XRGI 20®

MANUAL

XRGI SYSTEM COMPONENTS AND INSTALLATION GUIDE

VERSION 1.0 2012

www.ecpower.eu

This manual informs you in detail about the system components and about how to install your new XRGI 20G-TO. It also gives important safety instructions that must adhered to when the XRGI system is used. The manual includes descriptions of the main XRGI system components, i.e. Power Unit, Q60-Heat Distributor and IQ-Control Panel, and of the XRGI system accessories, i.e. Q-Network, Load Sharer and storage tank, which are not included in the supply and must be purchased individually.

The performance of the XRGI system depends very much on how it is used: we recommend you read the manual carefully before using the XRGI. This will make you familiar with how exactly the XRGI system works and ensures the manufacturer's warranty is not invalidated. Please keep the manual for later reference.

EC POWER A/S continues to improve its products. The company reserves the right to make changes and improvements if it considers this to be necessary. This does not mean the company is bound to make changes to XRGI systems we have already supplied.

If you have additional questions, please do not hesitate to get in touch with your dealer.

Enjoy using your XRGI 20G-TO.

Do not forget to read the operating and safety instructions before using the machine.

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SYSTEM DATA

System model:
PU no.:
XRGI ID:
First used:

FOREWORD

Congratulations on your purchase of the XRGI system. It offers an economically viable solution to lower your energy costs in an environmentally friendly way. Using the principle of combined heat and power generation, the XRGI system achieves an efficiency of up to 96 % and thus helps save resources and to protect the environment. In addition, it reduces your energy costs noticeably. What's unusual about this tried and tested method is that you can use the generated heat to produce electricity, instead of wasting it by releasing it into the atmosphere where it can do harm. This is why CHP is rightly seen as the sustainable energy production of the future. It contributes actively to protecting the environment. This is why environmentalists welcome it and the Federal Government supports it. CHP stands out when it comes to 'green' energy production methods. Unlike solar and wind power, CHP does not depend on the weather. Modular CHP units save resources whatever the weather and provide a reliable supply of electricity and heat. You will always have power and heat at hand – reliably!

OUR HISTORY

Denmark began using CHP in the 1950s, so it has acquired a lot of experience and competence in this field. In 1996 a group of Danish engineers decided to make use of this experience and teamed up to found EC POWER. One of the goals of EC POWER is to make optimal use of primary energy in order to cover growing electricity requirements cost-effectively while lowering the environmental impact. In order to meet the growing needs of the market, EC POWER subsequently founded a subsidiary in Germany. Today, EC POWER is one of Europe's leading manufacturers of modular CHP units in the 10-50 kWel class, and our XRGI systems are sold in more than ten European countries.

OUR VALUES AS A COMPANY

- Everything we do is guided by our concern for safety and for the environment.
- We meet expectations.
- We treat our clients as part of the EC POWER family.
- We are innovative.

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ANNEXES

1. GENERAL INSTRUCTIONS

You have acquired a quality product by EC POWER. Your XRGI 20G-TO system will provide you with the benefits you expect if it is cared for and properly maintained.
Using the system in any way other than described below constitutes misuse and is prohibited.

The XRGI 20G-TO is a [combined] heat and power generation system, and must be used for this purpose only. The XRGI system must be installed in accordance with the assembly and operating instructions.
The XRGI and its associated components must be assembled, commissioned, serviced and repaired by authorised EC POWER specialists only. Using it improperly may lead to irreparable damages. We will not accept any liability for any damage that occurs as a result of improper use of the XRGI system.

The XRGI 20G-TO must only be used in combinations approved by the manufacturer and with the accessories and spare parts stated in the assembly and commissioning instructions. Any other combinations, accessories and wearing parts may only be used if they are expressly intended for the proposed use and they do not affect the performance characteristics or safety requirements of the XRGI 20G-TO.
The XRGI 20G-TO must be maintained and checked in accordance with the intervals specified, otherwise any claims asserted under warranty will lapse. Please have your authorised EC POWER specialist carry out the maintenance work and inspections.
The XRGI 20G-TO must be protected from frost. The manufacturer will not be liable for frost damage.
You must follow the operating instructions when adjusting parameters.
If your XRGI 20G-TO has been out of use for a prolonged time period, you need to ensure that the condensate drain is filled with water.
Check the water level in the system regularly, and have any leaks dealt with by your authorised EC POWER specialist.

Warning! EC POWER assumes no liability for any damage caused by non-compliance with these instructions.

We reserve the right to make technical changes
Continuous development means that illustrations, procedures and technical data may vary slightly.

1.1. NOTES ON EQUIPMENT DOCUMENTATION

1.1.1. Symbols used

Please follow the safety instructions given in this manual when using your XRGI system. The following symbols are used in this manual:

Note!
Useful information and instructions

Warning!
Potentially hazardous situation for the product and the environment!

Danger!
Immediate threat to life and limb!

1.1.2. Other applicable documents

For the system operator:
1 Manual

For the specialised mechanic:
1 Assembly instructions

Scope of this manual
This manual applies to the XRGI 20G-TO

- without accessories
- with additional storage tank

Before assembling and installing the XRGI 20G-TO, read the assembly instructions carefully and follow the safety instructions there given.

Note: please keep these documents for future reference.

1.2. HANDLING THE EQUIPMENT

1.2.1. Operator's obligations

To take best advantage of all the benefits your XRGI 20G-TO offers, please read these instructions carefully. For your own safety, please note that your system must be set up and adjusted by an authorised EC POWER specialist only. The same applies for inspection/maintenance, servicing and repairs of the device. For a long, reliable service life, please note the following:

- Have your unit inspected and maintained by an authorised EC POWER specialist at least every two years.
- Keep the air inlets in walls or doors clear.

Danger! All connections (fuel, flue gas and electrical) as well as the initial commissioning, maintenance and repairs must be carried out by authorised personnel only. In addition, the generally recognised technical and architectural rules must be observed. Safety devices must be installed in accordance with local rules. Observe Health and Safety at Work Regulations.

Warning! Safety devices must not be disabled, bypassed or removed.

1.2.2. Rules and standards

Installation is governed in particular by the rules, regulations and guidelines below:

- Federal State building regulations
- MFeuVo model fire regulations and/or Federal State FeuVO
- BImSchV Federal emission protection regulations
- Energy saving law (EnEG) and heating system regulations issued pursuant to it (HeizAnlV)
- Technical rules for gas installations DVGW-TRGI 86, current edition, Wirtschafts- und Verlagsgesellschaft Gas und Wasser mbH., Bonn
- DVGW worksheet G600 (TRGI)
- DIN 1988 Technical rules for drinking water installations (TRWI)
- DIN 4701 Rules for calculating building heating requirements
- DIN 4751 Bl. 3 Safety equipment for heating systems with lead temperatures up to 110 °C
- ATV worksheet A 251 Feeding condensation water from gas- and oil-fired heating systems into the public drains and micro-treatment plants, November 1998 edition, GFA Verlag für Abwasser, Abfall und Gewässerschutz, Hennef
- Regulations on energy saving heat protection and building systems (energy saving regulations - EnEV) 16 November 2001
- DIN VDE 0100 (Parts 540 and 701 in particular) and DIN VDE 0105.
- Guidelines for connecting and operating local generation systems in the low voltage network of the association of German electricity works – VDEW – e.V.
- Technical connection requirements for connecting to the low voltage network of the association of German electricity works – VDEW – e.V.

1.2.2.1. Modifying XRGI system components

XRGI system components must not be modified without EC POWER's prior consent in writing.

1.2.3. Warranty instructions

- Install and operate the system professionally and in accordance with current EC POWER instructions.
- Have the system serviced regularly and in accordance with current servicing instructions. Servicing may be carried out by trained and authorised EC POWER specialists only.
- Warranty exclusions:
  In particular, losses over which the manufacturers have no direct or indirect control, such as:
  - faulty design and installation (e.g. fuel supply, hydraulic/electrical connections, flue gas extraction)
  - commissioning, servicing and repairs by purchasers and third parties
  - natural wear and tear
  - faulty, negligent treatment, alterations, repairs
  - unsuitable equipment/material, unauthorised lubricants
  - use of heating water that does not meet applicable technical guidelines
  - chemical, electrochemical and electrical influences
  - use of drinking water that is not in accordance with the generally recognised technical rules

The warranty provisions specified in the general terms and conditions of EC POWER A/S and EC POWER GmbH in the current version apply.

1.2.3.1. Rescission and complaints

Should the XRGI system be defective in fact or law (hereinafter: 'defective') at the time of delivery and should the cause for this defectiveness already have existed at the time of the passage of risk, the Purchaser will be entitled to subsequent performance, at the discretion of EC POWER, either by having the defect remedied or by delivering a substitute device. Should subsequent performance fail, the Purchaser may reduce payment or rescind the contract at his discretion (T&Cs section 8).

We cannot accept liability for any defects which are the result of (T&Cs section 7):

- improper use, incorrect assembly and/or commissioning, negligent operation or use of unsuitable equipment/material, lubricants, lubricant additives, water and/or replacements by the Purchaser or third parties, natural wear and tear, faulty construction work, chemical, electrochemical or electrical influences;

- the Purchaser failing to meet his obligations to investigate and complain duly under § 377 of the Commercial Code [HGB]. Notice of any defects must be given in writing within 10 days of receiving the supplied goods at their destination or, if they could not be detected by due examination, within 10 days of their being discovered;

- the Purchaser being in arrears with payment.

1.2.4. What to do in the event of an emergency

1.2.4.1. Gas smell

In the event of gas smell, please proceed as follows:

- Do not operate any electrical switches or remove any power plugs.
- Do not operate any electric bells.
- Do not use matches or lighters.
- Do not smoke.
- Do not use any telephone, radio telephone or mobile phone in the risk area.
- Open all doors and windows immediately.
- Extinguish all flames immediately.
- Close the stop-cock on the gas meter or main stop-cock in the basement immediately.
- Having closed the main stop-cock, close the gas stop-cock on the XRGI connection panel and check that the gas fittings of all other equipment are closed. Close all gas fittings that are still open (pilot lights, gas fridges, etc.)
- Warn your fellow residents and leave the building.
- Keep all lights switched off as long as you can still smell gas.
- Do not just rely on your own sense of smell, ask others for help.
- If you cannot find the reason why you smell gas, even though all gas fittings are closed, call your gas supplier (utility) immediately. This includes cases in which there is only a slight smell of gas and you cannot find the origin of the smell.
- If you smell gas from areas you cannot access immediately, call the police and/or fire brigade who are authorised to gain access immediately, and inform your gas supplier at the same time.
- If you suspect there is a gas leak in the basement, ventilate the basement well, but do not enter; inform the other residents and your gas supplier at the same time.
- Do not attempt to correct any problems or damage to the gas systems yourself. These may be corrected by specialists only, i.e. your gas supplier's staff and installation contractors.
- Keep the damaged area free to enable emergency services to access.

1.2.4.2. Fire or water ingress

In the event of fire or water ingress, please proceed as follows:

- Switch off the all-pole breaker.
- Switch off the main switch of the system.
- Close the stop-cock on the gas pipe.
- Inform your service point.
- In the event of a fire, close the gas stop-cock on the connection panel and the main stop-cock of the gas line, cut off the fresh air supply to the fire and inform your local fire brigade.
- Only use suitable fire extinguishers to put out the fire.
- Warn your fellow residents and leave the building.

1.2.4.3. Flue gas smell

In the event of flue gas smell, please proceed as follows:

- Shut system down.
- Open windows and doors.
- Inform your heating contractor.

1.2.5. Frost protection

If you are gone during a period of frost, make sure the XRGI system remains in operation and keeps the premises at the right temperature.

Note: frost protection and monitoring devices will only work when the main unit switch is set to '1' and it is connected to the grid.

One way of protecting the XRGI system against frost is to drain it; but you must ensure it is drained completely. Consult your authorised EC POWER specialist.

1.2.6. Contact risks

Any cover that can only be removed with keys or tools, etc. conceals components which can cause injuries when touched (hot and/or live components). Such covers must be removed by authorised EC POWER specialists only. The door of the IQ-Control Panel is there for your protection, and may only be opened by trained electricians. The main switch (red switch) is on the left-hand side of the IQ-Control Panel. When it is switched on, you risk getting an electric shock if you touch any of the control components. The IQ-Control Panel contains sensitive electronic components. If they are not handled professionally, the system may be damaged. The Power Unit hood is there for your protection. When you open it, be aware of the following in particular:

- The engine gets hot. When you touch it or many other components, you risk getting burned.
- The safety hood covers parts which rotate when the Power Unit starts and is running. Touching these parts while the Power unit is running is potentially life-threatening. Only authorised and instructed personnel may touch components under the hood. When checking the Power Unit visually in operation, watch out for loose clothing and jewellery which may get caught by rotating parts.
- The generator and many other components are connected to the grid. Touching non-insulated parts is potentially life-threatening.
- Anyone near a running XRGI system with an open hood risks having their hearing damaged. Please wear suitable hearing protection when the hood is open.

1.2.7. Combustion air supply

Check that the XRGI system's combustion air supply is unimpeded. Do not position any equipment with extractors, such as fans, tumble driers or dehumidifiers close to the XRGI system without consulting your authorised EC POWER specialist first. Before fitting moisture-tight windows, check with your authorised EC POWER specialist to ensure there is still a sufficient supply of combustion air for your XRGI system.

The Power Unit's combustion air supply must not contain any solvents or halogen compounds, which cause corrosion and damage when the Unit is operated.

Halogen compounds are used in industry, trade and domestic products.

Warning! Sealing air inlets may cause incomplete combustion and generate carbon monoxide, which is toxic.

Main known sources of incomplete combustion are the following:

Industrial sources	
Chemical cleaners	Trichloroethylene, a hydrofluorocarbon
Degreasing baths	Perchlorethylene, trichloroethylene, methylene chloride
Printing works	Trichloroethylene
Cooling equipment	Methyl chloride, trichlorofluoromethane, dichlordifluoromethane
Domestic sources	
Cleaners and degreasing agents	Perchlorethylene, methyl chloroform, trichloroethylene, methylene chloride, carbon tetrachloride, hydrochloric acid
Hobby areas	
Solvents and thinners	Chlorinated hydrocarbons
Spray cans	Hydrofluorocarbons (Frigen)

This list does not claim to be exhaustive.

One commonly found factor in practice are the solvents used in cleaners, adhesives and paints. Chemical cleaners and degreasing baths can give off halogen compounds, as may floor adhesives and others. Construction varnishes, paints and adhesives made in Germany have been made without halogenated hydrocarbons for some years now. Free halogen compounds arise mainly if CFC-based paint strippers or adhesive removers are used, and when boiler rooms are painted anew. The bleaching lye or hydrochloric acid often used for disinfection and cleaning purposes can also cause corrosion.

Professional craftspeople have more or less ceased using HCFC-based spray paints and adhesives.

If you cannot eliminate halogenated hydrocarbon sources, such as in a hairdressing salon, swimming pool, dry cleaners, etc. you must ensure the combustion air supply is taken only from unpolluted areas.

1.2.8. Filling and top-up water

The heated water must be used for heating purposes in closed circuits only and must not be bled off to be used.
Engine circuit water is filled and topped up from the heating circuit via the shutoff valve in the Q60-Heat Distributor. Check that the heating water meets VDI 2035 requirements.
Knowing the water hardness according to the detergents law is not sufficient: you need to ask your water supply company what its carbonate and/or calcium hardness is.
Stating carbonate hardness is normally sufficient. If you know both the carbonate and calcium hardness, use whichever value is lower to give the permitted water flow in Tables 1-3 in [°dH].

We advise you comply with the following safety precautions:

- Minimise top-up water requirements by fitting shutoff valves that can be closed during repairs and regular checks of the expansion vessel.
- Adding chemicals to stabilise hardness is not advised, as lime may be precipitated as sludge.
- Softening and deionisation by cation exchange, ion exchange or reverse osmosis are the most reliable methods to prevent scale formation.

Table 1-1: Converting carbonate hardness ($K_{S4,3}$): [°dH] = 2.79 * [mol/m³]

[°dH]	1	2	4	6	8	10	12	14	16	18	20	22	24
[mol/m³]	0.4	0.7	1.4	2.1	2.8	3.6	4.3	4.9	5.6	6.4	7.2	7.9	8.6

Table 1-2: Converting calcium hardness (Ca^{2+}): [°dH] = 5.59 * [mol/m³]

[°dH]	1	2	4	6	8	10	12	14	16	18	20	22	24
[mol/m³]	0.2	0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.8	3.2	3.6	4.0	4.3

Table 1-3: Total capacity of the heating water system

Water hardness factor	soft			Moderately hard					hard					very hard
Water hardness [°dH]	<1	1	2	4	6	8	10	12	14	16	18	20	22	24
Permitted fill and top-up water flow V_{max} [l]	30,000	5,600	2,800	1,400	930	700	560	470	400	350	310	280	250	230

You also need to check that the pH value of the fill and top-up water is in accordance with VDI 2035. As major engine components in contact with water are made of aluminium, a pH value of 8.2 to 8.5 is ideal.

1.2.9. Installation

Before installing your XRGI system, you must consult your gas supply company and district master chimney sweep, and obtain your electricity supplier's consent.
The system must only be installed by an authorised and trained EC POWER specialist, who will be responsible for proper installation and commissioning.

1.2.10. Installation area and space required

When deciding where to install the system, follow local rules for furnace rooms, your energy supplier's instructions and TRGI. The installation area must be fitted with the air vents specified by TRGI rules. It should also be frost-free. If you are using propane gas as fuel, observe TRF 2008 requirements.

The Power Unit must not be set up in the immediate vicinity of air inlets (freezing risk when turned off). The minimum footprint required to set up a Power Unit is approx. 4 m². It must be accessible from all sides for the required maintenance work to be performed. The maintenance clearances shown below should be observed:

Fig. 1.0. Top view

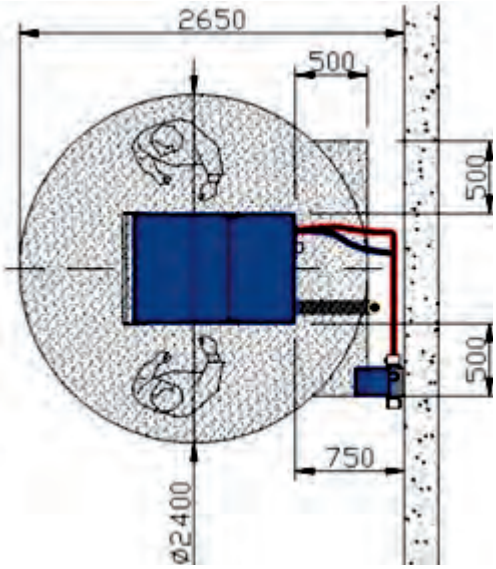
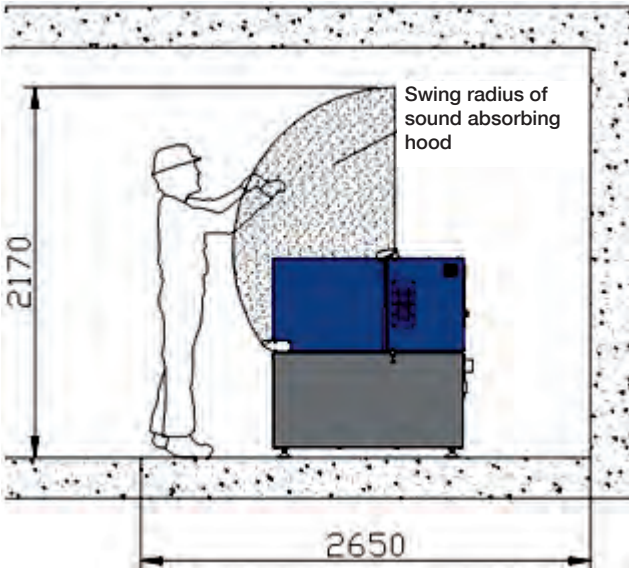


Fig. 1.1. Side view



The room temperature should not exceed 35 °C. Transient temperatures may reach 40 °C, but this will shorten the service life of some components (electronic modules). The room must be fitted with mechanical extractors and temperature controlled if necessary.
The room should be dust-free to avoid reducing the service life of the air filter.

1.2.10.1. Alterations in system surroundings

No alterations may be made to the following devices:

- Heater unit
- Gas, air inlet, water or electricity (pipe)lines
- Flue gas exhaust pipe
- Safety valve or heating water runoff pipe, and to any structural components that could affect the reliability of the Unit.

Note: XRGI system components must not be modified without EC POWER's prior consent in writing.

1.2.10.2. Explosive and highly inflammable substances

Do not use or store any explosive or highly inflammable substances, such as petrol, paper or inks, in the area where the unit is installed. Do not use any sprays, solvents, chlorine-based cleaners, dyes, adhesives, etc. close to the Unit. Such substances not only provide ignition risks, but may also cause corrosion, e.g. in the flue gas unit.

1.2.11. Transportation and accommodation

The Power Unit weighs around 750 kg. The risks pass to the client when the XRGI system is handed over to the shipper or carrier or when it leaves the works or dispatch warehouse, whichever is the sooner, even if Carriage Paid To destination is agreed (T&Cs section 5).

The best way of shipping the Power Unit is on a platform truck for Euro pallets. In order to lift the Power Unit the platform truck must be brought underneath the device fully and centrally. The Power Unit must be installed in one piece, and must not be put vertically or laid on its side when being shipped. Tip angles of 45-50, e.g. when the Unit is carried over steps, by crane, etc. must not be exceeded. It cannot be delivered in parts and assembled on site. See section 2.1.1.2 for Power Unit dimensions. Damages to the Power Unit cannot be ruled out completely, despite all quality assurance measures. Should the Power Unit be badly damaged, e.g. the engine or generator, it can only be repaired at the factory. So bear in mind that the Power Unit may have to be removed again as a whole. For the terms and conditions governing the installation and removal costs in these cases, please see the sales and partnership contracts.

1.2.12. Base

The Power Unit must be put on a level base to avoid movements due to vibration. The base must be strong enough to carry the Unit's weight. The base must be watertight and non-inflammable.

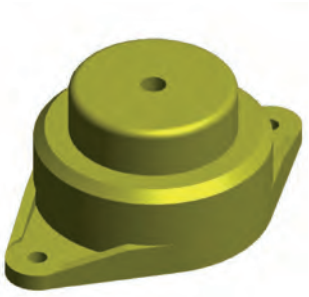
1.2.13. Soundproofing

The Power Unit comes with high-grade airborne and solid-borne soundproofing. (<49 [±2] dB (A), at 1 m distance with hood closed); but noise-sensitive areas should be taken into account when deciding where to install it. To avoid solid-borne noise carrying into building structures, all connections between the XRGI and building systems must be made via flexible connections (hoses) or suitable soundproofing expansion joints. When installing the flue gas pipe, only clips with sound-insulating lining must be used (class T160). Under no circumstances may the flue gas pipe come directly into contact with building structures. Combustion engine flue gases pulse in time with engine combustion cycles and stress the flue gas pipe accordingly: they cannot be compared with the even flue gas flow from boilers.

Although the Power Unit is well insulated against airborne and solid-borne noise, additional measures may be required in noise-sensitive areas close to the Power Unit.
One tried and tested solution to solid-borne noise is to set the Power Unit on a reinforced concrete plinth (dimensions L x W x H = 1400 x 800 x 200 mm, weight approx. 500 kg), which itself fully rests on Sylomer insulation, such as Puroplan 1.5/50 yellow (two-layer), made by Moschner & Partner.

Alternatively, noise-reducing feet are available which reduce solid-borne noise transmission to the building itself.

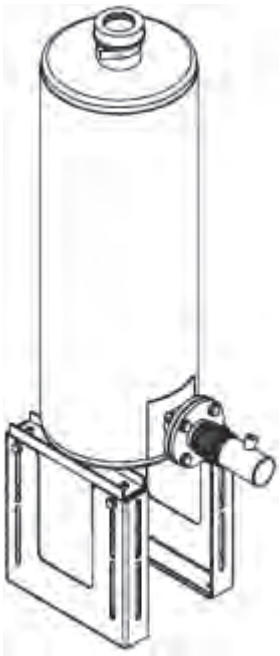
Fig. 1.2.



The base tray has an integrated flue gas silencer to reduce flue gas noise. This is sufficient in many cases. If flue gas noise has to be reduced to a minimum, an extra flue gas silencer is available, which is installed behind the XRGI.

Consult a building engineer if necessary.

Fig. 1.3.



2. XRGI 20G-TO SYSTEM COMPONENTS

2.1. MAIN XRGI SYSTEM COMPONENTS

The XRGI 20G-TO system consists of three main components:

POWER UNIT XRGI 20G-TO

Functions:

- Generates heat
- Generates electricity
- Safety functions
- Power control

Fig. 2.0.

IQ20-CONTROL PANEL

Functions:

- Connects to the grid
- Electrical safety features
- Controls the XRGI 20G-TO
- Displays status and output
- E-mails data

Fig. 2.1.

Q60-HEAT DISTRIBUTOR

Functions:

- Controls engine water temperature
- Discharges the storage tank
- Manages the storage tank

Fig. 2.2.

2.1.1. Power Unit 20G-TO

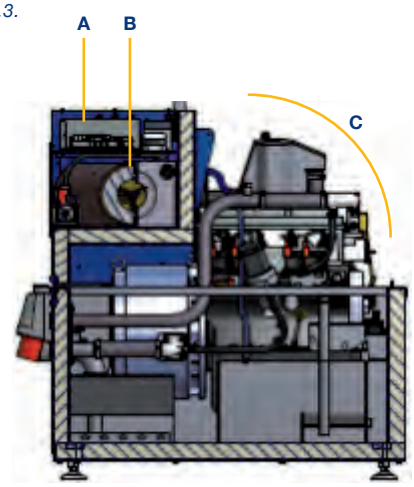
2.1.1.1 Structure

The main Power Unit components are:

- Engine
- Mixture control
- Generator
- Cooling circuit
- Engine electronics

The Power Unit turns gas into electricity and heat.

Fig. 2.3.



Key:

A	Electrical components and safety circuit
B	Air filter and mixture control (ventilated area under partial vacuum)
C	Soundproofed, thermally insulated engine compartment
1.	Silencer (integrated)
2.	Water-cooled generator
3.	Exhaust cooler (not visible)
4.	Oil sump
5.	Toyota gas engine (4-cylinder engine)
6.	Oil separator (patented)
7.	Oxidising catalytic converter (not visible)
8.	Primary circuit return (1 ¼“ PT)
9.	Primary circuit flow (1 ¼“ PT)
10.	Exhaust connection (twin tube, di 60 mm, da 100 mm) (not visible)
11.	Gas connection (¾“ PT)
12.	Electricity connection (CEE 63 A)
13.	Air filter
14.	Gas safety circuit
15.	Hood with gas compression springs
16.	Sparkplugs
17.	Oil filter (upright, water-cooled)
18.	Oil change upright pipe

Fig. 2.4.

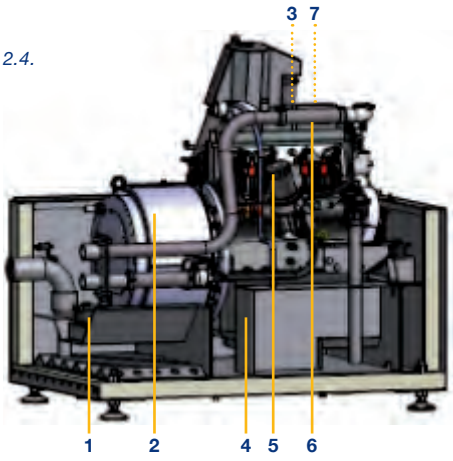
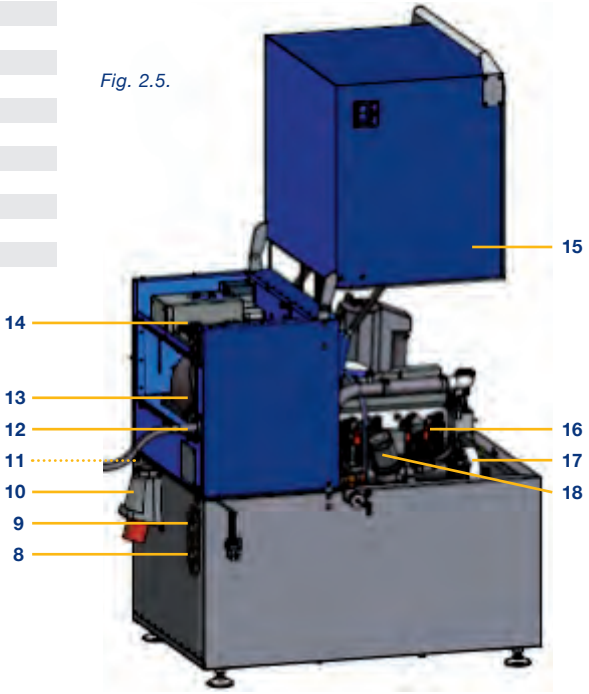


Fig. 2.5.



2.1.1.2. Dimensions and connections

Fig. 2.6.

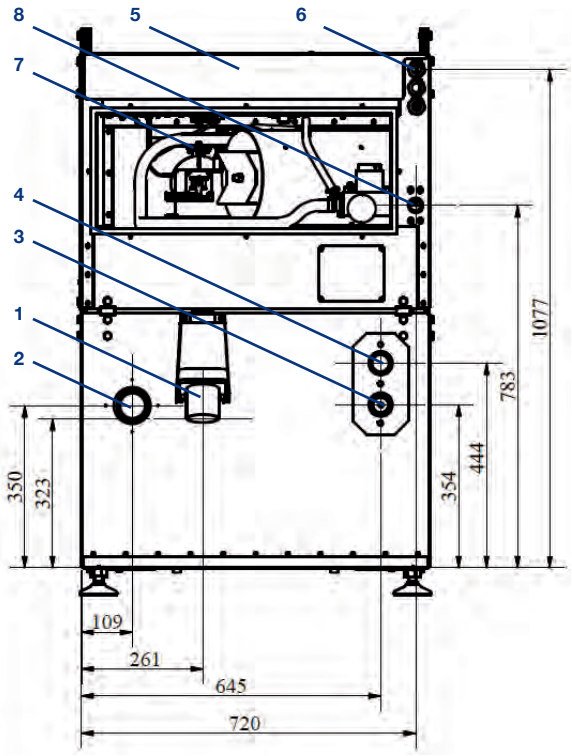


Fig. 2.7.

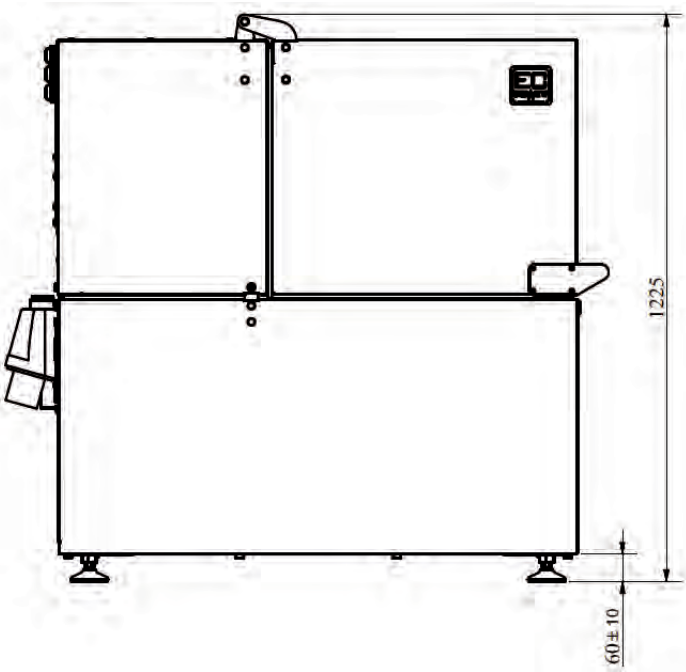
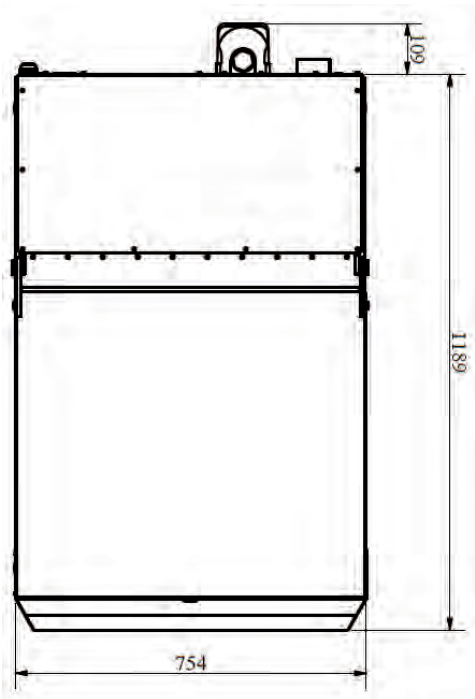


Fig. 2.8.



Key:

8. Space for the installation of a control board, a safety circuit and the electrical ignition

7. Space for the installation of an air filter, a gas pressure controller, a stepping engine and a gas mixture control

6. Control cable to IQ-Control Panel (1 x 2 x 0.75 mm² shielded + ground connection / 1 x 4 x 0.75 mm² shielded + ground connection / 1 x 10 x 0.75 mm² shielded + ground connection)

5. Gas connection ¾“ PT

4. 1 ¼“ PT flow to Q60-Heat Distributor

3. 1 ¼“ PT return from Q60-Heat Distributor

2. Exhaust connection (double-walled DN 60/100 aluminium tube)

1. 63 A CEE plug for generator cable 4 x 10 mm2 to IQ-Control Panel

2.1.1.3. Functioning

The generator is attached directly to the engine, thus minimising the required maintenance. The gas safety circuit, engine control and temperature control relay are integrated in the Power Unit.

2.1.1.4. Settings

Gas settings may only be made by authorised persons. See commissioning instructions for details.

The engine is equipped with automatic valve clearance adjustment (hydraulic tappets). No settings are required at the engine.

2.1.1.5. Technical data

XRGI 20®

Noise level:	49 dB(A)
Dimensions (L x W x H):	125 x 75 x 115-125 cm
Weight:	750 kg
Service interval:	6,000 hours
Primary energy factor:	0,36
Fuels:	Natural gas (all qualities), propane, butane
Power output (modulating):	10 - 20 kW
Electrical efficiency:	32 %
Thermal output excluding optional condenser:	25 - 40 kW
Thermal efficiency:	64 %
Total efficiency excluding optional condenser:	96 %
Emission levels (new device):	CO < 50mg/Nm³, NO_x < 100 mg/Nm³ (< ½ TA air)
Oil capacity:	50 l
Generator:	4 pole asynchronous
Rated speed:	1500 min^{-1}
Exhaust temperature:	< 110° C
Exhaust flow:	70 scm/h

All values are net and have been certified by an independent inspection body.

2.1.2. IQ-Control Panel

2.1.2.1. Structure

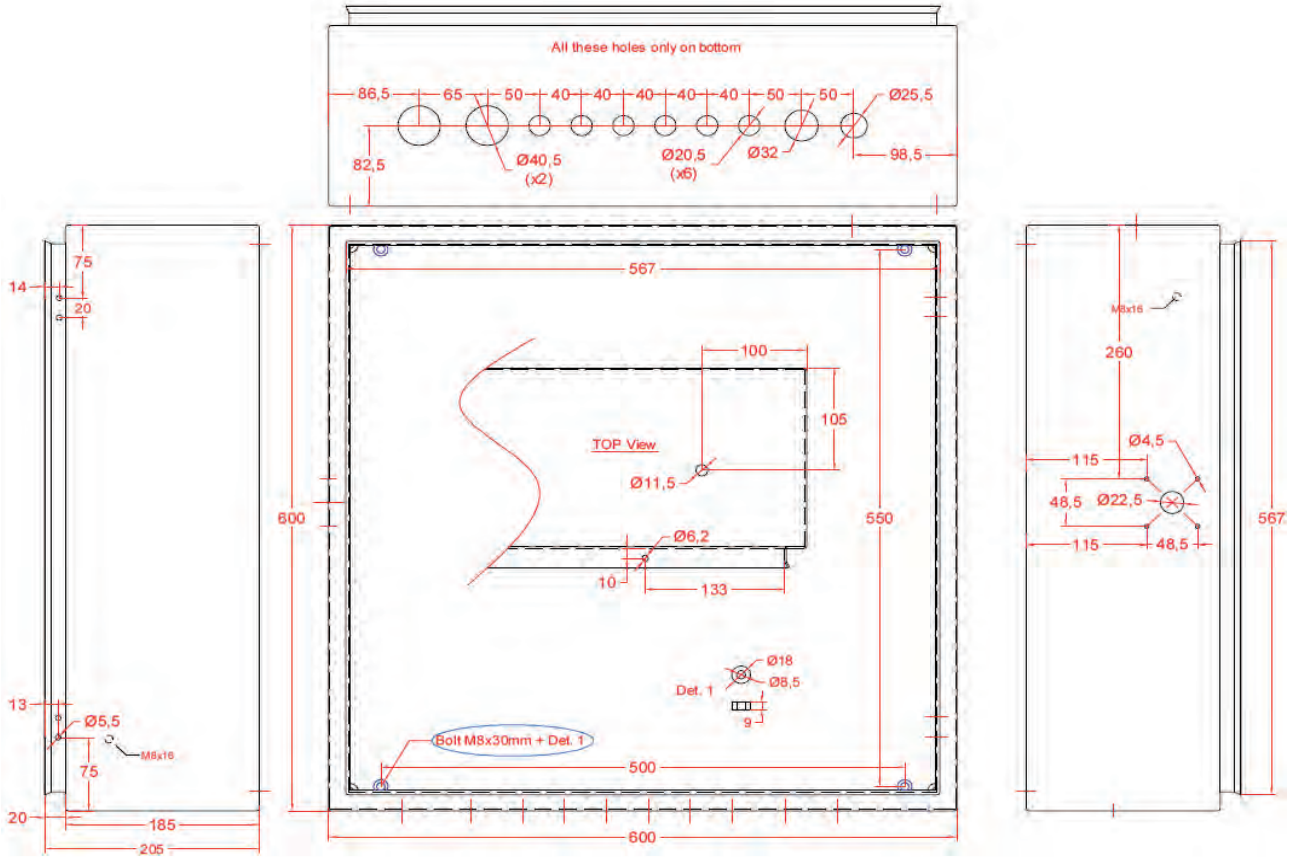
The IQ-Control Panel provides:

- Controller
- Power control system
- Electricity meter (output)
- Hardware and software for the operating strategy
- Data recording and analysis
- Communications with service database
- Interfaces for external connections

Fig. 2.9.

2.1.2.2. Dimensions and connections

Fig. 2.10.



2.1.2.3. Functions

The IQ-Control Panel is used to operate the system.

1. Mains breaker: main on/off switch for the IQ-Control Panel and the Power Unit. (Note: Q60-Heat Distributor is powered separately)
2. Soft starter: starts generator as engine
3. Auxiliary relay: soft starter auxiliary relay
4. RCD Type A: residual current protection
5. Fuses: surge protection
6. Output meter: measures the generator's electricity production.
7. Modem power supply (12 V)
8. Modem: sends data to EC POWER Service Database
9. Automatically operating circuit breaker: network monitoring device
10. Main board power supply (12 V)
11. Main board: communication interface with system
12. Board: system processor

2.1.2.4. Settings

The settings for the IQ-Control Panel are made on control field at the front of the device. The IQ-Control Panel is started with the switch on its left side.

2.1.2.5. Technical data

	IQ20 XRGI (17ELD1008)	IQ20 XRGI (17ELD1010) UK
Dimensions (L x B x H):	600 x 210 x 600 mm	600 x 210 x 600 mm
Weight:	40 kg	40 kg
Power:	3 phase + N + earth, 400 V	3 phase + N + earth, 400 V
Max. ambient temperature:	40 °C	40 °C
Soft starter:	Allan Bradley SMC-3 150-C43NBR	Allan Bradley SMC-3 150-C43NBR
Contactor:	Allan Bradley 100-C43KF00	Allan Bradley 100-C43KF00
RCD Type A:	Schneider 30MA 63A 4P.	Schneider 30MA 63A 4P.
Electricity meter:	Carlo Gavazzi EM24 AV9 P2	Carlo Gavazzi EM24 AV9 P2
Mains monitoring relay:	Carlo Gavazzi DPC72DM48B002 VDE 0126-01	Megacon KCG598E G59-2
Fuse and cable dimensions:		
Interface cable: Fuses: Automatic circuit breaker:	63A / 16 mm² Cu Neozed GL Type D	63A / 16 mm² Cu Neozed GL Type D

2.1.3. Q60-Heat Distributor

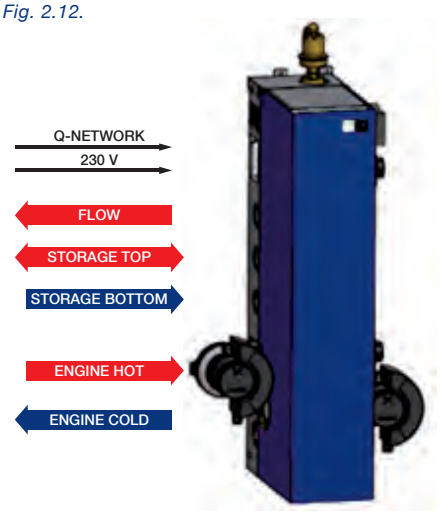
2.1.3.1. Structure

The Q60-Heat Distributor plays an important role in the XRGI 20G-TO system: .

- Separates (primary) engine circuit from the heating network
- Protects primary circuit
- Controls the engine temperature
- Controls the system temperature
- Manages loading and unloading of the storage tank
- Manages energy flows

Fig. 2.11.

Fig. 2.12.



Key:

1. Expansion vessel
2. Two connections for Q-Network and two for the IQ-Control Panel and Power Unit
3. Automatic microbubble separator
4. Mixer to control the flow temperature
5. Storage tank connections (1 ¼“)
6. Power Unit connections(1 ¼“)
7. Mixer to control the engine temperature
8. Dirt pan with outlets for primary and secondary circuit
9. Plate heat exchanger

Fig. 2.13.

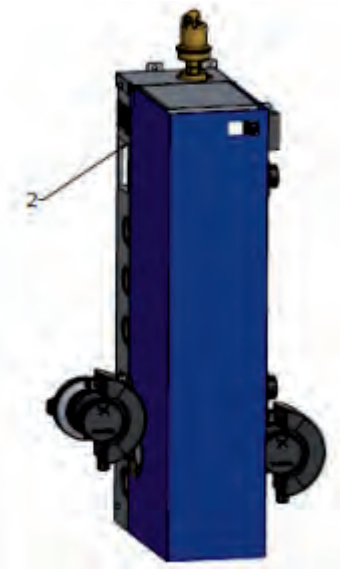
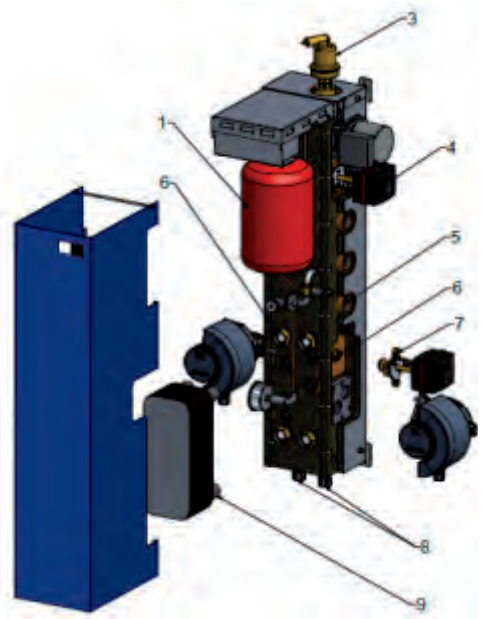
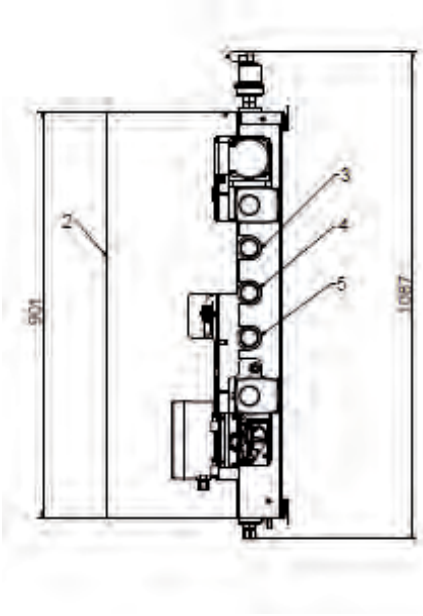


Fig. 2.14.



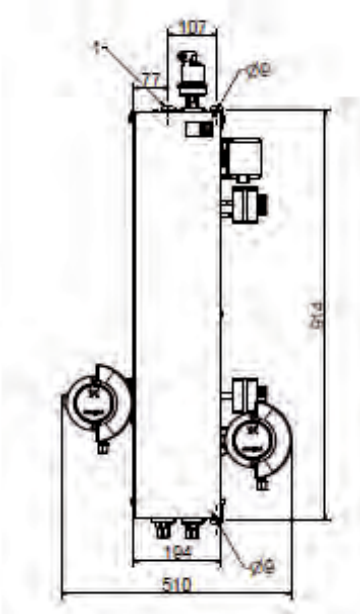
2.1.3.2. Dimensions and connections

Fig. 2.15.



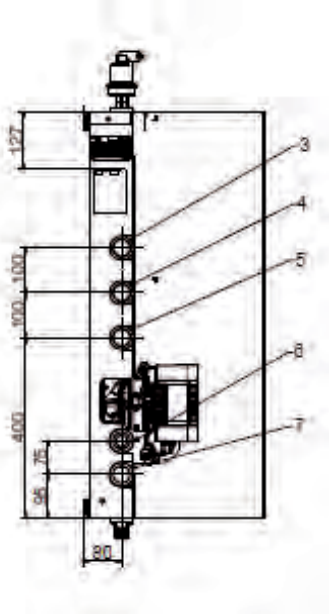
Right

Fig. 2.16.



Front

Fig. 2.17.



Left

Key:

1. Installation plate
2. Cover (insulated)
3. Grid feed (1 ¼“ PT)
4. Storage tank connection top (1 ¼“ PT).
5. Storage tank connection bottom (1 ¼“ PT)
6. Power Unit flow (1 ¼“ PT)
7. Power Unit return (1 ¼“ PT)

2.1.3.3. Function

The Q60-Heat Distributor separates the engine circuit (Power Unit cooling water circuit) from the heating system via a plate heat exchanger. The expansion vessel thus protects the engine circuit. The circulation pump for the engine circuit is fitted to the bottom left of the primary and secondary Q60-Heat Distributor circuits and is equipped with a specially modified connection on the pump housing for the Q60-Heat Distributor.
Once the Q60-Heat Distributor is connected to the mains, the circulation pumps run for 5-10 seconds to check their proper functioning.
The pumps do not require any adjustment. They start together with the Power Unit, and stop approx. 5-10 min. after the Power Unit has shut down. These high-efficiency pumps have a maximum power consumption of 185 W. Their power is controlled by the Q60-Heat Distributor as required. At maximum power, they circulate up to 6 m³/h.

The system is designed to maximise the storage tank charge temperature (80-85 °C). The storage tank charge group (bottom right in the Q60-Heat Distributor) controls the engine temperature via the mixer and the speed-controlled circulation pump.
The storage tank discharge group (top right) supplies the heating system with the desired heat.
The Q60-Heat Distributor is equipped with a self-learning control system which monitors the charging and discharging process and controls the system accordingly.
The charging and discharging of the storage tank enables the Q-Network to:

- provide optimum storage tank management
- maintain an efficient operation of the boiler and/or heat pumps
- pass heat to heating system without any pressure differential
- allow the simple setting up of multi-module systems

2.1.3.4. Settings

The Q60-Heat Distributor does not need to be adjusted after installation.
Open the isolation valve upstream of the expansion vessel when filling the engine circuit.
Close the isolation valve between the primary and secondary sides before filling water into the secondary side.

2.1.3.5. Technical data

	Q60 (17D1108)
Dimensions (H x W x D):	1100 x 500 x 390 mm
Weight:	68 kg
Connections	
Pipe:	PT 1 ¼“
Storage tank discharge pump:	Grundfos: UPS 15-60 (105 W)
Storage tank charge pump:	Grundfos: Magna 25-100 (185 W)
Engine circuit	
Pump:	Grundfos: Magna 25-100 (185 W)
Plate heat exchanger:	Danfoss: XB 10-1 50
Q-Network Connections:	Storage Control Boiler Control Flow Control
Connection:	Load Sharer
Power consumption at full load:	254 W
Standby consumption:	22.7 W

2.2. XRGI SYSTEM ACCESSORIES

2.2.1. Q-Network

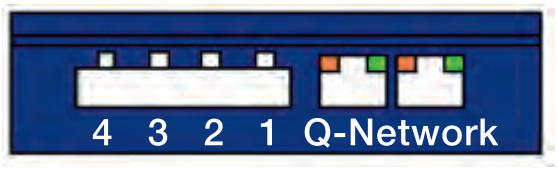
The XRGI control system is based on two logical networks:

1. Control network
2. Q-Network

Both systems use the conventional hierarchical master/slave strategy, with the master controller alone being able to access the common resource of its own accord. The slave controller cannot access the common resource of its own accord; it must wait until it is asked by the master controller.
All network units have two RJ45 ports per board. The IQ-Control Panel is master for the control network and hence for the Power Unit and the Q60-Heat Distributor. The Q60-Heat Distributor is master for the Q-Network and hence the interface between the two logical networks, so it has two boards and four ports.

Each RJ45 port has two LEDs (e.g. the Storage Control in Fig. 2.17):

Fig. 2.18.



The LED on the left (orange) shows the link status:

- Display off = System off
- Continuously on = Connected
- Flashing = Communicating

The LED on the right indicates the operating status:

- Display green = Everything OK
- Continuous red = Unit is connected to wrong network, or there is no space for more Power Units
- Flashing red = Error (see relevant product specifications)

The control network consists of the IQ-Control Panel (master), the Q60-Heat Distributor and the gas safety circuit (both slaves). In the Q60-Heat Distributor, the control network is arranged on the left-hand side (both sockets by the wall).
The Q-Network consists of the Q60-Heat Distributor (master) and the three downstream Q-Network members Storage Control, Flow Control and Boiler Control (all slaves). The network members that belong together are looped via the network cable (not star cabled).
Each Q60-Heat Distributor can control up to 20 slaves. There may only be one Flow Control in the network, but multiple Storage Controls.
Installations with multiple Power Units have their Q-Networks linked via a Q-Network Cable.

The control system and Q60-Heat Distributor(s) poll network members continuously every few seconds and update their functionality. This means that a Storage Control can be added to the network during operation, for example.

Available Q-Network Modules:

- Q-Network Storage Control
- Q-Network Flow Control
- Q-Network Boiler Control
- Q-Network Storage Tank

2.2.2.1. Storage Control

	Storage Control (01ELT2034)
Scope of supply:	Storage Control unit, 4 PT 100 sensor one network cable
Dimensions (H x W x D):	3,5 x 13 x 8 cm
Weight:	165 g
Sensor cable:	3 m
Network cable:	10 m Q-Network Cable (SFTP (CAT 6) network cable)

Flg. 2.19.

The Storage Control manages charging and discharging the storage tank.

Each XRGI system must be equipped with at least one Storage Control.

Note: a Storage Control unit is required if the EC POWER 475-litre storage tank is not used. The Storage Control is built into the EC POWER storage tank and only requires a network cable to connect it to the Q-Network.

Configuration
The Storage Control is a self-configuring sensor system. The sequence of the sensors within the storage tank is very important; it must start at the top with sensor 1 and run downwards to sensor 4 at the bottom. However, the sequence of the storage tanks is detected when they are charged for the first time and then assigned automatically.

Function
With its four temperature sensors the Storage Control measures the temperature layers (hot/cold transition) in the storage tank, and uses this data to calculate the storage level.
The EC POWER Storage Tank separates the cold return water from the hot water using a natural mixing layer. The mixing layer is a limited mixing of hot and cold water. It is essential for the storage capacity that this mixing layer is kept as small as possible. This is why the EC POWER system ensures that this layer is regenerated every time the storage tank is filled. With the multi-sensor system it is therefore possible to use the mixing layer to determine very precisely how the storage tank is to be filled. This optimizes the operation of the XRGI system so as to use the storage capacity to the full.

In order of priority, the storage tanks are used to:

- ensure that the XRGI runs for a reasonable amount of time. Reasonable operating times are ensured by waiting for a certain volume at the bottom of the storage tank to be cold before the XRGI system is allowed to start up.
- cover the building‘s peak heating loads with the output of the XRGI: when the residual heat capacity in the upper part of the storage falls below a certain amount, the XRGI starts up.
- ensure power-controlled operation (depending on electricity consumption and price). With an operating range between the heat and cooling reserve it is possible for the control to optimize operation and hence to allow power-controlled operation. This means that heat is produced at the times when it is financially most favourable.

The optimum position of the cooling and thermal reserves varies over time.

- If the XRGI system is to cover the average heat consumption (typically in spring/autumn), the optimum positions of the sensors are at the bottom of the storage tank.
- And conversely: in summer, when heat is usually consumed for 5 -10 hours a day, the optimum positions are at the top of the storage tank.

The Storage Control selects the optimum sensor positions based on demand and operating patterns.

2.2.1.2. Flow Control

	Flow Control (01ELT2031)
Scope of supply:	Flow Control unit, two PT 100 sensors, two assembly clips, one network cable
Size (H x W x D):	3.5 x 13 x 8 cm
Weight:	165 g
Sensor cable length:	3 m
Network cable:	10 m Q-Network cable (SFTP (CAT 6) network cable)

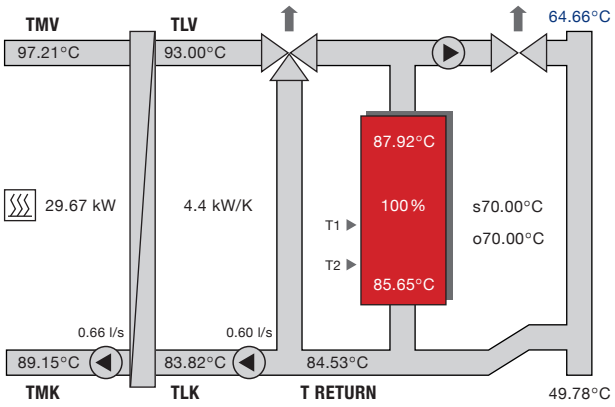
Fig. 2.20.

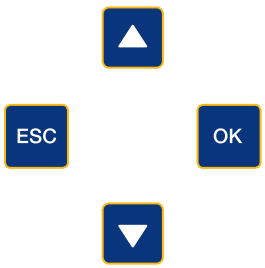
The Flow Control regulates how much heat the Q60-Heat Distributor releases to the heating system.

The Flow Control can only be used in installations with an XRGI Power Unit connected as installation 3.

Configuration
The set point (S) of the flow temperature is adjusted in the IQ-Control Panel.

Fig. 2.21.





- Press **OK** on controller.
- Select Storage status. Display shows *Fig. 2.21.*
- Press **OK**, then use the cursor keys ▲ and ▼ to select the set point you require (max. set point 75 °C)
- Press **ESC** to save the settings and to exit the menu.

Note: if a boiler is connected, its thermostat temperature must be set at least 5°C lower than the Flow Control set point to make sure the XRGI system is prioritized in the provision of heat.

Function
When the storage tank is full the Flow Control tries to achieve the desired mix temperature (set point).

The mix temperature is selected by entering the set point. As soon as the mix temperature falls below the set point, the control valve opens and the discharge pump in the Q60-Heat Distributor starts up.

When heat consumption is lower or when the return temperature is high the storage tank is filled. The system stops once the tank is full. It only resumes operation when the storage tank has sufficient cooling capacity to provide a stable operating period. When the XRGI system is disabled, heat is delivered from the storage tank.

If heat consumption is higher, however, the storage tank makes up the lack of heat. Once the storage tank has been emptied completely (the temperature at the top of the storage tank drops), the Flow Control selects a reduced set point temporarily in order to maintain the layer temperature and maximum heat generation.

Without a layer temperature the system is unable to maintain a stable flow temperature as long as the storage tank is not full.

With a cold start the Flow Control starts by creating layers in the storage tank. Only then does the control valve open and the discharge pump start. This ensures that the maximum heat output is rapidly available.

2.2.1.3. Boiler Control

	Boiler Control (01ELT2033)
Scope of supply:	Boiler Control unit, one control cable, one network cable
Size (H x W x D):	3,5 x 13 x 8 cm
Weight:	165 g
Cable length:	3 m
Cable dimensions:	3 x 0.5 mm²
Network cable:	10 m Q-Network cable (SFTP (CAT 6) network cable)

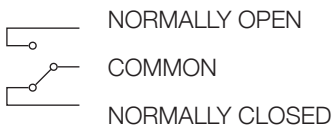
Fig. 2.22.

The Boiler Control ensures optimum operation of a peak load boiler in conjunction with the XRGI system.

The Boiler Control can be used if an additional heat source is available in the XRGI system apart from the Power Units.

Configuration
Once the Boiler Control has been installed it does not need to be adjusted further.

Fig. 2.23.

FUNCTION	
R1 Boiler	
off	
on	

WIRING		
NORMALLY OPEN	Brown	MAX
COMMON	White	230 V
NORMALLY CLOSED	Green	3 A

Function

The Boiler Control is used to control the boiler depending on the heat consumption. If more heat is consumed than the XRGI system can generate, the boiler is started. If less heat is consumed than the XRGI system generates, the boiler is blocked.

The Boiler Control is controlled via the top two sensors, S1 and S2, in the storage tank. If the heat consumption exceeds the heat generation by the XRGI system, storage tank sensor S1 will be cold: as a result, the Boiler Control enables the boiler until storage tank sensor S2 is registered as hot. When that happens the Boiler Control blocks the boiler again. If the heat consumption continues to be greater than heat generation by the XRGI system, the storage tank is cooled down, and the boiler is enabled when storage tank sensor S1 goes cold. This avoids short boiler operating times and makes for a better use of energy.

If the boiler is controlled via a Boiler Control unit, the boiler cannot start up by itself and produce heat. Hence it cannot reduce the operating time of the XRGI system.

2.2.1.4. Storage Tank

	Storage Tank (01KIT2500)	Storage Tank (01KIT2501)
Scope of supply:	Storage Tank	Storage Tank
Size (H x W x D):	172 x 69.5 x 69.5 cm	172 x 69.5 x 69.5 cm
Weight:	80 kg	80 kg
Max. op. pressure:	3 bar	6 bar
Network cable:	5m Q-Network Cable (SFTP (CAT 6) network cable)	5m Q-Network Cable (SFTP (CAT 6) network cable)
Thermal capacity:	22 kWh (at 40 °C return temperature)	22 kWh (at 40 °C return temperature)
Capacity:	475 l	475 l

Fig. 2.24.

The EC POWER Storage Tank with built-in Storage Control ensures that the XRGI system saves engine heat until it is required. The Storage Tank retains surplus heat for times when heat consumption is high. The XRGI system thus ensures long operating times, making it more effective.

A storage is essential for the XRGI system to operate properly. The XRGI Storage Tank is of conventional design.

The XRGI Storage Tank holds 475 l of water. The two connections have a nominal diameter of DN 50. Immersion sleeves with an internal diameter of 6 mm are provided for the four XRGI system Storage Tank sensors. A DN 25 bleed and DN20 drain are provided for installation and maintenance purposes.

The Storage Tank is connected to the connections provided: in systems with up to three modules, the minimum dimension is 1 ¼“ PT. Guide plates or inflow tubes must be fitted in the storage tank to smooth the flows.

Note: the storage tank capacity should not be less than 475 l per module.

Configuration
The Storage Tank is fully automatic: no further settings are required once it is installed.

Function
The water in the Storage Tank is heated by the heat exchanger in the Q60-Heat Distributor and stored in the Tank from above. This means that hot water is available at the desired temperature as soon as the Storage Tank starts operating. Surplus hot water can therefore be held in the Storage Tank at times when electricity consumption or tariffs are high and released into the heating system later on.
The EC POWER Storage Tank separates the cold return water from the hot flow water using a natural mixing layer. A mixing layer is a limited mix of hot and cold water. It is essential for the storage capacity that this mixing layer is kept as small as possible. This is why the EC POWER system ensures that this layer is regenerated every time the storage tank is filled. With the multi-sensor system it is therefore possible to use the mixing layer to determine very precisely how the Storage Tank is to be filled. This optimizes the operation of the XRGI system so as to use the storage capacity to the full.

