedure as at the work shop test in chapter 11, except for the part where injection of crude oil is made.

### 3.4.1 Computer Flow and Speed Page Description

4.0

```
PAGE FLOW AND SPEED
```

Page headline.

4.1

```
Flow max limit= 1000 m3/h  
min limit= 10 m3/h Delay 20(05)s
```

Overboard discharge maximum and minimum flow limits, and the related alarm delay time.

4.2

```
Speed max limit= 20.0 kn  
min limit= 2.00 kn
```

Ships speed, maximum and minimum limits.

4.3

```
Flinj(1)=insig(20.00%) * 1.260 + -.260  
Flow = 300 * Flowlinj ** 0.5000 m3/h
```

Calculation of flow from input signal. The input signal, in this line stated in the range 20 to 100%, corresponds to the real 4 - 20mA input signal. The formula on top calculates Flowlinj that is included in the bottom formula. The range of Flowlinj, that is abbreviated to Flinj in the top formula, is supposed to be in the range 0.000 to 1.000.

The bottom formula converts Flowlinj to a scientific value corresponding to the real flow. The flow corresponding to full scale is stated to the left. The factor in order to compensate for the non linear flowlinj signal is stated to the right. For a linear signal state the right value to 1.000. The value in this example is for a flow-input signal that is proportional to the square root of the actual flow.

## CLEANTRACK 1000 Operations and Technical Manual.

4.4

Log input	=	200 pulses/h
Log generates	=	200.0 pulses/nm

The current input signal from the log and the number of pulses that corresponds to 1 nautical mile.

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## 3.4.2 Computer Oil Content Page Description

5.0 

PAGE IR-DETECTOR
------------------

Page headline.

5.1 

Calibration values: 0 ppm solution
detector data 100.7 2.760 3.560 1.630 %

Zero ppm IR input values.

5.2 

Calibration values: Reference solution
detector data 61.90 17.80 22.60 12.10 %

Reference solution IR input values.

5.3 

Measuring
detector data 56.50 19.50 22.50 15.50 %

IR input signals generated during measuring of sample water.

5.4 

Cleaning OPEN WATER with STEP
detector data 98.50 3.700 5.500 2.700 %

IR input signals generated during measuring of water. "OPEN" / "CLOSE" indicates water valve action when the STEP key is pressed  
During stand by, i.e. periods in which neither measuring nor cleaning is performed, the fresh water valve may be remote controlled with the STEP key. If the valve is left opened it will automatically be closed after 2 minutes.

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5.5 

<b>Clean limits</b> detector data 70.00 10.00 30.00 20.00 %
--

IR input limit signals during measuring of water. The first value is a low limit value, and the others are high limit values. If any of the limit values are exceeded this alarm is generated:

3.11 - 

<b>ALARM CLEANING ERROR</b> Detector data 34.16 .8892 1.189.2643
---

5.6 

<b>IR-detector limits</b> detector data 150.0 .1000 -.100 -.100 %
--

IR input limit signals. The first value is a high limit value, and the others are low limit values.  
If any of the limit values are exceeded this alarm is generated:

3.7 - 

<b>ALARM IR-DETECTOR FAILURE</b> Detector data 34.16 .8892 1.189 .2643
---

5.7 

<b>Reference solution</b> Oil content 190.0 106.0 86.00 72.00 ppm
--

Reference solution is used to obtain the IR-values in line 5.2.

# CLEANTRACK 1000 Operations and Technical Manual.

## 3.4.3 Computer Pressure Measurement Page Description

6.0

PAGE PRESSURE

Page headline.

6.1

Pressure in analysing unit = 1.28 bar  
OPEN water with STEP

Actual pressure measured in the measuring unit. "OPEN" / "CLOSE" indicates water valve action when the STEP key is pressed. During stand by, i.e. periods in which neither measuring nor cleaning is performed, the fresh water valve may be remote controlled with the STEP key. If the valve is left opened it will automatically be closed after 2 minutes.

6.2

Static pressure from overboard line  
1.04 bar

Static pressure measured in the analysing unit with closed water valve and closed analysing valve. Consequently the static pressure is the pressure obtained without flow in the analysing unit. The proper sample point valves are of course supposed to be opened.

6.3

Cleaning pressure low limit .400 bar  
high limit 4.50 bar

Low and high pressure limits. The value to check is calculated from the difference between the pressure measured while fresh water is flowing and the static pressure, during periods of cleaning. If any of the limit values are exceeded this alarm is generated:

3.9

- ALARM CLEANING PRESSURE = 4.00 bar  
Check water supply shut off valve.

6.4

Work pressure low limit 1.00 bar  
high limit 6.50 bar

The low limit is always set to 1.00 bar at power on.

## CLEANTRACK 1000 Operations and Technical Manual.

Low and high pressure limits. The value to check is calculated from the difference between the pressure measured while sample water is flowing and the static pressure. If any of the limit values are exceeded this alarm is generated:

3.10 - 

ALARM WORK PRESSURE = 1.01 bar Check all sample tube valves.
---

6.5 

Pressure insignal = 20.12% Pressure = insignal * .3125 + -6.25bar
--

Line 6.5 displays the input signal from the pressure transmitter. The range 20 - 100% usually corresponds to 0 - 25 bar pressure.

The second line displays a formula that calculates the pressure that corresponds to a 25 bar transmitter input signal. Before you enter a new formula check the range of your transmitter because the range has varied during the years that has passed.



# CLEANTRACK 1000 Operations and Technical Manual.

## 3.4.4 Computer Timer Page Description

This paragraph shows the timers that control the measuring and cleaning cycles. The information is a help to understand the automatic operation of the CLEANTRACK 1000. This paragraph also provides information useful for trouble shooting.

7.0 - 

<b>PAGE TIMERS AND COUNTERS</b>
---------------------------------

Page headline.

7.1 - 

<b>Measurement status number,</b>	<b>time</b>
12	005 sec

This line shows the state number that is currently executed and the time that is left of the execution.

7.2 - 

<b>Number of cleaning meas. Cycles</b>	<b>03 (03)</b>
<b>Aftercleaning. Cycles</b>	<b>03 (03)</b>

The first line shows the maximum number of cleaning cycles CLEANTRACK 1000 does during start up of measuring. At the right side, the actual number of cycles that CLEANTRACK 1000 has done during cleaning is showed. The second line displays the corresponding information valid for the after-cleaning procedure.

7.3 - 

<b>Measuring cycle</b>	<b>Cleaning</b>	<b>Time</b>
<b>Step with STEP</b>	<b>07</b>	<b>005 sec</b>

Press STEP key and you will find out the length of the measuring and cleaning states.

7.4 - 

<b>Delay OBV,STV feedback</b>	<b>60 (60) (00) sec</b>
<b>Delay Overb. valve changes</b>	<b>60 (60) sec</b>

The first line displays the maximum delay in seconds for the overboard and slop tank valve feedback signal. The second line displays the minimum delay in seconds for the overboard valve to be closed, in order to prevent continuous opening and closing. Values inside parenthesis display actual delay times for the 2 valves.

# CLEANTRACK 1000 Operations and Technical Manual.

## 3.4.4.1 Working cycle during measuring.

The diagram, showed at the end of this paragraph, indicates in which state the pressure in the analysing unit is checked.

If the pressure fails, depending on present type of pressure check, one of the following alarms is generated:

3.9 - 

<b>ALARM CLEANING PRESSURE = 4.00 bar</b> <b>Check water supply shut off valve.</b>
--

3.10 - 

<b>ALARM WORK PRESSURE = 1.01 bar</b> <b>Check all sample tube valves.</b>
---

The current state, and the time of the current state is indicated by line 7.1

7.1 - 

<b>Measurement status number,</b>	<b>time</b>
12	005 sec

The oil-measuring cycle is made out of 10 states, 0 - 9. The length of each state is indicated by line 7.3.

7.3 - 

<b>Measuring cycle</b>	<b>Cleaning</b>	<b>Time</b>
<b>Step with STEP</b>	07	005 sec

Press the STEP key and the length of the selected measuring state will be displayed. States 0 - 4 are only used at start up. If the cleaning check in state 2 fails, states 1 and 2 are repeated as many times as indicated by line 7.2 "afterclean meas.:"

7.2 - 

<b>Number of cleaning meas.</b>	<b>Cycles</b>	03(03)
<b>Aftercleaning.</b>	<b>Cycles</b>	03(03)

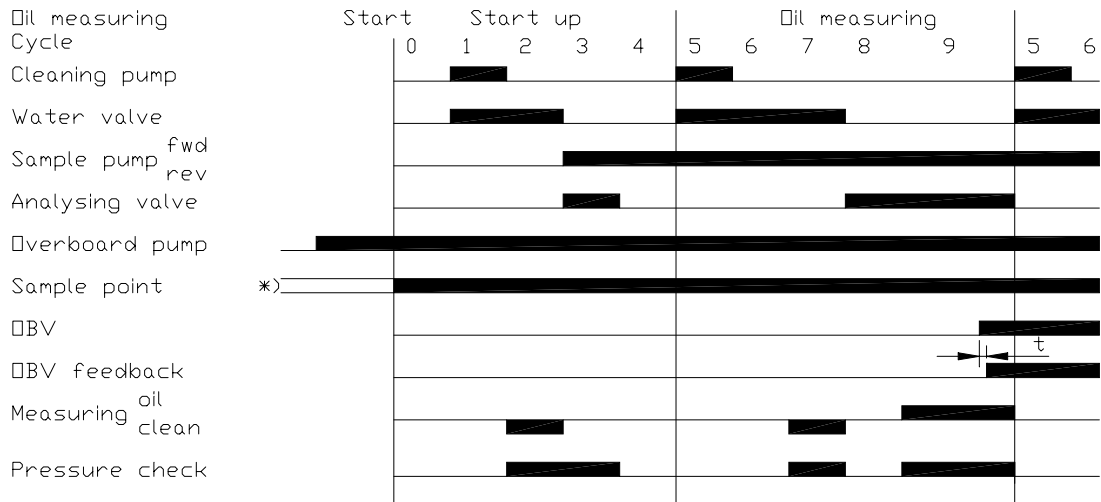
If the last cleaning cycle fails the start up is aborted, and this alarm is generated:

3.11 - 

<b>ALARM CLEANING ERROR</b>
<b>Detector data 34.16 .8892 1.189.2643</b>

After a normal successful start-up, states 5 - 9 are repeated until measuring stops. States 5 - 7 are the cleaning states, 8 and 9 are the measuring states.

# CLEANTRACK 1000 Operations and Technical Manual.



\*) This property is controlled by SL(O). If O doesn't begin with S then the sample point is always open if it is selected. See paragraph 2.3.2 CLEANTRACK 1000 Computer Programming Page Description 37

# CLEANTRACK 1000 Operations and Technical Manual.

## 3.4.4.2 Working cycle during cleaning.

The diagram, showed at the end of this paragraph, indicates in which state the pressure in the analysing unit is checked.

If the pressure fails, depending on present type of pressure check, one of the following alarms is generated:

3.9 - 

ALARM CLEANING PRESSURE = 4.00 bar Check water supply shut off valve.
--

3.10 - 

ALARM WORK PRESSURE = 1.01 bar Check all sample tube valves.
---

The current state, and the time left of the current state is indicated by line 7.1

7.1 - 

Measurement status number,	time
12	005 sec

The cleaning cycle is made out of 7 states, 10 - 16. The length of each state is indicated by line 7.3.

7.3 - 

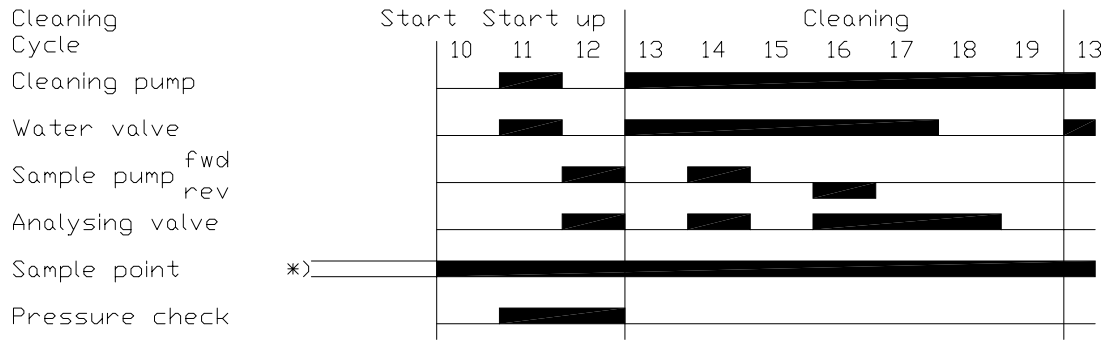
Measuring cycle	Cleaning	Time
Step with STEP	07	005 sec

Press the STEP key and the length of the selected measuring state will be displayed. The cleaning cycle is repeated as many times as indicated by line 7.2 "Aftercleaning Cycles".

7.2 - 

Number of cleaning meas.	Cycles 03(03)
Aftercleaning.	Cycles 03(03)

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# CLEANTRACK 1000 Operations and Technical Manual.

## 3.4.5 Computer Self Test Page Description

8.0

```
PAGE TEST
Enter testmode by pressing STEP
```

Page headline.

Enter test mode by pressing STEP. In test mode it is possible to manually program the computer and the Converting unit output signals and monitor the input signals. Please note the normal CLEANTRACK 1000 routines are inhibited in test mode. Without entering test mode, i.e. without pressing STEP while this line is displayed, the normal computer routines are not inhibited and input and output signals can be monitored. NOTE: Consideration to adjacent equipment should be taken during test mode, because CLEANTRACK 1000 performs in an unpredictable way.

8.1

```
Comm. (Ok 05678/Err 00003) Tx XX,XXXX,XX
XXXX,XXXX,XXXX,XXXX,XXXX,XXXX,XXXX,XX
```

- The amount of successful and unsuccessful communication cycles between the computer and the Converting units are shown inside the parenthesis. The remaining data shows the content of the communication between the computer unit and the converting unit and is for internal use only.

8.2

```
Ana  ZF1  ZF2  Flo3 Flo4 Pres HRef LRef
Inp  0368 0000 0000 0000 0368 2510 0225
```

Analogue signals from the different flow meter inputs and the pressure transducer. LRef and HRef are internal voltage references that correspond to 0% and 100% input signal respectively.

8.3

```
Ana  ZF1  ZF2  Flo3 Flo4 Pres
mA   10.00 .0000 .0000 .0000 4.000
```

Analogue signals from line 8.2 converted to 0-20mA current signals.

8.4

```
IR-data 0-3 (dark signals)
  00445  00444  00426  00447
```

Analogue signals from the IR detector.

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8.5

IR-data 4-7 (reference signals)			
00446	00446	00445	03956

Analogue signals from the IR detector.

8.6

IR-data 8-11 (measuring signals)			
07296	00544	00620	00490

Analogue signals from the IR detector during measuring.

8.7

IR-data 16-19 (cleaning signals)			
07296	00544	00620	00490

Analogue signals from the IR detector during cleaning.

8.8

I/O Computer	00100010	11001100	00001000
Move <-->, changes, OBV LAMP			

Computer input and output signal monitoring. The signal to monitor is selected by the arrow keys <-and->. A flashing digit and a short name to the right in the second line indicate the signal monitored. If an output signal is selected and in test mode the output may be changed with the STEP key. The following signals are available from left to right:

## Output signals.

<u>Bit</u>	<u>Description</u>
"INTERNAL-1"	Internal output
"INTERNAL-2 "	Internal output
"RELAY 9,10"	Relay output at terminals 9 and 10.
"RELAY 11,12"	Relay output at terminals 11 and 12.
"STV LAMP"	Slop tank valve indicator on the CLEANTRACK 900 computer front panel. The "LAMP" is of LED type.
"PAPER ROLLER"	Paper roller output
"INTERNAL-3"	Internal output
"OBV LAMP"	Overboard valve indicator on the CLEANTRACK 1000 computer front panel. The "LAMP" is of LED type.
"INTERNAL-4"	Internal output
"RELAY 7,8"	Relay output at terminals 7 and 8.
"OVERRIDE 3,4"	Override key output.
"INTERNAL-5"	Internal output
"BEEPER"	Alarm buzzer output
"RELAY 5,6"	Relay output at terminals 5 and 6.

# CLEANTRACK 1000 Operations and Technical Manual.

"ALARM RELAY" Alarm relay output  
 "WARNING RELAY" Warning relay output

## Input signals.

<u>Bit</u>	<u>Description</u>
"INTERNAL-6"	Internal input
"INPUT 29,31"	Input between terminals 29 and 31.
"INPUT 29,30"	Input between terminals 29 and 30.
"INPUT 26,28"	Input between terminals 26 and 28.
"INPUT 32,33"	Input from ships log.
"INPUT 26,27"	Input between terminals 26 and 27.
"OVERRIDE KEY"	Signal to monitor the override input key.
"PRINTER BUSY"	Busy signal from printer

8.9

COMDATA 00100010 11010000 00000001 Move <-->, change: STEP, CLEANING PUMP
--

Data communicated between computer and Converting unit. The first 16 numbers are data transmitted from the computer. The last 8 numbers are data received from the Converting unit. The signal to monitor is selected by the arrow keys <- and >. A flashing digit and a short name to the right in the second line indicate the signal monitored. If an output signal is selected and in test mode the output may be changed with the STEP key. The following signals are available from left to right:

## Transmitted values

<u>Bit</u>	<u>Description</u>
"FLOW INP 1/2"	Not used
"SAMPLE POINT 1"	Sample point valve.
"INTERNAL RELAY"	Relay for internal use.
"SAMPLE POINT 2"	Sample point valve.
"PUMP FORWARD"	Pump forward
"PUMP BACKWARD"	Pump backward
"WATER VALVE"	Water valve
"CLEANING PUMP"	Cleaning solution pump.
"INTERNAL-1"	Internal output A
"INTERNAL-2"	Internal output 2
"INTERNAL-3"	Internal output 1
"INTERNAL-4"	Internal 0
"INTERNAL-5"	Not used.
"ANALYSE VALVE"	Analyse valve
"EXTRA RELAY"	Spare output
"INTERNAL-6"	Internal B

## Received values.

<u>Bit</u>	<u>Description</u>
"INTERNAL-7"	Internal input B



## CLEANTRACK 1000 Operations and Technical Manual.

"INTERNAL-8"	Internal input A.
"INTERNAL-9"	Not used.
"PRESS SWITCH"	Pneumatic pressure switch.
"CL. PUMP START"	Cleaning solution pump start key.
"OVERCURRENT"	Sample feeding pump over-current relay and overheating switch.
"CL. LEVEL"	Cleaning solution low level alarm
"EXTRA INPUT"	Spare input

8.9a

```
GPS GPS receiver timeout
cntr:idx:rdy:used 00000:00:1:1, tout 00
```

NMEA survey line. CleanTrack 1000 extracts the "RMC" message by recognition of \$ followed by two don't care characters "--" and then the characters "RMC". The string is interpreted until part 6 is received. CleanTrack 1000 then checks for a "\*". If a "\*" is received the checksum is checked. The message is terminated by <CR><LF>.

```
$--RMC,hhmmss.ss,A,IIII,II,a,yyyyy.yy,x.x,x.x,ddmmyy,x.x,a,a*hh <CR><LF>
```

RMC = Recommended Minimum Specific GPS/TRANSIT Data

- 1 = UTC of position fix
- 2 = Data status (V=navigation receiver warning)
- 3 = Latitude of fix
- 4 = N or S
- 5 = Longitude of fix
- 6 = E or W
- 7 = Speed over ground in knots
- 8 = Track made good in degrees True
- 9 = UT date
- 10 = Magnetic variation degrees (Easterly var, subtracts from true course)
- 11 = E or W.
- 12 = Mode indicator (ver 3.0)
- 13 = Checksum

8.9b

```
$ RMC
```

Displays the last characters that have been received from GPS.

8.10

```
CU.  V1  V2  V3  V4  V5  V6  V7  V8
int 000 000 000 000 000 000 000 000
```

Internal analogue signals from the Converting unit PCB.

# **CLEANTRACK 1000 Operations and Technical Manual.**

# CLEANTRACK 1000 Operations and Technical Manual.

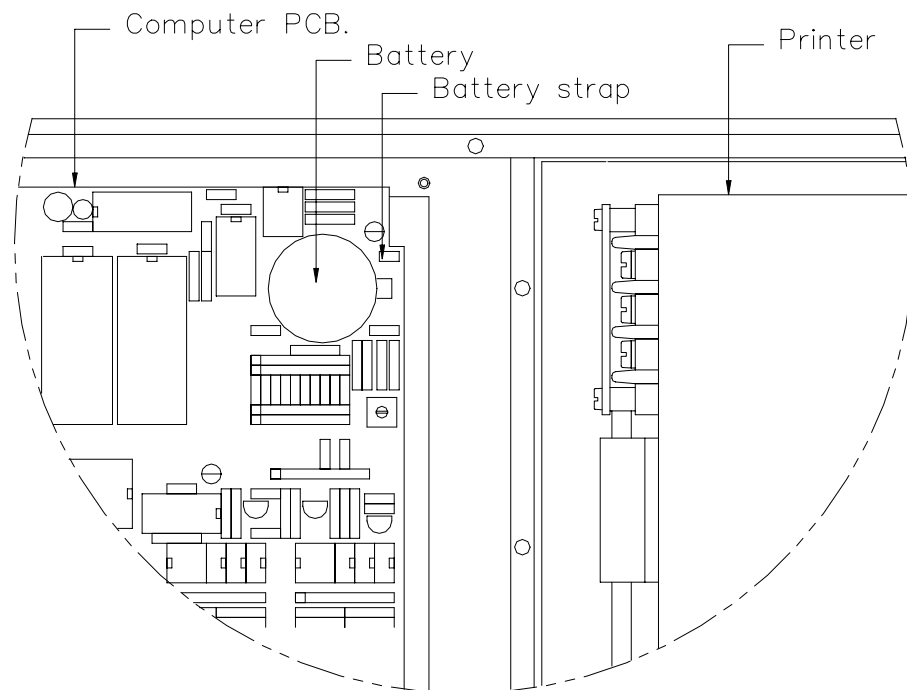
## 3.5 Replacing computer back up memory battery.

Make a print out of the CLEANTRACK 1000 program according to section 3.6 "Documentation of program in form of a Memory-print-out" at page 91. The computer will lose stored data when the battery is removed. Disconnect the computer power supply. The battery is located behind the display panel in the upper right corner. Replace the battery. Be sure to insert the new battery the same way as the old. Rotate the battery in the holder an orbit or two in order to remove oxidation.

Make a simple data retention check. Connect the computer power supply. Partly reprogram the computer. Disconnect mains for one minute. Reconnect the power supply. Check the partly programmed information.

If the system still has data retention problems use an emery cloth in order to remove the oxidation. Make a new data retention check, Program the computer as documented by the print out of the CLEANTRACK 1000 program.

The battery voltage should be greater than 2.7V. Check the battery strap to be in the correct position.



## 3.6 Documentation of program in form of a Memory-print-out.

The CLEANTRACK 1000 computer has a program documentation facility to provide the staff with back up copies of the program. Show line 2.11 in the display. Press the STEP key.

2.11

**Memory printout with STEP**

# CLEANTRACK 1000 Operations and Technical Manual.

Save the print out. The first lines contain data that has to be programmed if the computer battery fails.

See paragraph 4.8.3 "TCP/IP communication via the CT1000 LAN interface." at page 102 on how to log on to the CT 1000. Select operation. Now you can find two downloads.

## 3.7 Periodic Checks and Servicing

Certain checks and servicing should be carried out at regular intervals in order to minimise the risk for unexpected malfunctions during operation. Below is a maintenance list to be carried out after each use and another list to be carried out at regular intervals of 6 months.

After each time of usage:

- Check the installation and the components for signs of leakage. Clean if necessary.
- Check the print out for adequate colour and replace the printer ribbon if required.
- Check the amount of printer paper that is left and replace the roll if necessary for safeguarding uninterrupted operation during next discharge.
- Check the level in the cleaning solution tank and refill or replace if necessary.
- Check the oil level in the sample pump shaft seal.

Every six months:

- Inspect the interior of all cabinets for general condition and cleanliness.
- Check all components with respect to proper mounting, clamping of cables, and any signs of damage.
- Check all connections to be tightened and not leaking.
- Check the cables to the analysing unit along their entire length with respect to any signs of chafe, wear or other damage and the bulkhead penetrations to be in proper conditions.
- Inspect and clean the Inlet filter as described below.

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **3.8 Verification of accuracy and access to restricted parts.**

User access to the measuring cell is restricted with seals, which only Brannstroms Elektronik AB or its agents can replace, in order to comply to clause 5.1 of MEPC.108(49).

The accuracy of the Cleantrack 1000 has to be verified at the IOPP renewal service in order to comply to clause 5.3 of MEPC.108(49).

A calibration certificate is issued by Brannstroms Elektronik AB when the CleanTrack 1000 is new. Later on new calibration certificates can only be issued by Brannstroms Elektronik AB or its agents.

The validity of the calibration certificate is max 5 years or until next IOPP renewal. The calibration certificate should be retained on board for inspection purpose.

## **3.9 Cleaning of Inlet Filter**

Stop CLEANTRACK 1000 measuring and cleaning. Close the sample inlet-probe valve and the Analysing unit inlet valve. Remove the top cover. Remove and clean the filter screen. Usage of CLEANTRACK 1000 sample pump unit without inlet filter screen could harm the sample pump.

# CLEANTRACK 1000 Operations and Technical Manual.

## Chapter 4 Installation

This chapter contains advice for the installation of CLEANTRACK 1000 equipment onboard tankers. The advice given in this chapter is of general validity and should be supplemented with a detailed installation specification for the particular ship. Additionally all applicable regulations regarding the installation standard, issued by the relevant authorities and classification society must be followed.

The information in this chapter is edited in the following sections and paragraphs.

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## **4.1 Mounting of sample inlet probe and outlet stub**

Refer to drawing CT900105.4, CT891216.1 and CT891213.1. For basic convention requirements, see IMO Resolution 586 (14) and . The inlet probe is mounted towards the upstream of the outlet stub and downstream the flow-meter sensor, if any is included. Cut 2 holes with the indicated diameters in a vertical part of the overboard discharge line, according to drawing CT891216.1. Trim the contour of the stub to fit proper to the overboard line. Weld with continuous weld.

A positive fresh water pressure must be available in the discharge-line under all discharge conditions at the place where the inlet probe is located. The sample feed pump may be damaged if it runs dry for more than 10 sec.

The outlet probe shall be located higher than the analysing unit outlet connection.

The sample valves and sample inlet filter should be located with adequate space and accessibility for servicing.

## **4.2 Mounting of sample feed pump unit.**

Refer to Drawings CT891213.1, CT891211.1. For basic convention requirements, see IMO Resolution A. 586 (14) and .

The pump unit should be mounted, depending on pump type, to the bulkhead, or through the bulkhead, below the analysing unit. The length of the delivery pipe to the analysing unit should be maximum 1 metre.

The pump unit should also be mounted as close as possible to the overboard discharge line or lines. The transportation time for the sample water must be calculated and be confirmed to remain within the 40 seconds maximum response time of the total system. The CLEANTRACK 1000 response time is 12 sec, i.e. the maximum sample line time delay is 28 sec. Therefore the pipe length from any sampling probe should, whenever possible, be kept at maximum 25 metres. The drain valve, which is located below the sample pump, should be the lowest point in the sample system.

## **4.3 Installation of the analysing unit.**

### **4.3.1 Mounting of the analysing unit.**

Refer to drawing CT891120.3, CT891120.5, CT891120.4 and CT891213.1.

The analysing unit should be mounted in the pump room with 4 bolts to welded clips on the pump room to engine room bulkhead or in an equivalent suitable location. There should be an open service space on top of the unit in order to facilitate cleaning of the measuring cell from above with a brush. There should

## **CLEANTRACK 1000 Operations and Technical Manual.**

also be space available for operating the valve handles, opening the front cover and taking grab samples.

The analysing unit should be mounted lower than the sample outlet probe, to safeguard a positive pressure in the sample water system at all times.

### **4.3.2 Electrical connection of the analysing unit.**

Refer to drawings CT891120.9, CT891120.3, CT891120.4 and Appendix 10 "Calculations on intrinsically safe arrangements" at page 122. Also check the measuring unit and the pressure transducer documentation concerning intrinsically safety and that the equipment complies with the installation regulations for this particular hazardous area.

Loose the bottom cover of the measuring unit. Turn the cover 180 degrees.

Loose the detachable part of the cable terminators. Install cable Cb-7 and Cb-8 through the intended passages in the analysing unit and the measuring unit. Be careful when penetrating the measuring unit cable passage with the cables, to avoid damaging the printed circuit. Connect the cable according to drawing CT891120.9. Connect the detachable terminals to the intended places at the printed circuit board. Fasten the bottom cover of the measuring unit.

Install cable Cb-4 through the intended passage in the analysing unit. Terminate the cable according to drawing CT891120.9.

Make sure that the unit is properly connected to earth according to the applicable regulations for this particular hazardous area.

**Note!** The cables are normally already connected in the Analysing unit at delivery. Instructions above are for service purposes only.

## **4.4 Installation of sample piping..**

Refer to Drawing CT891213.1, CT900105.4 and CT891216.1. For basic convention requirements, see IMO Resolution A 586(14) and .

Pipe no	Size	Normal maximum length.
Tb11	22 x 1	25 metres.
T0b12	15 x 1	1 metre.
Tb13	22 x 1	25 metres.

The piping should be made of copper, "Yorcalbro", cupronickel or stainless steel. The piping should be run as straight as possible. The sample transit time should be recalculated to each installation to make sure that the requirements regarding total system response time is satisfied.



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Make sure that all valves and other components are mounted with the necessary accessibility and service space. The drain valve should be at the lowest point. Make sure that the drain water will not cause any harm to this or other equipment.

### **4.4.1 Installation of standard Flowmeter**

Refer to drawings CT891215.5.

Positive water pressure must be obtained in the discharge line under all discharge conditions at the place where the flow meter is located. It's important that the flow meter is located in such a way that there is no disturbance in the flow before and after the flow meter.

A correct installation should have a free flow up- and down-streams the orifice plate of 6 - 10 times respective 3 – 5 times the diameter of the discharge line.

We also recommend an installation in a vertical section of the discharge line as per drawing CT891215.5. However in some installations there isn't enough space for a vertical installation. In a horizontal installation it's important to build in a "gooseneck" downstream of the flowmeter to ensure that the discharge line always is full of liquid and to create a small counterpressure. Assemble a vacuum breaker at top of the gooseneck, in order to avoid a vacuum in the discharge line which otherwise will occur because of the "big drop" after the gooseneck.

# CLEANTRACK 1000 Operations and Technical Manual.

## 4.5 Installation of the Converting unit.

### 4.5.1 Mounting of the Converting unit.

Refer to drawing CT900209.1, CT900105.2, CT920227.3. The Converting unit should be mounted vertically in a safe (non-hazardous) area, normally the engine room, as close as possible to the analysing unit at the other side of the bulkhead. The unit should be provided with enough open space to make it possible to open both front covers.

### 4.5.2 Electrical connection of the Converting unit.

See drawing CT920227.3, CT891120.9.

If your equipment isn't equipped with a main switch, the power supply should be equipped with a main switch, or if specified, a detachable connector. Fuse size should be 3 x 10 Amp for Converting units equipped to supply electrical motor sample pumps and 6 Amp for the units meant to control air or hydraulically driven sample pumps. Check that the supply voltage corresponds to the voltage specified on the label below the mains terminals.

Make the electrical connections according to drawing CT891213.1. If the unit is intended to control a pneumatic or hydraulic motor sample pump, terminals 1 to 6 should be connected according to special drawing.

Terminals 7 to 10 have optional purposes.

Terminals 13 to 15 are optionally used for remote control of sample point valves. If the option is used see lines 2.12 to 2.14 descriptor SL(): regarding the particular sample point valve configuration. Then refer to paragraph 2.3.2 CLEANTRACK 1000 Computer Programming Page Description at page 37 and drawing CT929227.3 in order to get complete information on how to connect the sample point valves.

2.12

<b>Line 1: CARGO</b> <span style="float: right;"><b>-&gt;OIL KEEP</b></span>
<b>Vlv:E11 Flow:F3 SL(O/I/S):S1/_ /_</b>

If the standard arrangement with one two wire 4-20mA flowmeter transmitter is used connect it to Zener barrier ZF1. In order to get a complete description of a particular arrangement see lines 2:12 to 2:14 descriptor Flow. Then refer to paragraph 2.3.2 CLEANTRACK 1000 Computer Programming Page Description at page 37 and drawing CT920227.3 in order to get the complete information on how to connect the flowmeters.

# **CLEANTRACK 1000 Operations and Technical Manual.**

Connect the computer unit to terminals 115 and 116.

Connect the analysing unit to Zener barriers Z1 to Z10. Cables Cb4, Cb6 and Cb7 must be installed exactly as shown. These are selected cables and must not be replaced by other types of cables. See appendix regarding calculation of safety margins of cables connected to intrinsically safe equipment in hazardous area and the regulations that apply to the particular hazardous area.

## **4.6 Installation of pneumatic components.**

### **4.6.1 Air piping for valves and position indicator.**

Refer to drawings CT891213.1, CT900209.1.

The supply air should be clean and dry instrument air or control air. The pressure should be 4 - 6 Bar. The air supply should be provided with a shut of valve and if necessary the specified air filter.

Install 6x1mm copper pipes.

Air pipes other than Tb1 and Tb6 have configuration dependent purposes. Refer to the configuration drawing applicable to the unit being installed. A general pneumatic controlled valve system is described in drawing CT891213.1. Remote controlled valves can optionally be used in stead of the manual sample point valves described in drawing CT891213.1. However all sample points must be equipped with double valves of which at least one is manual. This applies for systems having manual as well as automatic overboard valve operation.

Bulkhead penetrations for air piping should be made to comply with the applicable classification society requirements.

### **4.6.2 Installation of Overboard and Slop tank valves.**

Refer to drawings CT891213.1.

When assembling BRANNSTROM delivered pneumatic valves: Open the valve before tightening the flanges in order to avoid seizing and to make smooth operation possible.

# CLEANTRACK 1000 Operations and Technical Manual.

## 4.6.3 Piping arrangements for pneumatic or hydraulic powered sample pump motors.

- Pneumatic powered motors.  
Check motor datasheet for supply air specification at pump capacity of 4Bar and 1000l/h. Piping and valve size should be 1/2" or bigger in order to achieve correct pressure at the pump motor when it runs. The air supply demand might be something like 2000 l/min of free air at 6 Bar. The air supply should be provided with a shut of valve, an air pressure regulator/lubricator and a water trap. See CT891213.1
- Hydraulic powered motors.  
Check motor datasheet for supply specifications, calculate pipe and valve dimensions. This is performed analogous to the pneumatic motor procedure. The supply demand might be something like 15 l/min at 100 Bar.

## 4.7 Piping for fresh water and cleaning solution

Refer to drawing CT891213.1.

Tube No	Size in mm
Tb7	8 x 1
Tb8	15 x 1

The two pipes should be provided with shut off valves close to the bulkhead penetrations.

Bulkhead penetrations must satisfy the requirements of the relevant classification society.

