ATTACHMENT NO. 7

PROCESS CONTROL SYSTEM

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SCADA Description

Project No.:
Made by: M Mc Eniry
Issued: 13th March 2008

Contents

1 Description

This material describes the SCADA-structure of a biogas plant. The scope of supply and interfaces are described in the quotation. This material is not part of an offer and is not a description of the scope of supply, but it only information to support the plant description.

1.1 Installations

1.1.1.1 Instrumentation

Instrumentation is delivered according to the flow charts and this description.

Flow and energy meters are mounted with flow distances in accordance with the directions of the supplier.

All instruments, machinery, etc. located in gas classified areas are delivered with approval and are mounted in accordance with the valid rules for this.

Gas blowers are frequency controlled and delivered as gastight blowers.

Temperature transmitters are mounted in sleeves welded on the tubes in lengths corresponding to the insulation thickness.

Pressure transmitters (liquid systems) are mounted on pressure gauge pipes for pressure relief and constant liquid column.

Pressure gauges are glycerine filled (e.g. disc diameter 100 mm, 0-10 bar, ½" pipe thread). A shut-off valve is mounted in front of all pressure gauges.

Thermometers (disc diameter 100 mm, 0-120°C) are mounted with pockets.

All indicating instruments will be located in positions, which can easily be read from the floor.

All pressure switches and thermostats, etc., which are to be operated, are mounted in a height suitable for operation.

1.1.2 Electrical Switchboards and Installations

1.1.2.1 Panels

A main distribution switchboard with a field for power meter is installed. Switchboards and control panels for gas engine, boiler and auxiliary equipment are installed.
Panels for receiving station, heating modules and biogas part are installed.

The distribution panel is designed according to EN 60 439-1 and 439-3, while panels and switchboard for the machinery is designed according to EN 60 204-1.

Panels located in panel / control room are supplied in IP41, while panels for location in machinery plant are supplied in IP44.

The SCADA system is made with functions for automatic and manual operation of each motor starter.

PLC equipment is mounted in separate panel field and I/O' for instrumentation is connected in terminals.

Frequency converters are normally located outside the panels.

Standard components of Western European quality are used in the panel and for machinery components.

1.1.2.2 Electrical installations
Electrical installations are performed for the machinery plant.

All other installations such as internal supply cable and medium voltage cable between middle voltage switchboard plants are purchased/performed by the Client.

Electricity for machinery and buildings shall be installed in separate cable trays.

Cable trays are supplied in materials suitable for mounting in the specific environment.

All cables from cable trays to electronic components are located either in a pipe or a flexible cable. Alternatively, strips are used.

Cables in the terrain buried directly in the ground.

1.2 SCADA System

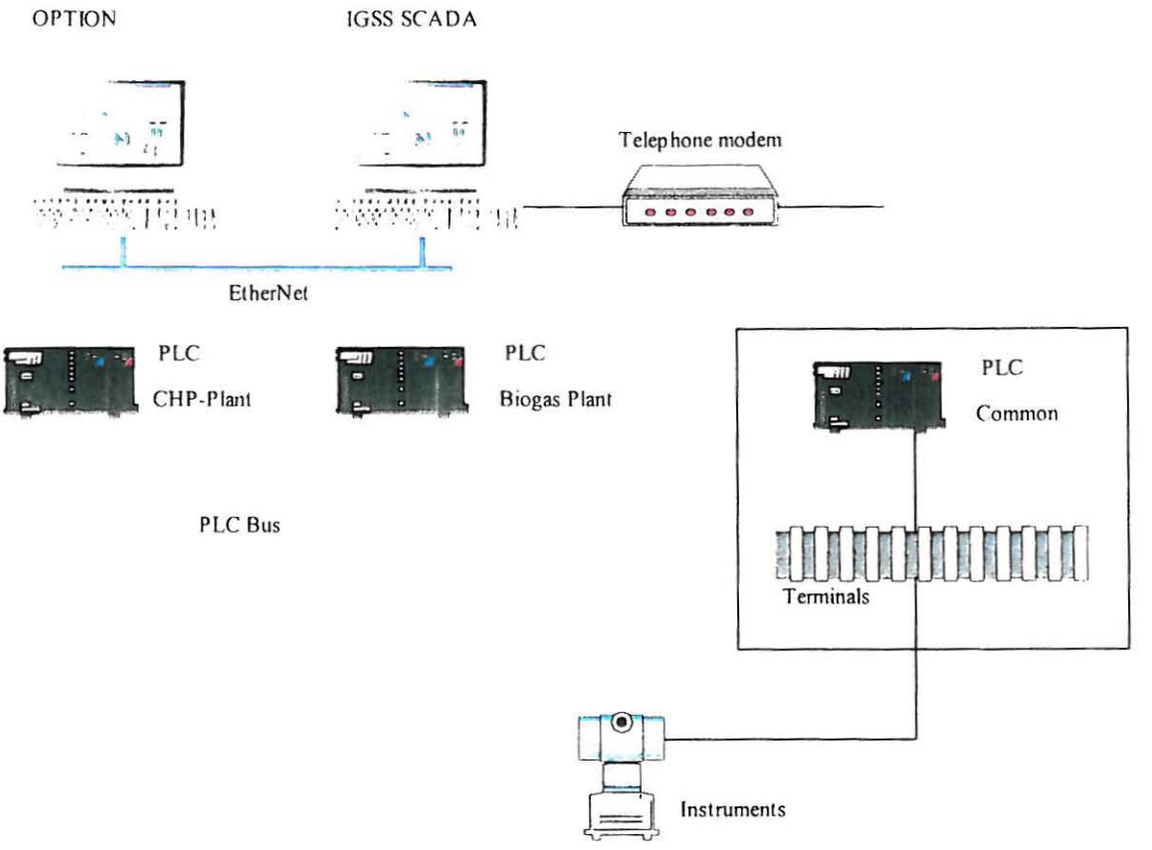
The SCADA system is based on the make IGSS from Seven Technologies A/S.

IGSS is running on a standard PC with Windows XP. IGSS is constantly developed and thus fulfil all requirements regarding openness in relation to data exchange with other PC based systems. The system is designed with one main station and one operator station in the control room. The software is installed on standard PC is according to present standard.

The quotation also includes a standard modular PLC system of make as Siemens S7-300 series. The PLC can be programmed in both off-line and on-line mode, and programming is performed through a program designed in accordance with approved IEC norm. It is possible to program the PLCs locally or through a modem.

As shown on the below diagram of the design of the SCADA system, a service modem is installed. This modem serves two purposes: Service and remote monitoring in connection with ordinary service, remote user instruction, updates, etc. and for remote plant operation by the operating crew on duty.

UPS is installed for supply of PLC and PC with a capacity of 10 minutes of battery operation. The figure below shows an example of the configuration for a biogas plant.



1.2.1 System Software

The operating system is Windows XP. IGSS software is supplied in a runtime version.

1.2.2 User Interface

The user interface is an industry standard user interface with symbols for valves, engines, instrumentation, etc. The system is designed with clear screen pictures which make it possible for the operating crew to get a quick overview of each part of the plant with regard to reading of dynamic values, functionality and operator possibilities. P&I diagrams are used as a starting points for the screen pictures for each section. The system is built up as a function hierarchic system.

The SCADA system is secured against unintentional changes of e.g. set points and against operating errors by means of personal passwords, which give access to defined user and operation levels.

The interface is designed in a logic way with icons and general menus in order to secure a constant overview of the present operation condition of the plant.

The system is designed as an object orientated system with TAG numbers. An object is e.g. a pump, a blower, a pump or a valve.

1.2.3 Curves

The system is designed with a number of fixed curves. However, it is very easy for the operator to set up individual curves with up to 5 analogue values at the time. The values can be selected from a

list or pointed out by means of the mouse on the screen. Zooming is easily made by means of the mouse directly on the curve picture.

1.2.4 Reporting

Reports and curves are made on the basis of a proposal, which is forwarded to the Client for approval. Reports can be printed both automatically and upon request.

1.2.5 Handling of Alarms

Alarms are presented on the screen and on the alarm printer. The system is designed with the necessary safety circuits hard-wired to the safety relays, in order to ensure that a stop of the plant due to disconnection of a safety component requires manual reset of the safety relay on the panel front. Alarms are registered on the system with time stamping for both on and off acknowledgement of alarms. The alarms can be divided into several levels.

1.2.6 Equipment for Main Station and Operator Station

The quotation includes two of the below PC's. The hardware is specified at the time of purchase as the development within PCs constantly moves performance in relation to price. Therefore, the specification below is intended as an indication only. One of the computers will be equipped with a modem to enable remove control by the personnel on duty.

Hardware :	2 GHz Intel Pentium 4 CPU, 512 MB RAM, 80 GB hard disc, CD-RW, 20" screen, key board and mouse, net card
Printer:	Inkjet printer
Software:Windows XP	

1.2.7 IGSS Software

The SCADA software is Windows based and is a complete system for data acquisition, storage and calculation of derived values for data from the substations. The quotation is based on IGSS SCADA software from seven - Technologies for main station and operator stations. Xergi has installed IGSS SCADA software on energy plants since 1992 and thus holds extensive knowledge of this system.

The basis of the software is a reliable data acquisition, safe storage of data and functions relevant for handling of the connected substations.

1.2.8 IGSS Introduction

IGSS is a SCADA system used for monitoring and controlling processes. IGSS is used within a wide range of areas including water supply, heat supply, food industry and railway security. More than 25,000 licenses have been sold since the system was first launched in 1984.

IGSS is a object orientated program. This gives a number of useful advantages for the system designer and the operator. The most important feature of the system is that a process component consisting of a number of I/O points is treated as an individual object in IGSS. This means that the system designer and operator has the same understanding of an object and that the characteristics of the object can be seen and adjusted from one dialogue box. Types and templates are other expressions used in IGSS. Templates are useful for the system designer in the way that he can define

one template tan the base as many objects with identical characteristics on this template as required.