The task for the Storage Tank is to:

- ensure reasonable operating times by providing adequate cooling water before the system starts up.
- cover peak heating loads by providing sufficient residual heat capacity at the top of the storage tank.
- enables power-controlled operation by making optimum use of the thermal and cooling reserves in the Storage Tank. This means that heat is produced at the times when it is financially most favourable.

The optimum position of the cold and hot reserves varies regularly, following the pattern below:

- If the XRGI system is to cover the average heat consumption (typically in spring/autumn), the optimum positions of the sensors are at the bottom of the storage tank, providing larger cooling reserves.
- And conversely: in summer, when heat is usually consumed for 5 -10 hours a day, the optimum positions are at the top of the Storage Tank, providing larger thermal reserves.

How the Storage Tank is used determines the capacity effectively available. Using a Storage Tank like a hydraulic header (four connections) can lead to non-stable or fluctuating stratification in certain operating modes. This upsets the controls and means the storage capacity is not used to the full. This is why Storage Tanks in the XRGI system only have two hydraulic connections, irrespective of the hydraulics selected, e.g. as shown below:

Fig. 2.25.

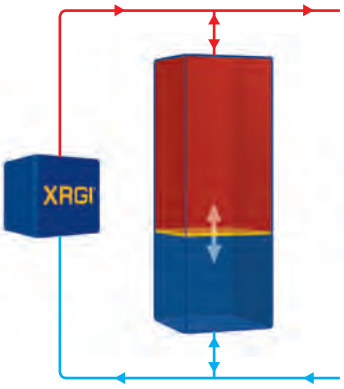


Fig. 2.26.

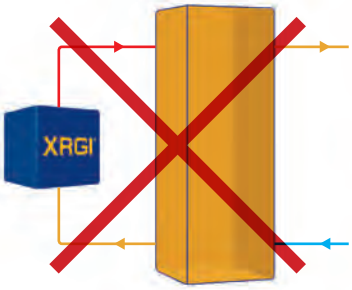
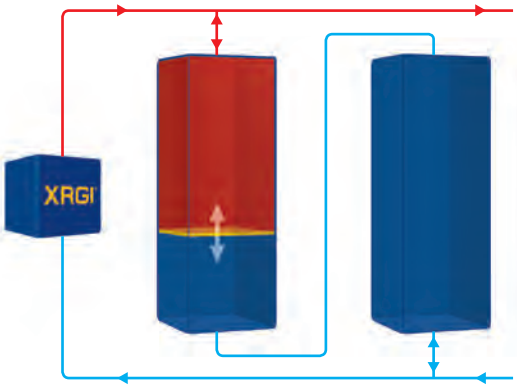


Fig. 2.27.



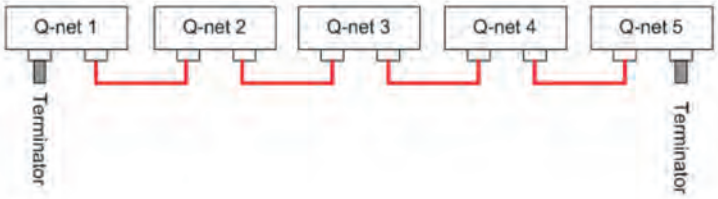
If more than one storage tank is used, they must be connected in series. Experience shows that parallel or Tichelmann circuits do not work satisfactorily.

2.2.1.5. Q-Network wiring

After the IQ-Control Panel, Q60-Heat Distributor and Power Unit have been mounted and the three control cables between the Power Unit, the IQ-Control Panel and the power installation have been established, the network is completed by shielded computer cables (LAN patch cable 1:1, twisted pair, SFTP Cat 6) with RJ45 plugs. EC POWER can supply cables at the required lengths.

Unused RJ45 plugs must be covered with RJ45 (8x8) ISDN network terminators.

Fig. 2.28.



Q-Network components
Connection in random order

ALWAYS termination resistors in first and last unit

Q-Netzwerk-Einheiten
Einbindung in willkürlicher Reihenfolge

IMMER Endwiderstände in erster und letzter Einheit

	Connection type	RS 485
	Cable type	EC POWER Q-Network Cable (due to EMC-emissions)
	Termination	150 Ω
	Connection order	Indifferent
	Communication type	Master Slave
	Verbindungstyp	RS 485
	Kabeltyp	EC POWER Q-Netzwerk-Kabel (wegen to EMC-Störung)
	Endwiderstand	150 Ω
	Verbindungsreihenfolge	Ohne Bedeutung
	Kommunikationstyp	Master Slave

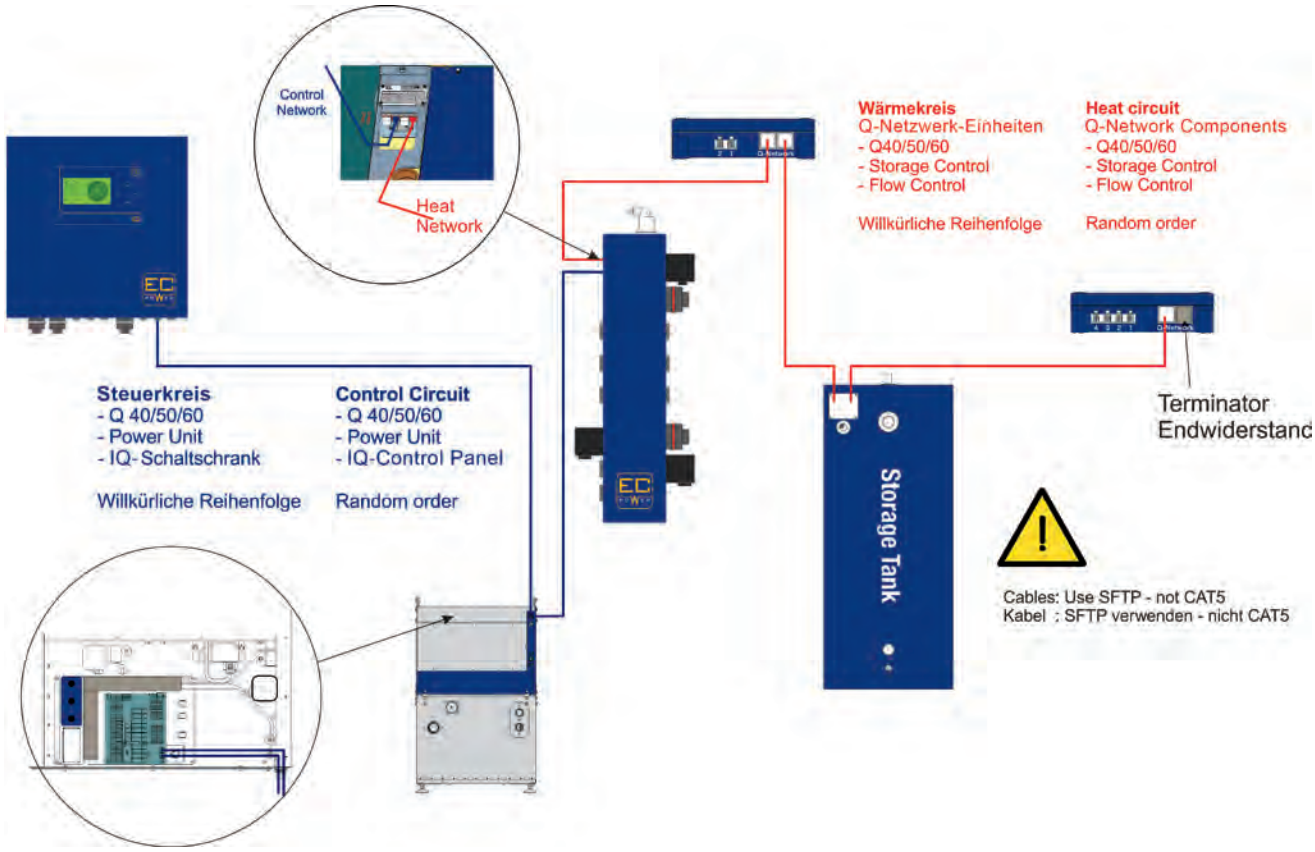
Q-net Cables Q-net Kabeln

Meter	Red / Rot Heat Circuit/Wärmekreis	Blue / Blau Control Circiut / Kontrollkreis
1	01ELU1110	01ELU1116
2	01ELU1111	01ELU1117
5	01ELU1112	01ELU1118
10	01ELU1113	01ELU1119
15	01ELU1114	01ELU1120
20	01ELU1115	01ELU1121

Terminator / Endwiderstand 01ELT2036

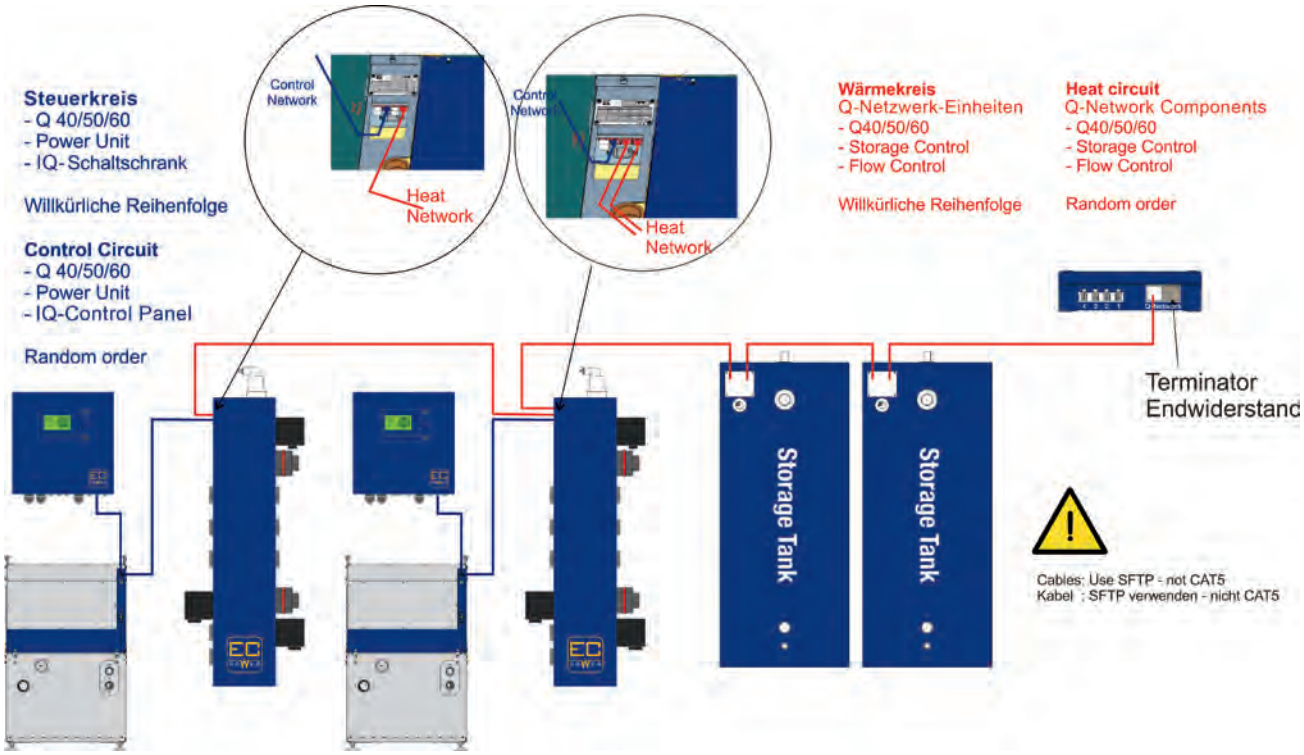
Q-Network Cabling (individual systems)

Fig. 2.29.



Q-Network Cabling (multiple systems)

Fig. 2.30.



2.2.2. Power-controlled operation

2.2.2.1. Load Sharer

	Load Sharer (01ELT2006)
Scope of supply:	Load Sharer Box
Size (H x W x D):	90 x 260 x 160 mm
Weight:	2 kg

Fig. 2.31.

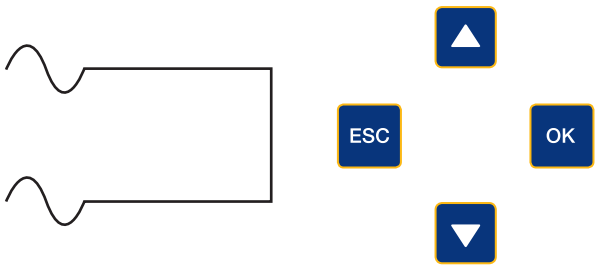
The Load Sharer divides the required system output between the existing XRGI systems in power-controlled mode. It ensures that each XRGI system is started individually. This reduces the amount of start-up current required.

A Load Sharer must be used if multiple XRGI systems are to work in power-controlled mode. In heat-controlled mode the Load Sharer is used to start each XRGI system up separately. A Load Sharer is installed as shown in Fig. 1. Up to four XRGI systems can be connected to one Load Sharer.

CONFIGURATION

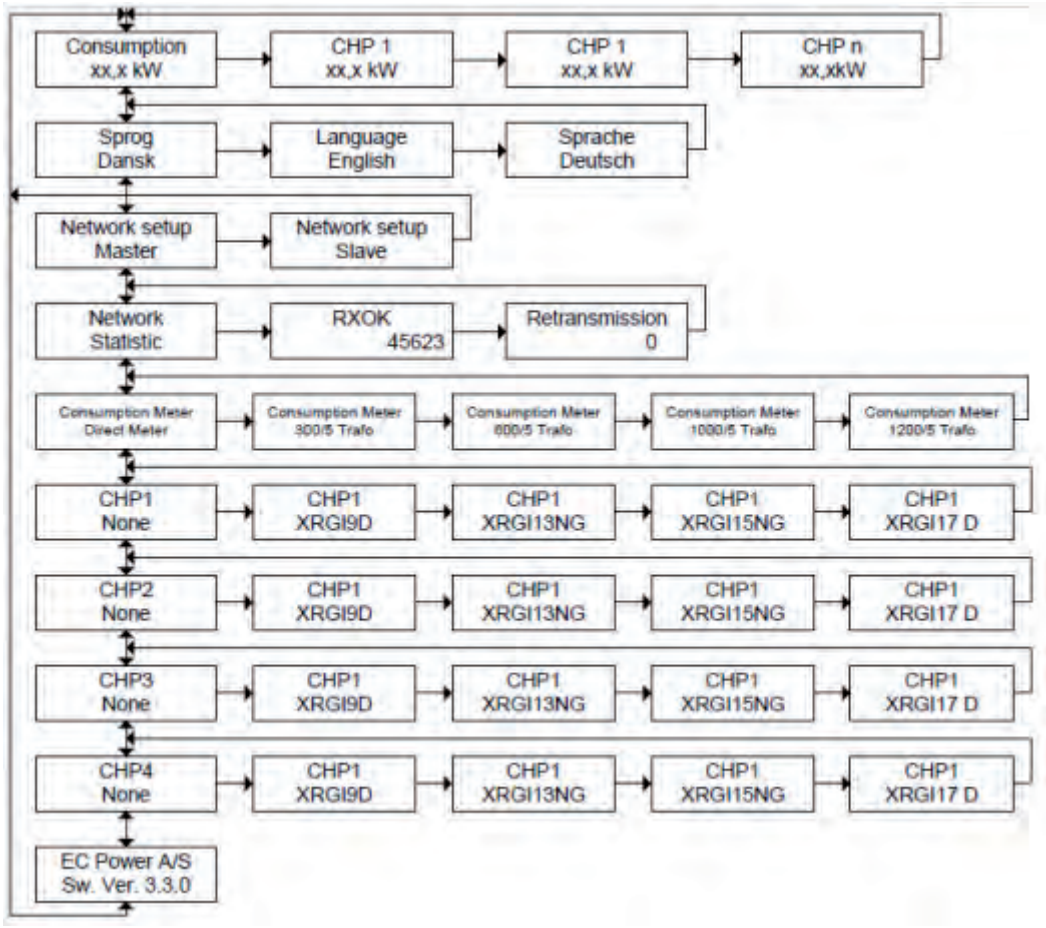
Operation
The Load Sharer is configured at the LCD display under the cover. Next to the LCD display there are four keys:

Fig. 2.32.



- Use ▲ and ▼ to scroll through the menu.
- Use **ESC** to return to the menu and **OK** to select entries.
- Press **OK** and selection will flash.
- Press the cursor keys ▲ or ▼ to select the value required.
- Press **OK/ESC** to save the entry (the selection stops flashing).

Menu structure



Select language

Press the ▼ key to select language:

LANGUAGE DANISH

- Press **OK** and the selected language flashes.
- Press ▲ or ▼ to select the desired language.
- Now press **OK/ESC**: the LCD display stops flashing, and the language selected is saved.

Network setup

Use ▼ to select from the menu:

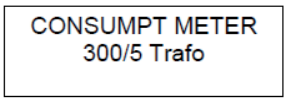
NETWORK SETUP MASTER

The Load Sharer linked to the reference meter must be configured as the MASTER. In installations with more than one Load Sharer, those Load Sharers not connected to the reference meter must be programmed as SECONDARY.

- Press **OK**, “MASTER/SLAVE” is shown on the LCD display.
- Use ▲ or ▼ to make the selection you require.
- Press **OK/ESC**: the text will stop flashing and the status required is saved.

Network statistics
This function is used to monitor RS485 traffic and assess the network stability. It is only relevant in installations with more than one Load Sharer. Use **OK/ESC** to scroll through statistics.

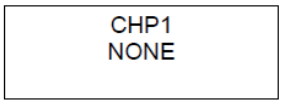
Set reference meter
Press ▼ to select from the menu:



- Press **OK**: the menu starts flashing
- Press ▲ or ▼ to select a given meter
- Press **OK/ESC**: the setting is saved (stops flashing).

Select connected XRGI systems
Up to four modular CHP units can be connected to one Load Sharer. Each is configured the same way.

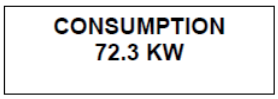
Press ▼ to select from the menu:



- Press **OK**, the selected XRGI starts flashing.
- Press ▲ or ▼ to select the desired XRGI.
- Press **OK/ESC**: the setting is saved (stops flashing).

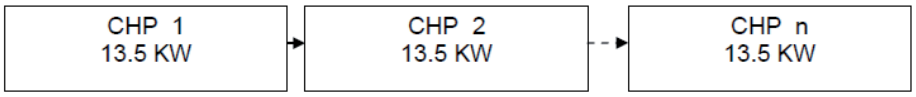
Main menu
The main menu display varies, depending on your network settings.

Master



Displays total consumption.

- Press **OK/ESC** to scroll through the four connected XRGIs to display the results. Another Load Sharer's XRGIs can also be shown here:



Slave unit

SEC. CHP Unit no. 2

The menu displays the number of the secondary XRGI, which the master unit allocated automatically.

- Press **OK/ESC** to scroll through the secondary Load Sharer's four XRGIs:

CHP 1 15 KW	→	CHP 2 15 KW	- - →	CHP 4 15 KW

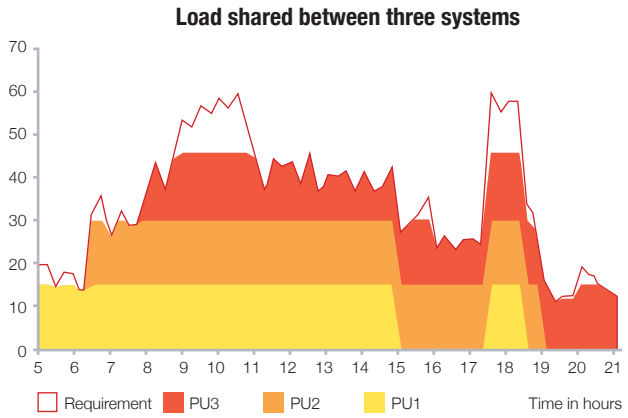
Function

In installations with 2 to 4 XRGI systems the Load Sharer ensures that the load is shared between the XRGI systems. The required output is covered with a minimum of systems. This maximises efficiency and hence requires fewer operating hours overall. The Load Sharer passes on the information of the desired output to the next XRGI system that is ready for operation. If necessary, it then starts up several XRGI systems.

The Load Sharer has a built-in sequential start to ensure that each XRGI system starts separately. This keeps the start-up current and cable load low.

In a sequential start the first XRGI system is given 10 seconds to start up. If it does not, the Load Sharer waits another 10 seconds before it starts the next unit. When that XRGI system starts, the following system will not be released for at least a minute. This means that the first XRGI system generates the current to start further systems.

Fig. 2.33.



3. INSTALLATION INSTRUCTIONS

3.1. INSTALLING XRGI SYSTEM COMPONENTS

When installing your system, please observe the measures given in the figures below. The setup is merely an example and can of course be changed if required.

Make sure the IQ-Control Panel and Power Unit are easily accessible for servicing: please keep the required working area clear. Make sure also that there is sufficient space for the exhaust pipe, tubes, expansion vessel and other system components of the existing boiler system. Please see fitting instructions with associated minimum distances.
All stated dimensions include connections and other distances required. The given heights refer to the tops of the components (for the Power Unit with its hood open) and are stated in mm.

Fig. 3.0.

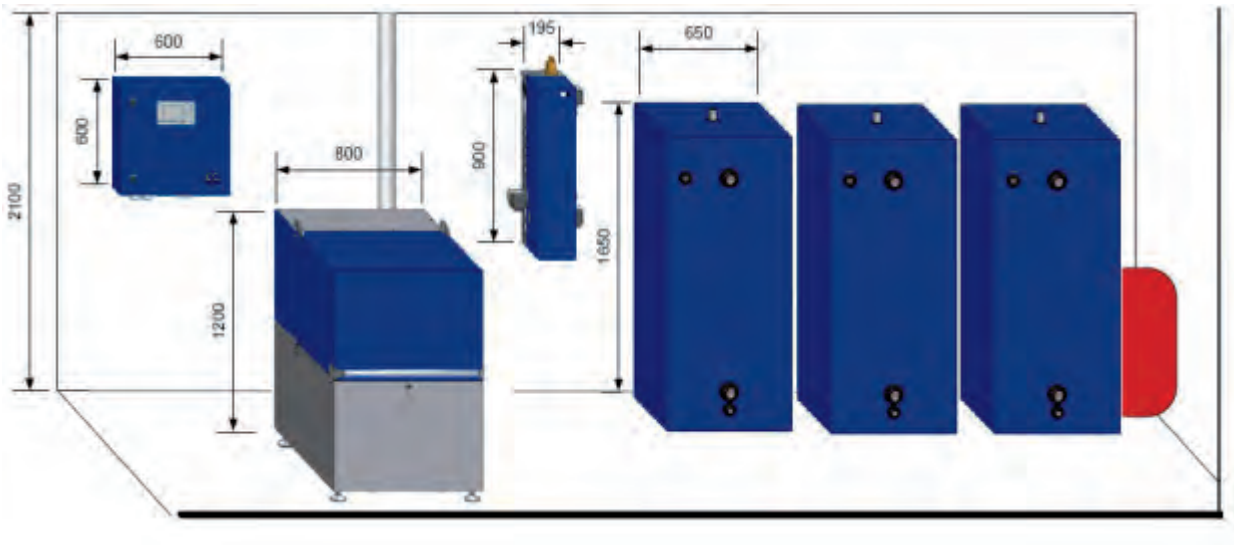
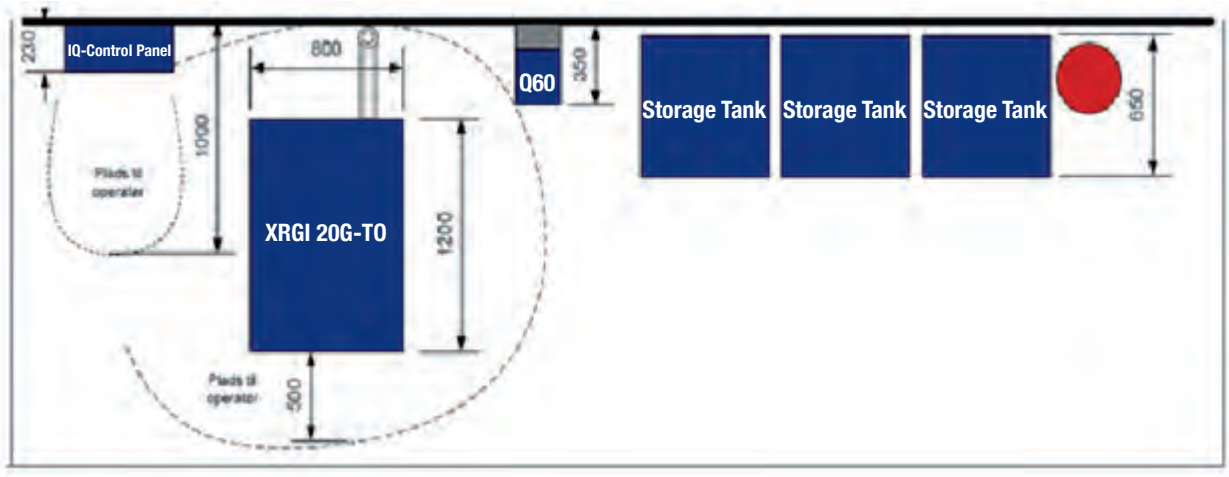


Fig. 3.1.



3.2. GENERAL INSTALLATION INSTRUCTIONS

3.2.1. Location

- Boiler room
- Separate location
- Space approved under model boiler regulations and/or Federal State regulations

Consider the following chapters when deciding where to install the system:
"General setup location findings", section 5.2, "General setup findings", section 5.3 and "Additional requirements when installing gas equipment Art. B", section 5.5, DVGW worksheet G600 (TRGI) must be followed.

The setup location must meet the following criteria:

- There must be sufficient clearance for installation and future maintenance work.
- The entrance must be at least 800 mm wide, with no stairwells, etc. impeding free access to the location.
- It is also highly beneficial if adjacent areas enable pallet trucks or forklifts to be used.
- Space must be adequate for the installation of fireplaces, heat pumps, CHP stations and fixed combustion engines.
- The area must be well lit.
- A 230 V AC power supply is required for the Q60-Heat Distributor.
- The area must be ventilated.
- The area must be frost-free.
- The XRGI 20G-TO must not be set up in the vicinity of boiler air inlets.

3.2.1.1. Foundations

The Power Unit must be set up on a level, watertight, non-inflammable base of sufficient strength. The base foundations must be designed to take the weight of the XRGI 20G-TO (750 kg).

Consult a structural engineer for statical calculations on how to best distribute the load permissibly over the floor.

3.2.1.2. Room temperature/dust

The room temperature should be kept below 35 °C, and should never exceed 40 °C to maximise the service lives of some of the components (electronics). If temperatures are expected to be higher, the room must be ventilated to control the temperature. The XRGI 20G-TO may not be set up in dusty areas or in areas with high humidity levels, e.g. laundry rooms. The area should be completely dust-free, so the Power Unit inlet filter does not clog up. The room must be ventilated as laid down in section 5.5 "Additional requirements when installing gas equipment Art B" in DVGW worksheet G600 (TRGI).

3.2.1.3. Exhaust gases

The exhaust gas system must be designed in accordance with DVGW worksheet G600 (TRGI) section 6 "Gas-fired unit exhausts". Consult your district master chimney sweep before you install the system. The exhaust gas temperature is around 110 °C when the system is new. However, older XRGI systems, which have been in continuous operation, can be expected to show temperatures of anything up to 140 °C. Mass/volume flow at full load is approx. 130 kg per hour, i.e. approximately 100 m³ per hour. The pressure drop in the exhaust system must not exceed 20 mbar.
The exhaust system must be designed to be pressure-tight. The power unit is not designed condensing operation. However, a condensate drain should be fitted to catch any condensate that arises.

3.2.1.4. Noise/vibration

Although the system is relatively quiet (< 49 dB (A) at 1 m distance with hood closed), allowance must be made for areas sensitive to noise. All connections should also be soundproofed reliably.

3.2.1.5. Corrosive ambient conditions

The system as a whole must not be exposed to corrosive gases such as ammonia, chlorine, etc. which can be found in swimming pool water systems. Here, systems must be set up in a separate room.

If an XRGI 20G-TO is set up in rooms where the air can be expected to be badly polluted with halogenated hydrocarbons, e.g.

- hairdressing salons
- printers
- dry cleaners
- laboratories, etc.

Adequate precautions must be taken to ensure the supplied combustion air is clean, e.g. by air intake from outside.

3.2.1.6. Required air inlet

When there is a single XRGI 20G-TO in the setup area, there are the following options:

- an opening from the setup area to the open air measuring 150 cm^2 or 2 x 75 cm^2 or pipe of equivalent cross-section
  or
- a connection to rooms opening to the open air with a combustion air inlet of 150 cm^2. Total space required min. 4 m^3 pro kW total output,
  or
- a door to the open air and 4 m^3 space capacity per kW total output.

3.2.2. Setting up XRGI 20G-TO

3.2.2.1. Setting up the system

Check that the packaging was not damaged during shipping.

Remove the packaging and dispose of properly. Cut through the packing straps that hold the Power Unit on the pallet. Separate the IQ-Control Panel, Q60-Heat Distributor and other accessories from the Power Unit. Only then do you take the Power Unit to its setup location.

Do not try to move the Power Unit with unsuitable equipment. Always lift the Power Unit before moving it. Otherwise, the adjustable feet might be damaged.
Please note that the Power Unit weighs 750 kg.

Protect the XRGI 20G-TO against dirt and damage while installing it.

Use a platform truck to lift the Power Unit from the pallet and to position it in the desired place.

Align system horizontal by turning the adjustable feet, using a relatively long (>150 mm) fork wrench (13 mm).

3.3. INSTALLING YOUR XRGI 20G-TO

The main steps involved in the technical setup are the following:

1. Set up Power Unit.
2. Install Q60-Heat Distributor and IQ-Control Panel.
3. Set up storage tank.
4. Fit tubes between Q60-Heat Distributor and storage tank (min. tube size 1 ¼" PT, DN32).
5. Fit tubes between Q60-Heat Distributor and XRGI 20 Power Unit (tube size 1 ¼" PT, DN32).
6. Fit tubes, adapters, hoses and other components to supply the XRGI 20 Power Unit with natural gas.
7. Connect to existing heating system (min. tube size 1 ¼" PT, DN32).
8. Fit external expansion vessel and safety valve if required.
9. Fit exhaust gas system after consulting district master chimney sweep.
10. Secure combustion air supply.

Hydraulic connections MUST be fitted according to the instructions in section 3.5.3.

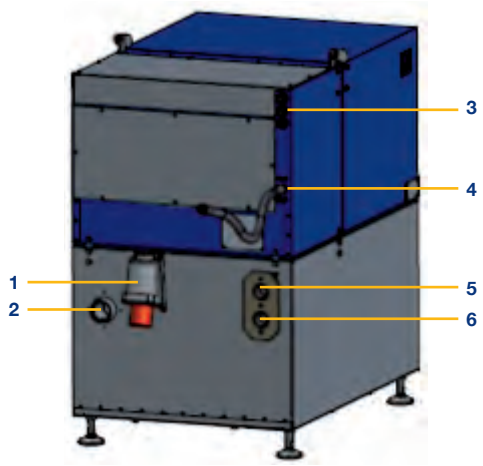
Note: flush the heating system out before connecting it in order to prevent foreign matter getting into the engine circuit.

Note: if sludge or foreign matter can be expected to enter the heating system during operation, the system must be equipped with a filter and/or sludge separator.

3.3.1. Power Unit connections

1. Electrical connection: generator cable to IQ-Control Panel (4 x 10 mm² cable with 63A CEE plugs)
2. Exhaust connection: (double-walled DN60/100 aluminium tube)
3. Electrical connection: control cable to IQ-Control Panel (1 x 2 x 0.75mm² shielded + ground connection/ 1 x 4 x 0.75 mm² shielded + ground connection/ 1 x 10 x 0.75 mm² shielded + ground connection) and 5 m Q-Network Cable (SFTP (CAT 6) network cable)
4. Gas connection: (800 mm flexi hose ¾" PT (see below))
5. Hydraulic connection: feed to Q60-Heat Distributor (DN32 max length 150 cm) 1 ¼" PT.
6. Hydraulic connection: return from Q60-Heat Distributor (DN32 max. length 150 cm) 1 ¼" PT.

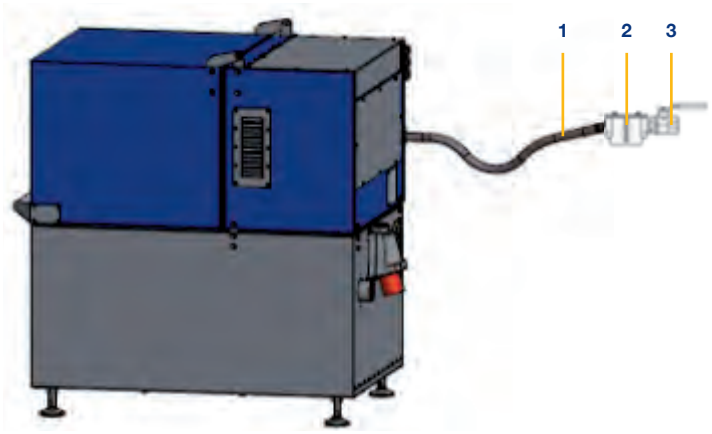
Fig. 3.2.



3.3.1.1. Gas connection

1. 800 mm flexi hose with ¾" external thread (included in scope of supply)
2. Gas filter, e.g. Dungs (not included)
3. Stopcock with fuse protection, e.g. Dungs (not included)

Fig. 3.3.



The gas installation must only be installed by an authorised fitter, following local utility company and TRGI rules and EC POWER installation guidelines.

Ensure the gas line is fitted tension- and torsion-free, using the gas safety hose included in the scope of supply. This hose complies with the rules for boiler systems and is authorised by the manufacturers for this use. Using improperly and/or unsuitable tools could cause damage. Follow hose manufacturers' installation guidelines. An easily accessible gas cock and gas filter must be fitted upstream of the gas hose (see diagram above).

The gas supply used must comply with the gas data as stated on the type plate. Gas safety block settings may only be made by trained specialists. The maximum permitted upstream pressure from the gas network is 50 mbar; the minimum upstream pressure required is 10 mbar (low pressure). A gas pressure regulator must be used if the pressure is higher.
The XRGI 20G-TO is designed for gas type I2R natural gas, i.e. natural gas family 2 (H, E, L and LL gas). The mixer device is preset for H and E gas as standard. Ask your gas supplier what type of gas they supply.

The XRGI 20G-TO can run on both natural gas H and liquid gas without the need to be modified. If you use liquid gas, however, a pressure reducer must be used upstream of the system and reduce the pressure to 10–20 mbar.
If you use natural gas L, an adjusting screw on the mixer box must be replaced.

3.3.1.2. Hydraulic connection

The Power Unit flow and return must be connected to the Q60-Heat Distributor via flexible connections (hoses) or suitable vibration dampers (1 ¼" PT). Connecting lines must be diffusion-proof and permanently temperature-resistant up to at least 100 °C. Maximum line length between Power Unit and Q60-Heat Distributor is 1.50 m per line. These components provide stress-free connections and help soundproof the building from solid-borne noise from the Power Unit. Take particular care to comply with the respective hose and adapter manufacturers' instructions. EC POWER's installation guidelines must be observed.

Heating pipes may only be mounted using rubber lined pipe clips.

Fig. 3.4. Primary connection (side view)

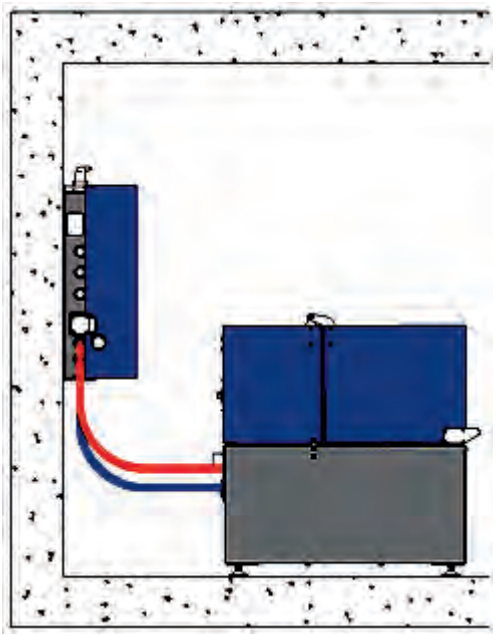
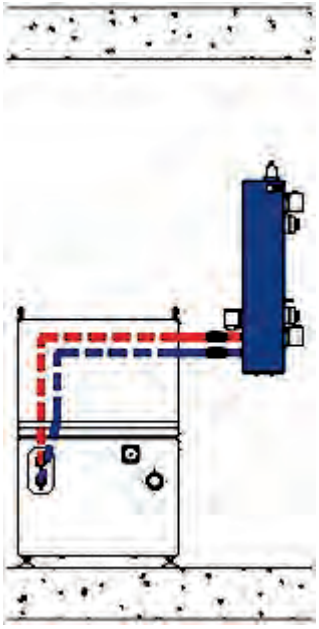


Fig. 3.5. (Front view)



No ball valves are required between the Power Unit and the Q60-Heat Distributor. The Q60-Heat Distributor does not contain a great deal of water. However, if shutoff elements are fitted, at least one of these must be secured to prevent unauthorised persons from shutting them (remove handle, use fitting with hood, etc.). Otherwise the expansion vessel in the Q60-Heat Distributor may be separated from the Power Unit accidentally.
The primary circuit safety valve (1.5 bar) is supplied in the Power Unit to prevent the system from being installed without protecting the engine circuit against excess pressure. To avoid that water enters the engine compartment accidentally, the factory configuration (Fig. 3.5.) of the safety valve may be changed. A manual vent must then be fitted in the engine compartment instead of the safety valve.
The expansion vessel for the primary circuit is supplied in the Q60-Heat Distributor. It has a capacity of 5 l, and provides a water reserve of just 1-1½ l. The engine circuit must be bled very thoroughly when it is commissioned in order to avoid problems. If enough space is available, the water reserve should be supplemented with another expansion vessel (to be provided by the client) in the return with a capacity of approx. 35 l. The upstream pressure must then be reduced to 0.1 bar.

Note: the scope of supply does not include adapters or stops. Make sure connecting pipes are fitted stress- and torsion-free.

3.3.1.3. Exhaust connection

The Power Unit flue gases must be removed via an exhaust line. The exhaust system must be installed in accordance with TRGI rules and those of the country concerned.

Note: ensure that the exhaust pipe is gastight. Adhere to national/local boiler regulations.

The fresh air supply and the exhaust lines must meet installation type B rules (depending on air space). Connections may only be carried out by a specialist.
The Power Unit is not designed for condensing operation. However, a condensate drain must be fitted to trap the condensate which develops when the system is started up. A condensate box with a large water reserve or siphon with ball valve connection or the like must be fitted to prevent the condensate drain from drying out.
The exhaust gas flow rate at full load is 0.0325 kg/s with a residual oxygen content of 7.2 % and 0.0128 kg/s at part load with a residual oxygen content of 6.5 %. The exhaust gas temperature reaches 110 °C when the device is new, but may increase to 140 °C in use. If the cooling water temperature in the exhaust gas heat exchanger exceeds 120 °C, the safety temperature control switches the system off. As the exhaust temperatures involved are continuously close the permissible limit and the XRGI mainly runs for long periods, exhaust pipes of temperature class T160 or higher should be used.
The pressure drop in the exhaust system must not exceed 20 mbar. The back pressure of the exhaust gas is monitored by a safety pressure control valve at the inlet to the exhaust gas heat exchanger.
The exhaust system must be pressure-tight (pressure resistant up to 5,000 Pa, Type H1 or H2). Only rubber lined pipe clips may be used to attach pipes to the building. The exhaust connection is designed to take the double-walled exhaust system which is available as an accessory (double-walled aluminium tube DN 60/100). Exhaust and condensate pipes must not be laid horizontally: they must slope at least 2 % so the condensate can run off.
The exhaust with an internal diameter of 60 mm and up to five bends can be approximately 20 m long. If there are more than five bends or if the pipe is longer, extrapolate according to DIN 4705 as required.
In principle, each XRGI needs a separate exhaust pipe. Exhaust pipes can be cascaded from the Power Unit side; but the manufacturers must approve the exhaust pipe used for this purpose. In this case it is necessary to extrapolate pressure conditions in particular according to DIN 4705. Consult your district master chimney sweep before installing the XRGI system.

Note: if you are planning to install the exhaust pie in an existing chimney, make sure to consult your district master chimney sweep in the design stage.

3.3.1.3. Exhaust gas heat exchanger

You can add an exhaust gas heat exchanger to the Power Unit to optimise the thermal efficiency. However, a notable increase in yield can only be achieved in condensing operation. The return temperatures from the heating system should permanently be below 45-50 °C for this purpose.

3.3.1.4. Electrical connections

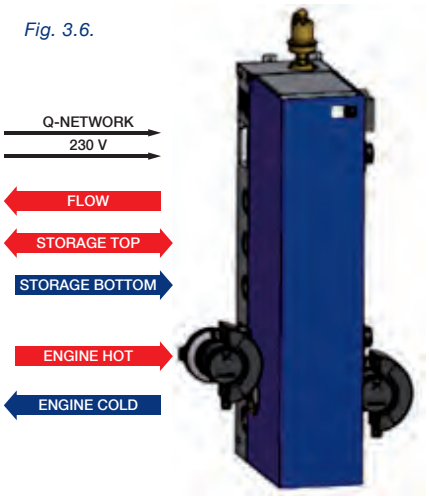
The Power Unit has a 63 A CEE socket at the back for the generator cable (H07RN-F 4 x 10 mm², max. 10 m long) connected to the IQ-Control Panel. The Power Unit is equipped with protective switches for the engine, RCBs and a grid monitoring relay for emergency shutdown in the IQ-Control Panel. Three more control lines and a network cable are required for the communication between the IQ-Control Panel and the Power Unit:

1. 10 x 0.75 mm², NSSHÖU-J 12G0, 75, shielded + ground connection / for 24 V DC
2. 4 x 0.75 mm², NSSHÖU-J 5G0, 75, shielded + ground connection / for 24 V DC
3. 2 x 0.75 mm², NSSHÖU-J 5G0, 75, shielded + ground connection / for 230 V AC
4. 1 x SFTP CAT6 RJ45

3.3.2. Q60-Heat Distributor connections

- Variable volume flow rate – top stable diameter (1¼" PT) – only if Flow Control is connected.
- Storage tank connection, top–centre stable diameter (1¼" PT).
- Storage tank connection, bottom stable diameter (1¼" PT).
- Hydraulic connection: flow from Power Unit – top left (1¼" PT).
- Hydraulic connection: return to Power Unit – lower left (1¼" PT).
- Electrical connection: two connections for Q-Network and two to Power Unit.
- Automatic microbubble separator mounted on top of the Q60-Heat Distributor

Fig. 3.6.



3.3.2.1. Return water temperature

The return water temperature in the water circuit to the Q60-Heat Distributor should not exceed 65 °C. The aim is to have the water cool by at least 20-30 °C between the system's flow and return.
In systems with heat pumps, a return temperature of at least 40 °C must be maintained. It is thus necessary to fit return temperature control valves to all uncontrolled short circuits or to take other suitable precautions.

Note: the lower the return water temperature the more efficient the storage tank and the more rational the energy use.

3.3.2.2. Hydraulic connections

The primary side connection from the Power Unit to the Q60-Heat Distributor is described in section 3.4.2. When installing on the secondary side of the Q60-Heat Distributor (heat distribution/building installation), the relevant standards and rules in heating system construction must be observed. This includes the installation of a safety valve and an expansion vessel according to EN 12828 for direct heating, tR ≤ 105 °C depending on the conditions of the building. If required, these devices may be connected directly to the Q60-Heat Distributor via an unused return connection. The Q60-Heat Distributor's secondary side can be pressurised up to 6 bar (not to be confused with the Q60-Heat Distributor engine side, where the operating pressure is 1.5 bar, and is already protected (factory configuration)).
Shutoff elements on the secondary side are essential to avoid the need to drain large parts of the secondary network when servicing and maintaining the Q60-Heat Distributor. If it cannot be ruled out that dirt enters the system from the secondary side, a dirt pan must be installed in the system return pipe upstream of the Q60-Heat Distributor to protect the Q60-Heat Distributor and plate heat exchanger.

3.3.2.3. Electrical connections

The Q60-Heat Distributor needs a separate 230 V grid feed, protected by at least a 10 A fuse (10 A/250 V AC connector). The network lines used are Q-Network Cables (SFTP (CAT 6))with RJ45 plugs, which are used for the Q60-Heat Distributor to communicate with other Q-Network Components.

3.3.3. IQ-Control Panel connections

- Mains connection 5 x 16 mm² – 5 m Q-Network Cable (SFTP (CAT 6) network cable).
- Power Unit generator connections 4 x 10 mm²
- Impulse line from Load Sharer 2 x 2 x 0.8 mm²
- Power Unit control cable

Fig. 3.7.

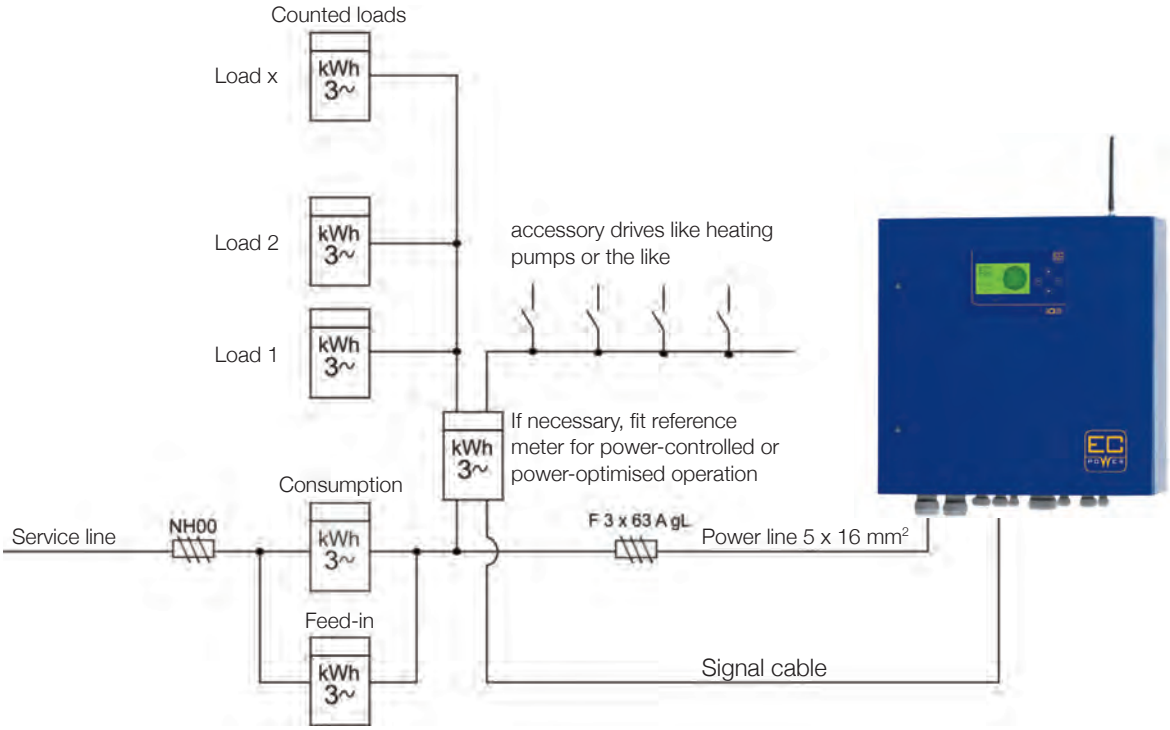
3.3.3.1. Electrical connections

The IQ-Control Panel needs a feed line protected to at least 63 A gl/gG. With multi-module systems, each IQ-Control Panel must be protected individually. With multi-module systems, the Load Sharer prevents that more than one Power Unit starts up at the same time. Therefore the joint cable section to the IQ-Control Panels need only be designed to take the input current of a single system (see section on Q-Network).
The electrical lines and components required are the following (not included in scope of supply):

1. Fuse: 63 A gL
2. Feed line from fuse to IQ-Control Panel 5 x 16 mm2, e.g. NYM-J 5 x 16 mm²
3. Power Unit generator cable to IQ-Control Panel H07RN-F 4 x 10 mm²
4. CEE socket for generator, 63 A with spring terminals (!)
5. Control line X3: 10 x 0.75 mm² shielded + ground connection NSSHÖU-J 12G0.75
6. Control line X4: 4 x 0.75 mm², shielded + ground connection NSSHÖU-J 5G0.75
7. Control line X5: 2 x 0.75 mm², shielded + ground connection NSSHÖU-J 5G0.75
8. Potential equalization line between IQ-Control Panel, Q60-Heat Distributor and Power Unit 1 x 6 mm², H07V-K
9. Q-Network: network cable CAT6 SFTP (shielded!) with RJ45 plug

To be able to use the power-controlled functions, the electrical connections must be carried out downstream of the main meter; and a reference meter must be fitted upstream of all electricity loads. It is essential to check that the property is suitable before using power-controlled mode: major load fluctuations, e.g. due to machinery or lights may cause the XRGIs to cut in and out frequently, which may reduce their working life and make them more problematic.

Fig. 3.8.



The IQ-Control Panel is equipped with a grid monitoring relay according to DIN VDE 0126-1-1. A safety switch “accessible at all times” is not required for individual systems.

3.3.3.2. Reactive current compensation

The XRGI system has a three-phase asynchronous generator, which not only generates active power but also, of course, reactive power. The cos ∂ of the angle between active and reactive power is approximately 0.76. Compensating for an XRGI without taking the nature of the property itself into account is pointless, on a number of counts. With an individual compensation, multi-module systems would require multiple reactive current compensations. In addition, when XRGIs produce power they not only reduce the power requirement from the utility company but also the reactive current allowance (even if the XRGI does not generate any reactive power at all).
This means the reactive current from machinery, fluorescent tubes, etc. is deducted from the allowance and must be paid for. If a power tariff includes reactive current, it would therefore be advisable to include the whole property in a viable reactive current compensation strategy.
If reactive current compensation is only required for the XRGI 20G-TO, having considered the matters above, this is available as an accessory.

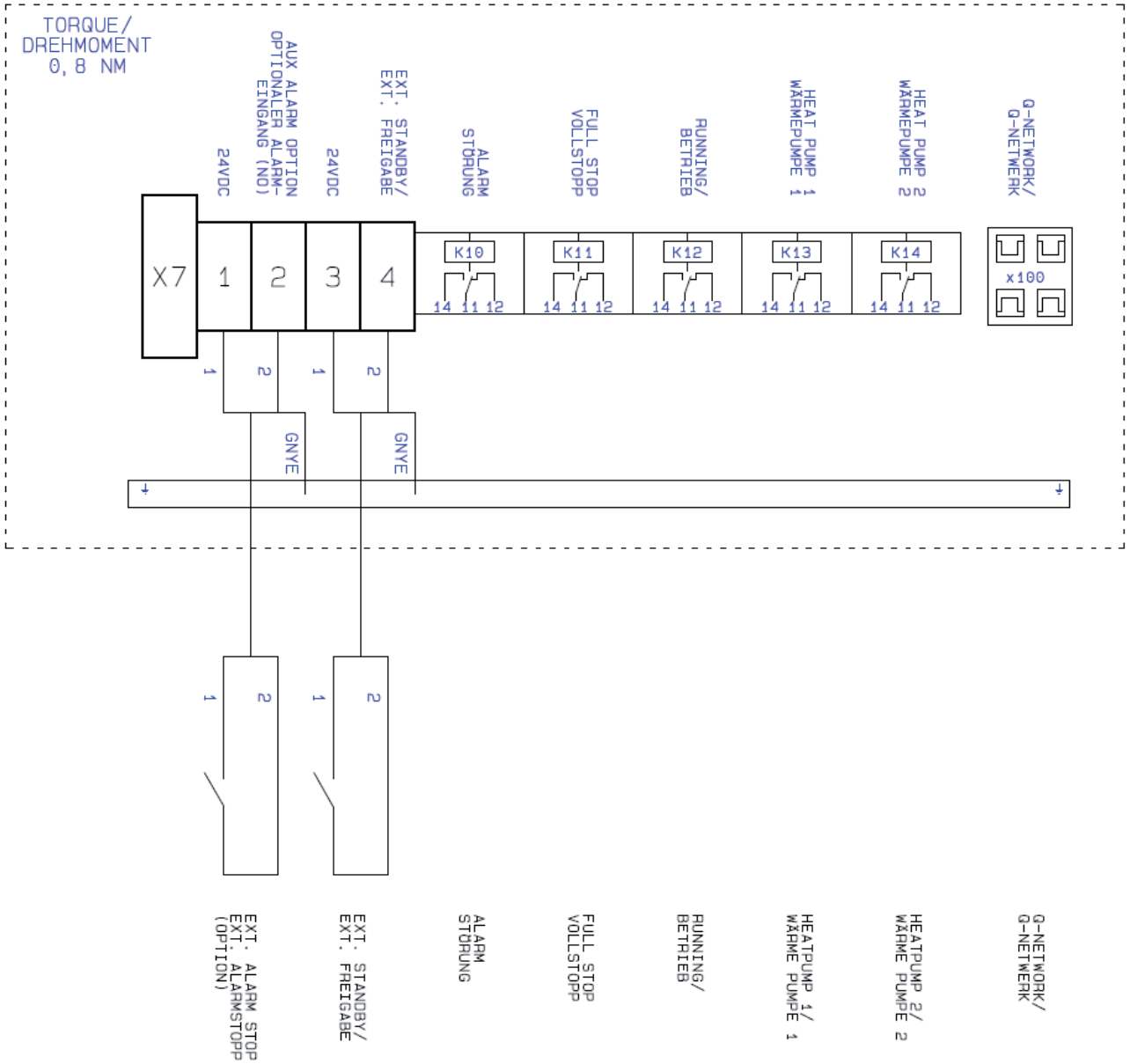
Fig. 3.9.

3.3.3.3. External connections

A number of messages are provided for the connection to external regulation and control systems:

1. External alarm
2. Terminal strip X7, terminals 1/2, grounded 24 V (AUX alarm, interlocking if contact closed)
3. External standby
4. Terminal strip X7, terminals 3/4, non-floating 24 V (external standby if contact closed).
5. Alarm
6. Auxiliary switch (SPDT switch) to contactor K10
7. Full stop (e.g. through operating strategy)
8. Auxiliary switch (SPDT switch) to contactor K11
9. Running
10. Auxiliary switch (SPDT switch) to contactor K12

Fig. 3.10.



3.3.3.4. Remote data transmission

The IQ-Control Panel is equipped with a wireless modem for the transmission of data. The IQ-Control Panel and its antenna must therefore be installed in an area with mobile phone coverage. An adequate location can be found and tested using a mobile phone.
If the signal is not strong enough at the installation location of the IQ-Control Panel, the antenna must be fitted in a place where coverage is better. This requires an extension cable matched to the modem. A directional antenna can be supplied, if required (not included in scope of supply).
The SIM card required to send e-mails as well as the transmission charges are included in the annual costs for Service Database access.
If data cannot be e-mailed by either of the means above, a connection to a landline network can be set up in such exceptional cases.

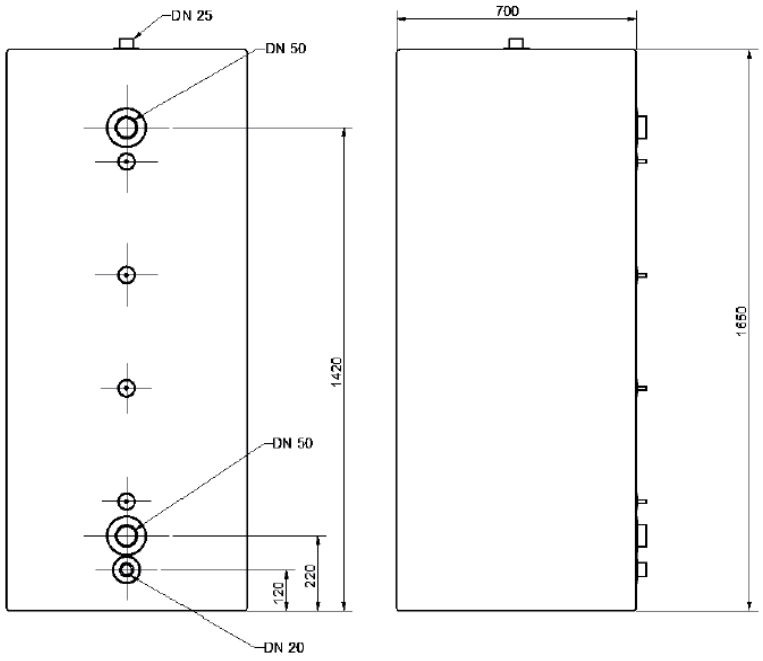
Note: a working modem connection is a condition for the warranty to be applicable.

3.3.4. Storage tank connections

Fig. 3.11.

- Hydraulic connection: DN50 - top and bottom of storage tank
- With systems with up to three storage tanks, these must be connected using at least DN32.
- Automatic air vent connection: DN25 – top of storage tank
- Drain valve connection: DN20 – bottom of storage tank
- Network connection: Q-Network Cable (SFTP (CAT 6) network cable)

Fig. 3.12.



Note: installation of a storage tank without thermal stratification (4 connections) leads to unstable layers. These lead to system failures and a poor utilization of the storage tank volume. For that reason the storage tank in the XRGI system may only be connected with two hydraulic connections, regardless of the hydraulic system that is selected.

The storage tank can be set up on concrete without any specific foundations. On uneven ground, a suitable base must be used to ensure the tank is stable. Set up only in frost-proofed areas unless the heating system is filled with antifreeze. Otherwise the storage tank must be drained, if there is a risk of frost.

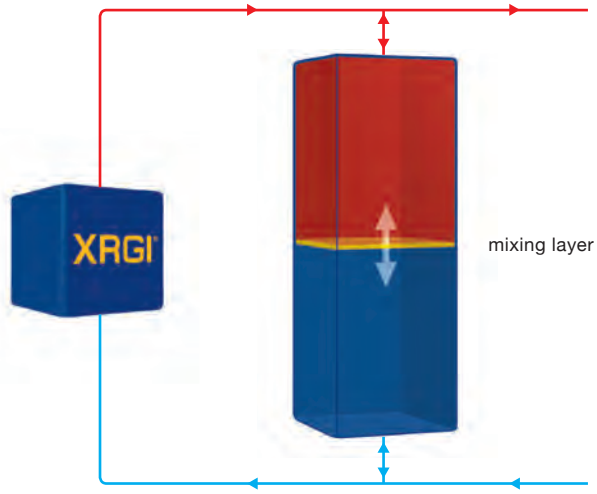
If the storage tank is set up close to a wall, ensure that there is enough space to reach connections of the tank.

EC POWER's 475-I-Storage Tank has a built-in Storage Control, and must therefore only be connected using a Q-Network Cable; the sensors are already mounted in the right positions in the Storage Tank.

The storage tank makes it possible to separate the generated heat from the electrical power and to prevent the EC POWER system from cycling (switching constantly on and off). If the demand for electricity is high and also at high tariff times, the surplus heat generated can be accumulated in the storage tank and released to the heating system later on. It is the storage tank that makes it possible to use the XRGI control strategies (see section 4). The storage tank must be suited to the size of the building, the type of heating system used and individual circumstances. It should have a capacity of at least 475 l, which usually makes it possible to run for at least 30 minutes. Larger storage tanks are possible, and may even be advisable, especially if the heat load fluctuates considerably and there are long periods when little heat is needed (e.g. in schools). Peak heat loads can be covered by the XRGI, especially in spring and autumn.

How the storage tank is integrated into the system governs its effective capacity available. Installing a storage tank like a hydraulic header (for connections) causes unstable or fluctuating layers in certain operating modes. This causes the control system to fail and the storage volume to not be used effectively. For that reason the storage tank in the XRGI system may only be connected with two hydraulic connections, regardless of the hydraulic system that is selected.

Fig. 3.13.



If more than one storage tank is used, they must be connected in series. Experience shows that parallel or Tichelmann circuits do not work satisfactorily.

