Duplex Anaesthetic Gas Scavenging Plant Control Panel

Installation, Operation & Maintenance

CONTENTS

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 control panel must be **mounted between 0.6 and 1.9 metres above the servicing level in an easily accessible position.**

Electrical Connections.

The prospective fault current must not exceed l.5kA.The earth fault loop impedance of the supply at the plant terminals must not exceed 1 ohm.

Three phase plant.

Note. This plant requires a neutral. See Drawing DUPLEX8

Single phase plant.

See Drawing DUPLEX10

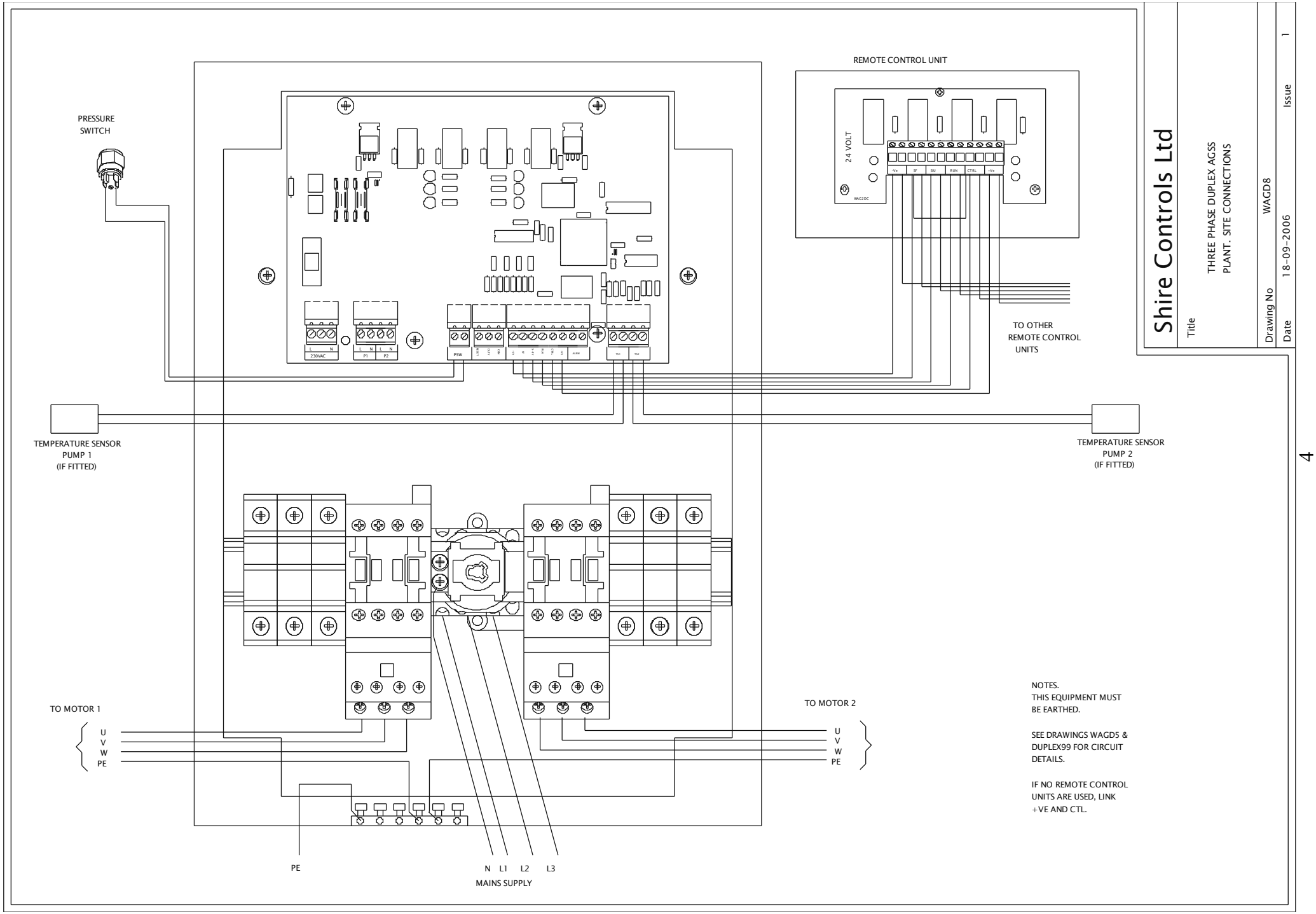
All plant.