1.2.9 Data Exchange

Openness is one of the cornerstones in the IGSS system. Therefore, IGSS supports many different standards, including DDE, ODBC, OPC, OLE Automation and ActiveX. This makes it possible to extend IGSS data with 3rd party programs. If a large configuration is to be made, it may be required to define the process components in an external data base and then import the data to IGSS.

1.2.10 Scaling

The possibility of scaling is a key function in IGSS. As the system is based on a genuine client/server architecture, it is easy to increase the number of operator stations or the number of objects in the configuration. If the company covers a large area, remote operator station can be connected by means of dial-up lines or directly on LAN.

When choosing IGSS it is necessary to acquire the number of objects and operator stations required at present. The number of objects and operator stations can be increased at any time if required.

1.2.11 Alarm Function

The system includes a conventional alarm list in which all alarms are presented with identification, etc. The alarm list icon is always visible and the alarm list can be called up from all screen pictures when activating the icon. Notification is given on all incoming alarms, no matter where the operator is working in the program; an alarm remains on the screen until they have been signed for. All alarms can be printed.

1.2.12 Login Safety System

The system is secured with a login procedure controlling rights for operation in the system by means of login name and password.

2 Layout of pictures

In the following you se different pictures from a typical Biogas Plant.

2.1 Overall View

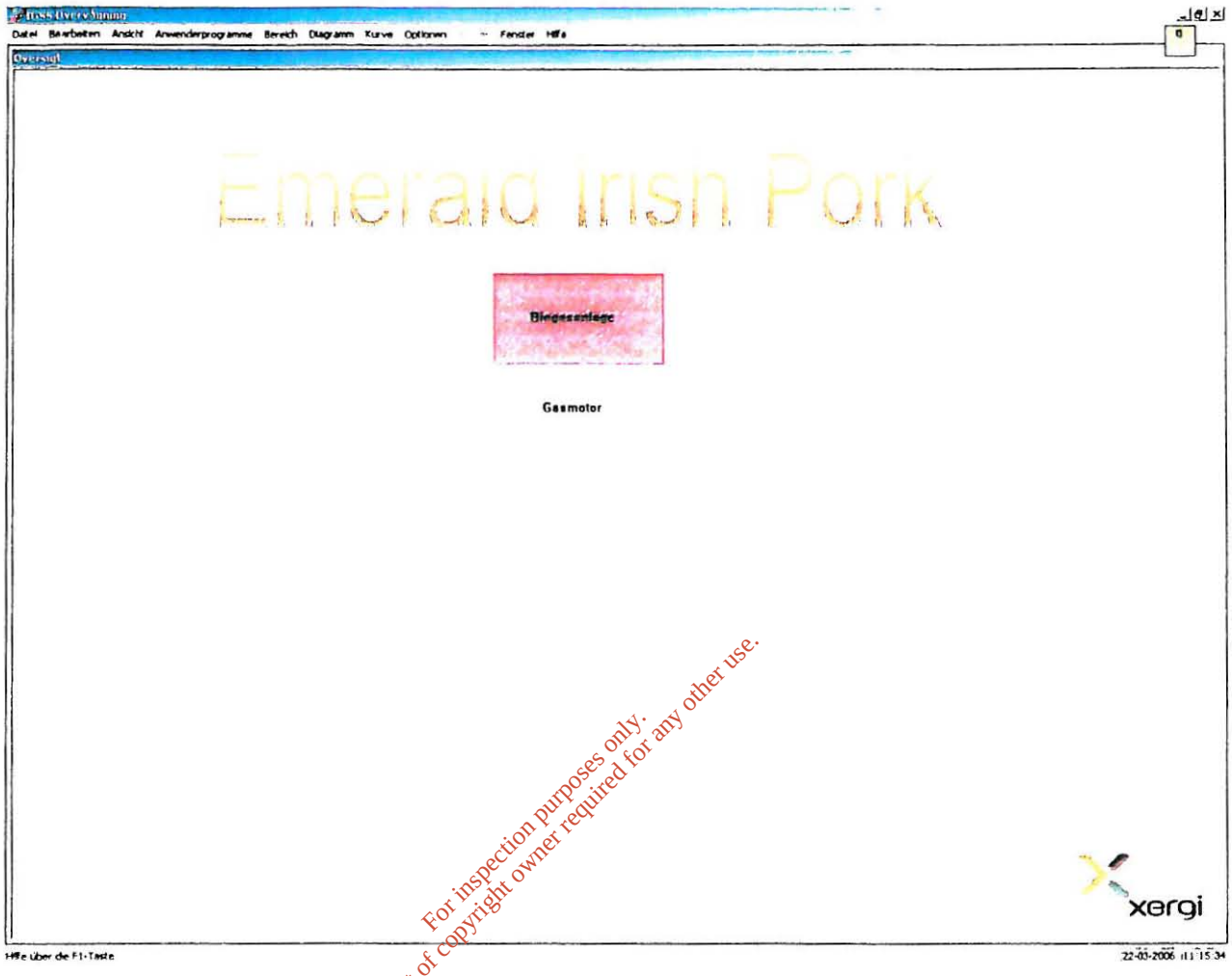


Figure 1 Overall View

2.2 Biogas Plant

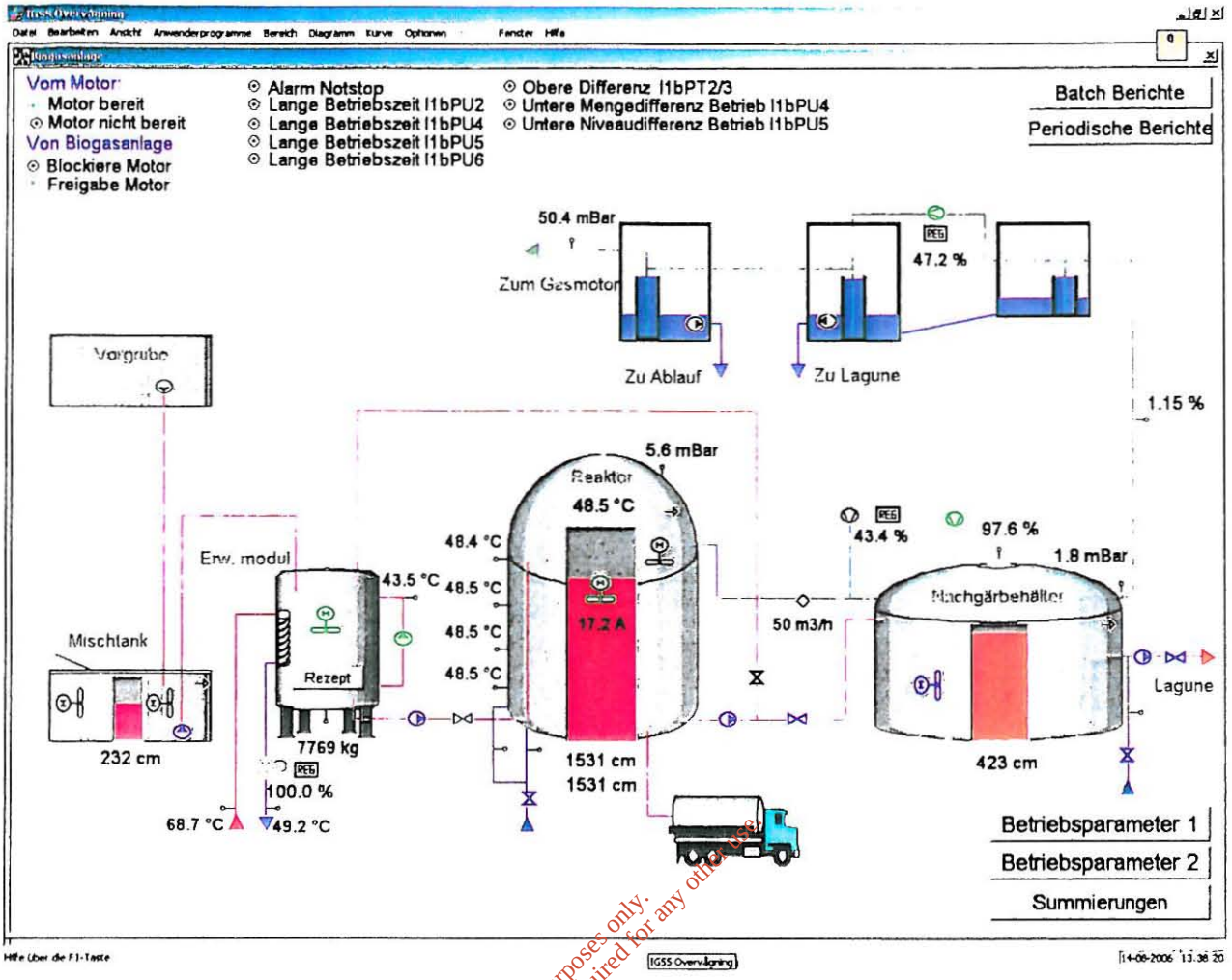
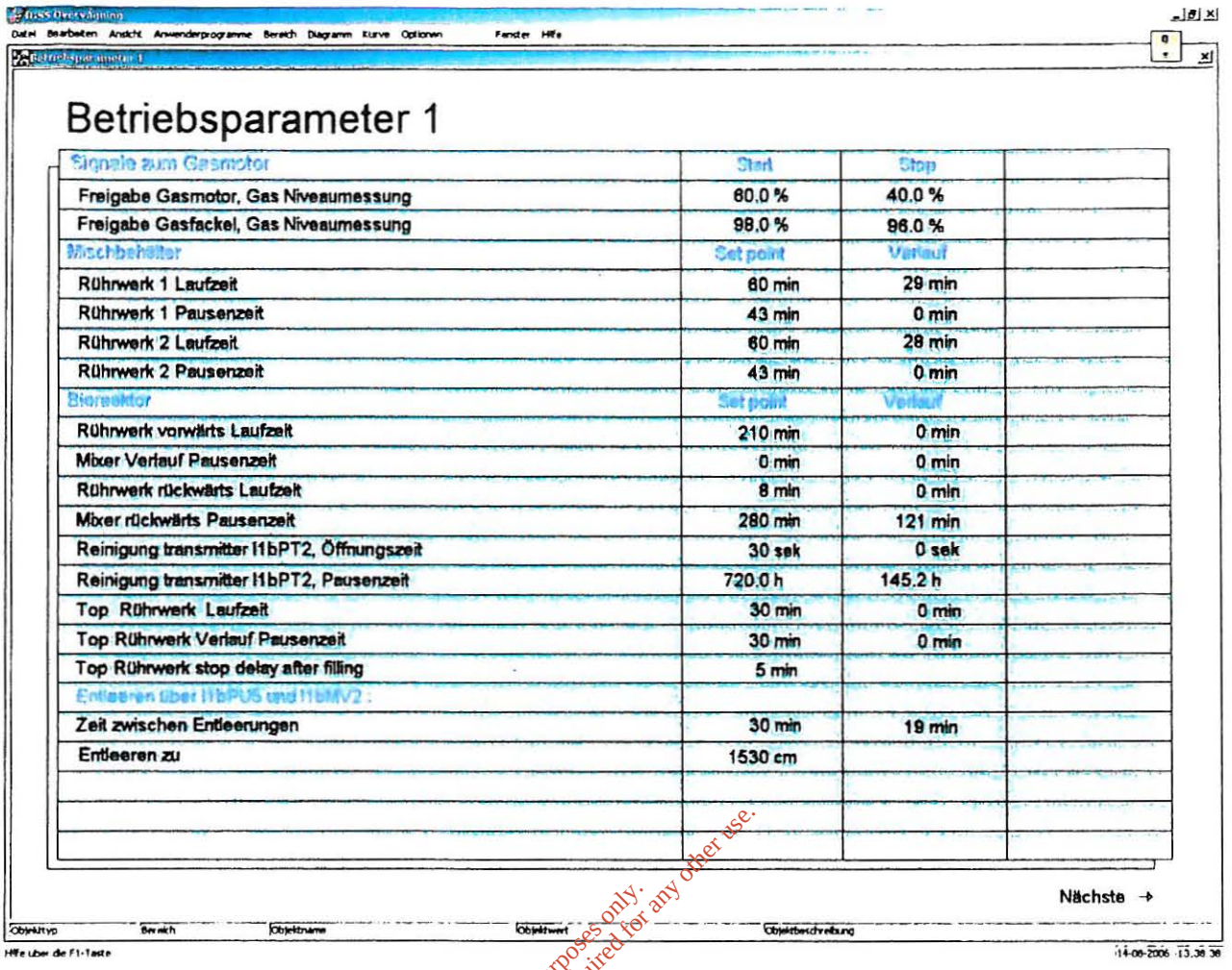


