



TRANS-ATS AUTOMATIC TRANSFER SWITCH User Manual

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EU DECLARATION OF CONFORMITY

Manufacturer's Name : EMKO ELEKTRONIK A.S.
Manufacturer's Address : DOSAB, Karanfil Sk., No:6,
16369 Bursa, TURKEY

The manufacturer hereby declares that the product:

Product Name : Automatic Transfer Switch

Type Number : TRANS-ATS

Product Category : Electrical equipment for measurement, control and laboratory use

Conforms to the following directives :

2006 / 95 / EC The Low Voltage Directive

2004 / 108 / EC The Electromagnetic Compatibility Directive

has been designed and manufactured to the following specifications:

EN 61000-6-4:2007 EMC Generic Emission Standard for Industrial Environments

EN 61000-6-2:2005 EMC Generic Immunity Standard for Industrial Environments

EN 61010-1:2001 Safety Requirements for electrical equipment for measurement, control and laboratory use

When and Where Issued

25th February 2011

Bursa-TURKEY

Authorized Signature

Name : Serpil YAKIN

Position : Quality Manager

1.Introduction

1.1 General Specifications

The unit provides the mains voltage monitoring and automatic transfer switching. In the event of a mains voltage failure, the remote start relay output is energized and the unit automatically transfers the load from the mains to the generator. Both automatic and manual control is possible. A test mode is also available which allows the generator to be run without taking the load.

The unit is extensively programmable through the front panel, with password protection on two levels. Operational parameters can also be monitored and controlled from a PC via a built-in USB port.

The unit monitors generator operation and gives warning of any faults that are detected. If a fault is detected, the unit shuts down the engine and shows the failure message on the LCD display.

1.2 Warranty

EMKO Elektronik warrants that the equipment delivered is free from defects in material and workmanship. This warranty is provided for a period of two years. The warranty period starts from the delivery date. This warranty is in force if duty and responsibilities which are determined in warranty document and instruction manual performs by the customer completely.

1.3 Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.

Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.

2.Installation



Before beginning installation of this product, please read the instruction manual and warnings below carefully.

A visual inspection of this product for possible damage occurred during shipment is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of serious accident resulting from a failure or defect in this unit , power off the system and separate the electrical connection of the device from the system.

Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.

2.1 Unit Configuration

The unit can be programmed using the buttons and LCD display on the front panel or PC Software.

2.2 Panel Mounting

The unit is designed for panel mounting. Fixing is by two screw fixings.

1- Insert the unit in the panel cut-out from the front.

2- Insert the fixings in the slotted at the corners of the unit and tighten the fixing screws to secure the unit against the panel.



During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.

