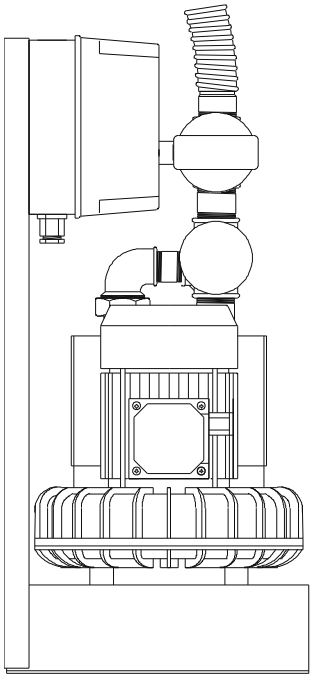
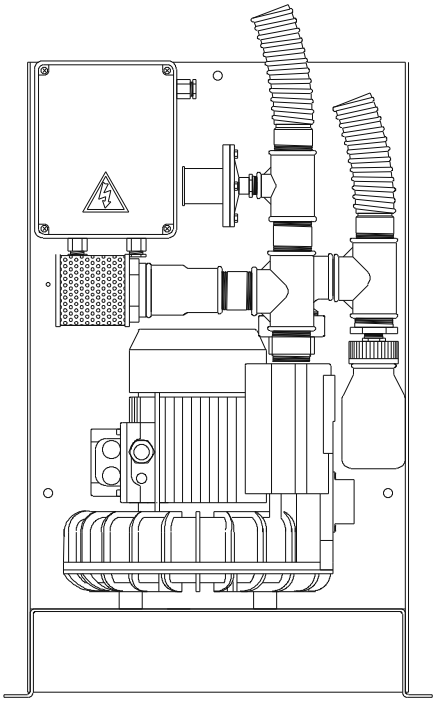
# *Simplex Anaesthetic Gas Scavenging System*

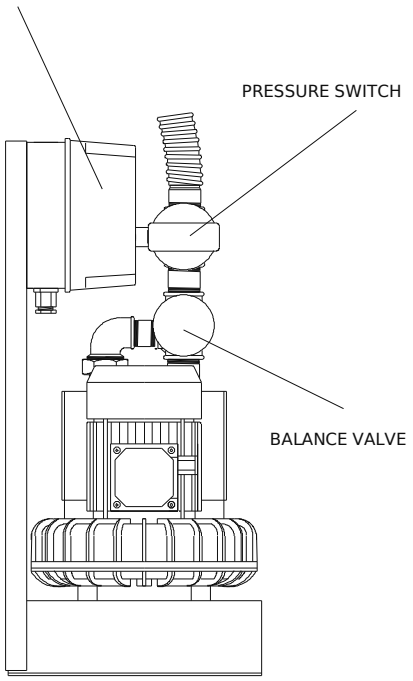
## Installation, Operation & Maintenance