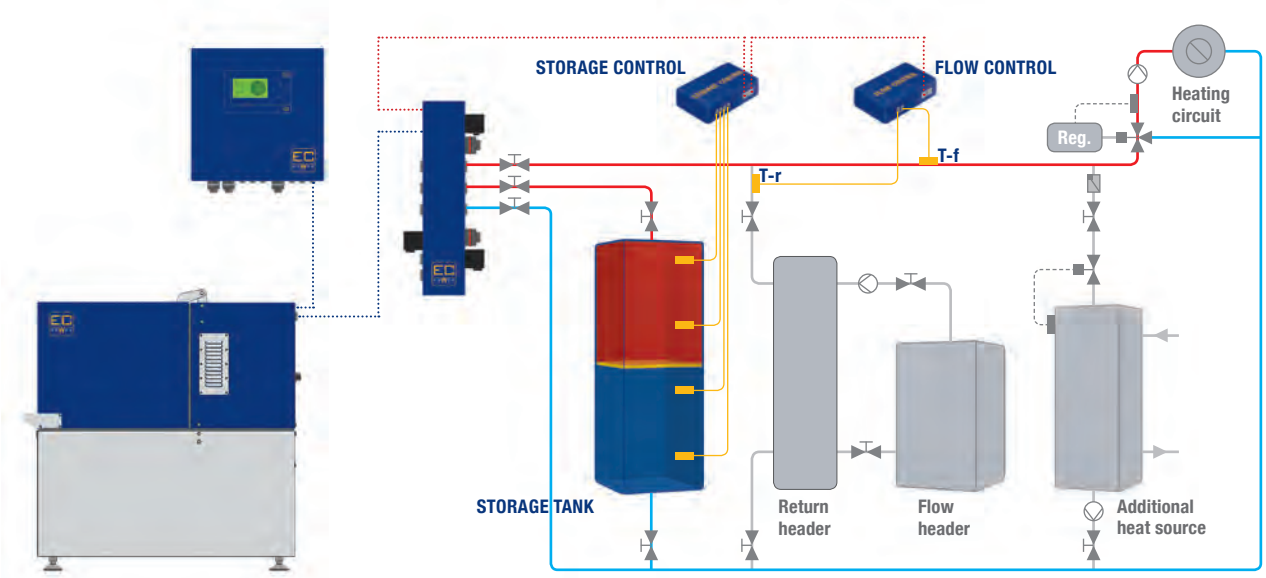
3.3.5. Connecting Q-Network Modules and Load Sharer

Q-Network Modules and Load Sharer may only be installed by authorised EC POWER specialists. Q-Network Module Cables must not be shortened, extended or cut off.

Q-Network Modules are networked with other Q-Network Modules and the Load Sharer with other Load Sharers via a Q-Network Cable (SFTP (CAT 6) network cable). Unused RJ45 plugs must be covered with RJ45 (8x8) ISDN network terminators.

3.3.5.1. Flow Control

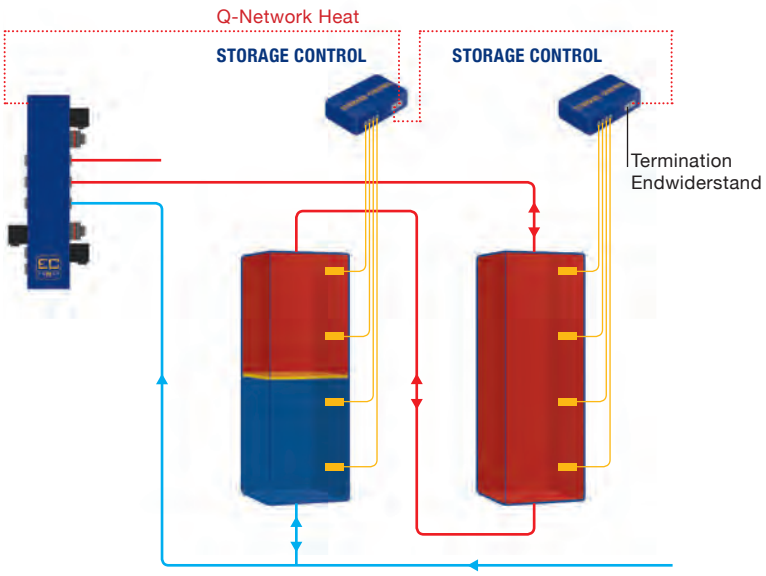
Fig. 3.14.



- Sensors must be positioned as shown in Fig. 3.14. Other positions will cause operation errors!
- Fit the flow temperature sensor downstream of the XRGI flow connection (T-f).
- Fit the return temperature sensor upstream of the return connection (T-r).
- The sensors must be attached to the pipe using the clamps supplied and then be insulated.
- If the pipes run horizontally the Flow Control sensors must be fitted on top of the pipe. It is best to use baffle plates to induce mixing.
- The Flow Control is networked with other Q-network Modules via a network cable (SFTP (CAT 6) network cable).

3.3.5.2. Storage Control

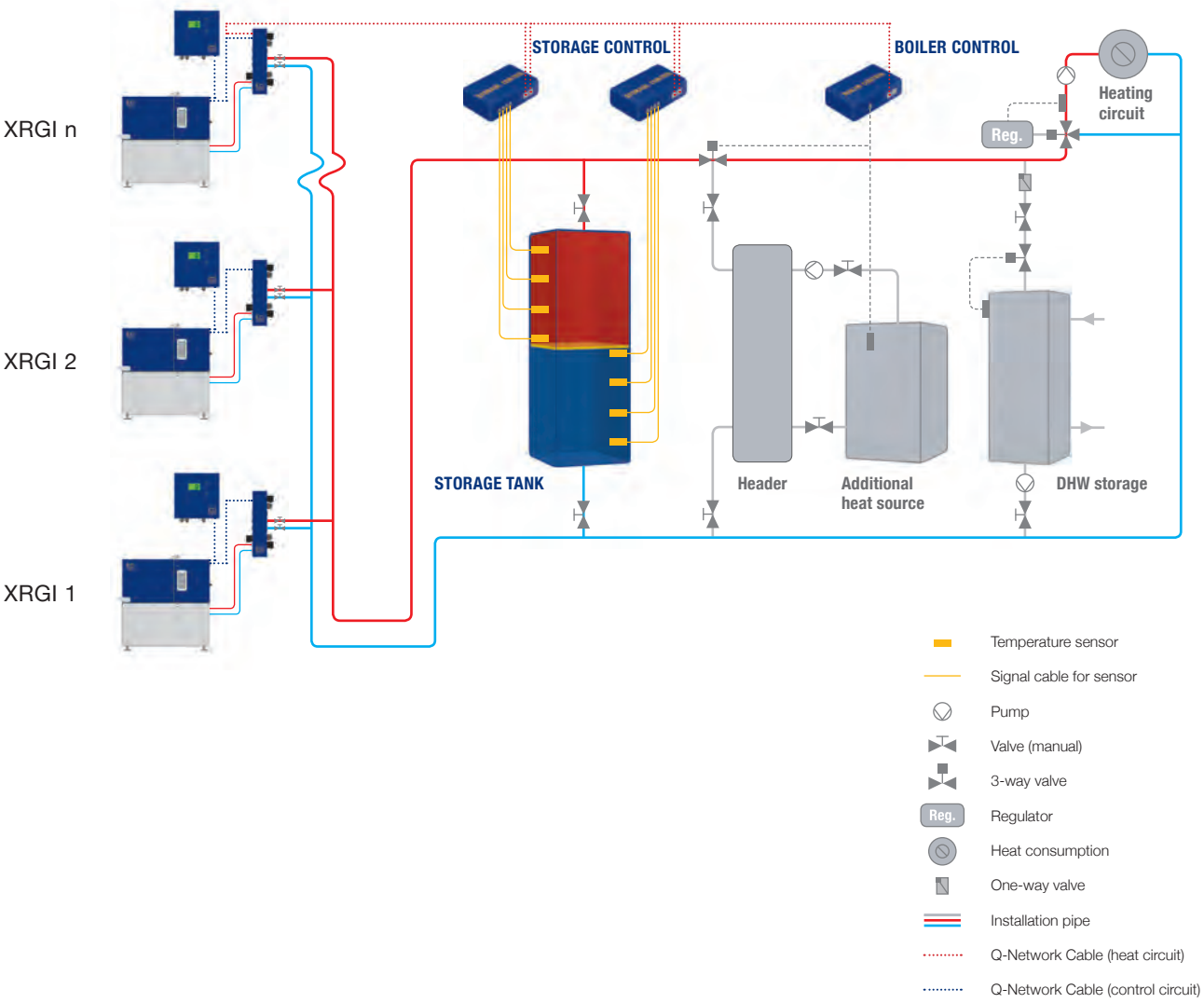
Fig. 3.15.



- The sensors must be positioned as shown in Fig. 3.15. Other positions will cause operation errors!
- The Storage Control Temperature Sensors must be fitted to the storage tank in immersion sleeves; sensor No. 1 must be installed at the topmost measuring point and sensor No. 4 at the lowest measuring point.
- The distance between all four temperature sensors must be identical.
- If there is more than one storage tank in the system, each must have its own Storage Control unit. The Q-Network detects the sequence of the storage tanks automatically when in operation.
- All four Storage Control Temperature Sensors must be installed in the same storage tank.
- If the storage tank capacity exceeds 1,000 litres, two Storage Control units must be used.

3.3.5.3. Boiler Control

Fig. 3.16.

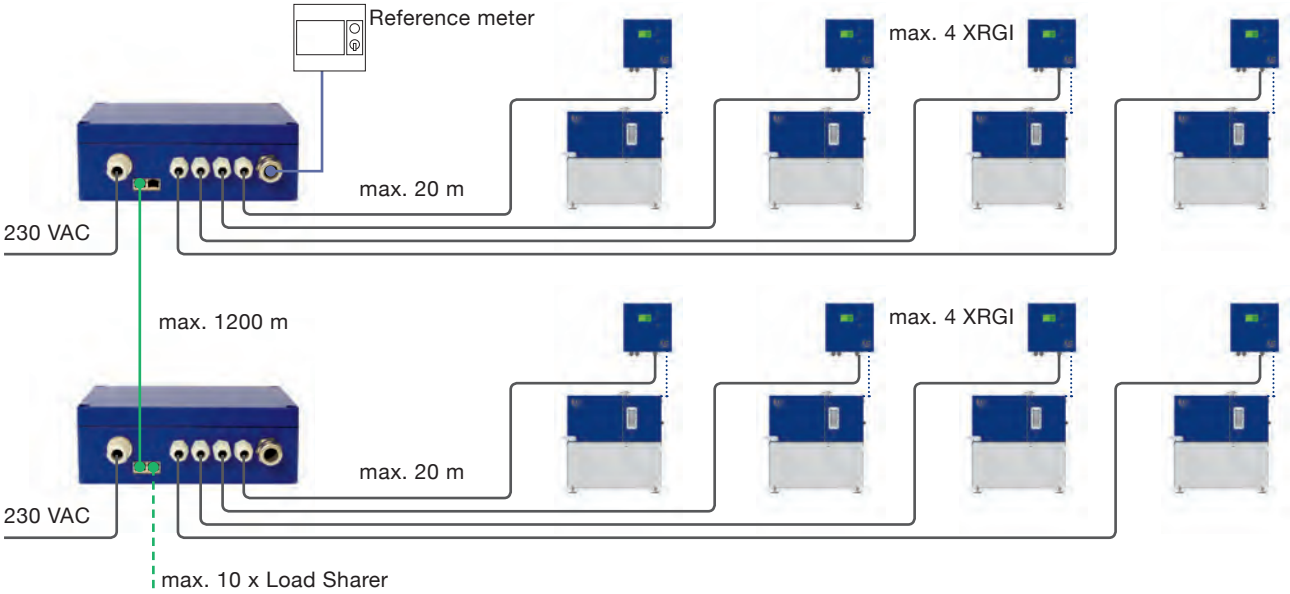


- The control cable must be installed in accordance with the instructions from the boiler manufacturer.
- The Boiler Control provides a zero-potential contact (SPDT switch): either as a
  - NORMALLY OPEN (NO) contact, the contact is open when the boiler is isolated

    or as a
  - NORMALLY CLOSED (NC), the contact is closed when the boiler is isolated.

3.3.5.4. Load Sharer

Fig. 3.17.



- A Load Sharer must be installed as shown in 3.17. Incorrect installation will cause operation errors!
- The Load Sharer is connected to the IQ-Control Panels via CHP 1-4 connections.
- For each XRGI system a six-core cable must be laid from the IQ-Control Panel to the Load Sharer.
- The XRGI systems do not need to be connected to the Load Sharer in any particular order.
- The reference meter (not included) is connected to the reference meter input on the Load Sharer. The reference meter may be polarised, so the wires must be connected correctly to avoid permanent damage.
- The Load Sharer is compatible with the following measurement types: 300/5, 600/5, 1000/5, 1250/5, 1500/5, 1600/5 and 2000/5.

3.4. HYDRAULIC INTEGRATION OF THE XRGI 20G-TO

3.4.1. System temperatures

The return temperature of the heating system should not normally exceed 65 °C. Return temperatures may be as high as 70 °C, but this affects the commercial viability and the storage capacity of the system. If other heat sources are included in the system, such as heat pumps or a condensing boiler, their demands on system temperatures must also be taken into account when designing the system. As a general rule, the lower the return temperature, the more efficient the system is as a whole.

Before the system is installed, heating circuits that often cause high return temperatures, such as industrial water treatment units, convector heaters, etc., should be considered in particular. If these heating groups can be expected to cause major fluctuations in or high return temperatures, these should be minimised by taking appropriate measures (e.g. return temperature control valves or hydraulics for variable volumes, e.g. injection devices, etc.)

The XRGI system can generate flow temperatures in the range 80–85 °C, irrespective of heating system return temperatures.

3.4.2. Selecting the right hydraulics

On the following pages we have put together a selection of tried and tested hydraulics. They share a common principle: they feed heat to loads without any pressure differential and works like a hydraulic header. The XRGI system controls provide the network with the necessary amount of flow water to achieve the required flow temperature (thermal energy) via the primary flow of the header. The non-return valve in the overflow (header) is needed to prevent temporary overflows on the primary side in case of major load fluctuations, since such overflows might cause the XRGI to shut down at random.

The installation models shown can therefore be used to create the known distributor circuits (e.g. mixer circuit) at no additional cost, and without the risk of hydraulic malfunctions on the consumer side.

3.4.2.1. Basic hydraulic circuits of XRGI components

The basic circuits in this section show how the XRGI components are connected hydraulically. They include set ups of single- and multi-module systems, without including other heat sources or loads. They therefore provide the starting point for the circuits in section 4.3, which add heat sources of different kinds, outputs and characteristics.

Up to three Power Units can be connected via the Q60-Heat Distributor, depending on the return temperature of the heating system and on the volumes of water this involves as for the XRGI system. Multi-module systems via coupled Q60-Heat Distributors have the advantage that the piping is simple and elegant.

3.4.3. Integration into heating system

There are four methods we can use when integrating the XRGI in heating systems:

1. Parallel integration with Flow Control
2. Parallel integration without Flow Control with multiple systems
3. Heating return increase
4. Heating return increase with multiple systems

3.4.3.1 Parallel integration with or without Flow Control

The heat source is arranged in parallel with the Power Units. The network temperature must be given at the point where the Power Unit and storage tank flows mix. It can be set via the Flow Control or an external control.

Paralleleinbindung mit Flow Control (Installation 1)

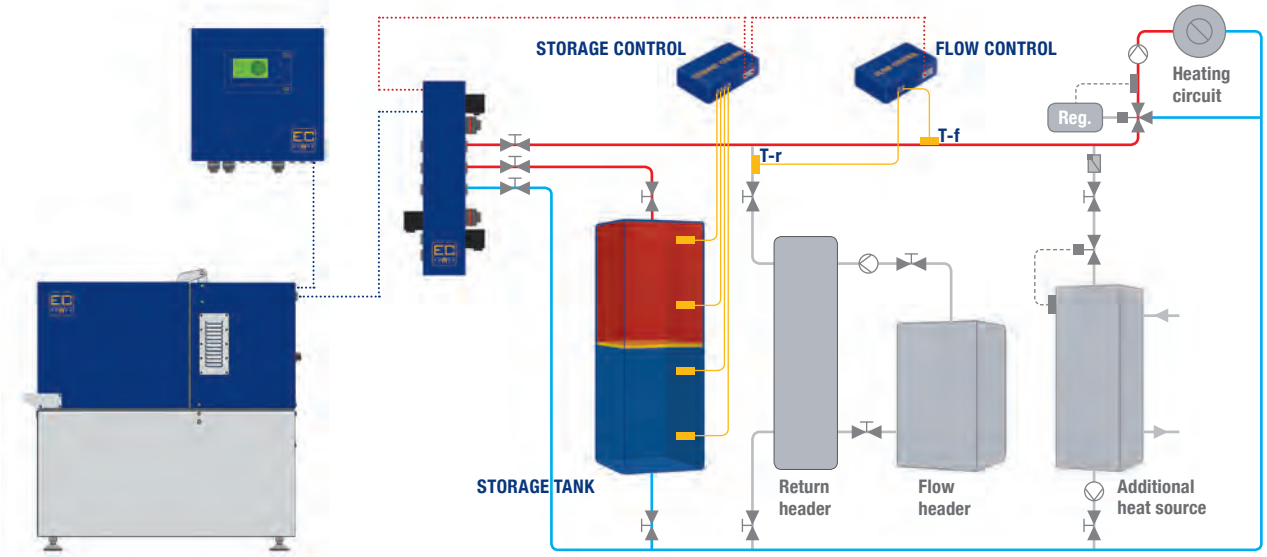
Installation 1 besteht aus einer XRGI-Anlage, einer Verbrauchswasserinstallation und einem Backup-Kessel. Es wird eine regulierte Wärmeinstallation des Hauses vorausgesetzt. D.h. warmes Wasser darf nicht zurück zur XRGI-Anlage geleitet werden.

Über die obere Leitung des Q60-Wärmeverteilers wird dem Netz so viel 85 °C warmes Wasser beigemischt, bis die eingestellte Temperatur erreicht ist (Einspritzschaltung). Die Speicherentladung erfolgt über die Flow Control-Pumpe mit maximal 2,5 m³/h. Der Speicher wird mit 80 - 85 °C beladen. Die Speicherschichtung wird über den Q60-Wärmeverteiler überwacht und gesteuert. Dadurch können die Speicheranschlüsse klein gehalten werden, unabhängig von den Dimensionen des übrigen Netzes. Diese Einbindung bietet sich an, wenn mit kleinen Speichern und kleinen Anschlussdimensionen auf der XRGI-Seite gearbeitet werden soll. Sie ist nur für eine einzelne XRGI-Anlage geeignet. Die von dieser Hydraulik in das Heizungssystem eingebrachte Wärmeleistung ist von der Rücklauftemperatur des Heizungsnetzes abhängig.

Die Kesselfreigabe und -leistungsregelung ist bauseitig zu lösen. Die Kesseltemperatur sollte hierbei mindestens 5 K tiefer als die Solltemperatur der Flow Control eingestellt sein, um die Leistungsabgabe der Flow Control nicht zu beeinflussen. Die Nachwärme (nach Abschalten des Brenners aus den verbleibenden Heizgasen) ist hierbei zu berücksichtigen.

Installationsdiagramm 1

Fig. 3.18.



- Temperature sensor
- Signal cable for sensor
- Pump
- Valve (manual)
- 3-way valve
- Reg. Regulator
- Heat consumption
- One-way valve
- Installation pipe
- Q-Network Cable (heat circuit)
- Q-Network Cable (control circuit)

Paralleleinbindung ohne Flow Control bei Mehrfachanlagen (Installation 2)

Installation mit mehr als einer Power Unit

Die Installation besteht aus mehreren XRGI-Anlagen, einer Verbrauchswasserinstallation und einem Backup-Kessel. Es wird eine regulierte Wärmeinstallation des Hauses vorausgesetzt. D.h. warmes Wasser darf nicht zurück zur XRGI-Anlage geleitet werden.

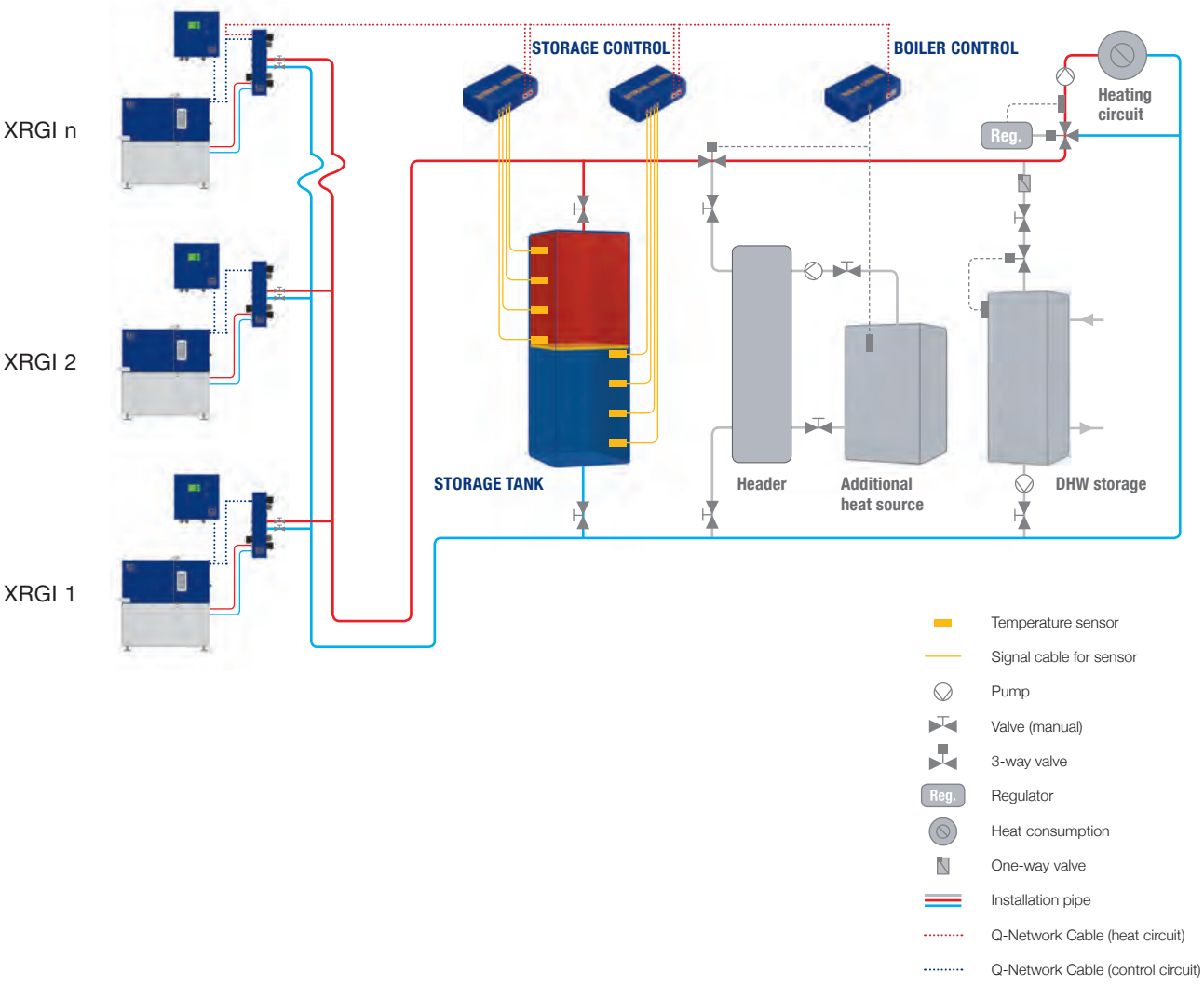
Bei Installation 2 ist eine der XRGI-Anlagen (die Master-Anlage) mit einer Boiler Control ausgestattet (nicht im Lieferumfang enthalten). Die Wärmereserve im Speicher bestimmt, ob der Backup-Kessel freigegeben wird und ob das Dreiwegeventil den Flow zum Kessel leiten soll. Geschieht dies wird Wärme von den XRGI-Anlagen gespeichert. Die XRGI-Anlagen sind mit dem Speicher verbunden. Die Zirkulationspumpen des Wärmeverteilers senden die produzierte Wärme zum Speicher und die Vorlaufpumpen des Hauses sorgen für den Flow über dem Speicher.

Diese Einbindung bietet sich u. a. an:

- bei Einsatz mehrerer XRGI-Anlagen (Kaskaden)
- wenn die Speicherkapazität auch für den Kessel verwendet werden soll
- wenn die Entnahmeleistung im Netz extrem schwankt.

Installationsdiagramm 2

Abb. 3.19.



Heating return increase with Flow Control (Installation 3)

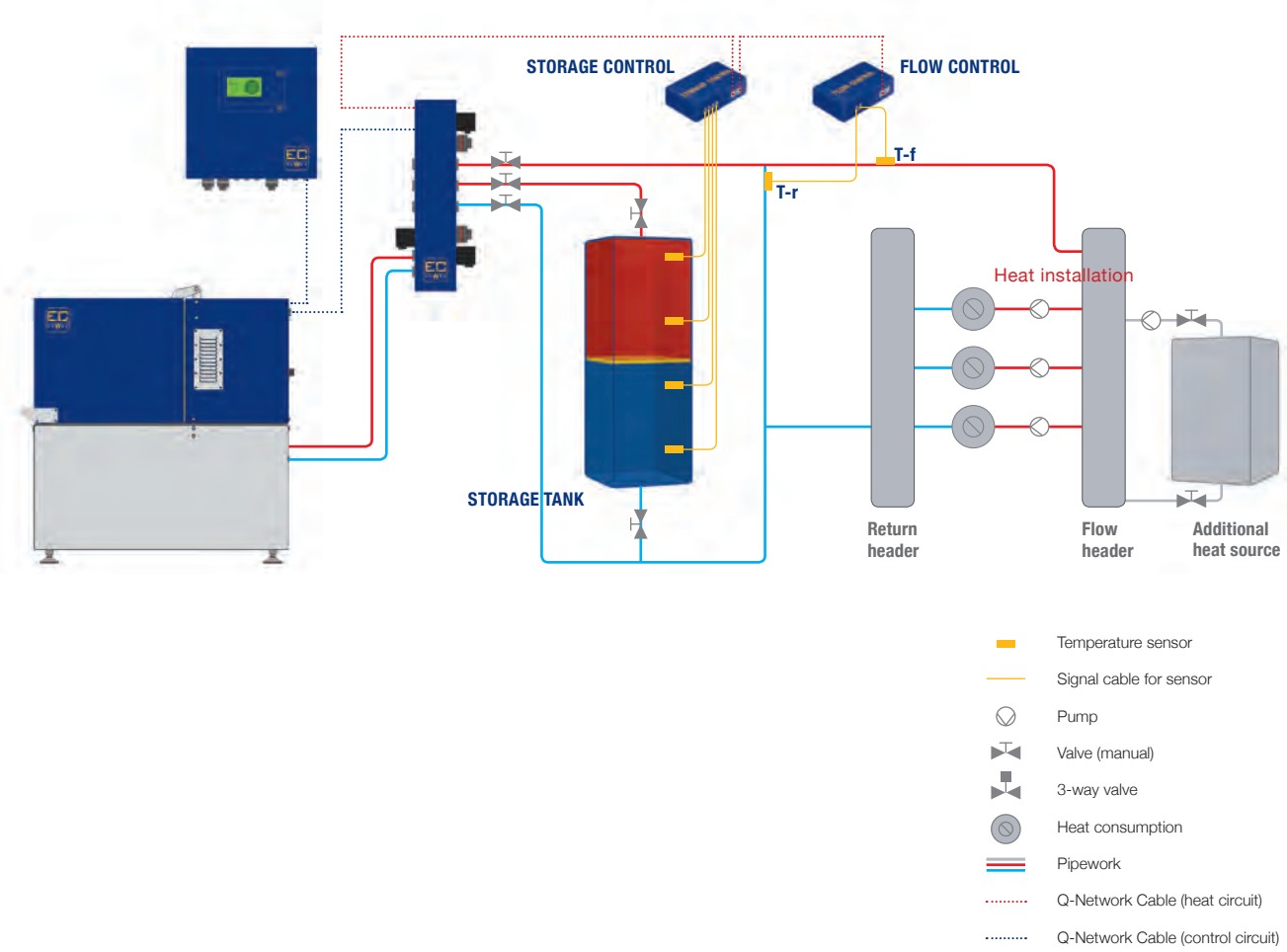
Installation with one Power Unit

Installation 3 consists of one XRGI system and an additional heat source.

In installation 1, the XRGI system is equipped with a Flow Control (not included). The Flow Control regulates how much heat is fed in the building's heating system and how much is stored in the storage tank. The XRGI system is connected to the return pipe of the building‘s heating system. There must be a direct flow connection to the additional heat source. With this installation, the XRGI system takes as much water as it requires and passes the rest to the additional heat source.

Installation diagram 3

Fig. 3.20.



Heating return increase for multiple systems (Installation 4)

Installation with more than one Power Unit

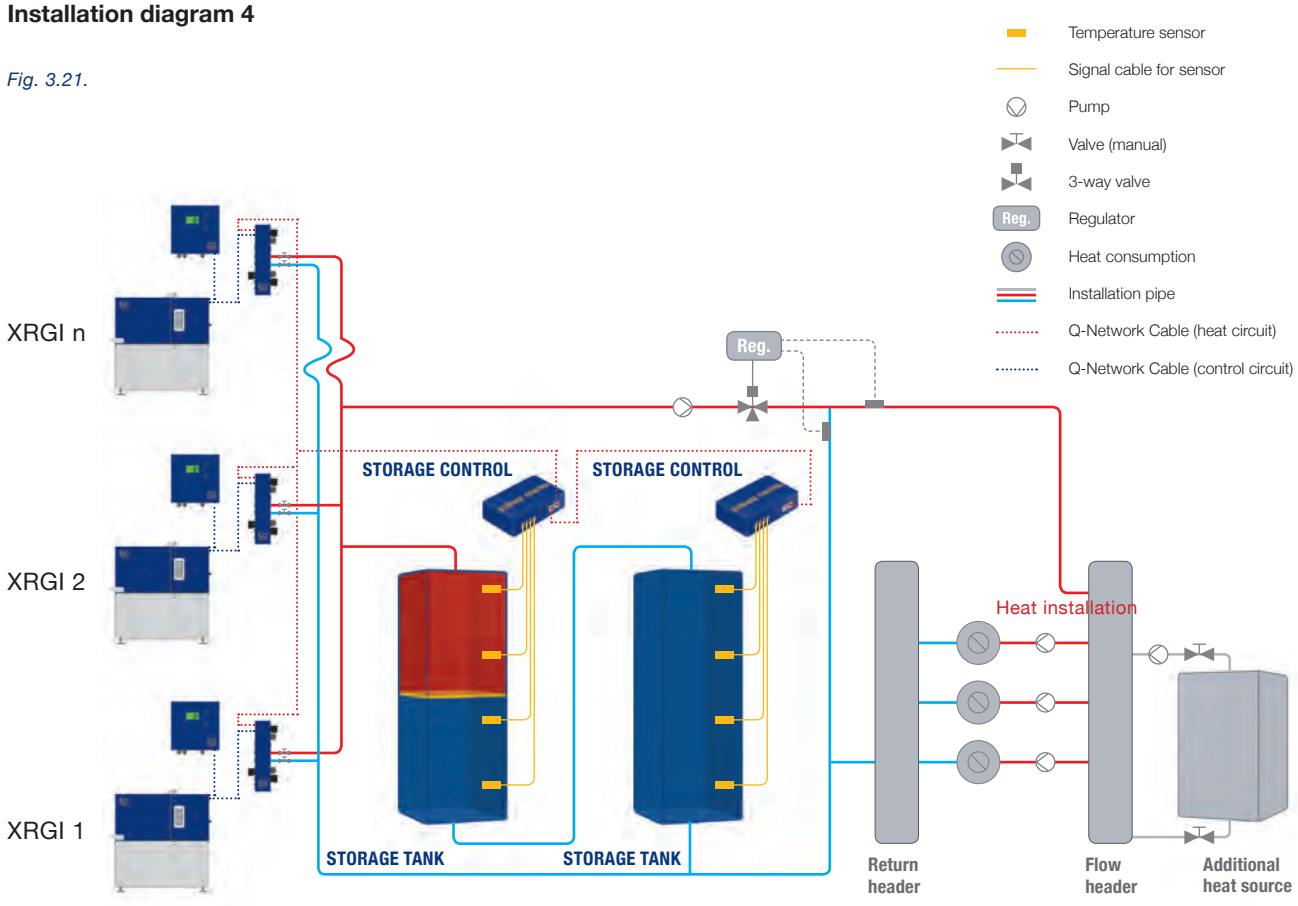
The installation consists of multiple XRGI systems and an additional heat source.

For the operation of the installation it is necessary that the building‘s heating circuit is regulated, i.e. that hot water is not led back to the XRGI system.

The XRGI systems are connected to the storage tank. The circulation pumps of the Q60-Heat Distributor pass the heat produced to the storage tank. A flow pump (not included) must be installed to ensure there is flow from the storage tank. f There must be a direct flow connection to the additional heat source.

Installation diagram 4

Fig. 3.21.



3.4.4. Transmitting heat to the consumer side

Stable and low return temperatures (below 65 °C) are essential for an economic an reliable operation of XRGI systems. Overflows, short circuits and bypasses must thus be avoided.
In the worst case, high return temperatures are taken to mean that the storage tank is full, and the system will switch off until electricity and heat conditions allow it to restart.

3.4.4.1. Overflows

Overflows should be limited and fitted with temperature sensors for reasons of frost protection. When this is done only a limited amount of water prevents freezing when there is a risk of frost.

Overflows for hydraulic reasons (e.g. differential pressure free distributors) are harmful to today's energy systems in principle. They cause circulating pumps to use current unnecessarily, increase line losses, reduce storage tank performance and make the heat sources less efficient. They must therefore be replaced with suitable variable flow hydraulic systems.

3.4.4.2. Hot water production

Hot water storage tanks cause high return temperatures, particularly towards the end of the loading process. For this reason the charge pump should be switched off before the return temperature rises significantly. The loading pump will also cause excessive return temperatures if it pumps too powerfully.

If the existing control system does not end the loading process in due time, a return temperature control valve should be fitted.

3.4.5. Indications of lack of hydraulic equalization

- Radiators do not warm up, while other system components are over-supplied ('hydraulic short circuit').
- Radiator valves and/or pipes make noises.
- Thermostat control is poor.
- Heating system is being operated at temperatures that are too high.
- The pumps used are too powerful.
- The heat source is becoming less efficient.
- Flow/return temperatures are unnecessarily high. Especially when using the latest condensing systems or with heat pumps and systems with auxiliary solar heating, efficiency falls (same applies XRGI)
- Non-optimum operation means using considerably more electricity and heat energy.

3.4.6. Summary

With all installation options, heat loads must be thermostatically controlled and regulated for their specific flow (hydraulic equalization). Water flows without any significant cooling (short circuits) should be avoided. Only by ensuring that heating water cools down in the heat loads can long service lives and high heat capacity in the storage tank be ensured. Return temperature control valves may help in some cases, e.g. with water heaters and convectors.

High return temperatures put stable system operations at risk.

3.5. CONTROL STRATEGY

The XRGI system monitors how heat and electricity are used over the day and the week. To record electricity consumption, a reference meter is required which meters the electricity the property requires. The building heat consumption is recorded by monitoring how the layers are built up and reduced.
This data is saved and analysed, so the XRGI system learns the property's consumption patterns. The saved data and the current electrical output are used to manage the storage tank and engine output.
If high tariff periods cannot be covered by generating electricity in-house, and there are no major differences in price between buying and selling electricity, the system can also be operated to meet heating requirements alone, in which case any current not required is sold and fed into the public grid.
A storage tank is required to smooth out fluctuations in heat consumption and to generate electricity when heat requirements are low. It should also be able to operate for at least half an hour, even when heat requirements are very low. Using larger or multiple storage tanks improves operation times and helps separate generating electricity from heat demand.

The XRGI system can handle a large number of operating strategies:

1. Heat-controlled
2. Tariff-oriented
3. Power-controlled
   a. Manually
   b. Metered
4. Heat-controlled, power-controlled
5. VPP (Virtual Power Plant) – Requires purchasing VPP accessories
6. ESC (External Storage Control)– Requires an external module

Warning! It is essential to check the dynamics and strength of electrical load fluctuations before installing a reference meter to optimise electricity production. Running major electricity loads, e.g. lifts for short periods only, while electricity demand is generally low, may make the XRGI's operation time patterns extremely unfavourable and increase system wear.

3.5.1. Heat-controlled operation

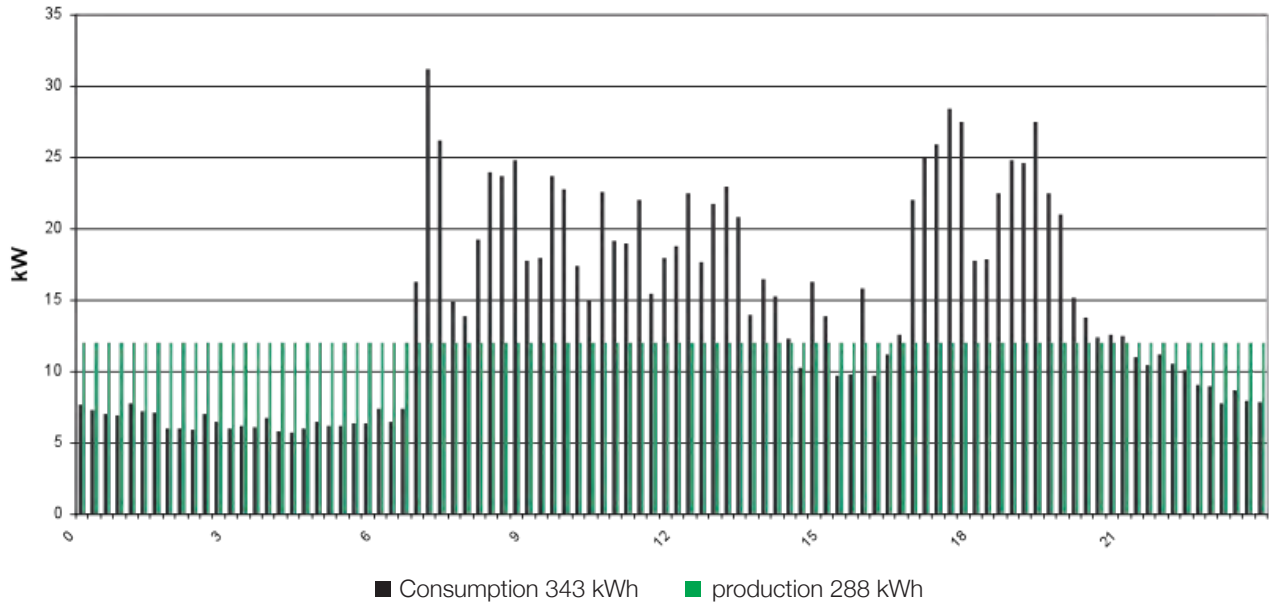
The device produces the maximum amount of electricity based on the property's heat consumption. How much heat the property needs is recorded via the storage tank level. The point at which the XRGI cuts in varies between sensors 1 and 2 of the storage tank depending on how much output the heating system requires. The XRGI does not cut out until the storage tank is full. The heat output required is recorded via the time it takes for the storage tank to discharge or via the Flow Control. This operating mode does not require a reference meter.

The benefits of this operating mode are that it has the lowest specific maintenance costs and is highly efficient in electrical terms, as the Power Unit always runs at the maximum output set.
Heat-controlled operation is to be preferred when the electricity and heat required are almost always greater than the maximum Power Unit output or if surplus electricity produced during heat generation is to be fed into the mains.

Comparison: demand and production of heat in heat-controlled mode (example):

Fig. 3.22.

Electricity: consumption and own production, fixed output



Power consumption and XRGI output do not affect one another.

3.5.2. Tariff-oriented operation

The Power Unit produces the set output preferably in high-tariff periods. This operating mode is thus guided by the electricity tariff and the property's heat requirements as follows:

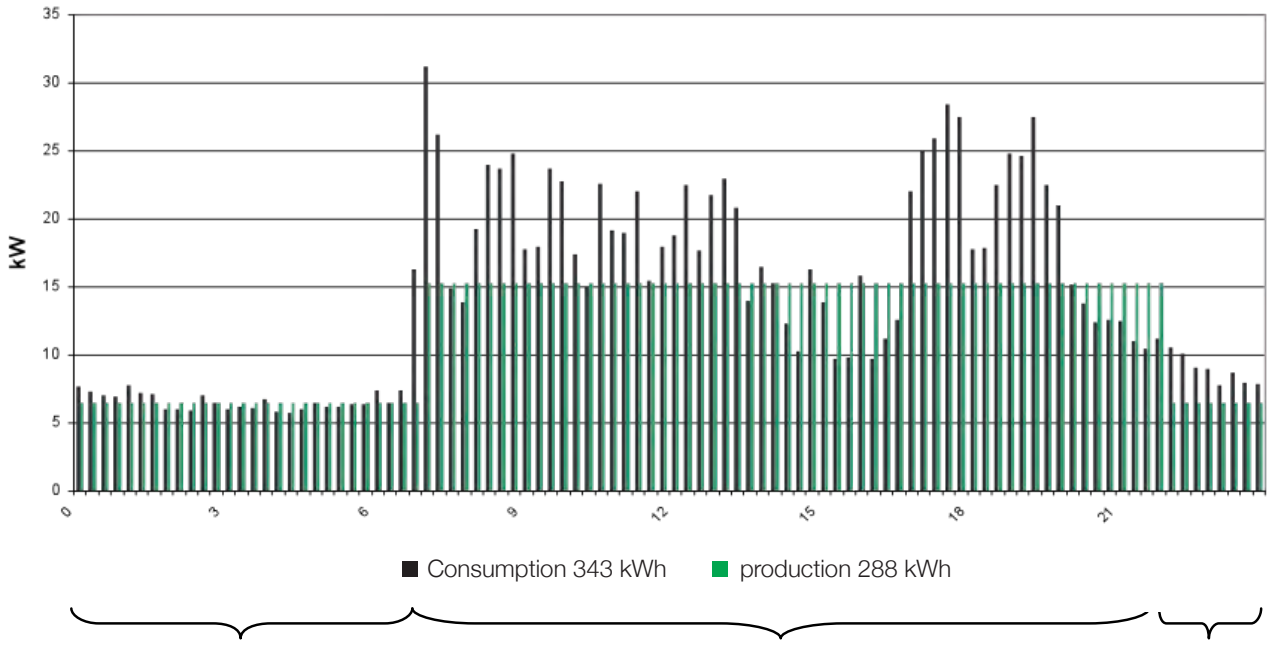
- maximum electricity production during the high tariff periods entered
- minimum heat production in low load mode

At low load times, the Power Unit can be switched out if desired, in which case heat is produced by the alternative heat source, the boiler or heat pump; or the Power Unit works at minimum heat output which is required to heat the property without switching in peak load production if at all possible. Producing heat is preferred. Any surplus electricity produced is fed into the grid.
Electricity tariff periods can be entered in the LCD display of the user interface via a weekly schedule.
Tariff-oriented operation is to be preferred when electricity demand at high-tariff periods is almost always greater than electricity production and the storage tank is to remain empty at low-tariff periods to cover peak electricity demand.
Switching the Power Unit out in low load mode makes sense if feed-in tariffs are unprofitable at these times.

Comparison: demand and production for load lead operation (example):

Fig. 3.23.

Electricity consumption and own production, fixed output, two-stages



1. Minimum output at low tariffs. Storage tank kept free to produce at high tariffs.

2. Generates electricity at high tariffs at fixed preset output as long as heat storage tank has enough capacity, irrespective of how much electricity property needs

3. as 1.

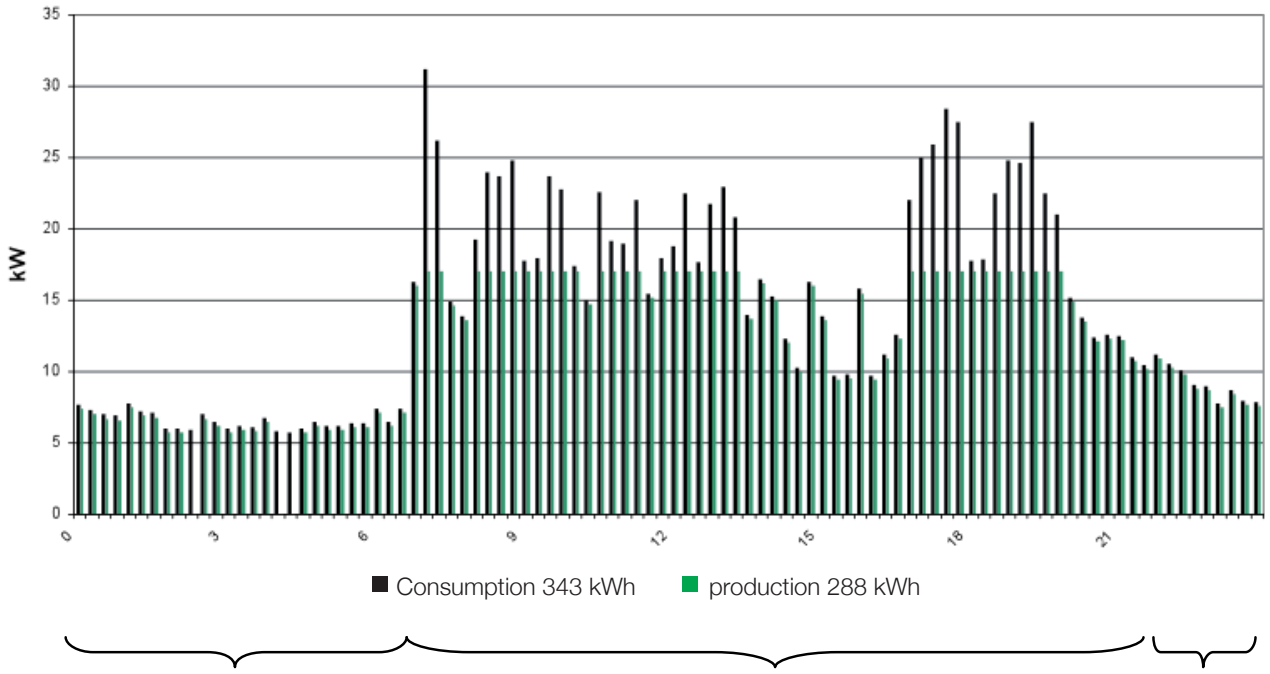
3.5.3. Power-controlled operation

This operating mode is guided by the electrical output required, electricity tariffs and the property's heat requirements. The output required here can either be entered in the LCD display of the user interface via a weekly schedule or metered via a reference meter. The reference meter has the advantage that the control system adjusts precisely to changing consumption and living patterns and special uses such as weekends and public holidays. When electricity demand and tariffs are low, the Power Unit can be switched out if required, in which case the heat is produced by the boiler or heat pump, or the Power Unit runs at minimum output until the top storage tank area is hot, then stops. Surplus electricity can thus either be avoided or fed into the mains in as small as possible amounts. During high tariff periods, the aim is for the Power Unit to run in line with the electricity the property requires. However, heat demand takes priority. When the property needs relatively little electricity during high-tariff periods, but the heat storage tank is empty, the XRGI system will try to cover the heat demand and feeds the surplus electricity into the grid.
Power-controlled operation is to be preferred when electricity costs are high during high-tariff periods, e.g. through output tariff feeding in comparatively little at low load periods.

Comparison: demand and production in power-controlled operation (example):

Fig. 3.24.

Electricity: consumption and self-generation



1. *Minimum production when tariffs are low. The boiler is started when heat demand is high. Storage tank kept empty for high-tariff production.*

2. *Electricity production during high-tariff periods according to metered demand as long as the heat produced can be loaded into the storage tank. The boiler is switched in if heat demand increases.*

3. *as 1.*

3.5.4. Heat-controlled, power-controlled operation

This operating mode is guided by the property's heat and electricity requirements, the electrical load profile for the past week and the electricity tariff.
The XRGI system uses the load profiles saved to try to cover both heat and electricity demand optimally. High-tariff periods take priority. If the data saved and heat requirement indicate that a surplus will be produced, this surplus will be fed in during high-tariff periods if possible. If the data saved indicate that heat production will fall short of demand, the storage tank is (partly) loaded and electricity is fed into the grid during low-tariff periods as an exception.
Heat-controlled, power-controlled operation should be used in particular if:

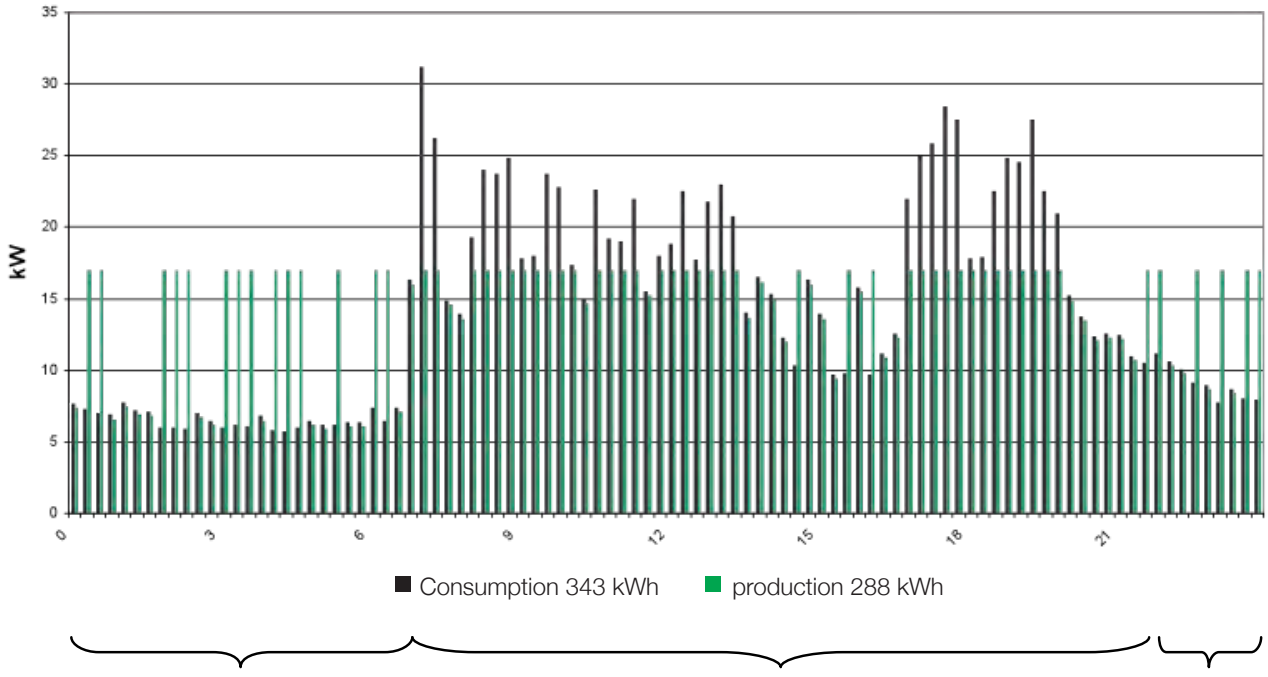
- Electricity demand fluctuates and the Power Unit output regularly falls below maximum
- Heat requirements are at times (e.g. in summer) lower than the heat production of the Power Unit and
- Electricity costs are high.

This operating strategy is forward-looking. It works like a virtual power station, but does not produce electricity in response to external control commands from control centres. Instead, it is based on the tariff structure, which is increasingly governed by the power requirements of the economically less viable peak load power stations. At the same time, the property's heat requirements are covered by the XRGI system as optimally as possible.

Comparison: demand and production in heat-controlled, power-controlled mode (example):

Fig. 3.25.

Controlled feed-in without putting own requirements at risk



1. Minimum production when tariffs are low: if heat demand is high, electricity is fed into the grid. Storage tank is kept empty for high tariffs.

2. Electricity is produced during high-tariff periods to meet metered demand as long as the produced heat can be stored in the storage tank. If heat demand increases, electricity is fed into the grid.

3. as 1.

3.6. ELECTRICAL INSTALLATION OF THE XRGI 20G-TO

The electrical installation must be large enough for a protected output with 63 A gl/gG fuses to be available for the XRGI system. With multi-module systems, each XRGI system must have its own output.

The Power Unit can modulate its electrical output to meet the property's current electricity consumption, and only generate electricity at the current purchase price, and not feed it into the grid.

To achieve the power-controlled function, the electrical connection must be made at a supply point in the main control cabinet behind the main meter, and an additional reference meter must be installed behind this supply point and upstream of the electrical loads.

In properties which always use more electricity and heat than the Power Unit can produce, or where the sales price for electricity is equal to or greater than the purchase price, the XRGI system can be connected at any sufficiently dimensioned connection point without a reference meter.

Any electricity feed-in must be reported to the network operator before commissioning the XRGI system.

The IQ-Control Panel is equipped with grid monitoring relay according to DIN VDE 0126-1-1, and is used to replace the "control point with separator function accessible at any time".

(See also circuit diagram for electrical connections – Annexe 1)

The electrical installation consists of the following steps:

- Install the supply point: a protected output immediately behind the electricity meter (utility company's meter), upstream of the reference meter and all other outputs.
- Install the reference meter (electronic meter with pulse output, provided by EC-Power A/S) downstream of the supply point and upstream of all other outputs.

Option: connect the current converter to the reference meter if the feed line safety is > 80 A.

Option: create groups for each heat pump and/or each heating cartridge.

- Mount the IQ-Control Panel.
- Lay supply, signal and control cables between the units as follows:
  - Power supply cable from supply point to IQ-Control Panel
  - Signal cable from reference meter to IQ-Control Panel
  - Signal cable from Q60-Heat Distributor to IQ-Control Panel
- With existing storage tanks: introduce the PT 100 sensors in four immersion sleeves for 6 mm immersion sensor and fit them in the storage tank.
- Fit a 230 V AC socket for the Q60-Heat Distributor if there is not one already.
- Lay a power supply cable between Power Unit and IQ-Control Panel.
- Lay control cables between Power Unit and IQ-Control Panel.

Option: lay a control cable between heat pump and IQ-Control Panel.

Option: lay a power supply cable from each output to the heat pump and to the heating cartridge.

- Inform your electricity supply company in writing in good time before commissioning the XRGI system and say when you expect to start using it. Ask the electricity supply company's network master to handle commissioning.
- Be at hand personally when the system is commissioned, and send the correctly completed VDEW commissioning report to the electricity supply company immediately after commissioning.

Cable dimension tables:

Please note!

All cable lengths and dimensions are recommended by EC POWER; factors such as parallel lines, ambient temperatures, mechanical and chemical effects, etc. must also be taken into account for each XRGI system individually.

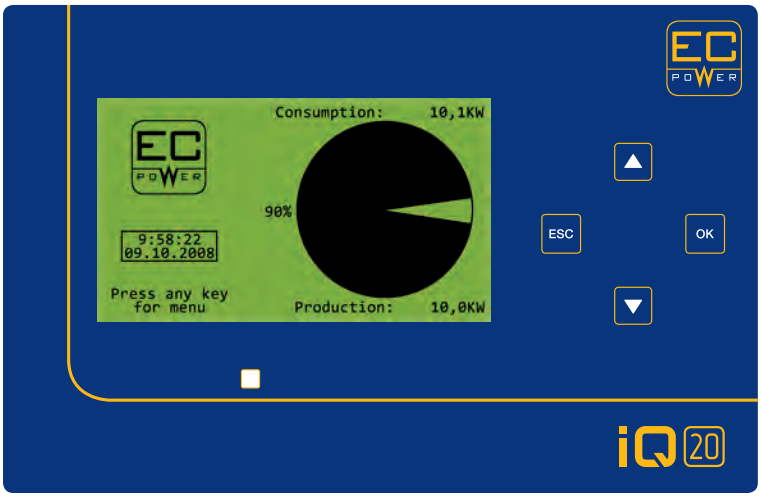
Conductor material	Cable type recommended	Number of conductors x cross-section [mm²]	Maximum length advised
Installation cable generation/production (from supply point to IQ-Control Panel)			
Cu		5 x 10	100 m.
Cu		5 x 16	150 m.
Power supply/generation cable (from IQ-Control Panel to Power Unit)			
Cu		4 x 10	10 m.
Control cable (from IQ-Control Panel to Power Unit)			
Cu		11 x 0.75	15 m.
Cu		4 x 0.75 shielded	15 m.
Cu		2 x 0.75 shielded	15 m.
Signal cable (upstream of reference meter to IQ-Control Panel)			
Cu		3 x 0.5 shielded	250 m.

Optional cables

Conductor material	Cable type recommended	Number of conductors x cross-section [mm²]	Maximum length advised
Power supply cable (from safety output to heat pump(s)			
Cu		5 x 2.5	100 m.
Control cable (from IQ-Control Panel to heat pump box)			
Cu		2 x 2 x 0.8	250 m.
Control cable (from heat pump box to heat pump(s)			
Cu		3 x 1.5	100 m.

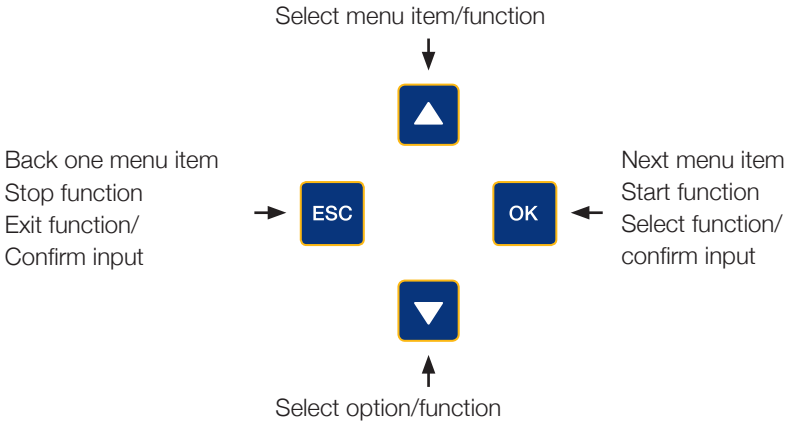
4. OPERATING INSTRUCTIONS

4.1. User interface at IQ-Control Panel

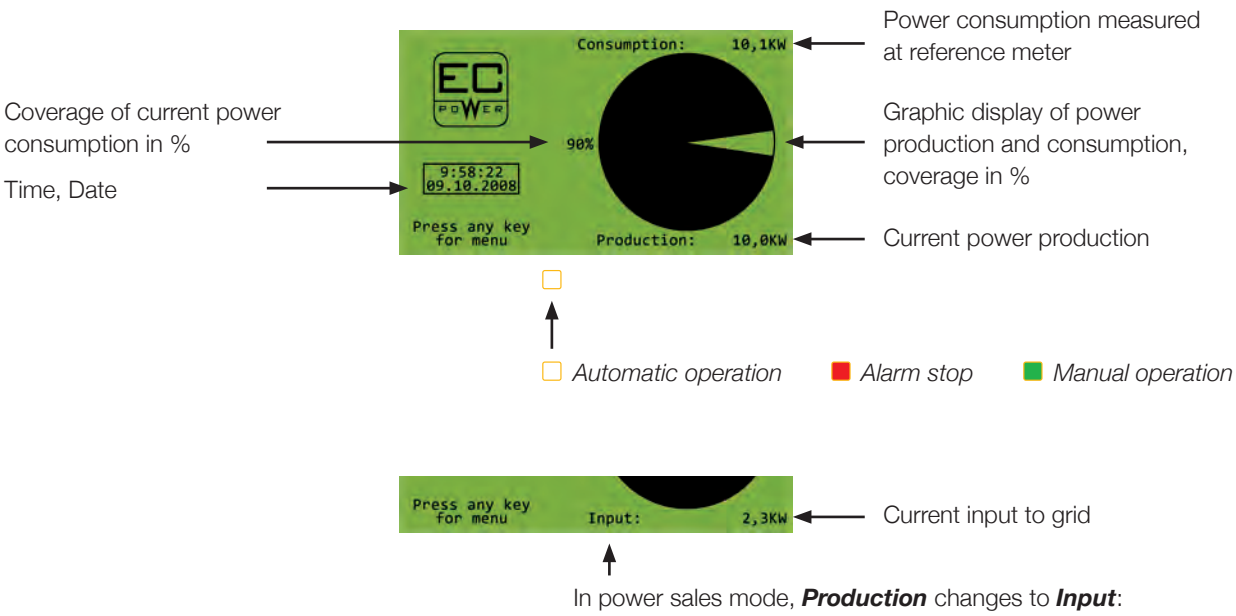


4.1.1. Control keys

Use the four keys of the control field to work through the menus as follows:



4.1.2. Display



4.1.3. Starting and stopping automatic operation

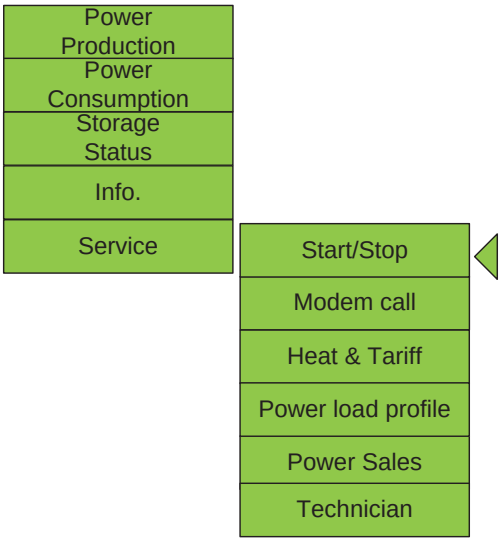
If the XRGI is operating in fully automatic operation, the control system ensures that the electricity and heat requirements are always covered at the best and most financially viable terms at the time.