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 , Duty Failed 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, SIU, -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.Smm 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, Duty Failed 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.

Setting up.

Check the rotation of the motors 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 pumps are not running and that all remote control units and the control panel show a Power On lamp. Switch on the local off switch on the control panel. 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, adjust the pressure switch until the System Failure lamp goes out. Turn the adjustment the opposite direction until the System Failure lamp comes on and continue for a small amout. If the system is operated at a very low vacuum, it may be necessary to use a lower setting. Replace the suction hose and pressure switch cover. Disconnect the suction pipework assembly from the pipeline. Switch on a remote control unit. The duty pump should start with the System Failed lamp showing. Wait until the stand-by pump starts. Reconnect the suction pipework assembly. Go to each remote control unit in turn, switch on and check that the Duty Failed lamp is on. Reset the control panel with the reset button and check that the stand-by pump stops.



NOTES.
THIS EQUIPMENT MUST BE EARTHED.

SEE DRAWINGS WAGD5 & DUPLEX99 FOR CIRCUIT DETAILS.

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

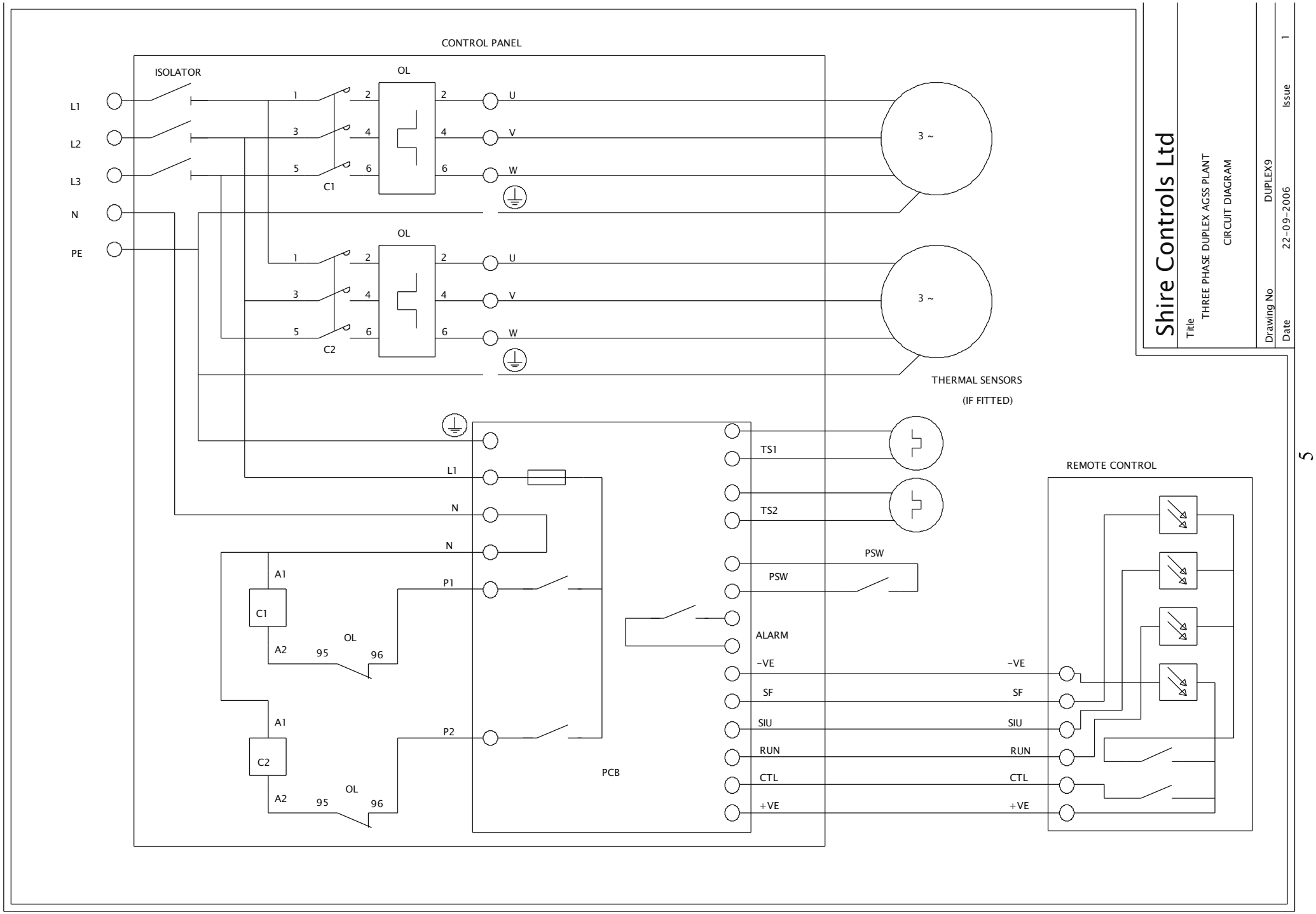
Shire Controls Ltd

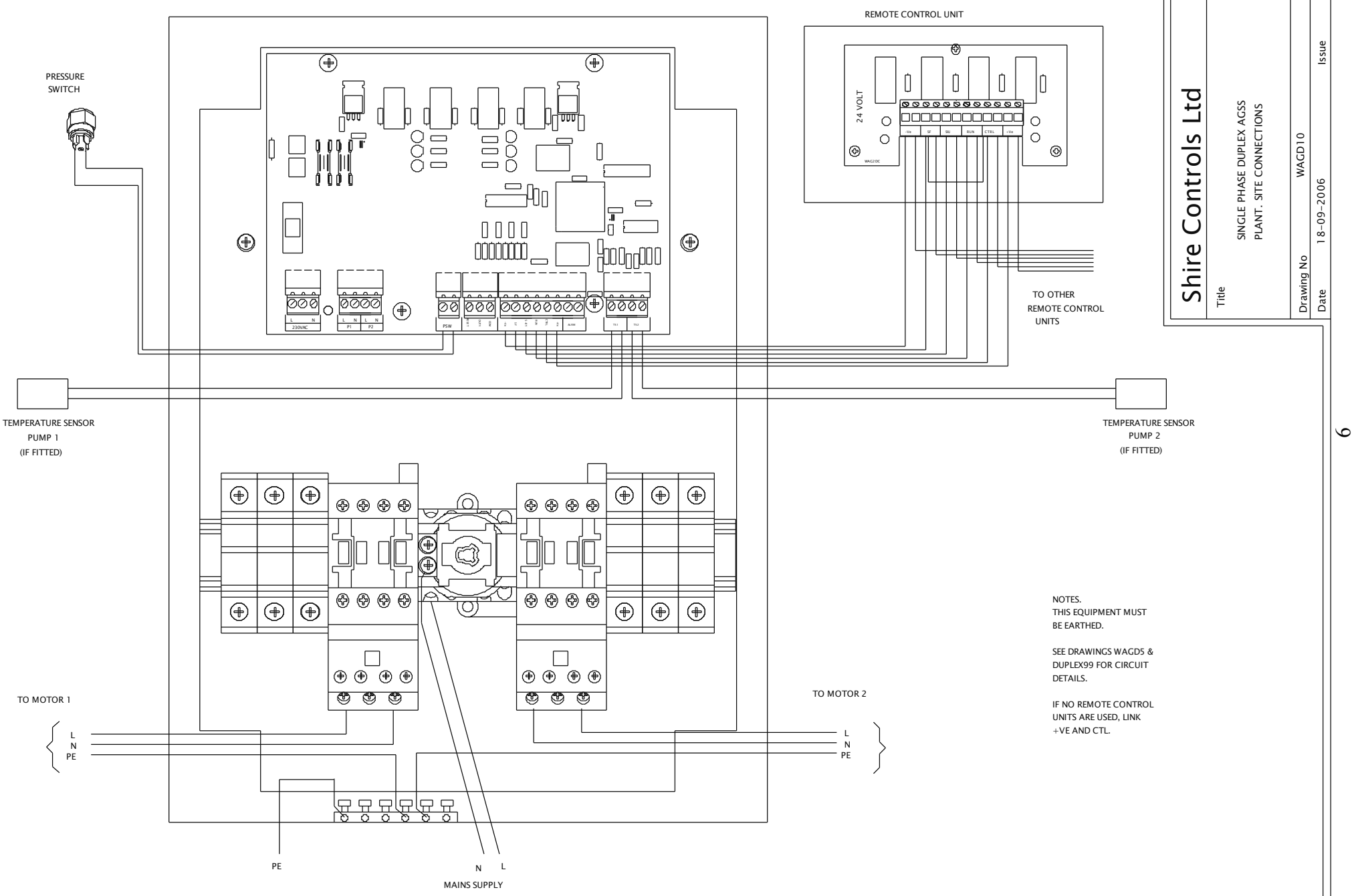
Title
THREE PHASE DUPLEX AGSS
PLANT. SITE CONNECTIONS