The fresh water supply should be provided with one shut off and one vacuum check valve and one check valve. The fresh water temperature should be higher than the sample water temperature. Suitable temperature is approximate 5 - 20 centigrade warmer than the sample water temperature. The water should, however, not be warmer than 45 centigrade. It is recommended to install a temperature-controlled mixer to achieve proper water temperature.

The water consumption is intermittent with a maximum flow of approximate 600 l/h. The average consumption is 60l/h. The pressure at this flow should be at least 0.5Bar more than the OB-line pressure.

Avoid getting impurities into the cleaning solution piping during installation. The impurities might clog the small diameter nozzle in the cleaning solution injector.

# CLEANTRACK 1000 Operations and Technical Manual.

## 4.8 Installation of the computer unit.

### 4.8.1 Mounting of the computer unit.

For CT1000 with printer:

Refer to drawings CT891120.7 and CT891120.8. It shouldn't be any problem in recognising drawings that belongs to a certain type just by watching them.

For wall mount types:

Mount the unit with 4 bolts to the bulkhead in the cargo control room or an equivalent dry and safe space. The computer should be provided with adequate space to facilitate opening of the front cover. Position the computer in order to make handling convenient.

For CT1000 with LCD printer:

Refer to drawings CT041004.1 and CT041004.3. Both wall and panel mount options are shown.

### 4.8.2 Electrical connection of the computer unit.

Refer to Drawing CT891120.9.

Supply voltage should be single phase, 220VAC(110VAC) 50-60Hz. The power supply should be equipped with a main switch, or if specified, a detachable connector. The fuse size should be 6 A. If the Converting unit is equipped with a computer unit transformer, the computer unit power supply should be connected to the Converting unit without any connectors or fuses in between.

The alarm relay is normally open. An activated alarm is indicated with an open relay, which means that the alarm is activated when the power supply fails.

For panel mounted type with printer:

No ground terminators are provided. They are presumed to be included in the electrical cabinet the unit is to be mounted in. Use these ground terminators.

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## 4.8.3 TCP/IP communication via the CT1000 LAN interface.

Display the IP Configuration page. First display the survey page. Then press ALT and SCROLL until the IP Configuration page is displayed.

If the CT1000 is connected to a LAN that supports DHCP configuration use DHCP.

### IP Configuration

```
1) DHCP Enabled: Yes
   IP Address   : 172.21.1.207
   Netmask      : 255.255.248.0
   Gateway      : 172.21.0.1
```

Ret) Apply changes

In DHCP mode the obtained IP addresses are displayed.

### IP Configuration

```
1) DHCP Enabled: No
2) IP Address   : 192.168.0.250
3) Netmask      : 255.255.255.0
4) Gateway      :
```

Ret) Apply changes

In non DHCP mode state the IP addresses.

A permanent LAN installation can be made via the small 4 terminal connector located on the right side of the computer power supply PCB. The numbers 1, 2, 3 and 6 can be found on the RJ45 connector. A temporary LAN installation can be made to the RJ45 connector on the computer PCB inside the door of the CT 1000.

In order to log on to CT1000 start a Web browser and state the IP address of the CT1000 as "<http://aaa.aaa.aaa.aaa>". "aaa.aaa.aaa.aaa" is the IP address of CT1000.

## 4.9 Electrical connections, general.

Electrical connection is made according to CT891120.9.

Cb4, Cb6 and Cb7 connected to intrinsically safe equipment must be blue marked according to valid requirements for hazardous areas.

## CLEANTRACK 1000 Operations and Technical Manual.

Cb3 to Cb7 should not be mounted close to high current cables or other disturbing equipment.

Cb5 should be a pair twisted 2 wire shielded cable.

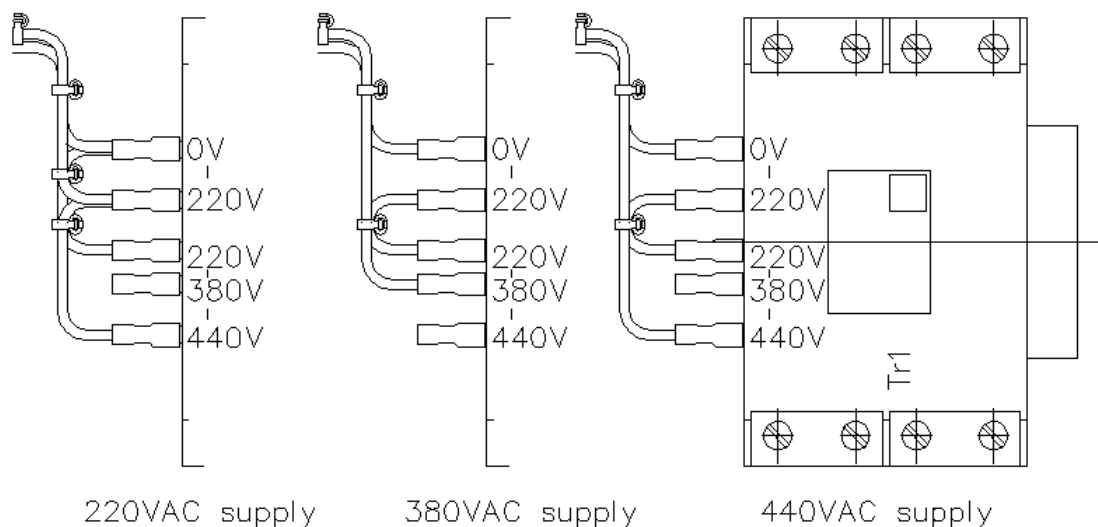
The NMEA terminator resistor switch should be in OFF position if the NMEA signal is of RS422 type and the Cleantrack is not positioned at the end of the cable. For other cable arrangements set the terminator resistor switch in ON position.

The switch, marked SW1, is positioned above terminals 21-23. The OFF position is when the switch knob is positioned towards the cable connectors.

### 4.10 First Start Up Checklist.

The intention of this first start up checklist is not to verify that everything has been installed according to the drawings, but to try to avoid mistakes that might harm the equipment or ship.

1. Check that the supply voltage to be connected to the Converting unit corresponds to the particular voltage the unit is intended for. The intended voltage appears from the connections on the transformer. See figure below. If you are not certain about the supply voltage that is to be connected to the Converting unit, ask authorised personnel to measure the voltage before connection.



2. It is very important that all electrical wires connected in the Converting unit are properly tightened. A wire that of mistake falls on secondary side of the Zener barriers might cause serious damage.
3. Check all Zener barriers are correct connected. See appendix in order to receive information on intrinsically safe arrangements. Don't connect mains to the equipment before this is in order.

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4. Check the check-valve 29 of the fresh water and if any cleaning solution check-valve is used, the check-valves to be mounted in the proper direction. Refer to MJC-.60-.1.
5. Be sure not to harm the pump unit, by pumping towards a closed valve or pumping when dry.
6. Check that the main voltage switch on the power supply PCB is in a position that corresponds to the actual power supply.
7. It is important that the fresh water solenoid valve is mounted in the proper direction. If not, it doesn't close properly.
8. Check and/or refill oil in pump shaft seal.

When this is finished:

- Fill cleaning solution according to section 2.7.
- Perform a CLEANTRACK 1000 operation test. Consult section 3.4.

Now Your CLEANTRACK 1000 is ready for use.



# CLEANTRACK 1000 Operations and Technical Manual.

## Chapter 5 Flow meter and Log transmitter

This chapter contains general information about requirements of information about flow rate and ships speed to be monitored by the oil discharge monitoring and control system.

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# CLEANTRACK 1000 Operations and Technical Manual.

## 5.1 Flow meter

In oil tankers fitted with a category A monitoring system the flow rate should be measured with a flow meter. Selection of flow meter is optional. The flow meter should meet the following requirements according to IMO Res.MEPC.108(49).and .

"A flow meter for measuring the rate of discharge should be installed in a vertical section of a discharge line or in any other section of a discharge line as appropriate, so as to be always filled with the liquid being discharged.

A flow meter should employ an operating principle suitable for shipboard use and, where relevant, which can be used in large diameter pipes.

A flow meter should be suitable for the full range of flow rates that may be encountered during normal operation. Alternatively, arrangements such as the use of two flow meters of different ranges or a restriction of the operational flow rate range may be necessary in order to meet this requirement.

The flow meter, when installed, should have an accuracy of  $\pm 15\%$ , or better, of the instantaneous rate of discharge throughout the operating range for discharging the effluent.

The design of the flow metering arrangements should comply with the safety requirements of the space in which it is intended to be located.

CLEANTRACK 1000 can be programmed or adapted to accept most flow-meter output signals.

Follow the installation instruction for the selected flow meter.

Refer to paragraph 1.3.1 "CLEANTRACK 1000 Input Signals" at page 8 regarding electrical data and possible flow meter input configurations.

Refer to paragraph 3.4.1 "Computer Flow and Speed Page Description" at page 75 regarding software adaptation to the flow meter.

### **5.1.1 BRANNSTROM standard flow transmitter**

BRANNSTROM has selected a flow transmitter that complies with the regulations and works well in the application. This flow transmitter is often supplied as a part of the CLEANTRACK 1000 deliveries. In this manual this particular flow transmitter is called the standard flow transmitter. The standard transmitter is described in the following subparagraphs. However any flow transmitter, having an output signal of 4-20mA and that complies with the regulations that applies to the particular installation may be used.

# CLEANTRACK 1000 Operations and Technical Manual.

## 5.1.1.1 Standard flow transmitter safety considerations

The flow transmitter has the following approval:

## 5.1.1.2 Standard flow transmitter calibration

In case the signal from the flow transmitter isn't accurate adjust its zero point according to the instructions below. During adjustment the OB pipe has to be full of water. If not fill it by running the discharge pump the normal way.

1. Get rid of the air:  
Open valves VF1 and VF2 and close VF3 as in normal operation. Drain the transmitter from air by opening the on the transmitter situated two drain plugs somewhat. Close them after a while when only water is draining off.
2. Adjust zero point:  
Close VF1 or VF2. Open VF3. Tubes belonging to both sides of the pressure transmitter are now communicating. It should now transmit a zero flow signal.

**IMPORTANT:** Set the mode switch on the transmitter to position 0. Check if ZERO is lit when LCD indicator is provided.

Connect a current-meter to terminal blocks CK+ and CK-. The current between the blocks should be 4mA. If necessary calibrate the current with the adjustment screw.

Close valve VF3. Open both VF1 and VF2. The system is now in operation with a calibrated Zero point. Keep the mode switch in position 0.

3. Adjust span:  
Warning! **Don't adjust the span** (mode switch in pos.1), because a pressure or flow standard to adjust to is difficult to apply. The span adjust is done by the manufacturer and is supposed to last lifelong.

# CLEANTRACK 1000 Operations and Technical Manual.

Figure 5.1: The mode switch and how to connect a current meter.

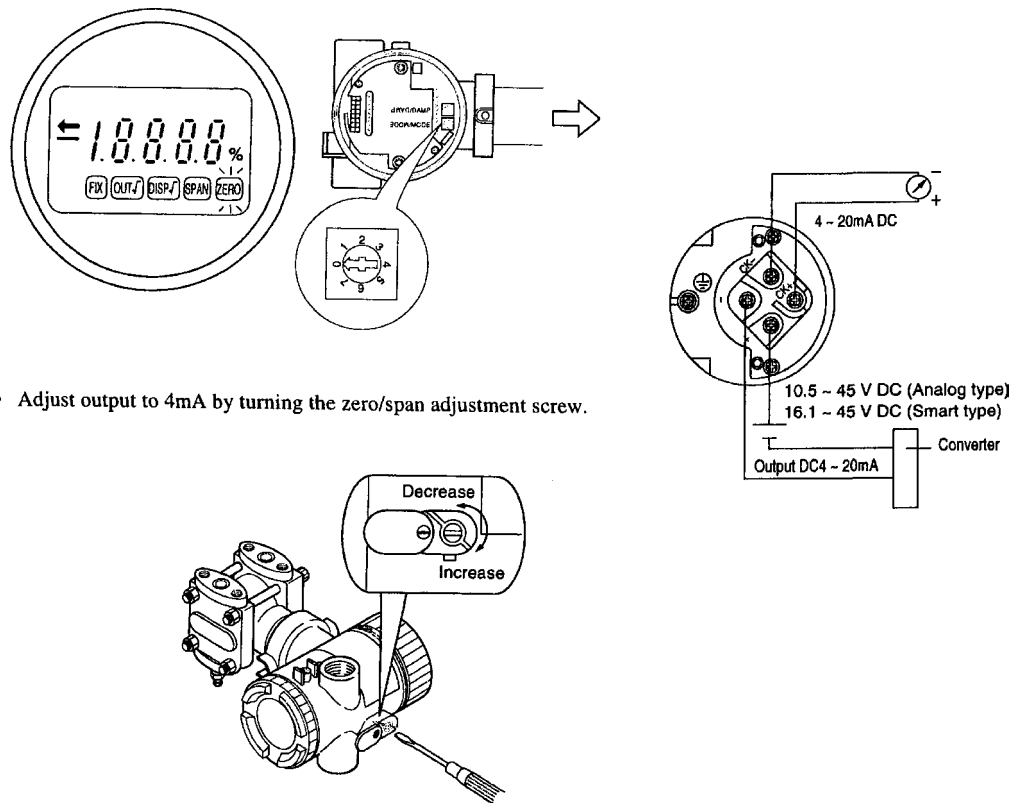
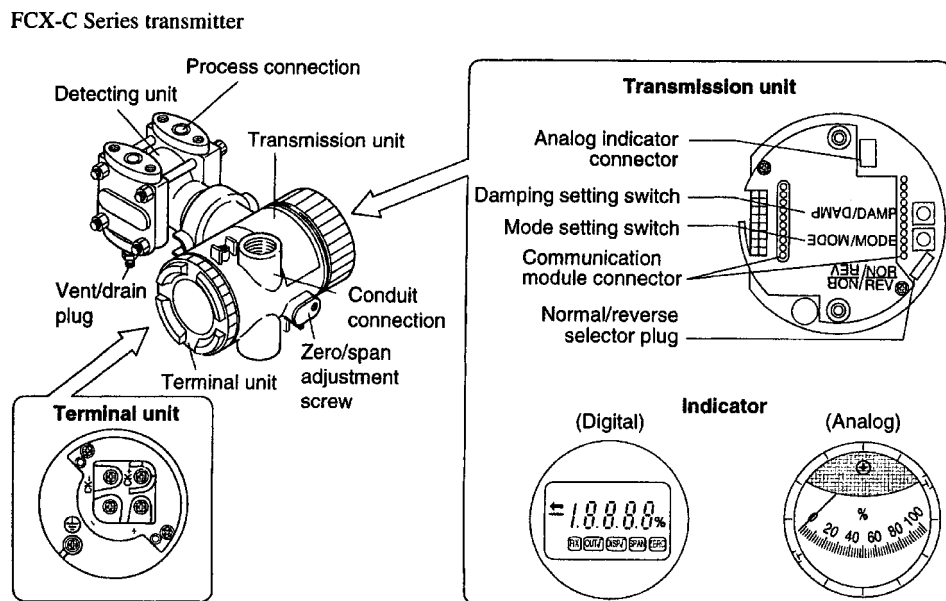


Figure 5.2: The adjustment screw.

Figure 5.3: The drain plug position and some other guidance:



# CLEANTRACK 1000 Operations and Technical Manual.

## 5.2 Speed Log Transmitter

In oil tankers fitted with a category A monitoring system the speed of the ship should be fed automatically to the CLEANTRACK 1000. The automatic speed indicating system should meet the following requirements according to IMO Res.MEPC.108(49).

"The automatic speed signal required for a category A monitoring system should be obtained from the ships speed indicating device in form of a repeater signal. "

The speed signal to CLEANTRACK 1000 should be a pulse signal from a voltage free relay or switch. The pulse frequency should be proportional to the speed.

The high speed limit is set to 20 knots as standard. The high speed limit alarm will assist in detecting possible pulse relay switch rebound errors.

The data of the speed input signal should meet:

Minimum switch on or off time:	33ms.
Maximum switch on or off rebound time:	8ms for suppression.
Pulse frequency range:	45-999 pulses/nm.

# CLEANTRACK 1000 Operations and Technical Manual.

## Chapter 6 Spare parts and Consumables

This chapter contains information about spare parts and consumables for the CLEANTRACK 1000 equipment, related to normal operation of the equipment. Below a drawing number is connected to each spare part. If necessary, identify the spare part in the stated drawing of chapter 7.

	<b>Page</b>
<b>Chapter 6 Spare parts and Consumables</b>	<b>110</b>
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6.3 Analysing unit spare parts	112
6.4 Pump unit spare parts	112
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6.6 Miscellaneous spare parts	113
6.7 Consumables	113

# CLEANTRACK 1000 Operations and Technical Manual.

## 6.1 Computer unit spare parts

<b>Description</b>	<b>Qty</b>	<b>Drawing</b>	<b>Part NO</b>
Computer program State serial no.	1	-	-
Printer	1	CT891120.7	CT891120.7- d1
Paper winder	1	CT891120.7	CT891120.7- d2
Computer PCB with with program. State serial no.	1	-	-
Computer power supply PCB. State serial no.	1	-	-
Fuses	1 set	CT900831.6	CT900831.6

## 6.2 Converting unit spare parts

Converting unit PCB Sate serial no.	1	-	-
Pump relay	1	CT920227.3	CT920227.3 – K3
Over current relay	1	CT920227.3	CT920227.3 – Oc1
Fuses	1 set	CT900831.6	CT900831.6

## **CLEANTRACK 1000 Operations and Technical Manual.**

### **6.3 Analysing unit spare parts**

<b>Description</b>	<b>Qty</b>	<b>Drawing</b>	<b>Part NO</b>
Measuring unit	1	CT891120.4	CT891120.4 – d1
Analysing valve	1	CT891120.4	CT891120.4 – d2
Pressure transmitter	1	CT891120.4	CT891120.4 – d3

### **6.4 Pump unit spare parts**

Seal kit	1	CT891211.1	CT891211.1 – d2
Coupling bipex	1	CT891211.1	CT891211.1 – d5
Oil level glass	1	CT891211.1	CT891211.1 – d14
O-ring nitrile rubber	1	CT891211.1	CT891211.1 – d15

### **6.5 Flow-meter unit spare parts**

Transmitter, Fuji State serial no.	1	CT891215.5	CT891215.5 – d6
---------------------------------------	---	------------	-----------------



# CLEANTRACK 1000 Operations and Technical Manual.

## 6.6 Miscellaneous spare parts

Description	Qty	Drawing No	Part No
Inlet filter	1	CT891213.1	CT891213.1 - 15

## 6.7 Consumables

Printer paper	
Printer ribbon	
Cleaning brush	1
Cleaning solution	1 (approx. 5 litres)
Consumption kit including:	1
Printer paper	5 pcs
Printer ribbon	2 pcs
Brush	1 pc
Cleaning solution	10 litres
Set of fuses	1 set

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **Chapter 7 Figures and Drawings**

<b>Chapter 7</b>	<b>Figures and Drawings</b>	<b>114</b>
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# CLEANTRACK 1000 Operations and Technical Manual.

## 7.1 Register of identifications used in the drawings.

In order to improve the clarity of the drawings, an unambiguous designation number, in the listing below identifies all significant items. All items included in this register are not parts of a CLEANTRACK 1000, adapted for a certain ship. See **paragraph 1.4** "CLEANTRACK 1000 oil content meter delivery extent" at page 20.

1. Computer unit.
3. Converting unit.
8. Water valve.
10. Analysing unit.
14. Sample feed pump.
15. Inlet filter.
18. Sample outlet probe valve.
19. Sample inlet probe valve.
20. Sample outlet probe.
21. Sample inlet probe.
22. Flow transmitter.
27. Overboard valve.
29. Water check valve.
30. Air shut off valve
31. Water shut off valve.
33. Water vacuum check valve.
34. Cleaning solution shut off valve.
35. Water shut off valve.
36. Valve air supply pressure regulator and water separator.
- Tb1. Valve air supply 6mm
- Tb6. Analysing unit valve actuator pipe. (Open) 6mm
- Tb7. Cleaning solution pipe. 8mm
- Tb8. Water pipe. 1/2"
- Tb11. Analysing unit outlet pipe. 3/4"
- Tb12. Analysing unit inlet pipe. 1/2"
- Tb13. Pump unit inlet pipe. 3/4"
- Cb1. Converting unit power supply.
- Cb2. Electrically powered pump power supply.
- Cb3. Intrinsically safe flow-meter supply.
- Cb3b. Intrinsically safe flow-meter supply. Flow-meter 2.
- Cb4. Analysing unit pressure transmitter cable.
- Cb5. Computer unit and Converting unit interconnection cable.
- Cb6. Measuring unit part 1 cable.
- Cb7. Measuring unit part 2 cable.
- Cb8a. Overboard valve or interlock cable from computer unit.
- Cb8b. Computer unit power supply.
- Cb9a. Alarm output cable.
- Cb9b. Warning output cable.
- Cb10. Flow-meter signal cable.
- Cb11. Water solenoid cable.
- Cb12. Log cable.
- Cb13. Overboard valve position indicator cable.

# CLEANTRACK 1000 Operations and Technical Manual.

## 7.2 Register of drawings

This register comprehends drawings of the standard system as well as a number of available system options.

If this manual is intended for a particular system the drawings in chapter 7.3 are adapted to this particular system. If not, drawings on the standard system are included. Your CLEANTRACK 1000 distributor will provide you with not included drawings on request.

CT891213.1	General assembly and arrangement
CT891120.9	Cable diagram
CT041001	Computer unit, wall mounted
CT041002	Computer unit, optional 19" frame
CT041003	Computer unit, panel mounted
CT041004	Computer unit, frontpanel
CT041005	Computer unit, inside (cpu-pcb)
CT891120.7	Computer unit, front view
CT891120.8	Computer unit, view from behind
CT910805.1	Computer unit, internal cable diagram
CT900105.2	Converting unit, Front and side view
CT900209.1	Converting unit, Valve enclosure
CT920227.3	Converting unit, Electrical enclosure
CT920227.2	Converting unit, Internal cable diagram
CT891120.5	Analysing unit, front view
CT891120.3	Analysing unit, bottom view
CT891120.4	Analysing unit, internal arrangement
CT891211.1	Sample pump unit, bulkhead mounted type
CT891216.1	Sample probes, installation arrangement
CT900105.4	Sample probes, valve arrangement
CT891215.5	Flow-meter unit, front view

## **CLEANTRACK 1000 Operations and Technical Manual.**

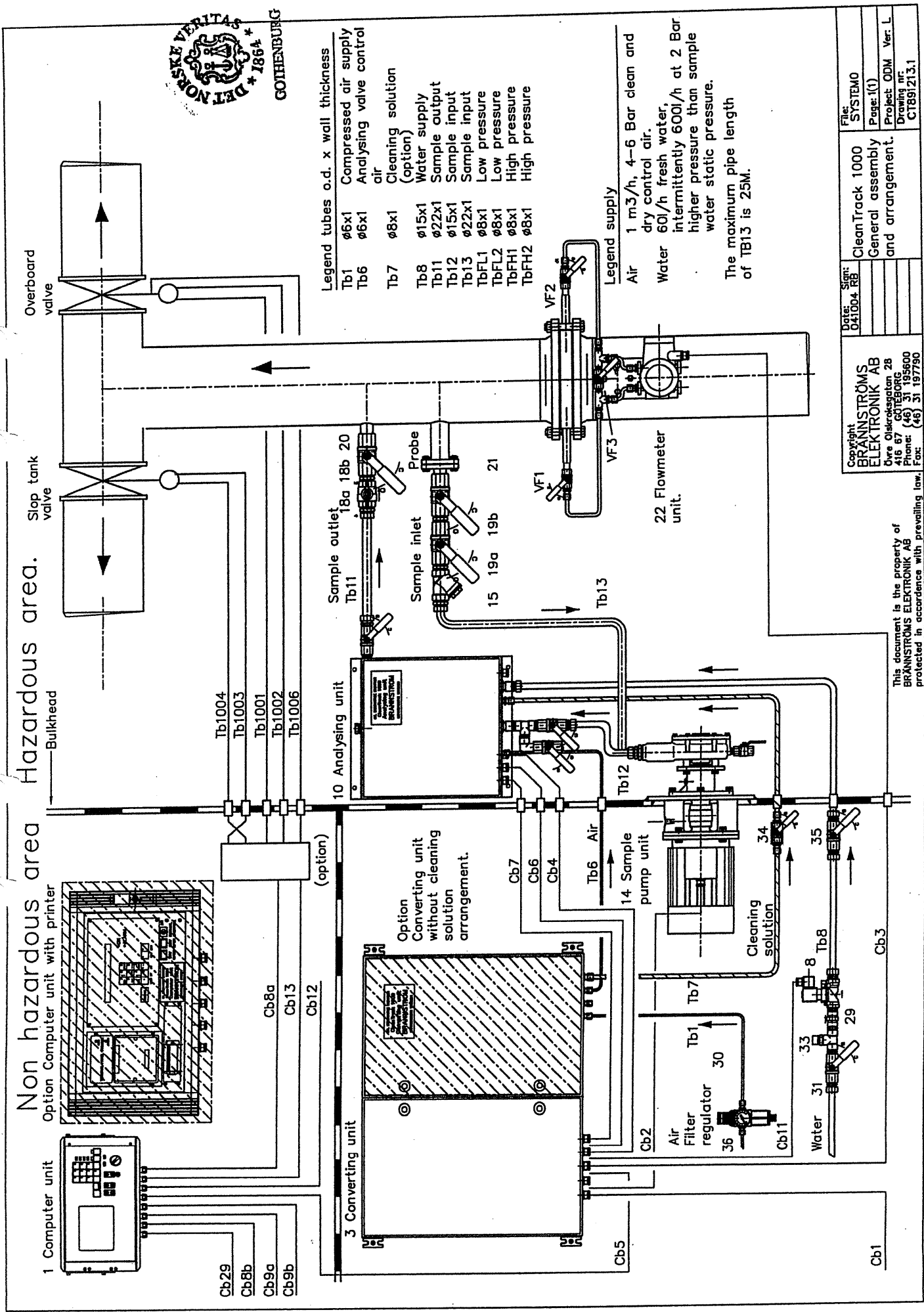
CT050426.1      Optional Pneumatic/electric valve control interface

CT050426.2      Optional Pneumatic/electric valve control arrangement

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **7.3 Drawings**

If this manual is intended for a particular system the drawings included are adapted to this particular system. If not, drawings on the standard system are included. Your CLEANTRACK 1000 distributor will provide you with not included drawings on request.



- Legend tubes o.d. x wall thickness
- Tb1     $\phi 6 \times 1$    Compressed air supply
  - Tb6     $\phi 6 \times 1$    Analysing valve control air
  - Tb7     $\phi 8 \times 1$    Cleaning solution (option)
  - Tb8     $\phi 15 \times 1$    Water supply
  - Tb11    $\phi 22 \times 1$    Sample output
  - Tb12    $\phi 15 \times 1$    Sample input
  - Tb13    $\phi 22 \times 1$    Sample input
  - TbFL1   $\phi 8 \times 1$    Low pressure
  - TbFL2   $\phi 8 \times 1$    Low pressure
  - TbFH1   $\phi 8 \times 1$    High pressure
  - TbFH2   $\phi 8 \times 1$    High pressure

- Legend supply
- Air    1 m<sup>3</sup>/h, 4-6 Bar clean and dry control air.
  - Water 60l/h fresh water, intermittently 600l/h at 2 Bar higher pressure than sample water static pressure.
- The maximum pipe length of TB13 is 25M.

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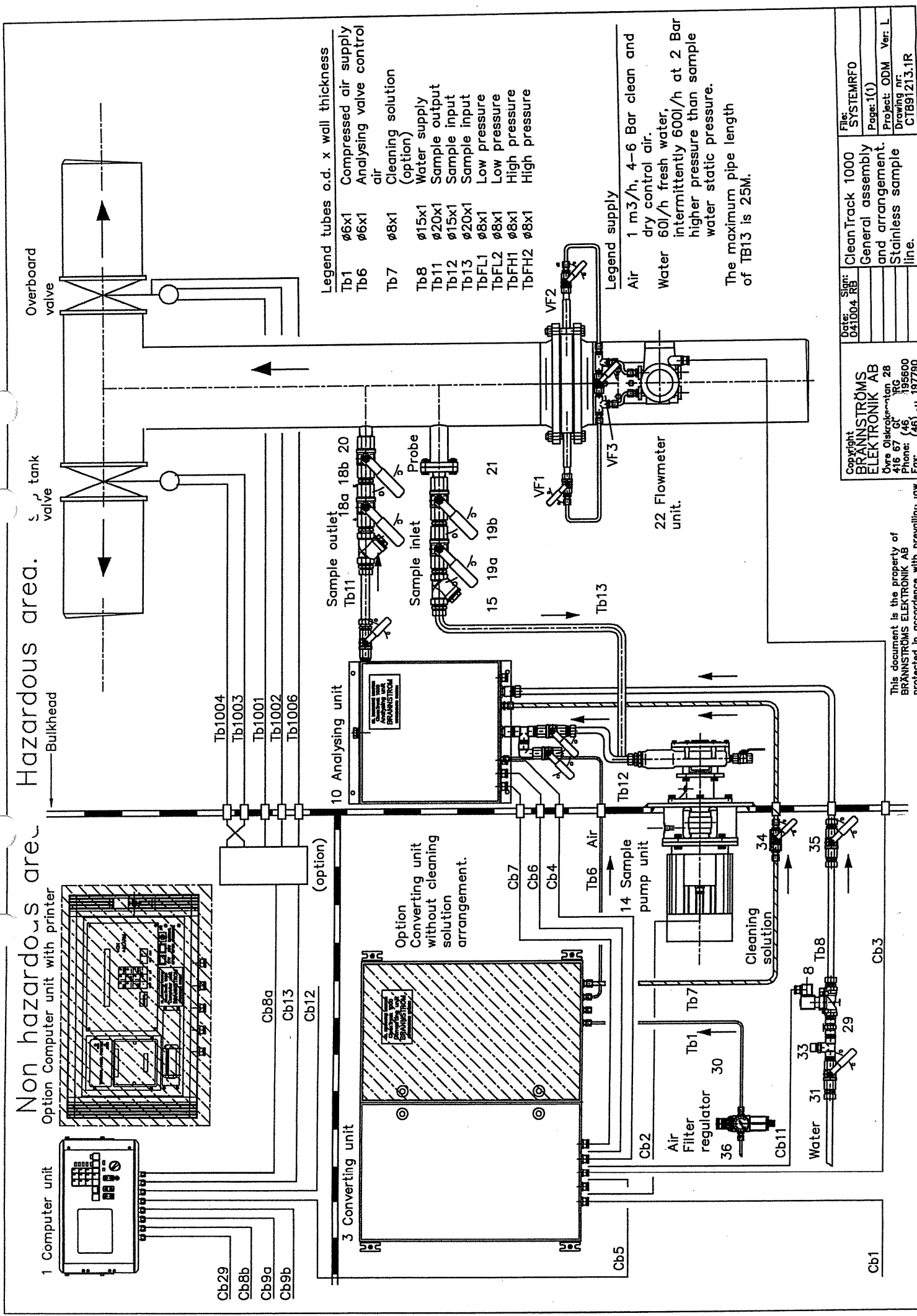
Date: 04/10/04 RB  
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File: SYSTEMO  
CleanTrack 1000  
General assembly  
and arrangement.  
Page: (1)  
Project: ODM Ver: L  
Drawing nr:  
CTB91213.1

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Non hazardous area

Hazardous area



- Legend tubes o.d. x wall thickness
- Tb1 ø6x1 Compressed air supply
  - Tb6 ø6x1 Analysing valve control air
  - Tb7 ø8x1 Cleaning solution (option)
  - Tb8 ø15x1 Water supply
  - Tb11 ø20x1 Sample output
  - Tb12 ø15x1 Sample input
  - Tb13 ø20x1 Sample input
  - TbFL1 ø8x1 Low pressure
  - TbFL2 ø8x1 Low pressure
  - TbFH1 ø8x1 High pressure
  - TbFH2 ø8x1 High pressure

Legend supply

- Air 1 m<sup>3</sup>/h, 4-6 Bar clean and dry control air.
- Water 60l/h fresh water, intermittently 600l/h at 2 Bar higher pressure than sample water static pressure.

The maximum pipe length of TB13 is 25M.