4.1.3.1. Manual stop

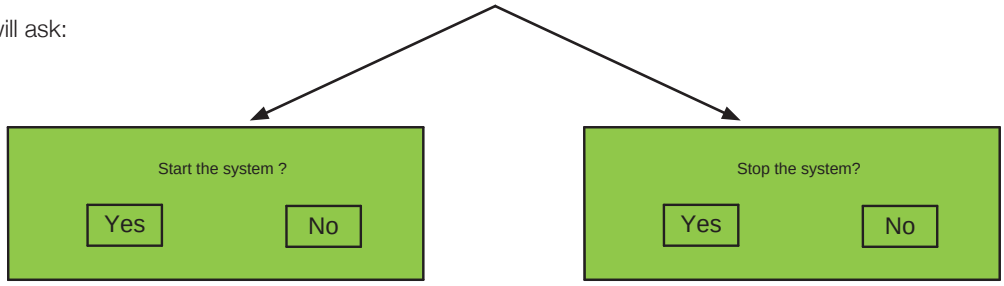
The XRGI can be stopped as follows:

Select option **Service -> OK**

Select option **Start/Stop -> OK**



The system will ask:



Automatic operation *Not in automatic operation*

Use the ▲ ▼ keys to select whether to switch automatic operation on or off, press **OK** to confirm, or **ESC** to exit the menu.

4.1.3.2. Manual start

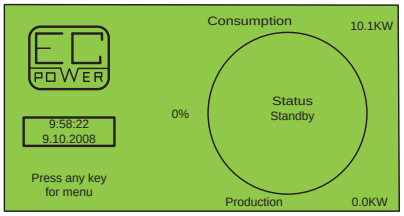
If the system is in the standby position in automatic operation, the system can be started, provided the storage tanks are not full. If the system asks "Stop the system?" and you answer "**No**", the system will ask whether you want to start the system.

4.1.3.3. Automatic operation

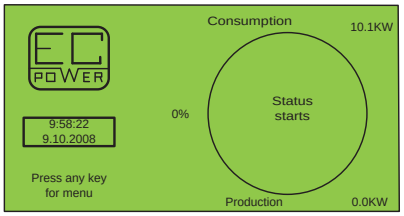
In automatic operation, the system monitors electricity and heat consumption constantly and covers them as economically as possible.

In normal automatic operation, the system starts and stops automatically, as shown here:

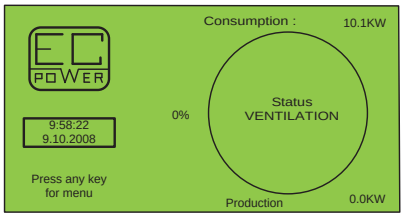
Standby: Waits for power/heat consumption to rise.



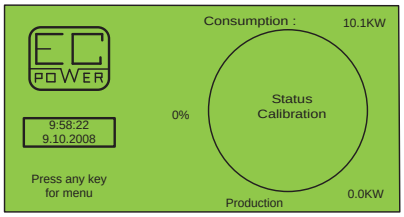
Starts: The system is starting.



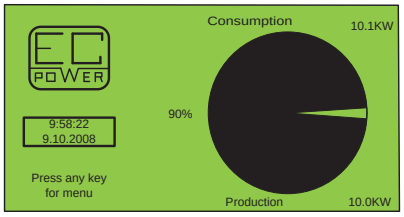
Ventilation: Mixture control and engine module flushed with fresh air.



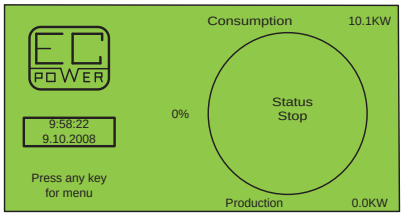
Calibration: Control system checks system is working.



Normal: Output controlled automatically.

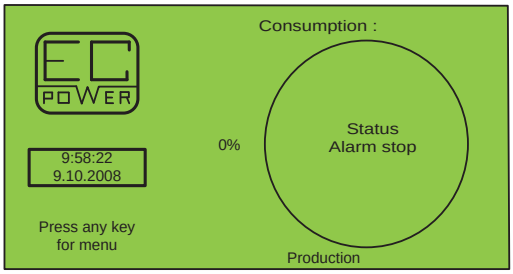


Stop: System stops because power or heat demand is low.

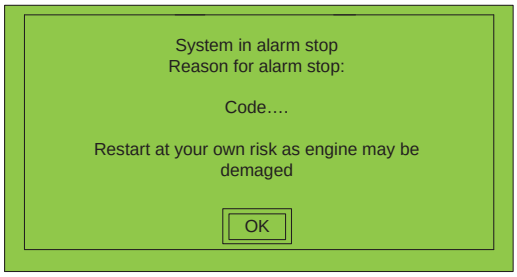


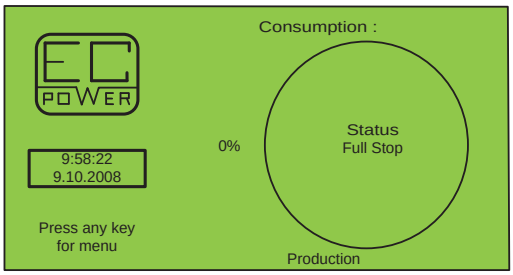
4.1.3.4. Alarm stop

If a fault occurs during operation, the system stops automatically. The LED on the IQ-Control Panel illuminates red to indicate a fault. The control system reports the problem to the central database automatically via the integrated modem.



Alarm fault details
Press the key and the system explains why the stop alarm was set off.
The system should not be restarted without consulting a service engineer. Consequential damage as a result of restarting improperly is not covered by the warranty.





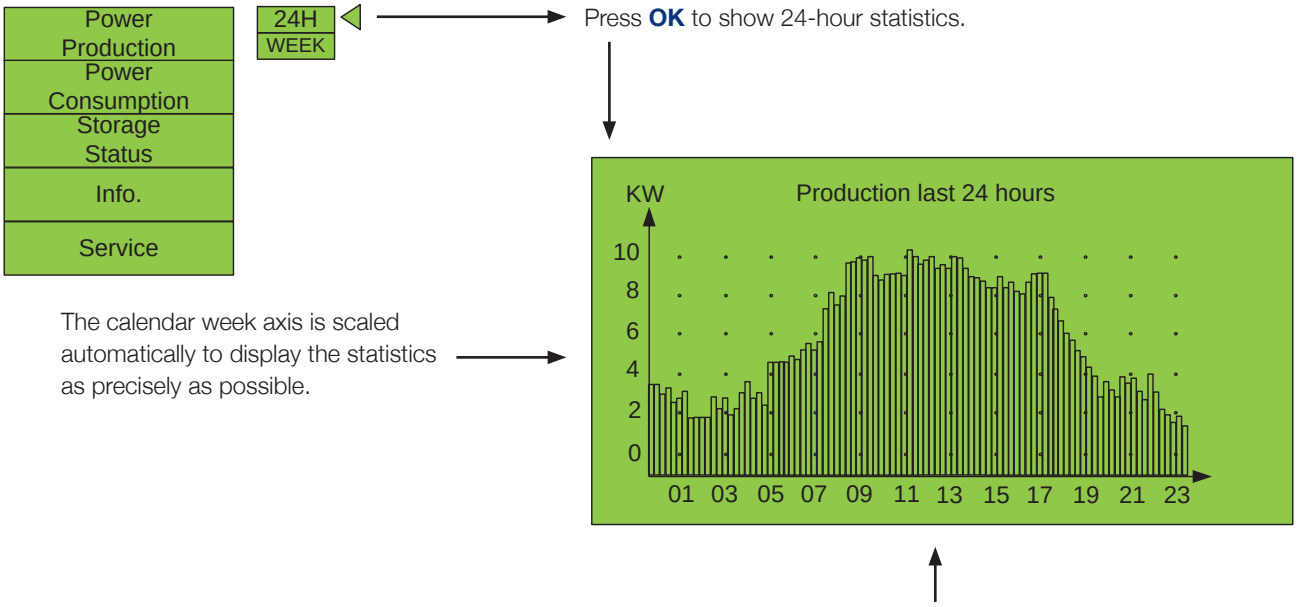
Acknowledge alarm
Press **OK** to reset alarm.

4.1.4. Power statistics

The control system provides 24-hour and weekly statistics on power consumption and generation. The two functions are structured identically.

4.1.4.1. 24-hour statistics

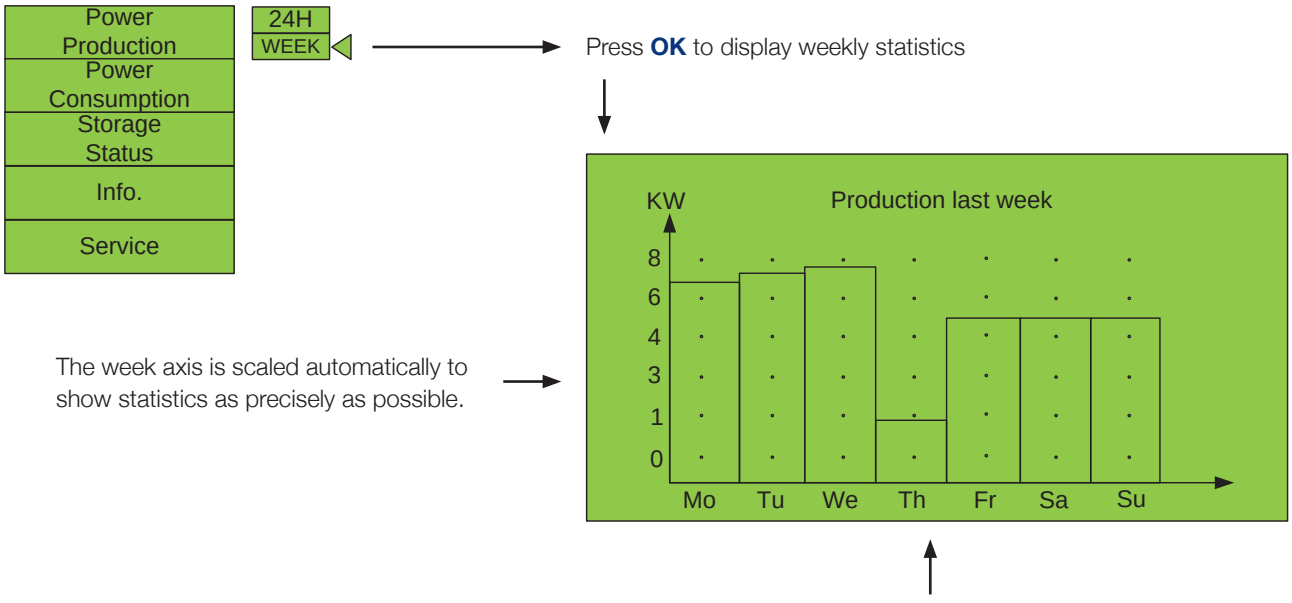
The menu items are shown below:



The time axis shows the 24 hours and power output as 15 minute averages. That is, if the output shown at 14.00 is 130 kW, that is the average for 13:45–14:00, i.e. 1:45 p.m. to 2:00 pm. Statistics are updated every 15 minutes. Press **ESC** to return to menu.

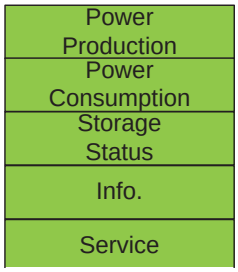
4.1.4.2. Weekly statistics

Menu items are shown below:

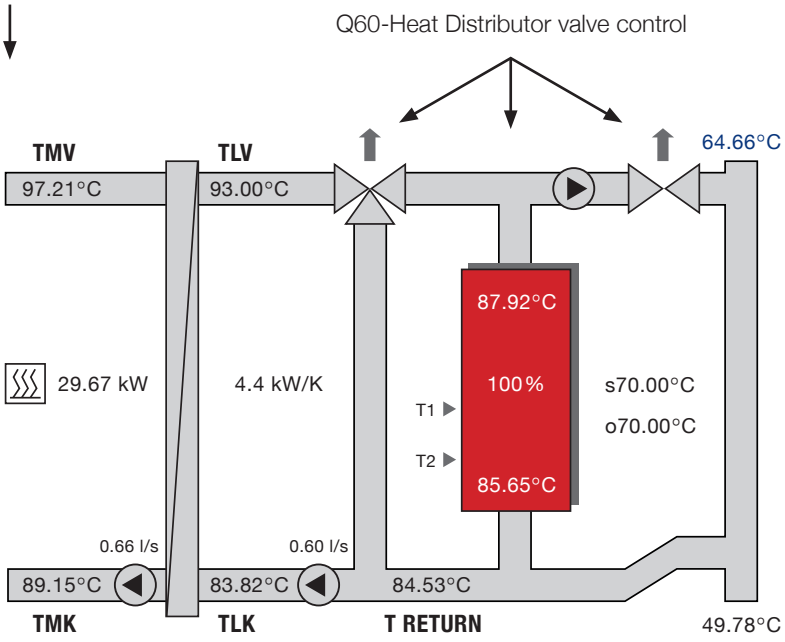


The time axis shows the days of the week, each bar is an average for the relevant 24 hours. Statistics are updated at midnight. Press **ESC** to return to menu.

4.1.5. Storage tank and heat production



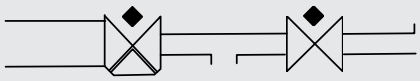
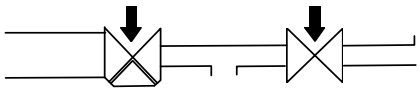
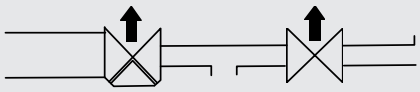
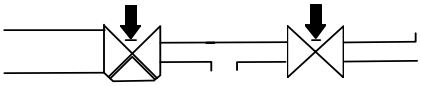
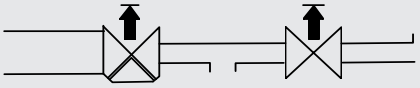
Press **OK**, select Storage Status, the system overview with storage status is displayed.



Key

TMV	Flow temperature from engine
TMK	Return temperature to engine
TLV	Feed temperature from heat exchanger
TLK	Return temperature to heat exchanger
29.67 kW	Heat production/output from engine
kW/K	Heat distributor efficiency in kW/K (below 2.5 kW/K is critical)
T RETURN	Return temperature from storage tank and grid to Q60-Heat Distributor
s70.00°C	Flow temperature set point to heating network (adjustable)
o70.00°C	Operational set point
64.66°C	Flow temperature to heating network
49.78°C	Return temperature from heating network
87.92°C / 100% / T1 / T2 / 85.65°C	Storage tank status Temperature above Level Temperature below

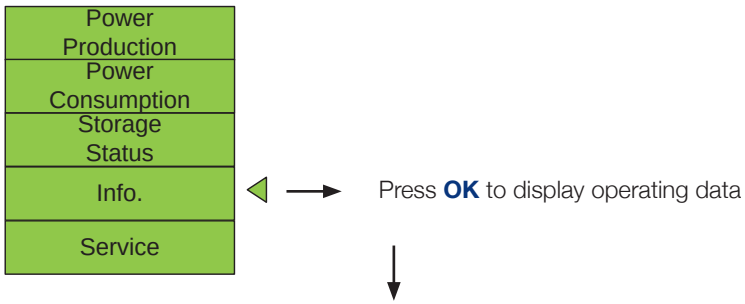
Valve markings

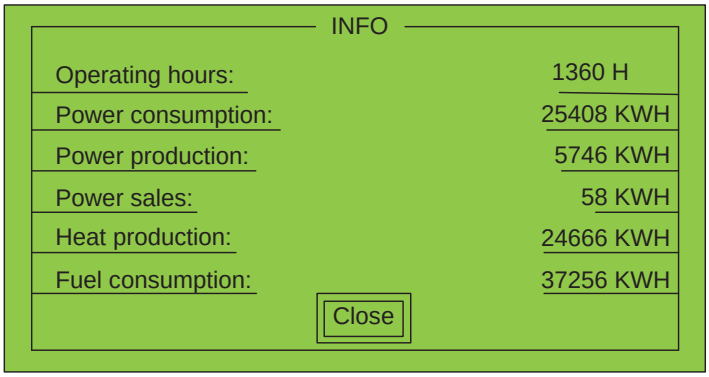
	Valves in standby position
	Close valves
	Open valves
	Valves closed
	Valves open

Press **ESC** to return to menu.

4.1.6. Operating data

The menu items are shown below:





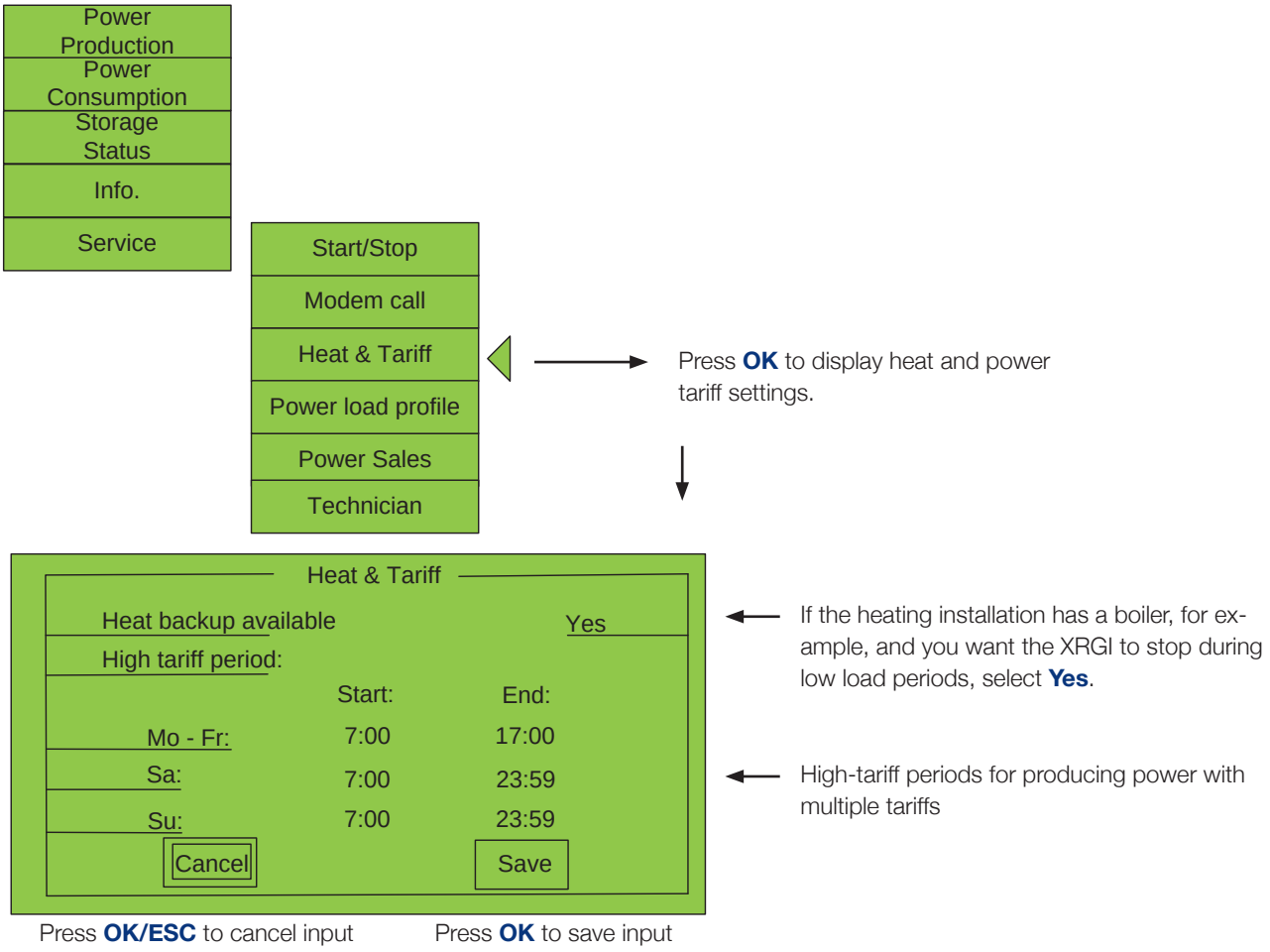
Operating hours, total
Power consumption, metered
Power production, metered
Power sales, metered
Heat production, calculated
Fuel consumption calculated from GCV

Press **OK/ESC** to return to menu.

4.1.7. Operating data online

You can also find your system operating data online at www.ecpower.de by entering your username and password. You will need to agree to connect your system with your specialist dealer separately.

4.1.8. Heat & Tariff



4.1.8.1 Heat backup

If a heat backup is available, such as a boiler, select **Yes**. The control system will then start the boiler as a heat source when heat/power demand is low. The XRGI then remains off during these periods, and the control system waits for heat/power demand to rise. If you want the XRGI to cover base-load heating demand outside high-tariff periods also, select **No** for the heat backup.

- Use the ▲ ▼ keys to move the cursor to the heat backup line.
- Press **OK** to change settings.
- Use the ▲ ▼ keys to select **Yes/No**, then **ESC** to end selection.

Warning! If the boiler is not always in operation, the setting must be changed to No, and the XRGI system will cover heat production.

4.1.8.2. HT period

If the installation has only one power tariff, select high tariff for all 24 hours in the day, as shown below.
If there is more than one tariff, enter the start and end times for the HT periods (HT).

There are three period options: All working days
Saturdays
Sundays

Typical inputs:

	Start:	End:
24-hour high tariff	0:00	23:59
HT during specific periods	6:00	21:00
No HT within 24 hours	0:00	0:00

The control system optimises heat and power production based on the times entered.

Should the XRGI preferably be used to cover peak power loads at certain times of day, these times can be programmed here as high tariff periods. Use the heat backup settings to select whether to use the XRGI outside peak loads or not.

Eingabe:

Use the ▲ ▼ keys to move the cursor to the time you want to change then press **OK**. The cursor now flashes on the hours figure.
Use the ▲ ▼ keys to change the hours and press **OK**. The cursor now moves to the minutes figure.
Use the ▲ ▼ keys to change the minutes and press **OK** to complete.
Use the **ESC** key to go back from minutes to hours.

Use the same procedure to change all times that need to be changed.

Move cursor to Save and press **OK** to save.

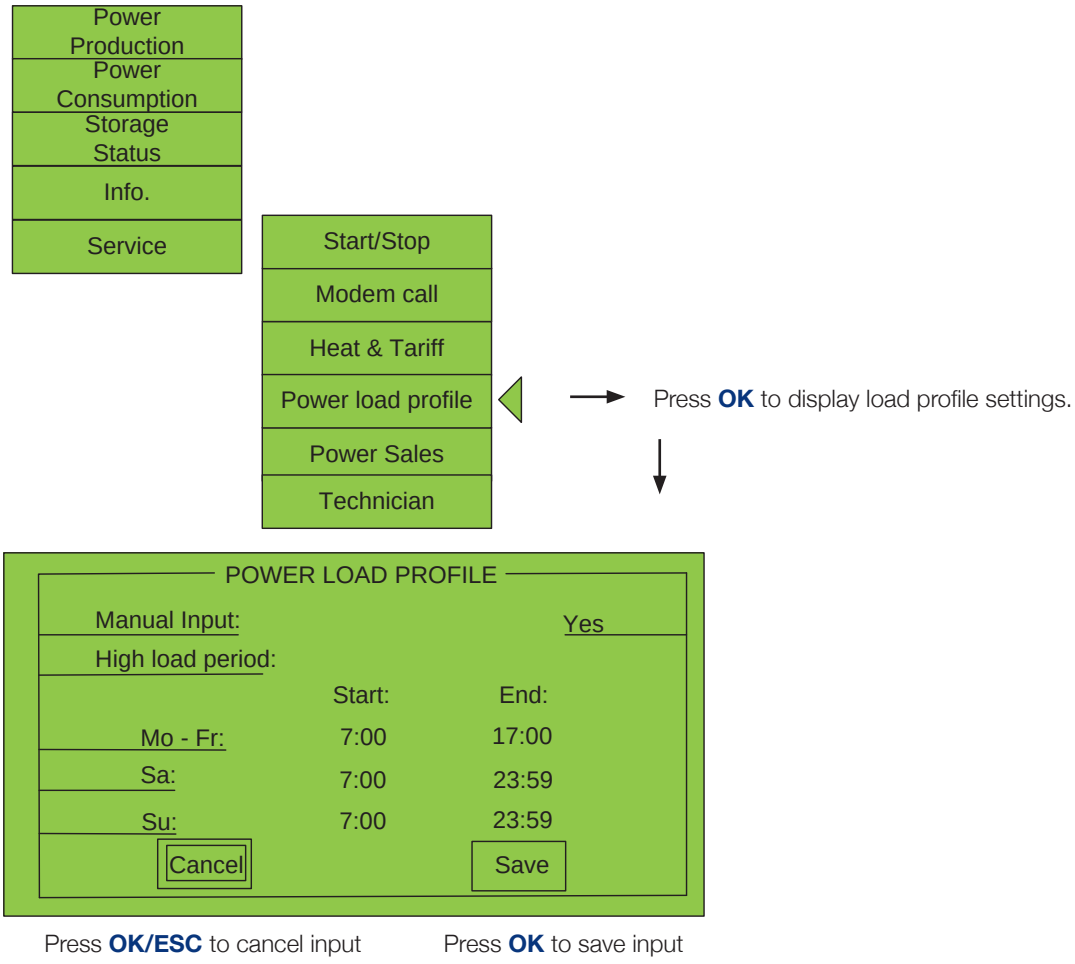
Changes will take effect a few seconds after they are entered. Settings can be changed at any time, even in automatic operation.

4.1.9. Load profiles and heat-controlled

If a reference meter to meter the property's heat requirements is installed and switched on, the menu will show the Power load profile item. Otherwise the menu item Heat Controlled will appear at this point (see next section).

4.1.9.1. Load profiles

Menu items as shown below:



You can use the menu above to enter load periods. Load periods are periods during which power consumption is greatest. They are used to optimise heat and power production.
You can choose to set load periods manually or automatically. In automatic operation, the system resets the periods every night at midnight based on measured consumption.

Manual input:

In manual input operation, any period can be selected.

Use the ▲ ▼ keys to set the cursor to Manual input.
Press **OK** to change settings.
Use the ▲ ▼ keys to select **Yes/No**, press **ESC** to end.

Load period:

In manual input operation, you should enter the period when power consumption is highest.

There are three period options: All working days
Saturdays
Sundays

Typical inputs:

	Start:	End:
24-hour high tariff	0:00	23:59
HT during specific periods	6:00	21:00
No HT within 24 hours	0:00	0:00

The control system optimises heat and power production based on the times entered.

Should the XRGI preferably be used to cover peak power loads at certain times of day, these times can be programmed here as high tariff periods. Use the heat backup settings to select whether to use the XRGI outside peak loads or not.

Eingabe:

Use the ▲ ▼ keys to move the cursor to the time you want to change then press **OK**. The cursor now flashes on the hours figure.
Use the ▲ ▼ keys to change the hours and press **OK**. The cursor now moves to the minutes figure.
Use the ▲ ▼ keys to change the minutes and press **OK** to complete.
Use the **ESC** key to go back from minutes to hours.

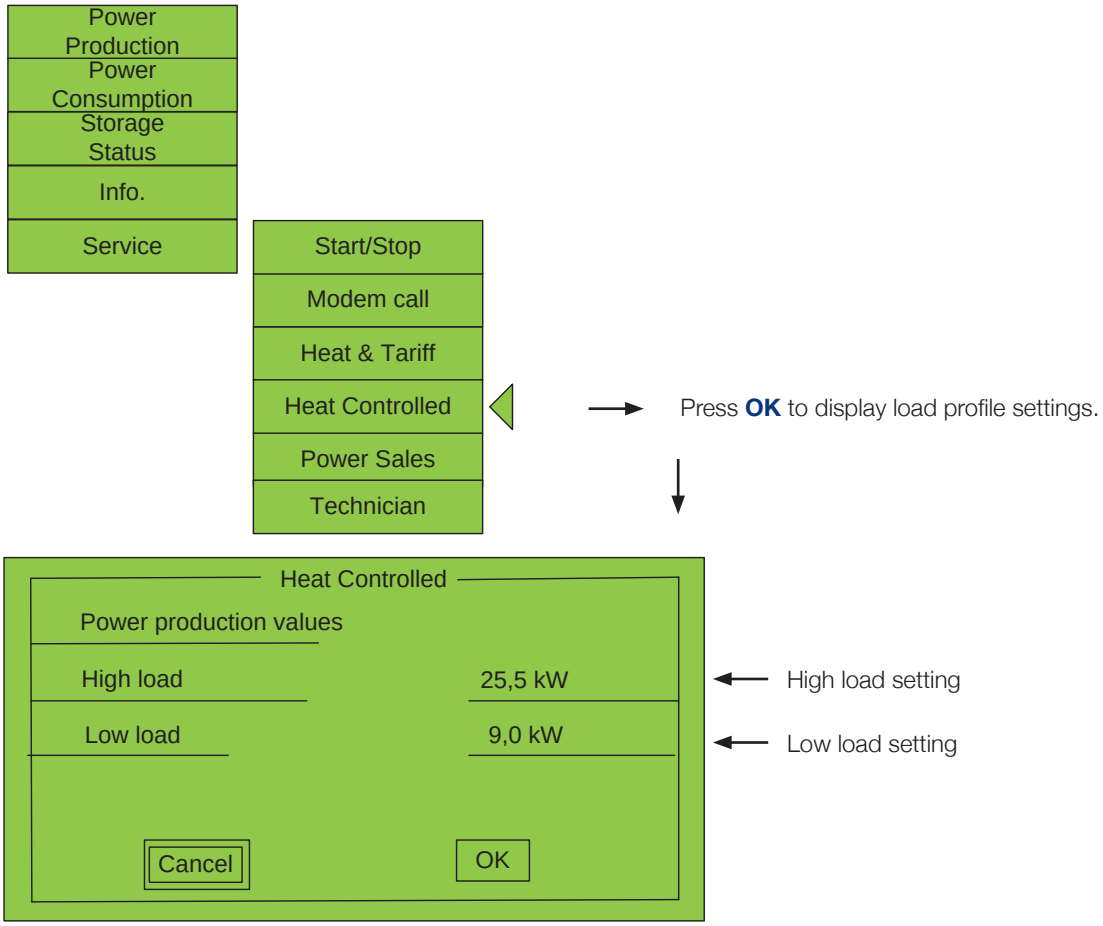
Use the same procedure to change all times that need to be changed.

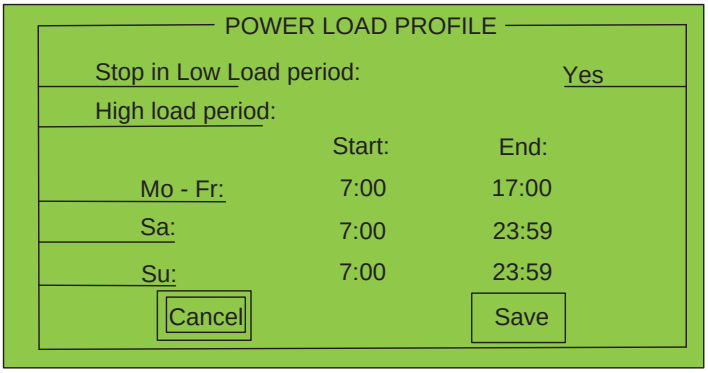
Move cursor to Save and press **OK** to save.

Changes will take effect a few seconds after they are entered. Settings can be changed at any time, even in automatic operation.

4.1.9.2. Heat-controlled

The menu items are shown below:





← Select **Yes** if you wish to enter periods manually.

← Displays high load periods

Press **OK/ESC** to cancel input Press **OK** to save input

Entering the consumption figures for high and low loads and associated high load periods sets the consumption pattern for the XRGI.

Stop in low load:
If you want the system to switch off at low loads if possible, answer **Stop in low load profile** with **Yes**.
If a heat backup is available, the system will switch off at low load. If no heat backup is available, the system will run at minimum only, to keep the storage tank in heat.

Use the ▲ ▼ keys to move the cursor to **Stop in low load profile**.
Press **OK** to change settings.
Use the ▲ ▼ keys to select **Yes/No** or **ESC** to exit.

Load period:
High load periods determines the times during which power should preferably be produced. Outside these periods, low load values apply.

There are three period options: All working days
Saturdays
Sundays

Typical inputs:

	Start:	End:
24-hour high tariff	0:00	23:59
HT during specific periods	6:00	21:00
No HT within 24 hours	0:00	0:00

The control system optimises heat and power production based on the times entered.

Should the XRGI preferably be used to cover peak power loads at certain times of day, these times can be programmed here as high tariff periods. Use the heat backup settings to select whether to use the XRGI outside peak loads or not.

Input:

Use the ▲ ▼ keys to move the cursor to the time you want to change then press **OK**. The cursor now flashes on the hours figure.
Use the ▲ ▼ keys to change the hours and press **OK**. The cursor now moves to the minutes figure.
Use the ▲ ▼ keys to change the minutes and press **OK** to complete.
Use the **ESC** key to go back from minutes to hours.

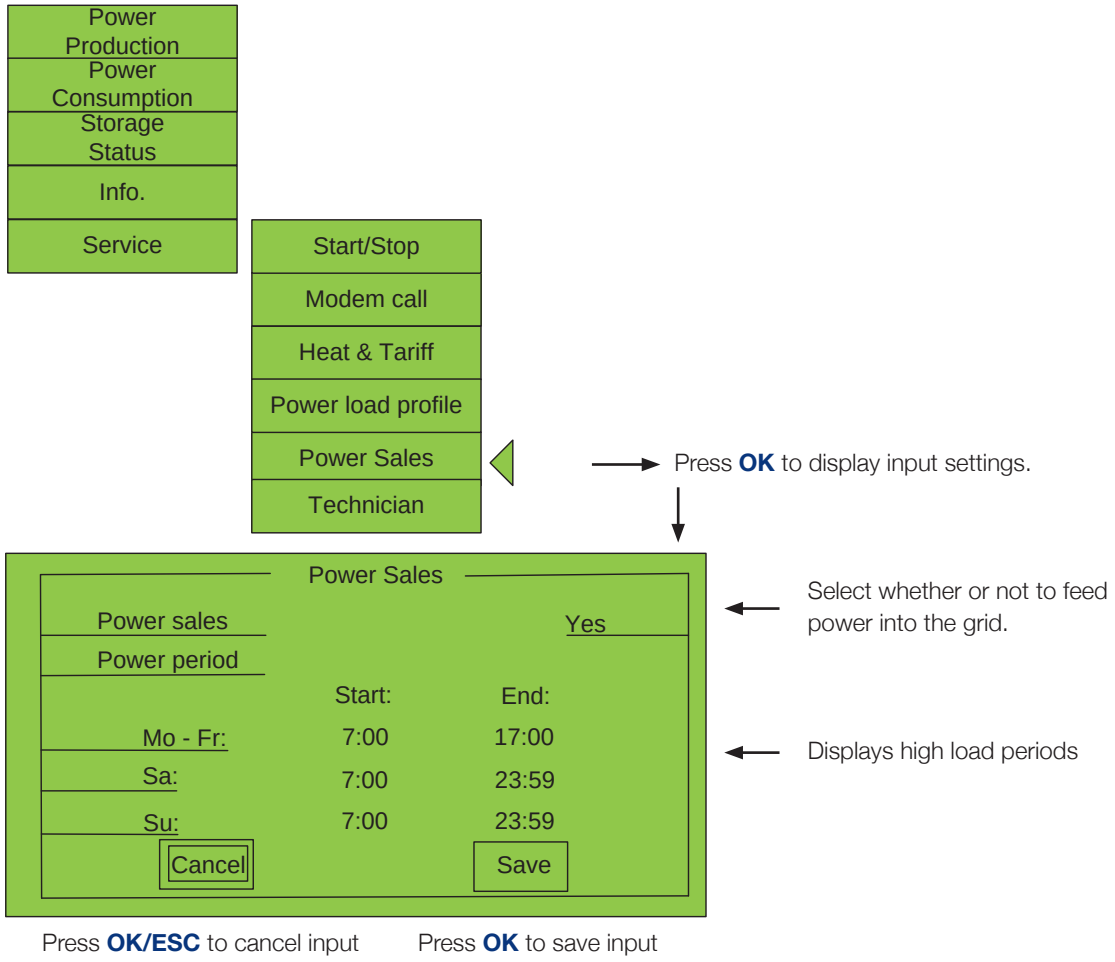
Use the same procedure to change all times that need to be changed.

Move cursor to Save and press **OK** to save.

Changes will take effect a few seconds after they are entered. Settings can be changed at any time, even in automatic operation.

4.1.10. Power sales

The menu items are shown below:



Power sales
If you do not want to feed the power produced into the grid, select **NO** (default) here. HT times entered are not considered. The control system then tries to generate output based on the manual inputs or reference measurements only.
If you want to feed the power produced into the grid, select **Yes**. It is also possible to select the times during which you want to sell power to the network operator. The control system will then try to sell power during the periods specified, provided the heat produced is used.

Selling periods
Enter the times agreed with your network operator.

There are three period options: All working days
Saturdays
Sundays

Eingabebeispiele:

	Start:	End:
24-hour high tariff	0:00	23:59
HT during specific periods	6:00	21:00
No HT within 24 hours	0:00	0:00

The control system optimises heat and power production based on the times entered.

Should the XRGI preferably be used to cover peak power loads at certain times of day, these times can be programmed here as high tariff periods. Use the heat backup settings to select whether to use the XRGI outside peak loads or not.

Use the ▲ ▼ keys to move the cursor to the time you want to change then press **OK**. The cursor now flashes on the hours figure.
Use the ▲ ▼ keys to change the hours and press **OK**. The cursor now moves to the minutes figure.
Use the ▲ ▼ keys to change the minutes and press **OK** to complete.
Use the **ESC** key to go back from minutes to hours.

Use the same procedure to change all times that need to be changed.

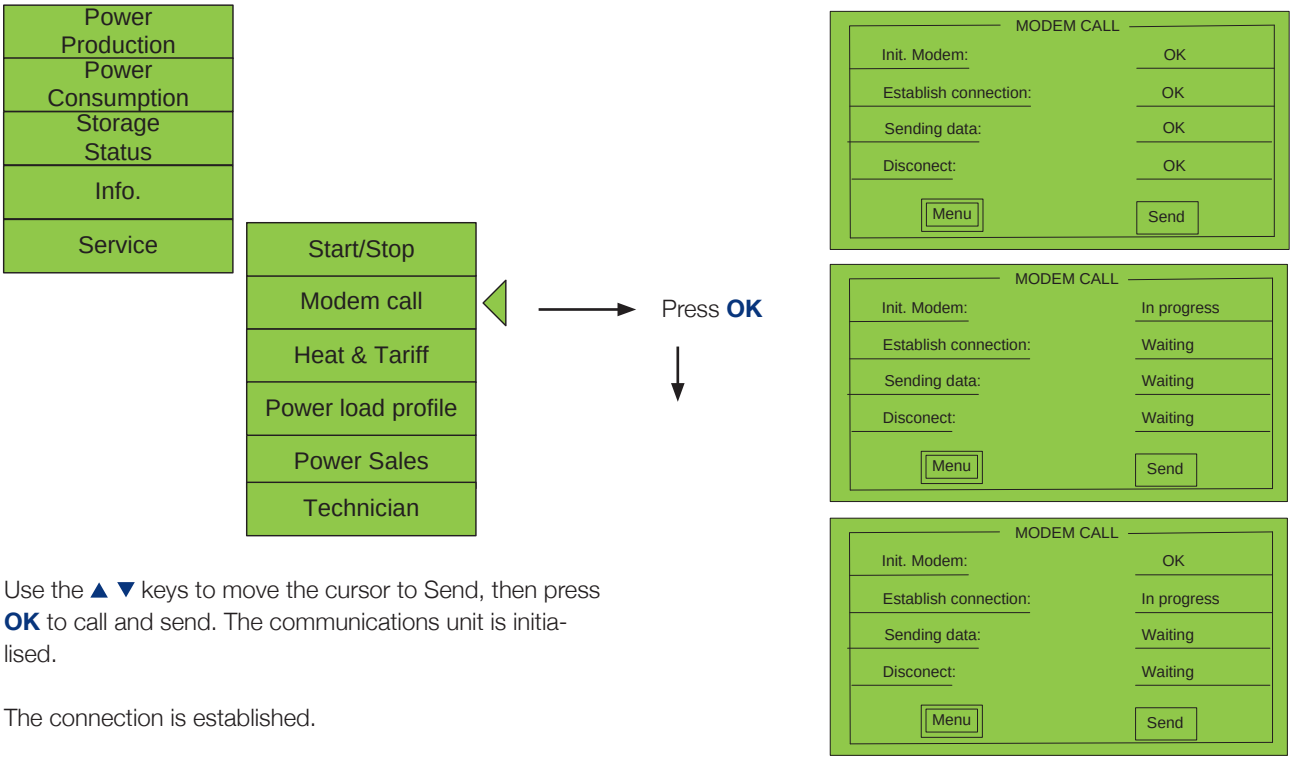
Move cursor to Save and press **OK** to save.

Changes will take effect a few seconds after they are entered. Settings can be changed at any time, even in automatic operation.

4.1.11. Modem calls

The built-in modem connection is used to send service and operating data to EC POWER A/S and/or the relevant partner company at regular intervals (e.g. twice a day). You can access this information using you customer login if this has been agreed with your specialist dealer.

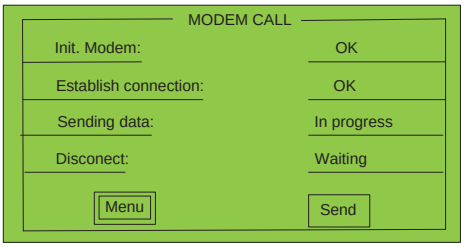
It is possible to make modem calls manually to test the line or update the database:



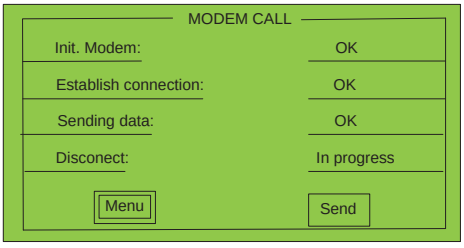
Use the ▲ ▼ keys to move the cursor to Send, then press **OK** to call and send. The communications unit is initialised.

The connection is established.

The data is sent.

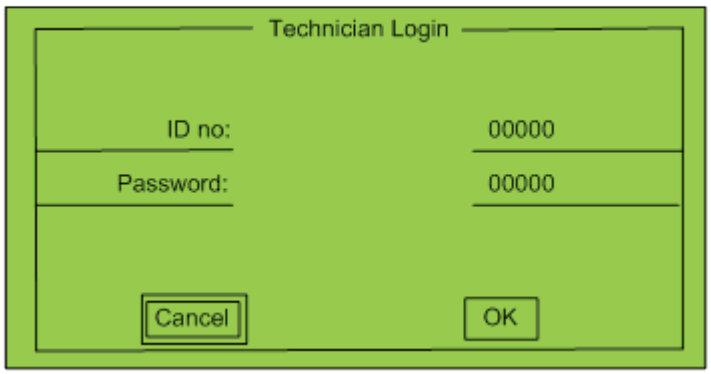


The call is disconnected.



4.1.12. Technician

The menu item Technician Login provides password-protected access for installation and service technicians. Using functions under this option without authorisation as well as any resulting damage to the system are not covered by the warranty.

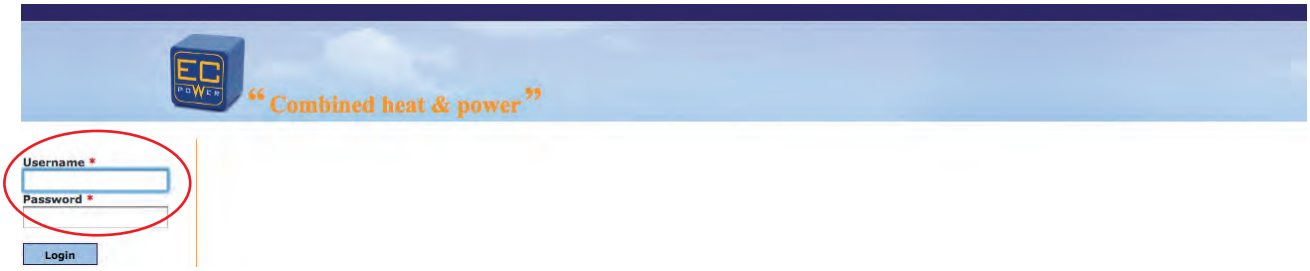


5. PRE-COMMISSIONING

5.1. Registering new XRGI site in the Service Database

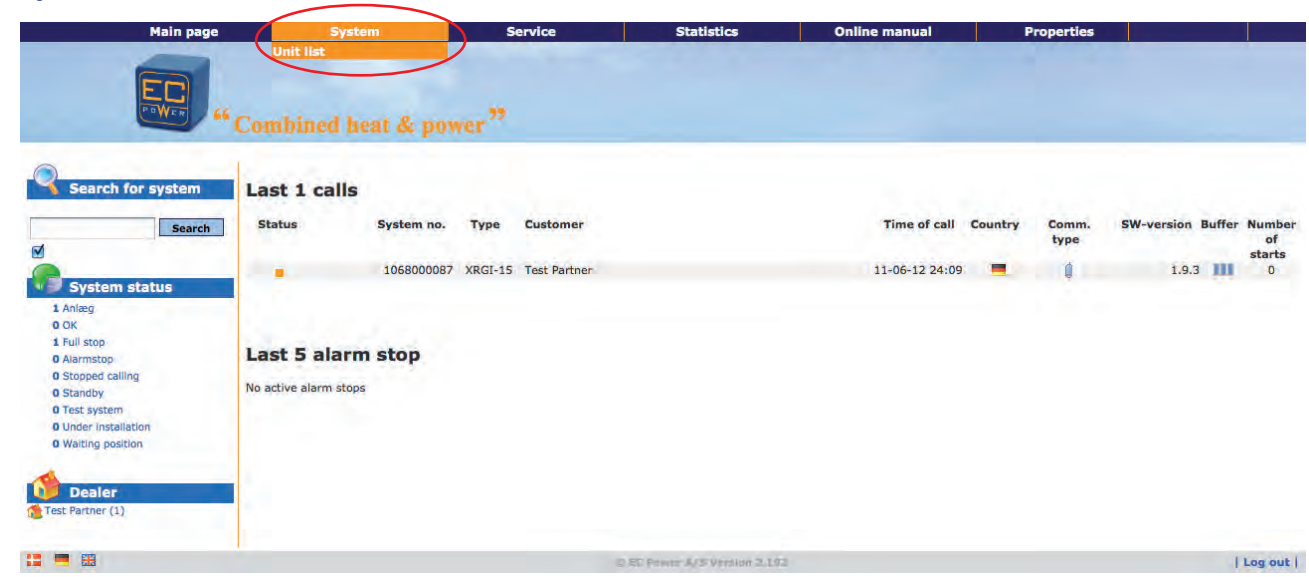
Before you can start using your XRGI 20G-TO, you need to register your XRGI system in the EC POWER Service Database at https://service.ecpower.dk.

Fig. 5.0.



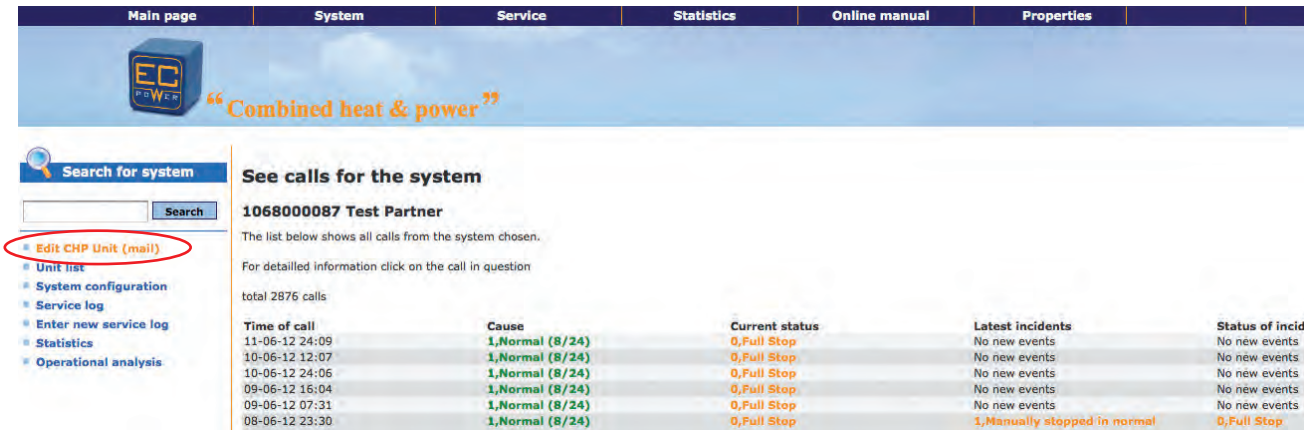
Enter your username and password.
Please make sure you enter upper and lower case characters and numbers correctly.

Fig. 5.1.



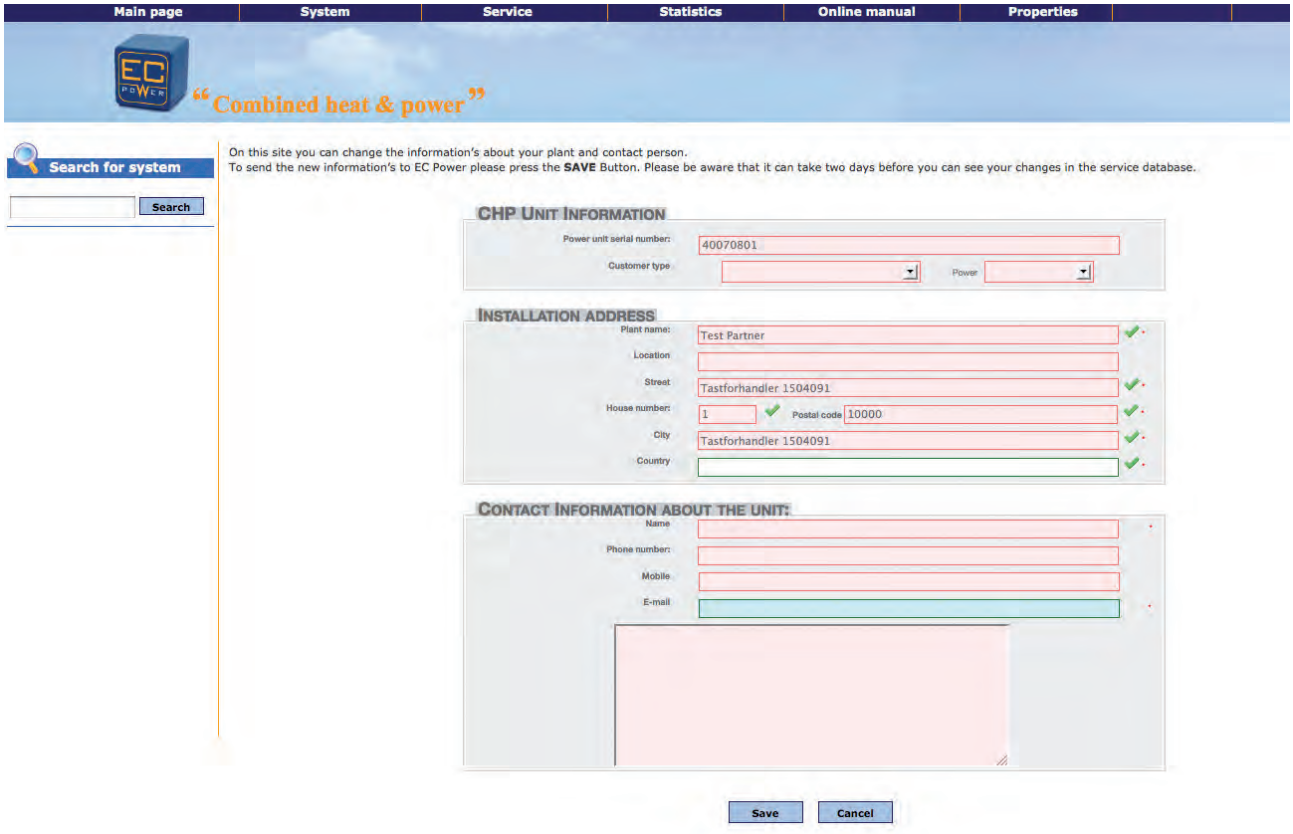
Click on **System -> Unit list**.
Click on the unit you want to register.

Fig. 5.2.



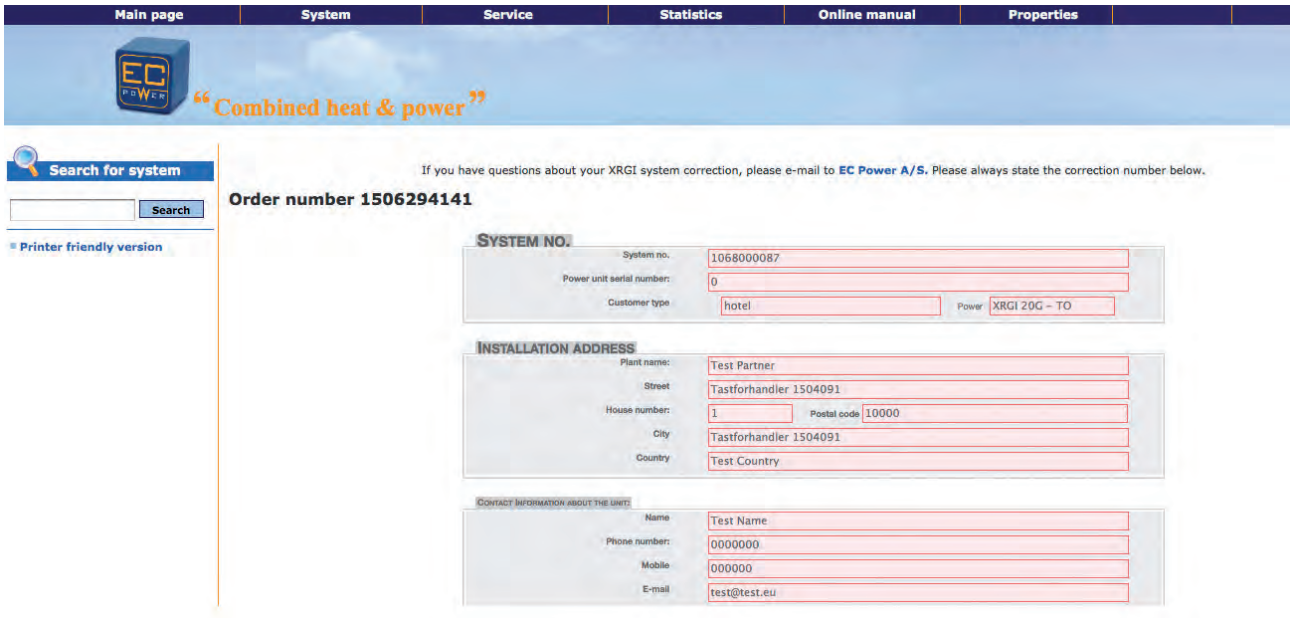
Click on **Edit CHP unit (mail)**.

Fig. 5.3.



Complete the form with the correct installation address and contact information (fields marked with • marked are mandatory). If there are subgroups in your unit list, please write in the comments field in which subgroup you wish the unit to be listed. Then click on **Save**.

Fig. 5.4.



When the changes have been saved properly, you will receive a confirmation and a correction number.

The form is e-mailed to EC POWER. It may take up to two working days until you can see your new XRGI site in the Service Database.

If you have questions about your XRGI system correction, please e-mail to **serviceitem@ecpower.dk**. Please always state the order number.

Note: you need to register your XRGI system in the EC POWER Service Database. Otherwise it cannot be monitored.

5.2. Checklist

Check that your XRGI system has been installed and complete the pre-commissioning checklist (see Annexe 6).

6. MONITORING

6.1. Troubleshooting

6.1.1. Your XRGI 20G-TO system does not start

If your XRGI system does not start, there are a number of points you can check yourself:

- Gas stop-cock open?
- Shutoff valves open?
- Water level/filling pressure sufficient?
- Power supply on?
- Mains breaker on?

When you have checked these points and your unit still does not work, contact your authorised EC POWER specialist.

6.2. Service codes

The control system monitors the XRGI system continuously and any change in operating conditions is saved as a service code. Your XRGI system uses this monitoring data to determine whether faults arise in the engine or other areas. In addition, service codes are useful for troubleshooting. If problems occur with your XRGI 20G-TO, a fault code will appear in the LCD display and in the Service Database.
The list in the next sub-section shows the different service codes, the operating conditions they involve and why they may have been displayed.

Note: always contact your authorised EC POWER specialist if there are problems with your XRGI system.

There are three different types of service code that may be displayed:

Normal change in operating status

Status change

Alarm code

6.2.1. Service

1: Manual stop
The operator has stopped automatic operation of the system, i.e. by pressing a key.

3: Manual stop while calibrating
The operator has stopped the system, i.e. by pressing a key, while it was being calibrated.

4: Storage full
The storage tank is full.
This is a normal, automatic stop. The system will restart once power and heat conditions require it do so.

5: Storage 2/3 full
Sensors 1 and 2 are hot, power consumption is low.
This is a normal, automatic stop. The system will restart once power and heat conditions require it do so.

6: Power consumption low
Sensor 1 is hot, power consumption is low. However, the system will not shut down for at least 20 min.
This is a normal, automatic stop. The system will restart once power and heat conditions require it do so.

7: No power production
The production meter in the IQ-Control Panel is not recording any power production.

This will cause an alarm stop.

This service code is displayed after just a few seconds to ensure no unburned gas is released into the exhaust.
Potential faults are:

- Ignition problems
- Gas mixing problems
- The production meter in the IQ-Control Panel or connection to the IQ-Control Panel is faulty.

10: Oil pressure probe defective
The oil pressure is recorded while the engine is not running. This fault generates a system alarm stop immediately.
This fault is usually due to a defective oil pressure sensor, other reasons can be a broken cable or a short circuit.

12: No oil pressure
There is no oil pressure 15 seconds after starting.
This will cause an alarm stop.

There may be a number of causes here:

- The engine is not running because a fuse has blown, for example.
- There is no oil. If this is the case top up oil, but check why there was not enough oil in the first place.
- Oil pressure sensor faulty.

18: Power production too high when calibrating
This service code appears when power production surges during calibration. This means that adjusting the stepper engine even slightly causes power production to surge suddenly.

When this service code is posted, the system ventilates and calibration restarts. If this alarm service code occurs three times within an hour, this will cause an alarm stop.

This code may be displayed due to problems with the stepping engine. However, it is more likely that the engine is not running steadily, possibly due to an interruption shortly before.

19: Production failed while calibrating

Production failure was recorded while calibrating. However, production has started, otherwise service code 86 would be displayed.

When this service code is displayed, the system ventilates and calibration restarts. If there is another alarm service code within one hour of this alarm, this will cause an alarm stop.

20: Oil pressure alarm

Oil pressure has failed during operation. There was oil pressure in the engine when it started up, otherwise service code 12 would have been displayed.
The system stops at once (alarm stop).
This alarm was probably caused by a fault in the lubricating oil system, but could also be due to a defective oil pressure sensor or line.

21: Hot alarm

Cooling water circuit temperature is too high.

The system stops at once (alarm stop).

Hot alarms may be due to:

- Water return temperature too high
- Filter blocked
- Fault in circulating pump
- Engine cooling circuit leak
- Air in/insufficient bleeding of bearing circuit, engine cooling circuit, system and consumption circuit
- Mixer valve faulty or set too high
- Fault in heat sensor

22: No power consumption

No power consumption signals recorded from building in last 72 hours.

This operating status data is checked at 12.00 every day and displayed if necessary. If there is a heat backup, the system will not generate power. If not, the system will generate just enough heat to supply the property.
Potential cases: low power consumption (less than 0.4 % of rated quantity of current meter), a faulty current meter or signal cable.

24: Power output too low

The stepping engine is set to maximum output but the system is not producing enough power to reach the specific minimum output level required.

If this service code is displayed, the system ventilates and calibration restarts. Should this alarm service code occur three times within an hour, this will cause an alarm stop.

Potential faults in diesel engines are defective mechanical systems in the stepping engine or intermittent fuel supply, e.g. if a diesel tank is empty. However, unstable engine operations generally can cause this code to be displayed.
With gas-fired systems, the fault may lie in the ignition or gas mix.