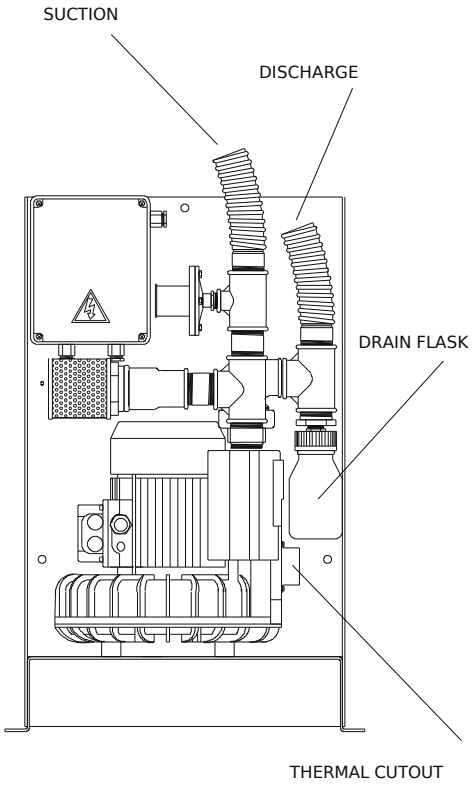


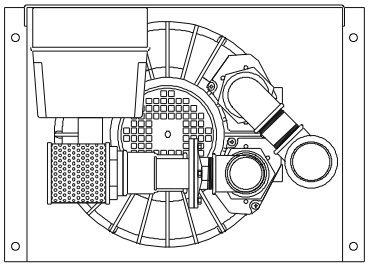


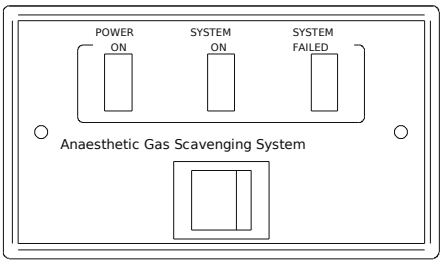
CONTENTS


| | |
|---|---|
| Plant general layout | 2 |
| Typical Simplex AGSS system | 3 |
| Operating Environment | 4 |
| Mounting | 4 |
| Electrical connections | 4 |
| Setting up | 5 |
| Three phase site connections | 6 |
| Three phase circuit diagram | 7 |
| Single phase site connections | 8 |
| Single phase circuit diagram | 9 |
| Control panel circuit diagram | 10 |
| Operation | 11 |
| Maintenance | 11 |