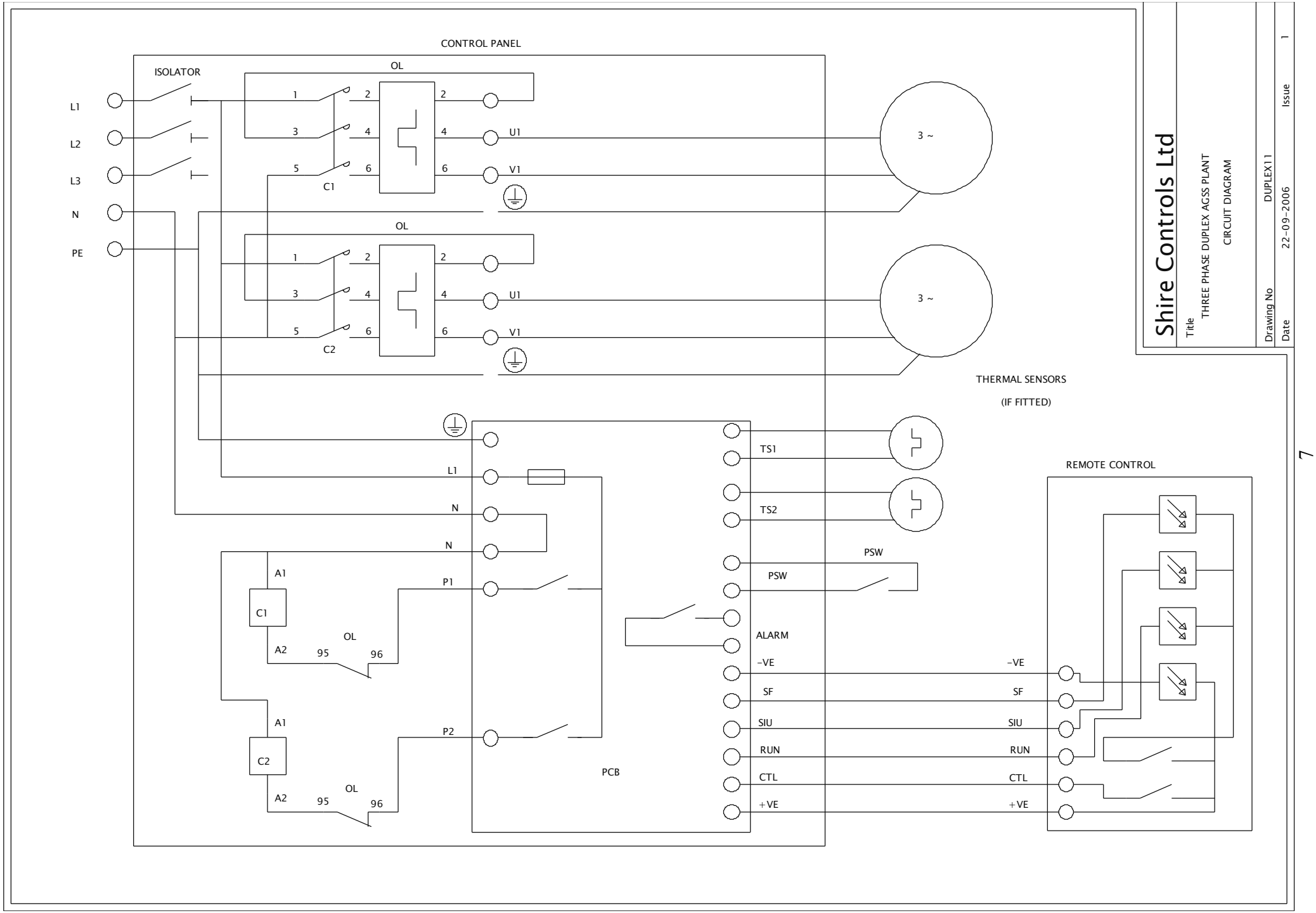
Drawing No WAGD8

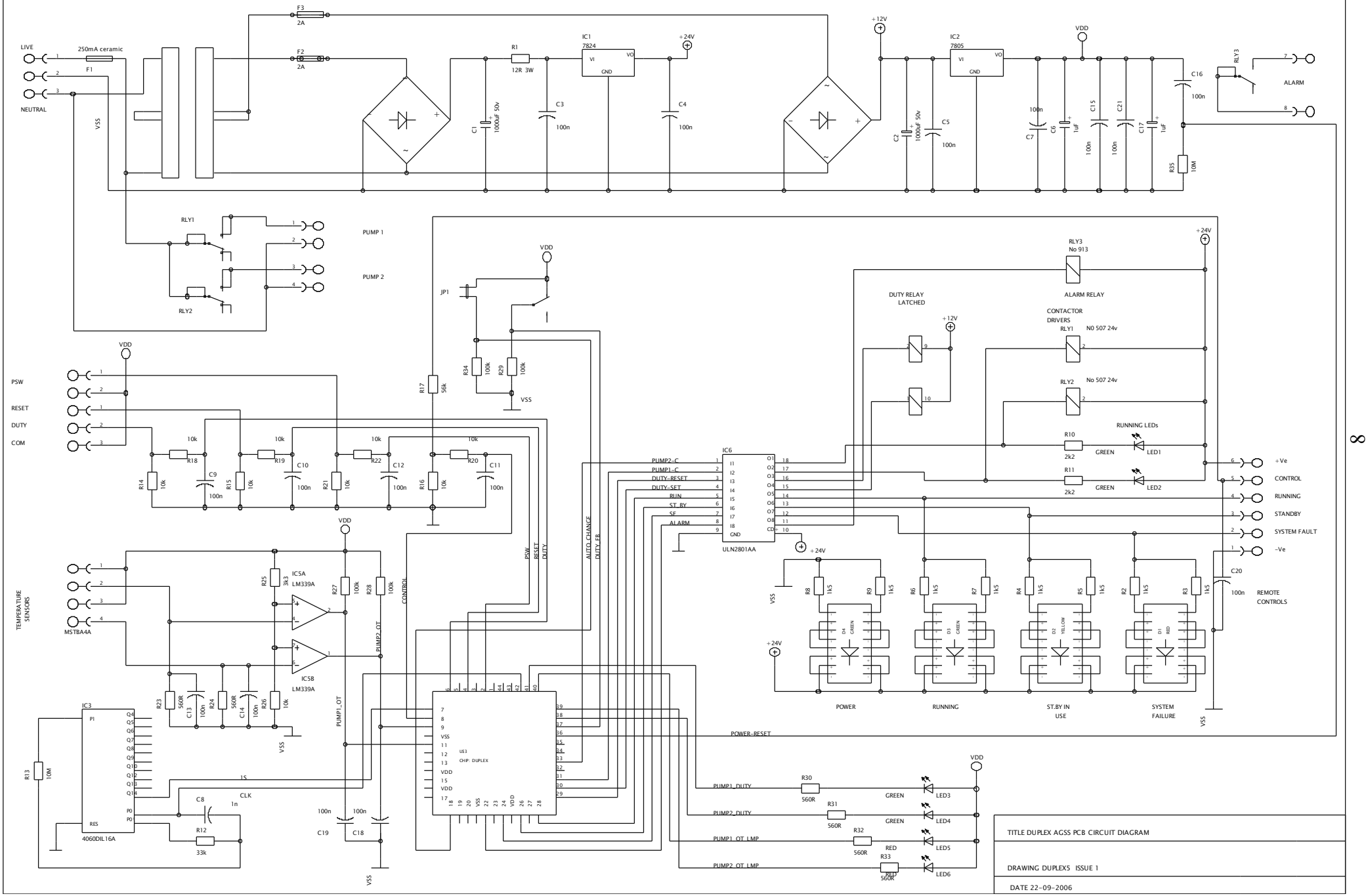
Issue 1

Date 18-09-2006


CONTROL PANEL
ISOLATOR
OL
L1
L2
L3
N
PE
1
2
3
4
5
6
C1
C2
U
V
W
3 ~
THERMAL SENSORS
(IF FITTED)
TS1
TS2
L1
N
A1
A2
P1
P2
95
96
PSW
ALARM
-VE
SF
SIU
RUN
CTL
+VE
PCB
REMOTE CONTROL
Shire Controls Ltd
Title
THREE PHASE DUPLEX AGSS PLANT
CIRCUIT DIAGRAM
Drawing No
DUPLEX9
Issue
1
Date