47: Additional heat source

Power consumption is low and the system has been informed that another heat source is available which is more economical than the XRGI system if power consumption is low. The operating status arose during a high tariff period because service code 48 “Night tariff stop” describes the same operating status, only during a night tariff period.
This is a normal, automatic stop. The system will restart once power and heat conditions require it do so.

48: Night tariff period stop

Power consumption is low and the system has been informed that another heat source is available which is more economical than the XRGI system if power consumption is low. The operating status arose during a night tariff period because service code 47 “Additional heat source” describes the same operating status, only during a high tariff period.
This is a normal, automatic stop. The system will restart once power and heat conditions require it do so.

49: Low priority (night standby position)

During night tariff periods, the system stops and displays this service code if storage tank 1 is hot, independent of the amount of power used at that time, but only after it has operated for at least 20 minutes. During night tariff periods, the system also only runs if power consumption is high or no additional heat sources is available.
This is a normal, automatic stop. The system will restart once power and heat conditions require it do so.

52: Fluid alarm

There is fluid in the Power Unit. (Not all systems are equipped with fluid sensors.)
The system stops at once (alarm stop).
This may be due to leaks in the cooling water, engine oil or diesel circuits.

55: Aux.-Alarm

Aux.-Alarm belongs to an additional alarm input, which is normally not connected (factory configuration).
The system stops at once (alarm stop).

56: Initial output too high

The system has recorded that the output is too high when starting calibration.

If this service code is displayed, the system ventilates and calibration restarts. Should this alarm service code occur three times in an hour, this will cause an alarm stop.

This code may be displayed due to problems with the stepping engine, but it is more likely that the engine is not running steadily, possibly due to an interruption shortly before.

58: Over-regulation

Over-regulation was recorded while calibrating. The output must be distributed over at least 15 steps of the stepping engine.

If this service code is displayed, the system ventilates and calibration restarts. Should this alarm service code occur three times in an hour, this will cause an alarm stop.

This code may be displayed due to problems with the stepping engine, but it is more likely that the engine is not running steadily, possibly due to an interruption shortly before.

61: Gas pressure low

System has stopped (alarm stop).
System is gas-fired, gas pressure is less than the minimum required, so the safety circuit has stopped the engine and displayed a fault.
The gas safety circuit checks if enough gas is present. It does not do so if the engine is not running.

62: Flue gas pressure high

System has stopped (alarm stop).
The gas safety circuit has detected high pressure in the flue gas, stopped the engine and displayed a fault. The pressure may have increased because the chimney is blocked or gas has burned in the exhaust.

63: No vacuum in gas engine

System has stopped (alarm stop).
The gas safety circuit has detected that the gas mixer box is not under vacuum.
As the engine is running, the fault is due to a leak or fault in the hose, since the vacuum required is not being created.

65: Engine water temperature high

System has stopped (alarm stop).
The gas safety circuit has detected that the water at the top of the engine is hot, so it has stopped the engine and displayed a fault.
There are a number of possible faults here:

- Not enough water is flowing through the engine, either because there is a blockage or because the pump is not working properly
- No water in the engine
- Engine was not properly bled.

66: Q60-Heat Distributor temperature high

System has stopped (alarm stop).
The gas safety circuit has detected that the Q60-Heat Distributor is too hot, so it has stopped the engine and displayed a fault.
There are a number of possible faults here:

- Not enough water is flowing through the engine, either because there is a blockage or because the pump is not working properly
- No water in the engine
- Engine was not bled properly

67: Engine compartment temperature high

System has stopped (alarm stop).
The gas safety circuit has detected that the air in the engine compartment is too hot, so it has stopped the engine and displayed a fault.
There are a number of possible faults here:

- There may be a fault in the flue gas system, causing hot flue gases to get into the compartment and to heat the air.
- There may be a fire in the engine or piping which could also heat the air.

68: TMV temperature too high

The system is in normal stop mode and in the standby position. The Q60-Heat Distributor has opened the cold water valve completely and the valve has been open for some time, which would normally lead to code 4 “Storage full”. This has led the engine water to overheat and the system has stopped.
Possible causes of frequent stops in the event of a hot TMV:

- Not enough water in engine circuit or air in engine circuit, so cooling water is boiling in some areas.
- Return temperatures too high, or rising rapidly.

72: 5 V fault in main board

System has been set to alarm stop because there is a fault in the electronics of the main board in the 5 V supply.
The system stops at once (alarm stop).
A fuse may have blown. Before changing the fuse, you should try to find out why it blew.

73: 24 V fault in main board

System has been set to alarm stop because there is a fault in the electronics of the main board in the 24 V supply.
The system stops at once (alarm stop).A fuse may have blown. Before changing the fuse, you should try to find out why it blew.

74: 24 V surge on main board

The system has gone into an alarm stop because of the surge protection on the main board, i.e. there is too much current running through one of the inputs or outputs.
The system stops at once (alarm stop).
This is typically due to an electrical fault or short circuit. One or more inputs or outputs are faulty, either on the main board, in the Power Unit, or in the circuits between them. The 24 V supply to the main board is working.

75: 24 V surge fault display board

The system has gone into an alarm stop because of the surge protection on the display board, i.e. there is too much current flowing through the display board inputs/outputs.
The system stops at once (alarm stop).
As no external components are connected to the display board at present, the fault must be in the electronics.

76: Engine safety switched off

Engine safety is switched off.
The system stops at once (alarm stop).
Engine safety switch must be engaged manually.

77: Gas engine faulty

The system has stopped working as there was an alarm signal from the gas safety circuit.
The system stops at once (alarm stop).
See documents on troubleshooting in gas safety circuit.

78: Startup, all tanks cold

When the control system starts the engine, the LCD display shows the start time (also appears in Service Database later).
This code (78) means that all the storage tanks were cold when the engine started (no heat in storage). If there is heat in storage when the engine starts, code 79 “Start under other circumstances” is displayed.

79: Start under other circumstances

When the control system starts the engine, the display shows the start time (also appears in Service Database later).
This code (79) means the storage tank was partly full when the engine started. If the storage tanks are cold when the engine is started, code 78 “Start, all tanks are cold” is displayed.

80: System restart

The control system has restarted. This normally means that power was cut, either because there was a power outage or because the operator has switched the IQ-Control Panel off and on again.
If the system restarts without power being interrupted, this is an isolated case and not important. If this occurs frequently, however, it means there is a fault in the electronics or power supply.

81: Alarm acknowledged

The operator has acknowledged an alarm. This is merely intended to show that the operator has noticed the alarm and confirmed it.

82: Forced startup

The operator has forced the system to start, i.e. the system was in standby mode due to the power/heat situation, but the operator started it.

83: Network fault

The system has switched to standby mode due to a fault signal from the grid monitoring relay. Once the network is stable again, the system waits for three minutes, then restarts automatically (assuming the power/heat situation requires it to do so).
If this fault appears, it means there is a:

- Phase fault or break
- Overvoltage or undervoltage
- Overfrequency or underfrequency

86: No power output while calibrating

Code 86 is displayed when the system was not able to generate power while calibrating.
If this service code is displayed, the system ventilates and restarts calibrating. If there is another alarm service code within an hour of this alarm, this will cause an alarm stop.
It is very probable that one of the diesel units is out of fuel. If the system is gas-fired, the fault may lie in the ignition.

87: Start to sell power

The system is starting up to feed power into the grid.
This can be done within the specified selling period if the storage tanks have been cold for some time.

88: Out of regulation limits

The system cannot regulate downwards any further, i.e. it is running in its minimum range – which is not normal. This is probably the case because the stepping engine is currently in a higher position than the control system has recorded.

The system tries to resolve the problem by reducing the function of the stepping engine and by starting to recalibrate. If this error code occurs three times within an hour, this will cause an alarm stop.

89: Forced standby

The system is on standby because the forced standby input was activated. As long as this input is on, the system will remain on standby, whatever the heat or power situation may be. Check the Service Database, under 'Calls' to see if the input is on and to see if this is what is causing long outages.

90: Gas alarm when starting engine

The control system has tried to start the engine either because too much power was being consumed or because the storage tanks were cold. However, it recorded a gas alarm and thus did not start.
The gas alarm occurred either while the system was switched on or when it was switched out.

94: Fire alarm
The fire alarm input has been tripped and the system is on standby. It will remain there for as long as the fire alarm input is tripped. If the fire alarm stops, the system will restart automatically, if the power and heat situation allow.

95: No cooling
The system has stopped as there is no cooling, not because the storage is full. In that case Code 4 “Storage full” would have appeared. A system stop for lack of cooling may be due to a number of reasons:

- There is not enough flow in the storage tank return pipe. Check whether the pipe meets minimum dimension requirements as stated in the installation instructions.
- Return temperature may have increased suddenly, a Flow Control can often reduce unwanted shutdowns.

96: Q60-Heat Distributor pump safety
The system has had an alarm stop because the distributor pump fuse has blown.

97: Defective engine valve
The engine valve is not consuming power. This may be due a blown fuse or a poor valve connection.

98: Q60-Heat Distributor network 5 V supply absent
The system has suffered an alarm stop because there is no 5 V supply on the Q60-Heat Distributor network board.

99: Reduced output
This code is ONLY used when test runs are conducted at EC POWER, not for a system on the customer's premises.

100: Q60-Heat Distributor engine valve faulty
One of the engine valve limit switches is faulty. The valve engine must be replaced.
The system is working, but does not have full control over the engine valve. Could cause operating problems and alarm stops.
This code will appear at 12.00 every day until the problem is rectified.

101: Q60-Heat Distributor Flow Control valve faulty
One of the Flow Control valve limit switches is faulty. The valve engine must be replaced. The system is working, but does not have full control over the engine valve. This may cause operating problems and alarm stops. This code will appear at 12.00 every day until the problem is rectified.

102: Q60-Heat Distributor temperature probe faulty
The system has displayed an alarm stop because one or more of the five Q60-Heat Distributor temperature sensors are faulty. It cannot continue operating as the engine temperature sensor is not working.

103: Faulty PT 100 probe
One or more PT 100 sensors are faulty. The system does not indicate which sensor is affected, so the impact this has on the system’s operating is unclear.
If it is a bearing sensor, the system will ignore this sensor and try to continue operating the system with the remaining sensors. In all other cases, this will cause system operating problems.
This code will appear every day at 12.00 until the problem is rectified.

The unit that reported the faulty sensor will flash a red LED a number of times to indicate the number of the faulty sensor.

105: VPP-Modus 1
Der Code erscheint bei der Umstellung auf Modus 1 auf dem VPP-Gateway. Im Modus 1 ist die Anlage in Betrieb bis der Speicher voll ist.

106: VPP-Modus 2
Der Code erscheint bei der Umstellung auf Modus 2 auf dem VPP-Gateway. Im Modus 2 ist die Anlage in Betrieb bis T1 warm ist. Wenn der Speicher leer ist, erscheint der Code „Speicher leer“ und bei Stopp erscheint „VPP-Modus 2“ als Ursache.

107: VPP-Modus 3
Der Code erscheint bei der Umstellung auf Modus 3 auf dem VPP-Gateway. Im Modus 3 ist die Anlage nicht in Betrieb. Die Anlage steht in Warteposition bis ein anderer Modus, der erlaubt zu starten, gewählt wird.

108: VPP-Modus 4
Der Code erscheint bei der Umstellung auf Modus 4 auf dem VPP-Gateway. Im Modus 4 ist die Anlage nicht in Betrieb. Die Anlage steht in Warteposition bis ein anderer Modus, der erlaubt zu starten, gewählt wird. Ist jedoch ein Electric Heater angeschlossen, kann der Speicher ganz aufgewärmt werden.

109: VPP-Modus 5
Der Code erscheint bei der Umstellung auf Modus 6 auf dem VPP-Gateway. Im Modus 5 ist die Anlage nicht in Betrieb. Die Anlage steht in Warteposition bis ein anderer Modus, der erlaubt zu starten, gewählt wird. Ist jedoch ein Electric Heater angeschlossen, kann der Speicher aufgewärmt werden, bis T1 warm ist.

110: No network unit found
This code appears if a required network unit is not connected, e.g. if VPP is selected but no VPP Gateway is connected. The system remains on standby until the problem is rectified.

111: Flow Control valve faulty
The Flow Control valve is not consuming current. This may be due to a blown fuse or to the valve not being connected properly.

112: Misfiring
The system is in alarm stop, and will not start automatically, because one or more cylinders are misfiring. This may be due to the ignition system or the gas mix being defective.

6.2.2. Operating modes

8: Calibrating radiators
In this operating mode, the system checks to see if its internal radiators are working properly when production starts. (The internal radiators are in the engine/generator compartment in older systems and in the water tank in newer ones). If everything is OK, the operating mode switches to 10 “Normal operation”. If not, the procedure for restarting with minor complications is initiated, or an alarm stop is triggered due to a hot alarm or lack of oil pressure.

9: Calibrating
This is an operating mode in connection with a production start during which the diesel is supplied in stages. The system checks to see if the output is stable and whether the maximum output desired can be achieved. If everything is OK, the system switches to 10 “Normal operation”. If not, the procedure for restarting with minor complications is initiated, or an alarm stop is triggered due to a hot alarm or lack of oil pressure.

10: Normal operation
The system is operating, the engine and generator are coupled and production is running. You cannot see whether there is full or partial output.

21: Switch off due to manual stop
This transient operating mode appears if the operator uses the stop button (user interface). It only lasts 45 seconds, during which the stepping engine is wound back to 0 and the generator is cut out. The system then stops and will not restart until Manual Start is selected.

31: Switch off due to standby
This transient operating mode appears when the system stops temporarily because power consumption is low and/or the storage tank is full. It only lasts 45 seconds, during which the stepping engine is wound back to 0 and the generator is cut out. The system then stops and restarts of its own accord if power and heat circumstances so allow.

40: Standby
The system is interrupted, i.e. the engine and generator are disconnected and there is no output. This is due to a full storage tank and/or to the customer not using much power. The system is on standby deliberately. The system will restart of its own accord once conditions are right.

61: ALARM STOP
The system has stopped, i.e. the engine and generator are disconnected and there is no output. The system must be started via the keypad. This stop was caused by an alarm condition which may be due to a number of reasons. Refer to the specific stop code concerned to find out precisely what is wrong. This alarm stop has nothing to do with an oil change, however, as in this case the operating mode would be 62 “Alarm Stop/Oil Change”.

70: SERVICE
Diese Betriebsart betrifft ausschließlich die Generation-2-Steuerschränke.
Die Betriebsartanzeige bestätigt, dass sich die Anlage im VOLL-STOP-Modus befindet und sich der Wartungstechniker in das Betriebs-/Servicemenü eingeloggt hat.
Beim Ausloggen befindet sich das System wieder im VOLL-STOP-Modus.
Während der Wartungstechniker im System eingeloggt ist, werden alle Vorgänge entsprechend mit dem Vermerk “SERVICE“ protokolliert und vermerkt.

71: Selling power
This operating mode only applies to second generation systems. The system is feeding power into the grid, the engine and generator are switched on and the system is running at full load. (The code does not indicate whether power is being sold.)

72: Ventilation
This operating mode applies to gas-fired XRGI systems.
In this operating mode, which occurs when operation is begun, the engine runs without gas being fed. This draws fresh air through the engine to remove any residual gases.
Ventilation lasts 15 seconds.

6.2.3. Reasons for calls

1: Normal (8/24)

The system sends a modem call every eight hours (will only be every 24 hours at a later date). These calls are made whether the system is operating, in a normal alarm stop or some other mode. Continue reading here if the call does not get through. Continue reading here if call is not received.

Modem cannot make call

If the modem cannot make a call, e.g. because the line is engaged or the operator is using their own line, it will try and make a call every half hour, irrespective of the reason the call is made (e.g. normal call, alarm, etc.). If the call is successful, the eight-hour cycle resumes.

Modem cannot get through

Calls may appear to be successful, but may still not appear in the Service Database. This may be due to problems on the line, so part of the message may disappear, e.g. the system number. If that happens, the message is deleted from the Service Database. You can either wait until the next automatic or make an additional manual call.

2: ALARM

This call was generated by an alarm stop. If it happens again, the system will call immediately. Continue reading here if the call does not get through. Continue reading here if call is not received.

Modem cannot make call

If the modem cannot make a call, e.g. because the line is engaged or the operator is using their own line, it will try and make a call every half hour, irrespective of the reason the call is made (e.g. normal call, alarm, etc.). If the call is successful, the eight-hour cycle resumes.

Modem cannot get through

Calls may appear to be successful, but may still not appear in the Service Database. This may be due to problems on the line, so part of the message may disappear, e.g. the system number. If that happens, the message is deleted from the Service Database. You can either wait until the next automatic or make an additional manual call.

3: Extra manual call

This call was made manually from the user interface on the Control Panel. There is nowhere else a call could be made from (from EC POWERs' offices, for example). Continue reading here if the call does not get through. Continue reading here if call is not received.

Modem cannot make call

If the modem cannot make a call, e.g. because the line is engaged or the operator is using their own line, it will try and make a call every half hour, irrespective of the reason the call is made (e.g. normal call, alarm, etc.). If the call is successful, the eight-hour cycle resumes.

Modem cannot get through

Calls may appear to be successful, but may still not appear in the Service Database. This may be due to problems on the line, so part of the message may disappear, e.g. the system number. If that happens, the message is deleted from the Service Database. You can either wait until the next automatic or make an additional manual call.

4: Restart after stop

The plan is that the system will make a call each time it restarts after stopping. This information is used to establish how long the system was down.

7. CARE AND MAINTENANCE

Maintenance must only be carried out by authorised EC POWER specialists.

Warning! Do not carry out any maintenance unless and until the XRGI system has shut down and cooled down. Otherwise there is a risk of getting burned on hot components and scalded if media escape.

Handling engine lubricating oil and moving parts

Warning! Wear safety gloves and goggles when handling engine lubricating oil.

If engine oil comes into contact with:

- Equipment:
  Wipe up with absorbent material and dispose of as toxic waste. Change oil-drenched shoes and clothing. Do not put oily cloths in pockets.

- Skin:
  Wash off with soap and water or special hand cleaners using a nailbrush if required. Do not wash with petrol, solvents, etc. Apply oil skin cream to skin after cleaning.

- Eyes:
  Cover and see doctor immediately.

7.1. Care

Clean your unit covering with a damp cloth and a little soap. Do not use scouring cleaners or cleaning agents that could damage the covering or plastic controls.

7.2. Maintenance

Examples:

- 6,000 hours or at least every 24 months
- 12,000 hours or at least every 48 months
- 18,000 hours or at least every 72 months
- 24,000 hours or at least every 96 months
- 30,000 hours or at least every 120 months

The XRGI 20G-TO system needs care and maintenance after 6,000 operating hours or at least every two years if it is to keep working safely and reliably. Regular maintenance will ensure your XRGI system is always ready to use, reliable and long lasting. A well-maintained XRGI 20G-TO system is more efficient and hence economical.
Maintenance requires a maintenance kit (Order number 01KIT2583).

Warning! Never try to maintain or repair your XRGI 20G-TO system yourself. Hire an authorised specialist dealer. We recommend concluding a maintenance contract. Failure to maintain equipment could make it less reliable and cause damage to property as well as personal injury.

Note: if maintenance is not carried out within 200 hours after the recommended 6,000 operating hours, the warranty will lapse.
Use EC POWER spares and components only. Using any other components or materials voids the warranty completely.

7.2.1. Display of maintenance requirements

You can monitor in the Service Database how many hours your XRGI 20G-TO system has run. There you can also see when your XRGI 20G-TO system next needs servicing:

Next service in:

Please contact your specialist dealer and get them to service it. If no service is indicated, your XRGI 20G-TO system will need to be maintained within two years.
The service technician must complete and sign the service log each time the system is serviced.

EC POWER A/S

SAMSØVEJ 25
DK- 8382 HINNERUP
TEL. +45 87 434 100
WWW.ECPOWER.EU

XRGI CONTROL PANEL
XRGI STROMLAUFPLAN

20KW GENERATOR

WITHOUT LUBRICATION PUMP
WITH CARLO GAVAZZI PHASE MONITORING
OHNE ÖL SCHMIERPUMPE
MIT CARLO GAVAZZI PHASEN MONITORING

DRAW NO. 52537T01	EC POWER A/S Samsøvej 25 DK - 8382 Hinnerup	Print date		24-11-2010	XRGI CONTROL PANEL / STEUERSCHRANK FRONT PAGE / DECKBLATT	PROJECT	FILENAME:52537T01 DRAWING NO. 52537T01 PAGE:0
			JHS	12-04-2011			
		OPR.	JHS	17-12-2010			

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	12	MOTHERBOARD Z1-8 OUTPUT / AUSGÄNGE	JHS	11-08-2008		12-04-2011
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	17	TERMINAL ROW X2 / KLEMMENREIHE X2	JHS	11-08-2008		17-12-2010
	18	TERMINAL ROW X3 / KLEMMENREIHE X3	JHS	11-08-2008		12-04-2011
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	22	TERMINAL ROW X7 / KLEMMENREIHE X7	JHS	11-08-2008		12-04-2011
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XRGI CONTROL PANEL / STEUERSCHRANK

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XRGI CONTROL PANEL / STEUERSCHRANK
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ELECTRIC DATA / ELEKTRISCHE DATEN

POWER SUPPLY / STROMVERSORGUNG	:	3X400VAC+N+PE
FREQUENCY / NETZFREQUENZ	:	50 Hz
CONTROL VOLTAGE / STEUERSPANNUNG	:	24VDC
MAX. SWITCHBOARD LOAD / MAX. SCHALTSCHRANKBELASTUNG		43 A
SUPPLY LINE FUSE / VORSICHERUNG	:	MIN 50A MAX 63A gL
SYSTEM EARTHING / NETZSYSTEM	:	TN-S/TT
MAX. SWITCHBOARD TEMP. / MAX. SCHALTSCHRANKTEMP.	:	40°C
GRADE OF PROTECTION / SCHUTZART	:	IP54
YEAR OF CONSTRUCTION / BAUJAHR	:	2011
NORM / NORM	:	EN60439-1 / EN60204-1

WIRE COLOUR CODE / ADERNFARBEN

POWER CIRCUITS / HAUPTSTROMKREIS	:	BLACK / SCHWARZ
NEUTRAL / NEUTRALLEITER	:	LIGHT BLUE / HELLBLAU
PROTECTIVE EARTH / SCHUTZLEITER	:	GREEN/YELLOW / GELB/GRÜN
INTERLOCKING AC/DC CIRCUITS AND EXTERNALLY SUPPLIED CIRCUITS / VERRIEGELNDE AC/DC SCHALTUNGEN UND EXTERNE SCHALTUNGEN	:	ORANGE / ORANGE
CONTROL CIRCUITS ABOVE 50 V / STEUERSTROMKREISE ÜBER 50 V		
PHASE AC / PHASE AC	:	BLACK / SCHWARZ
NEUTRAL AC / NEUTRALLEITER AC	:	LIGHT BLUE / HELLBLAU
CONTROL CIRCUITS BELOW 50 V / STEUERSTROMKREISE UNTER 50 V		
PHASE AC / PHASE AC	:	RED / ROT
NEUTRAL AC / NEUTRALLEITER AC	:	GREY / GRAU
DC+ / DC+	:	DARK BLUE / DUNKELBLAU
0V DC / 0VDC	:	WHITE / WEIß

WARNING

WHEN DISCONNECTING THE CONTROL PANEL MAIN SWITCH, ITS INPUT-TERMINALS ARE STILL SUPPLIED

THE CONTROL PANEL IS TO BE OPENED BY AUTORIZED PERSONAL ONLY

ACHTUNG

AUCH BEI AUSGESCHALTETEM HAUPTSCHALTER SIND DIE EINGEBAUTEN GERÄTE NOCH UNTER SPANNUNG

DER SCHALTSCHRANK DARF NUR VON AUTORISIERTEN PERSONEN GEÖFNEN WERDEN

FUSES / SICHERUNGEN

FUSES: THE COMPLETE CURRENT ΣAMP FOR ALL OUTPUTS ARE LIMITED TO 1 AMP.
SICHERUNGEN: DER GESAMTE SUMMENSTROM ΣAMP FÜR ALLE AUSGANGE IST AUF 1 AMP. BEGRENZT

COMP. NO BEZEICHNUNG	FUNCTION / FUNKTION	TYPE / TYP
F1	24VDC INTERNAL FOR DISPLAY CARD (-D2) 24VDC INTERN FÜR DISPLAYKARTE (-D2)	1,6A
F2	24VDC INTERNAL FOR MOTHERBOARD (-D1) 24VDC INTERN FÜR MOTHERBOARD (-D1)	2,0A
F3	5VDC INTERNAL FOR DISPLAY CARD (-D2) 5VDC INTERN FÜR DISPLAYKARTE (-D2)	2,0A
F4	5VDC INTERNAL FOR MOTHERBOARD (-D1) 5VDC INTERN FÜR MOTHERBOARD (-D1)	1,6A

COLOUR CODE ACCORDING TO IEC 757 / FARBCODE ENTSPRECHEND IEC 757

WIRE COLOUR / KABEL FARBE	CODE / CODE	WIRE COLOUR / KABEL FARBE	CODE / CODE
BLACK / SCHWARZ	BK	VIOLET / VIOLET	VT
BROWN / BRAUN	BN	GREY / GRAU	GY
RED / ROT	RD	WHITE / WEIß	WH
ORANGE / ORANGE	OG	PINK / PINK	PK
YELLOW / GELB	YE	GOLD / GOLD	GD
GREEN / GRÜN	GN	TURQUISE / TÜRKIS	TQ
BLUE / BLAU	BU	SILVER / SILBER	SR
GREEN-YELLOW / GELB GRÜN	GNYE		

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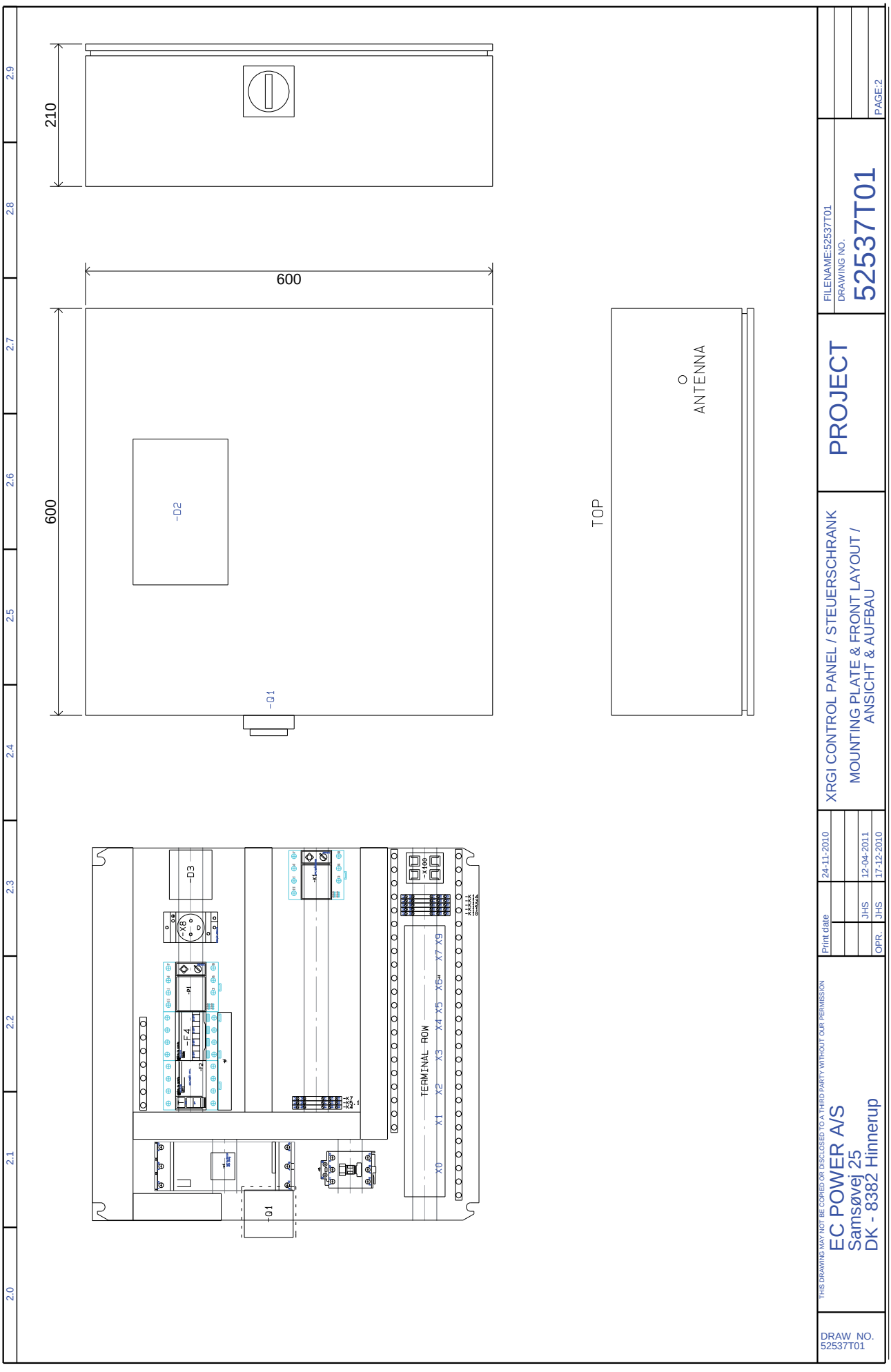
210
600
600
-D2
-G1
TOP
ANTENNA
-D3
-X8
-F4
-X100
TERMINAL ROW
X0 X1 X2 X3 X4 X5 X6 X7 X9
-G1
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ANSICHT & AUFBAU
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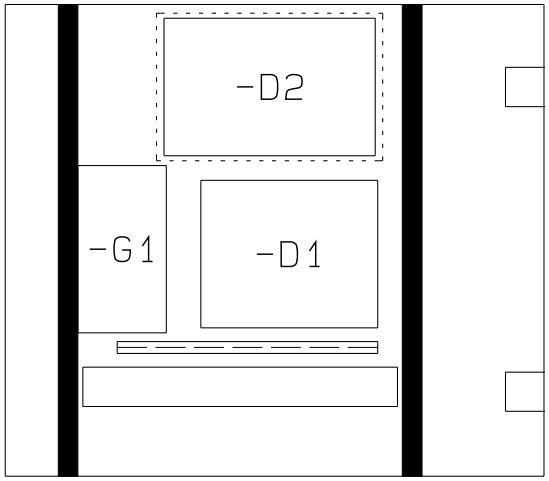
3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9



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XRGI CONTROL PANEL / STEUERSCHRANK

DOOR BACK SIDE LAYOUT /
RÜCKSEITE SCHALTSCHRANKTÜRE

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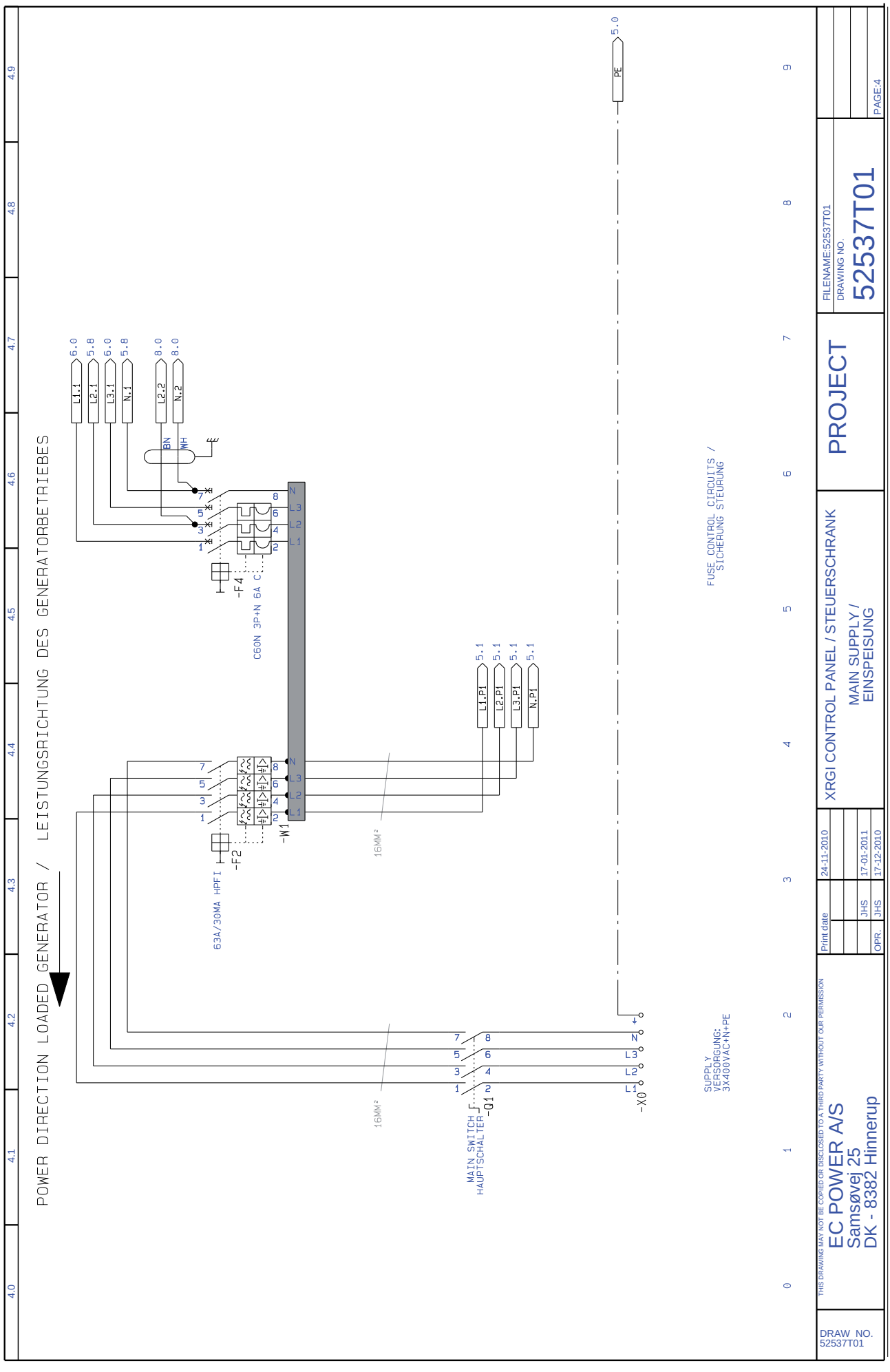
POWER DIRECTION LOADED GENERATOR / LEISTUNGSRICHTUNG DES GENERATORBETRIEBES
L1.1
L2.1
L3.1
N.1
L2.2
N.2
BN
WH
-F4
C60N 3P+N 6A C
-W1
-F2
63A/30MA HPFI
16MM²
L1.P1
L2.P1
L3.P1
N.P1
MAIN SWITCH
HAUPTSCHALTER
-Q1
-X0
PE
FUSE CONTROL CIRCUITS /
SICHERUNG STEUERUNG
SUPPLY
VERSORGUNG:
3X400VAC+N+PE
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EINSPEISUNG
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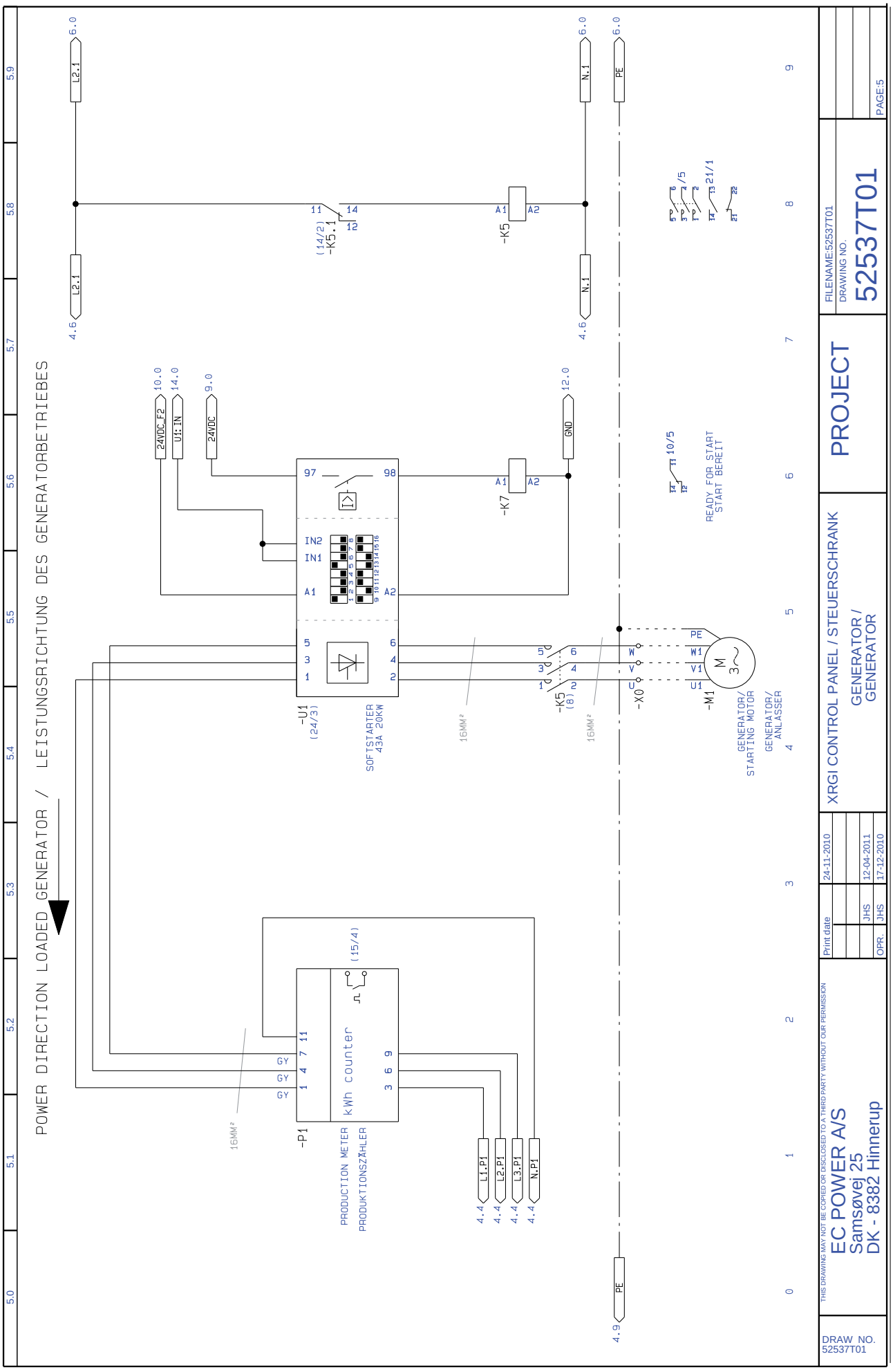
POWER DIRECTION LOADED GENERATOR / LEISTUNGSRICHTUNG DES GENERATORBETRIEBES
L2.1
N.1
PE
-K5.1
-K5
-K7
-U1
(24/3)
SOFTSTARTER
43A 20KW
-P1
PRODUCTION METER
PRODUKTIONSZÄHLER
kWh counter
-M1
GENERATOR/
STARTING MOTOR
GENERATOR/
ANLASSER
READY FOR START
START BEREIT
24VDC_F2
U1: IN
24VDC
GND
IN1
IN2
A1
A2
L1.P1
L2.P1
L3.P1
N.P1
16MM²
GY
-X0
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GENERATOR /
GENERATOR
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JHS
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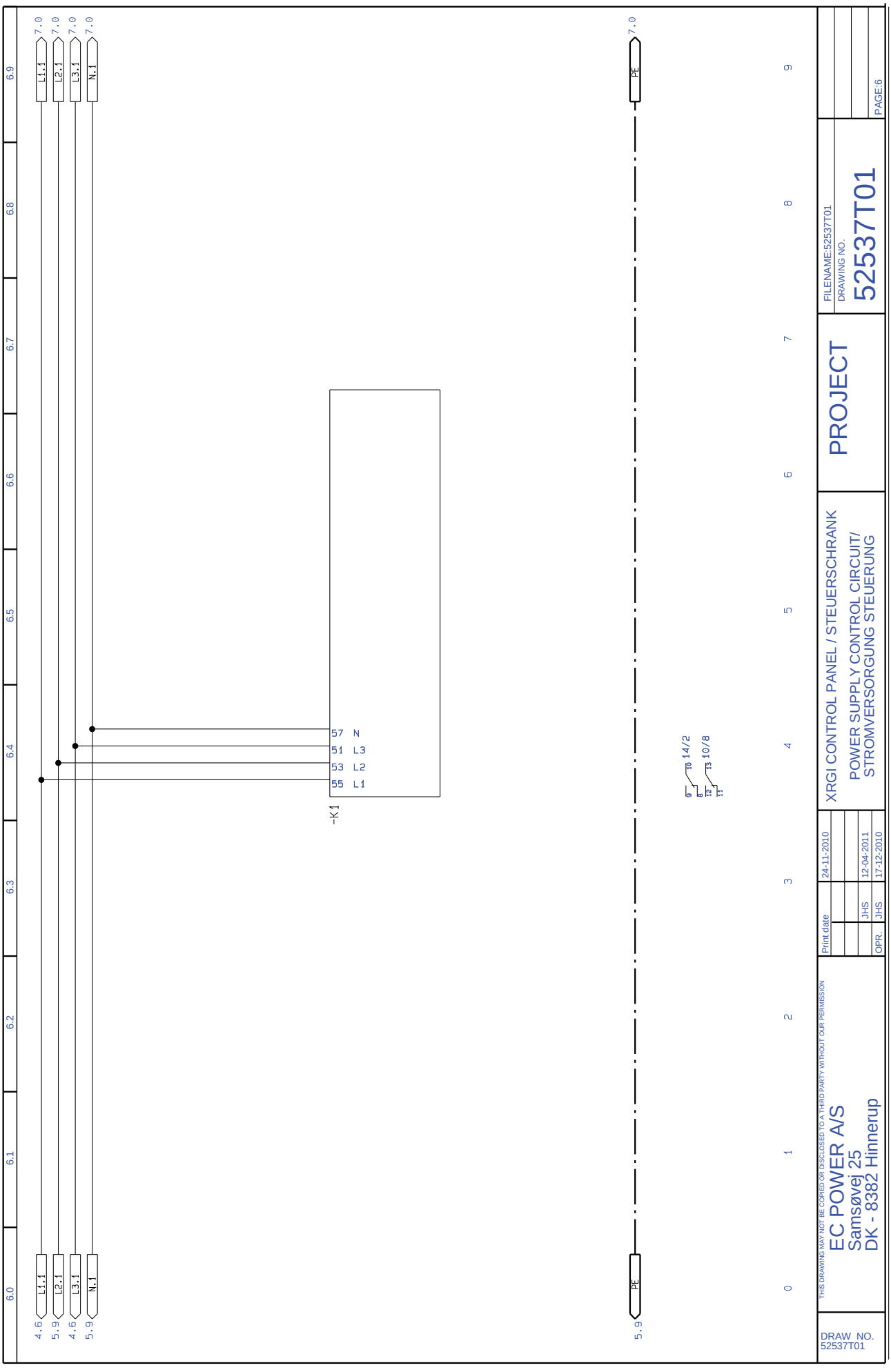
L1.1
L2.1
L3.1
N.1
7.0
4.6
5.9
PE
-K1
57 N
51 L3
53 L2
55 L1
14/2
10/8
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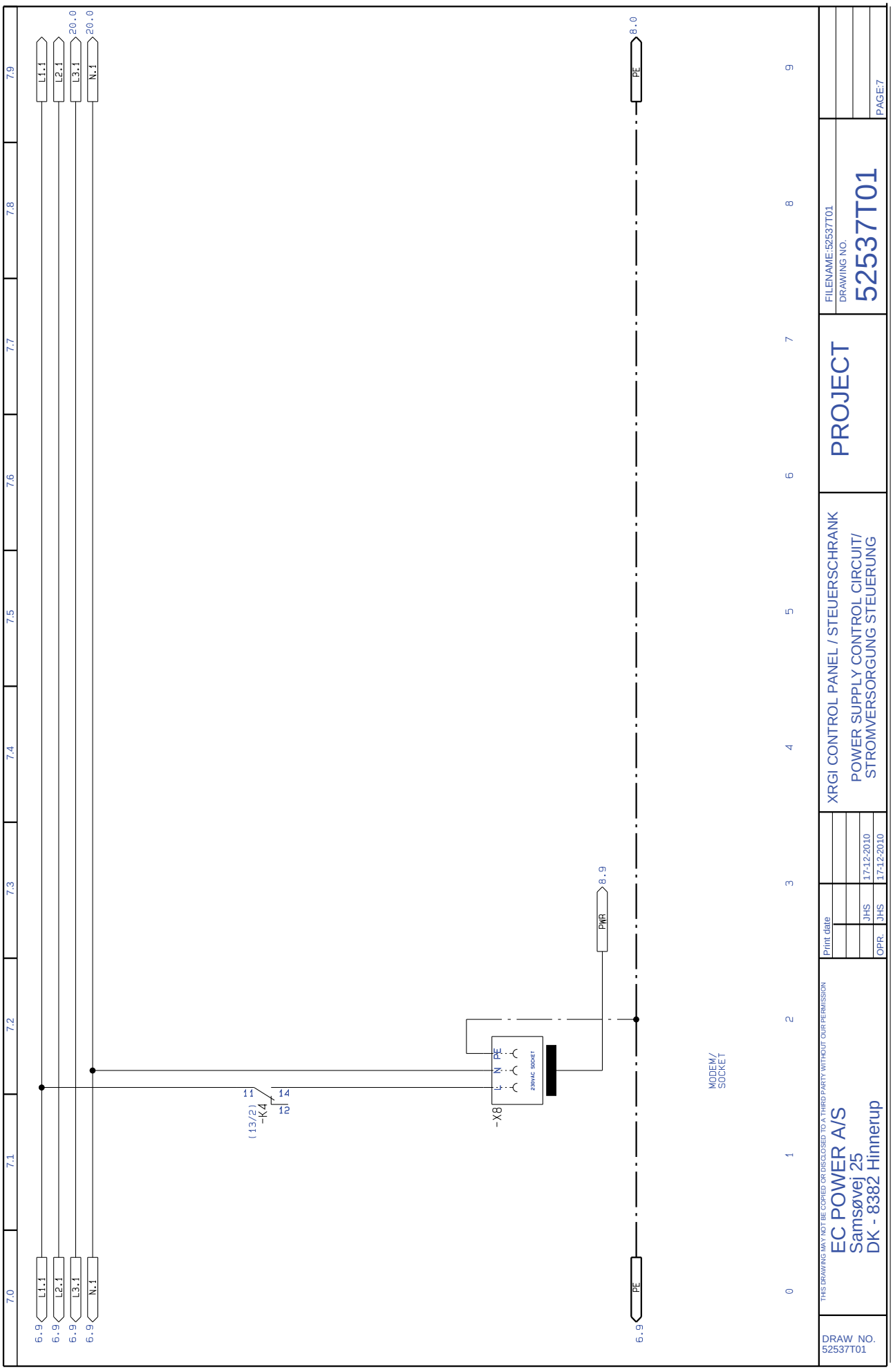
L1.1
L2.1
L3.1
N.1
PE
PWR
-K4
-X8
MODEM/
SOCKET
XRGI CONTROL PANEL / STEUERSCHRANK
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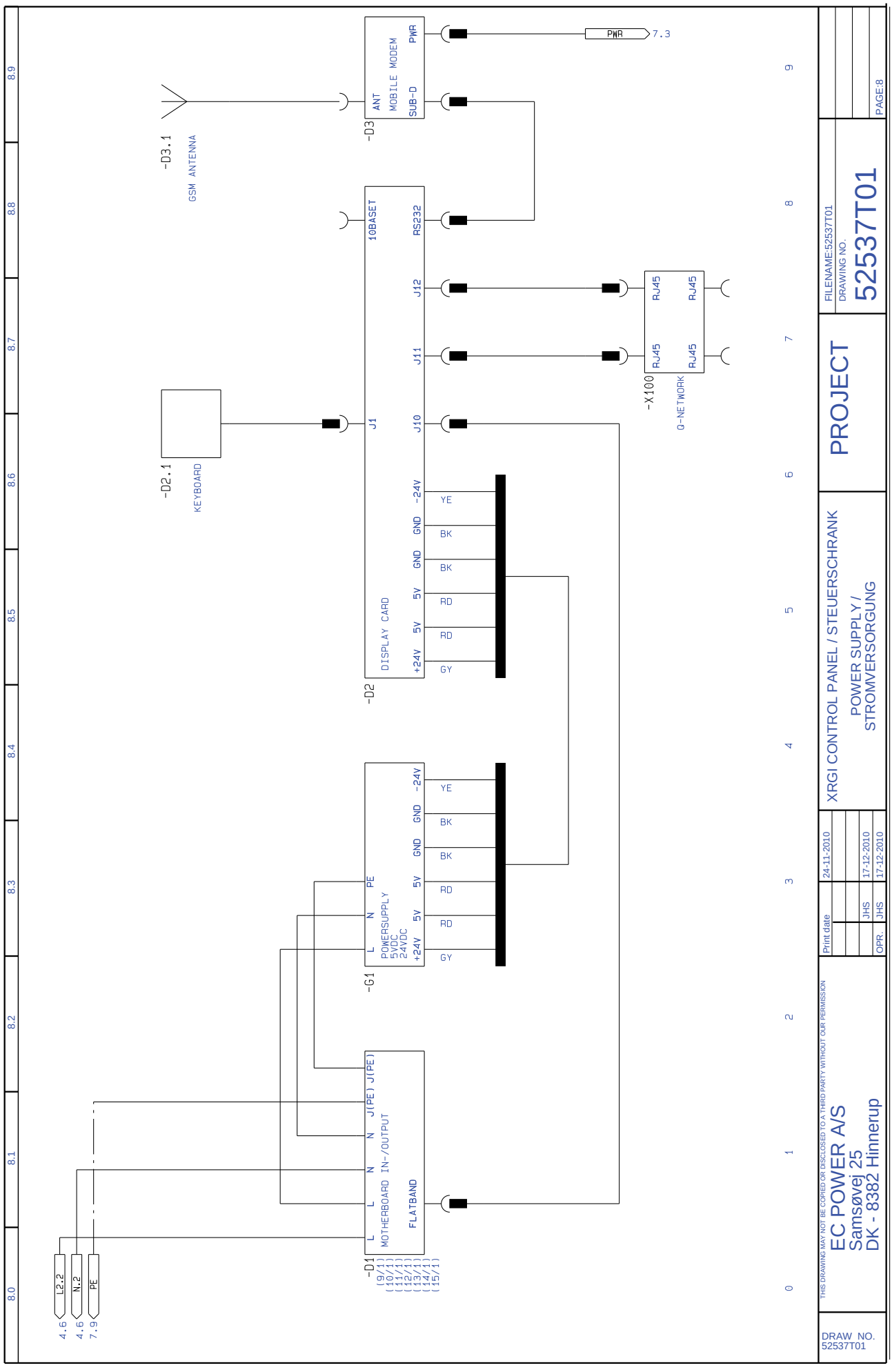
-D1
MOTHERBOARD IN-/OUTPUT
FLATBAND
L L N N J(PE) J(PE)
-G1
POWERSUPPLY
5VDC
24VDC
L N PE
-D2
DISPLAY CARD
J1
10BASET
RS232
J12
J11
J10
+24V 5V 5V GND GND -24V
GY RD RD BK BK YE
-D2.1
KEYBOARD
-D3
MOBILE MODEM
ANT
SUB-D
PWR
-D3.1
GSM ANTENNA
-X100
Q-NETWORK
RJ45
L2.2
N.2
PE
4.6
4.6
7.9
PWR 7.3
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JHS
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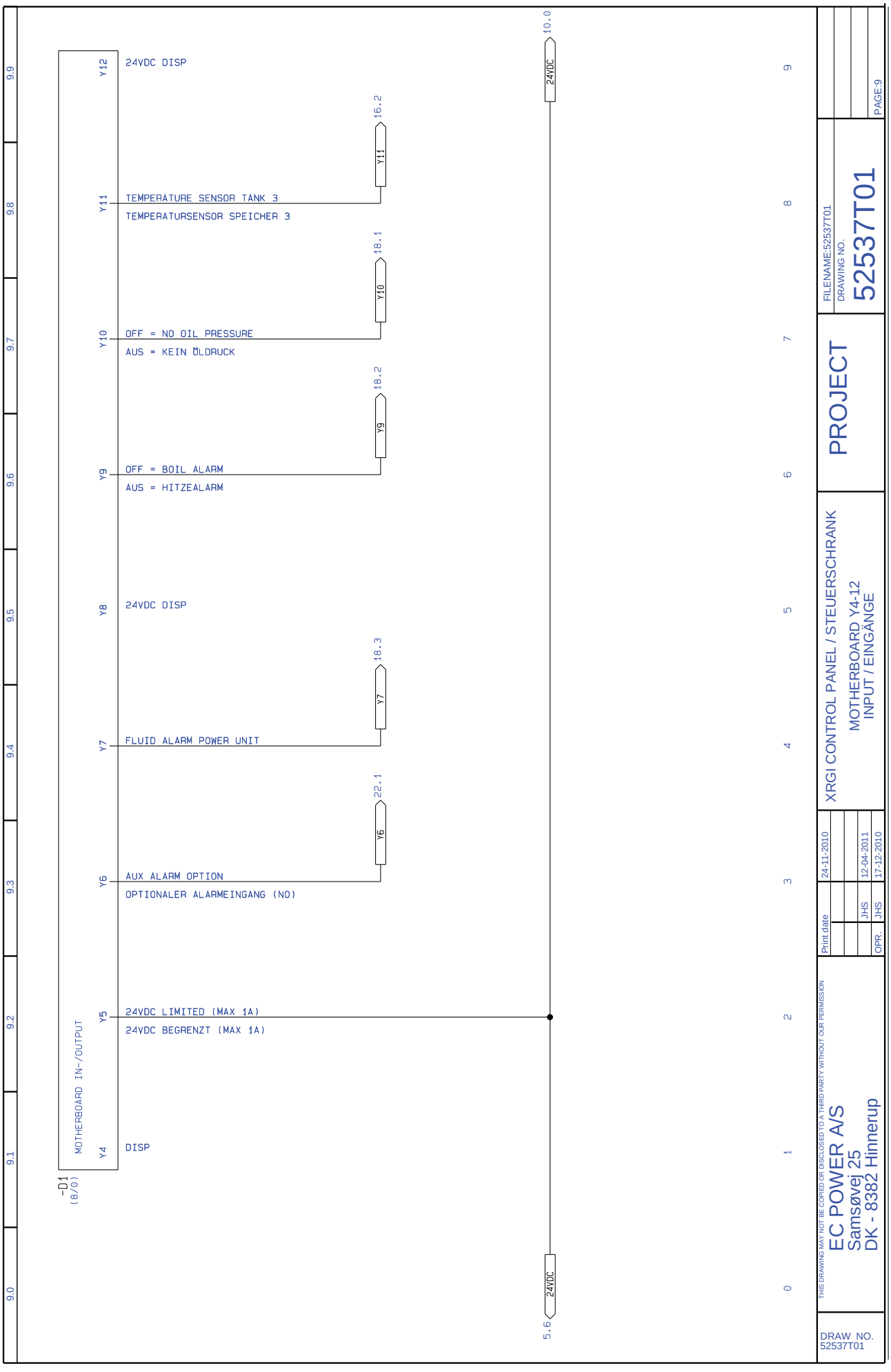
-D1
(8/0)
MOTHERBOARD IN-/OUTPUT
Y12 24VDC DISP
Y11 TEMPERATURE SENSOR TANK 3
TEMPERATURSENSOR SPEICHER 3
Y10 OFF = NO OIL PRESSURE
AUS = KEIN ÖLDRUCK
Y9 OFF = BOIL ALARM
AUS = HITZEALARM
Y8 24VDC DISP
Y7 FLUID ALARM POWER UNIT
Y6 AUX ALARM OPTION
OPTIONALER ALARMEINGANG (NO)
Y5 24VDC LIMITED (MAX 1A)
24VDC BEGRENZT (MAX 1A)
Y4 DISP
16.2
18.1
18.2
18.3
22.1
10.0
5.6
24VDC
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MOTHERBOARD Y4-12
INPUT / EINGÄNGE
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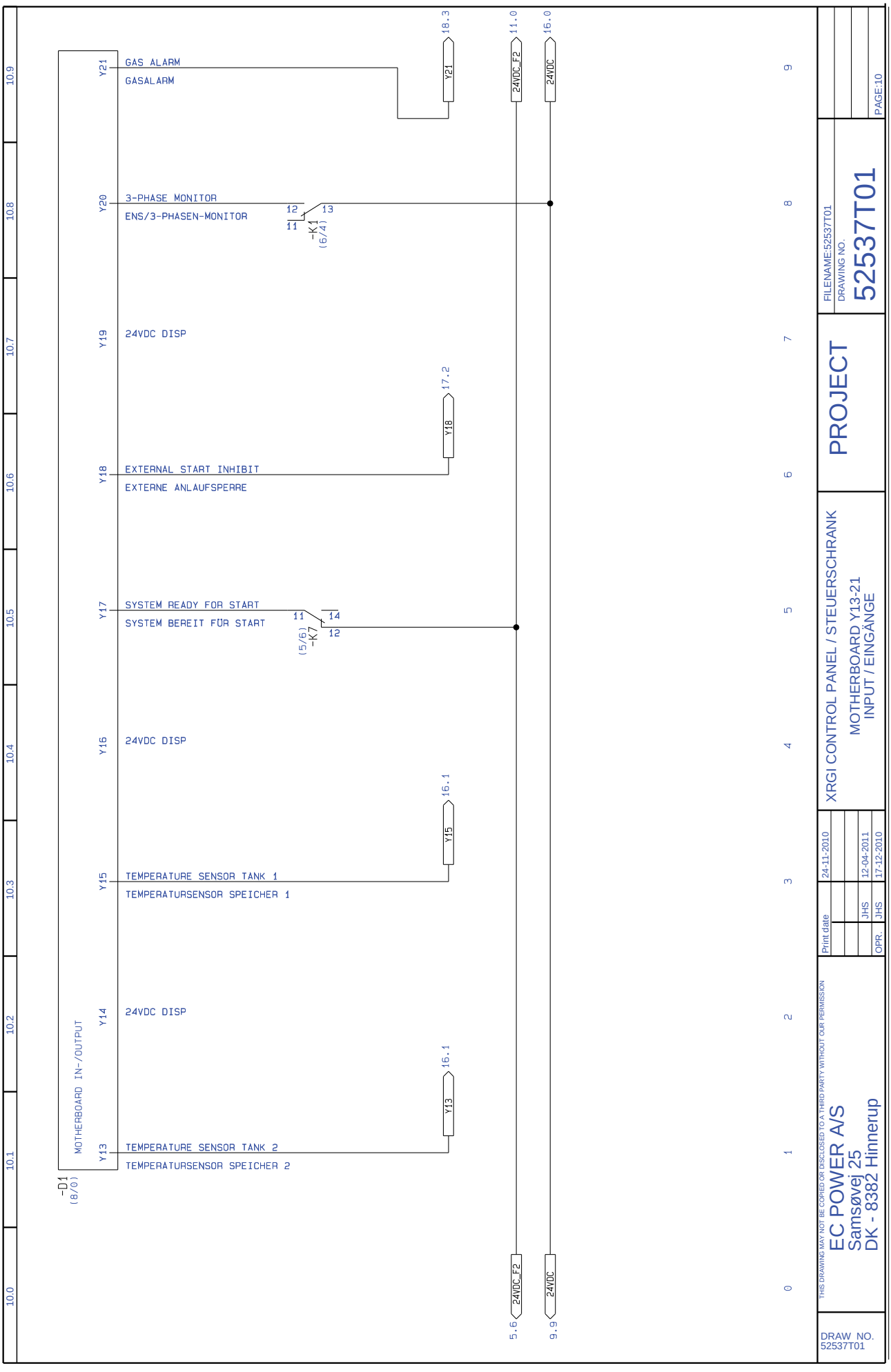
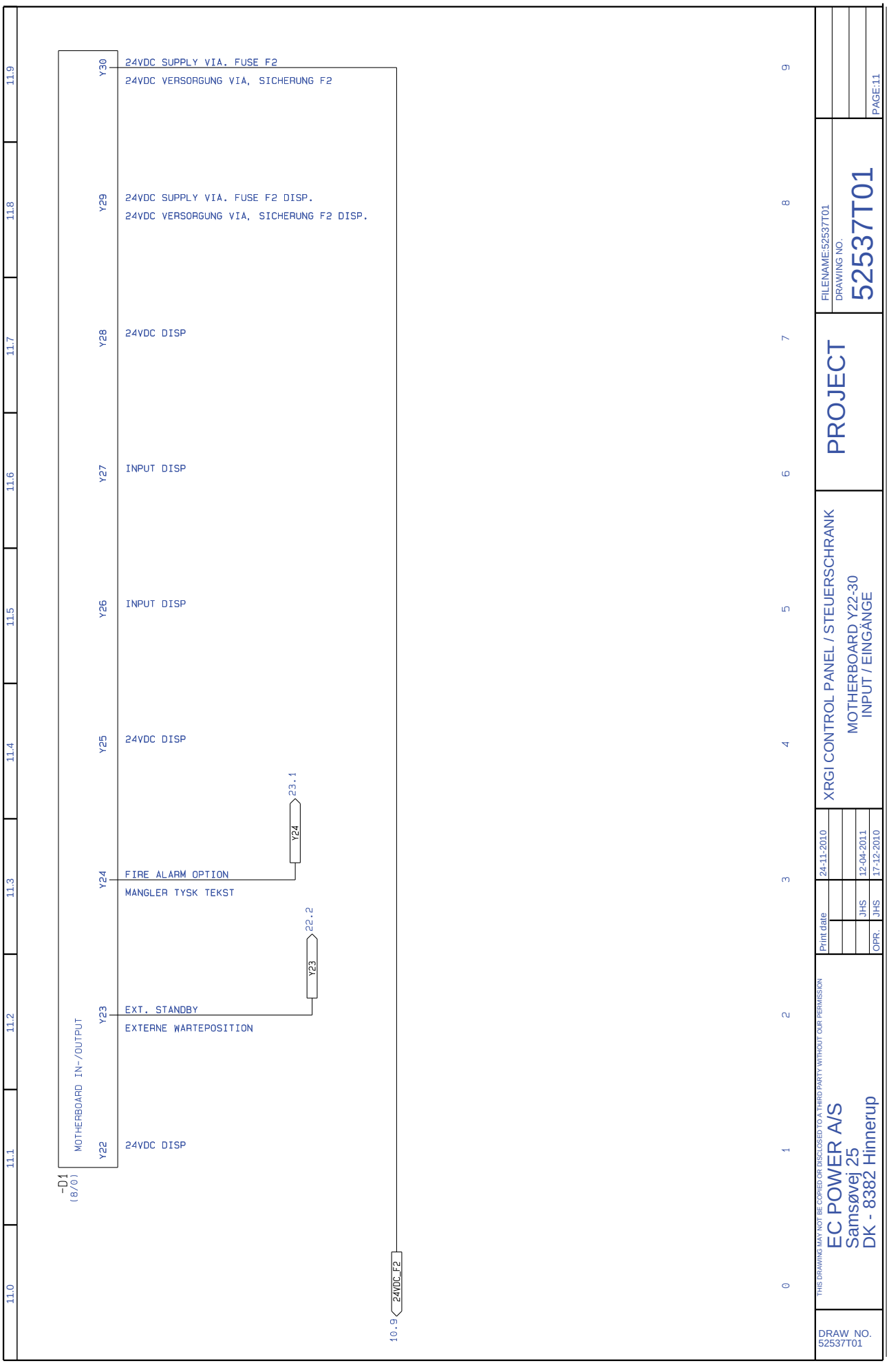