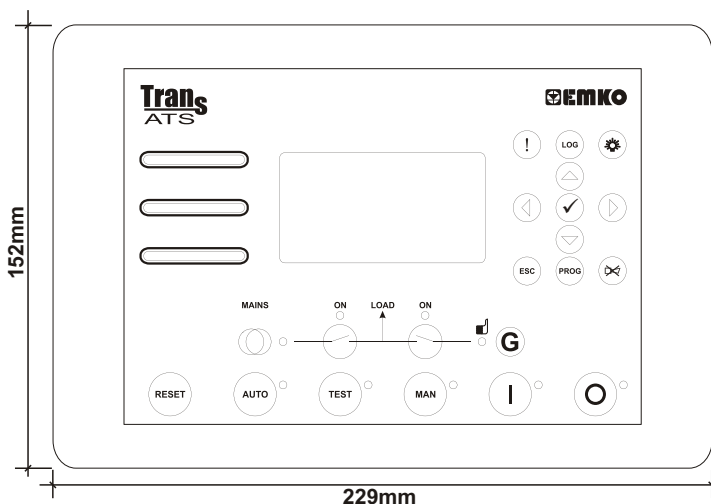


Figure 2.1 Front View

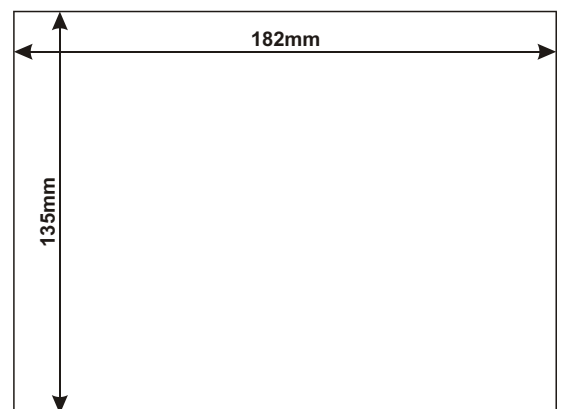
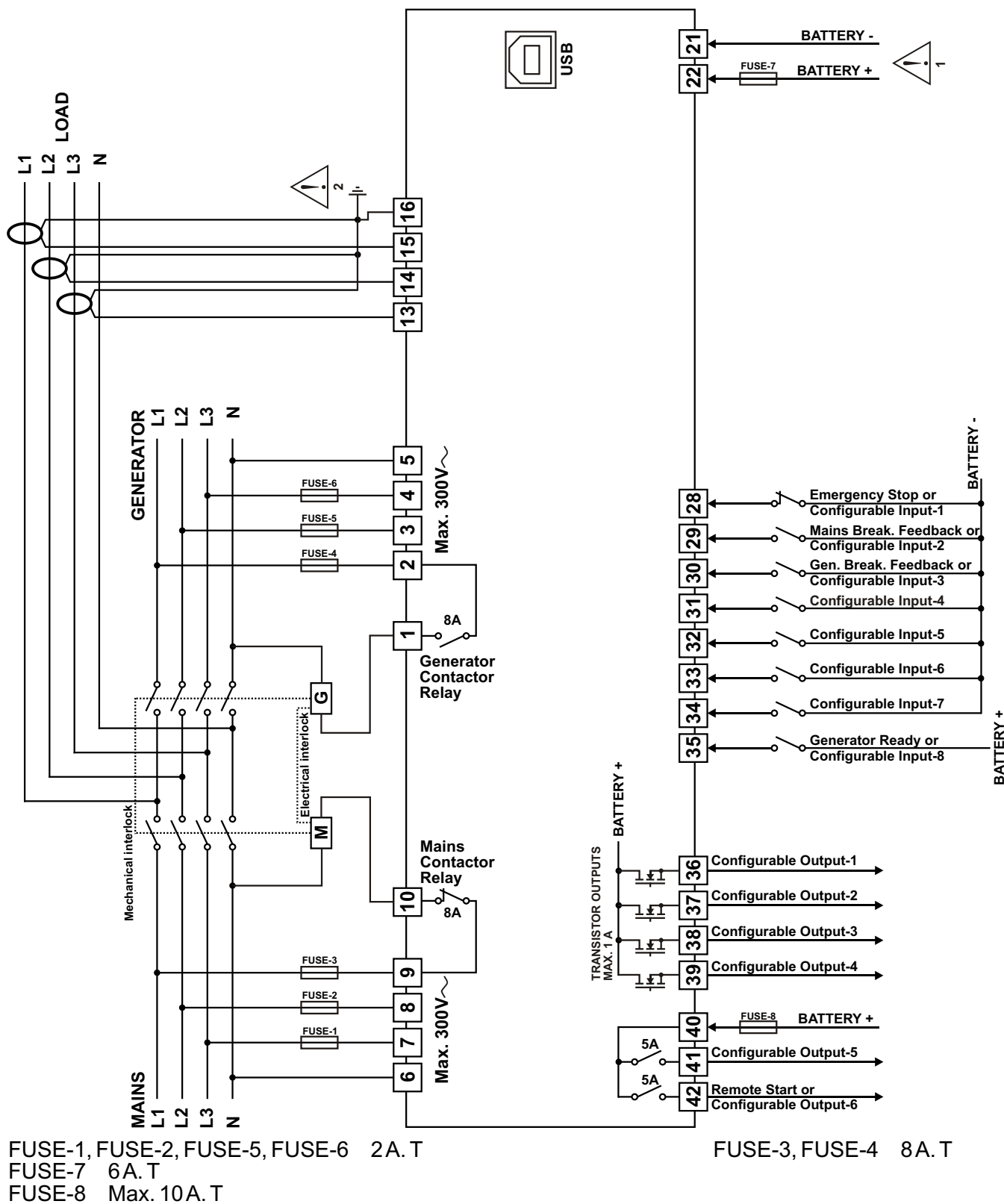