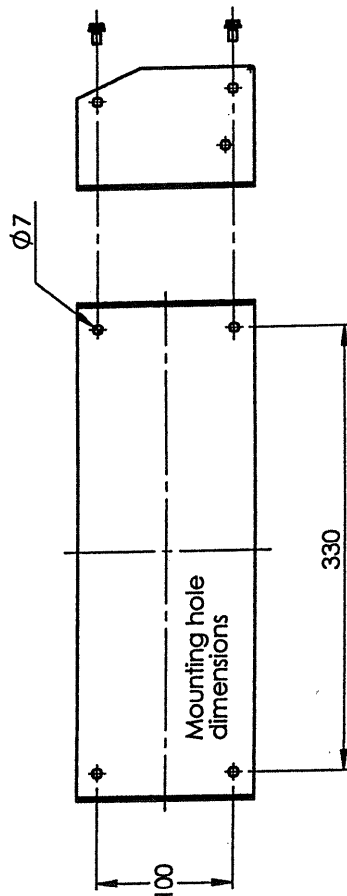
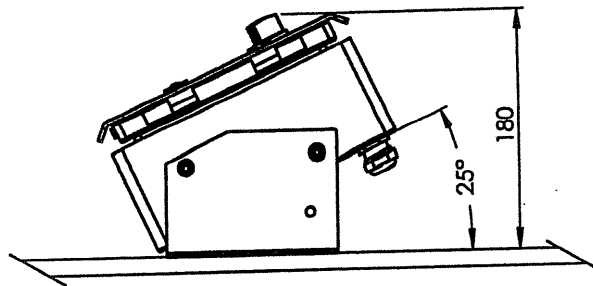
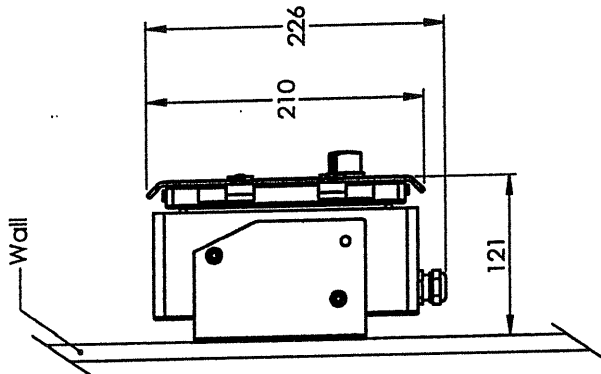
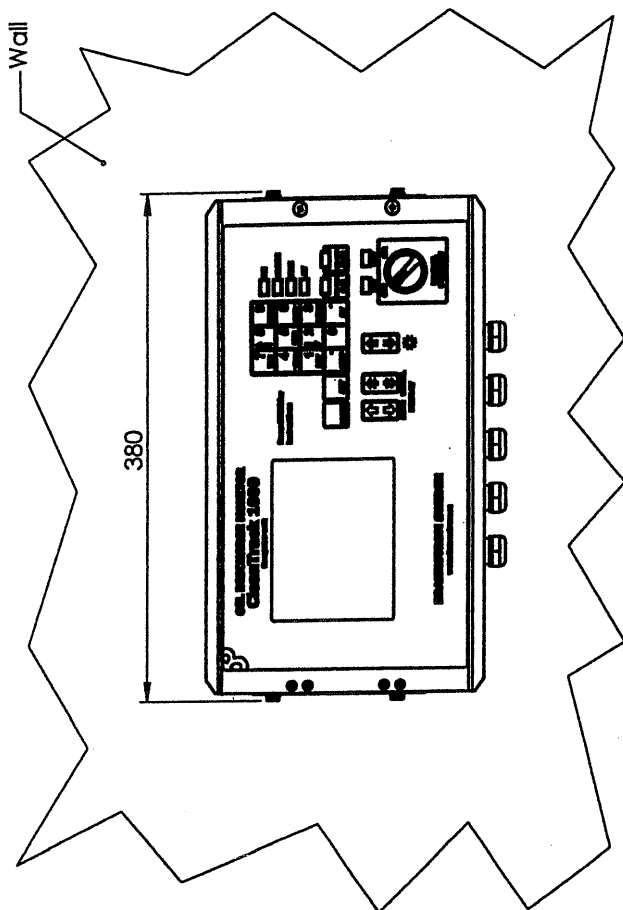
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Copyright BRANNSTRÖMS ELEKTRONIK AB		CleanTrack 1000
Övre Östgötsregionen 28		General assembly and arrangement.
416 67 Göteborg		Stainless sample line.
Phone: (46) 31 197900		
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Project: ODM		Page: 1(1)
Drawing nr. CTB91213.1R		Ver. L

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Legend

Item	Qty	Name	type	dimension	material
1	4	M6 Bolt			



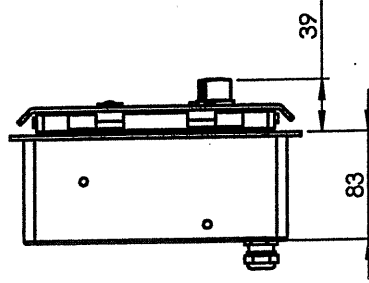
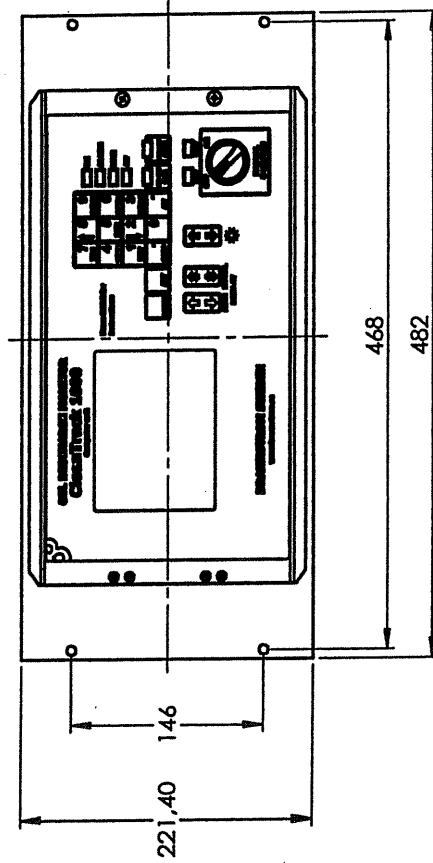
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Date:		Sign:	
041004	MH		
050228	MH		
Project: CleanTrack 1000			
Computer unit			
Wall mounted			
Page: 1(1)		Project: ODM.ver.B	
Drawing no: CT041001			

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ELEKTRONIK AB  
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S-413 45 Göteborg  
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Legend

Item	Qty	Name	type	dimension	Material
	1	Panel for 19"-frame			



Project:		CleanTrack 1000
Page: 1(1)		Computer unit
Project: ODM		19"-frame
Ver: B		
Drawing no: C1041002		
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041004 MH		
050228 MH		

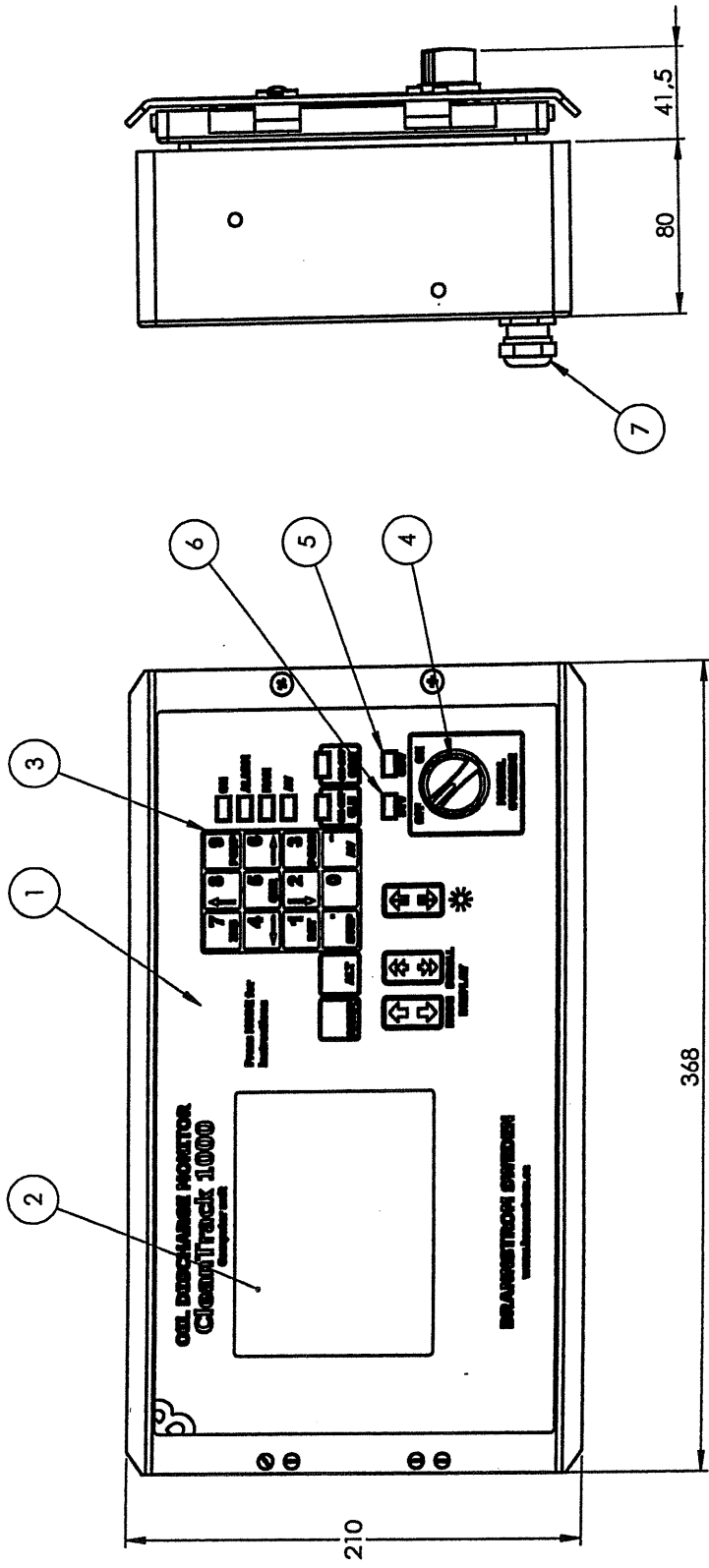
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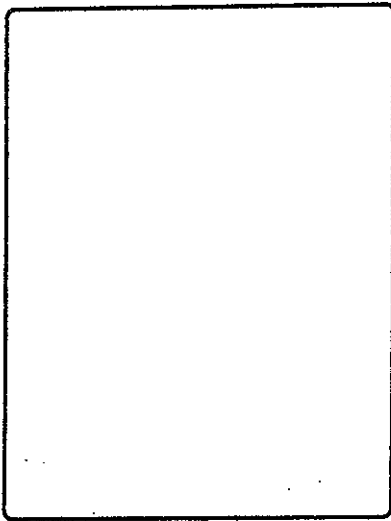
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**Legend**

Item	Qty	Name	type	dimension	Material
1	1	Computer unit			
2	1	Display			
3	1	Keyboard			
4	1	Manual override switch			
5	1	OBV open feedback indicator			
6	1	STV open feedback indicator			
7	1	Cable glands			



**OIL DISCHARGE MONITOR**  
**CleanTrack 1000**  
 Computer unit



Press MODE for instructions

Control panel with the following buttons and indicators:

- 9 PUMP
- 8 ↑
- 7 INS
- 6 ALARM
- 5 CHL
- 4 ←
- 3 PUMP
- 2 ↑
- 1 RET
- 0
- AV
- STOP
- RES
- ALT
- MODE SCROLL DISPLAY
- STV ON/OFF
- ON/OFF CLR
- ON/OFF ODR
- PARALLEL OVERRIDE (with ON/OFF switch)
- Starburst symbol

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Project: CleanTrack 1000 Computer unit Frontpanel	
Date:	Sign:
04/004.MH	
05/028.MH	
Page: 1/11	
Project: ODM - var. B	
Drawing no: C1041004	

Contractor: BRANNSTRÖM ELEKTRONIK AB  
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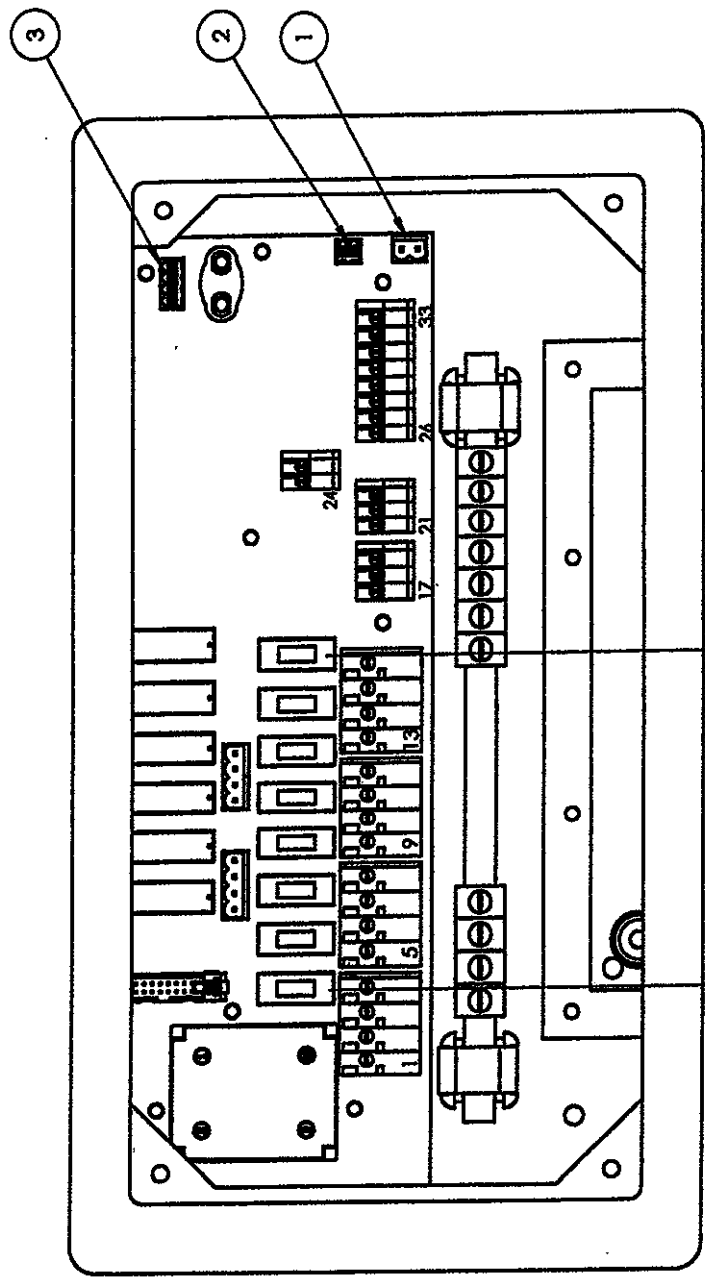
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Legend

Item	Qty	Size
1-2		Manual override connectors
3		LAN connection
S1	1	5x20mm 200mA time-lag
S2-S8	7	5x20mm 1A time-lag

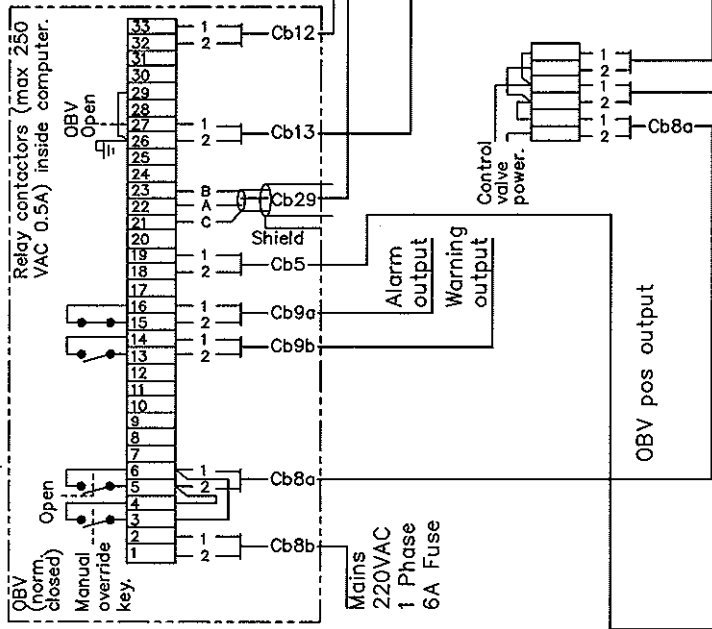


S1 S2 S3 S4 S5 S6 S7 S8

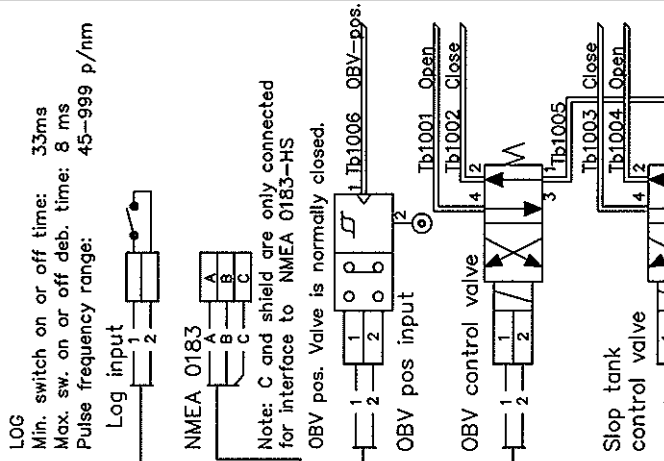
Copyright		Project:	
BRÄNNSTRÖMS ELEKTRONIK AB Industribyggnad 14 SE-412 79 Göteborg Phone: +46 31 17770 Fax: +46 31 17770		CleanTrack 1000 Computer unit inside (cpu-pcb)	
Date:	Sign:	Page:	Ver.:
041004_MH		111	B
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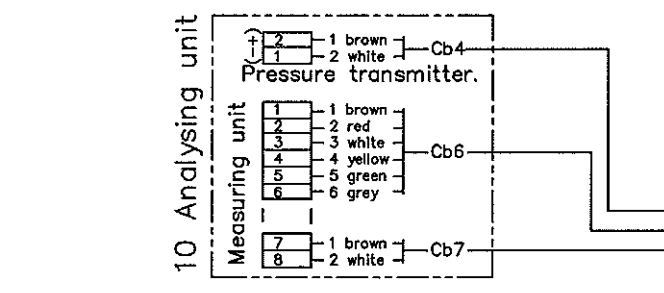
1 Computer unit



Non hazardous area



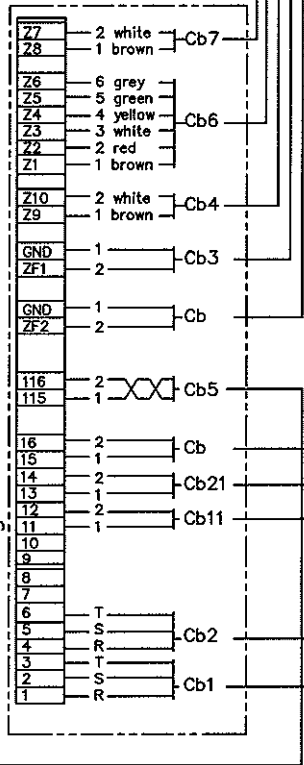
Hazardous area



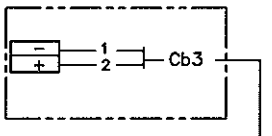
Legend

Cb1	4x1.5mm <sup>2</sup>	440VAC
Cb2	4x1.5mm <sup>2</sup>	440VAC
Cb3	2x0.5mm <sup>2</sup>	blue marked, shielded cable, intended for intrinsically safe equipment
Cb4	2x0.5mm <sup>2</sup>	blue marked, shielded cable, intended for intrinsically safe equipment
Cb5	2x0.5mm <sup>2</sup>	pair twisted, shielded cable
Cb6	6x0.5mm <sup>2</sup>	blue marked, shielded cable, intended for intrinsically safe equipment
Cb7	2x0.5mm <sup>2</sup>	blue marked, shielded cable, intended for intrinsically safe equipment
Cb8a	3x0.75mm <sup>2</sup>	220VAC
Cb8b	3x1.5mm <sup>2</sup>	220VAC
Cb9a	2x0.75mm <sup>2</sup>	220VAC
Cb9b	2x0.75mm <sup>2</sup>	220VAC
Cb11	3x0.75mm <sup>2</sup>	24VAC (220VAC)
Cb12	2x0.75mm <sup>2</sup>	24VAC (220VAC)
Cb13	2x0.75mm <sup>2</sup>	24VAC (220VAC)
Cb21	2x0.75mm <sup>2</sup>	24VAC (220VAC)
Cb22	2x0.75mm <sup>2</sup>	24VAC (220VAC)
Cb29	2x0.5mm <sup>2</sup>	pair twisted shielded cable

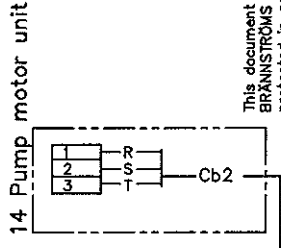
3 Converting unit



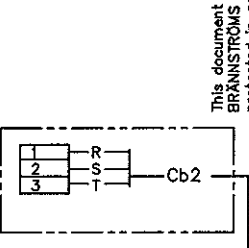
22 Flowmeter unit



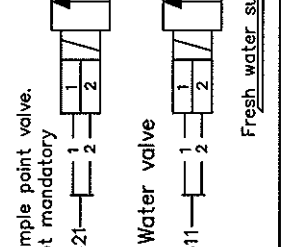
Optional Flowmeter unit



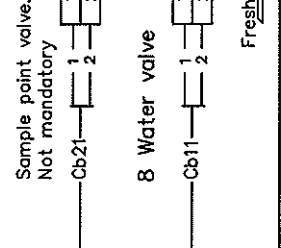
14 Pump motor unit



Optional sample point valve.



8 Water valve



Mains  
440VAC  
Fuses  
3x10A

Fresh water supply

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Date: 041102 RB  
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CleanTrack 1000  
Cable diagram

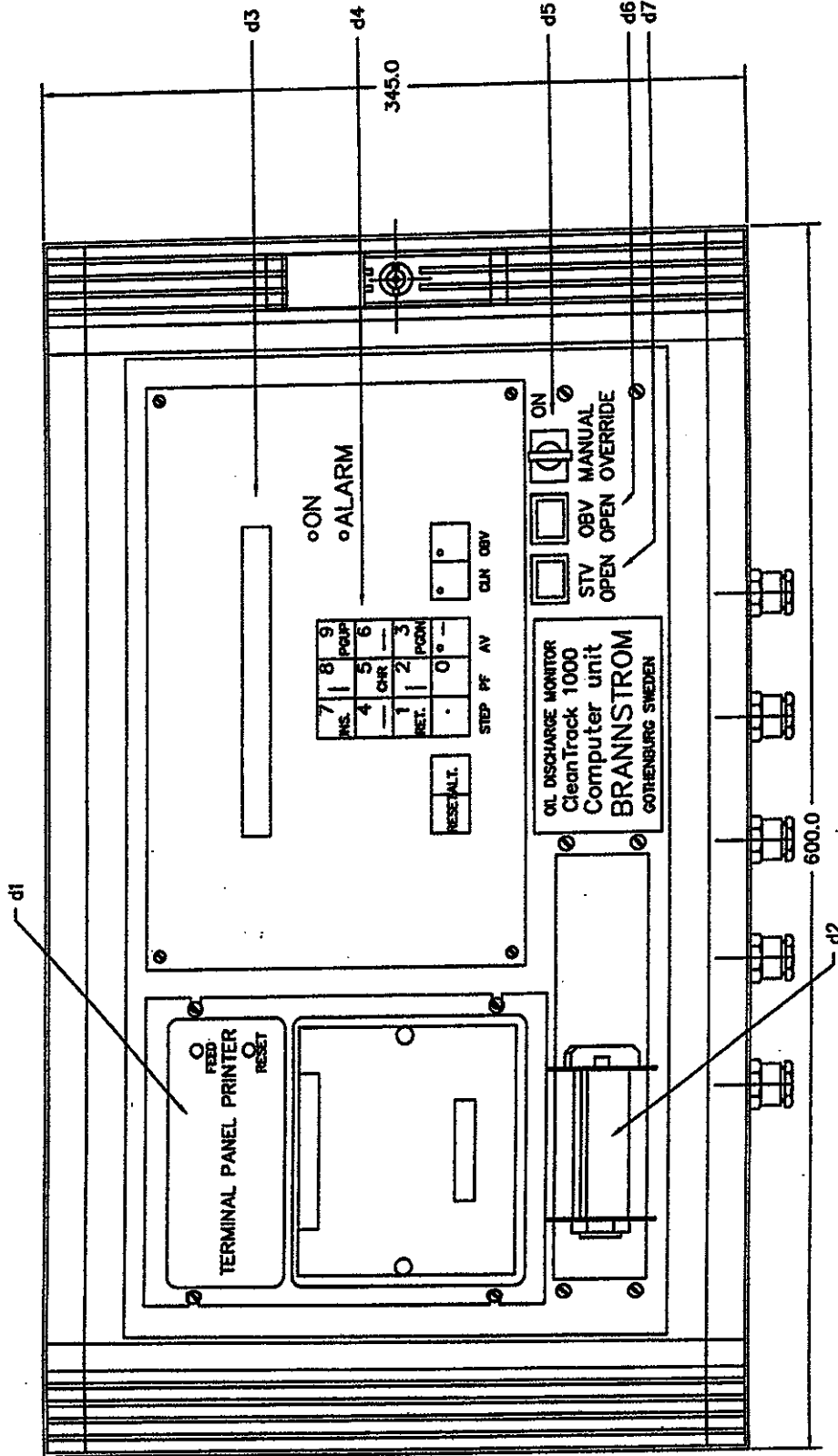
File: SYSTEMEL  
Page: (1)  
Project: ODM Ver: S  
Drawing nr: CT891120.9



GÖTTENBURG

Legende

Item	Qty	Name	type	dimension	Material
d1	1	Printer			
d2	1	Paper roller			
d3	1	LCD			
d4	1	Keyboard			
d5	1	Manual override switch			
d6	1	OBV open feedback indicator			
d7	1	STV open feedback indicator			
d6,d7	2	Indication lamp. 24VDC.			



DATE	04/04/88	FIG	COMPWP1
SCALE		PAGE	10
PROJECT		DRAWING NO.	Ver. H1
			CT081120.7

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418 76 Göteborg  
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Depth = 400

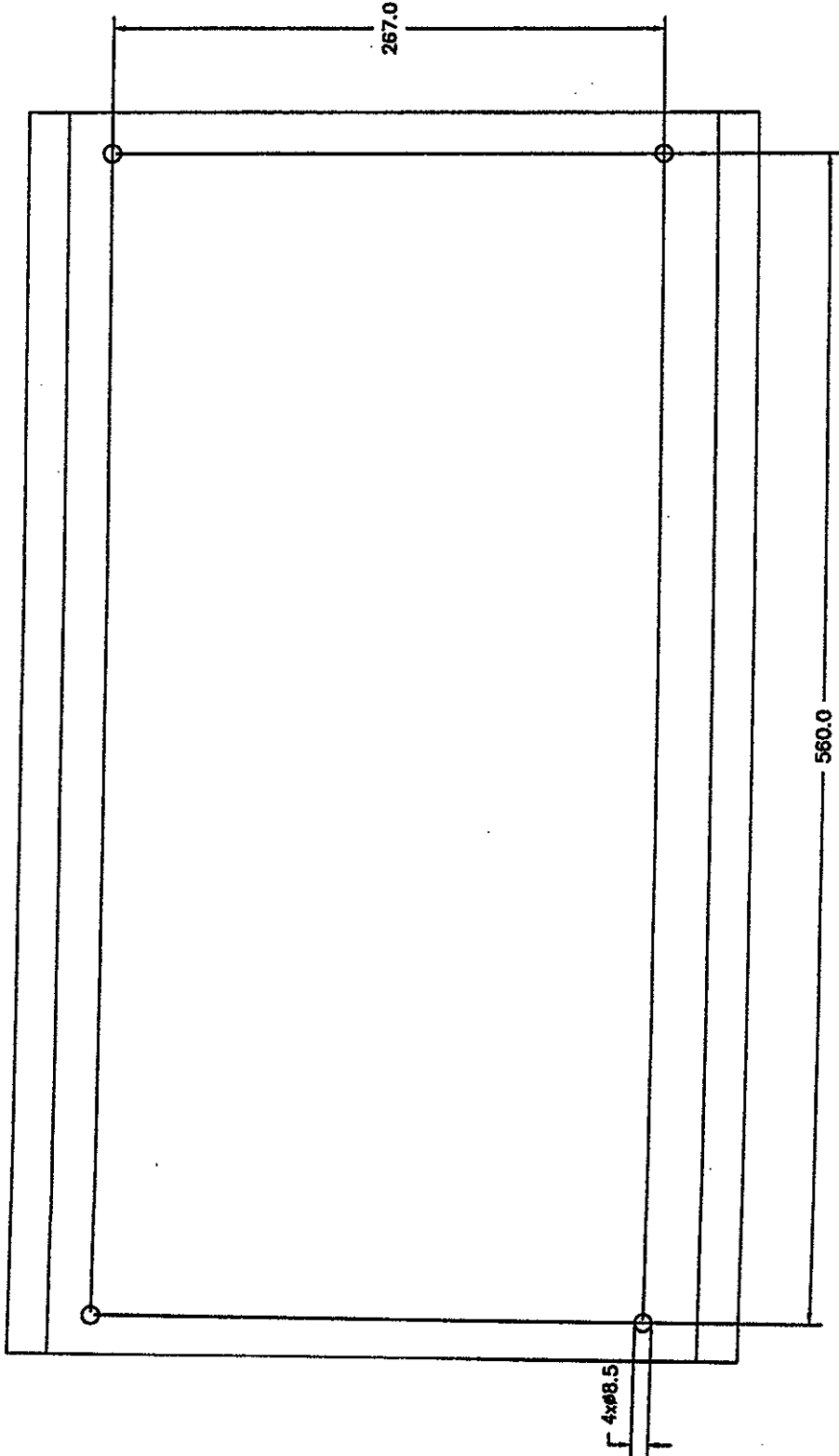
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Cleantrack 1000  
1 Computer unit  
with printer.  
Front view.

Legend

Item	Qty	Name	type	dimension	Material
d1	4	M6SM8x12			Steel

Mounting screws.



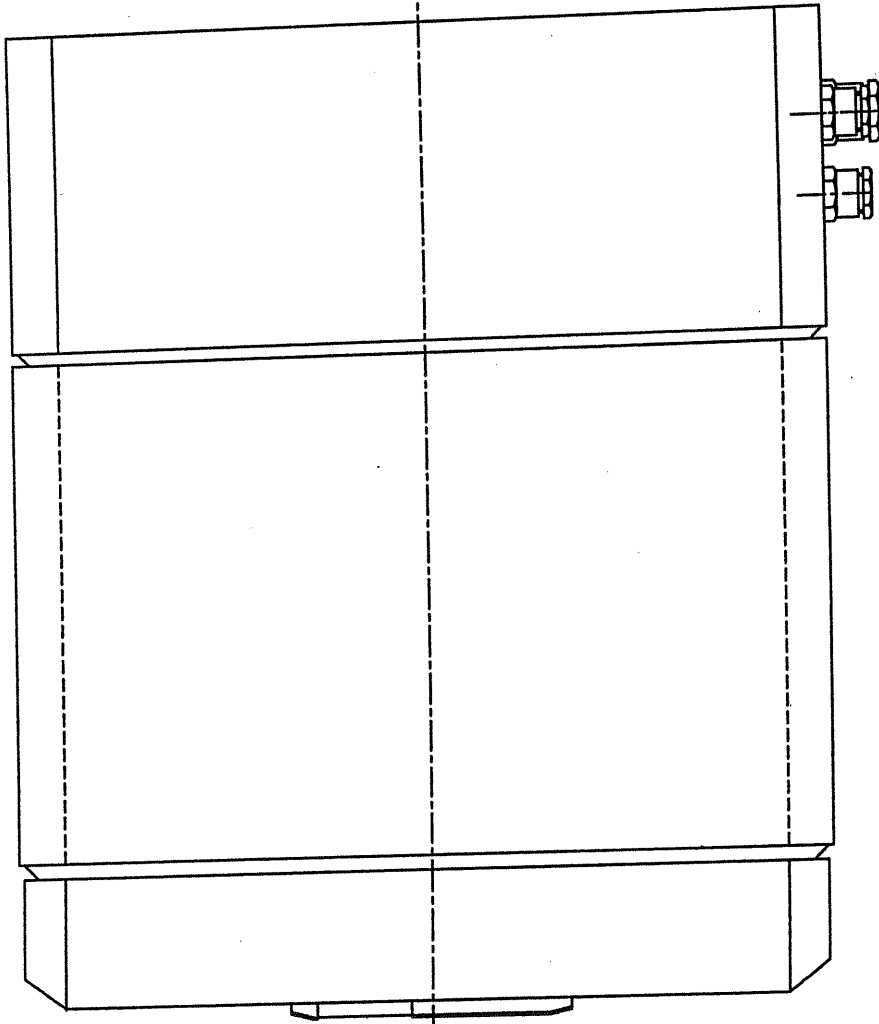
GOTHENBURG

DATE	01/01/88	FILE	COMPMP2
DRAWN		PROJECT	1 Computer unit
CHECKED		DRAWING NO.	with printer
APPROVED			View from behind.