Figure 2 Biogas Plant

2.3 Operation Parameters 1



Betriebsparameter 1

Signale zum Gasmotor	Start	Stop	
Freigabe Gasmotor, Gas Niveaumessung	60.0 %	40.0 %	
Freigabe Gasfackel, Gas Niveaumessung	98.0 %	96.0 %	
Mischbehälter	Set point	Verlauf	
Rührwerk 1 Laufzeit	60 min	29 min	
Rührwerk 1 Pausenzeit	43 min	0 min	
Rührwerk 2 Laufzeit	60 min	28 min	
Rührwerk 2 Pausenzeit	43 min	0 min	
Bioreaktor	Set point	Verlauf	
Rührwerk vorwärts Laufzeit	210 min	0 min	
Mixer Verlauf Pausenzeit	0 min	0 min	
Rührwerk rückwärts Laufzeit	8 min	0 min	
Mixer rückwärts Pausenzeit	280 min	121 min	
Reinigung transmitter I1bPT2, Öffnungszeit	30 sek	0 sek	
Reinigung transmitter I1bPT2, Pausenzeit	720.0 h	145.2 h	
Top Rührwerk Laufzeit	30 min	0 min	
Top Rührwerk Verlauf Pausenzeit	30 min	0 min	
Top Rührwerk stop delay after filling	5 min		
Entleeren über I1bPU5 und I1bMV2 :			
Zeit zwischen Entleerungen	30 min	19 min	
Entleeren zu	1530 cm		

Nächste →

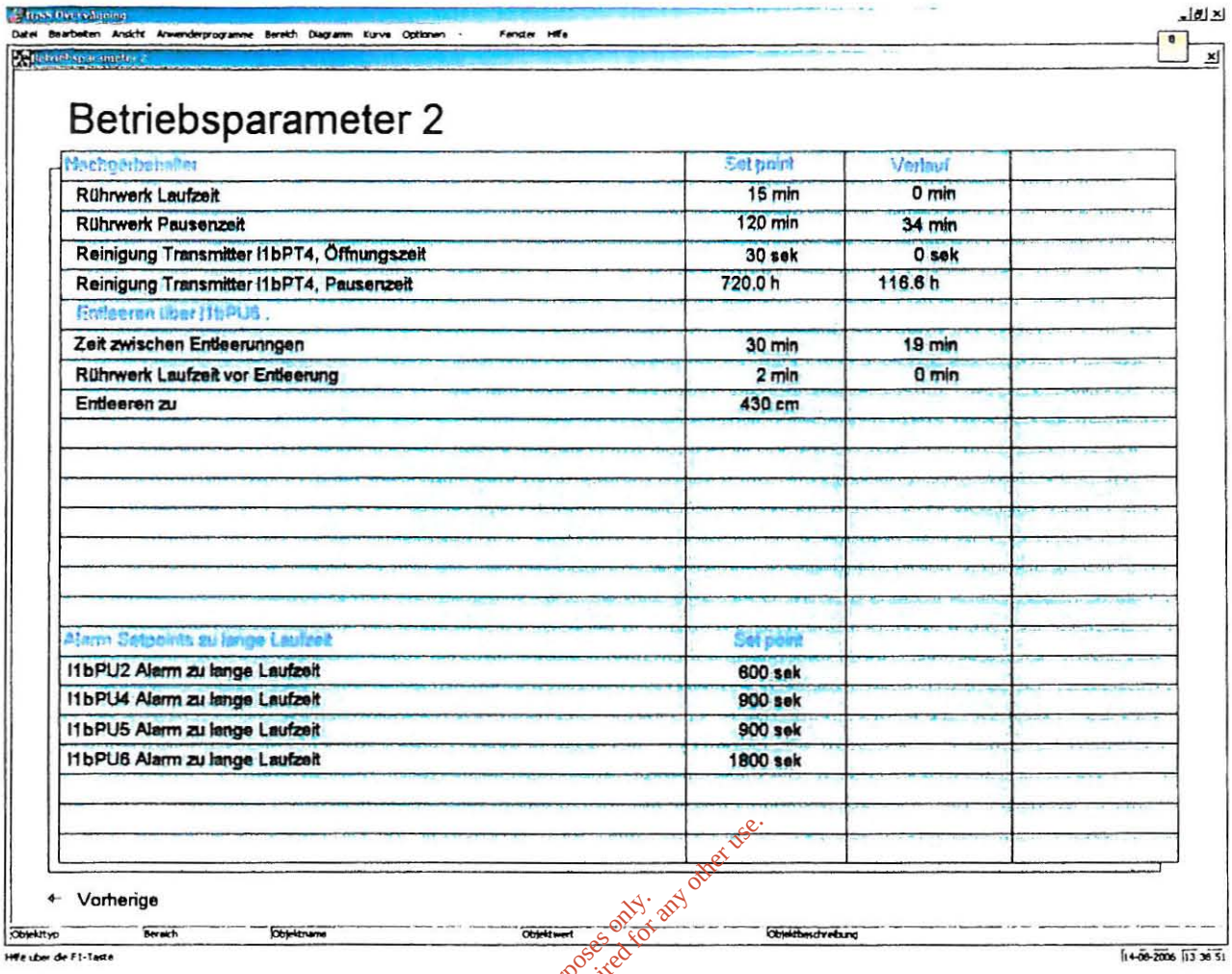
Objekttyp | Bereich | Objektname | Objektwert | Objektbeschreibung

Hilfe über die F1-Taste

14-06-2006 13:38:38

Fig. 3 Operation Parameters 1

2.4 Operation Parameters 2



Betriebsparameter 2

Nachgeschaltet	Set point	Verlauf	
Rührwerk Laufzeit	15 min	0 min	
Rührwerk Pausenzeit	120 min	34 min	
Reinigung Transmitter I1bPT4, Öffnungszeit	30 sek	0 sek	
Reinigung Transmitter I1bPT4, Pausenzeit	720.0 h	116.6 h	
Entleeren über I1bPU6 :			
Zeit zwischen Entleerungen	30 min	19 min	
Rührwerk Laufzeit vor Entleerung	2 min	0 min	
Entleeren zu	430 cm		
Alarm Setpoints zu lange Laufzeit	Set point		
I1bPU2 Alarm zu lange Laufzeit	600 sek		
I1bPU4 Alarm zu lange Laufzeit	900 sek		
I1bPU5 Alarm zu lange Laufzeit	900 sek		
I1bPU6 Alarm zu lange Laufzeit	1800 sek		