-D1
(8/0)
MOTHERBOARD IN-/OUTPUT
Y21
GAS ALARM
GASALARM
Y20
3-PHASE MONITOR
ENS/3-PHASEN-MONITOR
-K1
(6/4)
Y19
24VDC DISP
Y18
EXTERNAL START INHIBIT
EXTERNE ANLAUFSPERRE
Y17
SYSTEM READY FOR START
SYSTEM BEREIT FÜR START
-K7
(5/6)
Y16
24VDC DISP
Y15
TEMPERATURE SENSOR TANK 1
TEMPERATURSENSOR SPEICHER 1
Y14
24VDC DISP
Y13
TEMPERATURE SENSOR TANK 2
TEMPERATURSENSOR SPEICHER 2
18.3
17.2
16.1
16.1
11.0
16.0
5.6
9.9
24VDC_F2
24VDC
THIS DRAWING MAY NOT BE COPIED OR DISCLOSED TO A THIRD PARTY WITHOUT OUR PERMISSION
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
24-11-2010
12-04-2011
17-12-2010
JHS
JHS
OPR.
XRGI CONTROL PANEL / STEUERSCHRANK
MOTHERBOARD Y13-21
INPUT / EINGÄNGE
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:10
DRAW NO.
52537T01


-D1
(8/0)
MOTHERBOARD IN-/OUTPUT
Y30
24VDC SUPPLY VIA. FUSE F2
24VDC VERSORGUNG VIA, SICHERUNG F2
Y29
24VDC SUPPLY VIA. FUSE F2 DISP.
24VDC VERSORGUNG VIA, SICHERUNG F2 DISP.
Y28
24VDC DISP
Y27
INPUT DISP
Y26
INPUT DISP
Y25
24VDC DISP
Y24
FIRE ALARM OPTION
MANGLER TYSK TEKST
Y23
EXT. STANDBY
EXTERNE WARTEPOSITION
Y22
24VDC DISP
23.1
Y24
22.2
Y23
10.9
24VDC_F2
11.0 11.1 11.2 11.3 11.4 11.5 11.6 11.7 11.8 11.9
0 1 2 3 4 5 6 7 8 9
THIS DRAWING MAY NOT BE COPIED OR DISCLOSED TO A THIRD PARTY WITHOUT OUR PERMISSION
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
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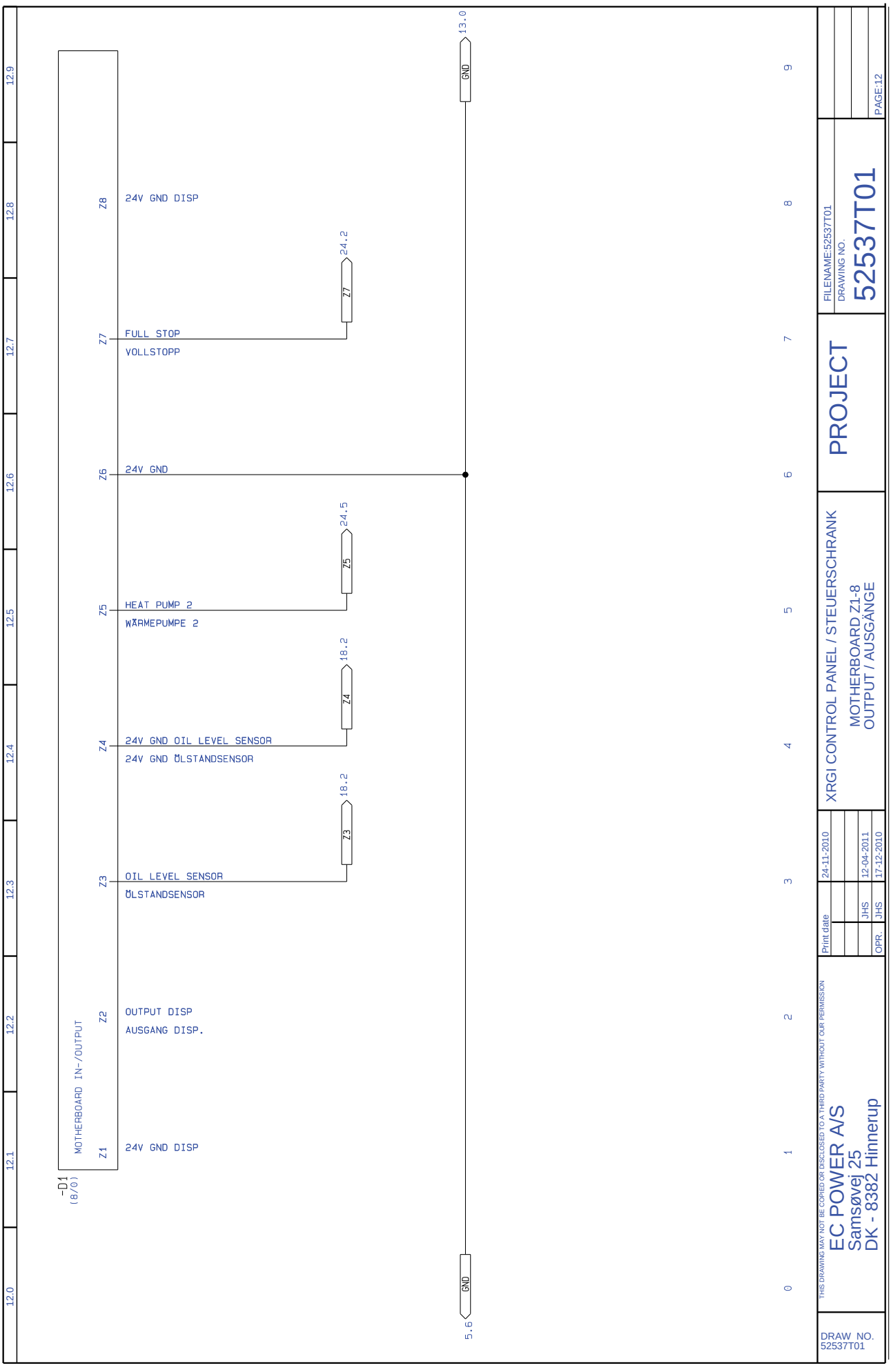
24-11-2010
12-04-2011
17-12-2010
JHS
JHS
OPR.
XRGI CONTROL PANEL / STEUERSCHRANK
MOTHERBOARD Y22-30
INPUT / EINGÄNGE
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:11
DRAW NO.
52537T01


-D1
(8/0)
MOTHERBOARD IN-/OUTPUT
Z1 24V GND DISP
Z2 OUTPUT DISP
AUSGANG DISP.
Z3 OIL LEVEL SENSOR
ÖLSTANDSENSOR
Z4 24V GND OIL LEVEL SENSOR
24V GND ÖLSTANDSENSOR
Z5 HEAT PUMP 2
WÄRMEPUMPE 2
Z6 24V GND
Z7 FULL STOP
VOLLSTOPP
Z8 24V GND DISP
GND 13.0
GND 5.6
24.2
24.5
18.2
18.2
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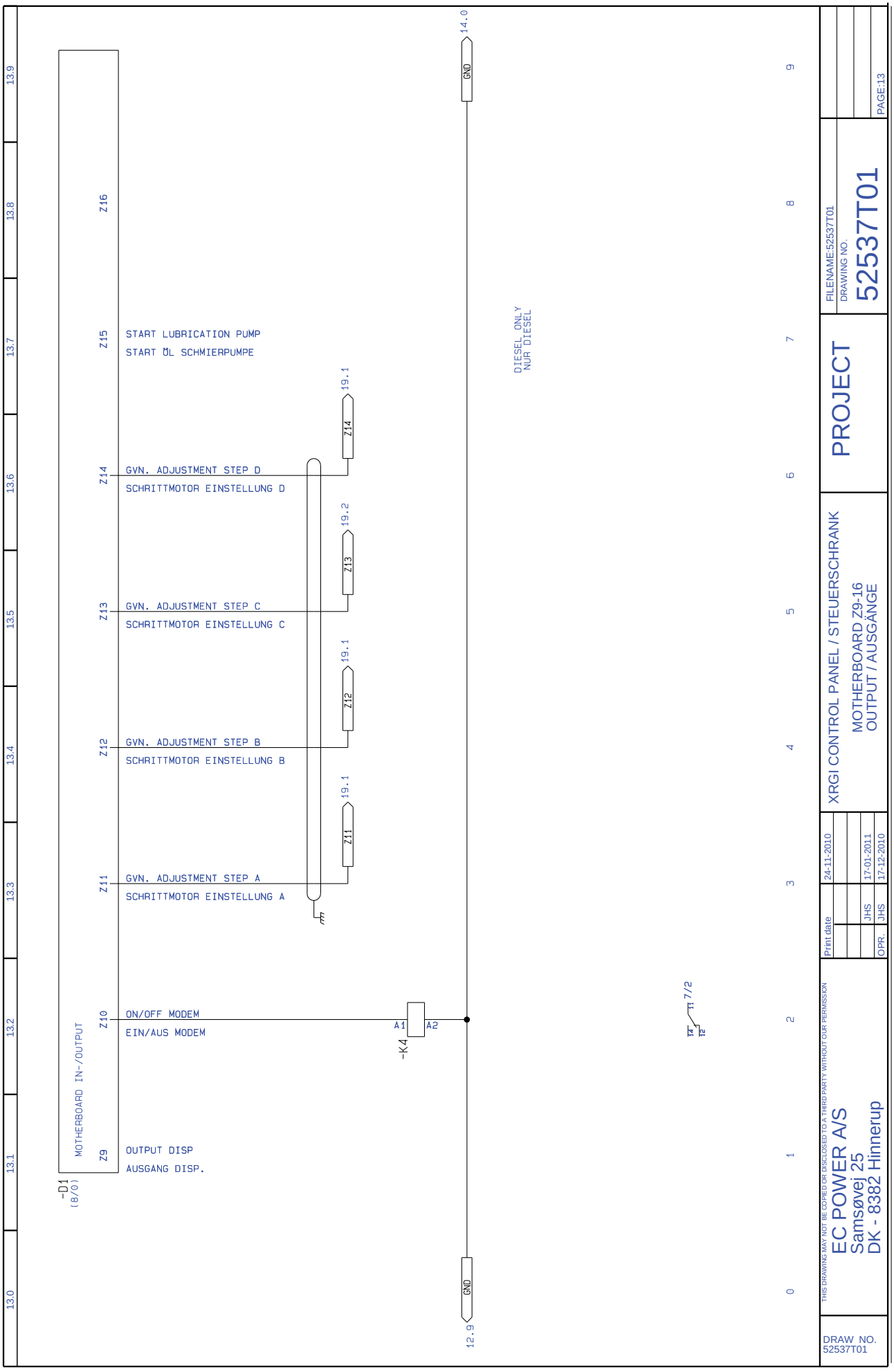
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
OPR. JHS
24-11-2010
JHS 12-04-2011
17-12-2010
XRGI CONTROL PANEL / STEUERSCHRANK
MOTHERBOARD Z1-8
OUTPUT / AUSGÄNGE
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:12
DRAW NO.
52537T01


-D1
(8/0)
MOTHERBOARD IN-/OUTPUT
Z9
OUTPUT DISP
AUSGANG DISP.
Z10
ON/OFF MODEM
EIN/AUS MODEM
Z11
GVN. ADJUSTMENT STEP A
SCHRITTMOTOR EINSTELLUNG A
Z12
GVN. ADJUSTMENT STEP B
SCHRITTMOTOR EINSTELLUNG B
Z13
GVN. ADJUSTMENT STEP C
SCHRITTMOTOR EINSTELLUNG C
Z14
GVN. ADJUSTMENT STEP D
SCHRITTMOTOR EINSTELLUNG D
Z15
START LUBRICATION PUMP
START ÖL SCHMIERPUMPE
Z16
-K4
A1
A2
GND
12.9
14.0
19.1
19.2
DIESEL ONLY
NUR DIESEL
7/2
PROJECT
XRGI CONTROL PANEL / STEUERSCHRANK
MOTHERBOARD Z9-16
OUTPUT / AUSGÄNGE
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:13
Print date
24-11-2010
17-01-2011
17-12-2010
JHS
JHS
OPR.
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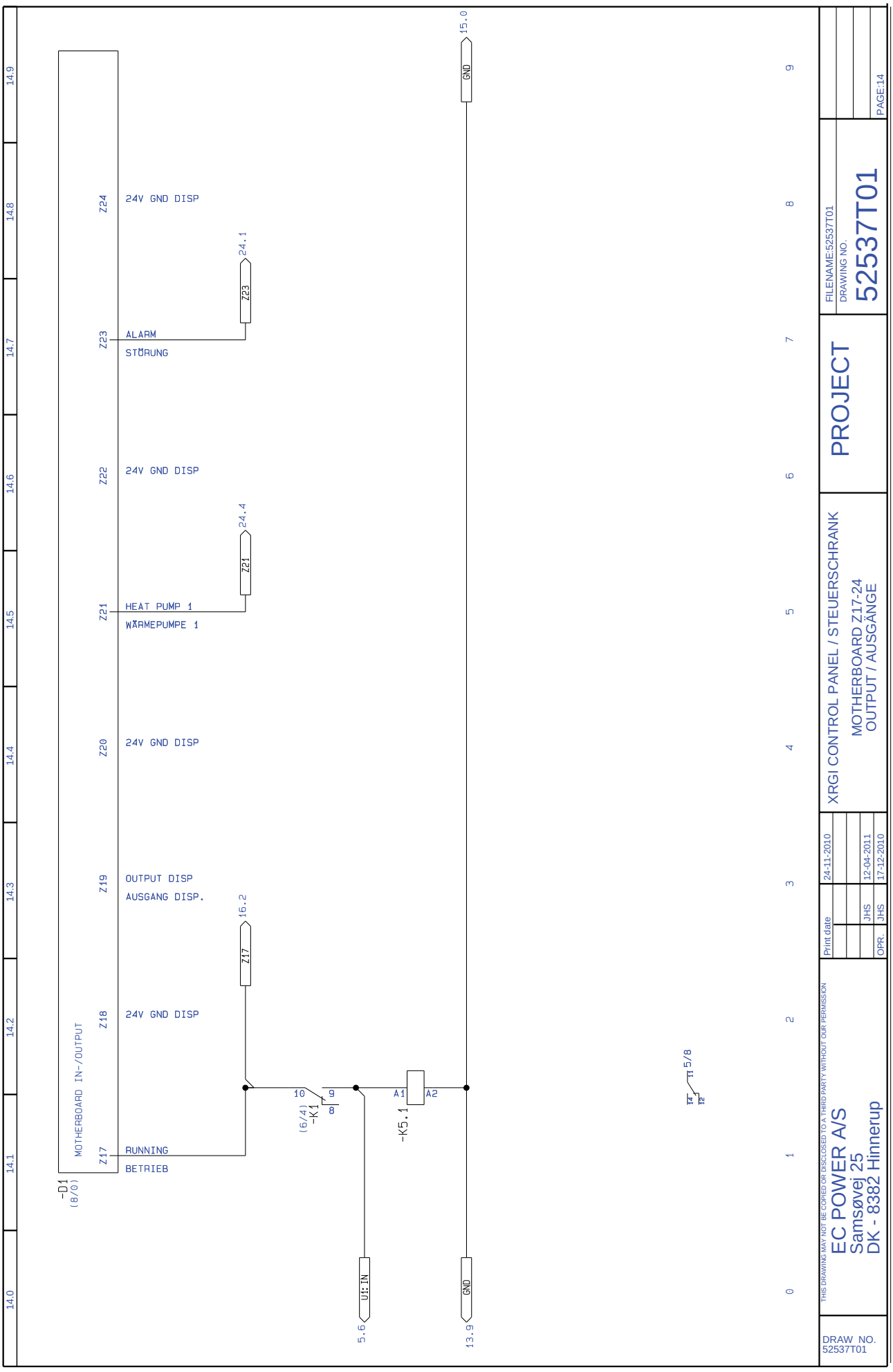
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
DRAW NO.
52537T01


-D1
(8/0)
MOTHERBOARD IN-/OUTPUT
Z17 RUNNING
BETRIEB
Z18 24V GND DISP
Z19 OUTPUT DISP
AUSGANG DISP.
Z20 24V GND DISP
Z21 HEAT PUMP 1
WÄRMEPUMPE 1
Z22 24V GND DISP
Z23 ALARM
STÖRUNG
Z24 24V GND DISP
16.2
24.4
24.1
15.0
GND
(6/4)
-K1
10
9
8
-K5.1
A1
A2
5.6
U1: IN
13.9
GND
5/8
14
11
12
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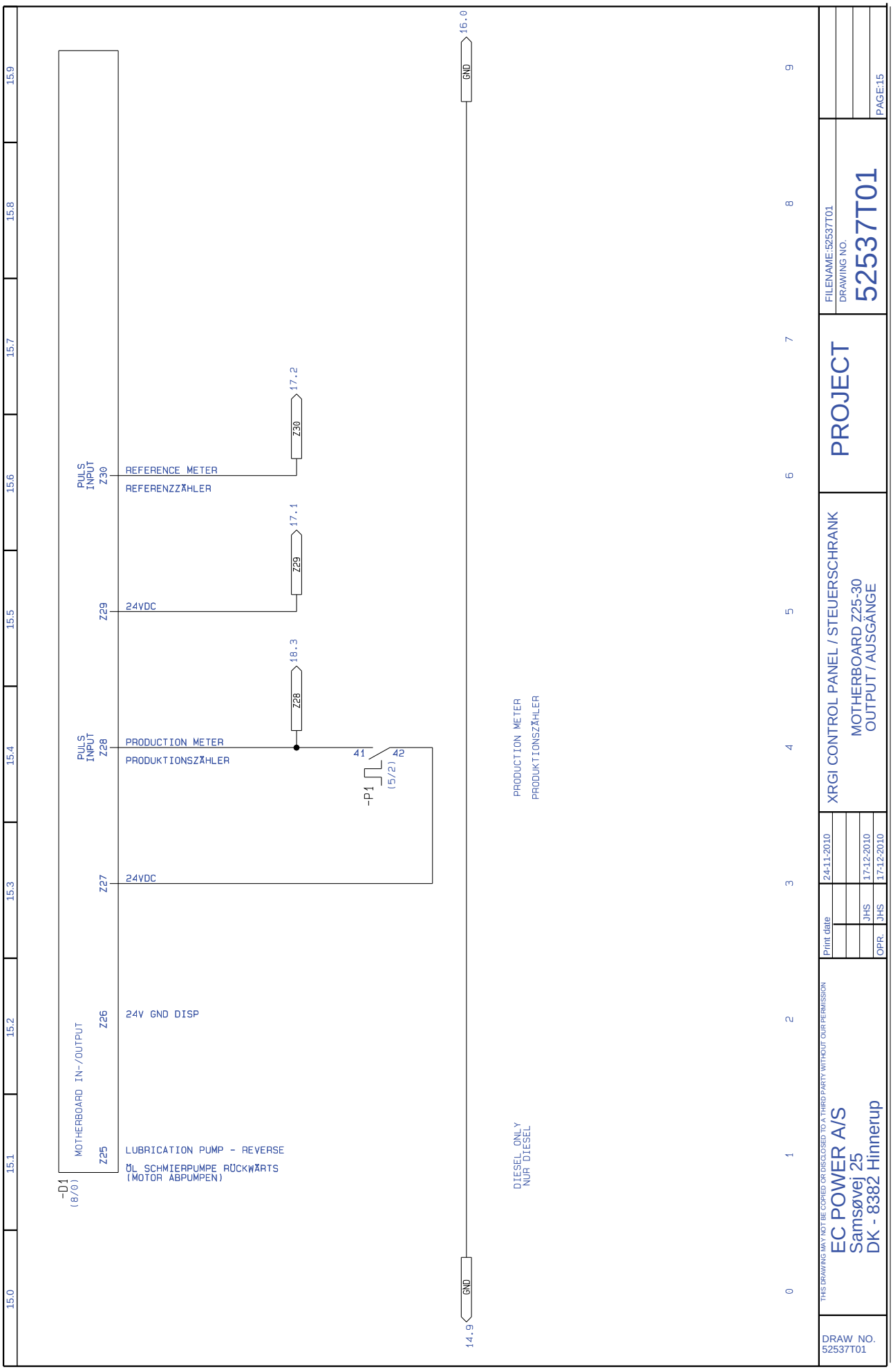
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
OPR.
JHS
24-11-2010
JHS
12-04-2011
JHS
17-12-2010
XRGI CONTROL PANEL / STEUERSCHRANK
MOTHERBOARD Z17-24
OUTPUT / AUSGÄNGE
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:14
DRAW NO.
52537T01


-D1
(8/0)
MOTHERBOARD IN-/OUTPUT
Z25
LUBRICATION PUMP - REVERSE
ÖL SCHMIERPUMPE RÜCKWÄRTS
(MOTOR ABPUMPEN)
Z26
24V GND DISP
Z27
24VDC
PULS INPUT
Z28
PRODUCTION METER
PRODUKTIONSZÄHLER
41
42
-P1
(5/2)
18.3
Z28
Z29
24VDC
17.1
Z29
PULS INPUT
Z30
REFERENCE METER
REFERENZZÄHLER
17.2
Z30
GND
16.0
14.9
GND
PRODUCTION METER
PRODUKTIONSZÄHLER
DIESEL ONLY
NUR DIESEL
15.0
15.1
15.2
15.3
15.4
15.5
15.6
15.7
15.8
15.9
0
1
2
3
4
5
6
7
8
9
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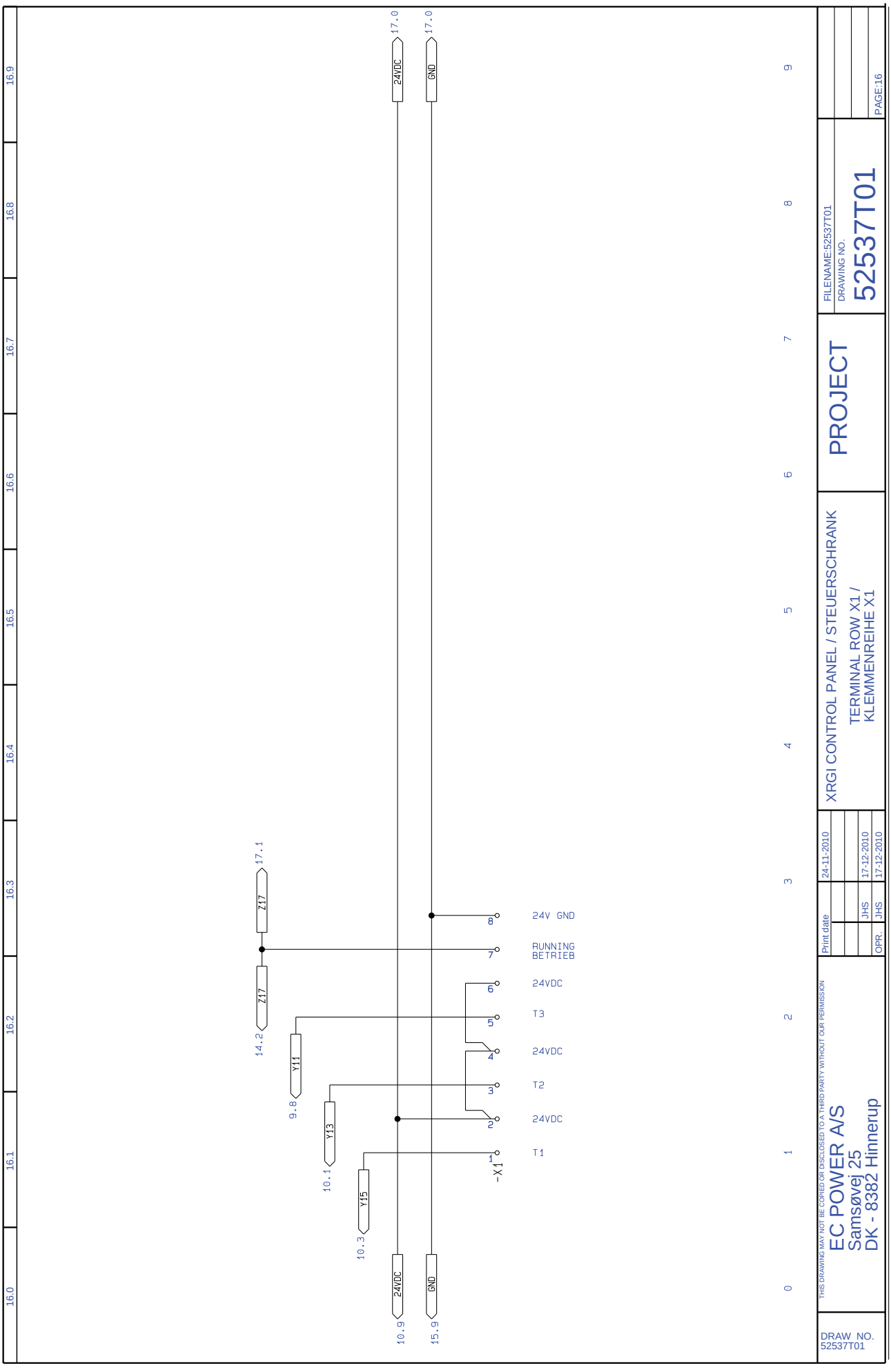
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
24-11-2010
17-12-2010
17-12-2010
JHS
JHS
OPR.
XRGI CONTROL PANEL / STEUERSCHRANK
MOTHERBOARD Z25-30
OUTPUT / AUSGÄNGE
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:15
DRAW NO.
52537T01


24VDC
17.0
GND
17.0
17.1
Z17
Z17
14.2
Y11
9.8
Y13
10.1
Y15
10.3
24VDC
10.9
GND
15.9
-X1
1
2
3
4
5
6
7
8
T1
24VDC
T2
24VDC
T3
24VDC
RUNNING
BETRIEB
24V GND
16.0
16.1
16.2
16.3
16.4
16.5
16.6
16.7
16.8
16.9
0
1
2
3
4
5
6
7
8
9
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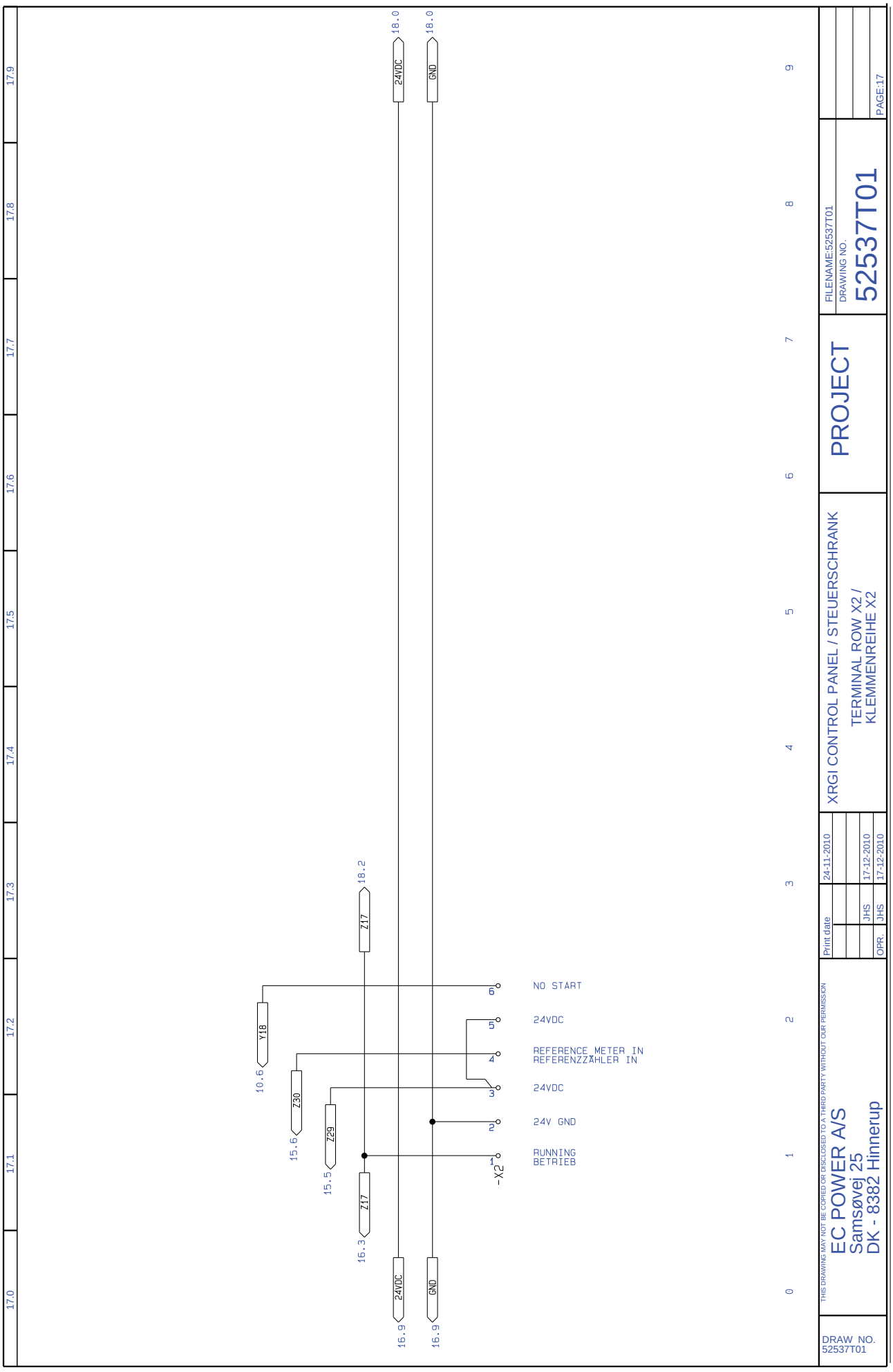
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
24-11-2010
JHS
17-12-2010
OPR.
JHS
17-12-2010
XRGI CONTROL PANEL / STEUERSCHRANK
TERMINAL ROW X1 /
KLEMMENREIHE X1
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:16
DRAW NO.
52537T01


24VDC
GND
18.0
18.0
18.2
Z17
Y18
Z30
Z29
Z17
10.6
15.6
15.5
16.3
16.9
16.9
-X2
6
5
4
3
2
1
NO START
24VDC
REFERENCE METER IN
REFERENZZÄHLER IN
24VDC
24V GND
RUNNING
BETRIEB
0 1 2 3 4 5 6 7 8 9
17.0 17.1 17.2 17.3 17.4 17.5 17.6 17.7 17.8 17.9
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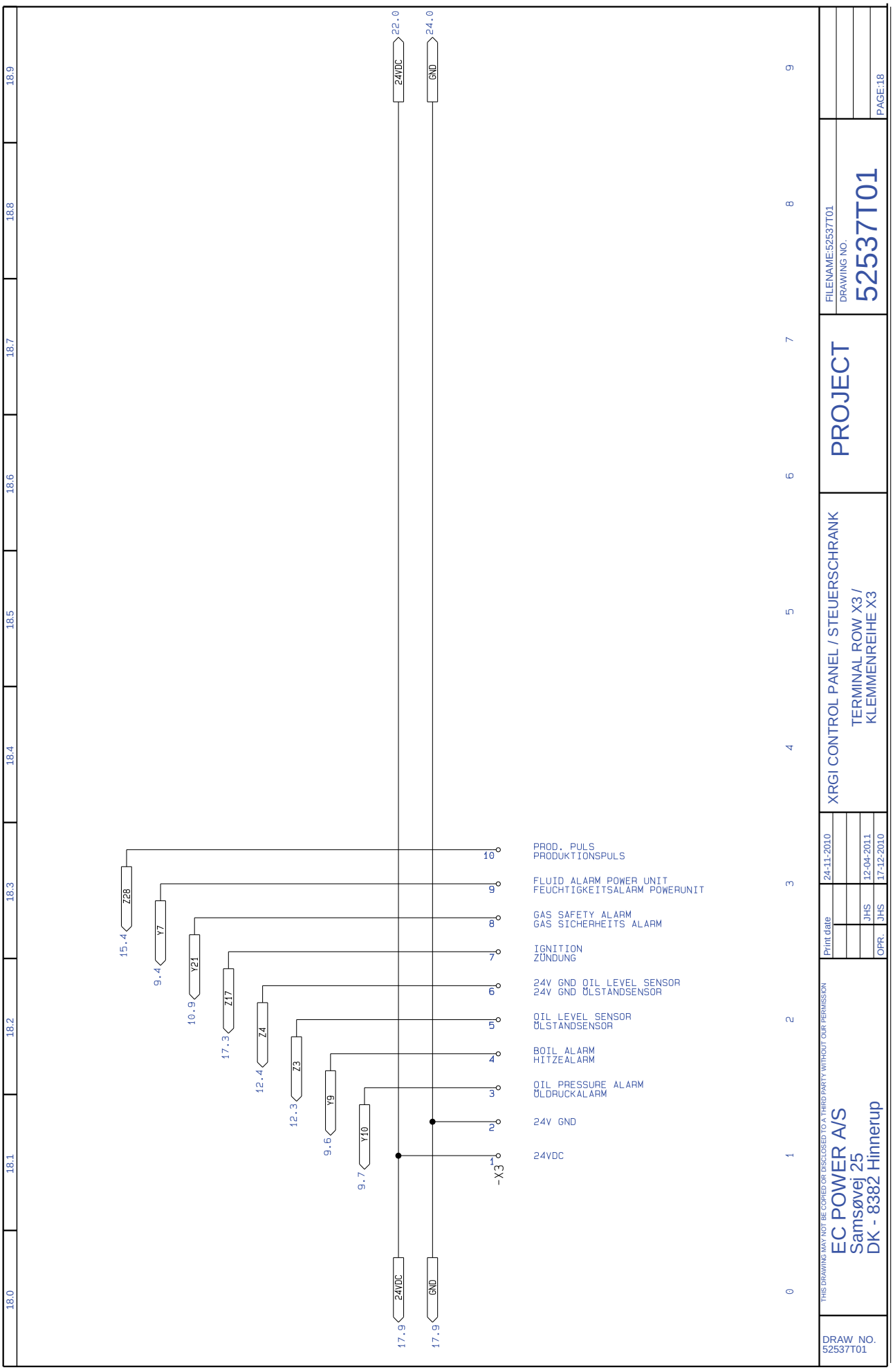
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
24-11-2010
JHS 17-12-2010
OPR. JHS 17-12-2010
XRGI CONTROL PANEL / STEUERSCHRANK
TERMINAL ROW X2 /
KLEMMENREIHE X2
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:17
DRAW NO.
52537T01


18.0
18.1
18.2
18.3
18.4
18.5
18.6
18.7
18.8
18.9
0
1
2
3
4
5
6
7
8
9
22.0
24VDC
24.0
GND
Z28
15.4
Y7
9.4
Y21
10.9
Z17
17.3
Z4
12.4
Z3
12.3
Y9
9.6
Y10
9.7
10
9
8
7
6
5
4
3
2
-X3
1
PROD. PULS
PRODUKTIONSPULS
FLUID ALARM POWER UNIT
FEUCHTIGKEITSALARM POWERUNIT
GAS SAFETY ALARM
GAS SICHERHEITS ALARM
IGNITION
ZÜNDUNG
24V GND OIL LEVEL SENSOR
24V GND ÖLSTANDSENSOR
OIL LEVEL SENSOR
ÖLSTANDSENSOR
BOIL ALARM
HITZEALARM
OIL PRESSURE ALARM
ÖLDRUCKALARM
24V GND
24VDC
17.9
24VDC
17.9
GND
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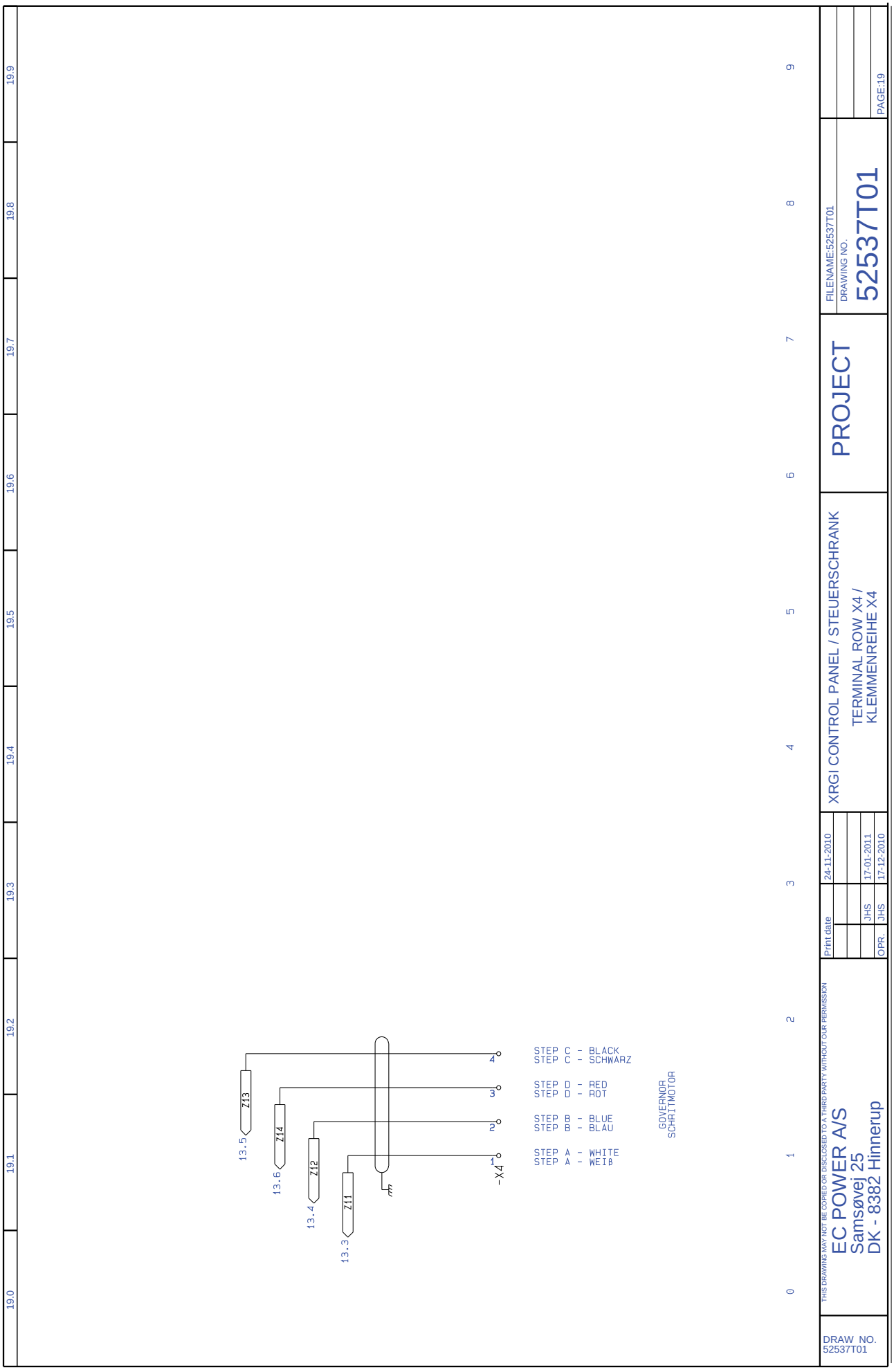
EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
24-11-2010
JHS
12-04-2011
OPR.
JHS
17-12-2010
XRGI CONTROL PANEL / STEUERSCHRANK
TERMINAL ROW X3 /
KLEMMENREIHE X3
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:18
DRAW NO.
52537T01


13.5
Z13
13.6
Z14
13.4
Z12
13.3
Z11
-X4
4
3
2
1
STEP C - BLACK
STEP C - SCHWARZ
STEP D - RED
STEP D - ROT
STEP B - BLUE
STEP B - BLAU
STEP A - WHITE
STEP A - WEIß
GOVERNOR
SCHRITTMOTOR
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EC POWER A/S
Samsøvej 25
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Print date
24-11-2010
JHS 17-01-2011
OPR. JHS 17-12-2010
XRGI CONTROL PANEL / STEUERSCHRANK
TERMINAL ROW X4 /
KLEMMENREIHE X4
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:19
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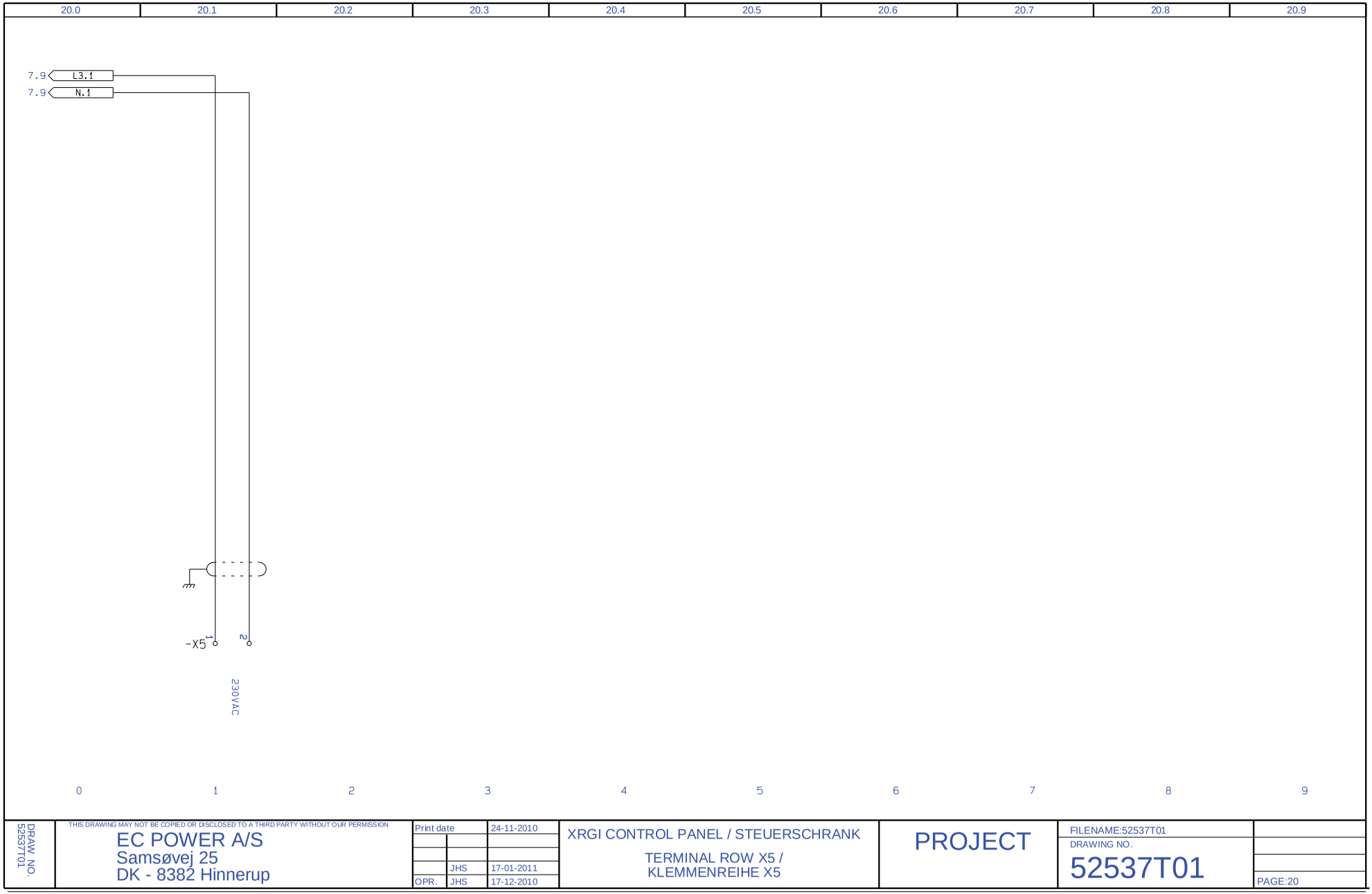
52537T01



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EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup

Print date		24-11-2010
	JHS	17-01-2011
OPR.	JHS	17-12-2010

XRGI CONTROL PANEL / STEUERSCHRANK

TERMINAL ROW X5 /
KLEMMENREIHE X5

PROJECT

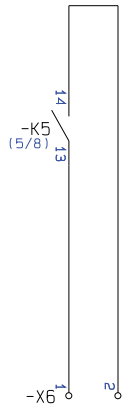
FILENAME:52537T01

DRAWING NO.

52537T01

PAGE:20

21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9



0	1	2	3	4	5	6	7	8	9

DRAW NO.
52537T01

EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup

Print date		
	JHS	12-04-2011
OPR.	JHS	17-12-2010

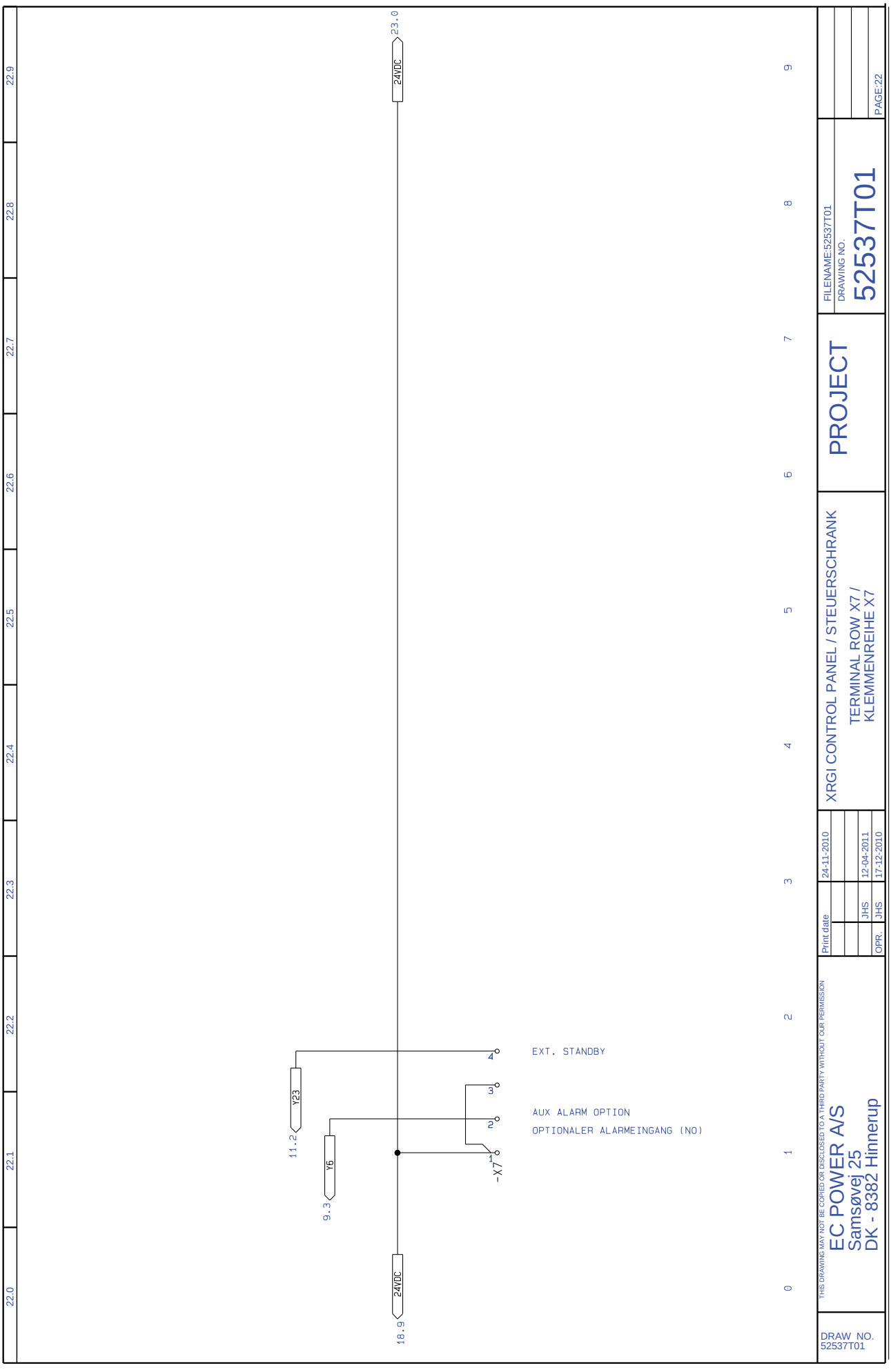
XRGI CONTROL PANEL / STEUERSCHRANK

TERMINAL ROW X6 /
KLEMMENREIHE X6

PROJECT

FILENAME:52537T01
DRAWING NO.
52537T01

PAGE:21


22.0
22.1
22.2
22.3
22.4
22.5
22.6
22.7
22.8
22.9
0
1
2
3
4
5
6
7
8
9
23.0
24VDC
18.9
24VDC
11.2
Y23
9.3
Y6
-X7
4
3
2
EXT. STANDBY
AUX ALARM OPTION
OPTIONALER ALARMEINGANG (NO)
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EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
24-11-2010
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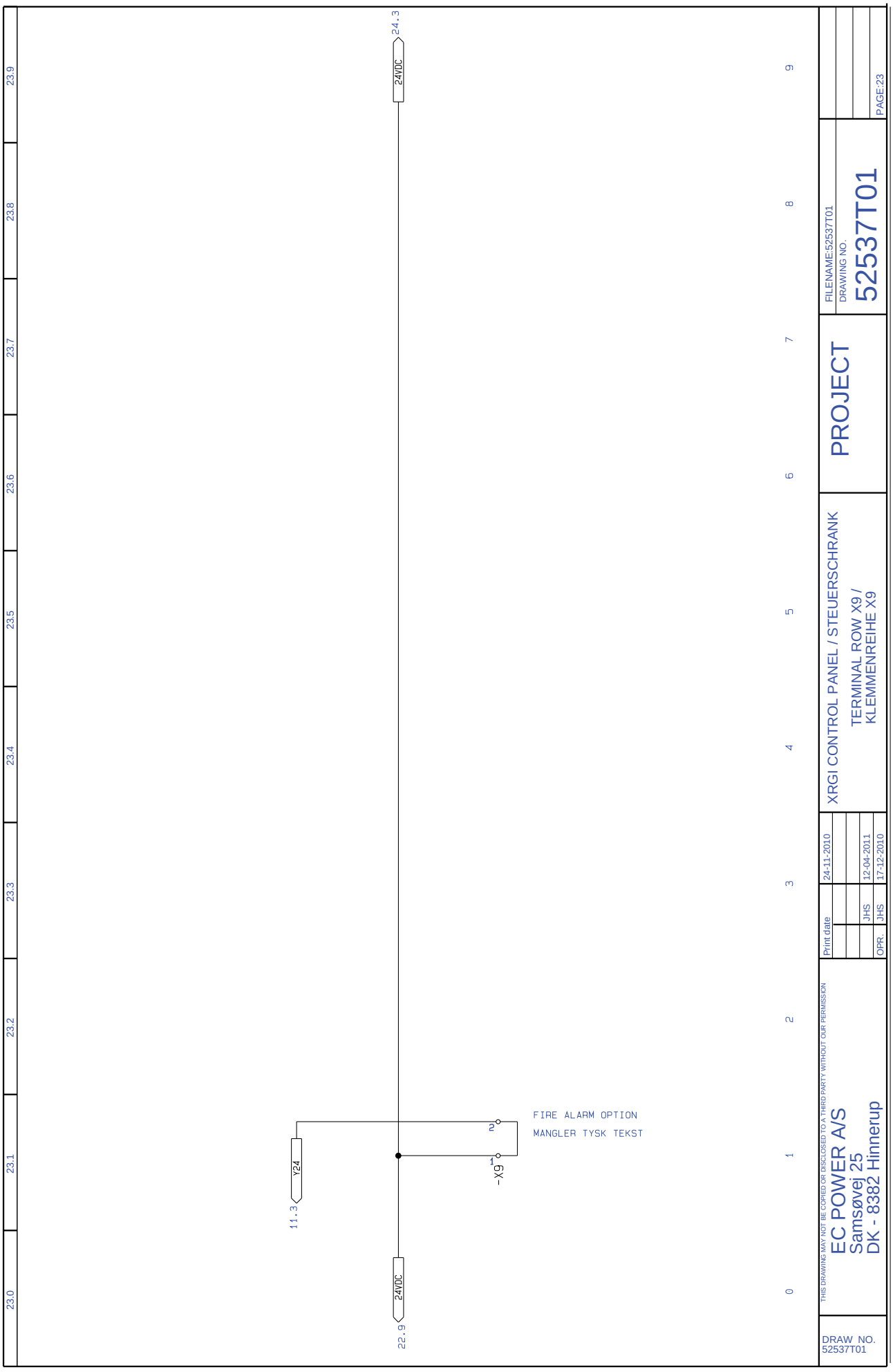
JHS
17-12-2010
XRGI CONTROL PANEL / STEUERSCHRANK
TERMINAL ROW X7 /
KLEMMENREIHE X7
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:22
DRAW NO.
52537T01


24VDC
24.3
Y24
11.3
-X9
1
2
FIRE ALARM OPTION
MANGLER TYSK TEKST
24VDC
22.9
23.0
23.1
23.2
23.3
23.4
23.5
23.6
23.7
23.8
23.9
0
1
2
3
4
5
6
7
8
9
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EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup
Print date
24-11-2010
12-04-2011
17-12-2010
JHS
JHS
OPR.
XRGI CONTROL PANEL / STEUERSCHRANK
TERMINAL ROW X9 /
KLEMMENREIHE X9
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:23
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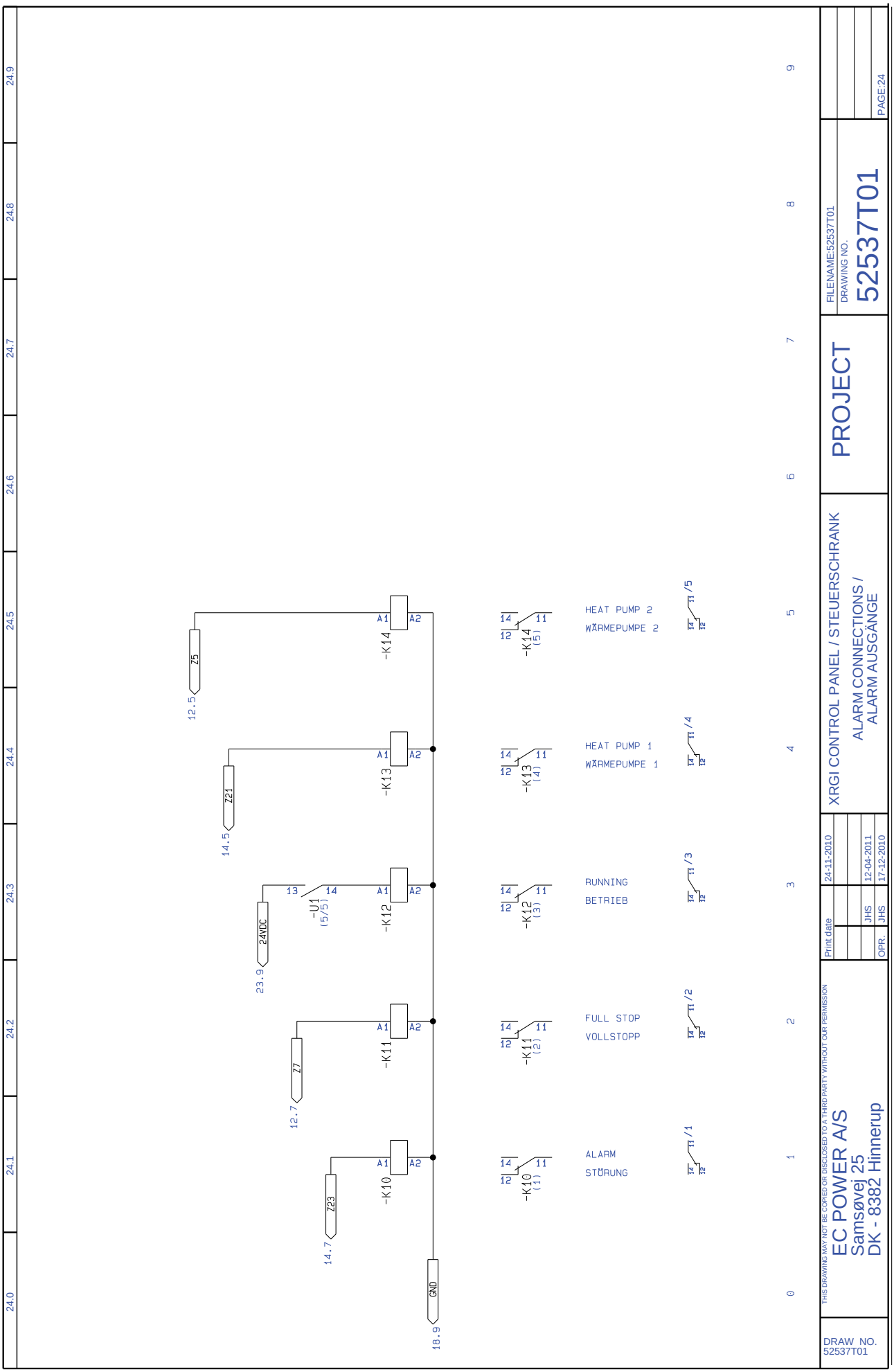
52537T01


-K14
-K13
-K12
-K11
-K10
-U1
(5/5)
24VDC
Z5
Z21
Z7
Z23
GND
12.5
14.5
12.7
14.7
23.9
18.9
HEAT PUMP 2
WÄRMEPUMPE 2
HEAT PUMP 1
WÄRMEPUMPE 1
RUNNING
BETRIEB
FULL STOP
VOLLSTOPP
ALARM
STÖRUNG
X1 /5
X1 /4
X1 /3
X1 /2
X1 /1
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DK - 8382 Hinnerup
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24-11-2010
12-04-2011
17-12-2010
JHS
JHS
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XRGI CONTROL PANEL / STEUERSCHRANK
ALARM CONNECTIONS /
ALARM AUSGÄNGE
PROJECT
FILENAME:52537T01
DRAWING NO.
52537T01
PAGE:24
DRAW NO.
52537T01

COMPONENT LIST / STÜCKLISTE

TAG NR.	PCS. ANZAHL	PART NO. ART. NR.	COMPONENT KOMPONENT	MANUFACTURER HERSTELLER
-A1	1	01ELF9131	PANEL 600X600X210 PANEL 600X600X210	EC POWER
-D1	1	01ELF5008	MOTHERBOARD IN-/OUTPUT MOTHERBOARD IN-/OUTPUT	EC POWER
-D2	1	01ELF9023	DISPLAY CARD DISPLAYKARTE	EC POWER
-D2	1	01ELF9096	FOAM GASKET F. DISPLAY SCHAUM PACKUNG FÜR DISPLAY	EC POWER
-D2	1	01ELT9027	PSC GLASS 130X76X1,5 + FILTER PSC GLAS 130X76X1,5 + FILTER	EC POWER
-D2.1	1	01ELT9028	KEYBOARD TASTATUR	EC POWER
-D2.2	1	01ELF9100	RIBBON CABLE 34P (F)/90MM/34P(F) FLACHBANDKABEL 34P (F)/90MM/34P(F)	EC POWER
-D2.F1	1	01SPA3077	FUSE 1,6A 5X20 SICHERUNG 1,6A 5X20	EC POWER
-D2.F2	1	01SPA3078	FUSE 2,0A 5X20 SICHERUNG 2,0A 5X20	EC POWER
-D2.F3	1	01SPA3077	FUSE 1,6A 5X20 SICHERUNG 1,6A 5X20	EC POWER
-D2.F4	1	01SPA3078	FUSE 2,0A 5X20 SICHERUNG 2,0A 5X20	EC POWER
-D3	1	01ELF9030	POWERSUPPLY FOR MOBILE MODEM STROMVERSORGUNG FÜR MOBILMODEM	SIEMENS
-D3	1	01ELF9029	MOBILE MODEM TC35I MOBILMODEM TC35I	SIEMENS
-D3	1	01ELF9031	CABLE 1,0M DB9(M) TIL DB9(F) RS232 RS232 KABEL 1,0M DB9(M) TIL DB9(F)	EC POWER

DRAW NO. 52537T01

EC POWER A/S
Samsøvej 25
DK - 8382 Hinnerup

Print date		24-11-2010
	JHS	12-04-2011
OPR.	JHS	17-12-2010

XRGI CONTROL PANEL / STEUERSCHRANK

COMPONENTS LIST / STÜCKLISTE

PROJECT

FILENAME:52537T01

DRAWING NO.