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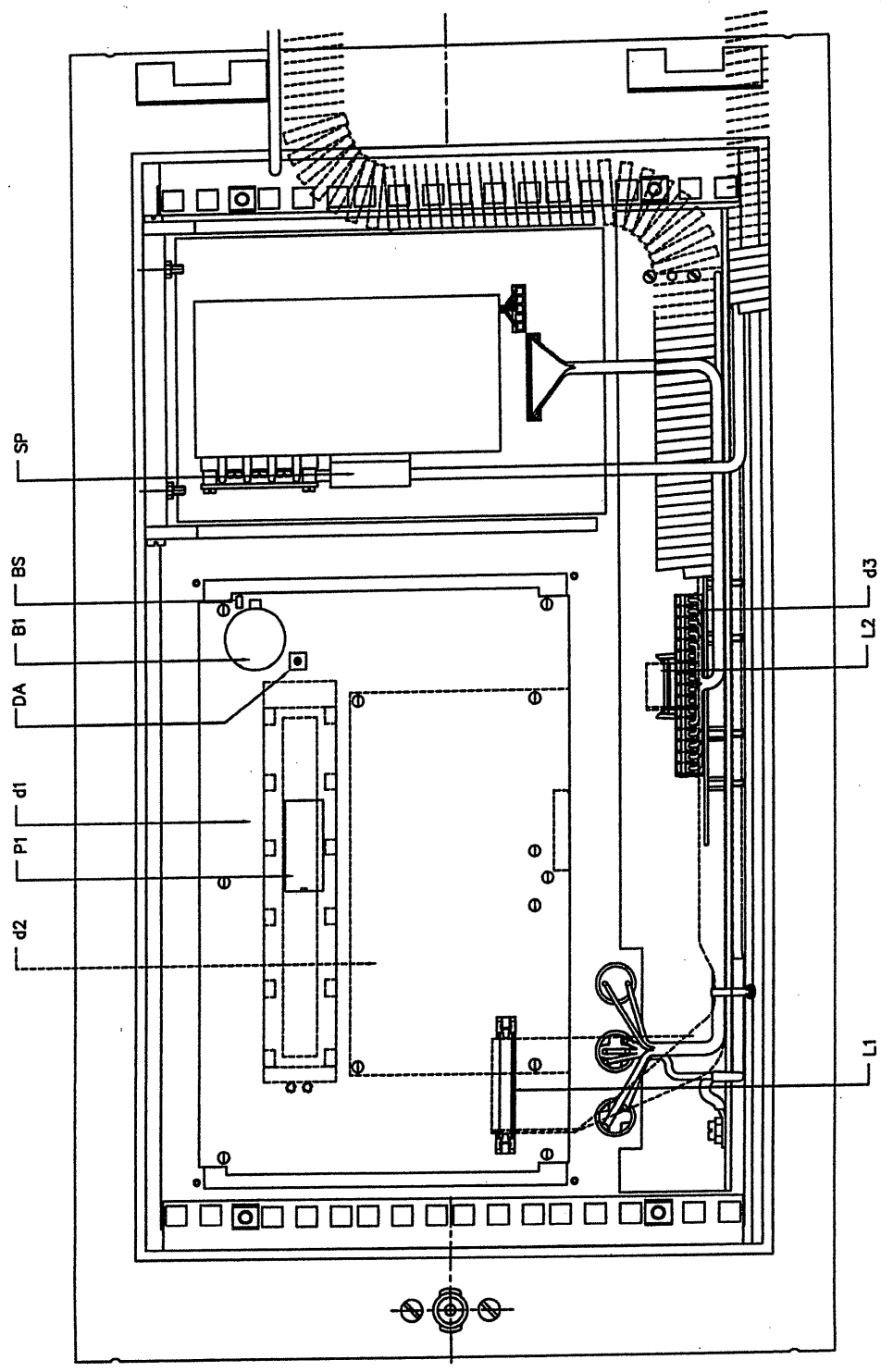
Date:	041001	Rev:	RB
File:	COMPWPO		
Page:	1(1)		
Project:	ODM Ver: G		
Drawn by:	CT941215.8		
Copyright		CleanTrack 1000	
BRANSTRÖMS		1 Computer unit	
ELEKTRONIK AB		with printer.	
Uddevallegatan, 14		Side view	
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File: COMPWP9  
 Page: 1(1)  
 Project: ODM Ver. F  
 Drawing nr: C1991215.9

Item	Qty	Name	type	dimension	Material
L1	1	34 pole flat cable			
L2	1	16 pole flat cable			
SP	1	Printer fuse 1A time lag 6.3x32mm			
B1	1	Battery 3V, Size 2325 or 2025			
BS	1	Battery strap			
DA	1	LCD view angle			
P1	1	Program			
d1	1	Computer unit, BE156			
d2	1	Keyboard PCB, BE158			
d3	1	Interconnection PCB, BE165			



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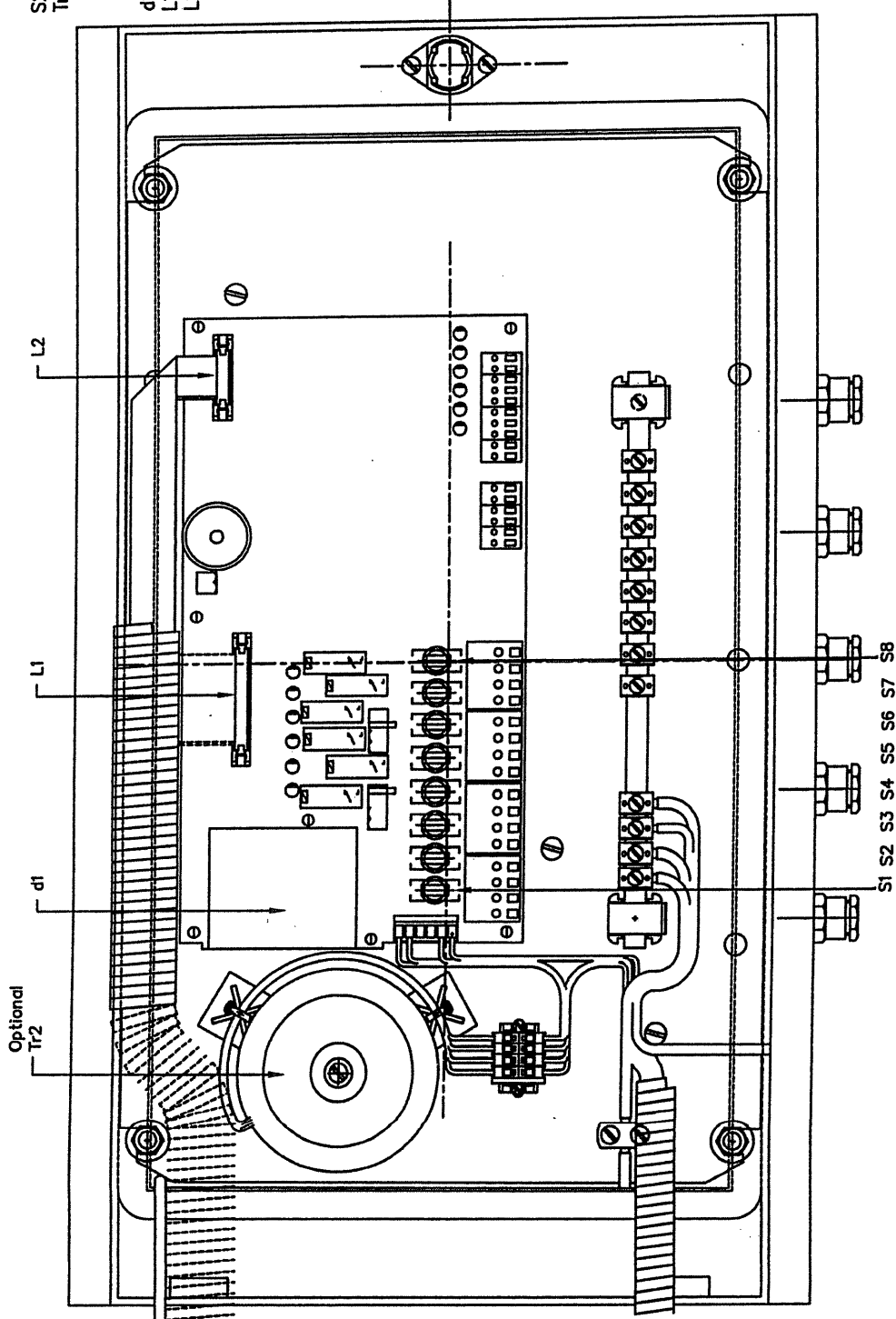
CleanTrack 1000  
 1 Computer unit  
 with printer  
 Front part,  
 inside view

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Legend fuses

Item	Qty	Size
S1	1	5x20mm 160mA time lag @ 230VAC 315mA time lag @ 115VAC
S2-S8	7	5 x 20mm 1A time-lag Optional transformer.
Tr2	1	Included if the unit is adapted to other supply voltages than 230VAC.
d1	1	Power supply unit. BE118
L1	1	34 pole flat cable
L2	1	16 pole flat cable



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Date:	04/001 RB
Sign:	
File:	COMHP10
Page:	(1)
Project:	ODM Ver: G
Drawing nr:	CT991216.1
CleanTrack 1000	1 Computer unit
	with printer.
	Rear part,
	inside view



**Legend fuses**

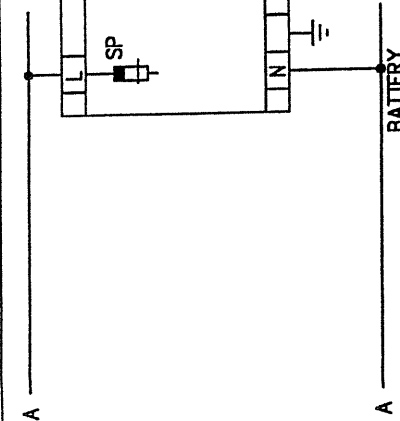
Item	Qty	Size
S1	1	5 x 20mm 150mA time lag @ 230VAC 315mA time lag @ 115VAC
S2-S8	7	5 x 20mm 1A time-lag
Sp	1	6.35x32mm 1A time-lag

Legend transformer

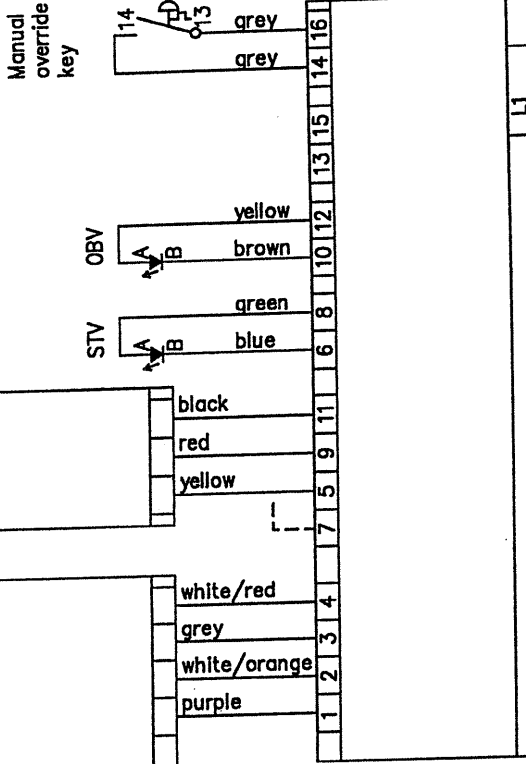
Item	Qty	Size
Tr1	1	90-115/230VAC transformer. Included if supply voltage is 90-115VAC.

PAPER ROLLER,  
JC9000 PU PRPAV

PRINTL. JC9000 PU  
PRTC5M520



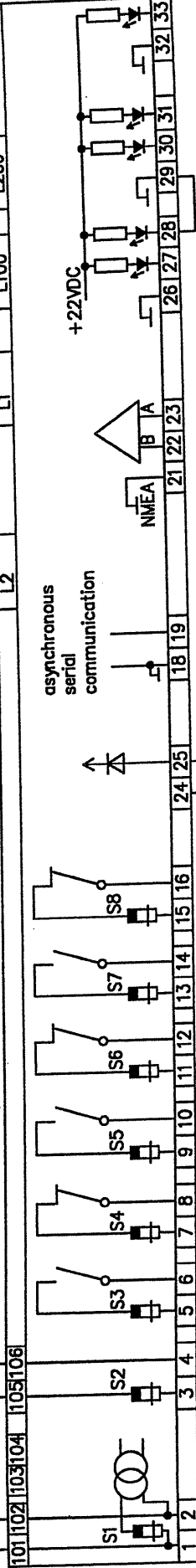
COMPUTER PCB, JC9000 PU PC BE156



INTERCONNECTION PCB, JC9000 PU PC BE165



POWER SUPPLY PCB, JC9000 PU PSPC BE118



Strap if F3 input  
is used for flow  
channels F3 and F4

Mains Manual  
override key

Converting unit  
connection

NMEA

External battery.

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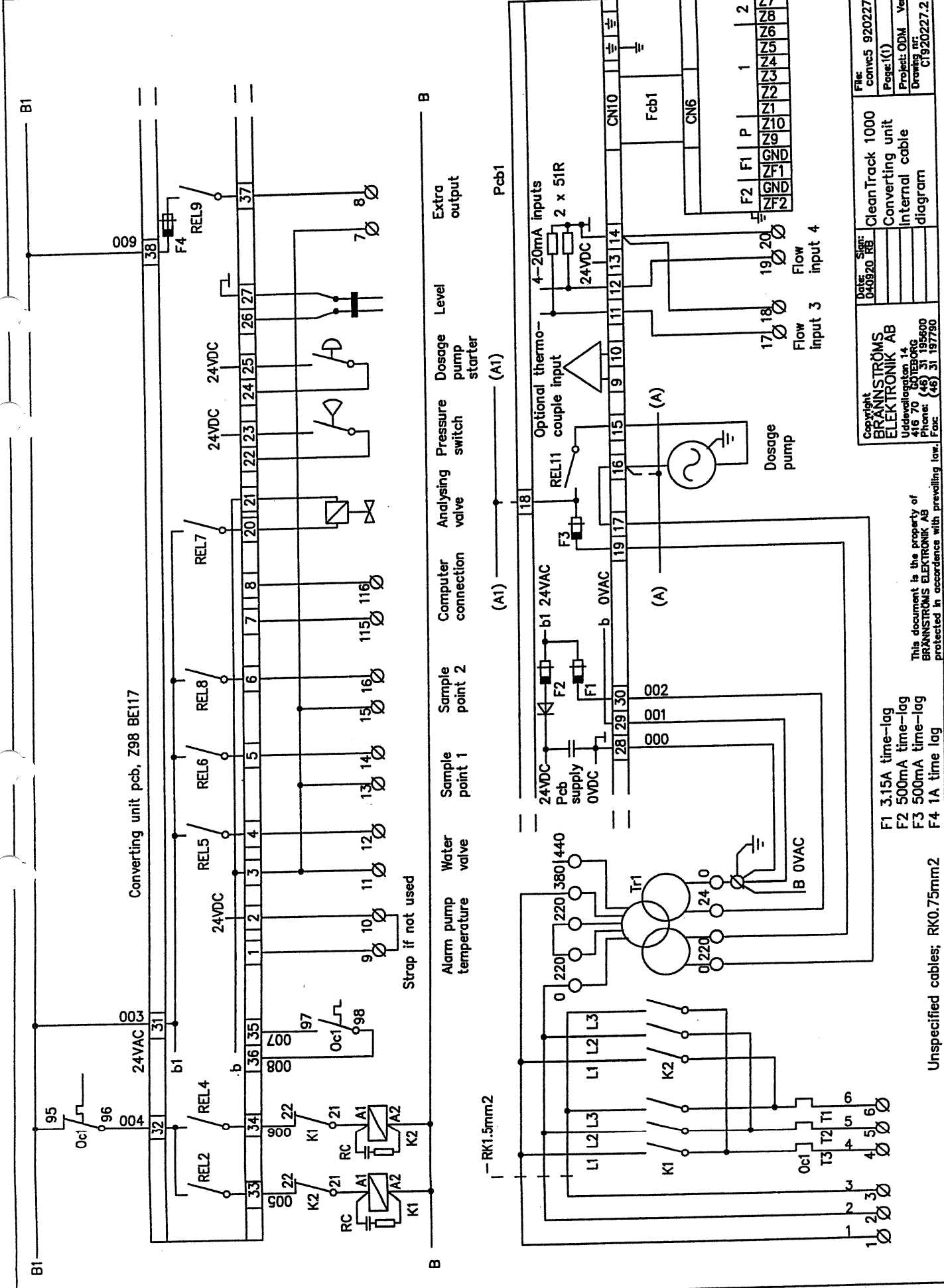
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Date: 04/1001 RB  
Sign: RB  
CleanTrack 1000  
1 Computer unit  
with printer  
Internal cable  
diagram

File: COMPPB  
Page: 1(1)  
Project: ODM Ver. E  
Drawing nr:  
CT910805.1



GÖTTENBURG



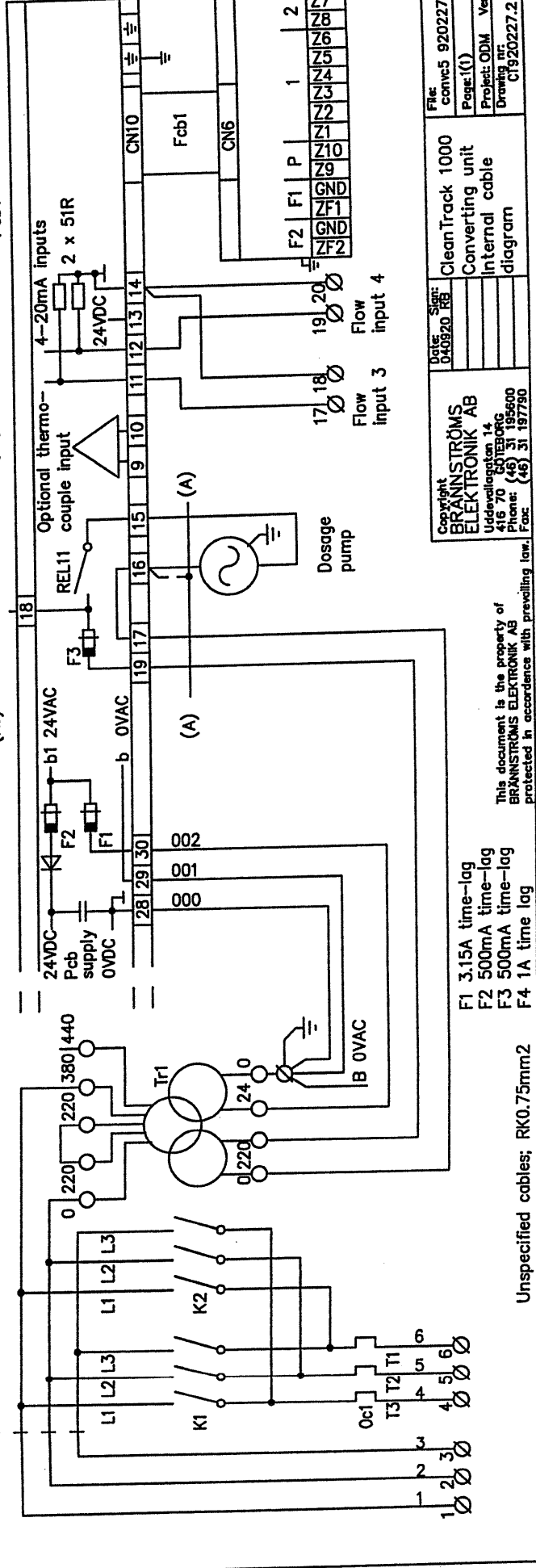
Converting unit pcb, Z98 BE117

B1 ————— B

Alarm pump temperature    Water valve    Sample point 1    Sample point 2    Computer connection    Analysing valve    Pressure switch    Dosage pump starter    Level    Extra output

— RK1.5mm2

Pcb1



Date:	04-09-20	RB
Sign:		
File:	conv5 920227.2	
Page:	(1)	Ver: J
Project:	ODM	
Drawing nr:	C1920227.2	

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CleanTrack 1000  
Converting unit  
Internal cable  
diagram

F1 3.15A time-lag  
F2 500mA time-lag  
F3 500mA time-lag  
F4 1A time lag

Unspecified cables; RK0.75mm2

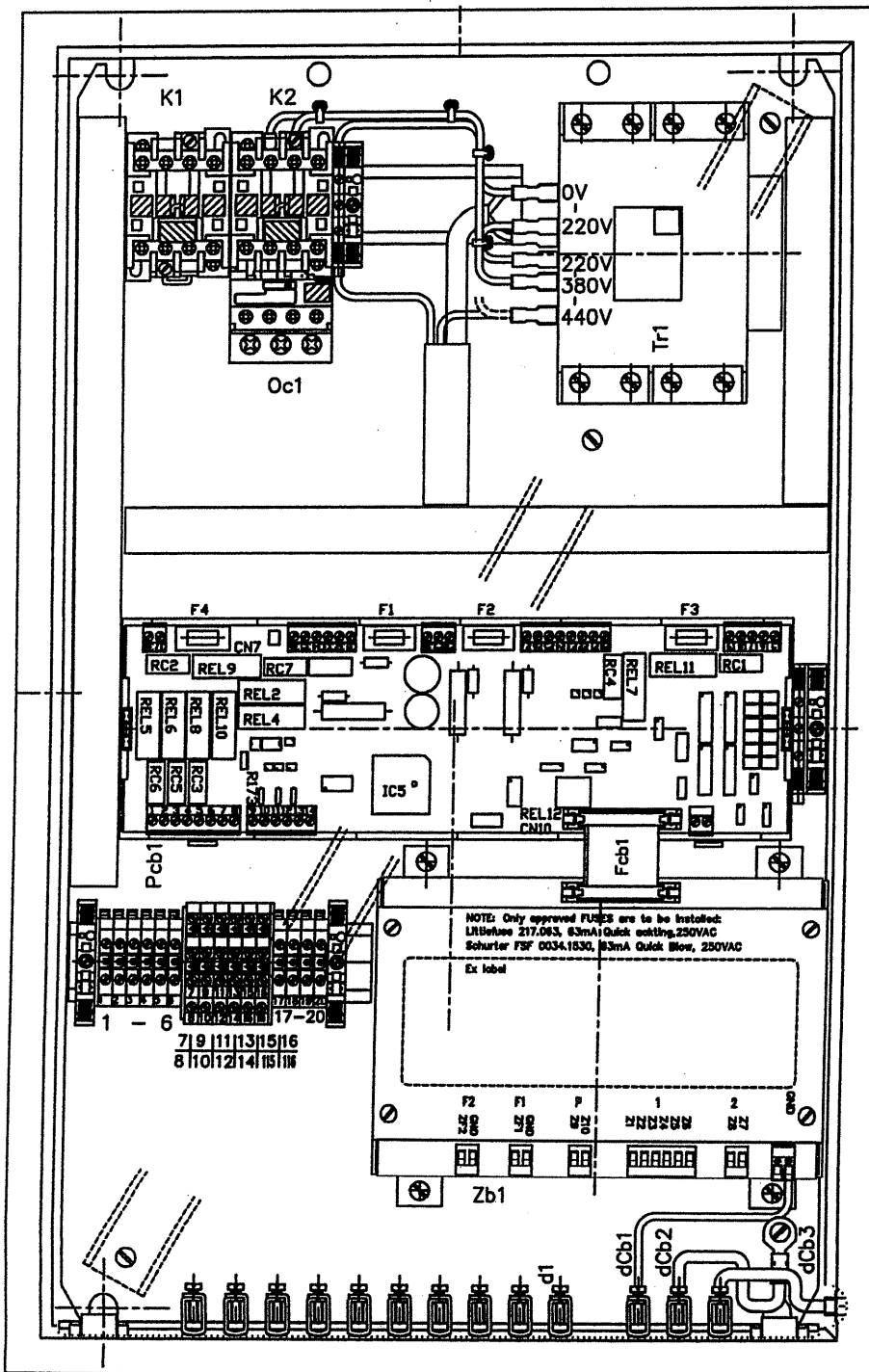
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GÖTTENBERG

Legend

Item	Qty	Name	type	dimension
K1	1	Contact "Telemecanique"	LC1-D0901B5	10A/500VAC
K2	1	Sample pump forward	Contact "Telemecanique"	LC1-D0901B5 10A/500VAC
K3	1	Sample pump reverse	Relay "Schrack" MR30624	
Oc1	1	Over current relay "Telemecanique"	LR2 D1310	4-6A
F1	1	Fuse	ø5x20mm	3.15A time-lag
F2	1	Fuse	ø5x20mm	0.5A time-lag
F3	1	Fuse	ø5x20mm	0.5A time-lag
F4	1	Fuse	ø5x20mm	1A time lag
Zb1	1	Oil Monitor interface type Z98	lm	
Z7		Uz	±1.6V	320mA 5.4R
Z8		Rs	-5V	150mA 38R
Z6			±1.6V	15mA 127R
Z5			±1.6V	15mA 127R
Z4			-8.6V	100mA 89R
Z3			±1.6V	15mA 127R
Z2			±1.6V	15mA 127R
Z1			8.6V	50mA 196R
Z10		(GND)		
Z9			28V	91mA 315R
ZF1			28V	91mA 315R
ZF2			28V	91mA 315R
Tr1	1	Transformer "Hahn" 10900	Pr	0-220,0-160,220
			Pr	0-220,380,440
			Sek	0-24 80VA, 0-220 120VA
Pcb1	1	Printed circuit board Z98 BE117		
IC5		Micro-processor		
d1	10+3	Ground screw clamp ZB16 16mm2		
				(3 are internally occupied)
Fcb1	1	26pole flat cable		



Date:	040920 RB	File:	conv4 920227.3
Sign:		Page:	1(1)
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		Checked by:	
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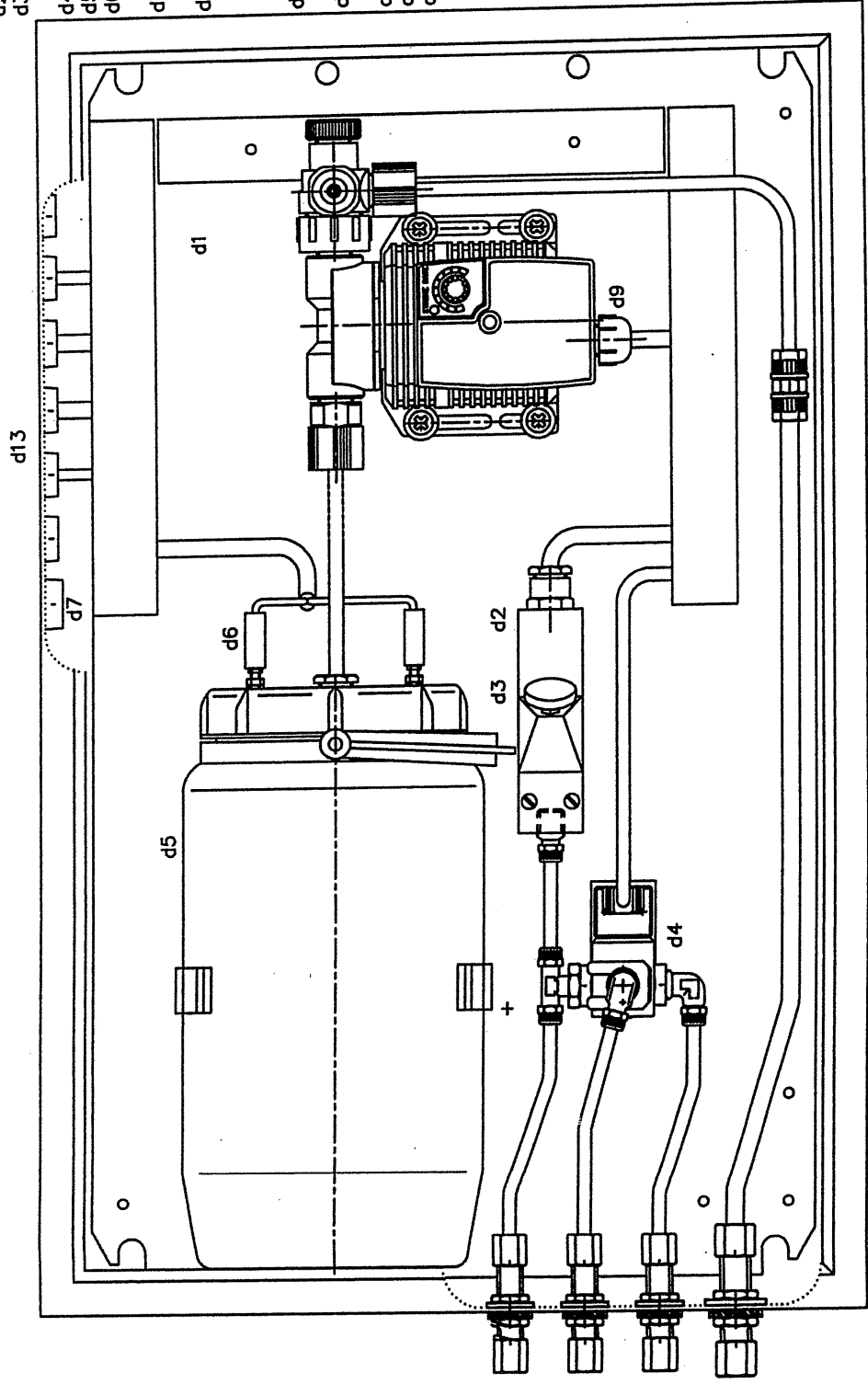
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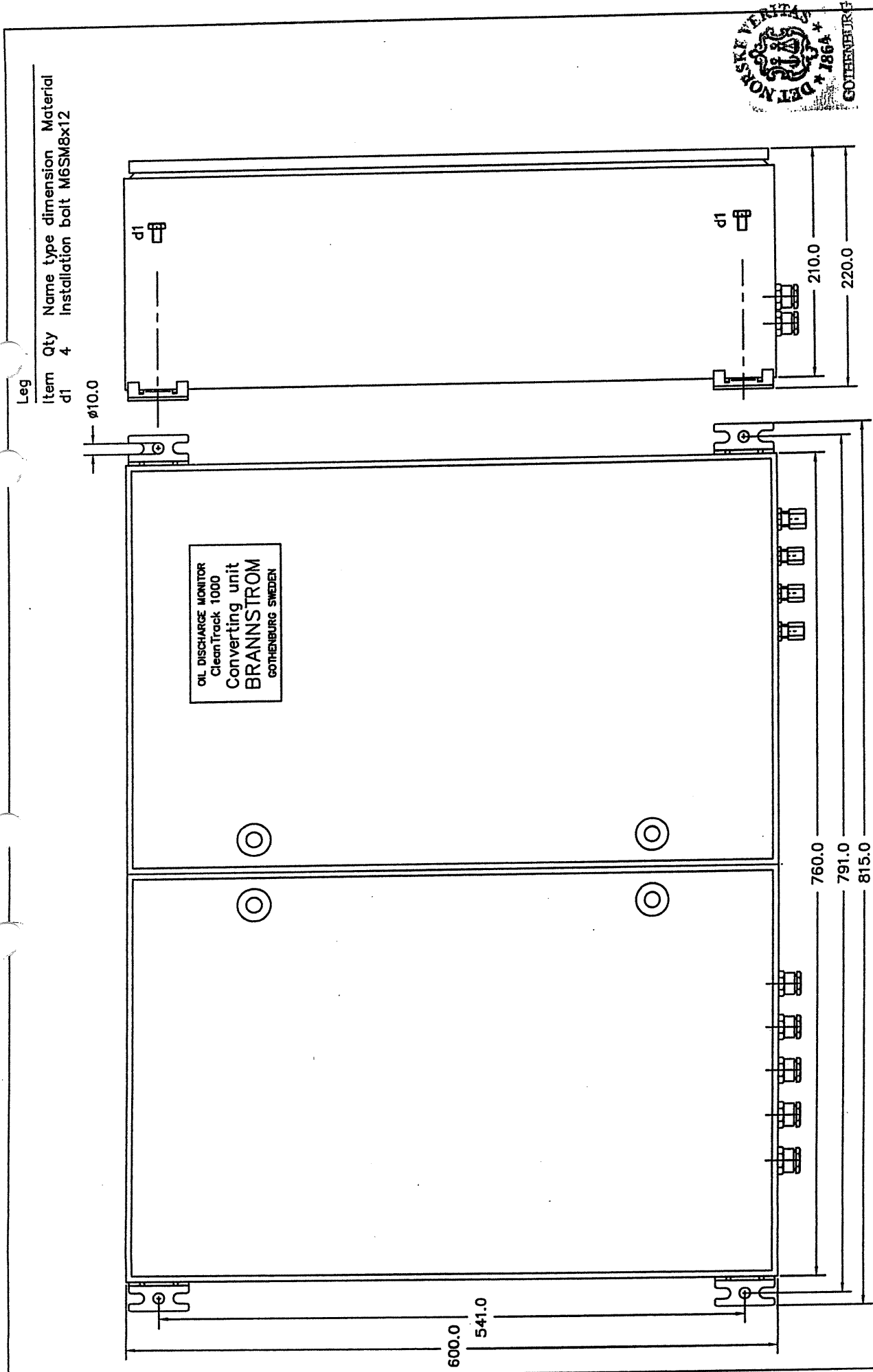
Item	Qty	Name	type	dimension	Material
d1	1	Cleaning solution pump.			
d2	1	Pressure switch			
d3	1	Pressure switch adjustment knob.			
d4	1	Analysing valve solenoid			
d5	1	Cleaning solution bottle.			
d6	1	Cleaning solution bottle level sensor			
d7	1	Cleaning solution pump start pushbutton.			
d9	1	Cleaning solution pump capacity adjustment knob, should normally be adjusted to 100%			
d11	4	Tube	o.d. $\varnothing 6 \times 1$	Polypropylene	
d12	2	Tube	o.d. $\varnothing 8 \times 1$	Polypropylene	
d13	6	Cable	conduit connector.		
d14	3	Bulkhead union	o.d. $\varnothing 6 \times 1$		
d15	1	Bulkhead union	o.d. $\varnothing 8 \times 1$		



Date:	04-09-20	Sign:	RB
File:	CONV2 900209.1		
Page:	1(1)		
Project:	ODM		
Ver:	H		
Drawing nr:	CT900209.1		

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Leg  
 Item Qty Name type dimension Material  
 d1 4 Installation bolt M6SM8x12

OIL DISCHARGE MONITOR  
 CleanTrack 1000  
 Converting unit  
 BRANNSTRÖM  
 GÖTTEMBERG SWEDEN

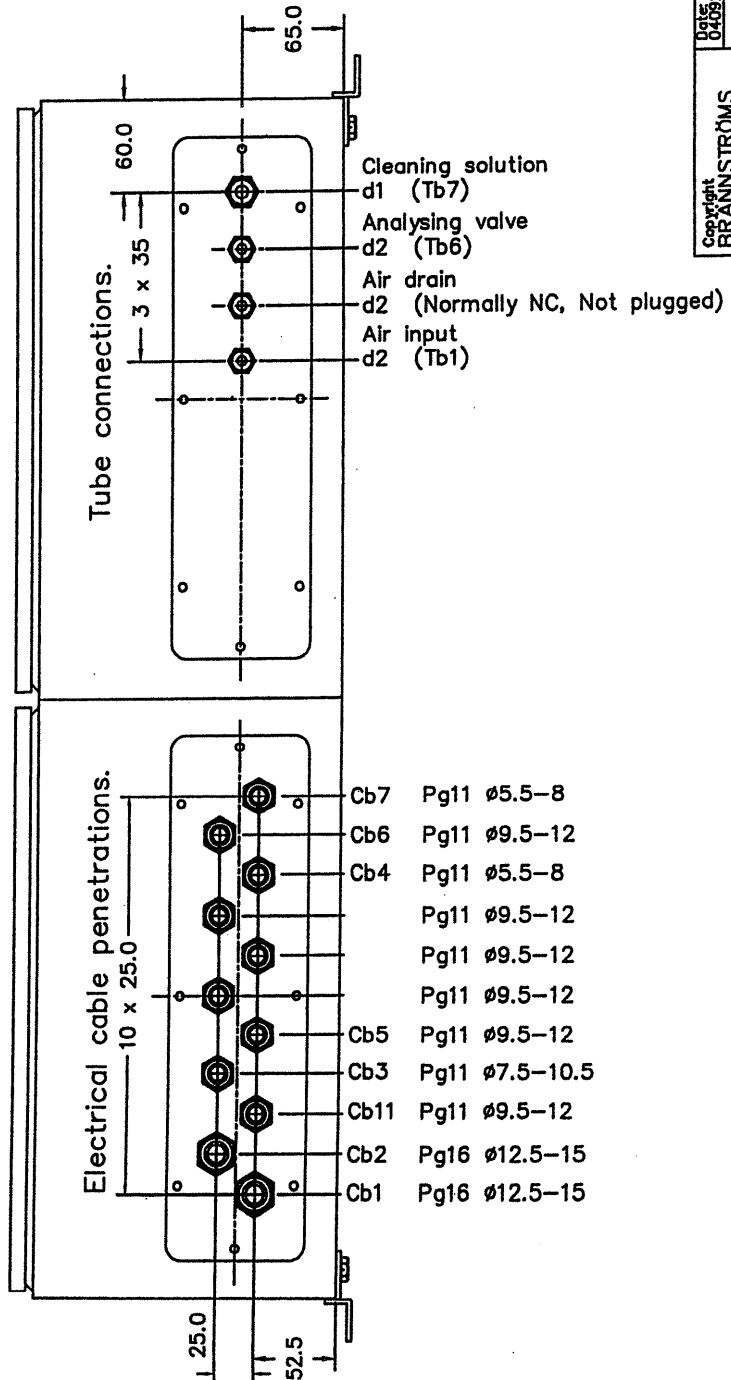
Copyright BRANNSTRÖMS ELEKTRONIK AB Uddevallevägen 14 416 70 GÖTTEMBERG Phone: (46) 31 195600 Fax: (46) 31 197790	Date: 040920 RB Sign: RB	CleanTrack 1000 Converting unit Front and side view.	FILE: CONVOA 900105.2 Page: (1) Project: ODM Ver: F1 Drawing no: CT900105.2
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Legend

Item	Qty	Name	type dimension	Material
d1	1	Counter connector for copper	tube o.d. $\varnothing 8.0 \times 1$	copper
d2	2	Counter connector for copper	tube o.d. $\varnothing 6.0 \times 1$	copper



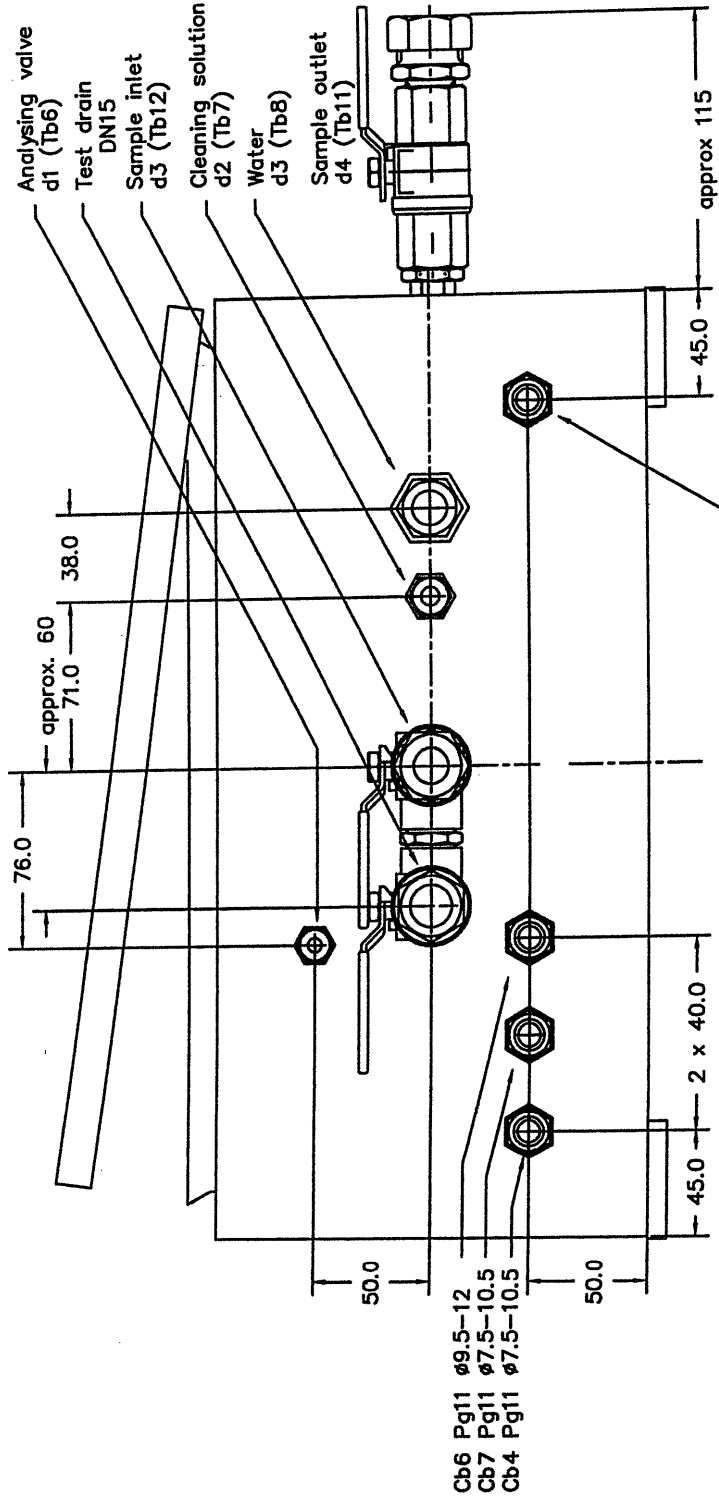
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			3 Converting unit	Page: 1(1)
			Bottom view	Project: ODM Ver: 1
				Drawing nr: C1900126.1

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**Legend**

Item	Qty	Name type dimension	Material
d1	1	Counter connector for copper tube o.d. $\phi 6 \times 1$	Copper
d2	1	Counter connector for copper tube o.d. $\phi 8 \times 1$	Copper
d3	2	Counter connector for copper tube o.d. $\phi 15 \times 1$	Copper
d4	1	Counter connector for copper tube o.d. $\phi 22 \times 1$	Copper

**Tube connections**



**Electrical cable penetrations.**

Cable penetration for earth bonding conductor.  
Refer to applying regulations concerning installation of intrinsically safe equipment.