Figure 4 Operation Parameters 2

2.5 Summing Up

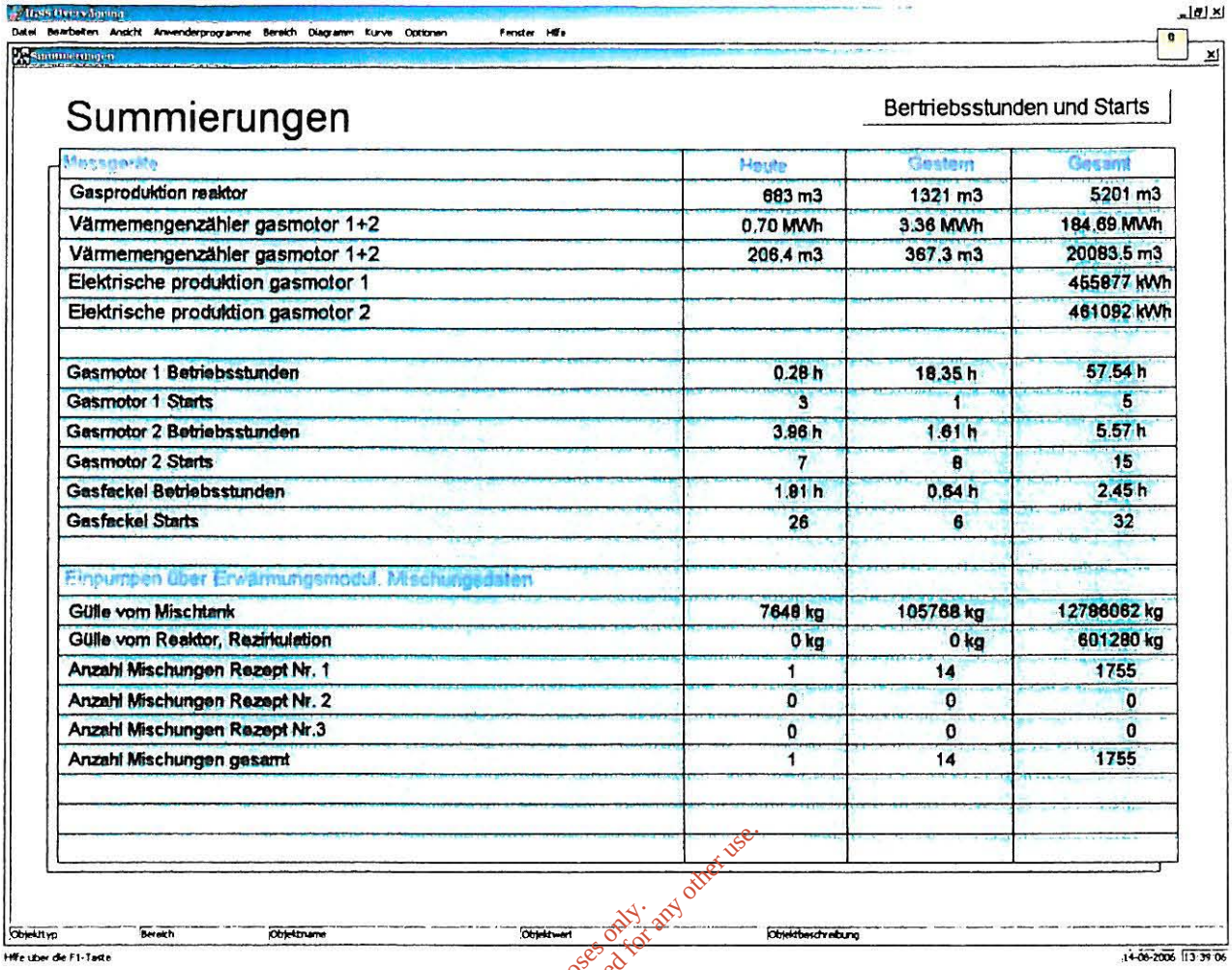
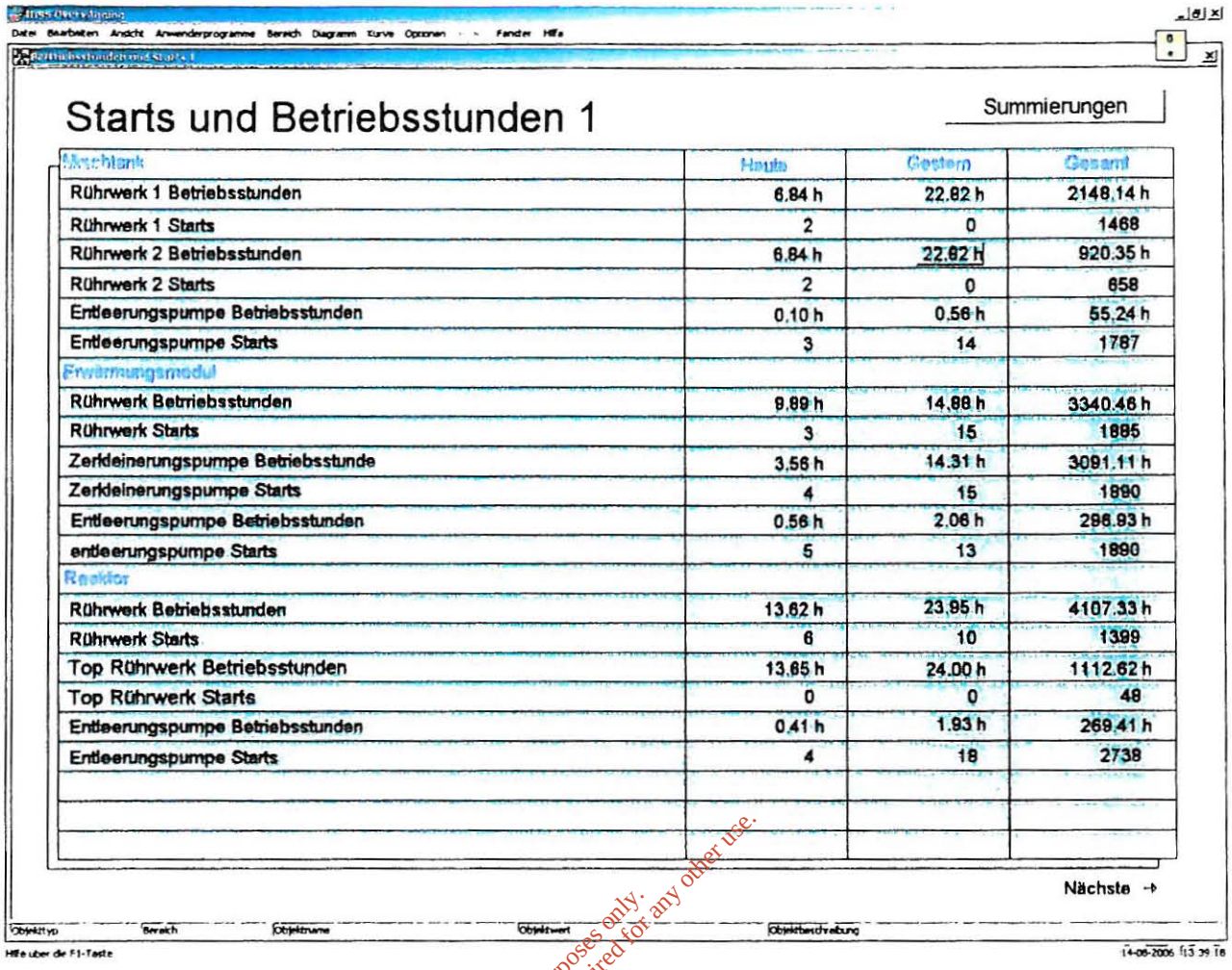


Figure 5 Summing Up

2.6 Operation Hours and Starts 1+2



Maschtank	Heute	Gestern	Gesamt
Rührwerk 1 Betriebsstunden	6.84 h	22.82 h	2148.14 h
Rührwerk 1 Starts	2	0	1468
Rührwerk 2 Betriebsstunden	6.84 h	22.82 h	920.35 h
Rührwerk 2 Starts	2	0	658
Entleerungspumpe Betriebsstunden	0.10 h	0.56 h	55.24 h
Entleerungspumpe Starts	3	14	1787
Erwärmungsmodul			
Rührwerk Betriebsstunden	9.89 h	14.88 h	3340.46 h
Rührwerk Starts	3	15	1885
Zerkleinerungspumpe Betriebsstunde	3.56 h	14.31 h	3091.11 h
Zerkleinerungspumpe Starts	4	15	1890
Entleerungspumpe Betriebsstunden	0.56 h	2.06 h	296.93 h
entleerungspumpe Starts	5	13	1890
Reaktor			
Rührwerk Betriebsstunden	13.62 h	23.95 h	4107.33 h
Rührwerk Starts	6	10	1399
Top Rührwerk Betriebsstunden	13.65 h	24.00 h	1112.62 h
Top Rührwerk Starts	0	0	48
Entleerungspumpe Betriebsstunden	0.41 h	1.93 h	269.41 h
Entleerungspumpe Starts	4	18	2738