52537T01

PAGE:25

COMPONENT LIST / STÜCKLISTE

TAG NR.	PCS. ANZAHL	PART NO. ART. NR.	COMPONENT KOMPONENT	MANUFACTURER HERSTELLER
-D3	1	01ELF9095	BRACKET FOR MOBILE MODEM KONSOLE FÜR MOBILMODEM	EC POWER
-D3.1	1	01ELF9036	ANTENNA ½ WAVE GSM DUALBAND/FME(F) ANTENNE ½ WELLE GSM DUALBAND/FME(F)	EC POWER
-D3.1	1	01ELF9034	25CM RG174 CABLE M/FME CHASSIS(M)+ FEM(F) 25CM RG174 KABEL M/FME CHASSIS(M)+ FEM(F)	EC POWER
-F2	1	01ELF9133	RCCB 4P 63A 30MA, A-CLASS FEHLERSTROM-SCHUTZEINRICHTUNGEN 4P 63A 30MA	SCHNEIDER
-F4	1	01ELF9041	C60N 3P+N 6A C-CHARACTERISTIC MCB 10KA/415V C60N 3P+N 6A C-CHARAKTERISTIK LEISTUNGSSCHUTZSCHALTER 10KA/415V	SCHNEIDER
-G1	1	01ELF9026	CABLE SET FOR POWER SUPPLY KABELSATZ FÜR STROMVERSORGUNG	EC POWER
-G1	1	01ELF9025	POWER SUPPLY 230VAC/ 5VDC-24VDC STROMVERSORGUNG 230VAC/ 5VDC-24VDC	EC POWER
-K1	1	01ELF_____	LOSS OF MAINS PROTECTION RELAY - THREE PHASE 4-WIRE SYSTEM LOSS OF MAINS PROTECTION RELAY - THREE PHASE 4-WIRE SYSTEM	CARLO GAVAZZI
-K4	1	01ELF9105	RELAY SNR 6,3MM 1CO 24VDC RELAY SNR 6,3MM 1CO 24VDC	SCHRACK
-K5	1	01ELF9135	CONTACTOR 43A 230V50/60HZ CONTACTOR 43A 230V50/60HZ	ALLEN-BRADLEY
-K5	1	01ELF9137	AUX.BLOCK SIDE MOUNTED 1 NO, 1NC HILFSCHALTERBLOCK SEITLICH 1 NO, 1NC	ALLEN-BRADLEY
-K5.1	1	01ELF9105	RELAY SNR 6,3MM 1CO 24VDC RELAY SNR 6,3MM 1CO 24VDC	SCHRACK
-K7	1	01ELF9105	RELAY SNR 6,3MM 1CO 24VDC RELAY SNR 6,3MM 1CO 24VDC	SCHRACK
-K10	1	01ELF9105	RELAY SNR 6,3MM 1CO 24VDC RELAY SNR 6,3MM 1CO 24VDC	SCHRACK

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EC POWER A/S
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DK - 8382 Hinnerup

Print date		24-11-2010
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XRGI CONTROL PANEL / STEUERSCHRANK

COMPONENTS LIST / STÜCKLISTE

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COMPONENT LIST / STÜCKLISTE

TAG NR.	PCS. ANZAHL	PART NO. ART. NR.	COMPONENT KOMPONENT	MANUFACTURER HERSTELLER
-K11	1	01ELF9105	RELAY SNR 6,3MM 1CO 24VDC RELAY SNR 6,3MM 1CO 24VDC	SCHRACK
-K12	1	01ELF9105	RELAY SNR 6,3MM 1CO 24VDC RELAY SNR 6,3MM 1CO 24VDC	SCHRACK
-K13	1	01ELF9105	RELAY SNR 6,3MM 1CO 24VDC RELAY SNR 6,3MM 1CO 24VDC	SCHRACK
-K14	1	01ELF9105	RELAY SNR 6,3MM 1CO 24VDC RELAY SNR 6,3MM 1CO 24VDC	SCHRACK
-P1	1	01ELF9126	3 PHASE ENERGY ANALYZER 3 PHASIG ZÄHLER	CARLO GAVAZZI
-Q1	1	01ELF9047	HANDLE RED-YELLOW ON-OFF DREHGRIFF ROT-GELB ON-OFF	ABB
-Q1	1	01ELF9129	MAIN SWITCH DISCONNECTOR 63A 4P HAUPTSCHALTER VORSATZ SCHWARZ 63A 4P	ABB
-Q1	1	01ELF9048	TERMINAL COVER FOR OT45 - 63E3 SCHUTZ FÜR OT45 - 63E3	ABB
-U1	1	01ELF9138	SOFTSTARTER SMC-3 150 C43nBR SOFTSTARTER SMC-3 150 C43nBR	ALLEN BRADLEY
-W1	1	01ELF9132	BUSBAR 4P MAX 100A 3XMCCB BUSBAR 4P MAX 100A 3XMCCB	SCHNEIDER
-X0	6	01ELF9050	TERMINAL 16 KLEMME 16	WEIDMÜLLER
-X0	1	01ELF9103	TERMINAL WDU 16MM² BLUE KLEMME 16MM² BLAU	WEIDMÜLLER
-X0	1	01ELF9051	END PLATE/SEPERATION PLATE ENDPLATTE/TRENNPLATTE	WEIDMÜLLER
-X0	4	01ELF9053	ENCLOSURE PLATE WITH LIGHTNING ABDECUNG MIT BLITZ	WEIDMÜLLER

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XRGI CONTROL PANEL / STEUERSCHRANK

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COMPONENT LIST / STÜCKLISTE

TAG NR.	PCS. ANZAHL	PART NO. ART. NR.	COMPONENT KOMPONENT	MANUFACTURER HERSTELLER
-X0	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X1	8	01ELF9054	TERMINAL 2,5MM² KLEMME 2,5	WEIDMÜLLER
-X1	1	01ELF9055	END PIECE WAP 2.5-10 ENDSTÜCK WAP 2.5-10	WEIDMÜLLER
-X1	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X2	6	01ELF9054	TERMINAL 2,5MM² KLEMME 2,5	WEIDMÜLLER
-X2	1	01ELF9055	END PIECE WAP 2.5-10 ENDSTÜCK WAP 2.5-10	WEIDMÜLLER
-X2	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X3	10	01ELF9054	TERMINAL 2,5MM² KLEMME 2,5	WEIDMÜLLER
-X3	1	01ELF9055	END PIECE WAP 2.5-10 ENDSTÜCK WAP 2.5-10	WEIDMÜLLER
-X3	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X4	4	01ELF9054	TERMINAL 2,5MM² KLEMME 2,5	WEIDMÜLLER
-X4	1	01ELF9055	END PIECE WAP 2.5-10 ENDSTÜCK WAP 2.5-10	WEIDMÜLLER
-X4	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X5	2	01ELF9054	TERMINAL 2,5MM² KLEMME 2,5	WEIDMÜLLER

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COMPONENTS LIST / STÜCKLISTE

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TAG NR.	PCS. ANZAHL	PART NO. ART. NR.	COMPONENT KOMPONENT	MANUFACTURER HERSTELLER
-X5	1	01ELF9055	END PIECE WAP 2.5-10 ENDSTÜCK WAP 2.5-10	WEIDMÜLLER
-X5	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X6	2	01ELF9054	TERMINAL 2,5MM² KLEMME 2,5	WEIDMÜLLER
-X6	1	01ELF9055	END PIECE WAP 2.5-10 ENDSTÜCK WAP 2.5-10	WEIDMÜLLER
-X6	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X7	4	01ELF9054	TERMINAL 2,5MM² KLEMME 2,5	WEIDMÜLLER
-X7	1	01ELF9055	END PIECE WAP 2.5-10 ENDSTÜCK WAP 2.5-10	WEIDMÜLLER
-X7	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X8	1	01ELF9056	230V OUTLET FOR DIN-RAIL 230V ANSCHLUSSDOSE FÜR DIN-SCHIENEN	SCHUPA
-X9	2	01ELF9054	TERMINAL 2,5MM² KLEMME 2,5	WEIDMÜLLER
-X9	1	01ELF9055	END PIECE WAP 2.5-10 ENDSTÜCK WAP 2.5-10	WEIDMÜLLER
-X9	1	01ELF9052	END PIECE WEW 35/2 ENDSTÜCKE WEW 35/2	WEIDMÜLLER
-X100	2	01ELF9134	RJ45 PATCH CABEL S/FTP 1MTR. RJ45 PATCH CABEL S/FTP 1MTR.	EC POWER
-X100	1	01ELF9125	RJ45 CONNECTOR SHIELDED RJ45 CONNECTOR SHIELDED	EC POWER

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COMPONENTS LIST / STÜCKLISTE

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SAMSØVEJ 25
DK- 8382 HINNERUP
TEL. +45 87 434 100
WWW.ECPOWER.EU

XRGI EXTERNAL CONNECTIONS
XRGI KABELZUG / EXTERNE VERBINDUNGEN

POWER UNIT	CONTROL PANEL / SCHALTSCHRANK	ECP PART NUMBER / ECP BESTELLNUMMER
XRGI 15 G TO	52536T0X 52538T0X	17ELD1007 17ELD1009
XRGI 20 G TO	52537T0X	17ELD1008

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EC POWER A/S
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XRGI EXT. CONNECT. / VERBINDUNGEN
FRONT PAGE / DECKBLATT

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XRGI EXT. CONNECT. / VERBINDUNGEN
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REVISIONS LIST / REVISIONSLISTE

REV.	DATE DATO	PAGE SEITE	DESCRIPTION BESCHREIBUNG
01	19-09-2011		NEW DOCUMENT, CREATED ON BASIS OF 69200T02
02	30-01-2012	03, 18	PAGE UPDATED

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EC POWER A/S
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XRGI EXT. CONNECT. / VERBINDUNGEN
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ELECTRIC DATA / ELEKTRISCHE DATEN

POWER SUPPLY / STROMVERSORGUNG	:	3X400VAC+N+PE
FREQUENCY / NETZFREQUENZ	:	50 Hz
CONTROL VOLTAGE / STEUERSPANNUNG	:	24VDC
MAX. SWITCHBOARD LOAD / MAX. SCHALTSCHRANKBELASTUNG	:	40 A
SUPPLY LINE FUSE / VORSICHERUNG	:	MAX 63A gL
SYSTEM EARTHING / NETZSYSTEM	:	TN-S/TT
MAX. SWITCHBOARD TEMP. / MAX. SCHALTSCHRANKTEMP.	:	40°C
GRADE OF PROTECTION / SCHUTZART	:	IP54
YEAR OF CONSTRUCTION / BAUJAHR	:	2009
NORM / NORM	:	EN60439-1 / EN60204-1

WIRE COLOUR CODE / ADERNFARBEN

POWER CIRCUITS / HAUPTSTROMKREIS	:	BLACK / SCHWARZ
NEUTRAL / NEUTRALLEITER	:	LIGHT BLUE / HELLBLAU
PROTECTIVE EARTH / SCHUTZLEITER	:	GREEN/YELLOW / GELB/GRÜN
INTERLOCKING AC/DC CIRCUITS AND EXTERNALLY SUPPLIED CIRCUITS / VERRIEGELNDE AC/DC SCHALTUNGEN UND EXTERNE SCHALTUNGEN	:	ORANGE / ORANGE
CONTROL CIRCUITS ABOVE 50 V / STEUERSTROMKREISE ÜBER 50 V		
PHASE AC / PHASE AC	:	BLACK / SCHWARZ
NEUTRAL AC / NEUTRALLEITER AC	:	LIGHT BLUE / HELLBLAU
CONTROL CIRCUITS BELOW 50 V / STEUERSTROMKREISE UNTER 50 V		
PHASE AC / PHASE AC	:	RED / ROT
NEUTRAL AC / NEUTRALLEITER AC	:	GREY / GRAU
DC+ / DC+	:	DARK BLUE / DUNKELBLAU
0V DC / 0VDC	:	WHITE / WEIß

WARNING

WHEN DISCONNECTING THE CONTROL PANEL MAIN SWITCH, ITS INPUT-TERMINALS ARE STILL SUPPLIED

THE CONTROL PANEL IS TO BE OPENED BY AUTORIZED PERSONAL ONLY

ACHTUNG

AUCH BEI AUSGESCHALTETEM HAUPTSCHALTER SIND DIE EINGEBAUTEN GERÄTE NOCH UNTER SPANNUNG

DER SCHALTSCHRANK DARF NUR VON AUTORISIERTEN PERSONEN GEÖFNEN WERDEN

FUSES / SICHERUNGEN

FUSES: THE COMPLETE CURRENT ΣAMP FOR ALL OUTPUTS ARE LIMITED TO 1 AMP.
SICHERUNGEN: DER GESAMTE SUMMENSTROM ΣAMP FÜR ALLE AUSGANGE IST AUF 1 AMP. BEGRENZT

COMP. NO BEZEICHNUNG	FUNCTION / FUNKTION	TYPE / TYP
F1	24VDC INTERNAL FOR DISPLAY CARD (-D2) 24VDC INTERN FÜR DISPLAYKARTE (-D2)	1,6A
F2	24VDC INTERNAL FOR MOTHERBOARD (-D1) 24VDC INTERN FÜR MOTHERBOARD (-D1)	2,0A
F3	5VDC INTERNAL FOR DISPLAY CARD (-D2) 5VDC INTERN FÜR DISPLAYKARTE (-D2)	2,0A
F4	5VDC INTERNAL FOR MOTHERBOARD (-D1) 5VDC INTERN FÜR MOTHERBOARD (-D1)	1,6A

COLOUR CODE ACCORDING TO IEC 757 / FARBCODE ENTSPRECHEND IEC 757

WIRE COLOUR / KABEL FARBE	CODE / CODE	WIRE COLOUR / KABEL FARBE	CODE / CODE
BLACK / SCHWARZ	BK	VIOLET / VIOLET	VT
BROWN / BRAUN	BN	GREY / GRAU	GY
RED / ROT	RD	WHITE / WEIß	WH
ORANGE / ORANGE	OG	PINK / PINK	PK
YELLOW / GELB	YE	GOLD / GOLD	GD
GREEN / GRÜN	GN	TURQUISE / TÜRKIS	TQ
BLUE / BLAU	BU	SILVER / SILBER	SR
GREEN-YELLOW / GELB GRÜN	GNYE		

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XRGI EXT. CONNECT. / VERBINDUNGEN
TECHNICAL DATA / TECHNISCHE DATEN

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RECOMMENDED CABLE TYPES FOR EXTERNAL INSTALLATION

CONTROL CABLES

UNSHIELDED CABLES

LAPP CABLES TYPE: ÖLFLEX(R) CLASSIC 110 (NUMBERED CORES) MIN. WIRE SIZE 0,75MM²

SHIELDED CABLES

LAPP CABLES TYPE: ÖLFLEX(R) CLASSIC 115CY (NUMBERED CORES) MIN WIRE SIZE 0,75MM²

COMMUNICATION CABLES (Q-NETWORK)

SFTP RJ45 = SCREENED FULLY SHIELDED TWISTED PAIR NETWORK CABLE

ERFORDERLICHE KABEL ZUR EXTERNEN INSTALLATION

STEUERKABEL

UNGESCHIRMTE KABEL

LAPP KABEL TYP: ÖLFLEX(R) CLASSIC 110 (NUMMERIERTE ADERN) MIN. QUERSCHNITT 0,75MM²

GESCHIRMTE KABEL

LAPP KABEL TYP: ÖLFLEX(R) CLASSIC 115CY (NUMMERIERTE ADERN) MIN. QUERSCHNITT 0,75MM²

KOMMUNIKATIONSKABEL (Q-NETWORK)

SFTP RJ45 = SCREENED FULLY SHIELDED TWISTED PAIR NETZWERK KABEL

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XRGI EXT. CONNECT. / VERBINDUNGEN
CABLE TYPES / KABELTYPEN

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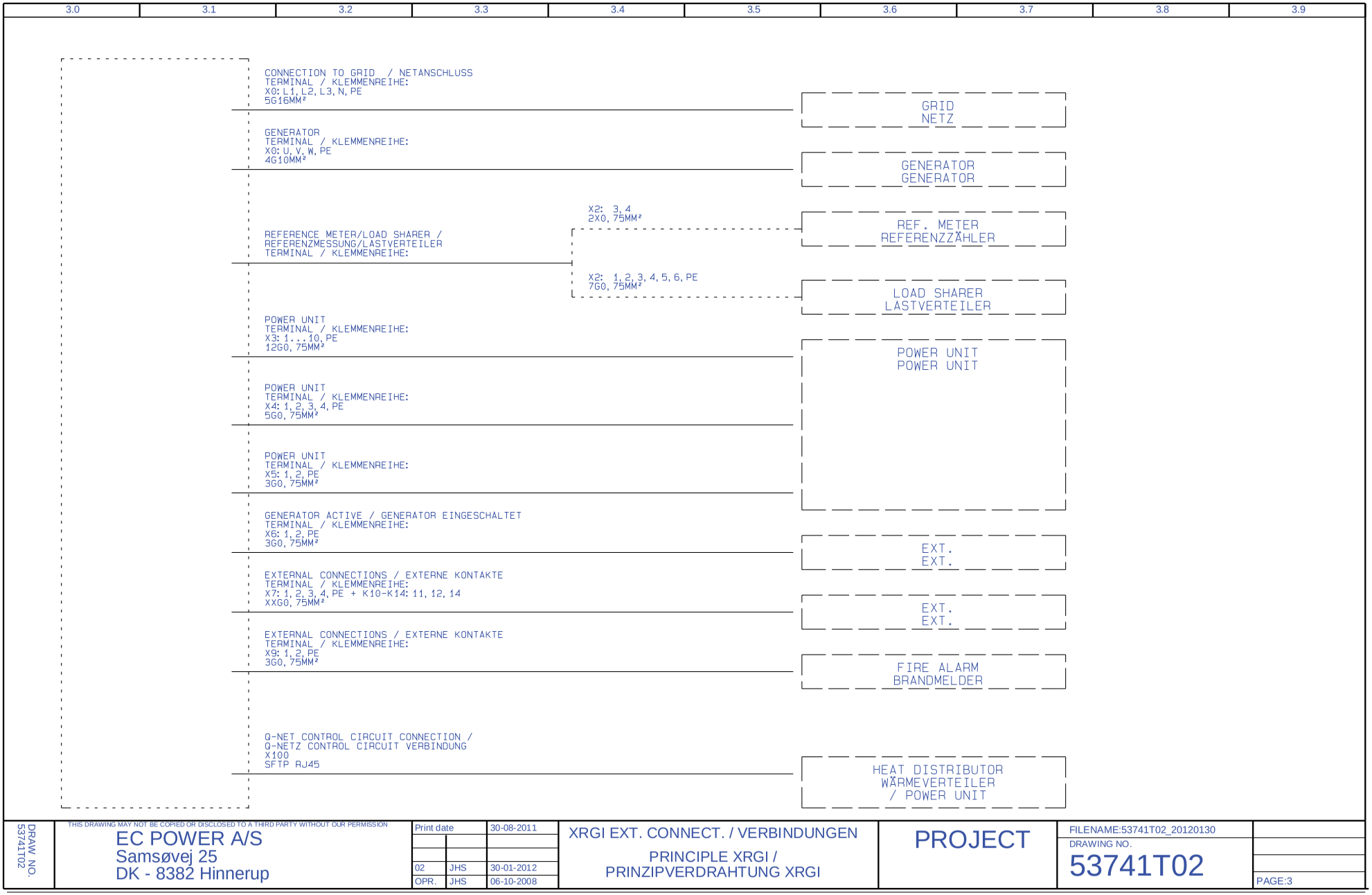

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DK - 8382 Hinnerup

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OPR.	JHS	06-10-2008

XRGI EXT. CONNECT. / VERBINDUNGEN

PRINCIPLE XRGI /
PRINZIPVERDRAHTUNG XRGI

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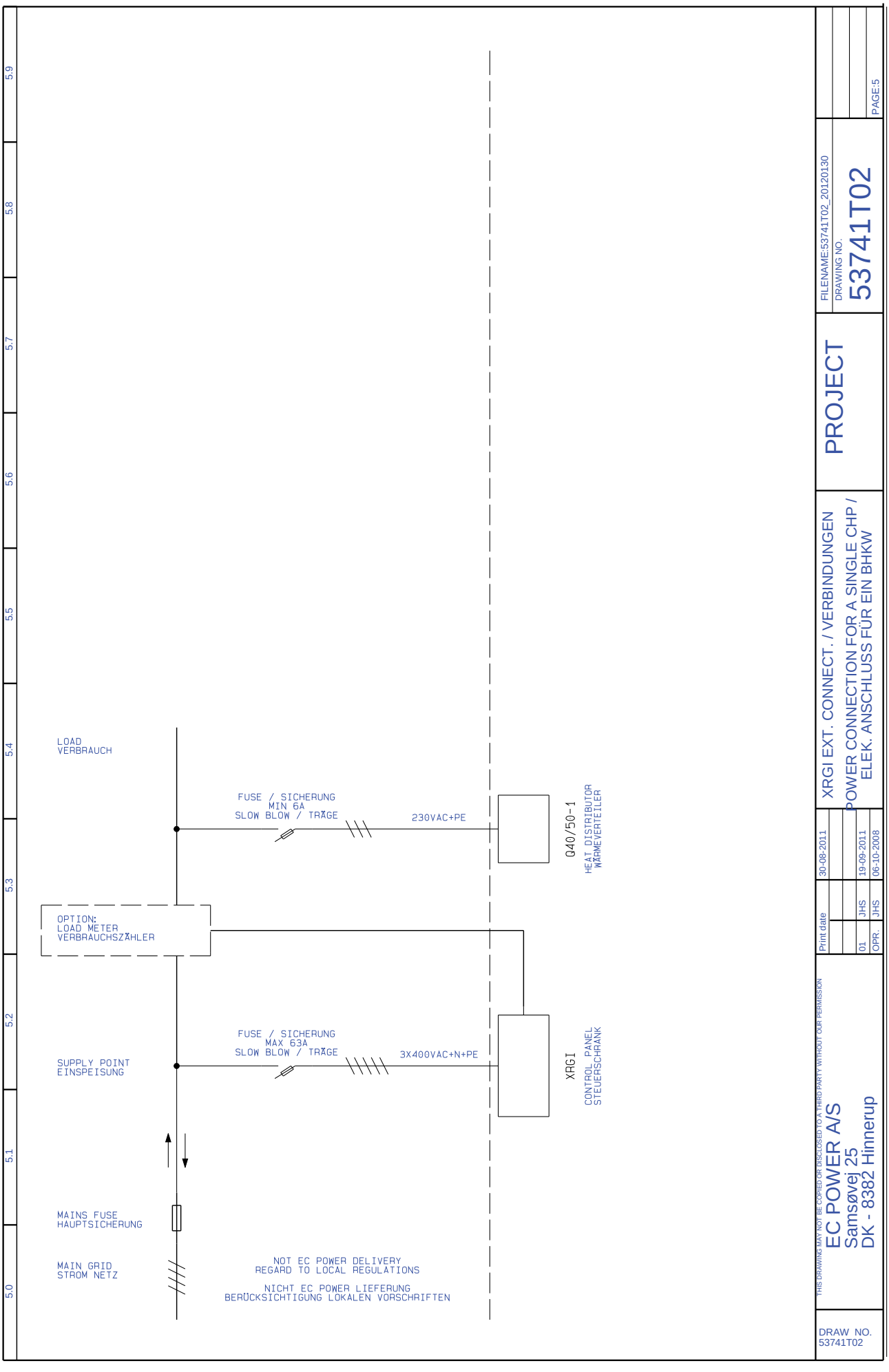
LOAD
VERBRAUCH
FUSE / SICHERUNG
MIN 6A
SLOW BLOW / TRÄGE
230VAC+PE
Q40/50-1
HEAT DISTRIBUTOR
WÄRMEVERTEILER
OPTION:
LOAD METER
VERBRAUCHSZÄHLER
FUSE / SICHERUNG
MAX 63A
SLOW BLOW / TRÄGE
3X400VAC+N+PE
SUPPLY POINT
EINSPEISUNG
XRGI
CONTROL PANEL
STEUERSCHRANK
MAINS FUSE
HAUPTSICHERUNG
MAIN GRID
STROM NETZ
NOT EC POWER DELIVERY
REGARD TO LOCAL REGULATIONS
NICHT EC POWER LIEFERUNG
BERÜCKSICHTIGUNG LOKALEN VORSCHRIFTEN
5.0
5.1
5.2
5.3
5.4
5.5
5.6
5.7
5.8
5.9
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01
JHS
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XRGI EXT. CONNECT. / VERBINDUNGEN
POWER CONNECTION FOR A SINGLE CHP /
ELEK. ANSCHLUSS FÜR EIN BHKW
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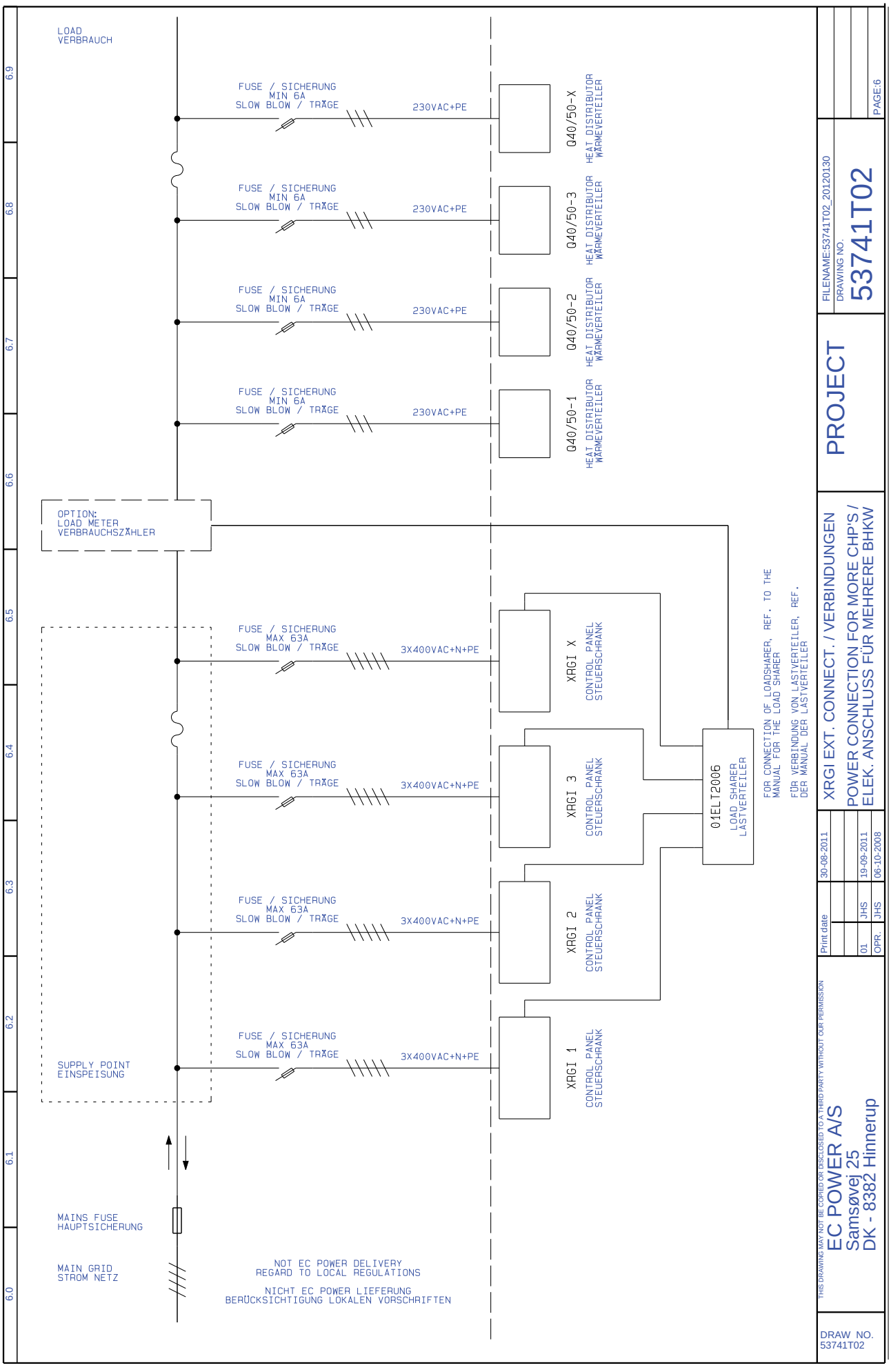
LOAD
VERBRAUCH
FUSE / SICHERUNG
MIN 6A
SLOW BLOW / TRÄGE
230VAC+PE
Q40/50-X
HEAT DISTRIBUTOR
WÄRMEVERTEILER
Q40/50-3
Q40/50-2
Q40/50-1
OPTION:
LOAD METER
VERBRAUCHSZÄHLER
FUSE / SICHERUNG
MAX 63A
SLOW BLOW / TRÄGE
3X400VAC+N+PE
XRGI X
XRGI 3
XRGI 2
XRGI 1
CONTROL PANEL
STEUERSCHRANK
01ELT2006
LOAD SHARER
LASTVERTEILER
FOR CONNECTION OF LOADSHARER, REF. TO THE
MANUAL FOR THE LOAD SHARER
FÜR VERBINDUNG VON LASTVERTEILER, REF.
DER MANUAL DER LASTVERTEILER
SUPPLY POINT
EINSPEISUNG
MAINS FUSE
HAUPTSICHERUNG
MAIN GRID
STROM NETZ
NOT EC POWER DELIVERY
REGARD TO LOCAL REGULATIONS
NICHT EC POWER LIEFERUNG
BERÜCKSICHTIGUNG LOKALEN VORSCHRIFTEN
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6.0
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XRGI EXT. CONNECT. / VERBINDUNGEN
POWER CONNECTION FOR MORE CHP'S /
ELEK. ANSCHLUSS FÜR MEHRERE BHKW
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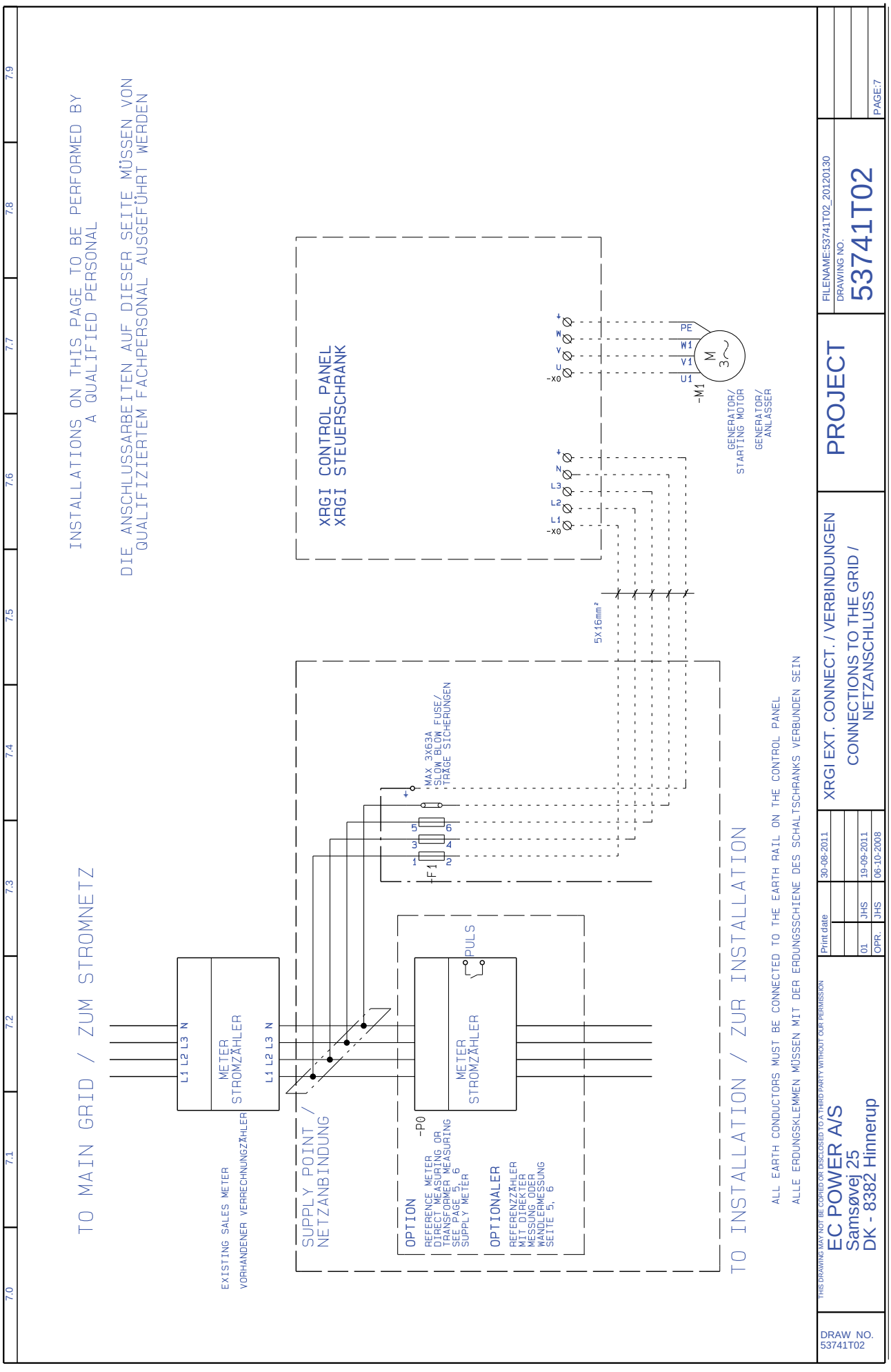
INSTALLATIONS ON THIS PAGE TO BE PERFORMED BY A QUALIFIED PERSONAL
DIE ANSCHLUSSARBEITEN AUF DIESER SEITE MÜSSEN VON QUALIFIZIERTEM FACHPERSONAL AUSGEFÜHRT WERDEN
TO MAIN GRID / ZUM STROMNETZ
EXISTING SALES METER
VORHANDENER VERRECHNUNGZÄHLER
METER
STROMZÄHLER
L1 L2 L3 N
SUPPLY POINT /
NETZANBINDUNG
OPTION
REFERENCE METER
DIRECT MEASURING OR
TRANSFORMER MEASURING
SEE PAGE 5, 6
SUPPLY METER
OPTIONALER
REFERENZZÄHLER
MIT DIREKTER
MESSUNG ODER
WANDLERMESSUNG
SEITE 5, 6
-P0
PULS
-F1
MAX 3X63A
SLOW BLOW FUSE/
TRÄGE SICHERUNGEN
5X16mm²
XRGI CONTROL PANEL
XRGI STEUERSCHRANK
-X0
PE
W1
V1
U1
-M1
GENERATOR/
STARTING MOTOR
GENERATOR/
ANLASSER
TO INSTALLATION / ZUR INSTALLATION
ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANKS VERBUNDEN SEIN
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XRGI EXT. CONNECT. / VERBINDUNGEN
CONNECTIONS TO THE GRID /
NETZANSCHLUSS
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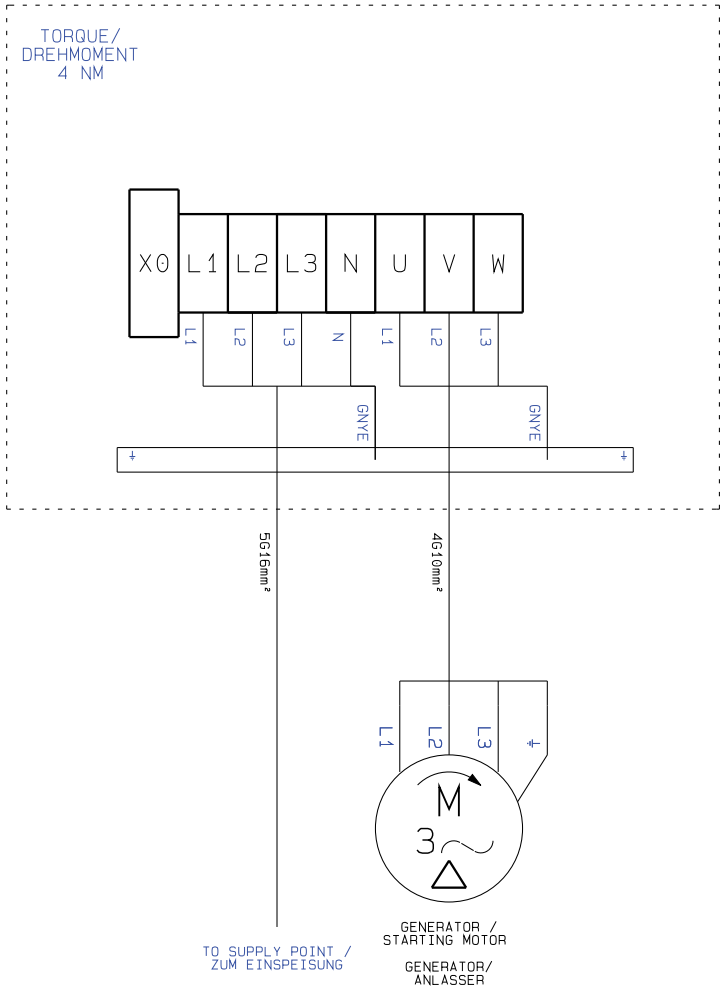

ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANK VERBUNDEN SEIN

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XRGI EXT. CONNECT. / VERBINDUNGEN

CONNECTION TO GRID+GENERATOR /
NETZ- UND GENERATORANSCHLUSS

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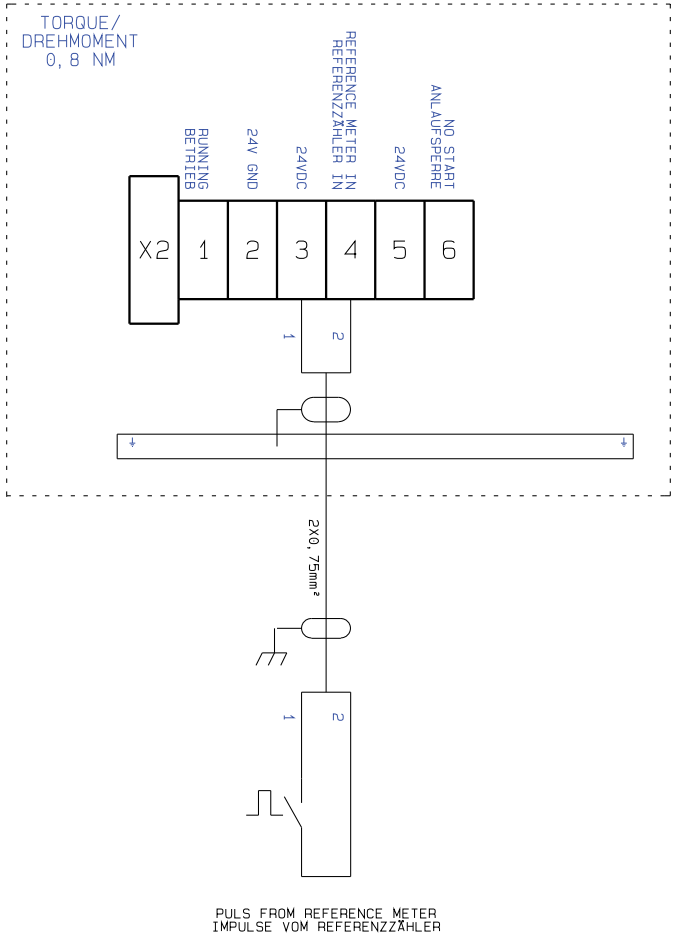
11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9



TRAFO RATIO SETUP IN CONTROL CABINET	WATT/PULS
TRAFO UMSETZUNG EINSTELLUNG IN STEUERSCHRANK	
600/5	2
300/5	1
250/5	0, 8333
100/5	0, 3333
DIRECT METER DIREKT ZÄHLER	1

FOR INSTALLATION - PLEASE USE MANUAL IN REFERENCE METER KIT
ZUM INSTALLATION - BITTE DEN MANUAL IM REFERENCEZÄHLERKIT VERWENDEN

ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANK VERBUNDEN SEIN

DRAW NO.
53741T02

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OPR.	JHS	06-10-2008

XRGI EXT. CONNECT. / VERBINDUNGEN

CONNECTION TO REF.METER /
ANBINDUNG DES REFERENZZÄHLERS

PROJECT

FILENAME:53741T02_20120130
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53741T02

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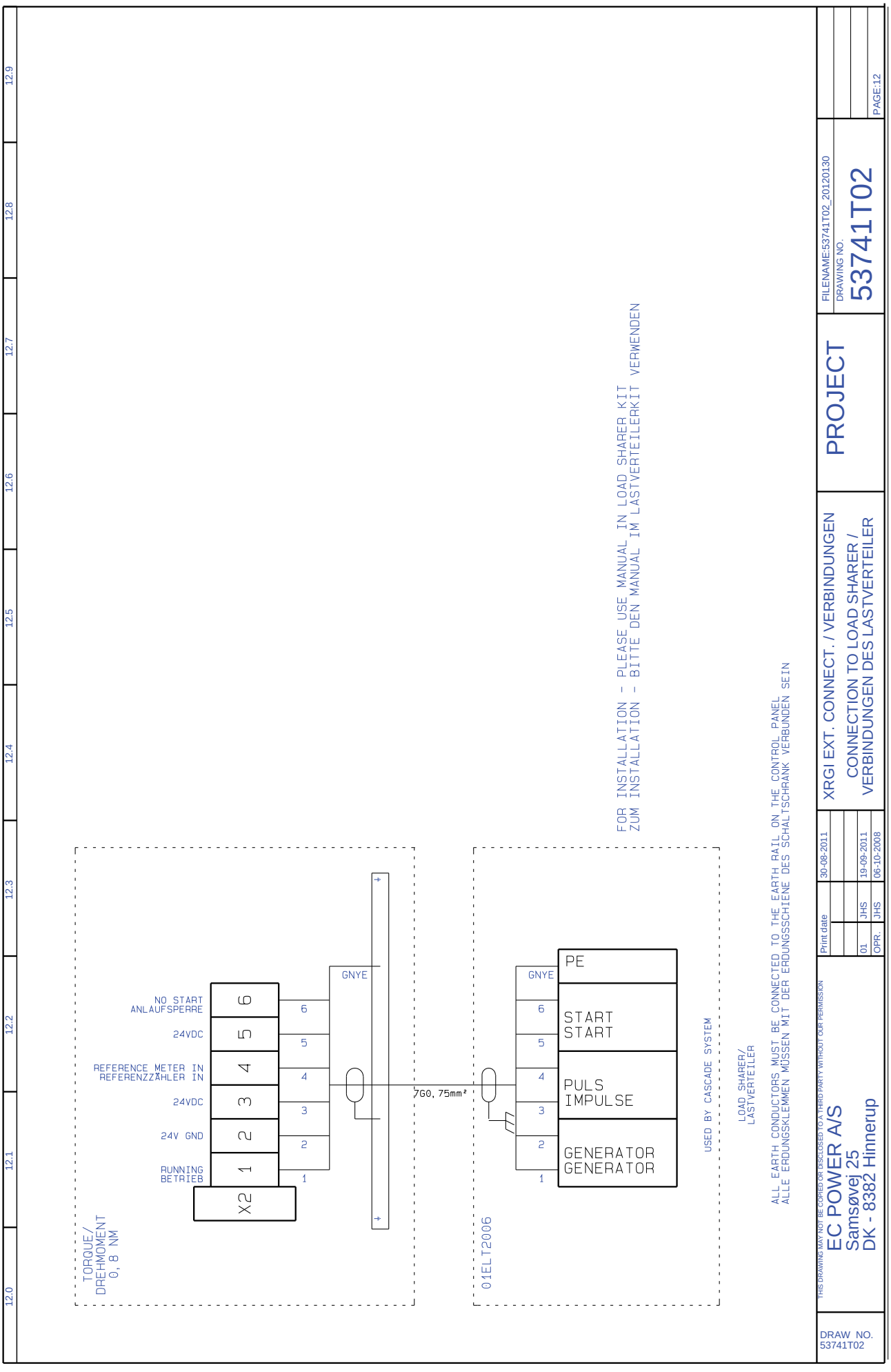
12.0
12.1
12.2
12.3
12.4
12.5
12.6
12.7
12.8
12.9
TORQUE/
DREHMOMENT
0,8 NM
X2
1
2
3
4
5
6
RUNNING
BETRIEB
24V GND
24VDC
REFERENCE METER IN
REFERENZZÄHLER IN
24VDC
NO START
ANLAUFSPERRE
GNYE
7G0,75mm²
01ELT2006
PE
START
START
PULS
IMPULSE
GENERATOR
GENERATOR
USED BY CASCADE SYSTEM
LOAD SHARER/
LASTVERTEILER
ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANK VERBUNDEN SEIN
FOR INSTALLATION - PLEASE USE MANUAL IN LOAD SHARER KIT
ZUM INSTALLATION - BITTE DEN MANUAL IM LASTVERTEILERKIT VERWENDEN
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XRGI EXT. CONNECT. / VERBINDUNGEN
CONNECTION TO LOAD SHARER /
VERBINDUNGEN DES LASTVERTEILER
PROJECT
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DRAW NO.
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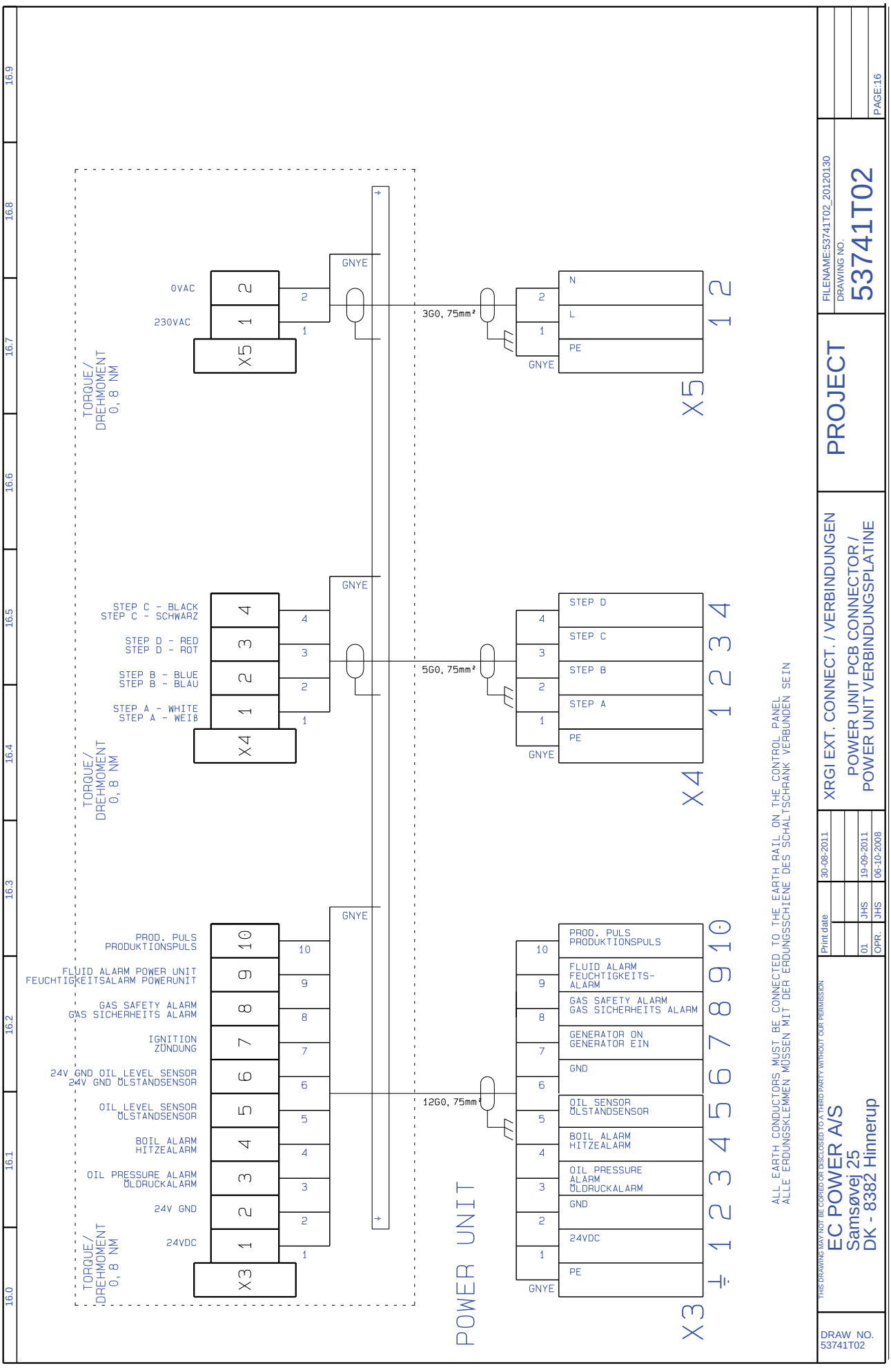
16.9
16.8
16.7
16.6
16.5
16.4
16.3
16.2
16.1
16.0
TORQUE/
DREHMOMENT
0,8 NM
X5
0VAC
230VAC
GNYE
3G0,75mm²
N
L
PE
X4
STEP C - BLACK
STEP C - SCHWARZ
STEP D - RED
STEP D - ROT
STEP B - BLUE
STEP B - BLAU
STEP A - WHITE
STEP A - WEIß
5G0,75mm²
STEP D
STEP C
STEP B
STEP A
X3
PROD. PULS
PRODUKTIONSPULS
FLUID ALARM POWER UNIT
FEUCHTIGKEITSALARM POWERUNIT
GAS SAFETY ALARM
GAS SICHERHEITS ALARM
IGNITION
ZÜNDUNG
24V GND OIL LEVEL SENSOR
24V GND ÖLSTANDSENSOR
OIL LEVEL SENSOR
ÖLSTANDSENSOR
BOIL ALARM
HITZEALARM
OIL PRESSURE ALARM
ÖLDRUCKALARM
24V GND
24VDC
12G0,75mm²
FLUID ALARM
FEUCHTIGKEITS-
ALARM
GENERATOR ON
GENERATOR EIN
GND
OIL SENSOR
ÖLSTANDSENSOR
BOIL ALARM
HITZEALARM
OIL PRESSURE
ALARM
ÖLDRUCKALARM
POWER UNIT
ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANK VERBUNDEN SEIN
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XRGI EXT. CONNECT. / VERBINDUNGEN
POWER UNIT PCB CONNECTOR /
POWER UNIT VERBINDUNGSPLATINE
PROJECT
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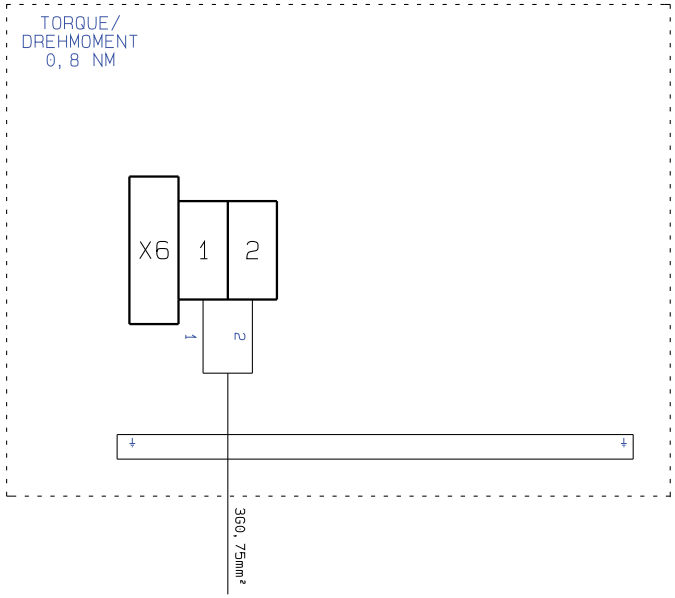
18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9



GENERATOR ACTIVE
GENERATOR EINGESCHALTET

ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANK VERBUNDEN SEIN

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02	JHS	30-01-2012
OPR.	JHS	06-10-2008

XRGI EXT. CONNECT. / VERBINDUNGEN
GENERATOR ACTIVE SIGNAL

PROJECT

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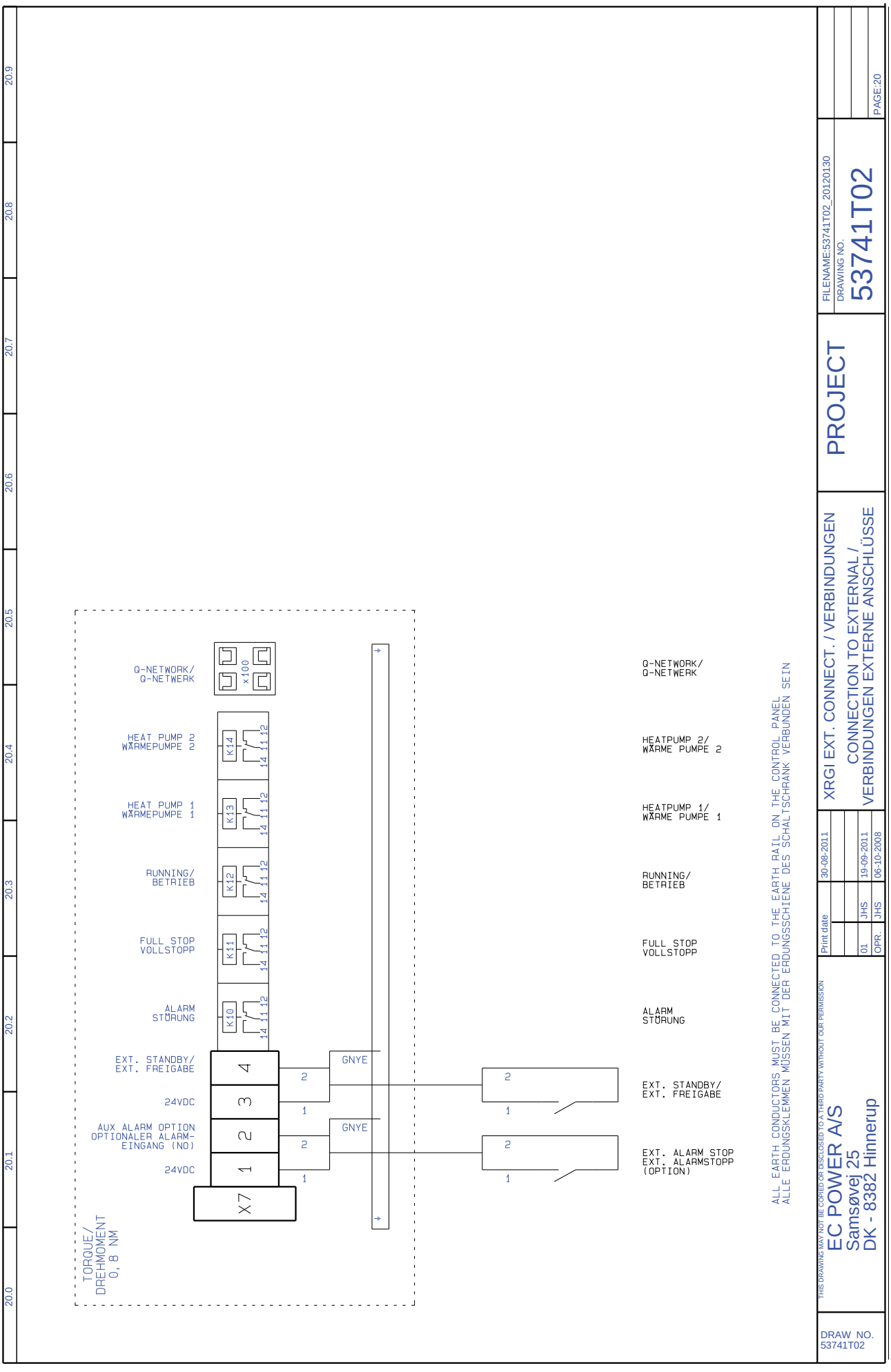
20.0
20.1
20.2
20.3
20.4
20.5
20.6
20.7
20.8
20.9
TORQUE/
DREHMOMENT
0,8 NM
X7
1
2
3
4
24VDC
AUX ALARM OPTION
OPTIONALER ALARM-
EINGANG (NO)
24VDC
EXT. STANDBY/
EXT. FREIGABE
ALARM
STÖRUNG
FULL STOP
VOLLSTOPP
RUNNING/
BETRIEB
HEAT PUMP 1
WÄRMEPUMPE 1
HEAT PUMP 2
WÄRMEPUMPE 2
Q-NETWORK/
Q-NETWERK
x100
K10
K11
K12
K13
K14
14 11 12
GNYE
2
1
EXT. ALARM STOP
EXT. ALARMSTOPP
(OPTION)
EXT. STANDBY/
EXT. FREIGABE
ALARM
STÖRUNG
FULL STOP
VOLLSTOPP
RUNNING/
BETRIEB
HEATPUMP 1/
WÄRME PUMPE 1
HEATPUMP 2/
WÄRME PUMPE 2
Q-NETWORK/
Q-NETWERK
ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANK VERBUNDEN SEIN
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XRGI EXT. CONNECT. / VERBINDUNGEN
CONNECTION TO EXTERNAL /
VERBINDUNGEN EXTERNE ANSCHLÜSSE
PROJECT
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53741T02
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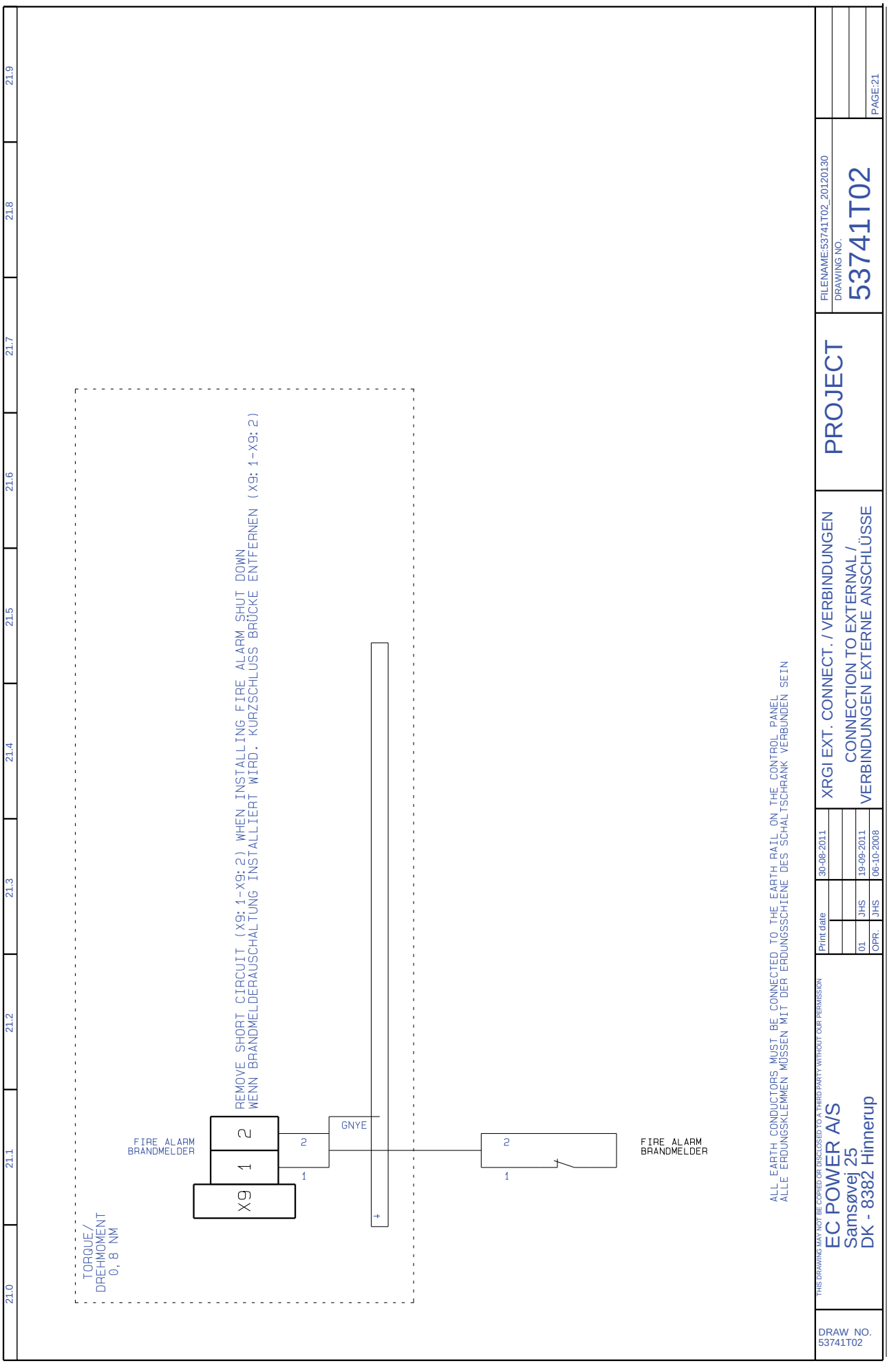
DRAW NO.
53741T02