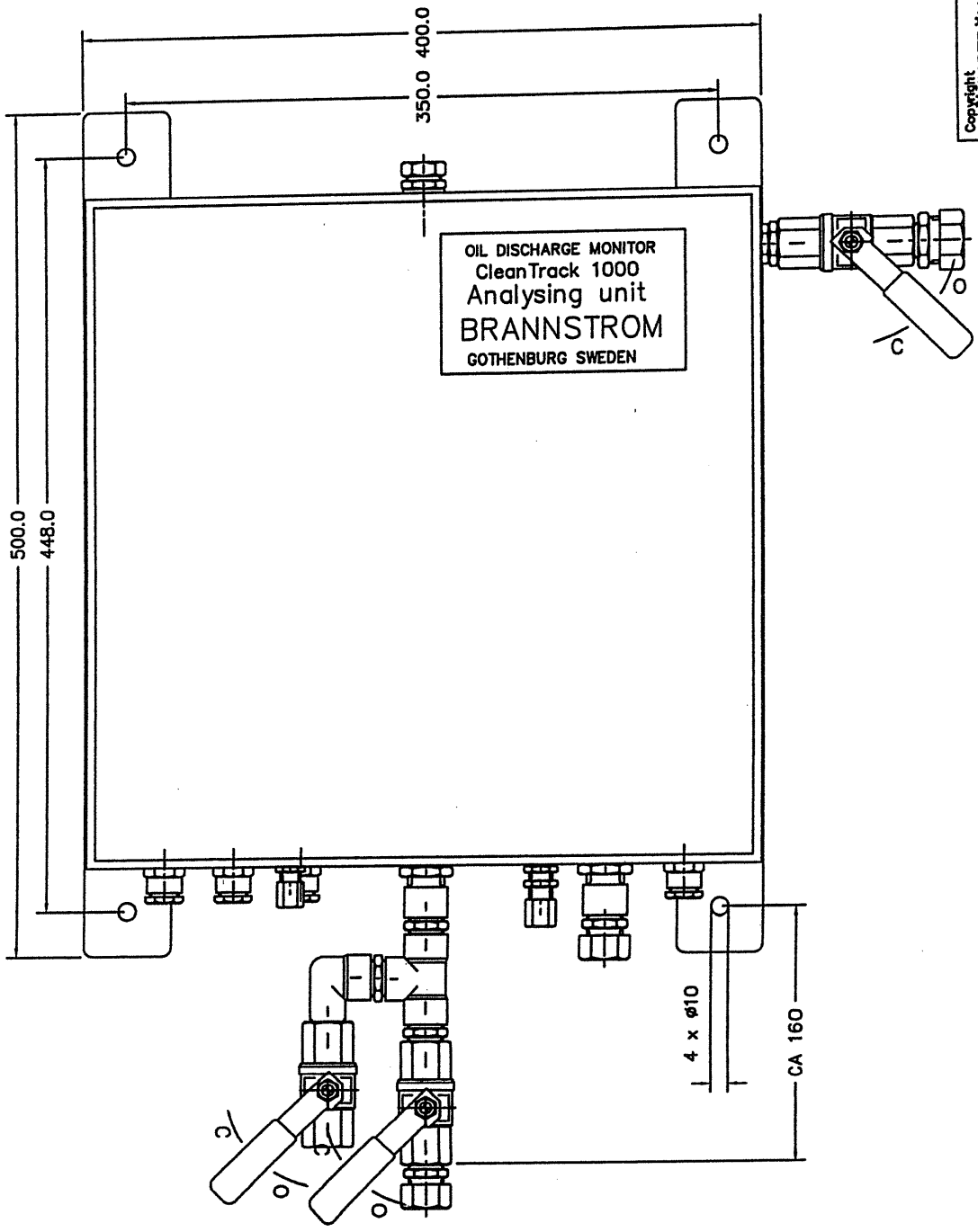
Copyright <b>BRÄNNSTRÖMS ELEKTRONIK AB</b> Uddevallevägen 14 416 70 GÖTEBORGS Phone: (46) 31 195600 Fax: (46) 31 197790	Date: 04/09/24 RB Sign:	CleanTrack 1000 Analysing unit Bottom view	File: ANALYUBO 891120.3 Pages: (1) Project: ODM Ver: H Drawing nr: CT891120.3
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Material enclosure: AISI 304L

UP

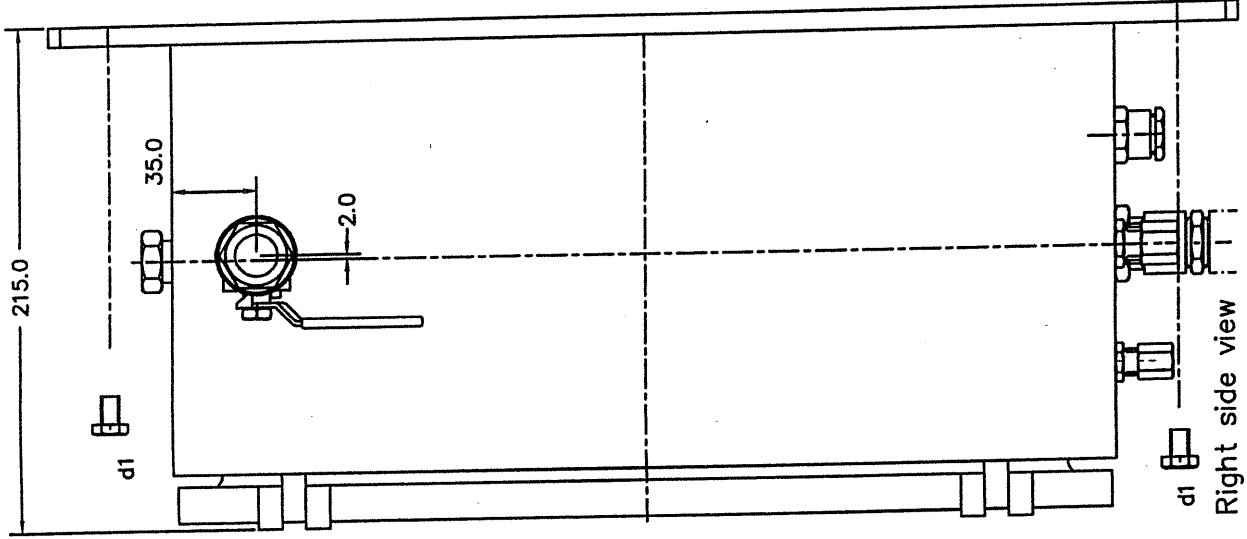
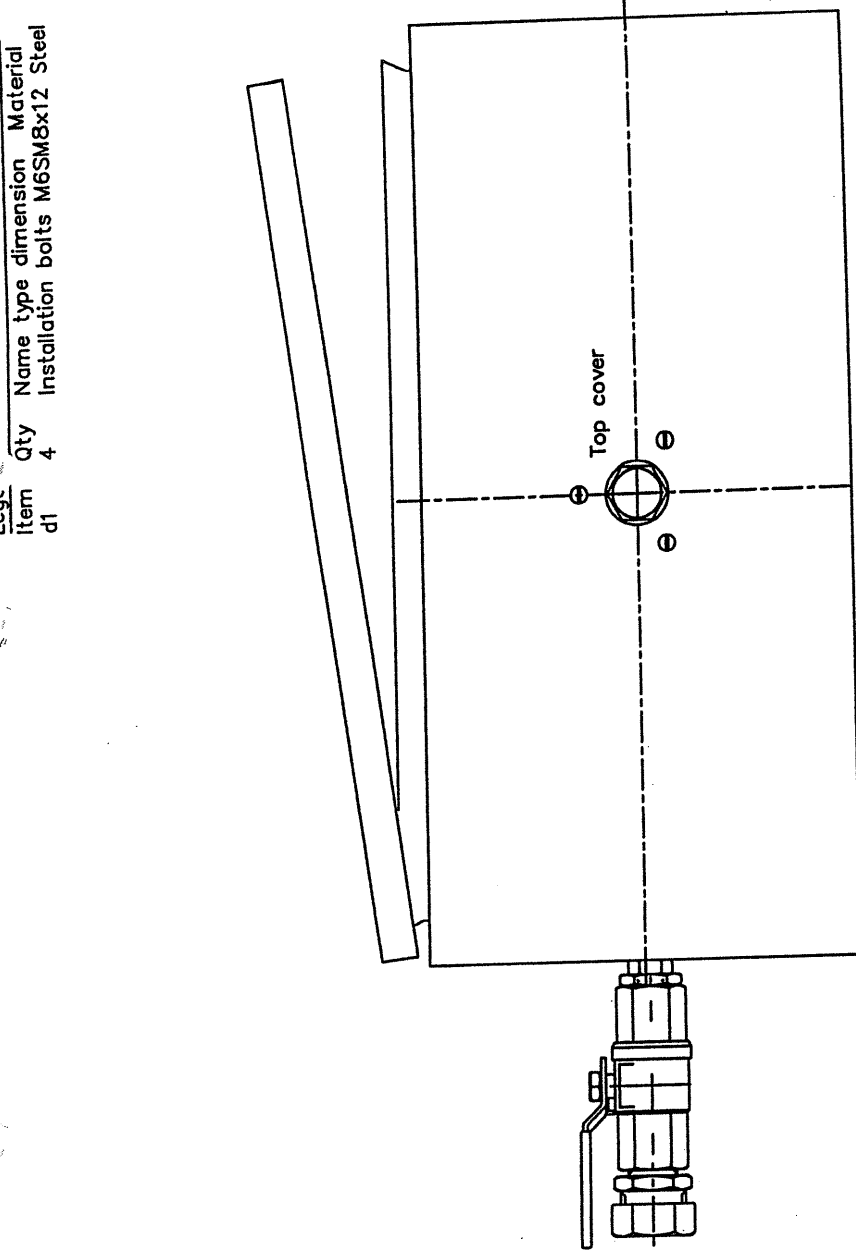


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File:	ANALYJB2 891120.5		
Pages:	1(1)		
Project:	ODM Ver:GJI		
Drawing nr:	CT891120.5		
CleanTrack 1000		Analysing unit	
Front view			

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Legs  
Qty Name type dimension Material  
4 Installation bolts M6SM8x12 Steel



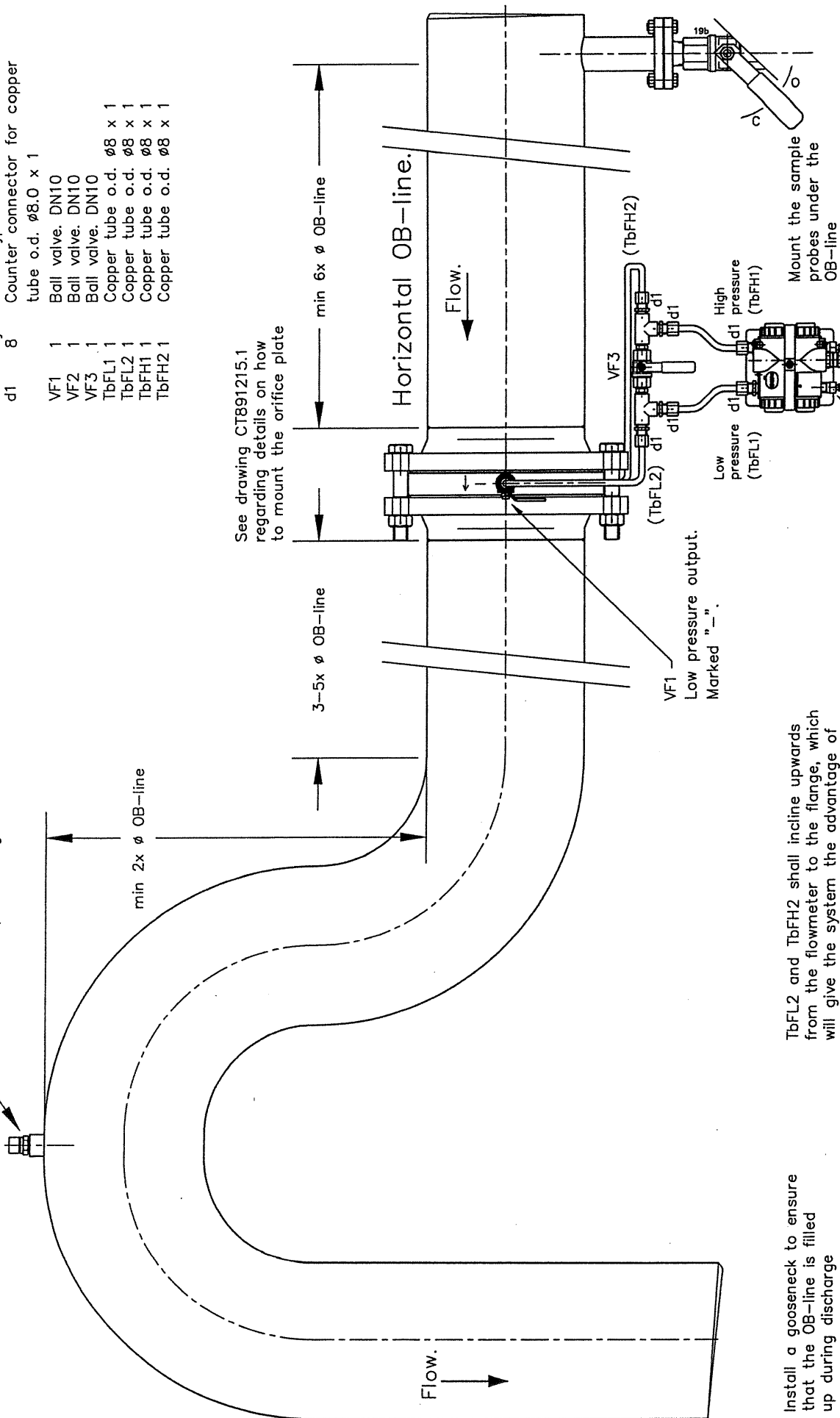
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Project	ODM Ver: GJ		
Drawing No.	C1881120.6		
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CleanTrack 1000  
10 Analysing unit  
Side and top view

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To avoid vacuum in the discharge line a vacuumbreaker should be mounted at the top of the gooseneck



Install a gooseneck to ensure that the OB-line is filled up during discharge

TbFL2 and TbFH2 shall incline upwards from the flowmeter to the flange, which will give the system the advantage of automatic air removal.  
Flowmeter mounting device is shown on drawing CT050505.1

**Legend**

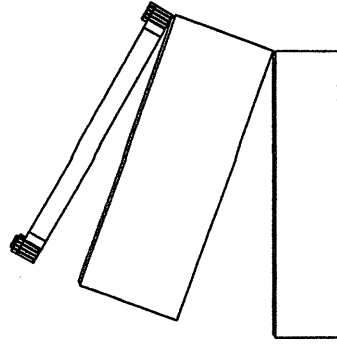
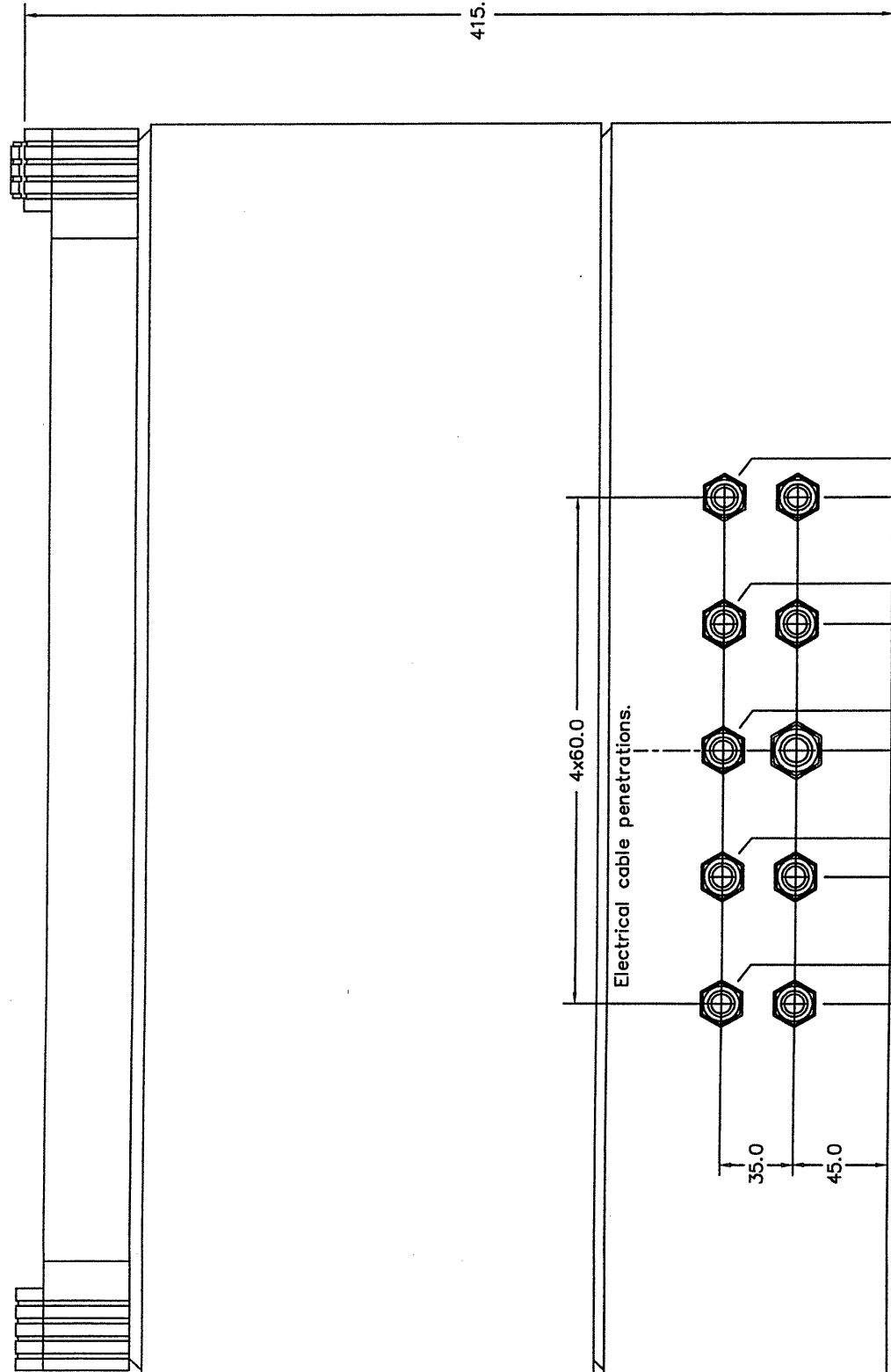
Item	Qty	Name	Type	dimension	Material
d1	8	Counter connector for copper tube	o.d.	ø8.0 x 1	copper
VF1	1	Ball valve	DN10		
VF2	1	Ball valve	DN10		
VF3	1	Ball valve	DN10		
TbFL1	1	Copper tube	o.d.	ø8 x 1	
TbFL2	1	Copper tube	o.d.	ø8 x 1	
TbFH1	1	Copper tube	o.d.	ø8 x 1	
TbFH2	1	Copper tube	o.d.	ø8 x 1	

See drawing CT891215.1 regarding details on how to mount the orifice plate

Drain valves

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Uddevallevägen 14	416 70 GÄDDERÖ	Sign:	990126 RB	CleanTrack	1000
Phone: (46) 31 197790	Fax: (46) 31 197790		050120 RB	Flowmeter unit	Horizontal OB-line
				Project:	ODM Ver: 1
				Drawing nr:	CT900503.1

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File:	COMPWP3
Page:	1(1)
Project:	ODM Ver: G
Drawing nr:	C1691214.2
Date:	041001.RB
Sign:	
CleanTrack 1000	
1 Computer unit	
with printer	
Bottom and top	
view	
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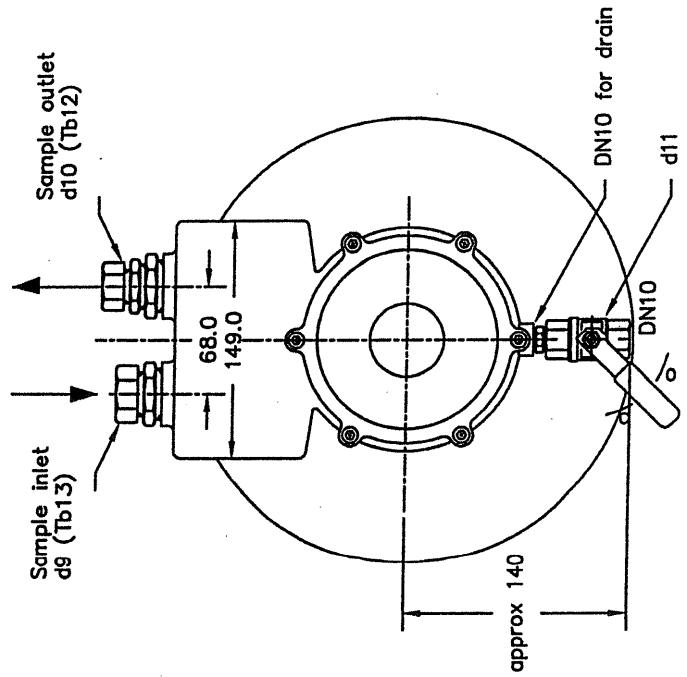
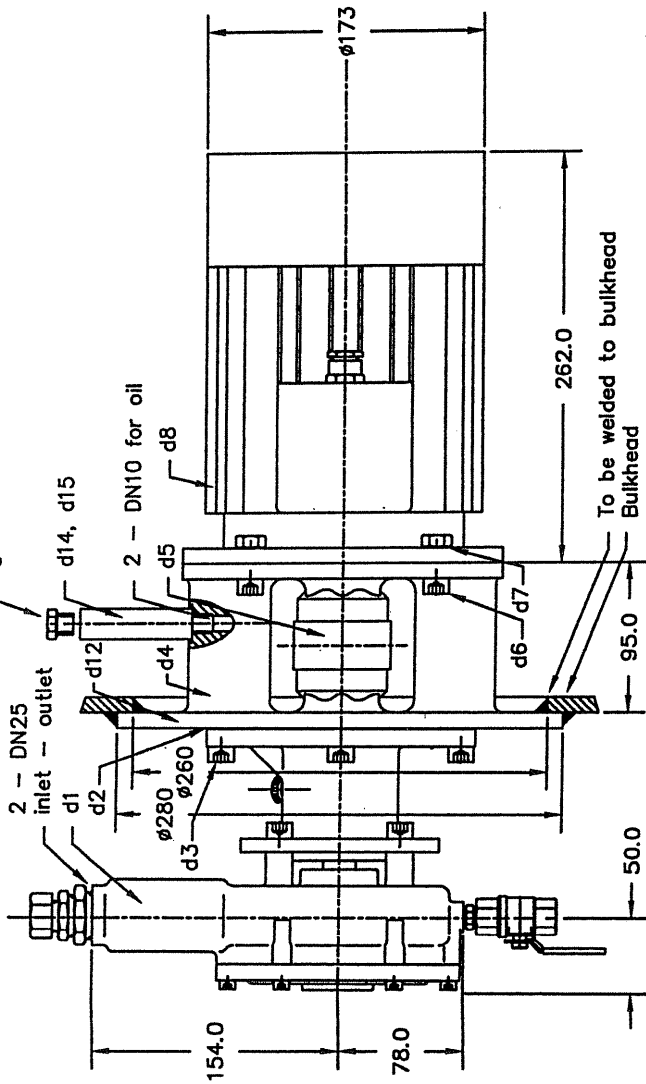
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GOVERNEMENTET

Legend

Item	Qty	Name	type dimension	Material
d1	1	Pump	PO6D	
d2	1	Seal	J.82BELLS 0.5mm	Steel
d3	4	Screw	M10x25mm	Steel
d4	1	Bracket	PO6D-EL2-1	1008/25
d5	1	Coupling	Bipex 62	Steel
d6	4	Screw	M10x30mm	Steel
d7	4	Nut	M10	Steel
d8	1	El. motor	2.2-2.6kW	440V 60Hz
d9	1	Counter connector	for copper tube o.d. $\phi 22 \times 1$	
d10	1	Counter connector	for copper tube o.d. $\phi 15 \times 1$	
d11	1	Drain ball-valve	DN10	
d12	1	Welding plate		
d13	2	Oil plug	DN10.	
d14	1	Oil level glass		
d15	1	O-ring	14.1x1.6 nitril rubber	



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Date: 04/004 RB  
Sign:  
CleanTrack 1000  
Sample pump unit  
Bulkhead mounted  
type

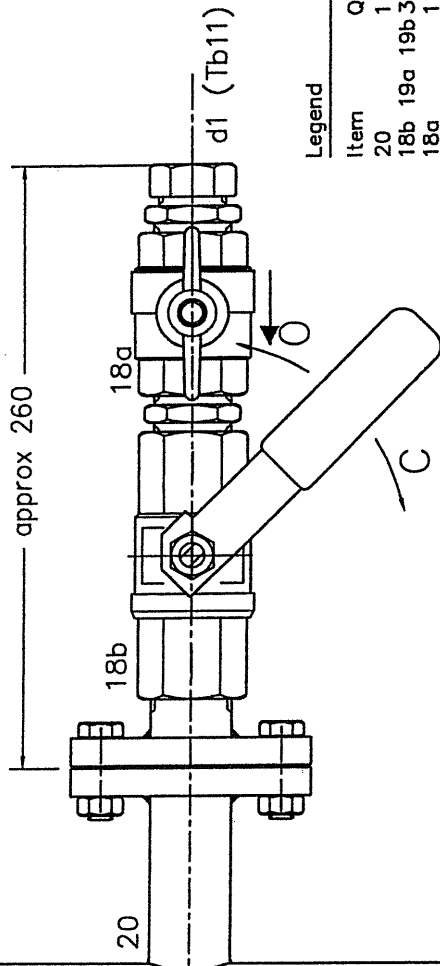
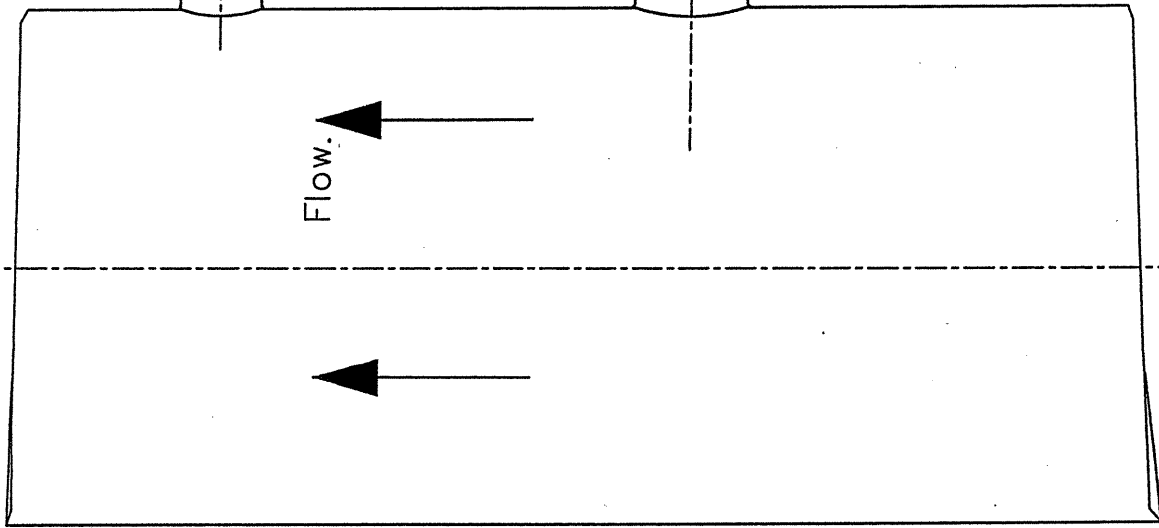
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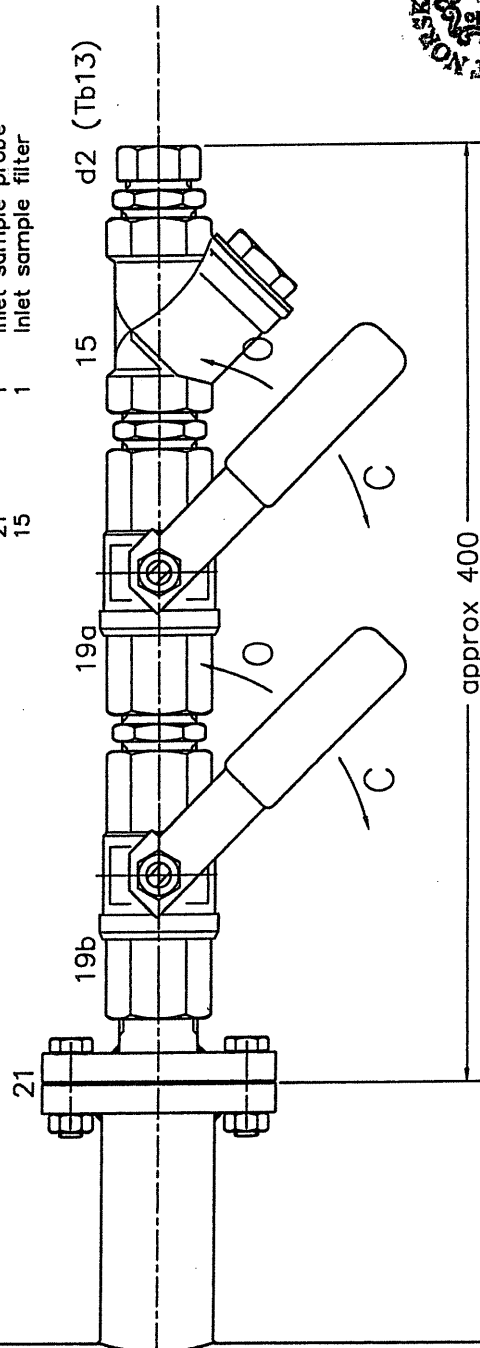


Vertical OB-line.

20 Sample outlet probe.

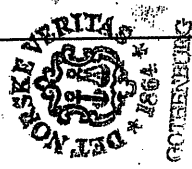


21 Sample inlet probe.



Legend

Item	Qty	Name	type	dimension	Material
20	1	Outlet	sample	probe	
18b	19b	3	Ball	valve DN25	
18a	1	Ball	check	valve DN25	
d1	d2	2	Counter	connector for copper	
21	1	tube	o.d. $\phi$ 22	x 1	
15	1	Inlet	sample	probe	
	1	Inlet	sample	filter	

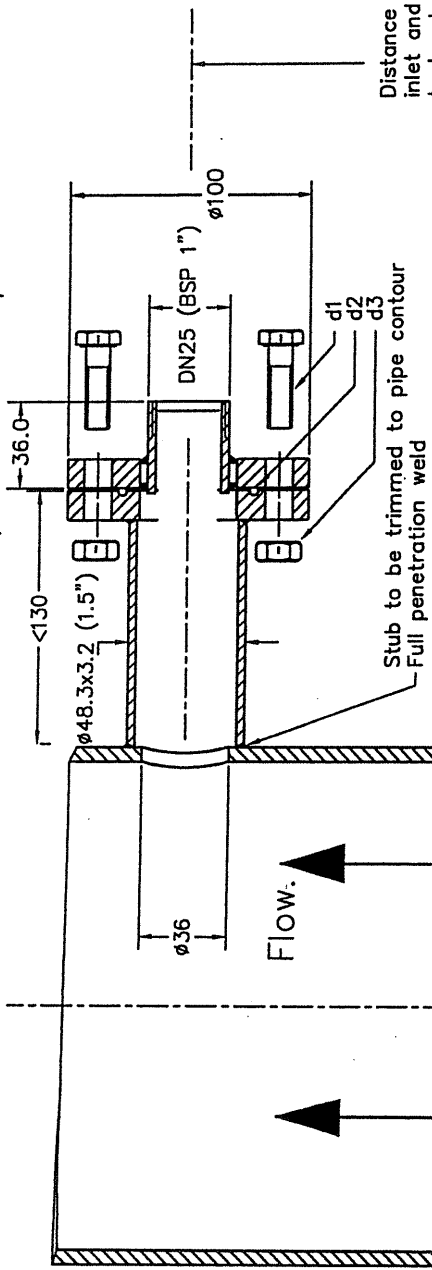


Date:	900105 RB	File:	PROBEB1 900105.4
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Copyright BRÄNNSTRÖMS ELEKTRONIK AB		CleanTrack 1000	
Uddevallevägen 14		Sample probes	
416 70 GÖTTENBERG		Valve arrangements	
Phone: (46) 31 197790		Project: ODM Ver: F1	
Fax: (46) 31 197790		Drawing nr: C1900105.4	

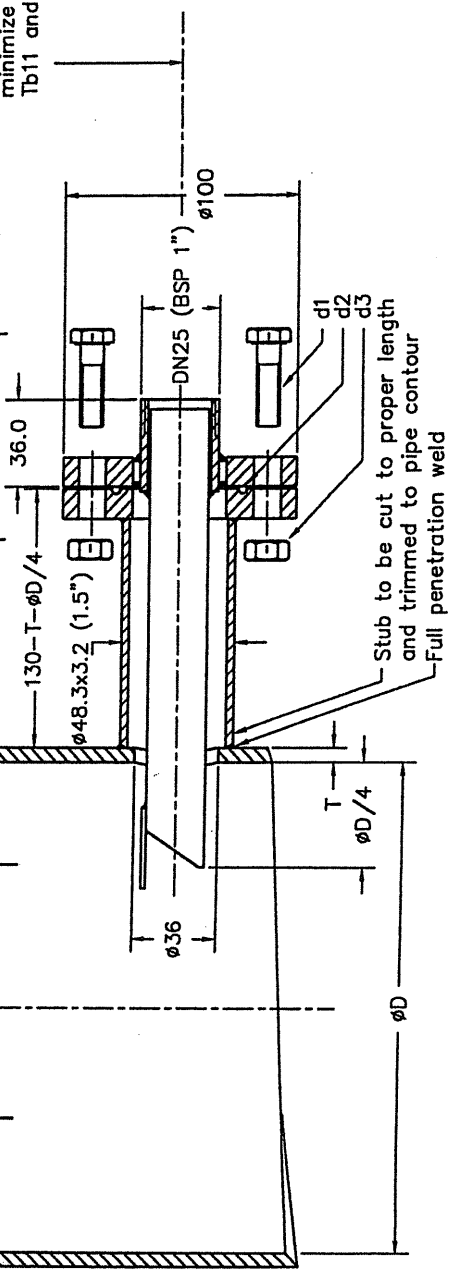
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### 20 Sample outlet probe.