22-09-2006
5


REMOTE CONTROL UNIT
24 VOLT
-Ve
SF
BU
RUN
CTRL
-Ve
WAG2 DC
PRESSURE SWITCH
TO OTHER REMOTE CONTROL UNITS
TEMPERATURE SENSOR PUMP 1 (IF FITTED)
TEMPERATURE SENSOR PUMP 2 (IF FITTED)
TO MOTOR 1
L
N
PE
TO MOTOR 2
L
N
PE
PE
N
L
MAINS SUPPLY
NOTES.
THIS EQUIPMENT MUST BE EARTHED.
SEE DRAWINGS WAGD5 & DUPLEX99 FOR CIRCUIT DETAILS.
IF NO REMOTE CONTROL UNITS ARE USED, LINK +VE AND CTL.
Shire Controls Ltd
Title
SINGLE PHASE DUPLEX AGSS
PLANT. SITE CONNECTIONS
Drawing No
WAGD10
Issue
1
Date
18-09-2006


CONTROL PANEL
ISOLATOR
OL
L1
L2
L3
N
PE
1
2
3
4
5
6
C1
C2
U1
V1
3 ~
THERMAL SENSORS
(IF FITTED)
TS1
TS2
PSW
ALARM
-VE
SF
SIU
RUN
CTL
+VE
L1
N
P1
P2
A1
A2
95
96
PCB
REMOTE CONTROL
Shire Controls Ltd
Title
THREE PHASE DUPLEX AGSS PLANT
CIRCUIT DIAGRAM
Drawing No
DUPLEX11
Issue
1
Date
22-09-2006