Figure 6.1 Operation Hours and Starts 1

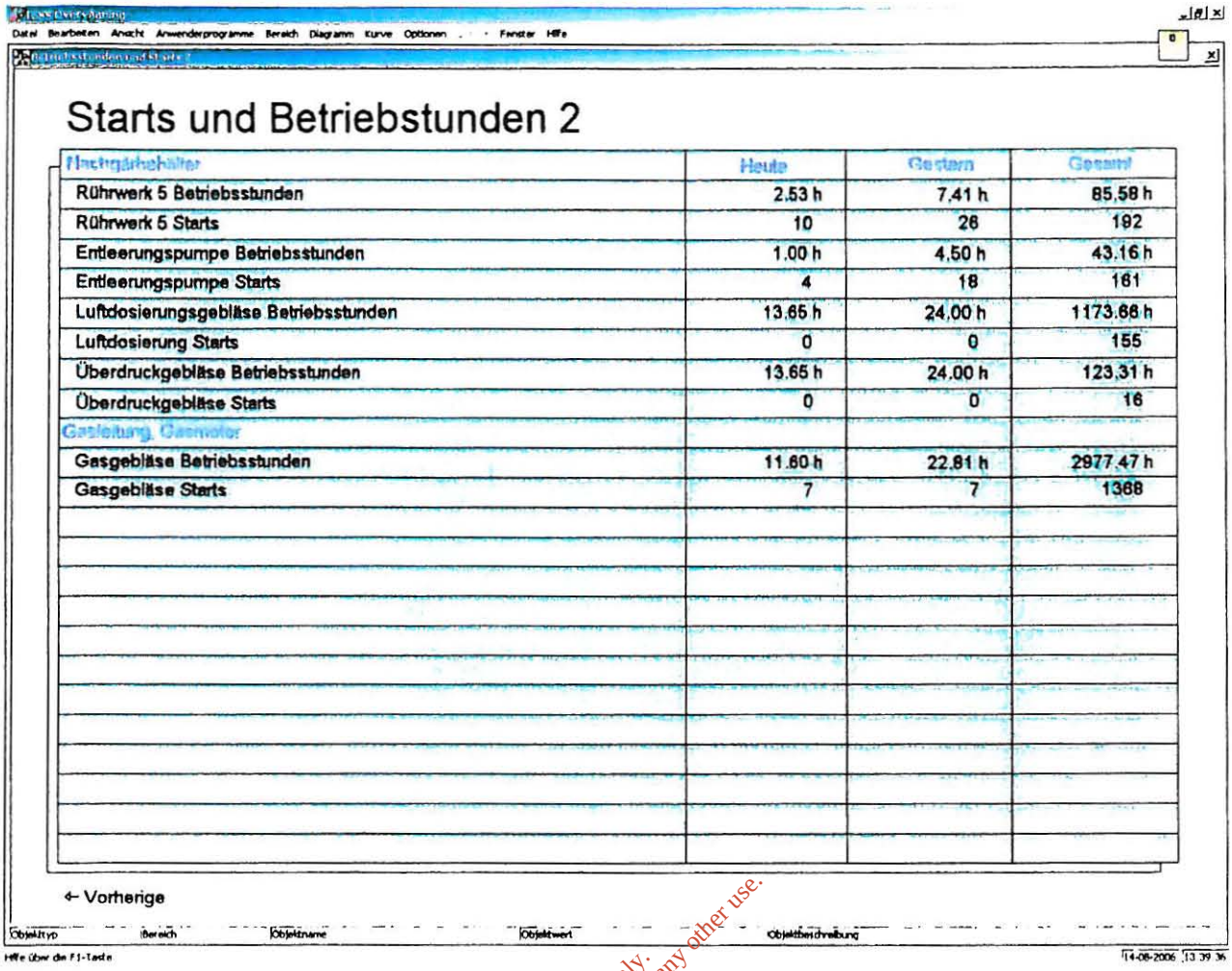


Figure 6.2 Operation Hours and Starts 2

2.7 Heating Module

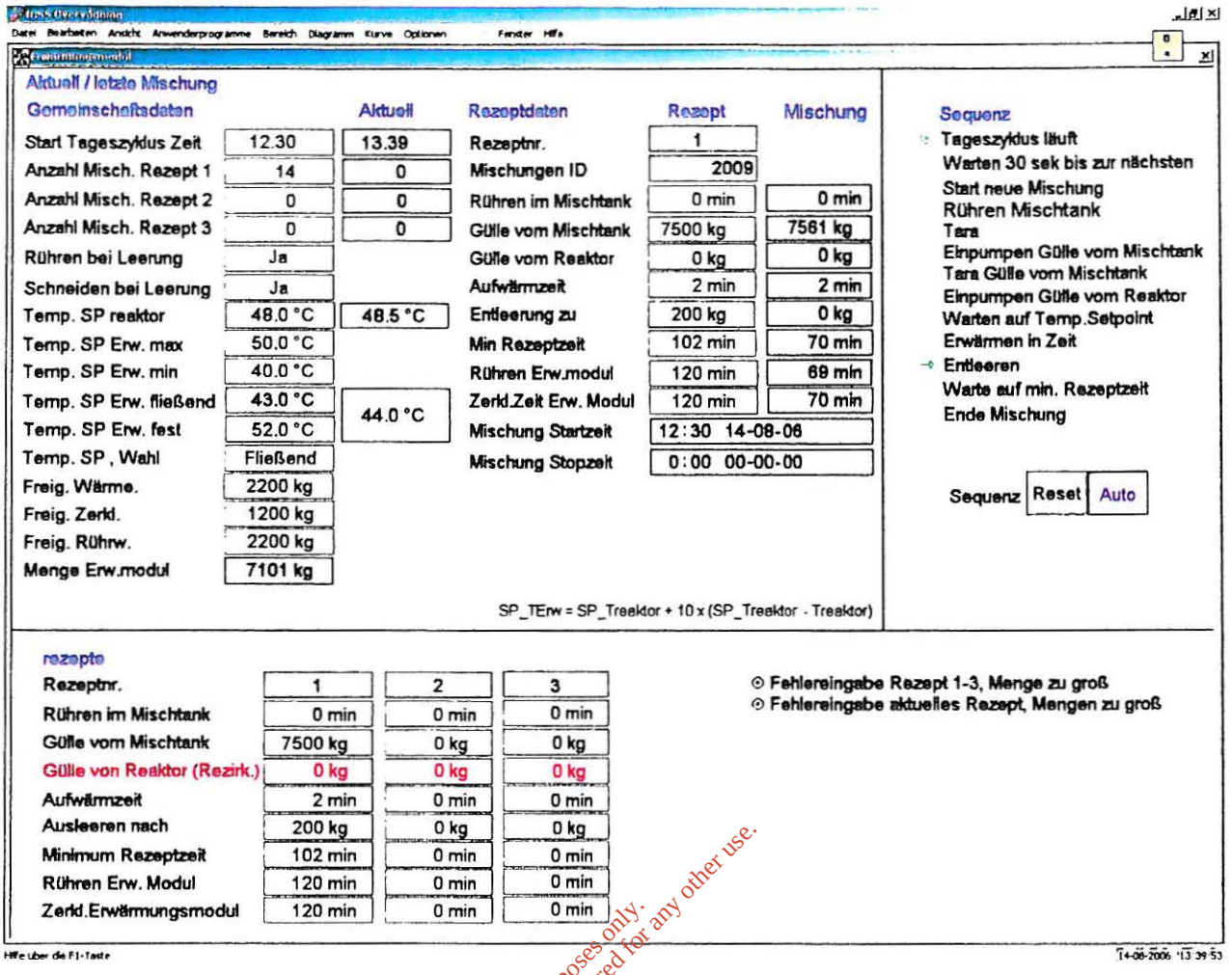


Figure 7 Heating Module

2.8 Gas Blower Controller

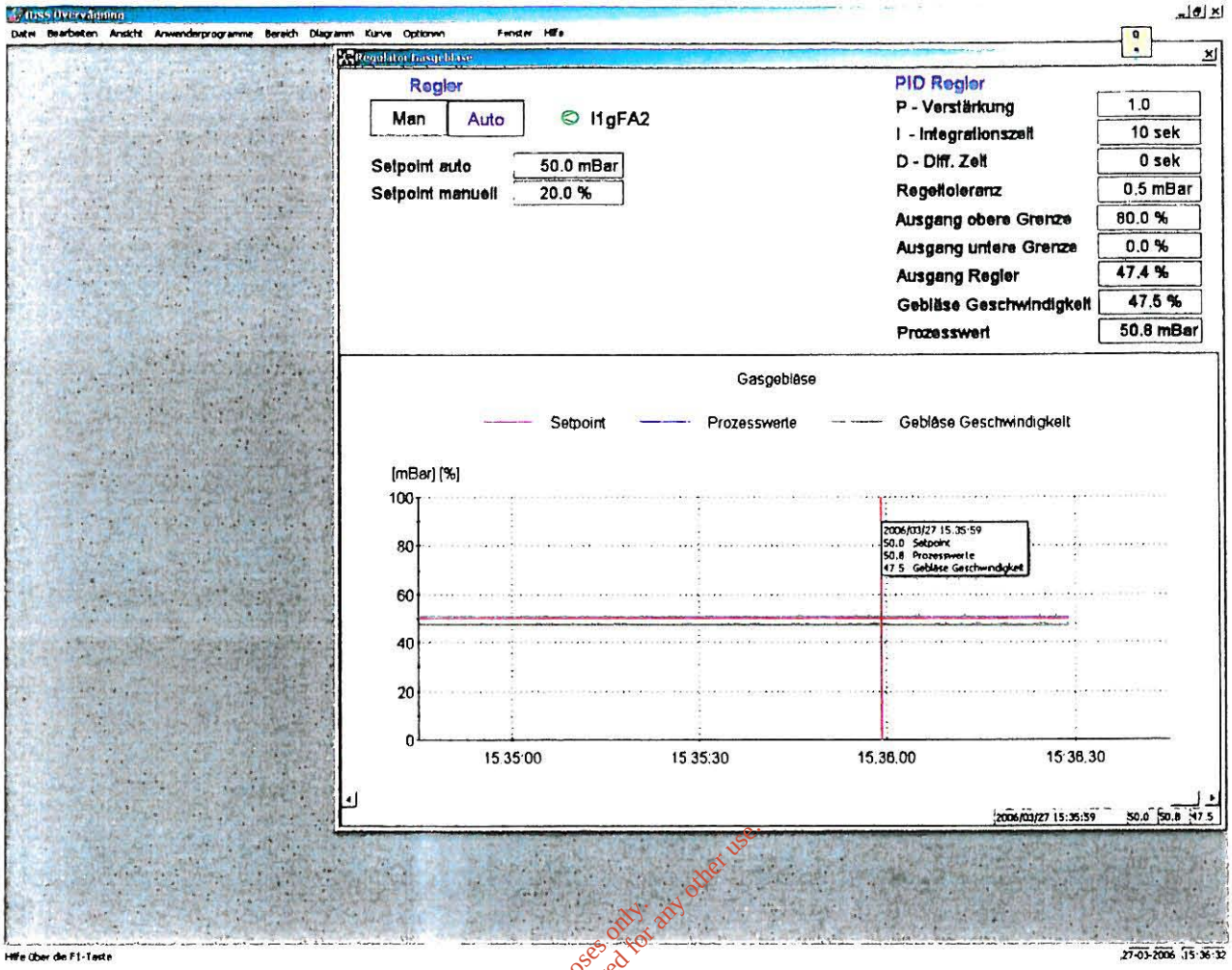