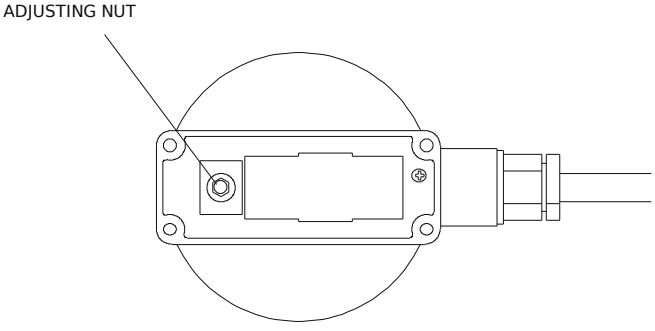


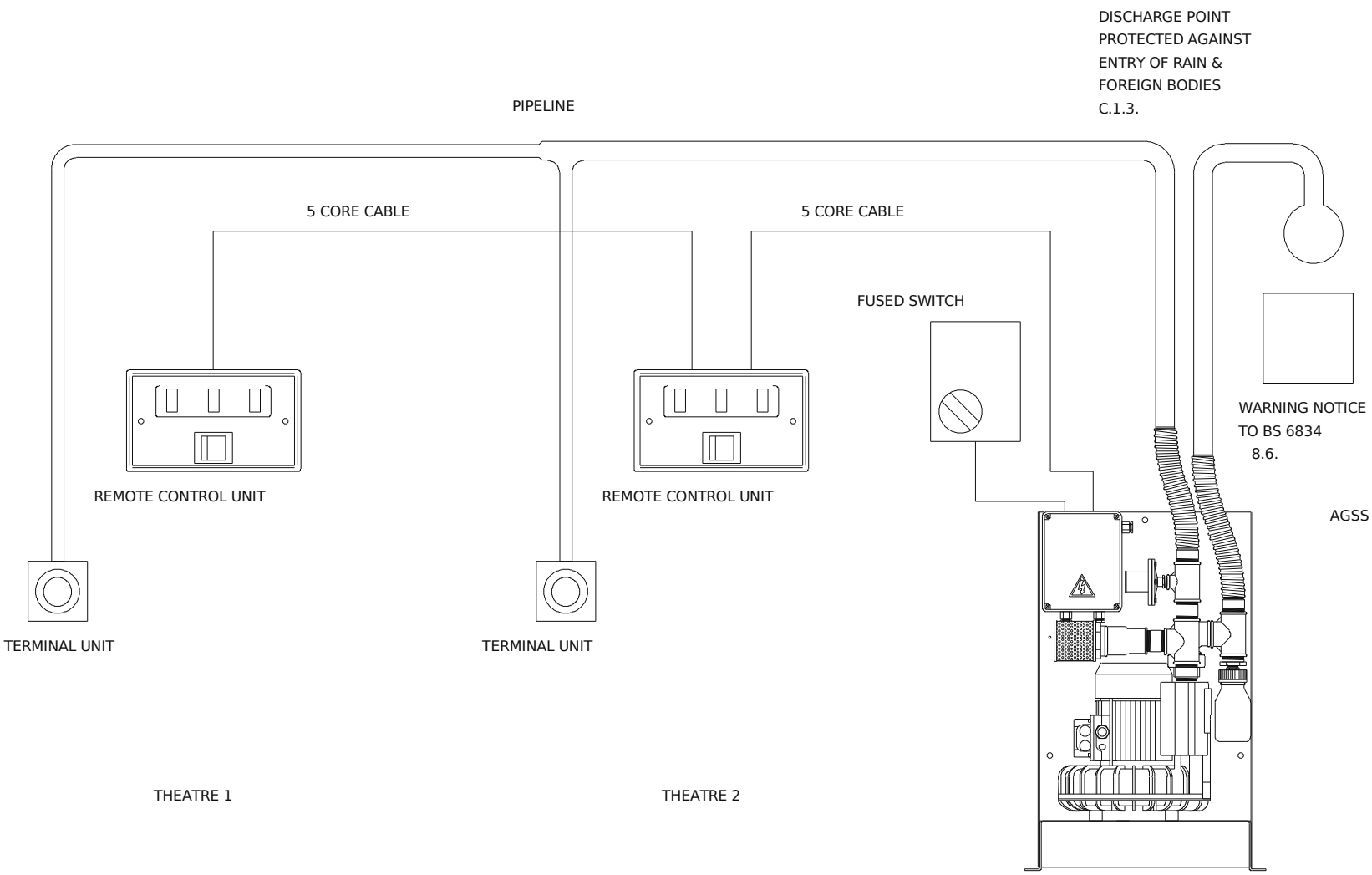



REMOTE CONTROL UNIT




PRESSURE SWITCH

| Shire Controls Ltd | | |
|---|---|---|
| Title | SIMPLEX AGSS<br>GENERAL LAYOUT | |
| Drawing No | WAGE4 | |
| Date 28-07-97 | | Issue 2 |




Shire Controls Ltd

Title: TYPICAL SIMPLEX AGSS DISPOSAL SYSTEM

Drawing No: WAGE12

Date: 28-07-97

Issue: 2

## About this manual.

When you see this symbol, the associated text in **bold type** refers to something which may cause danger or damage.

### Environment.

This plant is designed to be used in a dry environment with no abnormal levels of airborne dust. It is designed to work within the following parameters.

Temperature +5 to +35 deg. C. (+40 deg. C. maximum)
Max. Humidity 90% RH
Max. Altitude 1000m above sea level

## Mounting.

Consideration should be given to the likelihood of the plant being struck by passing traffic & additional protection provided if necessary. The plant must be fixed by means of the four mounting holes in the frame of the plant. Ensure a free flow of air to the motor. **If the pump is mounted in an enclosure, allow a minimum of 3 cubic metres per kilowatt of motor power of air space within the enclosure.**

## Electrical Connections.

**The plant must be supplied from a fused switch complying with EN60947-3, category AC-23B, with provision for locking m the OFF position, mounted between 0.6 and 1.9 metres above the servicing level in an easily accessible position. The prospective fault current must not exceed l.5kA.The fuses must be capable of breaking the prospective short circuit current. The fuse rating must not exceed 13 amps. Motor rated fuses should be used, using the nearest value above the running current of the motor. The earth fault loop impedance of the supply must not exceed 1 ohm.**

| Type | Power (kW) | Current (1 phase) | Current (3 phase) |
|---|---|---|---|
| AGS120 | 0.4 | 3.1 | 1.4 |
| AGS130 | 0.75 | 5.4 | 1.95 |
| AGS135 | 0.75 | 5.4 | 1.95 |
| AGS141 | 1.1 | 7.5 | n/a |
| AGS142 | 1.5 | n/a | 3.7 |
| AGS152 | 3.0 | n/a | 7.0 |

## Three phase plant.

Note. This plant requires a neutral. See Drawing WAGE8

## Single phase plant.

See Drawing WAGE10

## All plant.

**Replace fuses only with motor rated fuses, rated at the motor full load current. Do not use this plant with any control, indication or interface system other than that supplied by the manufacturers.** A relay interface is available giving volt-free contacts rated at 5 amps, 240 volt resistive, for Power on, System On and System Failed signals, and providing input terminals for control from volt-free contacts.