Figure 2.2 Panel Cut-Out

2.3 Electrical Connection

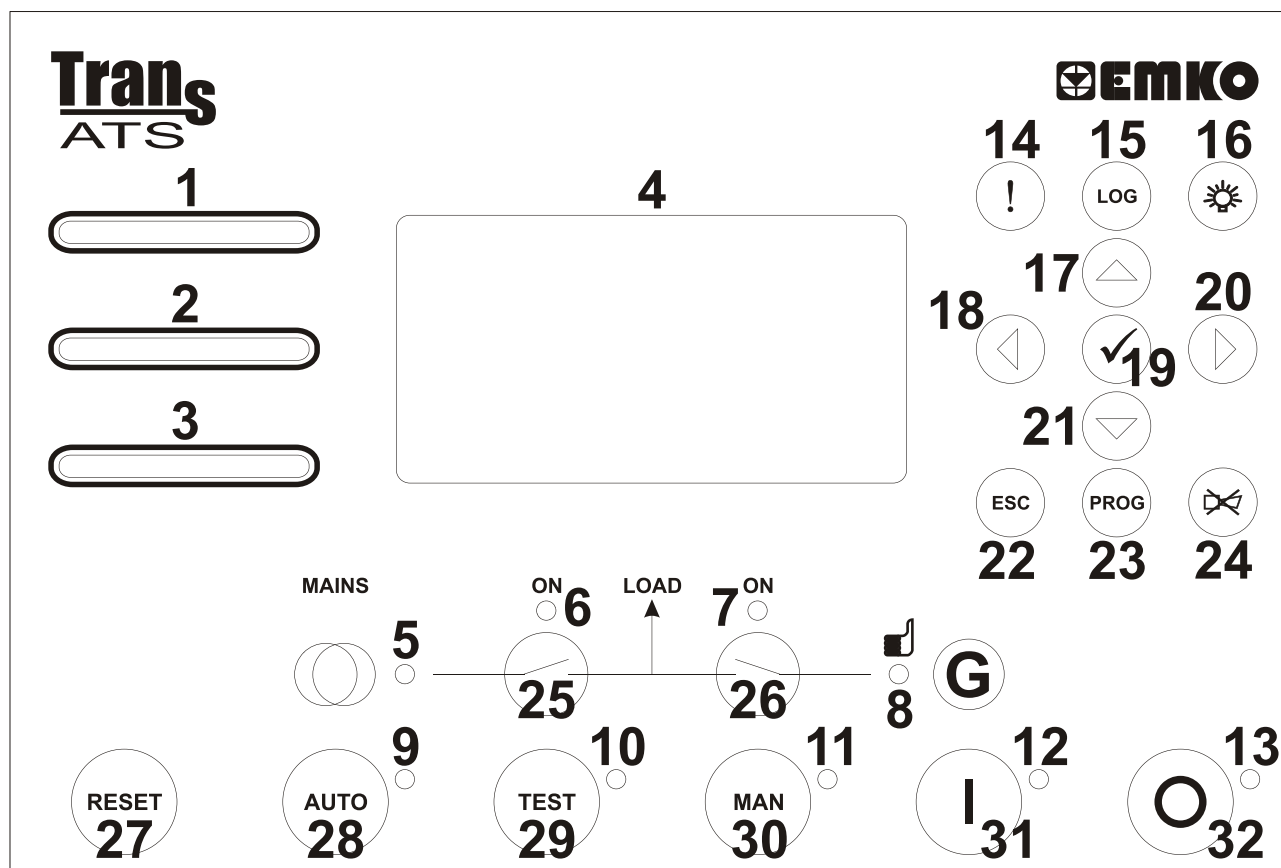
TRANS-ATS three phase connections schematic