### 21 Sample inlet probe.



Distance between inlet and outlet probes to be decided by installer, in order to minimize length of tubes Tb11 and Tb13.

Legend

Item	Qty	Name	Type	Dimension	Material
d1	8	Bolt	M6SM10x35		(Yard supply)
d2	2	O-ring	$\phi 50.39 \times 3.53$		(Yard supply)
d3	8	Nut	M6MM10		(Yard supply)

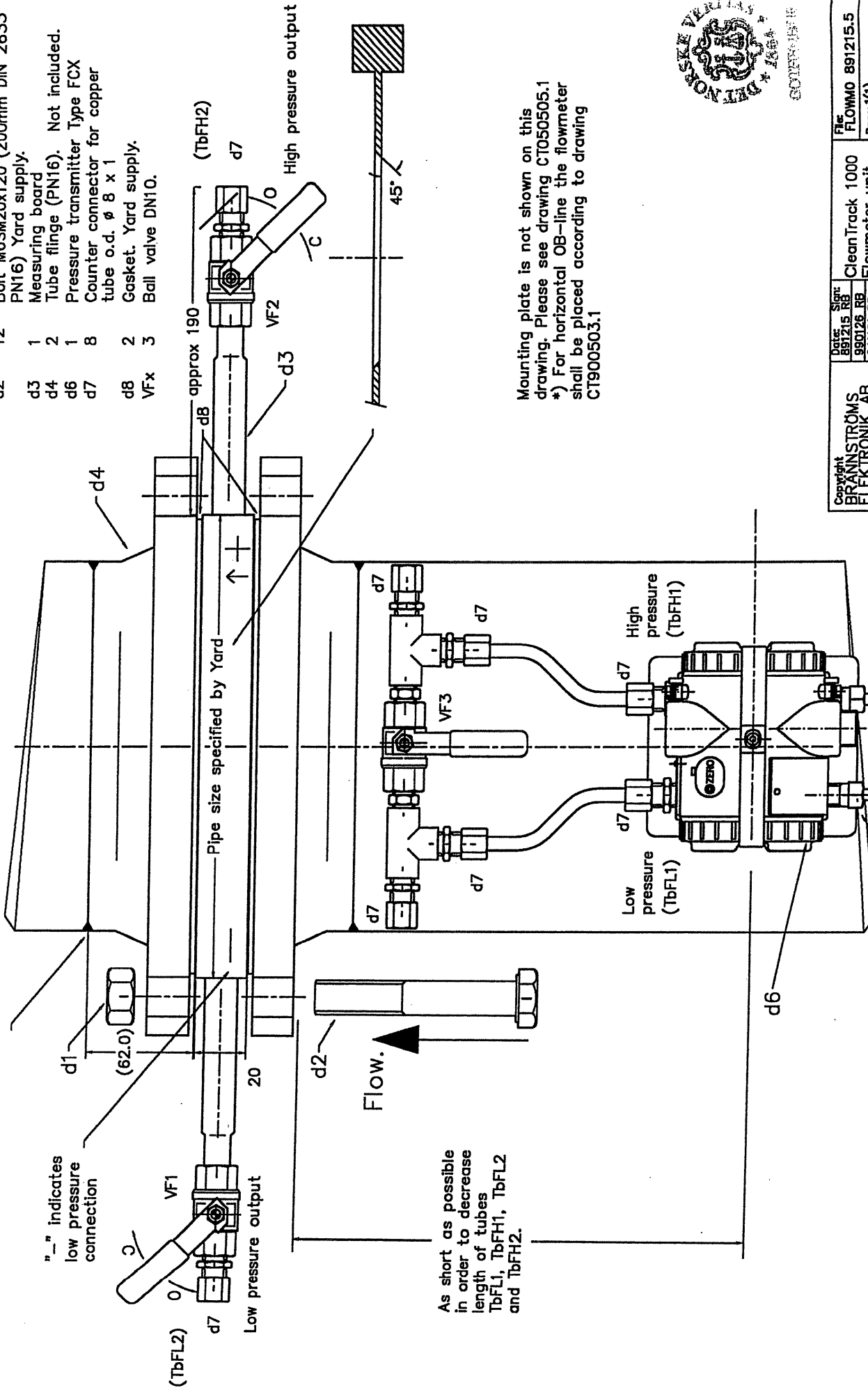
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Drawing nr:		Drawing nr:	CT1891216.1

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# Verdahl \*) OB-line

To be welded



Mounting plate is not shown on this drawing. Please see drawing CT050505.1  
 \*) For horizontal OB-line the flowmeter shall be placed according to drawing CT900503.1

## Legend

Item	Qty	Name	type dimension	Material
d1	12	Nut	M6MM20 (200mm DIN 2633 PN16)	
d2	12	Bolt	M6SM20x120 (200mm DIN 2633 PN16)	Yard supply.
d3	1	Measuring board		
d4	2	Tube flange	(PN16)	Not included.
d6	1	Pressure transmitter	Type FCX	
d7	8	Counter connector	for copper tube o.d. $\phi$ 8 x 1	
d8	2	Gasket	Yard supply.	
VFx	3	Ball valve	DN10.	



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Utdesignation	14	990126	RB	041101	RB	CleanTrack 1000	Page: 1(1)
Phone	(46) 7790 6560					Flowmeter unit	Project ODM Ver: K
Fax	(46) 7790 7790					Front view	Drawing nr CT991215.5

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Drain valves

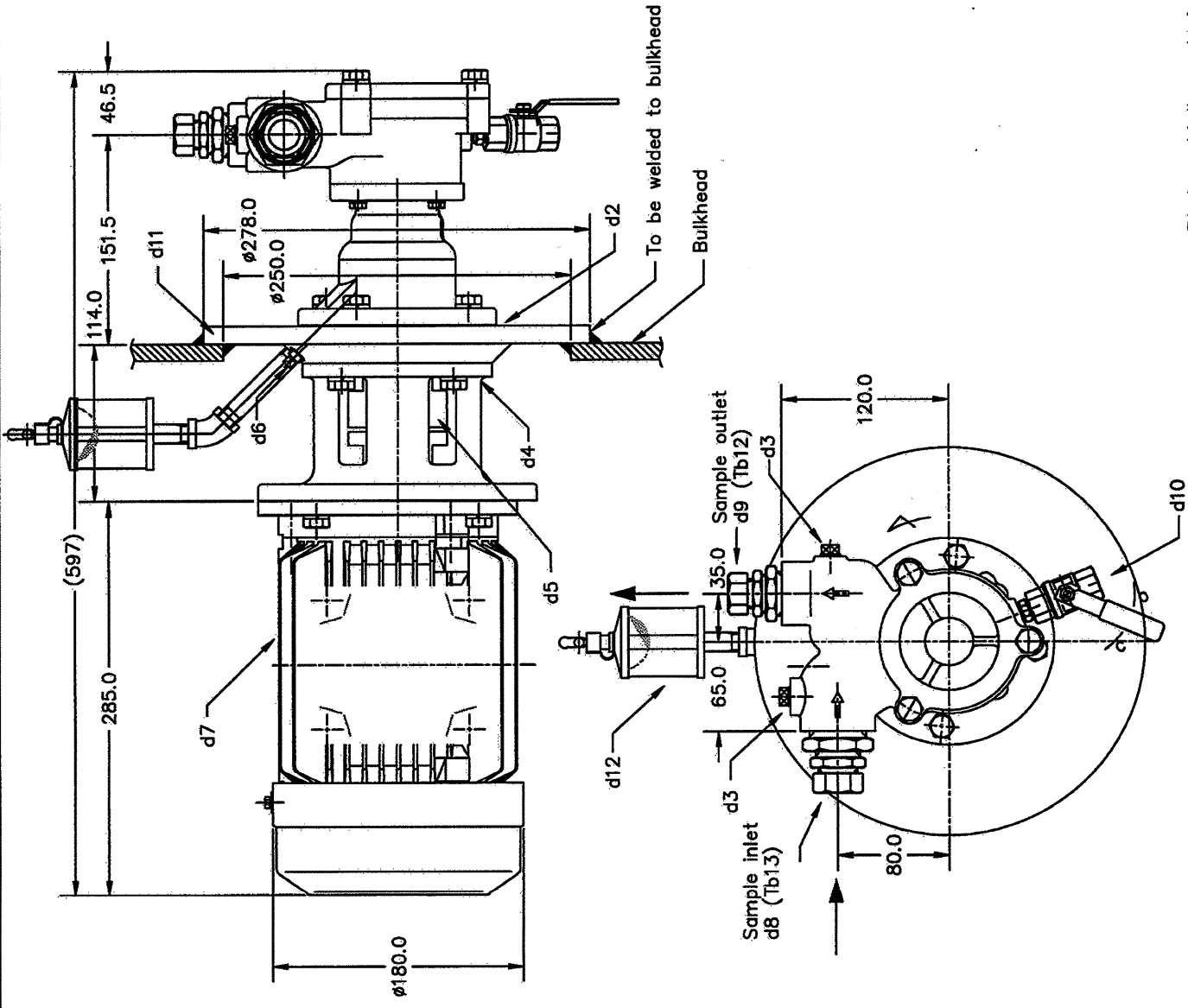


2006-04-21  
 AHA

Legend

Item	Qty	Name type dimension	Material
d1	1	Pump 32MED22	SCS14
d2	1	Gasket	NBR
d3	2	Plug 1/4B	FC200
d4	1	Bracket	FC200
d5	1	Coupling	FC200
d6	1	Oil plug 1/8B	2P 440V 60Hz
d7	1	El. motor 2.2-2.5kW	
		Frame: 90L	
		Totally enclosed fan cooling	
d8	1	Counter connector for copper tube o.d. $\phi 22 \times 1$	
d9	1	Counter connector for copper tube o.d. $\phi 15 \times 1$	
d10	1	Drain ball--valve DN10 (1/4B)	SS400
d11	1	Welding plate	
d12	1	Oiler 1/4B	

WEIGHT: 59kg

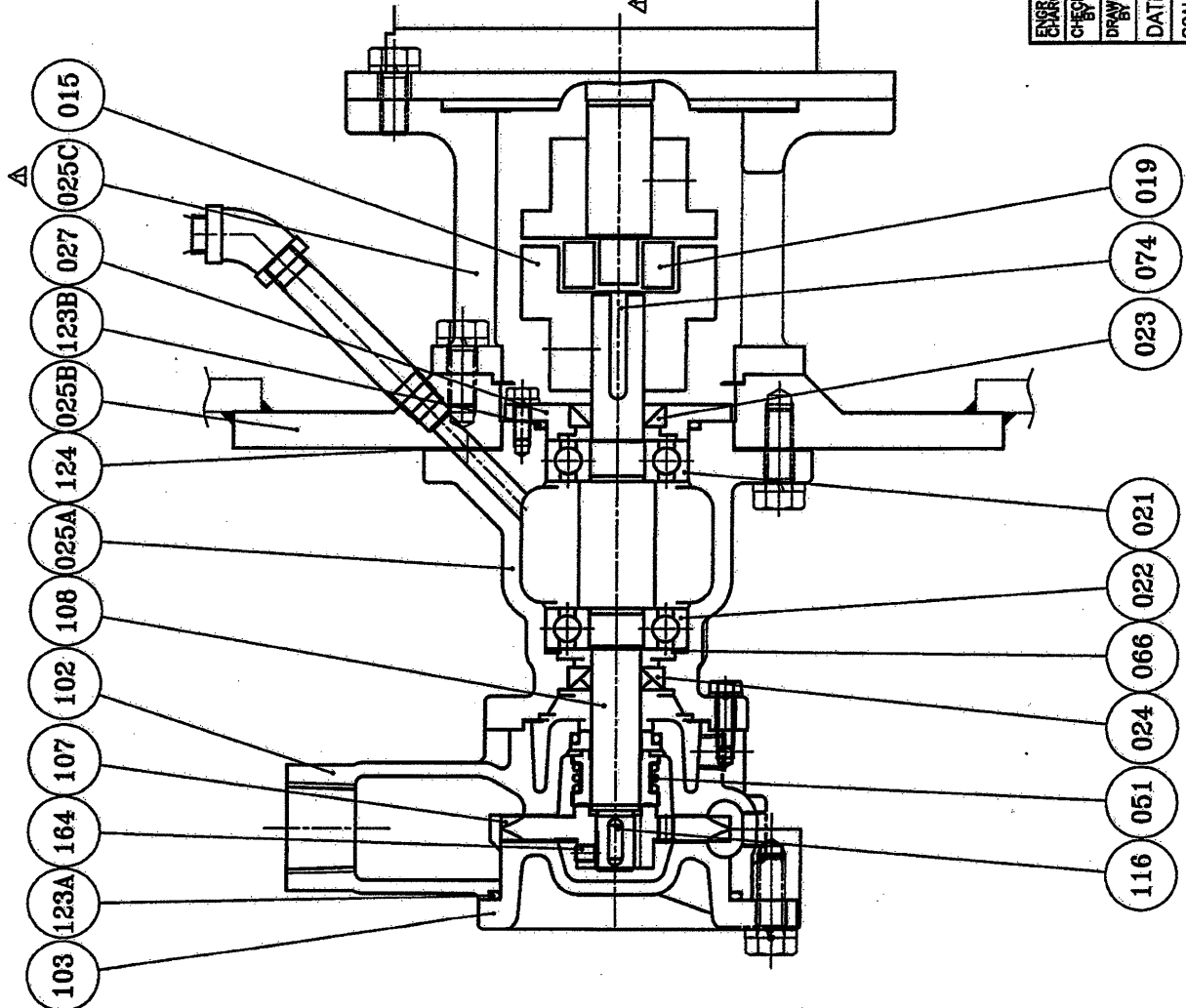


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Uddevallogatan 14	416 70 847TEBORG	060405 RB		Page: 1(1)
Phone: (46) 31 195500	Fax: (46) 31 197790			Project: ODM Ver: B
				Drawing nr: CT041029.1
				CleanTrack 1000
				Sample pump unit
				Bulkhead mounted
				type

NO.	DESCRIPTION	DATE	DRAWN
Δx2	025C added	06.3.7	A.ito
Δx			
Δx			

NO.	NAME OF PARTS	SET	MATERIAL	REMARKS
164	Set Screws	2	SUS316	
124	Gasket	1	NBR	
123B	O-ring	1	NBR	AN6230 #5
123A	O-ring	1	FKM	AN6230 #14
116	Key	1	SUS316	
108	Shaft	1	SUS316	
107	Impeller	1	SUS316	
103	Cover	1	SCS14	
102	Casing	1	SCS14	
074	Key	1	S45C	
066	Wave Washers	1	SK	
051	Mechanical Seal	1	SIC VS CARBON / FKM	φ18
027	Bearing Gland	1	FCD400	
025C	Bracket	1	FC200	
025B	Bracket	1	SS400	
025A	Bracket	1	FCD400	
024	Oil Seal	1	NBR	
023	Oil Seal	1	NBR	206-04-21
022	Ball Bearing	1	6304	
021	Ball Bearing	1	6304	
019	Coupling Rubber	1	NBR	
015	Coupling	1	FC200	



ENGR. IN CHARGE	K. Nagasawa
CHECKED	
DRAWING BY	A. Ito
DATE	2004.10.19
SCALE	free

SECTIONAL VIEW

PAGE	1
LAST PAGES	1

TYPE 32MED22

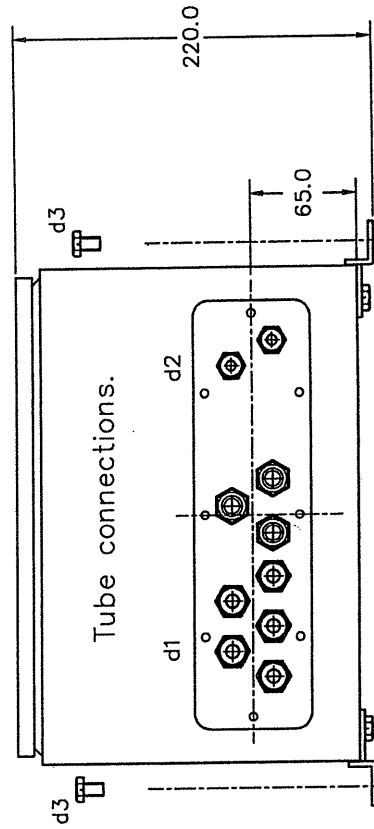
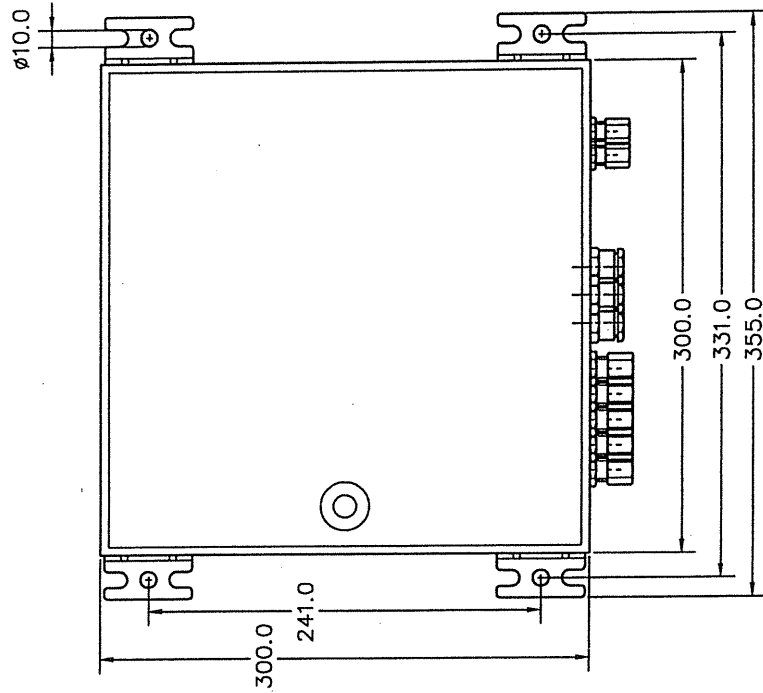
DRAWING NO. CS-32MED001

**NIKUNI** NIKUNI CO., LTD.

Legend

Item	Qty	Name	type dimension	Material
d1	5	Counter connector for copper tube o.d. $\varnothing 8.0 \times 1$		
d2	1-2	Counter connector for copper tube o.d. $\varnothing 6.0 \times 1$		
d3	4	Installation bolt M6SM8x12		

d1



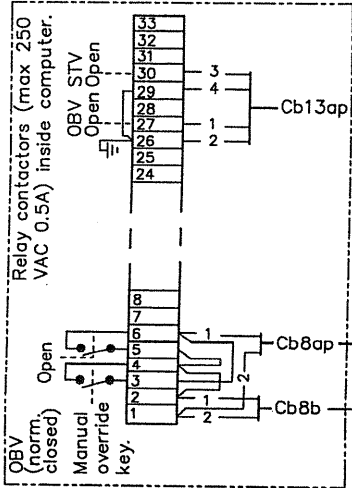
$\varnothing 6$ , STV feedback option  
 $\varnothing 6$ , OBV feedback

$\varnothing 8$ - $\varnothing 12$ , Extra  
 $\varnothing 8$ - $\varnothing 12$ , Cb13ap  
 $\varnothing 8$ - $\varnothing 12$ , Cb8ap  
 $\varnothing 8$ , STV CLOSE  
 $\varnothing 8$ , STV OPEN  
 $\varnothing 8$ , OBV OPEN  
 $\varnothing 8$ , OBV CLOSE  
 $\varnothing 8$ , AIR SUPPLY  
 6-8 BAR  
 DRY AND CLEAN AIR

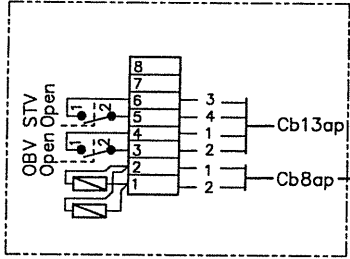
Copyright <b>BRÄNNSTRÖMS ELEKTRONIK AB</b> Uddevallevägen 14 416 70 GÖTEBORG Phone: (46) 395600 Fax: (46) 37790	Doc. No. 050426	Rev. RB	CleanTrack 1000	File: VENTILSTYR1
			Pneumatic/electric valve control interface	Page: 1(1)
			Box dimensions	Project: ODM Ver: A
				Drawing nr: C1050426.1

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 BRÄNNSTRÖMS ELEKTRONIK AB  
 protected in accordance with prevallin.

### 1 Computer unit



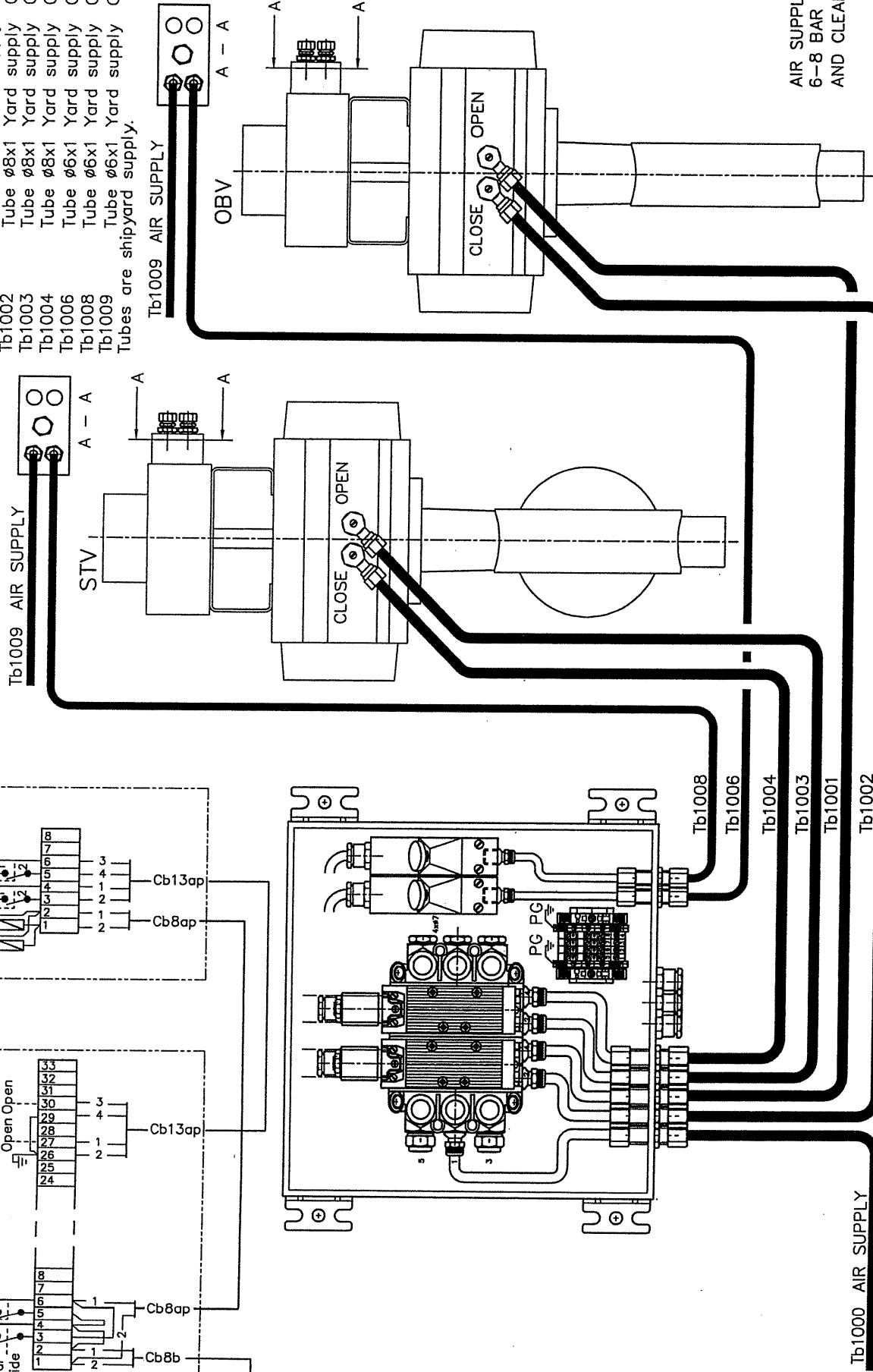
### Valve control box



Legend

Item	Qty	Name	type	dimension	Material
Tb1000		Tube	ø8x1	Yard supply	Cu
Tb1001		Tube	ø8x1	Yard supply	Cu
Tb1002		Tube	ø8x1	Yard supply	Cu
Tb1003		Tube	ø8x1	Yard supply	Cu
Tb1004		Tube	ø8x1	Yard supply	Cu
Tb1006		Tube	ø6x1	Yard supply	Cu
Tb1008		Tube	ø6x1	Yard supply	Cu
Tb1009		Tube	ø6x1	Yard supply	Cu

Tubes are shipyard supply.

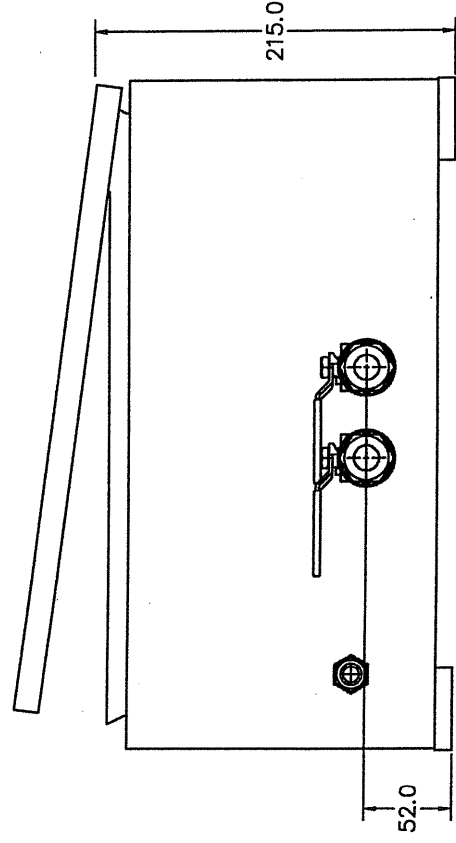
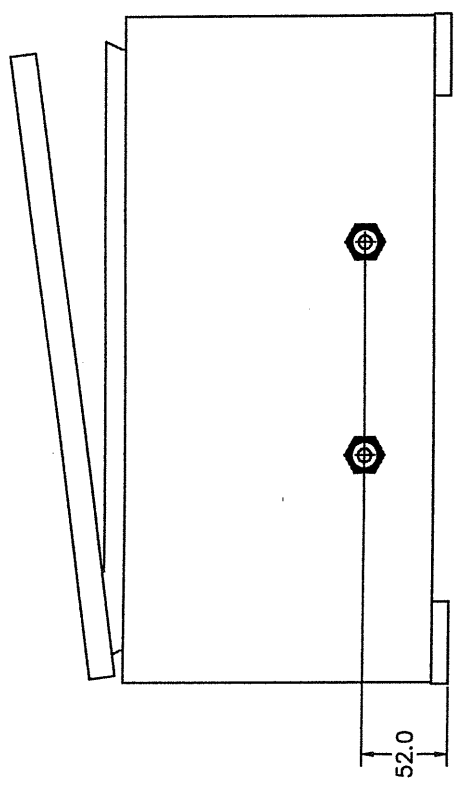
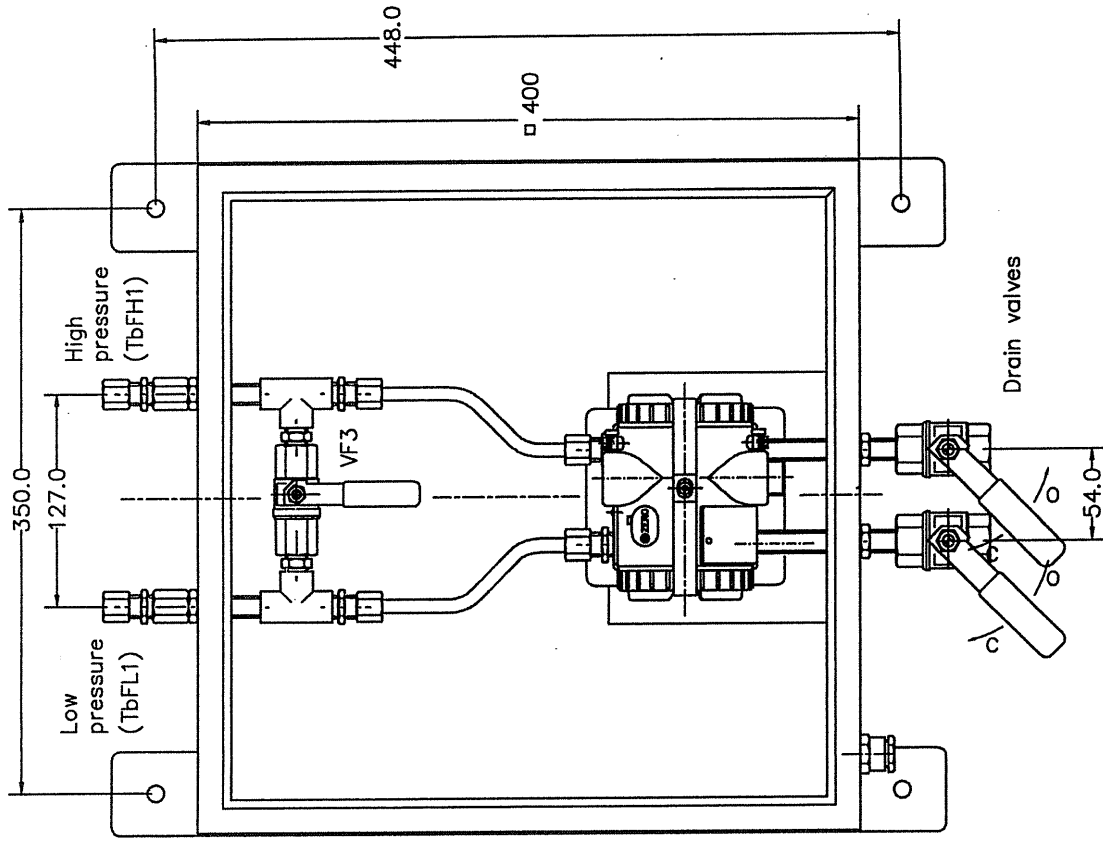


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Copyright  
BRÄNNSTRÖMS  
ELEKTRONIK AB  
Hälsövägsgatan 14  
418 70 GÖTEBORG  
Phone: (46) 31 7790  
Fax: (46) 31 7790

Doc. No. Sign. 050426 RD  
CleanTrack 1000  
Pneumatic/electric  
valve control  
arrangement.  
Connections

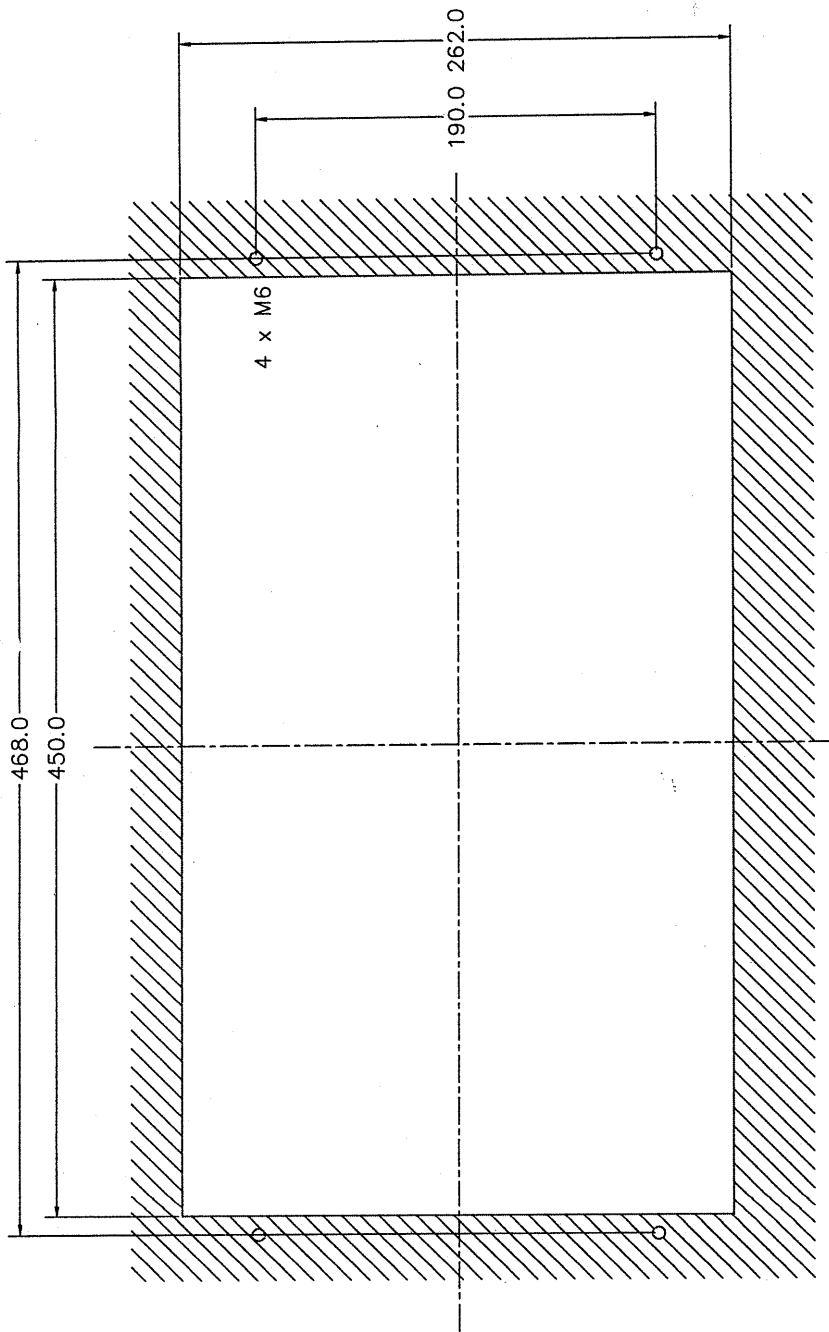
File: VENTILSTYR1  
Page: 1(1)  
Project: ODM Ver: A  
Drawing no. CT050426.2