LIVE
NEUTRAL
250mA ceramic
F1
F2
2A
F3
2A
VSS
IC1
7824
IC2
7805
+12V
+24V
VDD
R1
12R 3W
C1
1000uF 50v
C2
1000uF 50v
C3
100n
C4
100n
C5
100n
C6
1uF
C7
100n
C15
100n
C21
100n
C17
1uF
C16
100n
R35
10M
RLY3
ALARM
RLY1
RLY2
PUMP 1
PUMP 2
JP1
R17
56k
R34
100k
R29
100k
PSW
RESET
DUTY
COM
R18
R19
R22
R20
R14
R15
R21
R16
C9
C10
C12
C11
DUTY RELAY
LATCHED
ALARM RELAY
CONTACTOR
DRIVERS
RLY1
N0 507 24v
RLY2
No 507 24v
RLY3
No 913
RUNNING LEDs
R10
2k2
GREEN
LED1
R11
2k2
GREEN
LED2
IC6
ULN2801AA
PUMP2-C
PUMP1-C
DUTY-RESET
DUTY-SET
RUN
ST_BY
SF
ALARM
+Ve
CONTROL
RUNNING
STANDBY
SYSTEM FAULT
-Ve
C20
100n
REMOTE
CONTROLS
TEMPERATURE
SENSORS
MSTBA4A
IC5A
LM339A
IC5B
LM339A
R25
3k3
R27
100k
R28
100k
R23
560R
R24
560R
R26
10k
C13
100n
C14
100n
PUMP2_OT
PUMP1_OT
CONTROL
PSW
RESET
DUTY
AUTO_CHANGE
DUTY_FR
IC3
4060DIL16A
R13
10M
C8
1n
R12
33k
CLK
1S
C19
100n
C18
100n
US3
CHIP: DUPLEX
POWER-RESET
R8
R9
R6
R7
R4
R5
R2
R3
1K5
D4
GREEN
D3
GREEN
D2
YELLOW
D1
RED
POWER
RUNNING
ST.BY IN
USE
SYSTEM
FAILURE
PUMP1_DUTY
PUMP2_DUTY
PUMP1_OT_LMP
PUMP2_OT_LMP
R30
R31
R32
R33
560R
GREEN
GREEN
RED
RED
LED3
LED4
LED5
LED6
TITLE DUPLEX AGSS PCB CIRCUIT DIAGRAM
DRAWING DUPLEX5 ISSUE 1
DATE 22-09-2006

Operation.

Switching on any remote control unit will start the plant. Indication of system on, duty failed 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 duty Pump fails to produce vacuum e.g. if the overload has tripped etc., the duty pump will stop and the stand-by pump will start. If the stand-by pump produces vacuum in the pipeline, the Duty Failed lamp will show, indicating that the AGSS system is functioning but needs attention. If the stand-by pump also fails to produce vacuum, the System Failed lamp will show. The time from start-up (or loss of vacuum) is approximately 12 seconds. Turn the timer anti-clockwise to increase the time. To return to normal operation after rectifying the fault on the duty pump, operate the Reset button on the control panel. The stand-by pump will stop and the duty pump will start. To change over duty pump, operate the Duty push button on the control panel. It is not possible to change duty onto a pump which has failed and caused the stand-by pump to operate until the system is reset.

If over-temperature sensors are fitted, an over-heating pump will result in the pump stopping & the appropriate Pump Overheating lamp coming on. The standby pump will then start. It the standby pump also overheats, it will also stop, resulting in a System Failure. Overheating conditions are cleared by operating the Reset button.

An alarm output in the form of volt-free~ contacts, closed under normal operating conditions, rated at 50 V dc, 5OmA. These contacts will open if the power fails or the duty pump trips.

Maintenance.

Every 6 months.
Isolate the plant & remove the motor fuses to prevent the pumps starting. Switch the power back on. 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 (remember to allow enough time for the duty pump to trip when checking the first remote control). Turn off the plant & repeat for all other control positions. Next isolate the pump and replace the motor fuses for motor 1 only. Switch on the power. Start the plant and wait for it to trip. Go to each remote control unit in turn. Switch on & check that the Duty Failed lamp is on. Reset the plant. Isolate and replace the fuses for pump 2.

Parts list

Control	PCBWAGD	Shire Controls Ltd
Contactor	01 044050 240	MTE
Overload	0 1 000130 0XX *	MTE
Alternatives:-		
Contactor	BF 16.40	Lovato
Overload	RF 25.*	Lovato
Fuse	130 XX*	Legrand
(*dependant on plant size)		
Fuse Holder	214 0l	Legrand
Pushbutton	MP0031	Bulgin
Fuse Fl 250mA ceramic	S501 250mA	Bussmann
Fuse F2 & F3 2A	S500 2A	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
Duplex Anaesthetic Gas Scavenging Plant

Model .....Serial No.....Voltage.....V
Current .....A Phases.....Frequency Hz 50
Maximum Prospective Fault Current.....KA
Drawing No WAGD5 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 .