Figure 8 Gas Blower Controller

2.9 Controller for Oxygen Dosing Blower

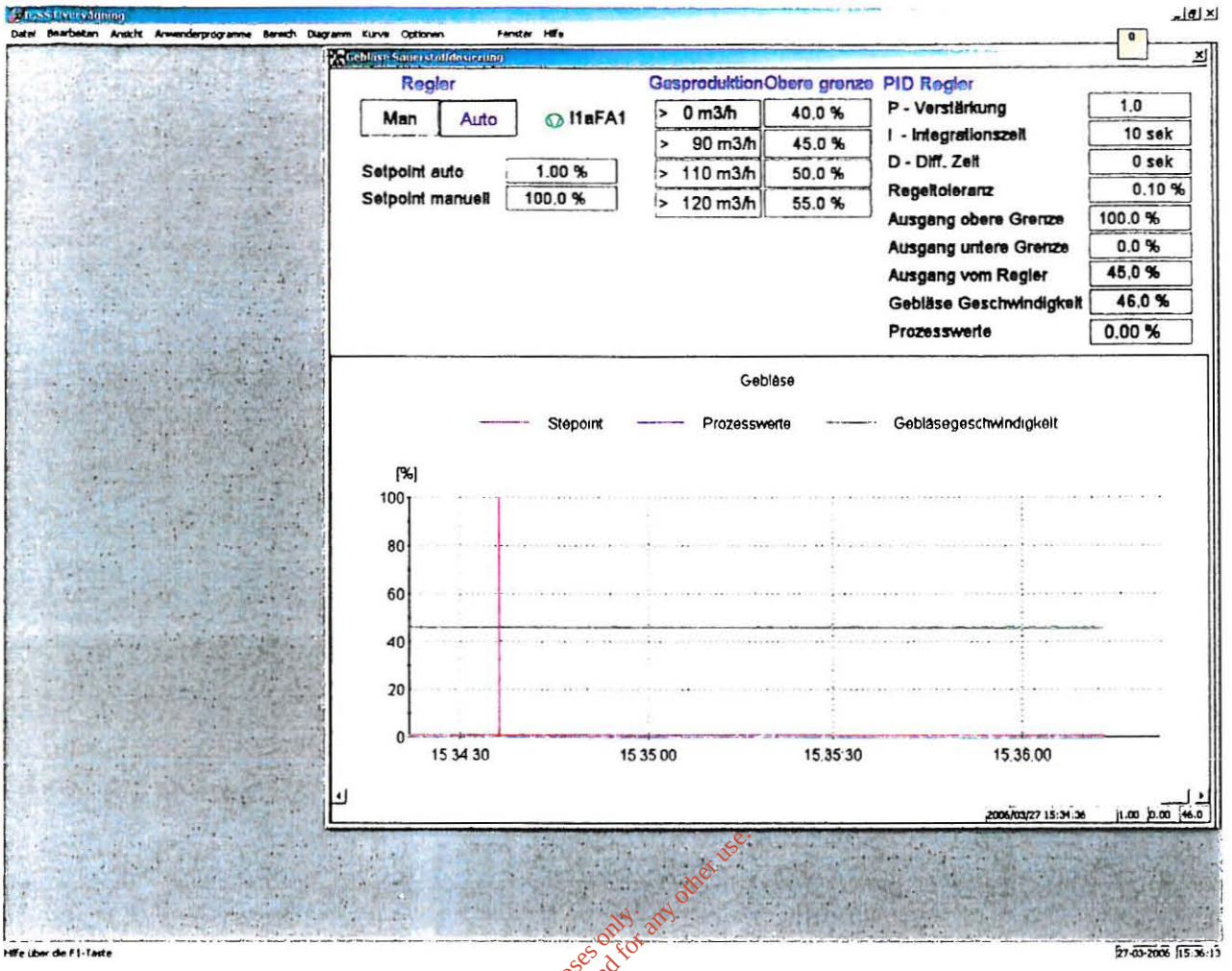


Figure 9 Controller for Oxygen Dosing Blower

2.10 Controller for Heating Valve on Heating Module

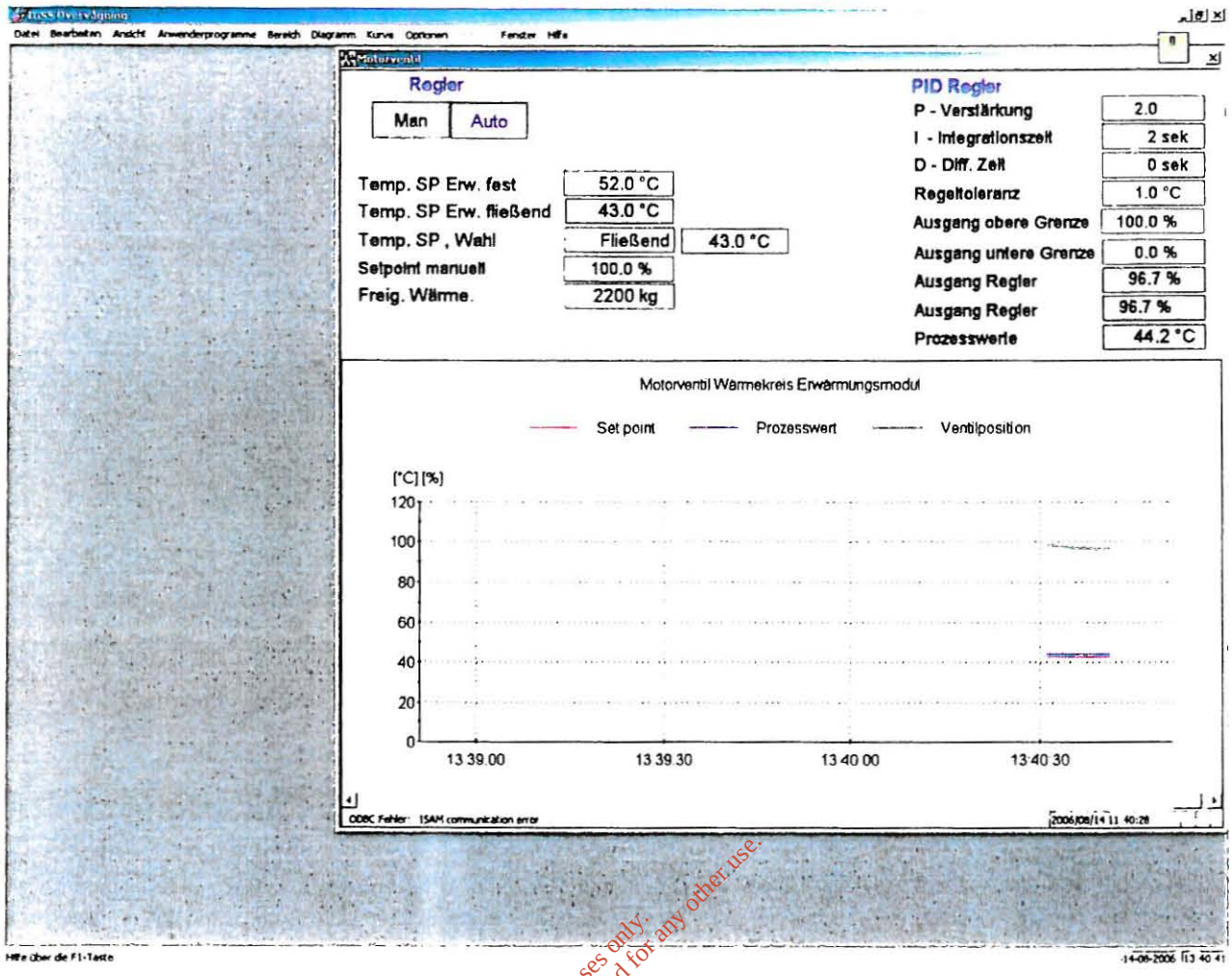


Figure 10 Controller for Heating Valve