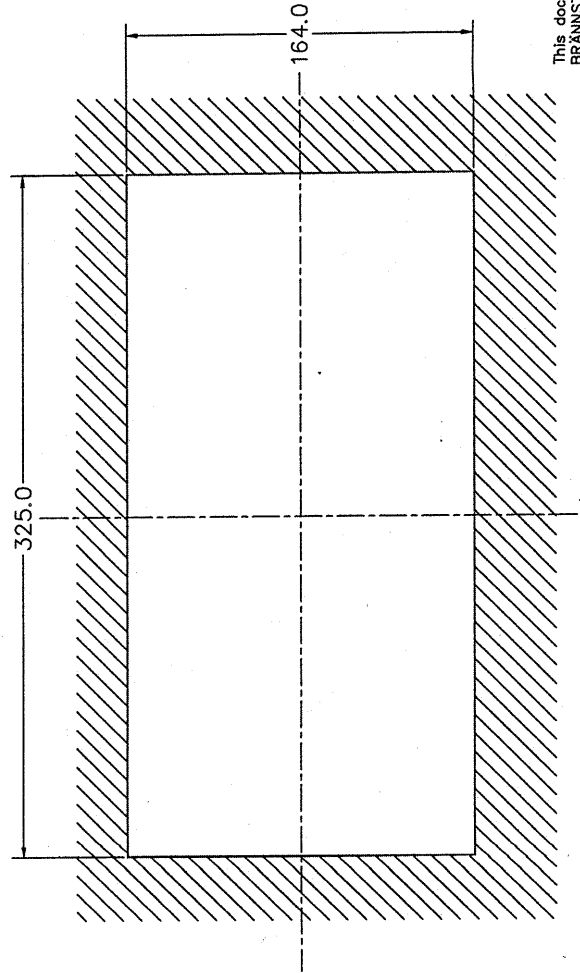
Copyright <b>BRÄNNSTRÖMS ELEKTRONIK AB</b> Uddevallegatan, 14 416 70 GÖTEBORGS Phone: (+46) 31 495600 Fax: (+46) 31 197790	Date: 051010 Sign: RB	CleanTrack 1000 Flowmeter in enclosure	File: flowib Page: 1(1) Project: ODM Ver: A Drawing nr: CT051010.1
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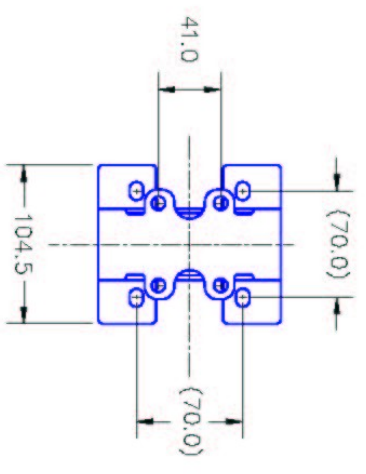
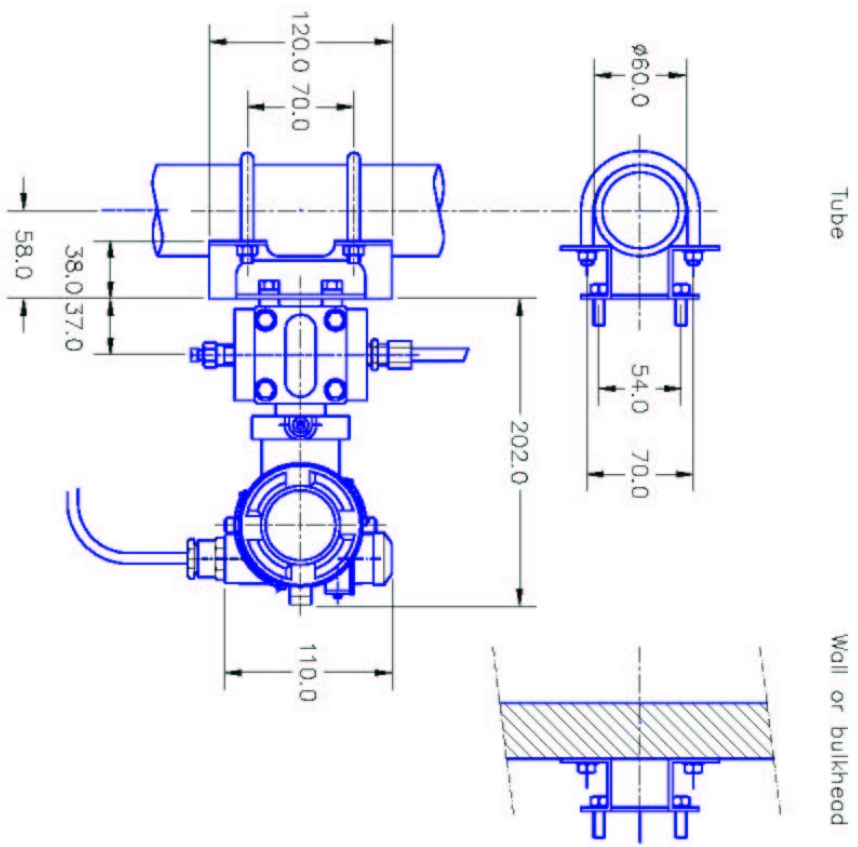
Panel cut out hole for paper printer panel mounted version of Cleantrack 900 and Cleantrack 1000 computer unit.



Panel cut out hole for LCD printer version of Cleantrack 1000 computer unit.

Copyright <b>BRÄNNSTRÖMS ELEKTRONIK AB</b> Uddevallevägen 14 416 70 GÖTEBORG Phone: (46) 31 195600 Fax: (46) 31 197790		Date: 04/1001 RB Sign: 060518 RB	File: COMPP6
			CleanTrack 1000
			1 Computer unit
			panel cut outs.
			Project: ODM Ver: D
			Drawing nr: CT900903.1

This document is the property of  
BRÄNNSTRÖMS ELEKTRONIK AB  
protected in accordance with prevailing law.



Material: 3mm 316L stainless

This document is the property of  
BRÄNNSTRÖMS ELEKTRONIK AB  
protected in accordance with prevailing law.

Copyright: BRÄNNSTRÖMS ELEKTRONIK AB Liljedalensplan 14 416 20 Göteborg Phone: (46) 31 195600 Fax: (46) 31 197700	Date: 05/05/05	Sign: RB	Project: CleanTrack
			Page 1 (1)
			RPR: ODM
			Ver: A
			Drawing nr: C1050505.1

Bracket for  
flow transmitter

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **7.4 Specification CLEANTRACK 1000 Equipment**

The CLEANTRACK 1000 ODM is specified by the following documents:

CT871203.10A	Oil Content Meter Computing Unit
CT871204.10A	Oil Content Meter Analysing /Converting Unit
CT880120.10A	Oil Content Meter Sample Feed Pump

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **Appendix 8 Certificates of type test and Approvals**

This Appendix contains the relevant Certificate of Type Tests and other essential approvals.



DET NORSKE VERITAS

EC TYPE-EXAMINATION CERTIFICATE

Application of: Council Directive 96/98/EC of 20 December 1996 on Marine Equipment as amended by directive 2002/75/EC, issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Directorate. This certificate is issued by Det Norske Veritas under the authority of the Government of the Kingdom of Norway.

CERTIFICATE NO. MED-B-3051

This Certificate consists of 4 pages

*This is to certify that the product*  
**Oil discharge monitoring and control system for an oil tanker**

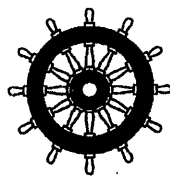
*with the type designation*  
**Oil Discharge and Control System (ODME),  
Type "CleanTrack 1000"**

*Manufactured by*  
**Brännströms Elektronik AB**  
Göteborg, Sweden

*is found to comply with the requirements in the following Regulations/Standards:*  
Annex A.1, Section 2, item No. A.1/ 2.5 and Annex B, Module B in the Directive.  
MARPOL 73/78, as amended, Annex I, Regulation 15(3), IMO Resolution MEPC.108(49).

*Further details of the product and conditions for certification are given overleaf.*

*Place and date*  
Høvik, 2005-04-08  
for DET NORSKE VERITAS AS



*This Certificate is valid until*  
2010-05-08

Notified Body No. 0575



Tom Bjørn Hansen  
Principal Surveyor

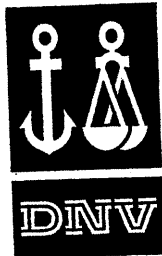
for Tore Morten Wetterhus  
Manager, MTPNO370  
Department Systems & Components

DNV local office:  
DNV Gothenburg



*Notice: The certificate is subject to terms and conditions overleaf. Any significant changes in design or construction of the product, or amendments to the Directive or Standards referenced above may render this certificate invalid. The product liability rests with the manufacturer or his representative in accordance with Council Directive 96/98/EC, as amended.*  
*The Mark of Conformity may only be affixed to the product and a Declaration of Conformity may only be issued when the production/product assessment module referred to in the council directive, is fully complied with.*

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Cert. No.: MED-B-3051  
Case No.: EC-MP-38  
File No.: A.1/2.5

## Product description

*The CleanTrack 1000 is intended for installation onboard oil tankers for ballast water monitoring/ alarm - max. 15ppm at discharge overboard (ODME).*

The oil content meter is tested and approved for crude oils, "black" and "white" products, oil-like substances of category C & D in MARPOL Annex II Reg. 14 as listed in this certificate. The system consists of an analyser unit and a sample pump installed in pump room (hazardous area), a converting unit in engine room, and a computer unit intended for installation in cargo control room.

## Applications/Limitations

Arrangement drawing and certificate for intrinsically safe equipment (equivalent to EEx ia IIC T4) is to be submitted for each installation. Inspection of intrinsically safety is to be carried out upon installation on board.

The oil content meter is tested and approved for crude oils, "black" and "white" products as per IMO Resolution MEPC.108(49), and oil-like substances of category C & D in MARPOL Annex II Reg. 14 as listed below;

- |               |                       |             |
|---------------|-----------------------|-------------|
| - cyclohexane | - metylcyclohexane    | - dipentane |
| - xylene      | - etylcyclohexane     |             |
| - toluene     | - tetrahydronaftalene |             |
| - octane      | - p-cymene            |             |
| - hexane      | - ethylbenzene        |             |
| - pentane     | - cyclopentane        |             |
| - heptane     | - dodecane            |             |
| - hexene      | - nonane              |             |

## Type Examination documentation

Drw. No.	Date/ Rev.	Title;
CT891213.1	041004/L	CLEANTRACK 1000, General assembly and arrangement
CT891120.9	041102/ Q	Cable diagram
CT891120.7	041004/ H1	Computer unit w/ printer – Front view
CT891120.8	041001/ G	Computer unit w/ printer – View from behind
CT941215.8	041001/ G	Computer unit w/ printer – Side view
CT991215.9	041001/ F	Computer unit w/ printer – Front Part, inside view
CT991216.1	041001/ G	Computer unit w/ printer – Rear Part, inside view
CT910805.1	041001/ E	Computer unit w/ printer – Internal cable diagram





Cert. No.: MED-B-3051  
Case No.: EC-MP-38  
File No.: A.1/2.5

CT041001	050228/B	Computer unit – Wall mounted
CT041002	050228/B	Computer unit – 19" frame
CT041003	050225/B	Computer unit – Panel mounted
CT041004	050228/B	Computer unit – Frontpanel
CT041005	050228/B	Computer unit – Inside (cpu-pcb)
CT920227.2	040920/ J	Converting unit – Internal cable diagram
CT920227.3	040920/ M	Converting unit – 3 phase, el. enclosure
CT900209.1	040920/ H	Converting unit – Valve enclosure
CT900105.2	040920/ F1	Converting unit - Front and side view
CT900126.1	040920/ I	Converting unit - Bottom view
CT891120.3	040924/ H	Analysing unit – Bottom view
CT891120.5	040920/ GJ1	Analysing unit – Front view
CT891120.6	040924/ GJ	Analysing unit – Side and top view
CT891120.4	040906/ K	Analysing unit – Internal arrangement
CT891211.1	041004/ H	Sample pump unit – Bulkhead mounted type
CT041029.1	041029/ A	Sample pump unit – Bulkhead mounted type
CT900105.4	041101/ F1	Sample probes – Valve arrangements
CT891216.1	041101/ J	Sample probes – Installation arrangements
CT891215.5	041101/ K	Flowmeter – Front view
CS-32MED001	04.10.19/ 0	Sample pump unit – Sectional view

### Tests carried out

#### Test Reports:

- Tested in accordance with the requirements of the specification contained in Part 1 of the Annex to the Guidelines and Specification contained in IMO Resolution MEPC.108(49), and witnessed by DNV Malmø, *October 2004*.  
Testing with additional oil-like substances of category C & D, verified by DNV Gothenburg, February 2005.
- DNV Technical Report No.2005-3043, dated 2005-02-11, Environmental testing of Oil Discharge Monitor CleanTrack 1000 Computer Unit.
- DNV Technical Report No.2004-3494, dated 2004-11-03, Environmental testing of the computer unit of the CleanTrack 1000 system.
- SP, Sveriges Provnings- og Forskningsinstitut, Test Report ref. P403621:A, dated 2004-11-04, Environmental test of converting unit.
- SP, Sveriges Provnings- og Forskningsinstitut, Test Report ref. P403621:B, dated 2004-11-04; Environmental test of Analysing unit.






Cert. No.: MED-B-3051  
Case No.: EC-MP-38  
File No.: A.1/2.5

### Marking of product

For traceability to this EC Type-Examination, each unit to be marked with;

- Manufacturer's name and trade mark
- Type designation
- Serial No.
- Mark of Conformity

### Mark of conformity

The manufacturer is allowed to affix the Mark of Conformity  according to Article 11 in the Council Directive 96/98/EC on Marine Equipment and issue a Declaration of Conformity, only when the module D or E or F of Annex B in the same directive is fully complied with.

Module D: The quality system for production and testing shall be approved by the Notified Body.

Module E: The quality system for inspection and testing shall be approved by the Notified Body.

Module F: Compliance of the products to type as described in this EC Type-Examination Certificate must be verified by the Notified Body who also shall issue a Certificate of Conformity.

*This certificate replaces previous EC Type-examination Certificate No. MED-B-2711.*

END OF CERTIFICATE







# TYPENPRÜFUNGSZEUGNIS für Ölgehaltsmessgeräte

zur Überwachung des Einleitens von mit Öl verunreinigtem  
Wasser aus dem Ladetankbereich von Öltankschiffen  
*Certificate of Type Approval for Oil Content Meters  
intended for monitoring the discharge of oil contaminated  
water from the cargo tank areas of oil tankers*

Ausgestellt im Namen der Regierung der  
**BUNDESREPUBLIK DEUTSCHLAND**  
durch die **SEE-BERUFGENOSSENSCHAFT**  
*Issued under the authority  
of the Government of the FEDERAL REPUBLIC OF GERMANY  
by See-Berufsgenossenschaft*

Hiermit wird bescheinigt, daß das Ölgehaltsmessgerät, das die nachstehend aufgeführten Anlageteile umfasst, einer Prüfung unterzogen und gemäß den Anforderungen der technischen Beschreibung, enthalten in Teil 1 der Anlage zu den Richtlinien und der technischen Beschreibung der IMO-Entscheidung MEPC.108(49), erprobt wurde.  
*This is to certify that the oil content meter, comprising the equipment listed below, has been examined and tested in accordance with the requirements of the specifications contained in part 1 of the annex to the Guidelines and Specifications contained in IMO resolution MEPC.108(49).*

Dieses Zeugnis ist nur für nachstehendes Ölgehaltsmessgerät gültig.  
*This certificate is valid only for an oil content meter referred to below.*

Anlage geliefert durch: Brännströms Elektronik AB, Uddevallagatan 14, 41670 Gothenburg, Sweden  
*Oil content meter supplied by:*

Typbezeichnung: CLEANTRACK 1000  
*under type and model designation and incorporating:*

Die Analyse-Einheit des Ölgehaltsmessgerätes Brännströms Elektronik AB  
wurde hergestellt durch:  
*Oil content meter analysing unit manufactured by:*

Zusammenstellungszeichnung Nr.: CT871204.10B Datum: 01.10.2004  
*to specification/assembly drawing No.: date:*

Der elektronische Teil des Ölgehaltsmessgerätes Brännströms Elektronik AB,  
wurde hergestellt durch:  
*Electronic section of oil content meter manufactured by:*

Zusammenstellungszeichnung Nr.: CT871203.10B Datum: 01.10.2004  
*to specification/assembly drawing No.: date:*

Versorgungspumpe hergestellt durch: Matre (Type P06D) und/and Nikuni (Type 32MED22)  
*Sample feed pump manufactured by:*

Zusammenstellungszeichnung Nr.: CT 880120.10B Datum: 01.10.2004  
*to specification/assembly drawing No.: date:*

Probenaufbereitungseinheit hergestellt durch: -  
*Sample conditioning unit manufactured by:*

Zusammenstellungszeichnung Nr.: - Datum: -  
*to specification/assembly drawing No.: date:*

Das Ölgehaltsmessgerät ist für folgende Verwendung geeignet:  
*The oil content meter is acceptable for the following applications:*

- Rohöle  
*Crude oils*
- „Schwarze“ Produkte  
*„Black“ products*
- „Helle“ Produkte  
*„White“ products*
- Ölähnliche schädliche flüssige Stoffe, andere Erzeugnisse oder Verwendungen wie nachstehend.  
*Oil-like noxious liquid substances, other products, or applications, listed below.*

Methylcyclohexane, Ethylcyclohexane, Tetrahydronaftalene, P-Cymene, Ethylbenzene, Cyclopentane, Dodecane, Nonane, Dipentene, Cyclohexane, Xylene, Toluene, Octane, Hexane, Pentane, Heptane, Hexene

Zulassungs-Nr.: 322008  
Certificate-No.:

Eine Kopie dieses Zeugnisses soll jederzeit auf jedem Schiff mitgeführt werden, das mit dieser Anlage ausgerüstet ist.  
*A copy of this certificate should be carried aboard a ship fitted with this equipment at all times.*

Dieses Typenzulassungszeugnis bleibt über das nachstehende Datum hinaus in Kraft, sofern kein Widerruf erfolgt. Ein Widerruf für auf einem Schiff eingebaute Einrichtungen kann z.B. erfolgen, wenn diese nicht gefahren und/oder nicht gewartet und/oder nicht funktionsbereit sind und/oder nicht innerhalb einer angemessenen Frist an zukünftige Bestimmungen angepasst werden können.

*This certificate of type approval is in force beyond the below mentioned date unless it is revoked. A revocation of the equipment installed aboard the ship can follow, but is not limited to, if the equipment is not maintained and/or is not in good working order and/or the equipment can not be modified within an appropriate time frame, due to future regulatory standards.*

Daten und Ergebnisse der Erprobungen siehe Anhang.  
*Test data and results attached as appendix.*

Dieses Typenzulassungszeugnis ist gültig bis:  
*This certificate of type approval is valid until:*

28.02.2010

Ausgestellt in Hamburg am: 01.03.2005  
*Issued at Hamburg on:*

SEE-BERUFGENOSSENSCHAFT  
- SCHIFFSSICHERHEITSDIVISION -



*i. A. Schifst*  
Unterschrift  
Signature

Das Öl/Wasser-Trennschicht-Messgerät, Serien-Nr.: \_\_\_\_\_ entspricht dem geprüften Typ.  
*The oil/water interface detector serial No.: \_\_\_\_\_ complies with the tested type.*

Ort  
*Place*

Datum  
*date*

Firmenstempel  
*Company stamp*

Unterschrift  
*Signature*

## CERTIFICATE OF TYPE APPROVAL

This is to certify that

Lloyd's Register did undertake the relevant type approval procedures of the equipment detailed below which was found to be in compliance with the essential Pollution Prevention requirements for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits, etc.

Manufacturer	Brannstroms Elektronik AB
Address	Uddevallagatan 14 Goteborg Sweden
Type	<b>OIL DISCHARGE MONITORING AND CONTROL SYSTEMS (POLLUTION PREVENTION)</b>
Description	Type: "CleanTrack 1000"
Specified Standard	IMO Resolution MEPC. 108 (49)

The attached Design Appraisal Document forms part of this certificate.  
This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	2 September 2005	Expiry date	1 September 2010
---------------	------------------	-------------	------------------

Certificate No.	SAS P050056
-----------------	-------------

Sheet No	1 of 12
----------	---------

Signed	
--------	---

Name	J.D. Morley Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group
------	--



**Note:**

**This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.**

\*Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.\*



Certificate number **CBM-009**  
Certificat numéro

**CERTIFICATE OF TYPE TEST FOR OIL CONTENT METERS INTENDED FOR MONITORING THE DISCHARGE OF OIL-CONTAMINATED WATER FROM THE CARGO TANK AREAS OF OIL TANKERS**

This is to certify that the oil content meter, comprising the equipment listed, below has been examined and tested in accordance with the requirements of the Specification contained in Part I of the Annex to the Guidelines and Specifications contained in IMO resolution MEPC 104(49). This Certificate is valid only for an oil content meter referred to below.

Il est certifié que le détecteur d'hydrocarbures comprenant les éléments ci-après a été examiné et soumis à des essais conformément aux dispositions des spécifications qui font l'objet de la Partie II de l'annexe aux Directives et spécifications contenue dans la résolution A.586(14) de l'OMI. Le présent certificat n'est valable que pour un détecteur d'hydrocarbures du type décrit ci-dessous.

Oil content meter supplied by

Brännströms Elektronik AB, Uddevallagatan 14, 41670 Gothenburg, Sweden

Détecteur d'hydrocarbures fourni par  
under type and model designation  
type et désignation du modèle:  
and incorporating:  
composant:

CLEANTRACK 1000

Oil content meter analysing unit manufactured by  
Dispositif d'analyse du détecteur d'hydrocarbures fabriqué par  
to specification/drawing numbers  
conformément à la spécification/au schéma n°

Brännströms Elektronik AB

CT871204.10B dated 01.10.2004

Electronic section of oil content meter manufactured by  
Éléments électronique du détecteur d'hydrocarbures fabriqué par  
to specification/drawing numbers  
conformément à la spécification/au schéma n°

Brännströms Elektronik AB

CT871203.10B dated 01.10.2004

Sample feed pump manufactured by  
Pompe d'échantillonnage fabriqué par  
to specification/drawing numbers  
conformément à la spécification/au schéma n°

Matre (Type P06D) and Nikuni (Type 32MED22)

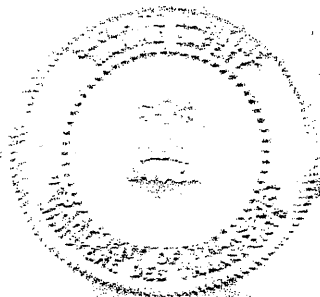
CT880120.10B dated 01.10.2004

Sample conditioning unit manufactured by  
Dispositif de conditionnement de l'échantillon fabriqué par  
to specification/drawing numbers  
conformément au schéma n°

THE SYSTEM IS ACCEPTABLE FOR THE FOLLOWING APPLICATION: Crude Oils, "Black" Products, "White products", Oil-like substances listed  
DISPOSITIF EST CONÇU POUR LES UTILISATIONS SUIVANTES: here: cyclohexane, p-cymene, dipentene, toluene, xylene, nonane, octane, hexane, pentane, heptane, hexene, methylcyclohexane, ethylcyclohexane, tetrahydronaphalene, ethylbenzene, cyclopentane, dodecane, nonane.

Test date and results: As per SEE-BERUFGGENOSSENSCHAFT Certificate No. 322008 dated 01.03.2005  
Les données et résultats des essais

A COPY OF THIS TEST CERTIFICATE SHOULD BE CARRIED ABOARD A VESSEL FITTED WITH THIS EQUIPMENT AT ALL TIMES  
UN EXEMPLAIRE DU PRÉSENT CERTIFICAT D'ESSAIS DEVRAIT SE TROUVER EN PERMANENCE A BORD D'UN NAVIRE ÉQUIPÉ DE CE MATÉRIEL



*[Signature]*

Matthias, Senior Marine Inspector, Environmental Protection  
(SIGNATURE OF AUTHORIZED INSPECTOR / SIGNATURE DE L'INSPECTEUR AUTONOME)

DATED THIS 11th  
DATE CE

DAY OF May  
JOUR DE

2005

AMSE - C030(06-94)

Canada



# NIPPON KAIJI KYOKAI

## *Certificate*

Certificate No.  
05EQ207N

OF

### **TYPE APPROVAL**

Item	:	Oil Discharge Monitoring and Control System for oil tankers
Type	:	CleanTrack 1000
Product descriptions	:	Intended for installation onboard oil tankers for ballast water monitoring control and alarm of contents of oil (or oil-like substances) at discharge overboard.
Manufacturer	:	Brännströms Elektronik AB Uddevallagatan 14, 41670 Göteborg, Sweden
Documentation	:	See Annex.
Limitations	:	See Annex.

THIS IS TO CERTIFY that the above type has been approved by Nippon Kaiji Kyokai with approval No. N-862 and that products of the type will be accepted for use on ships classed with the Society for compliance with the relevant requirements of the Society's *Rules for Marine Pollution Prevention Systems*, the *MARPOL 73/78, as amended, Annex I, Regulation 15(3)*, and *IMO Resolution MEPC.108(49)* subject to approval of the flag Administration and conditional upon that product verification be carried out by the Society.

This certificate is valid until 27th June, 2010.  
Issued at Tokyo on 28th June, 2005.

NIPPON KAIJI KYOKAI

H. Kitada  
General Manager

Material and Equipment Department



Initial approval date : 28th June, 2005

**MARINE DIVISION**

17 bis Place des Reflets - La Défense 2  
92400 Courbevoie - France

Tel. 33 1 42 91 52 91  
Fax. 33 1 42 91 28 94  
www.veristar.com



Certificate number: 15180/A0 BV

File number : ACM 216/2505/02

Product code : 8103I

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

**TYPE APPROVAL CERTIFICATE**

*as per Bureau Veritas Classification Rules*

*This certificate is issued to*

**Brännströms Elektronik AB**  
Göteborg - SWEDEN

*for the type of product*

**OIL DISCHARGE MONITORING AND CONTROL SYSTEMS**

CleanTrack 1000

**Regulations and standards :**

BUREAU VERITAS Rules for the Classification of Steel Ships/ MARPOL 73/78, as amended, Annex I, Regulation 15(3)(a)/ IMO Resolution MEPC.108(49)

*This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements of the Regulations and standards mentioned above.*

**This certificate is valid until : 11 Oct 2010**

At Paris la Défense, on : 11 Oct 2005

**For BUREAU VERITAS,**  
By order of the Secretary

Approval office

Local office : BV GOTHENBURG  
Surveyor : M. Moller

  
J. BENOIT



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION

Oil Discharge Monitoring and control system on oil tankers - Type CleanTrack 1000

> The oil discharge monitoring and control system consists of an analyser unit and a sample pump installed in pump room (hazardous area), a converting unit in engine room and a computer unit in cargo control room.

### 2. DOCUMENTS AND DRAWINGS

#### 2.1 Drawings N°

- CT891213.1 L	General assembly and arrangement
- CT891120.9 Q	Cable diagram
- CT891120.7 H1	Computer unit w/printer - Front view
- CT891120.8 G	Computer unit w/printer - View from behind
- CT941215.8 G	Computer unit w/printer - Side view
- CT991215.9 F	Computer unit w/printer - Front part, inside view
- CT991216.1 G	Computer unit w/printer - Rear part, inside view
- CT910805.1 E	Computer unit w/printer - Internal cable diagram
- CT0411001 B	Computer unit - Wall mounted
- CT0411002 B	Computer unit - 19" frame
- CT0411003 B	Computer unit - Panel mounted
- CT0411004 B	Computer unit - Front panel
- CT0411005 B	Computer unit - Inside (cpu/pcb)
- CT920227.2 J	Converting unit - Internal cable diagram
- CT920227.3 M	Converting unit - 3 phase, el. enclosure
- CT900209.1 H	Converting unit - Valve enclosure
- CT900105.2 F1	Converting unit - Front and side view
- CT900126.1 I	Converting unit - Bottom view
- CT891120.5 GJ1	Analysing unit - Front view
- CT891120.3 H	Analysing unit - Bottom view
- CT891120.6 GJ	Analysing unit - Side and top view
- CT891120.4 K	Analysing unit - Internal arrangement
- CT891211.1 H	Sample pump unit - Bulkhead mounted type
- CT041029.1 A	Sample pump unit - Bulkhead mounted type
- CT900105.4 F1	Sample probes - Valve arrangements
- CT891216.1 J	Sample probes - Installation arrangements
- CT891215.5 K	Flowmeter unit - Front view
- CS-32MED001 0	Sample pump unit - Sectional view

#### 2.2 Operational manual as per MARPOL Annex I Regulation 15(3)(c):

- To be installed in the oil tanker,
- To be available in one of the official language of IMO, in addition to ship's flag language.

### 3. TEST REPORTS

3.1 The required tests as per IMO Resolution MEPC.108 (49) Part 1 of the oil discharge monitoring system were carried out and witnessed by See-Berufsgenossenschaft (Germany) and were completed on 01/03/2005 according to the certificate N° 322008.

3.2 Environmental test of converting unit according to IMO Res. 108(49) carried out and witnessed by SP, Swedish National Testing and Research Institute and completed on 04/11/2004, test report N° P4023621:A.

3.3 Environmental test of analysing unit according to IMO Res. 108(49) carried out and witnessed by SP, Swedish National Testing and Research Institute and completed on 04/11/2004, test report N° P4023621:B.

3.4 DNV Technical reports N° 2004-3494 and N° 2005-3043, environmental testing of computer units.

### 4. APPLICATION / LIMITATION

4.1 The oil content meter is approved for the following applications:

- Crude oils, "black" and "white" products
- Oil-like noxious liquid substances of category C and D in MARPOL Annex II Regulation 14 as listed below:
  - > Methylcyclohexane, Ethylcyclohexane, Tetrahydronaphtalene, , *p*-Cymene, Ethylbenzene, Cyclopentane, Dodecane, Nonane, Dipentene, Cyclohexane, Xylenes, Toluene, Octane, Hexane, Pentane, Heptane, Hexene.

4.2 Complete details of units installed on board BV classed ships showing in particular pipe runs, electrical supply, sampling points and recording device, are to be submitted in each case. Certificates for intrinsically safe equipment are also to be submitted for each on-board installation.

4.3 Installation survey in section 11 and on-board functional test in section 12 of IMO Resolution MEPC.108(49) shall be complied with.

4.4 A copy of the certificate of type approval for the oil content meter shall be carried aboard a ship fitted with this equipment at all times.



#### **5. PRODUCTION SURVEY REQUIREMENTS**

5.1 Arrangements shall be made for a Society's Surveyor to carry out, on a periodic basis, visit of the manufacturer's premises and product audits. Final inspection of an unit may be performed either at works or on board.

5.2 Each unit is to be supplied with its manual for installation, use and maintenance.

#### **6. MARKING OF PRODUCT**

The unit is to be marked with:

- Manufacturer's name or trade mark
- Serial number
- Type designation
-  or  Society's brand as relevant

#### **7. OTHERS**

This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the approved unit at any time and that the manufacturer will accept the responsibility for informing shipbuilders or their sub-contractors of the proper methods of use and general maintenance of the approved unit and of the conditions of this approval.

**\*\*\* END OF CERTIFICATE \*\*\***





CERTIFICATE NUMBER

DATE

05-LD506718-PDA

26 July 2005

ABS TECHNICAL OFFICE

London Ship Engineering

# CERTIFICATE OF Design Assessment

This is to Certify that a representative of this Bureau did, at the request of  
**Brannstroms Elektronik AB**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate. It will remain valid for five years from the date of issue or until the Rules or specifications used in the assessment are revised (whichever occurs first).

PRODUCT: Oil Discharge Monitoring and Control System

MODEL: Clean Track 1000

ABS RULE: 2005 Steel Vessel Rules 1-1-4/7.7 & 5-1-7/5.3.4(b)

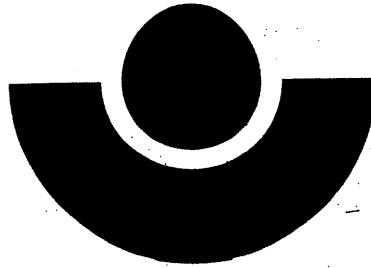
OTHER STANDARD: Regulation 15(3)(a), Annex I of MARPOL 73/78 and Amendments, IMO Resolution MEPC.108(49).;

AMERICAN BUREAU OF SHIPPING

John L. Morgan

Engineering Type Approval Co-ordinator

European notified body  
Identification number 0736



See-Berufsgenossenschaft  
Prüf- und Zertifizierungsstelle  
im BG-PRÜFZERT

# Certificate

No.

**04025**

valid until

**03.06.2009**

The **quality system** of the company

**Brannströms Elektronik AB**  
Udevallagatan 14, S - 41670 Göteborg

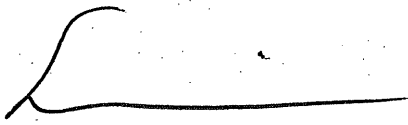
for the products listed in the annex

is in conformity with **Module D (Production Quality Assurance)**  
of the Council Directive 96/98/EC on marine Equipment.

**Translation**  
In any case, the German original shall prevail

Hamburg, 11.06.2004

Signature



.....  
(Schreiber)



Postal address:  
Postfach 11 04 89  
20404 Hamburg

Office:  
Reimerstwiete 2  
20457 Hamburg

Phone:  
0 40/3 61 37-0

Fax:  
0 40/3 61 37-2 04



# Germanischer Lloyd

**Fax**

Head Office Hamburg  
Vorsetzen 35  
20459 Hamburg/Germany

Phone +49 40 36149-0  
Fax +49 40 36149-200  
headoffice@gl-group.com  
www.gl-group.com

Brännströms Elektronik AB, Göteborg

To

Mr. P-O Danielsson

0046-31197790

Fax No.

H.Doelling

From

Ref. No.

2004-12-20

1

Date

Number of pages

Certification of Oil Discharge Monitoring and Control System, your E-Mail dated 14th December 2004.

Further to your a.m. e-mail please be informed that Germanischer Lloyd requires copies of certificates to be available as follows:

1. All vessels: Certificate of Type Approval in the standard format specified in Resolution MEPC108(49). For vessels flying the flag of a member state of the EU, this certificate has to be issued by one of the flag state administrations of the EU. A certificate issued by SBG will be accepted.
2. Vessels flying the flag of a member state of the EU: in addition to a.m. certificate an MED certificate issued by a nominated body, is required. A certificate issued by DNV will be accepted.

Yours faithfully,

Germanischer Lloyd

*A. Kästing*

*A. U.*

Chairman of the Supervisory Board: *Alfred Gossner* • Executive Board: *Hermann J. Klein* • *Rainer Schoendube*  
Germanischer Lloyd Aktiengesellschaft, Registered Office Hamburg, HR B 31383

Place of performance and jurisdiction is Hamburg. The latest edition of the General Terms and Conditions of Germanischer Lloyd is applicable.  
German law applies.