When using remote control units or relay interfaces, connect the terminals on the lower edge of the printed circuit board in the control panel marked RUN, SF, -Ve, +Ve & CTL to the corresponding terminals on the remote control units or relay interfaces. A maximum of 6 remote control units may be used with a control panel. The voltage drop on the cable to the remote control units should not exceed 1.2 volts.( the current drawn is .017 amps per remote control unit + .03 amps . 6 remote control units could be used on 300 M of l.5mm cable ) Cable exceeding 2.5mm should not be used.

When using a relay interface, connect the terminals marked "Local" on the relay interface to the contacts which will control the plant e.g. theatre panel switch. **These contacts must be volt-free.** Use the contacts on the relay interface to switch other circuits as required. When using the relay interface to switch indicator lamps on theatre panels etc. we strongly recommend that System On and System Failed conditions are displayed as a minimum, and that lamps are used which are of equal brightness and reliability to the lamps used on the standard remote control unit, When not using remote control units or relay interfaces, link the terminals marked +Ve & CTL.

## Mechanical.

Connect the suction & discharge hoses to the plant and pipelines as shown on drawing WAGE12.

## Setting up.

Check the rotation of the motor on three phase plant. If the rotation is incorrect, isolate the supply and reverse two phases.

With all remote control units switched off, check that the pump is not running and that all remote control units and the control panel show a Power On lamp. Switch on each remote control unit in turn. As the pump switches on, the System Failed lamp will come on momentarily as the pump produces vacuum in the pipeline, followed by the System On lamp. Switch off this remote control unit & continue to the next.

If the System failure lamp does not operate correctly, reset the pressure switch as follows. Disconnect the suction hoses from the plant. Switch on the plant. If the System Failure lamp is on, turn the pressure switch adjusting nut ( see drawing WAGE4) anti-clockwise until the System Failure lamp goes out. Turn the adjusting nut clockwise until the System Failure lamp comes on and continue for 3/4 turn. If the system is operated at a very low vacuum, it may be necessary to use a lower setting.

Set up the system flow as described in BS 6834, using the balance valve to set the operation vacuum in the pipeline.

**IMPORTANT. Ensure that an air flow is maintained through the pump via the balance valve when all terminal outlets are closed. Failure to allow an air flow will result in overheating of the pump with possible damage to the pump, motor and hoses and possible injury to personnel. The following minimum flow rates should be observed.**

| | | | | | |
|---|---|---|---|---|---|
| AGS120 | 130 l/m | AGS130 | 650 l/m | AGS135 | 650 l/m |
| AGS141 | 1170 l/m | AGS142 | 845 l/m | AGS152 | 1365 l/m |

MAINS SUPPLY

THREE PHASE + NEUTRAL

L1 L2 L3 N PE

NOTES.
THIS EQUIPMENT MUST
BE EARTHED.

SEE DRAWINGS WAGE5 &
WAGE9 FOR CIRCUIT
DETAILS.

IF NO REMOTE CONTROL
UNITS ARE USED, LINK
+VE AND CTL.