2.11 Gas Engine

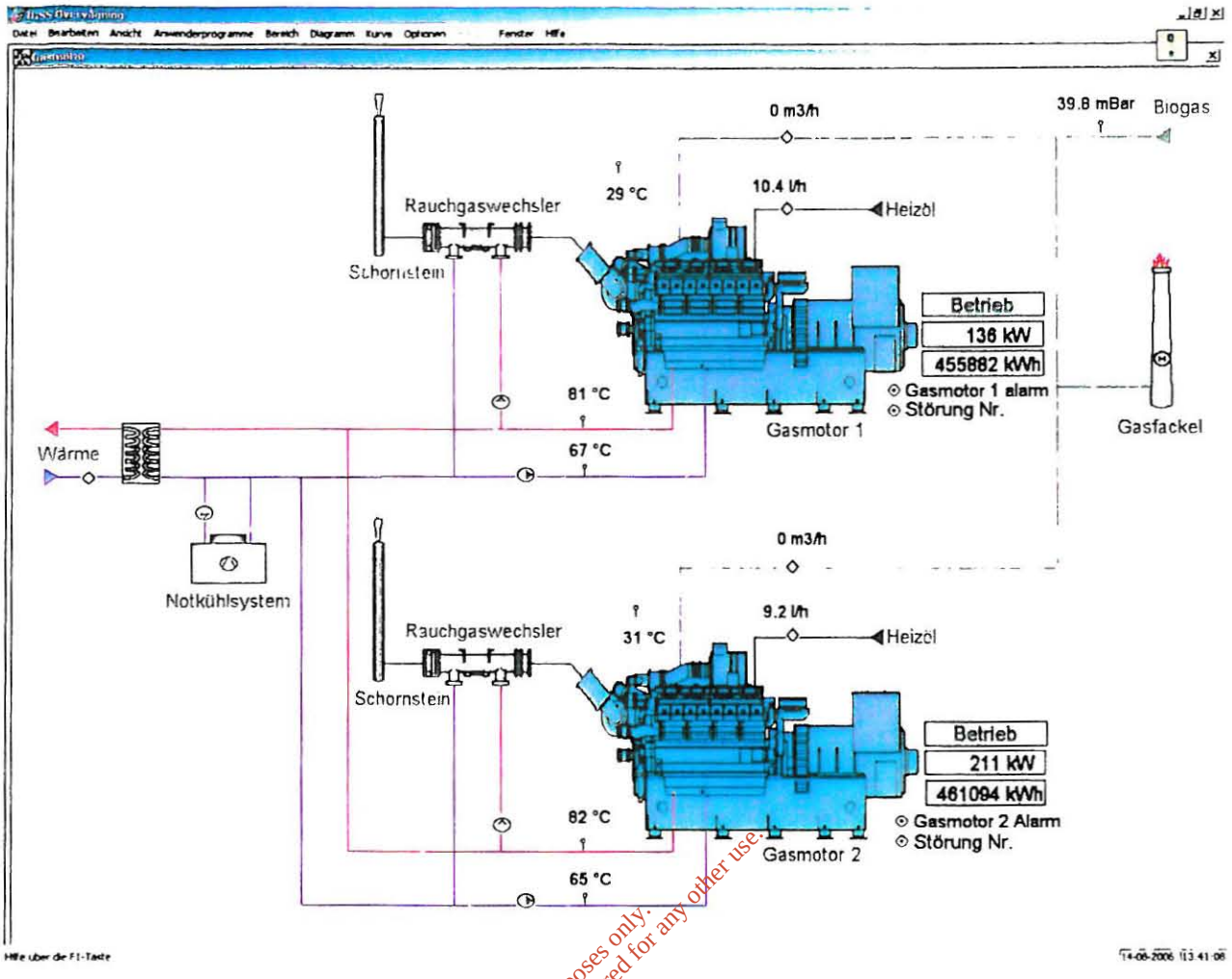


Figure 11 Gas Engine

2.12 Service

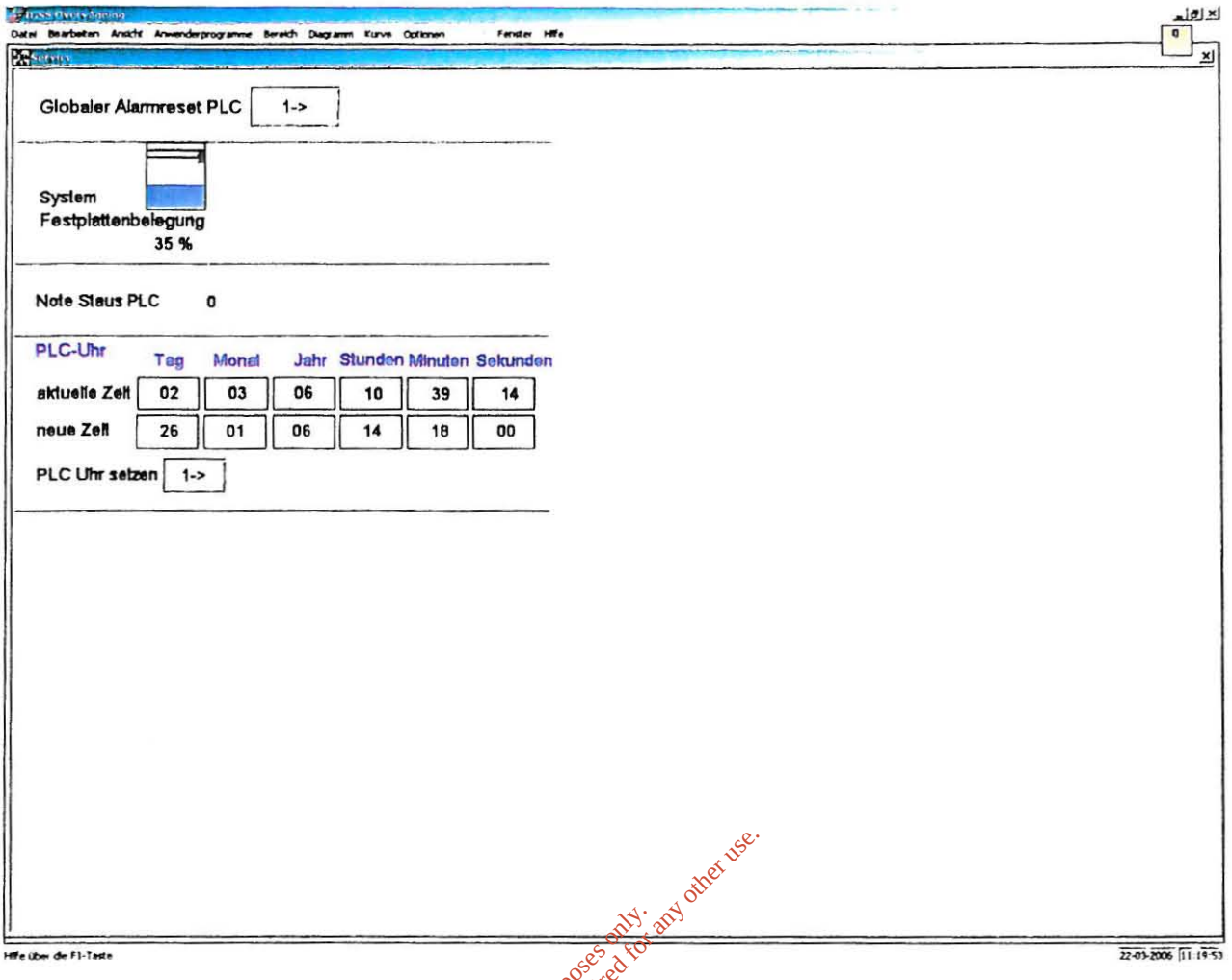


Figure 12 Service

2.13 Batch Reports

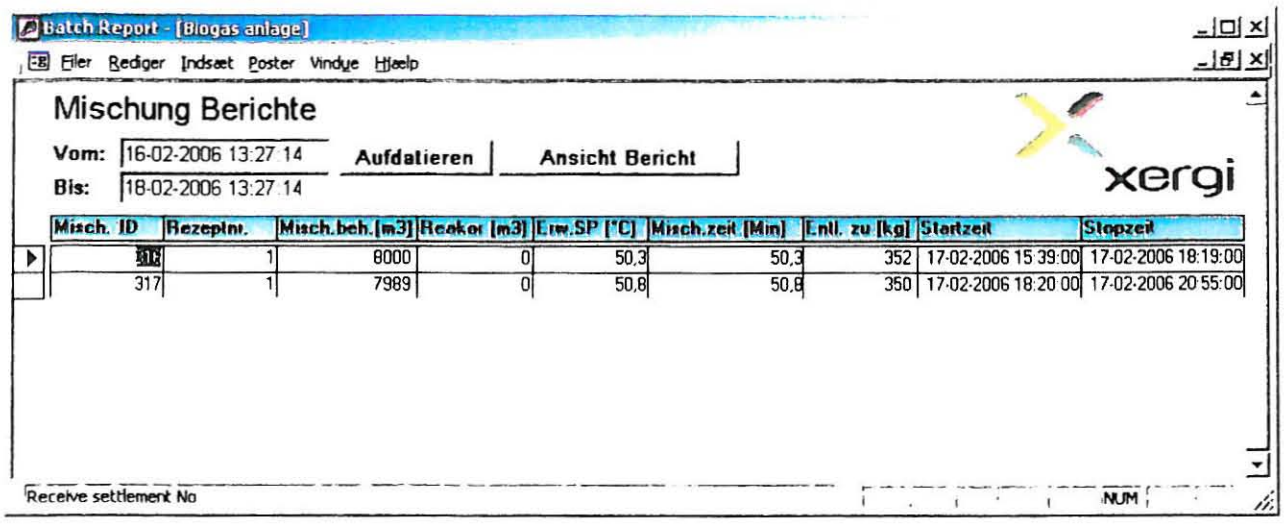
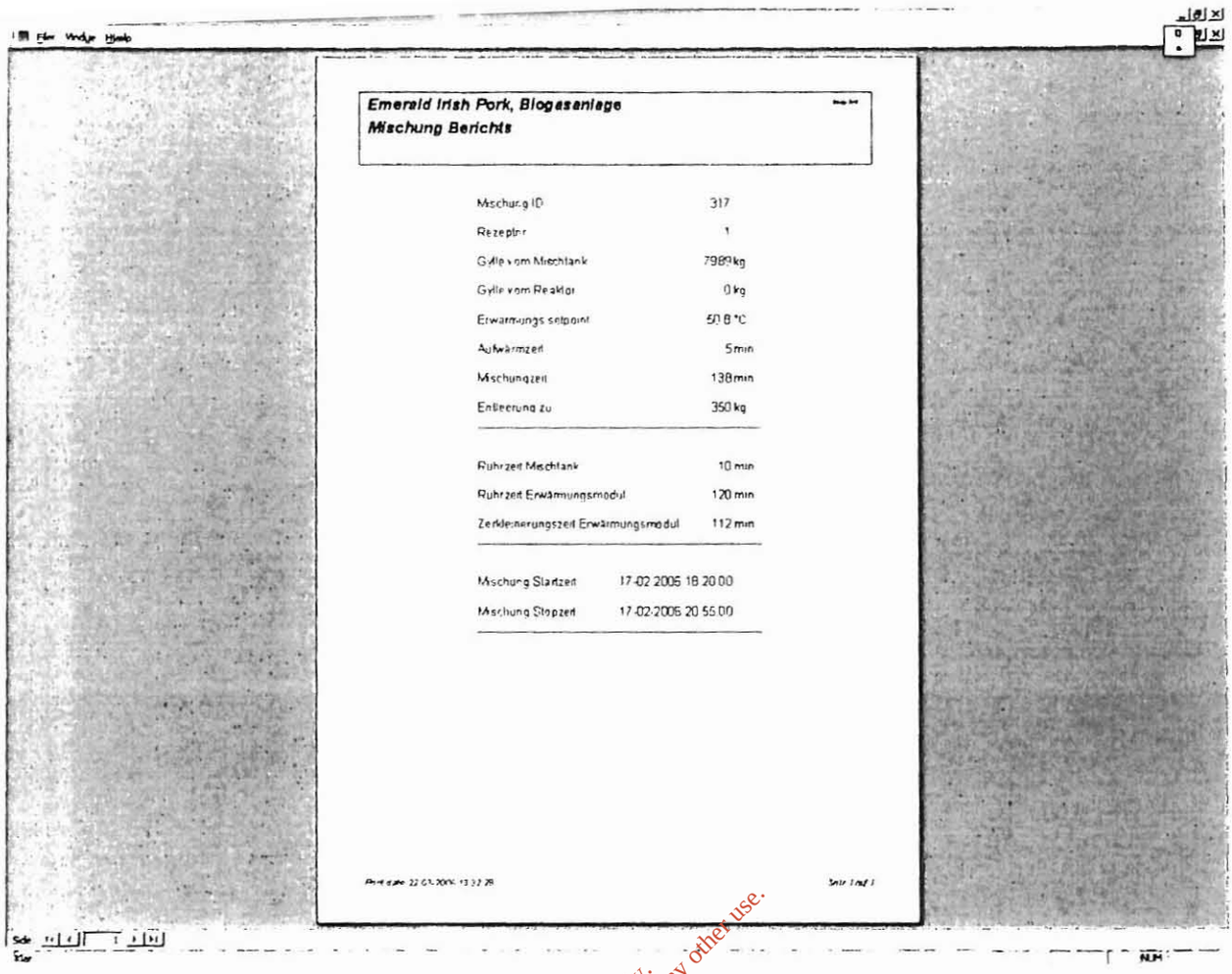