## Declaration of Conformity.

We hereby confirm that our product CleanTrack 1000 complies to all relevant regulations in accordance to MARPOL 73/78, Annex I and IMO resolution MEPC.108(49).

The product is MED certified according to the EC Marine Equipment Directive 96/98/EC, with module "D" certification by SBG of Germany number 04025, and module "B" by D.N.V of Norway number MED-B-3051.

The product is certified by a notified body, SBG of Germany, having identification number 0736.

On behalf of Brännströms Elektronik AB

Roland Brännström

---

Brännströms Elektronik AB  
Uddevallagatan 14  
416 70 Göteborg  
Tfn: +46 31 19 56 00  
Fax: +46 31 19 77 90

info@brannstrom.se ♦ www.brannstrom.se



## [1] EC-TYPE EXAMINATION CERTIFICATE



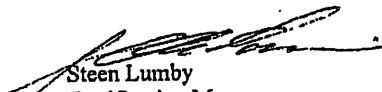
[2] Equipment or Protective System Intended for use  
in Potentially explosive atmospheres  
Directive 94/9/EC

- [3] EC-Type Examination Certificate Number: **DEMKO 01 ATEX 127938X**
- [4] Equipment or Protective System: **Pressure Transmitter MBS / AKS Type 4xx1 -xxxx-xxxx**
- [5] Manufacturer: **Danfoss A/S**
- [6] Address: **DK-6430 Nordborg, - Denmark**
- [7] This equipment or protective system and any acceptable variation there to is specified in the schedule to this certificate and the documents therein referred to.
- [8] UL International Demko A/S, notified body number 0539 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.
- The examination and test results are recorded in confidential report no. 127938
- [9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with: **EN50014 : 1997 - EN50020 : 1994 - EN50284 : 1999**
- [10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.
- [11] This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this requirement or protective system.
- [12] The marking of the equipment or protective system shall include the following:

**Ⓢ II 1G      EEx ia IIC T4 -T6**

On behalf of UL International Demko A/S

Herlev, 2001-01-31

  
Steen Lumby  
Certification Manager

This certificate may only be reproduced in its entirety and without any change, schedule included.

Notified body: UL International Demko A/S, P. O. Box 514, Lyksaer 8, DK-2730 Herlev, Denmark,  
Phone +45 44 85 65 65, Fax +45 44 85 65 00.

Ref.: 01 ATEX 127938

Page 1

A subsidiary of



Underwriters Laboratories Inc. ®



[13] **Schedule**

[14] **EC-TYPE EXAMINATION CERTIFICATE No.**

**DEMKO 01 ATEX 127938X**

[15] Description of Equipment or protective system:

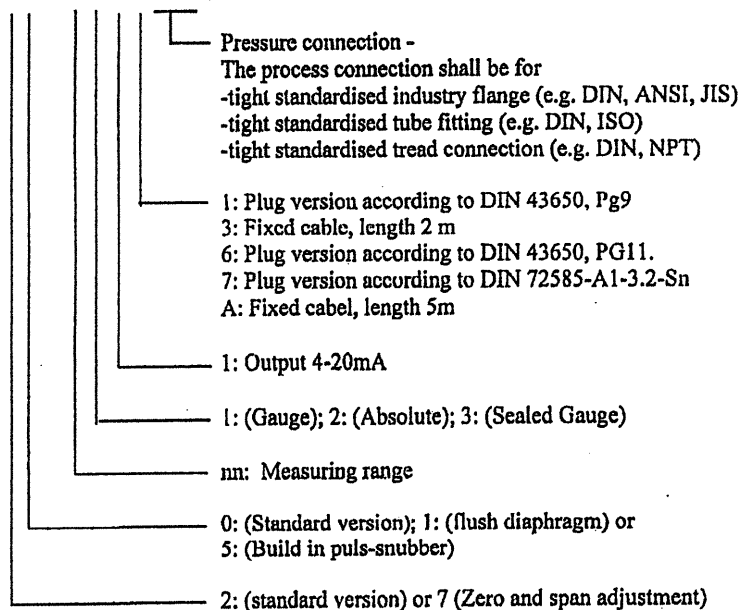
[15.1] The pressure transmitters consist of a cylindrical electronic case of stainless steel, which contain the pressure sensor and circuit board with the electronic components. The Circuit board is embedded in casting compound. The MBS /AKS transmitters convert the measured pressure in to a current loop signal 4-20mA. The pressure connection is available in different shape and size. The connection to the transmitter can be through a plug or with a fixed cable.

[15.2] The type variants comprised by the Certificate:

The difference between MBS type and AKS types is the adjustment of the AKS type, which is optimised for refrigerating installations.

Pressure Transmitter type: MBS or AKS 4xx1 -xxxx-xxxxx;

MBS 4xx1-xxx x-x xxx,



This certificate may only be reproduced in its entirety and without any change, schedule included.

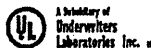
Notified body: UL International Demko A/S, P. O. Box 514, Lyskaer 8, DK-2730 Herlev, Denmark,  
Phone +45 44 85 65 65, Fax +45 44 85 65 00.

Ref.: 01 ATEX 127938

Report 127938

Page 2 of 4

**DEMKO**





**[15.3] Thermal characteristic parameters:**

The temperature classifications T4 – T6 is related to the ambient temperature and the medium temperature as following:

- For T4 : ambient temperature is  $-40^{\circ}\text{C} \leq$  to  $100^{\circ}\text{C}$  and medium temperature  $125^{\circ}\text{C}$ .
- T5 : ambient temperature is  $-40^{\circ}\text{C} \leq$  to  $75^{\circ}\text{C}$  and medium temperature  $95^{\circ}\text{C}$ .
- T6 : ambient temperature is  $-40^{\circ}\text{C} \leq$  to  $50^{\circ}\text{C}$  and medium temperature  $50^{\circ}\text{C}$ .

For all types with fixed cable the ambient temperature rating is  $-30^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$  when the installations is static and only  $-5^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  when it is flexing.  
For the other types the end user shall use cable with appropriate temperature rating for the actual use.

**[15.4] When pressure transmitter is used in category 1:**

When the pressure transmitter is used in category 1, the operating conditions are specified as follows:

- For T4 : ambient and medium temperature is  $-20^{\circ}\text{C} \leq$  to  $60^{\circ}\text{C}$ .
- T5 : ambient and medium temperature is  $-20^{\circ}\text{C} \leq$  to  $60^{\circ}\text{C}$ .
- T6 : ambient and medium temperature is  $-20^{\circ}\text{C} \leq$  to  $60^{\circ}\text{C}$ .

The process pressure of the media has to be between 0.8 bar and 1.1 bar.

**[15.5] Intrinsic safety specifications:**

For all types:

- Ui : 28V
- Ii : 100mA (for 4 –20mA signal).
- Pi : 0.7W
- Ci : 40nF (for fixed cable add 0.2nF per meter).
- Li : 0.1mH (for fixed cable add 0.8μH per meter).

Maximum length of the fixed cable is 5 meter.  
The fixed cable shall be of the type Ölflex EB CY no.: 0012 550 R+T

[16] Report No.: 127938-01

The type certificate entitles the license to provide the product with the registered mark (D).

Drawings:

Number	Vers. or Issue/Rev	Description
060R3087	Vers. 01	Constructions and productions detail
060R3079	Vers. 02	Label
060G9281	Vers. 01	Assembling drawing AKS/MBS 47x1
060G9282	Vers. 01	Assembling drawing AKS/MBS 42x1

This certificate may only be reproduced in its entirety and without any change, schedule included.

Notified body: UL International Demko A/S, P. O. Box 514, Lyskaer 8, DK-2730 Herlev, Denmark.  
Phone +45 44 85 65 65, Fax +45 44 85 65 00.

Ref.: 01 ATEX 127938

Report 127938

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**DEMKO**





060C0328	Issue 03 Rev. 01	EMC filter MBS33 Zero-span
060G2743	Issue 03 Rev 01	Parts list EMC filter
060C0335	Issue 07 Rev 03	EMC filter AKS32R
060G2741	Issue 07 Rev 03	Parts list EMC filter AKS32R
060G0342	Issue 01 Rev 01	Masters Specification and Layout
060G0495	Issue 01 Rev 01	Parts list circuit board
060G0464	Issue 01 Rev 01	Parts list circuit board
060C0344	Issue 01 Rev 00	Circuit diagram adjustable.
060G0456	Issue 01 Rev 00	Circuit board
060G0465	Issue 01 Rev 00	Parts list
060G0454	Issue 01 Rev 00	Parts list 4-20mA adjustable hybrid
060C0343	Issue 01 Rev 00	Diagram MBS EX adjustable transmitter
060G0453	Issue 01 Rev 00	Artwork top side
060G0455	Issue 01 Rev 00	Parts list 4-20mA fixed hybrid.

[17] Special conditions for safe use:

Installations of the pressure connection across boundary wall's requiring Category 1G equipment, and a less hazardous area, must at least conform to IP67 degree of protection according to IEC 529.

The manufacturers technical information shall be followed for correct installations. The installations and mounting shall be done according to appropriate national safety regulations and EN60079-14 Electrical installations in hazardous areas can be used as a guide.

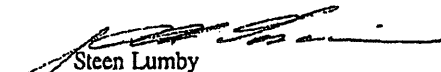
The size of the plastic plug is 9.2 mm<sup>2</sup>, so the installation in ZONE 0 and group IIC shall be done in area with low wind speed and where it is unlikely to be rub. It is recommended that the plug is cleaned by use of a damp cloth.

[18] Essential Health and Safety Requirements

Concerning ESR this Schedule verifies compliance with the Ex standards mention in clause 9 only. The manufacturer's Declaration of Conformity declares compliance with other relevant Directives.

On behalf of UL International Demko A/S

Herlev, 2001-01-31

  
Steen Lumby  
Certification Manager

This certificate may only be reproduced in its entirety and without any change, schedule included.

Notified body: UL International Demko A/S, P. O. Box 514, Lyskaer 8, DK-2730 Herlev, Denmark,  
Phone +45 44 85 65 65, Fax +45 44 85 65 00.

Ref.: 01 ATEX 127938

Report 127938

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**DEMKO**







(2) **Equipment and protection systems intended for use in potentially explosive atmospheres  
Directive 94/9/EC**

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(3) Number of the EC type examination certificate: **INERIS 01ATEX0074 X**

(4) Protection apparatus or system:

**ELECTRONIC TRANSMITTERS OF PRESSURE TYPES FCX-A, FCX-AII, FCX-C and FCX-CII**

(5) Manufacturers : **FUJI ELECTRIC FRANCE SA** **FUJI ELECTRIC INSTRUMENTS Co., Ltd**

(6) Adresses : **46, rue Georges BESSE** **2140, Oyashiki, Enzan-City**  
**Z.I du Brézet**  
**63039 CLERMONT FERRAND** **YAMANASHI 404-0053**  
**FRANCE** **JAPAN**

(7) This protection system or equipment and any other acceptable alternative of this one are described in the appendix of this certificate and the descriptive documents quoted in this appendix.

(8) The INERIS, notified body and identified under number 0080, in accordance with article 9 of Council Directive 94/9/CE of the 23<sup>rd</sup> March 1994, certifies that this protection system or equipment fulfils the Essential of Health and Safety Requirements relating to the design and construction of equipment and protection systems intended for use in potentially explosive atmospheres, described in appendix II of the Directive.

The examinations and the tests are consigned in official report No P36549/01.

(9) The respect of the Essential Health and Safety Requirements is ensured by:

- conformity with:

EN 50 014	of June 1997 + Amendments 1 and 2
EN 50 020	of August 1994
EN 50 0281-1	of September 1998
EN 50 0284	of January 1999

- specific solutions adopted by the manufacturer to meet the Essential Health and Safety Requirements described in the descriptive documents.

(10) Sign X, when it is placed following the Number of the EC type examination certificate, indicates that this equipment and protection system is subjected to the special conditions for safe use, mentioned in the annex of this certificate.

- (11) This EC type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system, these are not covered by this certificate.
- (12) The marking of the equipment or the protection system will have to contain:

 II GD

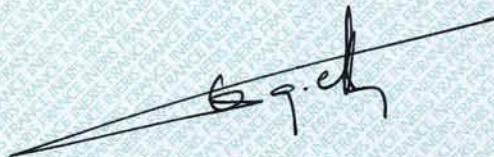
EEEx ia IIC T4 or T5

Verneuil-en-Halatte, le 2001 10 20



T. HOUEIX

Engineer at the Laboratory of Certification of Materials  
ATEX



Director of the Certifying Body,  
By delegation  
B. PIQUETTE  
Deputy manager of Certification



(13)

## ANNEX

(14)

EC TYPE EXAMINATION CERTIFICATE N° INERIS 01ATEX0074 X

(15)

**DESCRIPTION OF THE EQUIPMENT OR THE PROTECTION SYSTEM**

The standard transmitter of pressure FCX-AII, FCX-CII, FCX-A or FCX-C is with four alternatives. They are intended to measure the differential, absolute or relative pressures of a liquid or a gas.

The shell is different for the models type FCX-A.. and FCX-C..

The signal measured by the same chip silicon of measurement is converted by electronics into an output signal 4-20 mA representative of the pressure.

The transmitter of pressure is composed of a board with printed circuits on which are established the electronic components.

**PARAMETERS RELATING TO THE SAFETY**

Maximum characteristics of entry to the connector following model:

Standard model:

Reference of the pins	Ui (V)	Ii (mA)	Pi (W)	Ci (nF)	Li (mH)
(PWR), (0 V) / earth	28	93,3	0,66	27	1,134

Model with arrester:

Reference of the pins	Ui (V)	Ii (mA)	Pi (W)	Ci (nF)	Li (mH)
(PWR), (0 V) / earth	28	93,3	0,66	34,2	1,134



- Plan N° TC520755	of the 28.07.2000
- Plan N° TC425407 rev.A	of the 08.08.2001
- Plan N° TC425408	of the 28.07.2000
- Plan N° TC425409	of the 28.07.2000
- Plan N° TC425410	of the 28.07.2000
- Plan N° TC425411	of the 28.07.2000
- Plan N° TC425412	of the 28.07.2000
- Plan N° TC425413	of the 28.07.2000
- Plan N° TC425414	of the 28.07.2000
- Plan N° TC425415	of the 28.07.2000
- Plan N° TC425416	of the 28.07.2000
- Plan N° TC305507 rev.A	of the 18.10.2001
- Plan N° TC425695 rev.A	of the 18.10.2001
- Plan N° TC521050	of the 08.08.2001
- Plan N° TC521040	of the 03.10.2001
- Plan N° TC425692	of the 08.08.2001
- Plan N° TC425693	of the 08.08.2001
- Plan N° TC425694	of the 08.08.2001
- Plan N° TC521039 rev.B	of the 03.10.2001
- Plan N° TC425684	of the 26.07.2001
- Plan N° TC425689 rev.B	of the 03.10.2001
- Plan N° TC425688 rev.B	of the 03.10.2001
- Plan N° TC425687 rev.A	of the 03.10.2001
- Plan N° TC425686 rev.A	of the 08.08.2001
- Plan N° TC425685 rev.A	of the 08.08.2001
- Plan N° TC305514	of the 18.10.2001
- Plan N° TC425745	of the 18.10.2001
- Plan N° TC521041	of the 03.10.2001
- Plan N° TC425744	of the 03.10.2001
- Plan N° TC425750	of the 18.10.2001
- Plan N° TC425691	of the 03.10.2001
- Plan N° TC425690	of the 03.10.2001

These documents are signed of November 09, 2001

**(17) SPECIAL CONDITIONS FOR SAFE USE**

The user will have to connect, on the intrinsic safety connector, a voltage source whose electric characteristics are lower or equal to those indicated in paragraph 15.

The interconnection of the external circuits with this material must be compatible with intrinsic safety.

These special conditions are defined in the instruction notice.

**(18) ESSENTIAL REQUIREMENTS OF SAFETY AND HEALTH**

The respect of the Essential Requirements of Safety and Health is ensured by:

- conformity to the European standards EN 50 014:1997, EN 50 020:1994, EN 50 281-1:1998 and EN 50 284:1999
- the whole of the provisions adopted by the manufacturer and described in the descriptive documents.



# CERTIFICATE

Certificate issued by a Notified Body

SP 03ATEX3616X  
(22 94 03)



1(2)

## EC-TYPE EXAMINATION CERTIFICATE

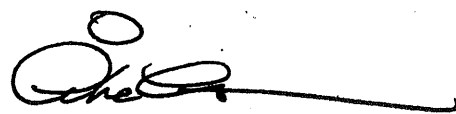
- [1] **Equipment or Protective System intended for use in Potentially Explosive Atmospheres  
Directive 94/9/EC**
- [2] EC-Type Examination Certificate Number: **SP 03ATEX3616X**
- [3] Equipment or Protective System: **Fluid analyzer type Measuring cell CO8788**
- [4] Applicant (manufacturer): **Brännströms Elektronik AB**
- [5] Address: **Uddevallagatan 14, SE-416 70 Göteborg, Sweden**
- [6] This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- [7] SP, Notified Body No. 0402 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
- The examination and test results are recorded in a confidential report No. P300338:C
- [8] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
- EN 50014:1997 + A1...A2 (SS-EN 50014 ed. 4 + A1...A2)
  - EN 50020:2002 (SS-EN 50020 ed. 5)
  - EN 50284:1999 (SS-EN 50284 ed. 1)
- [9] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.
- [10] This EC Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.
- [11] The marking of the equipment or protective system shall include the following

 II 1 G EEx ia IIC T4

Borås 13 October 2003

**SP Swedish National Testing and Research Institute  
Certification**

  
Lennart Månsson  
Certification manager

  
Åke Månsson  
Certification officer



## CERTIFICATE

SP 03ATEX3616X, dated 13.10.2003

Signed on behalf of SP, 13.10.2003:

2(2)

[13]

### Schedule

[14] **EC-TYPE EXAMINATION CERTIFICATE No. SP 03ATEX3616X**

[15] **Description of equipment**

Fluid analyzer type Measuring cell CO8788 analyzes a fluid by measuring its light transmission. In a block of PVC there are optical components and a glass pipe for the fluid to pass through. This block together with a printed circuit board is mounted in an encapsulation of aluminium.

The analyzer has two intrinsically safe circuits. Circuit 1 (terminals 1-6) has four optical detectors with associated electronics and circuit 2 (terminals 7-8) has a light emitting diode. Both circuits are galvanically isolated from each other and from earth.

#### Data

Ambient temperature ( $T_{amb}$ ): 0 °C to +60 °C

#### Circuit 1 (terminals 1-6)

Maximum input voltage ( $U_i$ ): 18,0V  
Maximum input current ( $I_i$ ): 0,20 A  
Maximum input power ( $P_i$ ): 0,35 W  
Maximum internal capacitance ( $C_i$ ): 30 nF  
Maximum internal inductance ( $L_i$ ): 0,10 mH

#### Circuit 2 (terminals 7-8)

Maximum input voltage ( $U_i$ ): 8,0 V  
Maximum input current ( $I_i$ ): 0,47 A  
Maximum input power ( $P_i$ ): 0,35 W  
Maximum internal capacitance ( $C_i$ ): 30 nF  
Maximum internal inductance ( $L_i$ ): 0,10 mH

[16] **Report No.**

P300338:C

[17] **Special conditions for safe use**

- 1 The enclosure of the analyzer must be earthed to avoid electrostatic discharges.
- 2 The housing of the analyzer is partly made of aluminium and shall not be subject to impacts or friction in order to avoid sparks.

[18] **Essential health and safety requirements**

Requirements according to amendment 1 (May 2002) to EN 50281-1-1:1998 have been applied for the optical radiation from a light emitting diode in the equipment.

[19] **Drawings and documents**

According to the specification P300338:D



# CERTIFICATE

Certificate issued by a Notified Body

SP 03ATEX3617X  
(22 94 04)

1(3)



- [1] **EC-TYPE EXAMINATION CERTIFICATE**
- [2] **Equipment or Protective System intended for use in Potentially Explosive Atmospheres  
Directive 94/9/EC**
- [3] EC-Type Examination Certificate Number: **SP 03ATEX3617X**
- [4] Equipment or Protective System: **Oil Monitor Interface type Z98**
- [5] Applicant (manufacturer): **Brännströms Elektronik AB**
- [6] Address: **Uddevallagatan 14, SE-416 70 Göteborg, Sweden**
- [7] This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- [8] SP, Notified Body No. 0402 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
- The examination and test results are recorded in a confidential report No. P300338:A
- [9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
- EN 50014:1997 + A1...A2 (SS-EN 50014:1997 + A1...A2)
  - EN 50020:2002 (SS-EN 50020 ed. 5)
  - EN 50284:1999 (SS-EN 50284 ed. 1)
- [10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.
- [11] This EC Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.
- [12] The marking of the equipment or protective system shall include the following

II (1) G [EEEx ia] IIC

Borås 13 October 2003

**SP Swedish National Testing and Research Institute  
Certification**


Lenaert Månsson  
Certification manager

Åke Månsson  
Certification officer



**CERTIFICATE**

SP 03ATEX3717X, dated 13.10.2003

Signed on behalf of SP, 13.10.2003: 

[13]

**Schedule**[14] **EC-TYPE EXAMINATION CERTIFICATE No. SP 03ATEX3617X**[15] **Description of equipment**

Oil Monitor Interface type Z98 is an associated apparatus to be used outside the hazardous area. The equipment has five separate intrinsically safe outputs designed to be connected to five separate intrinsically safe circuits for flow sensors, a pressure sensor and a fluid analyser. All the intrinsically safe outputs are earthed.

**Data**Ambient temperature ( $T_{amb}$ ): -20 °C to +60 °C**Power supply (connector CN6):**

250 V a.c. (maximum voltage  $U_m$ )  
±24 V (rated supply voltage)

**Intrinsically safe output, terminal 1:**

Maximum output voltage ( $U_o$ ): 17,2 V  
Maximum output current ( $I_o$ ): 190 mA  
Maximum output power ( $P_o$ ): 0,32 W  
Maximum external capacitance ( $C_o$ ): 350 nF  
Maximum external inductance ( $L_o$ ): 0,55 mH

**Intrinsically safe output, terminal 2:**

Maximum output voltage ( $U_o$ ): 6,6 V  
Maximum output current ( $I_o$ ): 320 mA  
Maximum output power ( $P_o$ ): 0,28 W  
Maximum external capacitance ( $C_o$ ): 400 nF  
Maximum external inductance ( $L_o$ ): 0,30 mH

**For each of the intrinsically safe outputs at terminals P, F1 and F2:**


Maximum output voltage ( $U_o$ ): 26,0 V  
Maximum output current ( $I_o$ ): 91 mA  
Maximum output power ( $P_o$ ): 0,58 W  
Maximum external capacitance ( $C_o$ ): 90 nF  
Maximum external inductance ( $L_o$ ): 3,0 mH

[16] **Report No.**

P300338:A



**CERTIFICATE**  
SP 03ATEX3717X, dated 13.10.2003

Signed on behalf of SP, 13.10.2003: 

[17] **Special conditions for safe use**

The equipment shall be installed in an enclosure which provides enough protection regarding the environment. For dry and clean environments a protection corresponding to IP20 according to EN 60529 is normally enough. The installation must also fulfil separation requirements according to sub-clause 6.4 in EN 50020:2002.

[18] **Essential health and safety requirements**

Additional requirements not applicable.

[19] **Drawings and documents**

According to the specification P300338:D.

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **Appendix 9 Cleaning solution data**

This Appendix contains the specification of the cleaning solution used in the CLEANTRACK 1000 measuring unit automatic cleaning system.

Always use the proposed cleaning solution in order to obtain the proper measuring accuracy and to avoid polluting the environment.

# Safety data sheet

## 1. Product and company identification

Product Name: **Process AL**  
Article no: 0121  
Application: Low foaming alkaline cleaner  
Supplier: Strövelskemi AB  
Box 9063  
S-291 09 Kristianstad  
Sweden  
Issued by: Jan Pettersson  
Telephone No: +46 - 44 24 53 30  
Telefax No: +46 - 44 24 58 78  
Drawn up: 95-04-21  
E-mail: info@strovvelskemi.se  
Web-site: www.strovvelskemi.se  
Revision date: 04-08-31

## 2. Composition/information on ingredients

Components Include and Risk Phrases	Cas-No	EU-No	Content (%)	Label	Symbol	TLV (mg/m <sup>3</sup> )
<b>Health and Environmental Hazardous</b>						
Sodium metasilicate - R34-37	6834-92-0	229-912-9	1-5	Corrosive	Corrosive	
Trisodium-NTA - R22-36	5064-31-3		1-5	Harmful	St Andrews cross	
Ethylhexanoethoxylate - R41	26468-86-0		0-1	Irritant	St Andrews cross	
Fattyalcohoethoxylate - R22-41	160875-66-1		1-5	Harmful	St Andrews cross	
<b>Other</b>						
Cumensulphonate 40 %	28348-53-0 28085-69-0	248-983-7 248-827-8	1-5			
Water						

## 3. Hazards identification

Label for supply:



Physical/chemical hazards:

Human health hazards:

Environmental hazards:

Irritating to eyes and skin.

## 4. First-aid measures

Generally:

Inhalation:

Skin contact:

Eye contact:

Ingestion:

Wash off with soap and water.

Flush with plenty of water. If irritation persists, obtain medical attention.

Give milk or plenty of water to drink. Seek medical advice.

## 5. Fire-fighting measures

Specific Fire Hazards:

Not combustible

Specific methods:

Extinguishing media:

Foam, dry powder, CO<sub>2</sub>, halon, fine water spray suitable

Extinguishing media not usable:

## 6. Accidental release measures

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Personal precautions: Access to safety shower and eye-shower.  
Environmental precautions:  
Methods for cleaning up: Wash down floor area as spillage's can be slippery.

## 7. Handling and storage

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Storage: Keep in tightly closed container. Protect from frost.  
Handling: Avoid contact with skin and eyes. Observe good standards of industrial hygiene.

## 8. Exposure controls/personal protection

---

Engineering measures: Access to safety shower and eye-shower.  
Personal protective equipment: Respiratory protection: Unlikely to be necessary.  
Eyes: Chemical eye goggles should be worn.  
Hand: PVC or rubber gloves are recommended.  
Skin:  
Exposure limits: Not determined.

## 9. Physical and chemical properties

---

Physical state, form and colour: Clear colourless fluid  
Odour:  
pH neat: 12,8  
Melting point/range (°C):  
Boiling point/range (°C):  
Flashpoint (°C):  
Auto ignition temperature (°C):  
Explosion limits:  
Vapour density (air=1):  
Vapour pressure (20 °C, kPa):  
Octanol/water partition coefficient:  
Decomposition temperature (°C):  
Explosion properties:  
Density (20 °C, kg/m<sup>3</sup>): 1 080  
Solubility in water (weight-%): Totally soluble  
Solubility in organic solvents: Insoluble  
Specific properties:

## 10. Stability and reactivity

---

Stability: Stable under normal conditions.  
Decomposition products:  
Specific properties:

## 11. Toxicological information

---

Generally:  
Inhalation:  
Skin contact: Prolonged or repeated contact can cause irritation.  
Eye contact: Spray or splash in eyes give pain.  
Ingestion: If swallowed pain, vomiting and eventually burns can occur.  
Toxicity: Sodium metasilicate: LD<sub>50</sub> (oral, rat): 1504-1722 mg/kg  
Trisodium-NTA: LD<sub>50</sub> (oral, rat): > 2000 mg/kg  
Ethylhexanoethoxylate: Ames test: negative  
Fattyalcoholethoxylate: LD<sub>50</sub> (oral, rat): 200-2000 mg/kg  
Specific effects:

## 12. Ecological information

---

Generally:  
Mobility:

Persistence/Degradability:	Trisodium-NTA:	OECD 301B: > 90 %
	Ethylhexanoethoxylate:	OECD 301B: > 60 % (CO <sub>2</sub> , 28 days)
	Fattyalcoholethoxylate:	OECD 301D: > 60 %
Bioaccumulation:	Ethylhexanoethoxylate:	Bioaccumulation not expected
	Fattyalcoholethoxylate:	Bioaccumulation not expected
Ecotoxicity	Sodium metasilicate:	LC <sub>50</sub> (fish ( <i>Gambusia affinis</i> ), 96h): > 2320 mg/l EC <sub>50</sub> (daphnia, 100 h): > 247 mg/l (pH 9,1) pH ≥ 9 causes damage to fish IC <sub>50</sub> (algae, 72 h): pH ≥ 8,5 causes damage to algae
	Trisodium-NTA:	LC <sub>50</sub> (fish, 96h): 98 mg/l EC <sub>50</sub> (Daphnia, 48h): > 780 mg/l EC <sub>50</sub> (algae, 96h): 780 mg/l
	Ethylhexanoethoxylate:	LC <sub>50</sub> ( <i>Oncorhynchus mykiss</i> , 96h): 13 mg/l EC <sub>50</sub> (Daphnia, 48h): 6,5 mg/l EC <sub>50</sub> ( <i>Scenedesmus subspicatus</i> , 72 h): 6,6 mg/l
	Fattyalcoholethoxylate:	LC <sub>50</sub> ( <i>Oncorhynchus mykiss</i> , 96h): >10-100 mg/l EC <sub>50</sub> ( <i>Daphnia magna</i> , 48h): >10-100 mg/l EC <sub>50</sub> ( <i>Scenedesmus subspicatus</i> , 72h): >10-100 mg/l
	Cumen-sulphonate:	LC <sub>50</sub> ( <i>Cyprinus carpio</i> , 96h): > 100 mg/l EC <sub>50</sub> (Daphnia, 48h): > 100 mg/l EC <sub>50</sub> (algae, 72 h): > 100 mg/l

Remarks:

**13. Disposal considerations**

Waste from residues:	Product should be disposed of in accordance with local and national regulations. Advice can be obtained from the Waste Regulation Authority whether special waste regulations apply to this product.
Contaminated packaging:	

**14. Transport information**

UN-no:	Not classified
Name:	
Class:	
Pack Group:	
Label:	
EmS code:	
Marine pollutant:	
ADR, RID:	
IMDG:	

**15. Regulatory information**

Label for supply:	Irritant
Symbol:	St. Andrews Cross
Risk Phrases:	R36/38 Irritating to eyes and skin.
Safety Phrases:	S2 Keep out of reach of children. S24/25 Avoid contact with skin and eyes.
Note:	

**16. Other information**

Risk phrases:	Fire	R35 - Causes severe burns	R67 - Vapours may cause drowsiness and dizziness
	R10 - Flammable	R36 - Irritating to eyes	
	R11 - Highly flammable	R37 - Irritating to respiratory system	
	R12 - Extremely flammable	R38 - Irritating to skin	Environment

- |  |  |  |
|--|--|--|
| Health   | R41 - Risk of serious damage to eyes                       | R50 - Very toxic to aquatic organisms                                |
| R20 - Harmful by inhalation                    | R42 - May cause sensitization by inhalation                | R51 - Toxic to aquatic organisms                                     |
| R21 - Harmful in contact with skin             | R43 - May cause sensitization by skin contact              | R52 - Harmful to aquatic organisms                                   |
| R22 - Harmful if swallowed                     | R65 - Harmful: may cause lung damage if swallowed          | R53 - May cause long-term adverse effects in the aquatic environment |
| R31 - Contact with acids liberates toxic gases | R66 - Repeated exposure may cause skin dryness or cracking |  |
| R34 - Causes burns                             |  |  |

Literature references:

Registration:

# CLEANTRACK 1000 Operations and Technical Manual.

## Appendix 10 Calculations on intrinsically safe arrangements

This appendix is a guidance, and nothing but a guidance, on how to demonstrate the intrinsically safety margins of the installation. The installation engineer, and no one but the installation engineer, is responsible for the intrinsically safety of the installation. No responsibility is given for the data below. Correct data is printed on the actual included apparatus or its certificate.

The zener barriers, ZBs, in the Converting are arranged in order to supply 5 separate intrinsically safe circuits, ISC. The following data applies to zone IIC:

ISC	ZB	Co	Lo	Uo	Io	Po
ISC1	ZB1-ZB6	350nF	0.55mH	17.2V	190mA	0.32W
ISC2	ZB7-ZB8	400nF	0.3mH	6.6V	320mA	0.28W
ISCP	Z9-Z10	90nF	3mH	26.0V	91mA	0.58W
ISCF1	Z9-Z10	90nF	3mH	26.0V	91mA	0.58W
ISCF2	Z9-Z10	90nF	3mH	26.0V	91mA	0.58W

The electronics in CLEANTRACK 1000 analysing unit is divided in 3 intrinsically safe apparatus:

ISM1	Intrinsically safe measuring unit circuit 1
ISM2	Intrinsically safe measuring unit circuit 2
ISP	Intrinsically safe Pressure transmitter

Data:

	ISM1	ISM2	ISP	ISF
Pmax	0.35W	0,35W	1,6W	0.6W
Umax	18V	8V	28V	28V
I <sub>max</sub>	0.200A	0.500A * )	660mA	93.3mA
Ceq	30nF	30nF	20nF	10nF
Leq	0.1mH	0.1mH	0uH	0.2mH

NOTE: The ISP data depends on type of pressure transmitter included in the actual system. Actual ISP data is available on the actual pressure transmitter.

ISF data applies to the standard CLEANTRACK 1000 flow transmitter.

\*) Max current granted by the supplementary approval.

An apparatus should relate to the supplying zener barrier circuit in the following way:

$P_{max} > P_o$   
 $U_{max} > U_o$   
 $I_{max} > I_o$



## CLEANTRACK 1000 Operations and Technical Manual.

$$C_o - C_{eq} = C_m$$
$$L_o - L_{eq} = L_m$$

Below follows  $C_m$  and  $L_m$  margins based on the circuit and apparatus data above:

Circuit	$C_m$	$L_m$	$C_{cable}$	$L_{cable}$
ISC1/ISM1	320nF	0.45mH	500nF/km	1.4mH/km
ISC2/ISM2	370nF	0.2mH	175nF/km	1.4mH/km
ISCP/ISP	80nF	3mH	175nF/km	1.4mH/km
ISCF1/ISF	70nF	2.8mH	175nF/km	1.4mH/km
ISCF2/ISF	see ISCF1/ISF			

The  $C_{cable}$  and  $L_{cable}$  are typical values of a 0.5mm<sup>2</sup> FKAR-PG from a big manufacturer. Check  $C_{cable}$  and  $L_{cable}$  values of the cable that is installed in the particular system.

Worst case applies to ISC2/ISM2 inductance. Maximum cable length is 140m.

Also check temperature class of installed intrinsically safe apparatus and if the specified zone is acceptable.

Screen of a cable between protective zener barriers and intrinsically safe electrical apparatus must be connected to the ground rail in the Converting unit and be isolated in the electrical apparatus. If the cable is lengthened a special box for the purpose must be used. The screen of the two cables should be connected together and isolated from ground or chassis. There are certain demands on isolation distance between cables belonging to different intrinsically circuit when they are lengthened in the same box. Be sure to comply with installation directions applying to the particular hazardous zone.

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **Appendix 11 Work shop test**

# **CLEANTRACK 1000 Operations and Technical Manual.**

## **Appendix 12 Specifications on supplementary equipment supplied by BRANNSTROM.**