Shire Controls Ltd

Title: THREE PHASE SIMPLEX AGSS PLANT SITE CONNECTIONS

Drawing No: WAGE8

Date: 28-07-97

Issue: 2

CONTROL PANEL

PE

L1
N
A1
A2

250mA CERAMIC

315mA

RUN SF -VE +VE CTL LOCAL O C CM PSW

REMOTE CONTROL UNIT

-Ve SF RUN CTRL +Ve

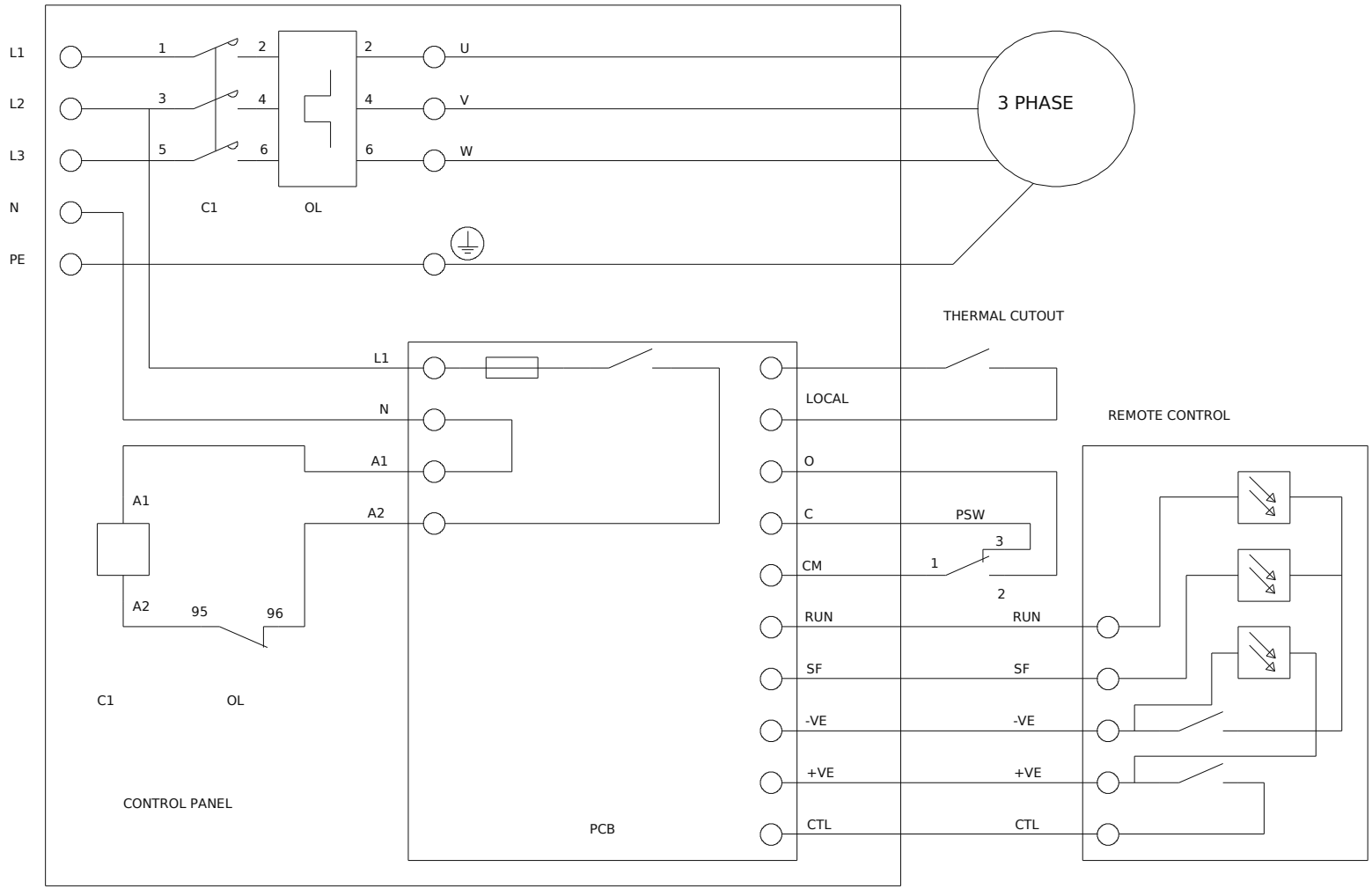
WAG1DC
ISSUE A

TO THERMAL CUTOUT

TO MOTOR U V W PE

TO OTHER REMOTE CONTROL UNITS IF USED

6




Shire Controls Ltd

Title: THREE PHASE SIMPLEX AGSS PLANT CIRCUIT DIAGRAM

Drawing No: WAGE9

Date: 30-11-95

Issue: 1

7

MAINS SUPPLY

SINGLE PHASE

L1 N PE

PE

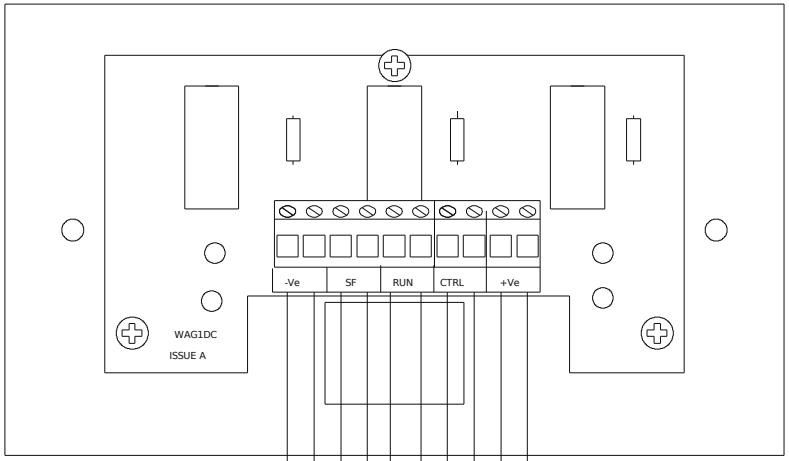
CONTROL PANEL

NOTES.
THIS EQUIPMENT MUST
BE EARTHED.