21.0
21.1
21.2
21.3
21.4
21.5
21.6
21.7
21.8
21.9
TORQUE/
DREHMOMENT
0,8 NM
X9
1
2
FIRE ALARM
BRANDMELDER
REMOVE SHORT CIRCUIT (X9: 1-X9: 2) WHEN INSTALLING FIRE ALARM SHUT DOWN
WENN BRANDMELDERAUSCHALTUNG INSTALLIERT WIRD. KURZSCHLUSS BRÜCKE ENTFERNEN (X9: 1-X9: 2)
GNYE
+
FIRE ALARM
BRANDMELDER
ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANK VERBUNDEN SEIN
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XRGI EXT. CONNECT. / VERBINDUNGEN
CONNECTION TO EXTERNAL /
VERBINDUNGEN EXTERNE ANSCHLÜSSE
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DRAW NO.
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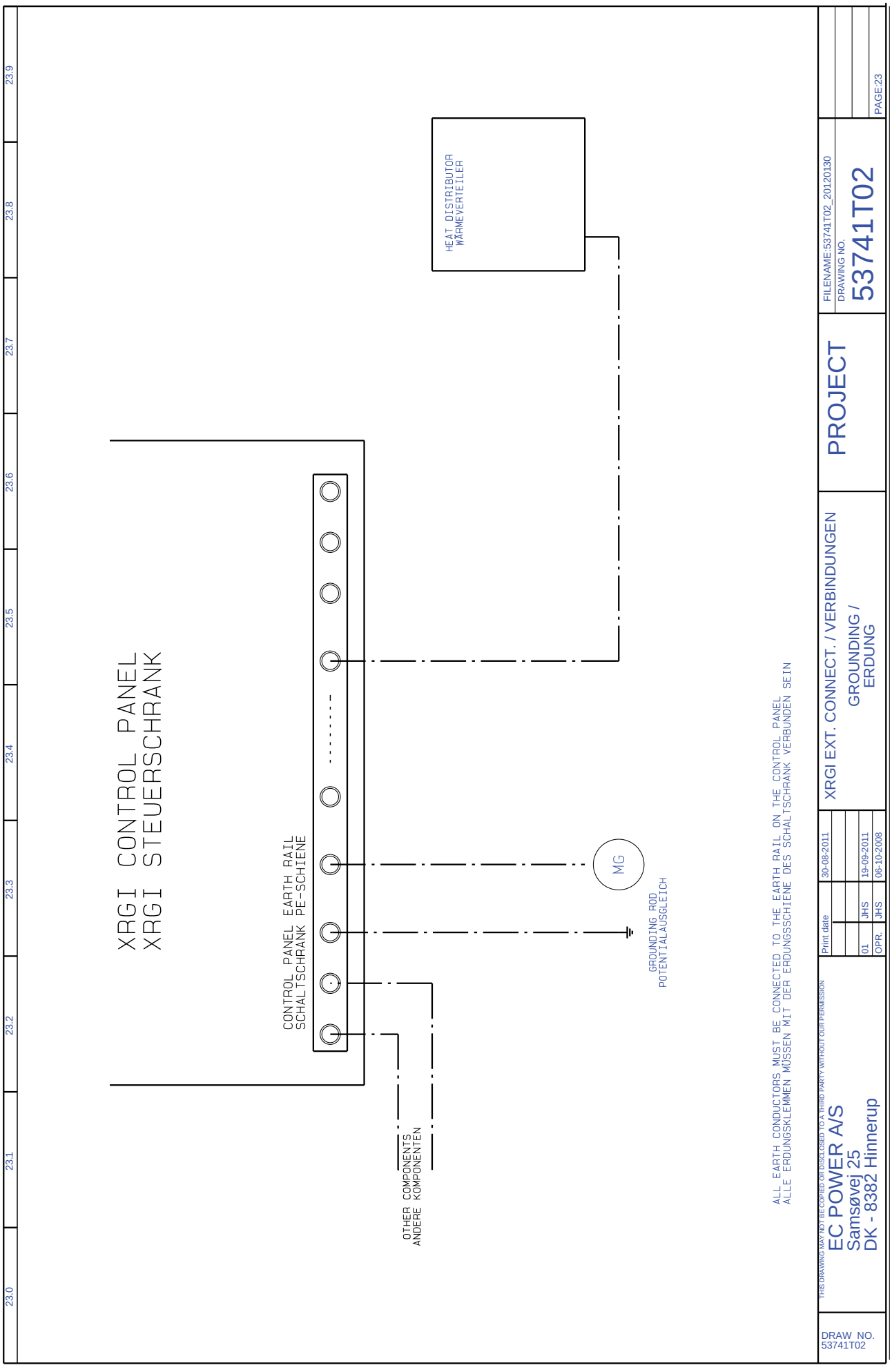
23.0
23.1
23.2
23.3
23.4
23.5
23.6
23.7
23.8
23.9
XRGI CONTROL PANEL
XRGI STEUERSCHRANK
CONTROL PANEL EARTH RAIL
SCHALTSCHRANK PE-SCHIENE
HEAT DISTRIBUTOR
WÄRMEVERTEILER
MG
GROUNDING ROD
POTENTIALAUSGLEICH
OTHER COMPONENTS
ANDERE KOMPONENTEN
ALL EARTH CONDUCTORS MUST BE CONNECTED TO THE EARTH RAIL ON THE CONTROL PANEL
ALLE ERDUNGSKLEMMEN MÜSSEN MIT DER ERDUNGSSCHIENE DES SCHALTSCHRANK VERBUNDEN SEIN
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XRGI EXT. CONNECT. / VERBINDUNGEN
GROUNDING / ERDUNG
PROJECT
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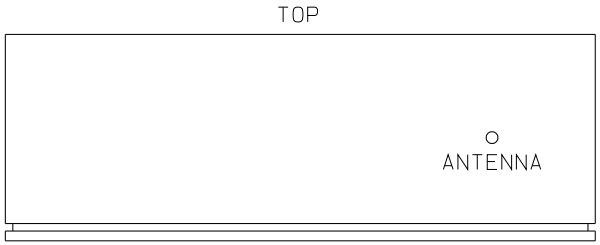
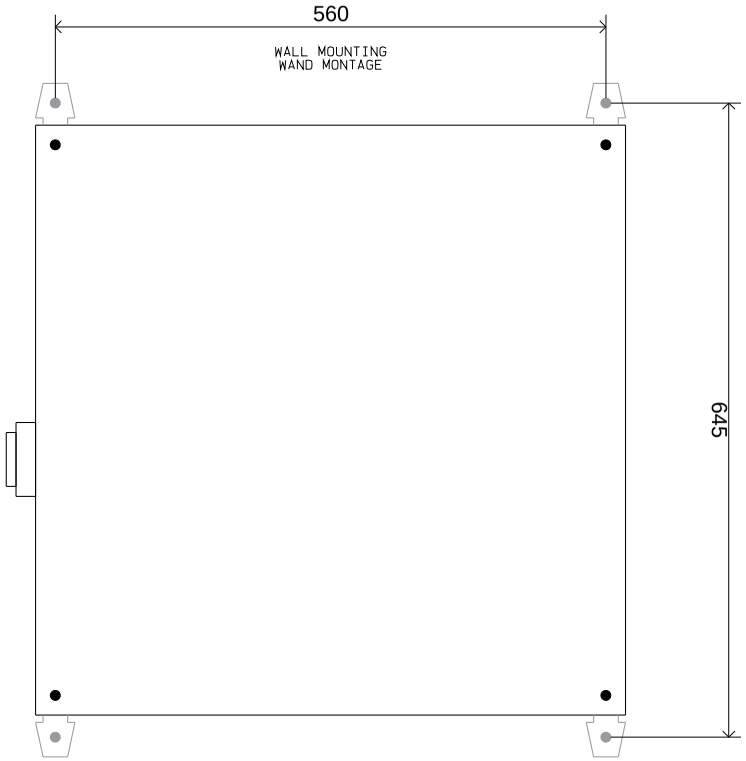
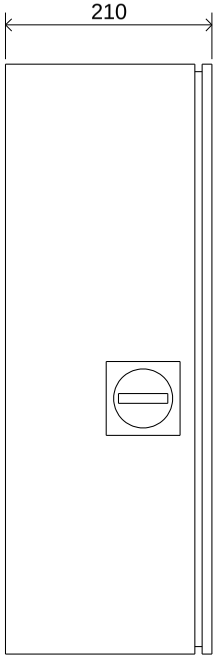
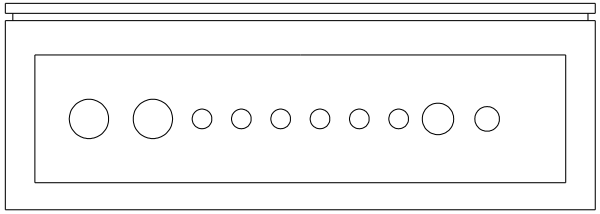
DRAW NO.
53741T02

24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9









WEIGHT / GEWICHT: 39KG

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XRGI EXT. CONNECT. / VERBINDUNGEN
MOUNTING / MONTAGE

PROJECT

FILENAME:53741T02_20120130
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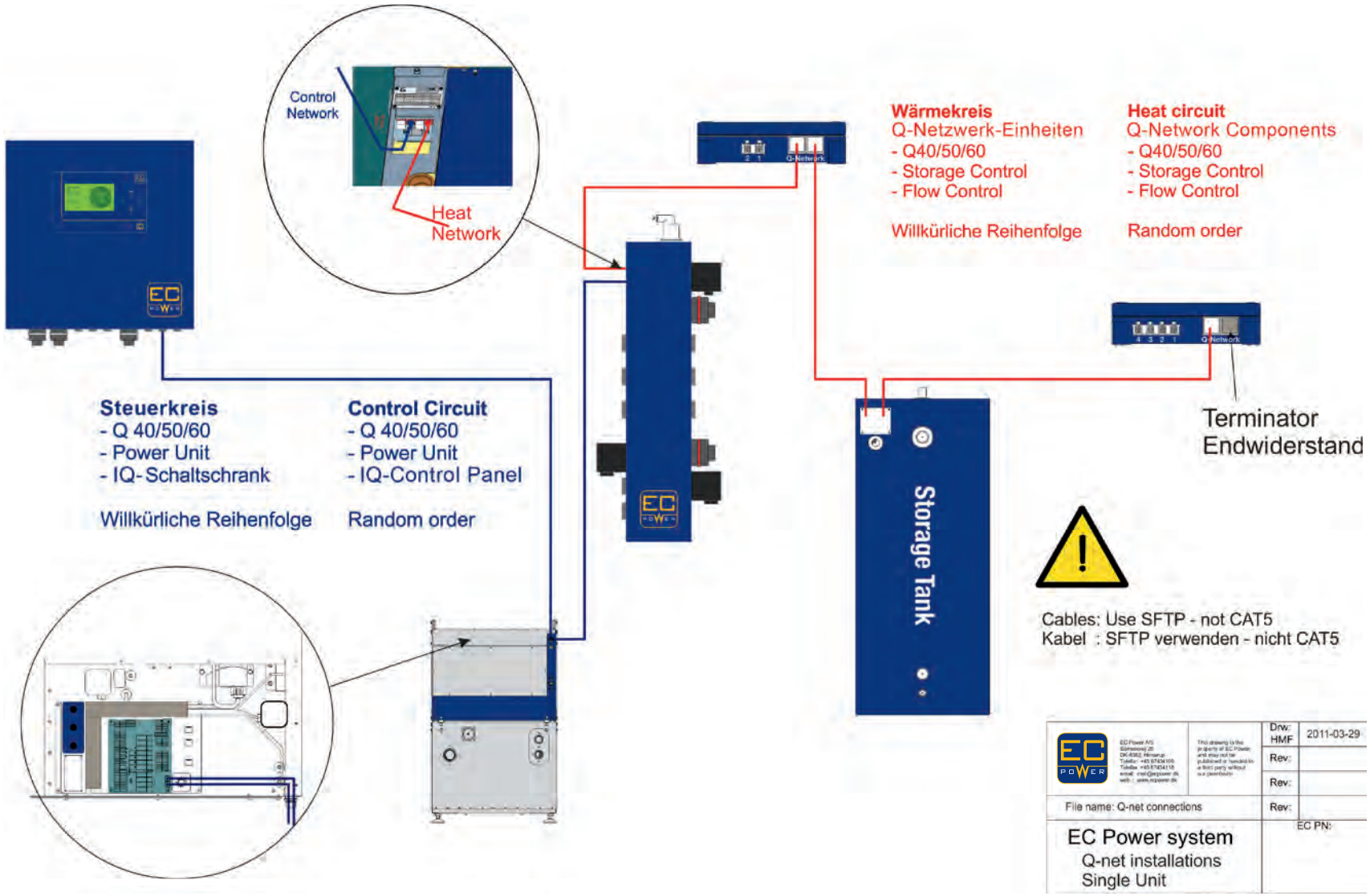

Drw: HMF	2011-03-29		
Rev:			
Rev:			
Rev:			
File name: Q-net connections		EC PN:	

EC Power system
Q-net installations
Single Unit

DRAW NO. 53741T02

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OPR.	JHS	06-10-2008

XRGI EXT. CONNECT. / VERBINDUNGEN
Q-NETWORK CONNECTIONS /
Q-NETWORK VERBINDUNGEN

PROJECT

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53741T02

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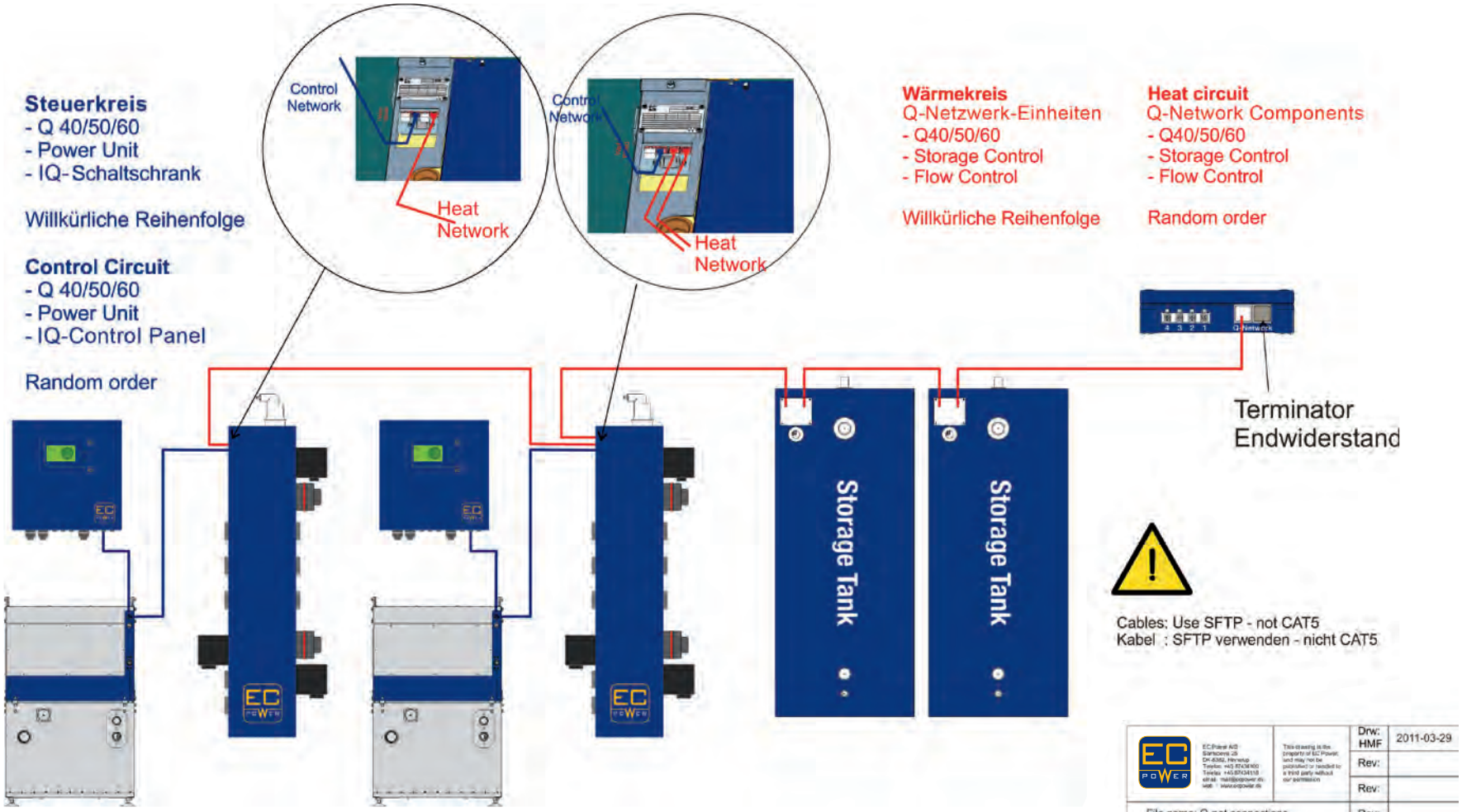

Drw: HMF	2011-03-29	
Rev:		
Rev:		
File name: Q-net connections	Rev:	
EC PN:		

EC Power system
Q-net installations
Multi Unit

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XRGI EXT. CONNECT. / VERBINDUNGEN
Q-NETWORK CONNECTIONS /
Q-NETWORK VERBINDUNGEN

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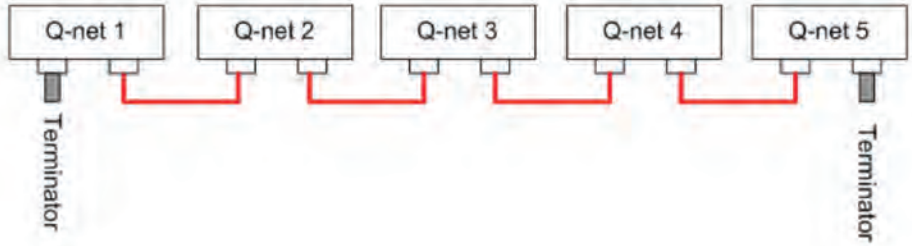

Q-Network components
Connection in random order

ALWAYS termination resistors in first and last unit

Q-Netzwerk-Einheiten
Einbindung in willkürlicher Reihenfolge

IMMER Endwiderstände in erster und letzter Einheit

	Connection type	RS 485
	Cable type	EC POWER Q-Network Cable (due to EMC-emissions)
	Termination	150 Ω
	Connection order	Indifferent
	Communication type	Master Slave
	Verbindungstyp	RS 485
	Kabeltyp	EC POWER Q-Netzwerk-Kabel (wegen to EMC-Störung)
	Endwiderstand	150 Ω
	Verbindungsreihenfolge	Ohne Bedeutung
	Kommunikationstyp	Master Slave

Q-net Cables Q-net Kabeln

Meter	Red / Rot Heat Circuit/Wärmekreis	Blue / Blau Control Circiut / Kontrollkreis
1	01ELU1110	01ELU1116
2	01ELU1111	01ELU1117
5	01ELU1112	01ELU1118
10	01ELU1113	01ELU1119
15	01ELU1114	01ELU1120
20	01ELU1115	01ELU1121

Terminator / Endwiderstand 01ELT2036

EC POWER	Drw: HMF	2011-03-29
	Rev:	
	Rev:	
File name: Q-net connections	Rev:	
EC Power system Q-net Principle	EC PN:	

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OPR.	JHS	30-08-2011

XRGI EXT. CONNECT. / VERBINDUNGEN
Q-NETWORK CONNECTIONS /
Q-NETWORK VERBINDUNGEN

PROJECT

FILENAME:53741T02_20120130
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53741T02

PAGE:27

SKOBERNE
Abgasleitungen

Abgasleitungen aus PPs

Typ B bis 120°C

Montageanleitung

Stand: Januar 2000

Postanschrift, Vertrieb und Technik:

Skoberne GmbH
Ostendstraße 1
64319 Pfungstadt

Telefon: **(0 61 57) 80 70 0**
Telefax: **(0 61 57) 82 67 1**
e-mail: **info@skoberne.de**

technische Änderungen vorbehalten

Vorbereitung

- Fragen zur Abgasführung sollten grundsätzlich mit dem/der zuständigen Bezirksschornsteinfegermeister/in abgestimmt werden.
- Abgaswege sind grundsätzlich so kurz wie möglich aufzubauen.

Achtung: Waagrechte Leitungsabschnitte müssen zum Kessel immer ein Gefälle von min. 3° erhalten, damit der Kondensatabfluß gewährleistet ist. **3° ≡ mind. 5 cm/ 1 m**

- Sitz der Dichtungen muß in allen Muffen kontrolliert werden.
- Es dürfen ausschließlich die mitgelieferten Spezialdichtungen verwendet werden.
- Die Einsteckenden der Bauteile sind vor Montage einzufetten. (Grundsätzlich mitgeliefertes Gleitmittel verwenden)
- Die Muffen der Abgasleitung müssen in Strömungsrichtung zeigen.
- Es dürfen nur die gelieferten Originalteile verwendet werden.
- Zulassungsbescheid dem/der Bezirksschornsteinfegermeister/in zur Verfügung stellen.

Erforderliche Hilfsmittel

- Seil zum Ablassen des Kaminsystems im Schacht (Länge: Kaminhöhe plus ca. 2 Meter)
- Säge und Feile zum Ablängen und Anfasen der Rohrstücke
- Bohrmaschine zum Befestigen der Kaminschachtabdeckung

Mindestquerschnitte des Kaminschachtes

- Quadratischer Querschnitt: Seitenlänge (A)
- Runder Querschnitt: Durchmesser (∅)

Nennweite	∅ (mm)	A (mm)
DN 70	150	130
DN 100	190	170
DN 125	200	180
DN 150	250	225
DN 200	290	270

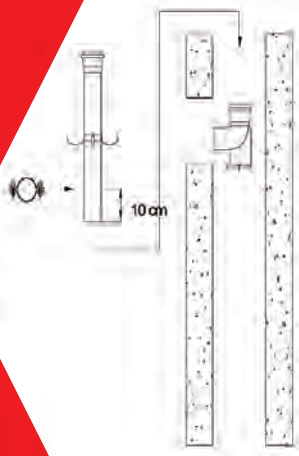
Kaminsystem montieren

Auflageschiene einbauen

- Um die Auflageschiene zu befestigen, ist genau gegenüber der Anschlußöffnung eine Bohrung (Ø 10-12 mm) anzubringen.
- Auflageschiene evtl. kürzen, in die Bohrung einsetzen und vorne fixieren (mit Schraube oder Mörtel).
- Stützbogen durch die Schachtöffnung auf die Auflageschiene aufsetzen und mit dem Stift in einer Bohrung der Auflageschiene fixieren.

Kaminsystem einbauen

- Bei Erfordernis einer Revisionsöffnung ist
  - eine evtl. vorhandene Kamintür zu verwenden oder in gut zugänglicher Höhe anzubringen
  - das Maß L (s. Seite 1) zwischen Stützbogen und Revisionsstück zu ermitteln
  - die Revisionsöffnung der Abgasleitung im unteren Bereich der Reinigungstür anzuordnen, da die Abgasleitung im Betrieb eine Längendehnung erfährt

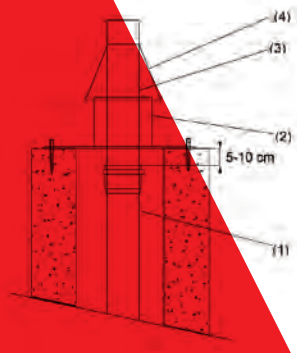


- Am ersten senkrechten Rohr, ca 10 cm von unten, Montageschelle mit Ösenschrauben befestigen und Seil anbringen.
- Bei Abstandhalter PP mit den Zungen nach oben über Einsteckende der Rohre schieben.
- Bei Abstandhalter VA mit den Zungen nach unten am Rohr anbringen. Zungen nach außen biegen und bis auf Schachtquerschnitt zusammenrollen.
- Nach und nach die weiteren Rohre zusammenstecken und mit dem Seil in den Schacht ablassen.
- Abstandhalter in gleichmäßigen Abständen anbringen. Je nach Schachtgröße und Querschnittsform, alle 2-5 m und an jedem Formstück (wie z. B. Reinigungsrohr oder Bogenstück bei Verschleifung) einen Abstandhalter einbauen.
- Zur Montage in sehr großen Schächten sind verstärkte Abstandhalter erhältlich.

Wichtig: Reinigungsrohr in ermittelter Höhe (Maß L) einsetzen

- Letztes Rohr im Schacht so kürzen, daß die Steckmuffe nach dem Ablassen aller Rohre 5 - 10 cm unterhalb der Schachtoberkante endet.
- Rohrsystem in Stützbogen einstecken (vorher Dichtung säubern und Rohrende einfetten).
- Seil entfernen

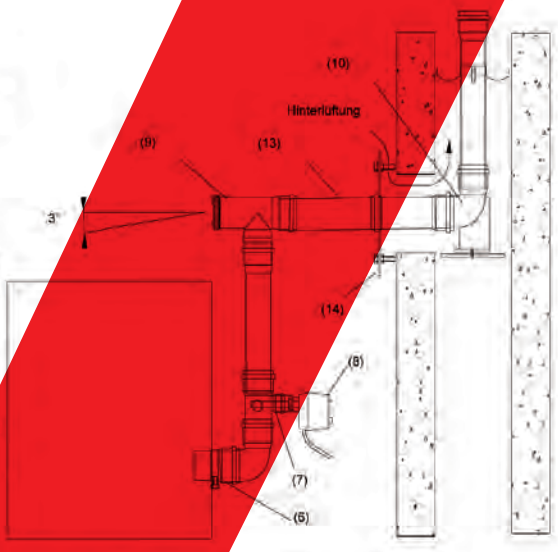
Schachtabdeckung montieren



- Oberstes Rohr im Schacht (1) endet 5 -10 cm unterhalb der Schachtoberkante.
- Das Unterteil (2) der Schachtabdeckung montieren, unter Verwendung einer geeigneten Dichtmasse.
- Letztes Rohr ohne Muffe (evtl. Reststück verwenden) (3) so kürzen, daß es ca. 3-5 cm über den montieren Wetterkragen ragt.
- Wetterkragen (4) aufstecken und Sicherungsseil mit den Schrauben des Unterteils befestigen.
- Zur Ringspaltbesichtigung kann der Wetterkragen vom Unterteil der Schachtabdeckung abgezogen werden.

Verbindungsleitung montieren

- Anschlußstück (6) am Kesselstutzen montieren.
- Meßstück (7) mit STB (8) und Abgasmeßschraube möglichst nah am Kessel einsetzen (STB nur in Einzelfällen erforderlich).
- T-Stück mit Deckel (9) so einsetzen, daß der Stützbogen (10) überprüft werden kann.
- Möglichst wenig Umlenkungen einbauen.
- Eventuell zusätzlich erforderliche Revisionsöffnungen mit dem/der Bezirksschornsteinfegermeister/in festlegen.
- Wenn erforderlich, kann ein Kondensatabscheider und ein Siphon möglichst nah am Kessel in den waagrechten Teil der Abgasleitung eingebaut werden.
- Auf das letzte Rohr (13) vor dem Stützbogen die Belüftungsblende (14) aufstecken und gegen die Schornsteinöffnung schieben.
- Die Distanzstücke dienen zur Hinterlüftung des Schachtes; zusätzliches Belüftungsgitter im Schacht ist nicht erforderlich.
- Gegebenenfalls Abgasleitung mit geeigneten Halterungen abstützen.
- Beiliegendes gelbes Zulassungsschild nahe der Anschlußöffnung am Kamin anbringen.

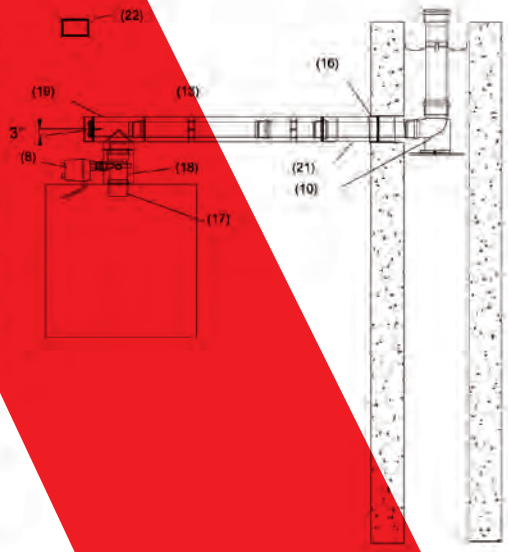


Achtung: Waagrechte Leitungsabschnitte müssen zum Kessel immer ein Gefälle von min. 3° erhalten, damit der Kondensatabfluß gewährleistet ist. **3° ≡ mind. 5 cm/ 1 m**

Verbindungsleitung als LAS-System montieren

(konzentrisches Doppelrohr zum Ansaugen der Verbrennungsluft über den Ringspalt)

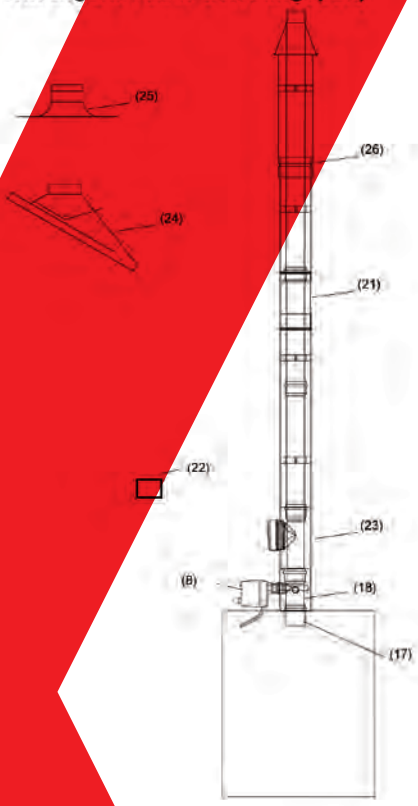
- Wandfutter (16) in Höhe des Stützbogens (10) in den Kamin einmauern.
- Anschlußstück (17) am Kesselstutzen montieren.
- Meßstück (18) mit STB (8), und Abgasmeßschraube möglichst nah am Kessel einsetzen (STB falls erforderlich).
- Meßstück kann auch nur mit Abgas-Zuluftmessung (ohne STB) bestellt werden, wenn ein Abgas-STB im Kessel eingebaut ist.
- T-Stück mit Deckel (19) möglichst so einsetzen, daß der Stützbogen (10) überprüft werden kann.
- Möglichst wenig Umlenkungen einbauen.
- Eventuell zusätzlich erforderliche Revisionsöffnungen mit dem/der Bezirksschornsteinfegermeister/in abstimmen.
- Als Verbindungsstücke zwischen den Außenrohren werden Nippel mit Gummidichtung eingesetzt.
- Zur einfacheren Montage der Innenrohre kann ein Schiebenippel (21) im Außenrohr verwendet werden; er wird als Teleskopstück zur Verbindung der Außenrohre verwendet.
- Bei längeren Verbindungsleitungen sollte das Außenrohr an geeigneten Stellen mit Rohrschellen befestigt werden.
- Zum leichteren Lösen des Schraubdeckels am T-Stück-Innenteil kann ein Revisionsschlüssel (22) verwendet werden.
- Zum Längenausgleich der Innenrohre bei verschiedenen Montagesituationen sind kurze Rohrstücke (150 mm) erforderlich, die bei der Montage angepaßt werden.
- Beiliegendes gelbes Zulassungsschild nahe der Anschlußöffnung am Kamin anbringen.



Dachheizzentrale als LAS-System montieren

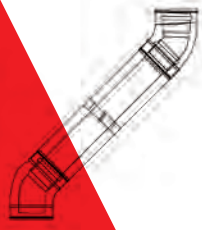
(konzentrisches Doppelrohr zum Ansaugen der Verbrennungsluft über den Ringspalt)

- Anschlußstück (17) am Kesselstutzen montieren.
- Meßstück (18) mit STB (8), und Abgasmeßschraube möglichst nah am Kessel einsetzen (STB falls erforderlich).
- Meßstück kann auch nur mit Abgas-Zuluftmessung (ohne STB) bestellt werden, wenn ein Abgas-STB im Kessel eingebaut ist.
- Revisionsstück (23) einsetzen.
- Schrägdachpfanne (24) bzw. Flachdachkragen (25) an vorgesehener Stelle in die Dachhaut einbauen.
- Dachdurchführung (26) ohne Innenrohr von oben in die Dachöffnung einsetzen.
- Verbindungsleitung vom Kessel bis zur Dachdurchführung montieren.
- Das Innenrohr der Verbindungsleitung so anpassen, daß das Innenrohr der Dachdurchführung unten nach der Montage genau in Höhe des Außenrohrs endet.
- Als Teleskopstück zur Verbindung der Außenrohre wird an dieser Stelle ein Schiebenippel (21) eingebaut, um eine einfache Montage der Innenrohre zu erreichen.



Verschleifung

- Bei bestimmten Situationen im Dachraum oder der Außenwand kann es erforderlich sein eine Verschleifung einzubauen. In Abstimmung mit dem/der Bezirksschornsteinfegermeister/in sollte die Position eines eventuellen Revisionsstücks festgelegt werden.

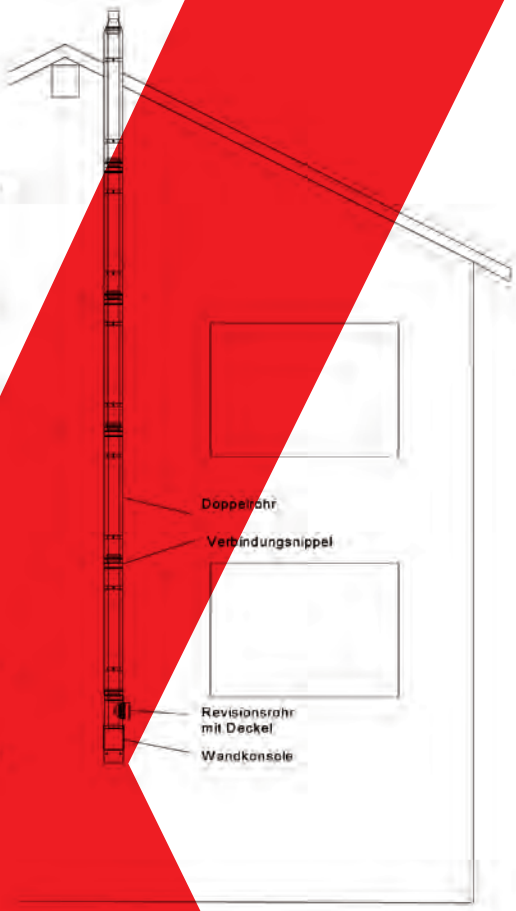


Wetterkragen montieren

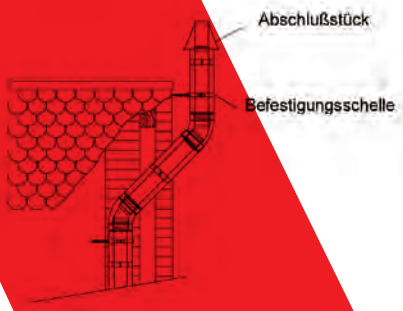
- Wetterkragen auf Dachdurchführung aufstecken und einrasten lassen.
- Der Wetterkragen der Dachdurchführung ist abnehmbar, damit gegebenenfalls der Ringspalt überprüft werden kann.
- Das Abgasrohr muß 3-5 cm über den Wetterkragen hinausragen.

Außenwandsystem montieren

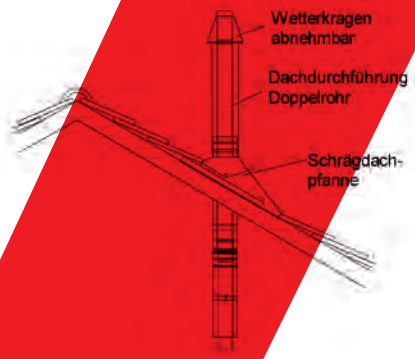
- An der Außenwand wird das System, als UV-Schutz für die Abgasleitung grundsätzlich in einem verzinktem oder pulverbeschichtetem Schutzrohr montiert. Bei rein verzinktem Schutzrohr wird ein bauseitiger Schutzanstrich empfohlen.
- Zur Zeit steht das Außenwandsystem in den Nennweiten DN 70 und DN 100, mit den entsprechenden Schutzrohren DN 125 und DN 160, zur Verfügung.
- Die Verbrennungsluft wird bei raumluftunabhängigem Betrieb über die Lüftungsschlitze der Wandkonsole bzw. des Luftansaugstück angesaugt.
- Hinsichtlich der Mindesthöhen über Dach gelten die landesrechtlichen Vorschriften über Abgasanlagen (in der Regel 40 cm über Dachfläche).
- Die Position des Reinigungsrohres ist mit dem/der zuständigen Bezirksschornsteinfegermeister/in abzustimmen.
- Abstand zwischen Befestigungsschellen max. 1 – 2 m
- Freie Länge nach der letzten Befestigung max. 1 m
- Abstände zu Fenstern und brennbaren Baustoffen sind gemäß Landesfeuerungsverordnung einzuhalten.



- Bei geringem Dachüberstand kann mit Bogenstücken gearbeitet werden.
- Die Position eines eventuellen Revisionsstücks ist mit dem/der Bezirksschornsteinfegermeister/in abzustimmen.



- Bei größeren Dachüberständen kann mit einer Dachdurchführung und Schrägdachpfanne gearbeitet werden (Montage wie bei Dachheizzentrale).



(1) Stützbogen

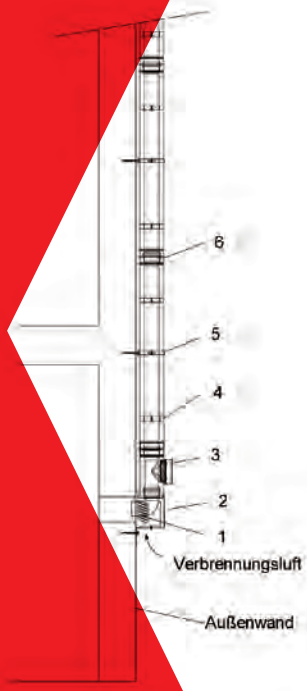
(2) Wandkonsole

(3) Revisionsrohr LAS

(4) Abstandhalter im Doppelrohr

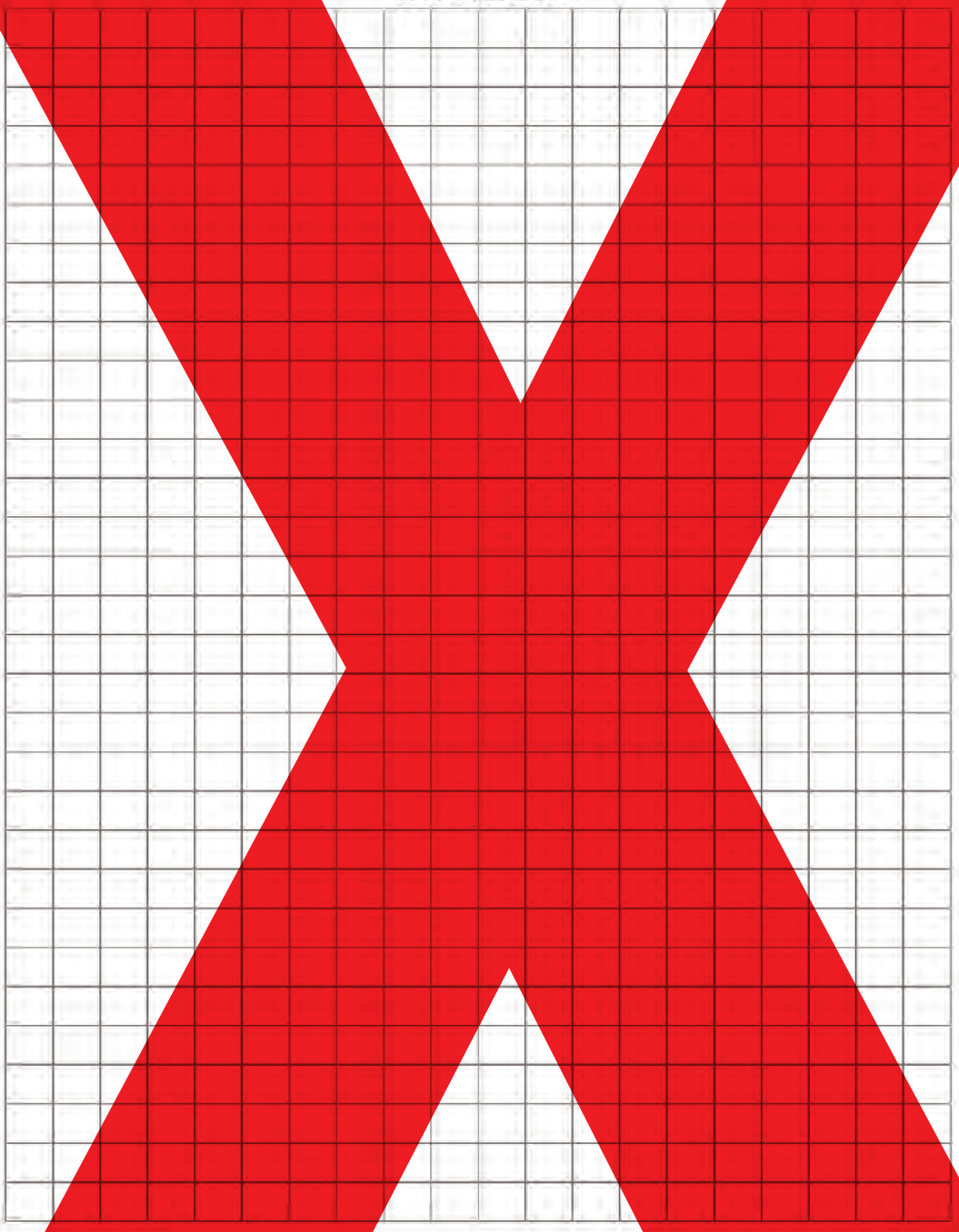
(5) Befestigungsschelle

(6) Verbindungsnippel



- Zur gleichwertigen Funktion der Wandkonsole kann das Luftansaugstück verwendet werden.
- Mit Befestigungsschelle an Wand montieren.
- Austritt aus der Wand erfolgt mit Doppelrohrbogen 90 °.

NOTIZEN



Seite 7

Konformitätserklärung
Declaration of conformity
Overensstemmelseserklæring
Déclaration de conformité

CE

845/11

EC Power A/S
Samsoevej 25,
DK 8382 Hinnerup
Danmark
Tel: +45 87 43 41 00
Fax: +45 87 43 41 01

Erklärt, dass das gasmotorbetriebene Blockheizkraftwerk:
Declare that the gas engine driven combined heat and power equipment:
Erklærer at det gasmotordrevne kraftvarmeværk:
Déclarons que la à gaz alimentée centrale de cogénération:

XRGI 20G

Mit den nachfolgend aufgeführten EG Richtlinien in Übereinstimmung sind:
Is in conformity with the requirements of the directives:
Er i overensstemmelse med følgende EF-direktiver:
Est conforme aux exigences des directives:

Richtlinie / Directive / Direktiv / Directive	
2006/42	ECC Maschinenrichtlinie / Machine directive / Maskindirektivet / Directive Machines
2009/142	ECC Gasgeräte Richtlinie / Gas Appliances Directive / Gasapparatsdirektiv / Directive Appareils à Gaz
2006/95	ECC Niederspannungsrichtlinie / Low voltage directive / Lavspændingsdirektivet / directive basse tension
2004/108	ECC EMV Richtlinie / Electromagnetic Compatibility / Elektromagnetisk kompatibilitet / Compatibilite Electromagnetique

Unter Anwendung der folgenden harmonisierten Normen:
Using the following harmonized standards:
Ved hjælp af følgende harmoniserede standarder:
En utilisant les normes harmonisées suivantes:

ISO 12100-1	Safety of machinery, basic concepts, general principles for design basic terminology, methodology
ISO 12100-2	Safety of machinery, basic concepts, general principles for design basic terminology, methodology
DS/EN 1037	Safety of machinery, prevention of unexpected start
DS/EN 1088	Safety of machinery, guards (fixed, moveable)
DS/EN 60204	Safety of machinery – safety related parts of control systems
DS/EN 60439-1	Low voltage switchgear
DS/EN 61000-3-11	Electromagnetic compatibility, limits
DS/EN 50081-2	Electromagnetic compatibility, generic emission standards
DS/EN 50082-2	EC, generic immunity standards
EN 50156-1:2004	Electrical equipment for furnaces and ancillary equipment Part 1:
DS/EN 12601:2001	Reciprocating internal combustion engine driven generating sets – Safety

Hinnerup, 16. November 2011

Geschäftsführer/CEO/Direktør/ Direkteur

Bjarne Bogner

CE20G-00

DGUV
Deutsche Gesetzliche Unfallversicherung
Spitzenverband
Fachausschuss Elektrotechnik

Fachausschuss „Elektrotechnik" • Postfach 510580 • 50941 Köln

EC Power A/S
Samsovej 25
DK-8328 Hinnerup
DÄNEMARK

Ihr Zeichen:
Ihre Nachricht vom: 22.08.2011
Unser Zeichen (bitte stets angeben): UB.010.17/11-4643-2649 Pl/Wi 11-240 VT01
Ansprechperson: Herr Pohl
Datum: 13.10.2011

Unbedenklichkeitsbescheinigung 11030

(Prüfschein)

Erzeugnis:	Selbsttätig wirkende Schaltstelle (ENS)
Typ:	DPC72DM48B002
Bestimmungsgemäße Verwendung:	Selbsttätig wirkende, dem Verteilnetzbetreiber (VNB) unzugängliche Schaltstelle, als Ersatz für eine jederzeit dem VNB zugängliche Schaltstelle mit Trennfunktion. Die Schaltstelle ist integrierter Bestandteil der Blockheizkraftwerke Typ XRGi 15 und XRGi 20
Prüfgrundlagen: DIN V VDE V 0126-1-1: 2006-02	„Selbsttätige Schaltstelle zwischen einer netzparallelen Eigenerzeugungsanlage und dem öffentlichen Niederspannungsnetz"

Das mit Prüfbericht 28.03.2006, W-E 1071-00/06 und W-E 1071-02/11 vom 22.08.2011 geprüfte Sicherheitskonzept des o. g. Erzeugnisses, entspricht den zum Zeitpunkt der Ausstellung dieser Bescheinigung geltenden sicherheitstechnischen Anforderungen für die aufgeführte bestimmungsgemäße Verwendung.

Abweichend von der Prüfgrundlage Abs. 4.3 darf der obere Abschaltpunkt der Frequenzüberwachung gemäß FNN „Technischer Hinweis - Rahmenbedingungen für eine Übergangsregelung zur frequenzabhängigen Wirkleistungssteuerung von PV-Anlagen am NS-Netz (März 2011)" festgelegt werden.

Die Unbedenklichkeitsbescheinigung gilt befristet bis:

31.12.2016

- Mehlem -
Leiter der Prüf- und Zertifizierungsstelle

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Checkliste vor Inbetriebnahme

Daten der Anlage

Standort

Kunde/Aufstellort		**Installateur**	
Name:		Name:	
Straße:		Straße:	
PLZ/Ort:		PLZ/Ort:	
Telefon:		Telefon:	

Daten

XRGI-ID:	
Power Unit Nummer:	
Zählerstand Gas:	
Zählerstand Strom Einspeisezähler:	
Zählerstand Prod.zähler Schaltschrank:	

Bemerkungen

Datum der Überprüfung	Unterschrift (EC POWER Servicetechniker)

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Aufstellraum

1.	Ist eine ausreichende Verbrennungsluftversorgung vorhanden (z. B. nach TRGI mindestens 160 cm² direkt ins Freie evtl. Loch mit Ø 16 cm o.dgl.) zzgl. der Verbrennungsluft für andere Geräte wie z. B. Kessel	☐
2.	Beträgt die Raumtemperatur dauerhaft unter 35 °C, insbesondere in Nähe des Schaltschranks	☐

Hydraulische Verrohrung

1. Power Unit

1.1	Ist die Power Unit stabil und gerade aufgestellt	☐
1.2	Sind die Kontermuttern der Aufstellfüße angezogen	☐
1.3	Ist die Power Unit flexibel mit dem Q-Wärmeverteiler verbunden	☐
1.4	Vorlauf Power Unit (oben) zu Vorlauf Q-Wärmeverteiler (oben)	☐
1.5	Rücklauf Power Unit (unten) zu Rücklauf Q-Wärmeverteiler (unten)	☐
1.6	Dimension der Leitung zum Q-Wärmeverteiler DN 32	☐
1.7	Keine Absperrungen, Schmutzfänger oder Wärmemengenzähler in der Verbindungsleitung	☐
1.8	Original Sicherheitsventil (1,5 bar Ansprechdruck)	☐
1.8.1	Power Unit	☐
1.8.2	nach außen verlegt und nicht durch Absperrungen blockierbar	☐

2. Q-Wärmeverteiler

2.1	Ist der Q-Wärmeverteiler-Rücklauf mit dem Speicher unten verbunden	☐
2.2	Ist der Q-Wärmeverteiler-Vorlauf mit dem Speicher oben verbunden	☐
2.3	Dimension der Leitung zum Speicher oder der Sammelleitung min. DN 32	☐
2.4	Absperrung vorhanden	☐
2.5	Schmutzfänger vorhanden	☐
2.6	Wärmemengenzähler	☐
2.6.1	Vorhanden	☐
2.6.2	Mindestens Qn 4,5 m³/h, besser 6 m³/h	☐
2.6.3	Ultraschallzähler	☐

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2. Q-Wärmeverteiler (Fortsetzung)

2.7	Ist eine Flow Control-Leitung (Entladeleitung) vorhanden	☐
2.7.1	Absperrung vorhanden	☐
2.7.2	Wärmemengenzähler	☐
2.7.2.1	Vorhanden	☐
2.7.2.2	Mindestens Qn 4,5 m³/h besser 6 m³/h	☐
2.7.2.3	Ultraschallzähler	☐
2.8	Ist die Nachspeiseleitung (Kugelhahn rechts) geschlossen	☐
2.9	Beträgt der Vordruck am Ausdehnungsgefäß zwischen 0,1 und 0,15 bar	☐
2.10	Ist der automatische Entlüfter montiert	☐

3. Pufferspeicher

3.1	Sind mehrere Pufferspeicher vorhanden	☐
3.1.1	In Reihe geschaltet	☐
3.2	Ist der Pufferspeicher mit nur einem oberen und einem unteren Anschluss eingebunden	☐
3.3	Ist der Rücklauf vom Pufferspeicher mit dem Rücklauf vom Heizungsnetz verbunden	☐

Gasseitige Verrohrung

1. Armaturen und Verrohrung

1.1	Ist die Power Unit flexibel mit der Gas-Anschlussleitung verbunden	☐
1.2	Wurde die Power Unit mit dem mitgelieferten, flexiblen Anschlussschlauch an die Versorgungsleitung angeschlossen	☐
1.3	Ist ein Gasfilter installiert	☐
1.4	Ist ein Gas-Absperrhahn installiert	☐
1.5	Ist ein Thermisches Schmelzventil installiert (TAS ggf. im Absperrhahn integriert)	☐
1.6	Ist ein separater Gaszähler für das BHKW installiert	☐

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2. Gasdruck

2.1	Ist ein Gasströmungswächter (GS) vorhanden	☐
2.1.1	Leistungsstufe des Strömungswächters min 10 m³/h	☐
2.2	Wird Erdgas L eingesetzt	☐
2.2.1	Wurde die mitgelieferte Düsennadel (flach, ohne Dorn) eingeschraubt	☐
2.3	Wird Flüssiggas eingesetzt	☐
2.3.1	Ist ein zusätzlicher Vordruckregler installiert	☐
2.4	Gasdruck an der Power Unit zwischen 10 mbar und max. 30-35 mbar	☐
2.5	Ist ein Gaszähler vorhanden	☐
2.5.1	Größe des Gaszählers für die XRGI mindestens G 6	☐

3. Allgemeine Vorschriften **(vom Ersteller der Leitung zu erfragen/bestätigen lassen)**

3.1	Ist die Installation gemäß den geltenden Richtlinien am Installationsort erfolgt (z. B. TRGI, Vorschriften des örtl. Versorgers etc.)	☐

Abgasseitige Verrohrung

1. Zulassung

1.1	Ist die Abgasleitung zugelassen bis 5.000 Pa (Druckklasse H1 oder H2 (nur im Freien))	☐
1.2	Ist die Abgasleitung zugelassen bis 160 °C (Typ C)	☐
1.3	Ist die Abgasleitung zugelassen bis 120 °C (Typ B) Hinweis für den Errichter: Abgasleitungen aus Polypropylen (PP) verspröden aufgrund der Dauerbelastung gelegentlich, trotz Einhaltung der Betriebsbedingungen.	☐

2. Verrohrung

2.1	Steigt die Abgasleitung kontinuierlich bis zur vertikalen Leitung an	☐
2.2	Ist am Abgasaustritt der Power Unit ein Kondensatablauf vorhanden	☐
2.3	Beträgt die Stauhöhe des Siphon vom Kondensatablauf mindestens 30 cm	☐

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Elektrische Einbindung

1.	Vorsicherung: MIN 50A MAX 63A gl	☐
2.	Versorgungsleitung Vorsicherung bis IQ-Schaltschrank nach VDE 0100 (i.d.R. 5 x 16 mm^2)	☐
3.	Generatorkabel Power Unit bis IQ-Schaltschrank nach VDE 0100 (i.d.R. 4 x 10 mm^2)	☐
4.	Sichtprüfung der Kupplung am Generator auf fachgerechte Montage der Kabel	☐
5.	Referenzzähler vorhanden	☐
5.1	Kabel vom Referenzzähler bis Schaltschrank 2 x 0,75 mm^2	☐
6.	Steuerleitungen Schaltschrank zur Power Unit	☐
6.1	Steuerleitung X3: 10 x 0,75 mm^2, geschirmt + Masse (z. B. ÖLFLEX® CLASSIC 110)	☐
6.2	Steuerleitung X4: 4 x 0,75 mm^2, geschirmt + Masse (z. B. ÖLFLEX® CLASSIC 15CY)	☐
6.3	Steuerleitung X5: 2 x 0,75 mm^2, geschirmt + Masse (z. B. ÖLFLEX® CLASSIC 15CY)	☐
7.	Q-Network	☐
7.1	Netzwerkkabel SFTP (geschirmt!)	☐
7.2	Steuerungsseite (Power Unit/Q-Wärmeverteiler/IQ-Schaltschrank) von Wärmeseite (Q-Wärmeverteiler/Storage Control…) getrennt	☐
7.3	Sind die ungenutzten Q-Network-Anschlüsse mit Terminierungen belegt	☐
7.4	Sind die Storage Control-Fühler richtig angeordnet (1 oben, 4 unten)	☐
7.5	Ist eine Flow Control vorhanden	☐
7.5.1	Ist Fühler 1 **hinter** dem Mischpunkt der Einspeiseleitung in das Netz, etwa 5 Rohrdurchmesser vom Einspeisepunkt entfernt	☐
7.5.2	Ist Fühler 2 vor dem Mischpunkt der Einspeiseleitung in das Netz, etwa 5 x Rohrdurchmesser vom Einspeisepunkt entfernt, in jedem Fall oberhalb eines evtl. Kesselvorlaufs	☐
7.5.3	Haben die Fühler einen guten Kontakt mit der Rohrleitung	☐
8.	Schaltschrankeinführung auf Rechtsdrehfeld prüfen	☐
9.	Potentialausgleich von Schaltschrank zu Power Unit und Q-Wärmeverteiler vorhanden	☐
10.	Isolationsmessung nach DIN VDE 0100 Teil 600 (Erstprüfung) i. V. m. BGV A3 Messspannung mind. 500 V, Isolationswiderstand ≥ 1 MΩ	☐
11.	Schleifenimpedanzmessung nach DIN VDE 0100 Teil 610 i. V. m. BGV A3	☐
12.	Prüfen des FI-Schutzschalters F2 mittels Prüftaste und Messung auf Auslösestrom	☐
13.	Durchgängigkeit der Schutzleiter von PE-Schiene bis zu den Verbrauchern messen ≥ 1 Ω	☐
14.	Potentialausgleich von Schiene zu jedem Verbraucher messen ≥ 0,1 Ω	☐
15.	Erstellen eines Messprotokolls nach BGV A3 für o. g. Messungen	☐

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Vorbereitende Maßnahmen für die Inbetriebnahme

1.	Ist das System mit Wasser gefüllt? (Vordruck kalt ca. 0,8 bar)	☐
2.	Ist das bestehende Heizungsnetz durchgespült worden	☐
3.	Ist das System auf Dichtigkeit überprüft (Druckprobenprotokoll)	☐
4.	Kann die XRGI-Anlage bei Inbetriebnahme die produzierte Wärme abführen	☐
5.	Ist die Wasserqualität gem. VDI 2035 auf der Primärseite eingehalten	☐
5.1	ph zwischen 8,2 und 10 – vorzugsweise bei ca. 8,5	☐
5.2	Härte unter 16,8 °dH	☐
5.3	Leitfähigkeit bei 25 °C < 100 µS/cm	☐
6.	Ist die XRGI in der Servicedatenbank bei EC POWER angemeldet worden	☐
7.	Ist die SIM-Karte im Modem eingelegt	☐
8.	Ist die Signalhöhe für die Modemverbindung ausreichend (ggf. mit Mobiltelefon testen)	☐

Notes

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