Figure 13.1 Overall View of Batch Reports



Emerald Irish Pork, Biogasanlage
Mischung Berichts

Mischung ID	317
Rezeptnr	1
Gylle vom Mischtank	7989 kg
Gylle vom Reaktor	0 kg
Erwärmungs setpoint	50.8 °C
Aufwärmzeit	5 min
Mischungzeit	138 min
Entleerung zu	350 kg
Rührzeit Mischtank	10 min
Rührzeit Erwärmungsmodul	120 min
Zerkleinerungszeit Erwärmungsmodul	112 min
Mischung Startzeit	17-02-2006 18:20:00
Mischung Stopzeit	17-02-2006 20:55:00

Figure 13.2 Example of Batch Report

ATTACHMENT NO. 8

TRAFFIC ASSESSMENT
BY M & J MCENIRY ENGINEERS

NRGE LTD, MOORESFORT, LATTIN CO TIPPERARY

TIPPERARY MILLING CO LTD

Assessment of Sightlines at the entrance to Woodville Pig Farm, Woodville, Ballymackey, Nenagh

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Nutrient Recovery to Generate Electricity

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Introduction

An assessment of the entrance to the Pig Breeding Unit at Woodville Ballymackey Nenagh was made in May 2009 in order to ascertain that adequate sight lines were available to support the Planning application to construct A new loose dry Sow House, which is required for animal welfare regulation compliance and Staff service building with office, canteen, shower facilities, and associated site works.

Existing Situation.

The entrance to the Pig Breeding Unit is currently located at the Eastern extremity of the site's Road Frontage. The entrance is 10m wide opening onto the Public road which is 5m wide at their intersection. The entrance abuts the front boundary wall of the adjoining dwelling which is situated 0.6m back from the road carriageway. The boundary wall is overhung by mature screening hedge approximately 3.5m tall. This slightly restricts the visibility to the east (Left) when exiting from the farmyard. The adjoining Dwelling to the West of the farmyard is setback over 2m from the road carriageway. The current entrance location is on the crest of a slight incline on the road. The road Speed limit is 80Km/Hr. The road is straight for more than 300m in both directions from the entrance, the photos attached in appendix 1 show there are unobstructed views of more than 300m at the entrance in both directions.

Proposed Improvements

In order to improve the sightlines is necessary to relocate the point of access from the farmyard to the Public approximately 30m to the West of its current location. The existing Hedgerow would be removed and relocated 2.3m back from its current location at the site boundaries and Drawing No 007 attached,

this will achieve a horizontal sightline of 160m in both directions. The reconstructed roadside boundary will be screen planted in the first growing season after the entrance has been reconstructed. The relocated entrance is down the incline. The crest of the incline will now be located 30m east of the entrance the Vertical alignment in the attached Drawing No007 shows that the crest does not impede the sightlines. It must highlighted that the vertical alignment is further improved from a commercial or agricultural vehicle because of the higher vantage point approximately 2.0m above ground level than that from a car 1.15m this is also demonstrated on Drawing No 007.

The desirable Stopping Distances for a vehicle travelling at 85Km/hr as per Table 3, Design Speed Related Parameters NRA TD 9/00 is 160m this can be achieved at the realigned entrance.

Conclusion

In our opinion sightlines in excess of 160m can be achieved at the realigned entrance

J. McEniry

BE MIEI

NRGE LTD.

Appendix 1

Photos

View West from Current Entrance

View East from Current Entrance

View Travelling East 300m from Current Entrance

View Travelling East 100m from Current Entrance

View Travelling East at the proposed Entrance

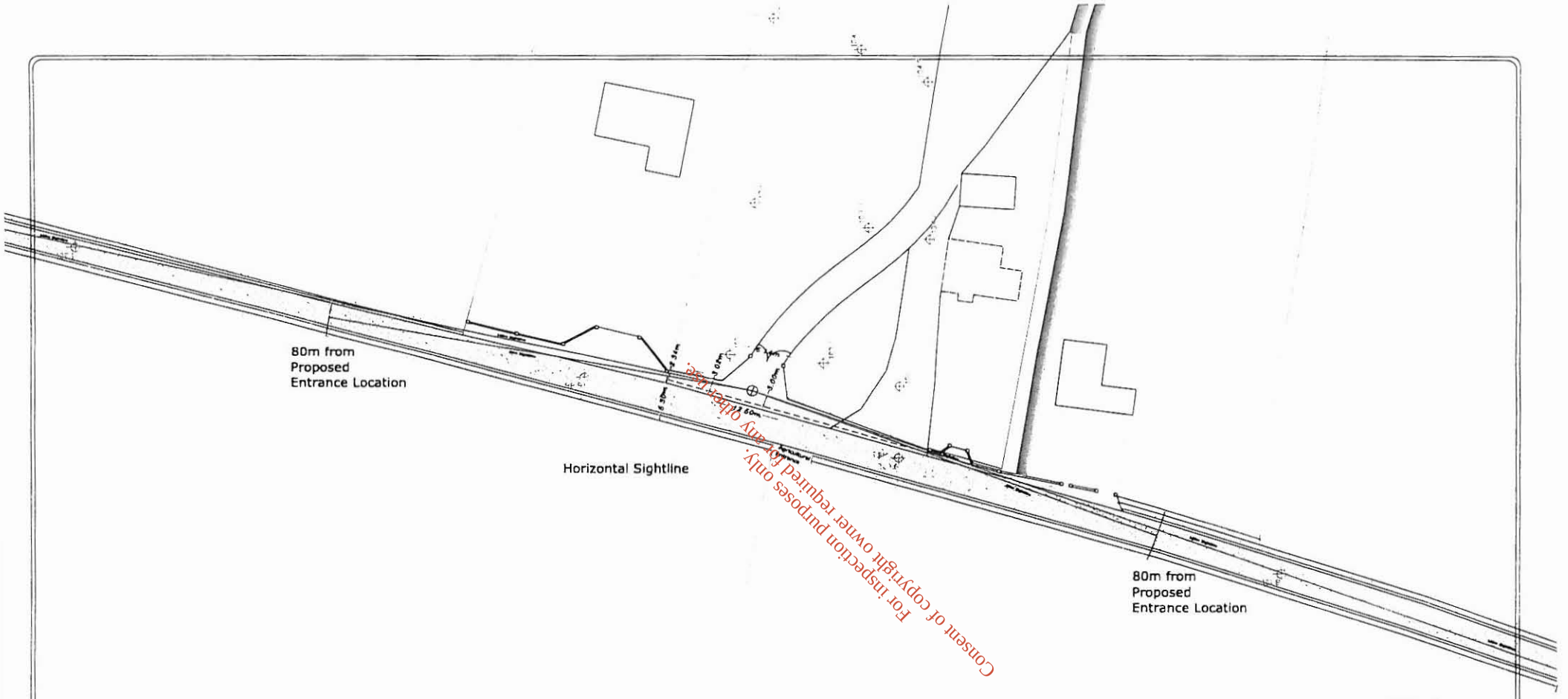
View Travelling West 300m from Current Entrance

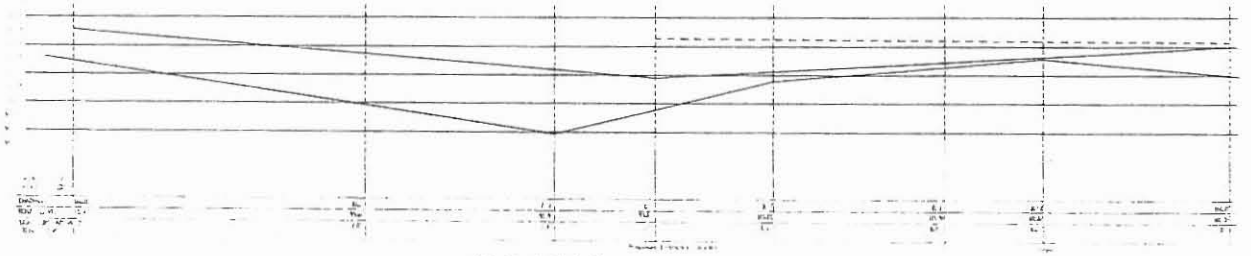
View Travelling West 200m from Current Entrance

View Travelling West 150m from Current Entrance

View Travelling West 100m from Current Entrance

View Travelling West at the Current Entrance





Vertical Sightline

RGE

Entrance Plan
Vertical & Horizontal Sightlines

May 09

1/500
1/1000
1/125

007