SEE DRAWINGS WAGE5 &
WAGE9 FOR CIRCUIT
DETAILS.

IF NO REMOTE CONTROL
UNITS ARE USED, LINK
+VE AND CTL.

REMOTE CONTROL UNIT




TO THERMAL
CUTOUT

TO MOTOR
L
N
PE

TO OTHER REMOTE
CONTROL UNITS
IF USED

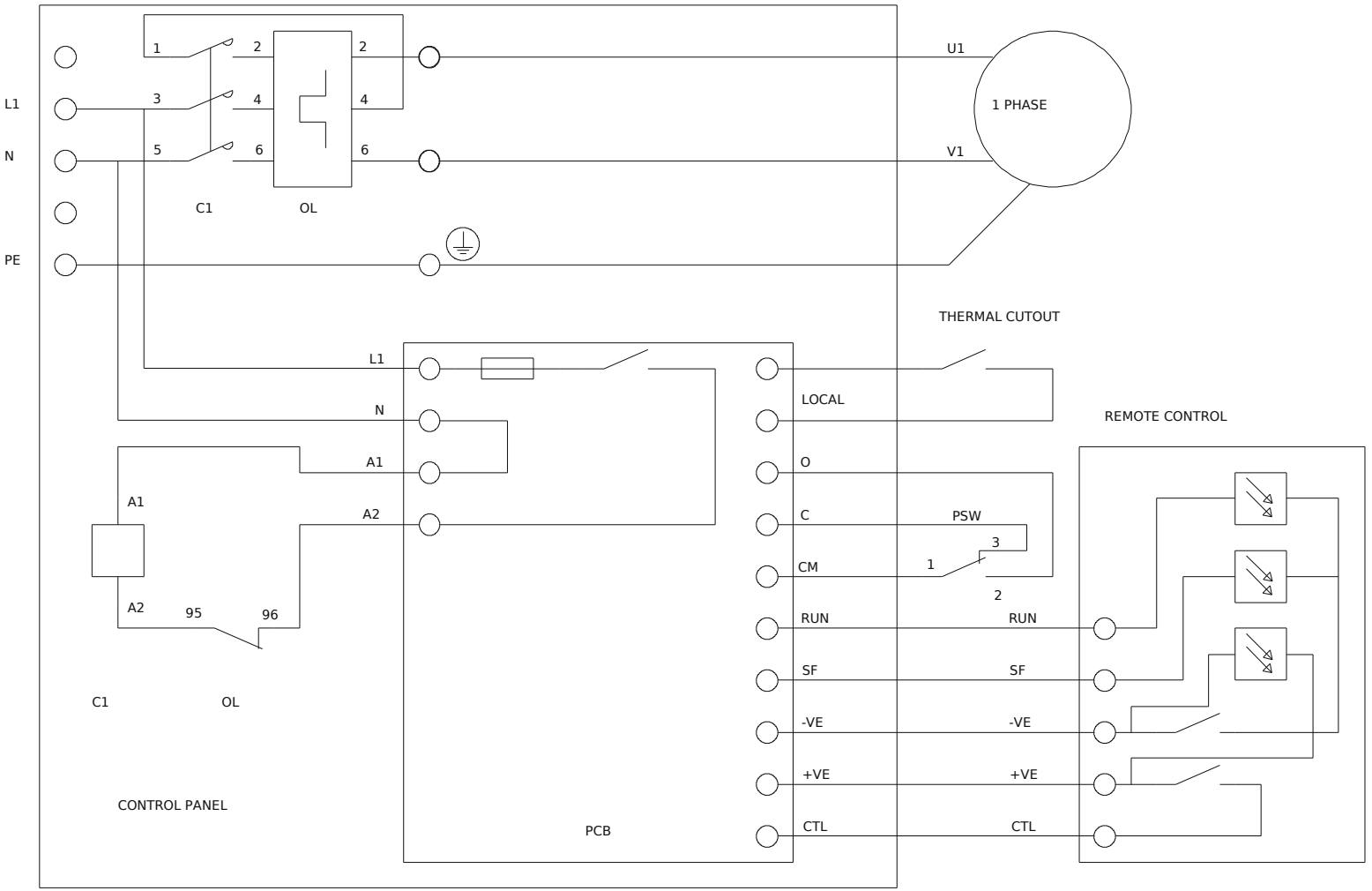
Shire Controls Ltd

Title: SINGLE PHASE SIMPLEX AGSS PLANT SITE CONNECTIONS

Drawing No: WAGE10

Issue: 2

Date: 28-07-97



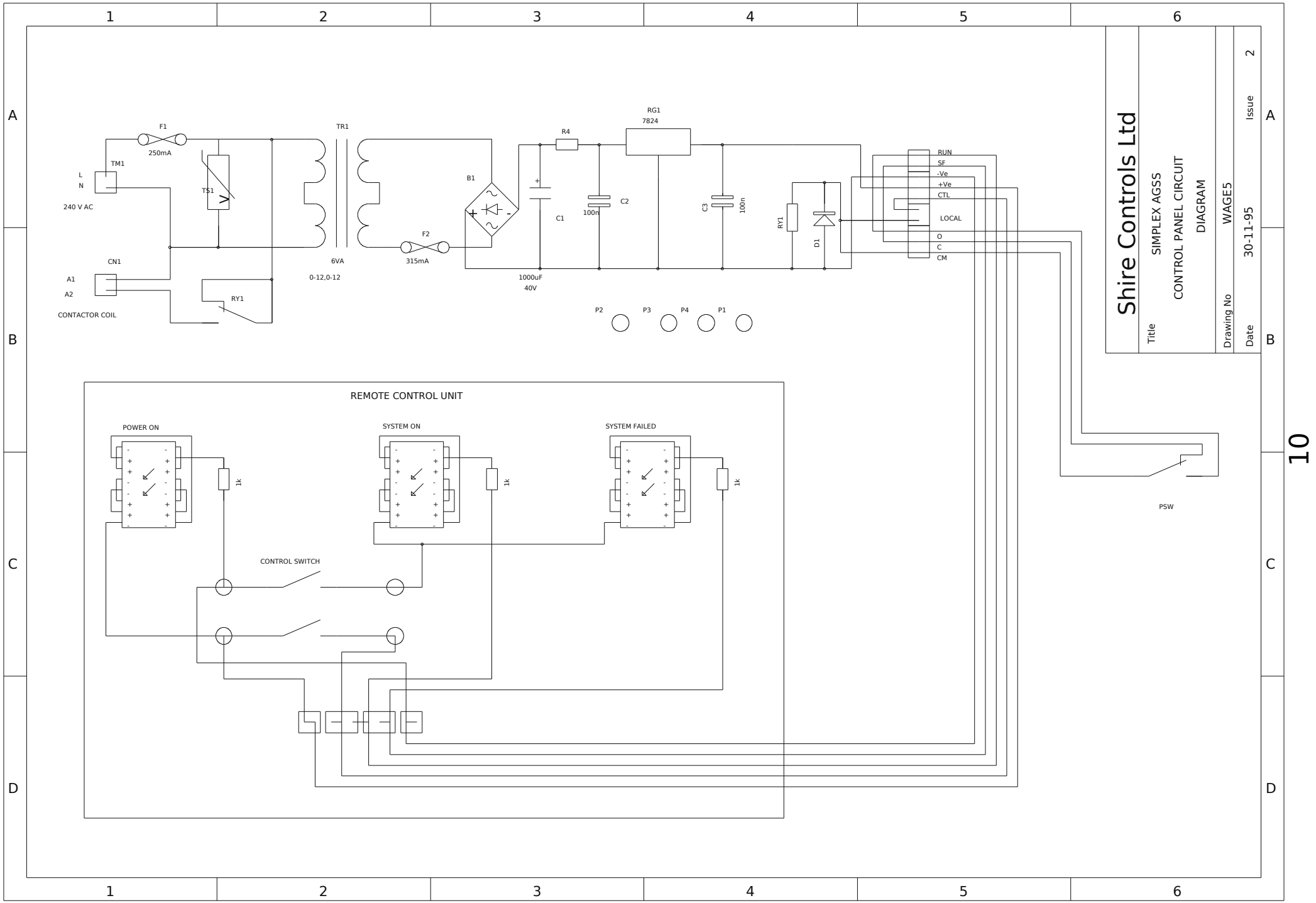

Shire Controls Ltd

Title: SINGLE PHASE SIMPLEX AGSS PLANT CIRCUIT DIAGRAM

Drawing No: WAGE11

Issue: 1

Date: 30-11-95


F1
250mA
TM1
L
N
240 V AC
TS1
TR1
6VA
0-12,0-12
F2
315mA
B1
R4
RG1
7824
C1
1000uF
40V
C2
100n
C3
100n
RY1
D1
RUN
SF
-Ve
+Ve
CTL
LOCAL
O
C
CM
CN1
A1
A2
CONTACTOR COIL
RY1
P2
P3
P4
P1
REMOTE CONTROL UNIT
POWER ON
SYSTEM ON
SYSTEM FAILED
1k
1k
1k
CONTROL SWITCH
PSW
Shire Controls Ltd
Title
SIMPLEX AGSS
CONTROL PANEL CIRCUIT
DIAGRAM
Drawing No
WAGE5
Date
30-11-95
Issue
2
10

## Operation.

Switching on any remote control unit will start the plant. Indication of system on or system failure will only be given at any remote control unit which is switched on. Any units switched off will show power on only. The plant will continue to run until all remote control units are switched off. On initial start-up, the system failure lamp will show momentarily as the pump produces a vacuum in the pipeline. This will change to System On as vacuum is produced. If the pump fails to produce vacuum, the System Failed lamp will show.

The pump is protected against overheating by a thermal cutout mounted on the end of the pump (see drawing WAGE4). If the thermal cutout operates, reset the cutout by isolating the plant, removing the cover & pressing the reset button. Establish the cause of the overheating before putting the plant back into service. Two likely causes of overheating are a lack of air flow through the pump when no outlets are in use, or inadequate ventilation for the pump and motor cooling.

## Maintenance.

The filter on the balance vale must be cleaned or replaced periodically. The frequency of these inspections will depend on operating environment & should be determined by experience. Every 6 months. Disconnect the suction hose. Go to each remote control unit or other point at which the plant conditions are displayed in turn. Turn the plant on & check that the System Failed lamp comes on . Turn off the plant & repeat for all other control positions. Replace the suction hose.

## Parts list

| | | |
|---|---|---|
| Pump | See name plate on pump mounting foot | Werner Reitschle or Esam |
| Balance valve | 169835 | Esam |
| Drain flask | | Shire controls Ltd |
| Pressure switch | Type 157 -400 mBar | Bailey & Mackey |
| Control panel box | GW44127 | Gewiss |
| Control | WAGB | Shire Controls Ltd |
| Contactor | 01 044050 240 | MTE |
| Overload | 0 1 000130 0XX * | MTE |
| Alternatives:- | | |
| Contactor | BF 16.40 | Lovato |
| Overload | RF 25.* | Lovato |
| (*dependant on plant size) | | |
| Fuse Fl 250mA ceramic | S501 250mA | Bussmann |
| Fuse F2 & F3 2A | S500 315mA | Bussmann |
| Remote control unit | Simplex remote control unit | Shire Controls Ltd |

DECLARATION OF CONFORMITY
89/392/EEC The Machinery Directive
73/23/EEC The Low Voltage Directive
89/336/EEC The EMC Directive

Manufacturer

Shire Controls Ltd
Studio 3, Channocks Farm
Gilston, Harlow
Essex, CM2O 2RL
United Kingdom
Tel.01279 434399
Fax 01279 451706

Product Type

Simplex Anaesthetic Gas Scavenging Plant

Model .....Serial No.....Voltage.....V
Current .....A Phases.....Frequency Hz 50
Maximum Prospective Fault Current.....KA
Drawing No WAGE5 issue 2
Year of manufacture .....
Standards used
BS EN 292 : part 1:1991 BS EN 292 : part 2:1991
BS EN 60204-1:1993 BS EN 50081-1
BS EN 50082-1 BS EN 61000-3-2
Authorised representative
I.R.Couchman Technical Director
Signature .

WAGDDECL 18-11-2005