- 1- Connect the unit as shown in the appropriate diagram. Be sure to connect the battery supply the right way round and battery negative should be grounded.
- 2- Current transformers secondary should be grounded.

3. Front Panel Description And Accessing To The Parameters

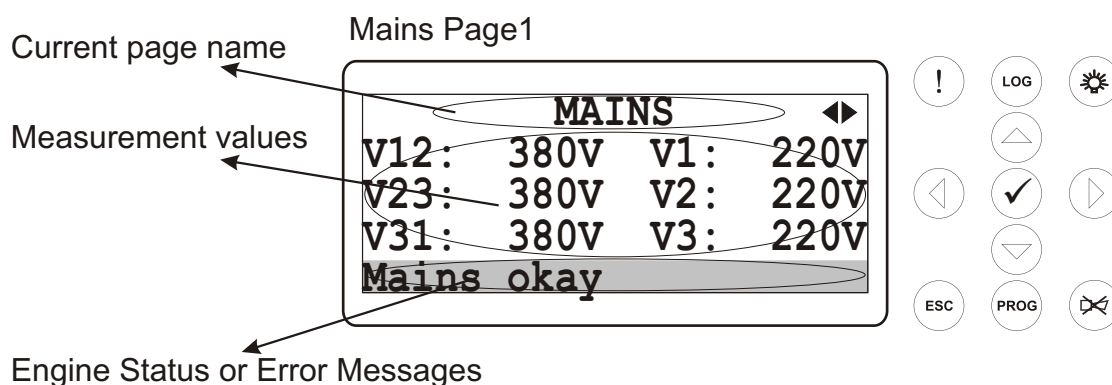
3.1 Front Panel Description



Number	Comment
1	This LED indicates that a "Shutdown" alarm was detected.
2	This LED indicates that a "Warning" alarm was detected
3	This LED indicates that a "Maintenance" alarm was detected
4	This LCD display is used for displaying the electrical measurements during normal operation, and editing/inspecting programming parameters in program mode.
5	This LED indicates that Mains voltage and frequency is within limits and is ready to take over the load.
6	This LED shows that the load is supplied from the mains.
7	This LED shows that the load is supplied from the generator.
8	This LED indicates that Generator voltage and frequency is within limits and is ready to take over the load.
9	This LED shows that the unit is in the AUTO mode.
10	This LED shows that the unit is in the TEST mode.
11	This LED shows that the unit is in the MANUAL mode.
12	In the MAN, AUTO and TEST modes, this LED indicates that the engine is starting up or is running.
13	This LED shows that the unit is in the STOP mode.

Number	Comment
14	Warning and Alarm messages shortcut button.
15	Event Logs shortcut button.
16	The LAMP TEST button illuminates all LED indicators.
17	This button is used for showing previous parameters on the currently selected page in normal operation. In Programming mode, it operates as an Up button (changing cursor position) or Increment button (increase parameter value).
18	This button is used for showing previous page in normal operation. In Programming mode, it operates as an Left button (changing cursor position).
19	This button is used for entering parameter edit section and saving parameter value in programming mode.
20	This button is used for showing next page in normal operation. In Programming mode, it operates as an Right button (changing cursor position).
21	This button is used for showing next parameters on the currently selected page in normal operation. In Programming mode, it operates as an Down button (changing cursor position) or Decrement button (decrease parameter value).
22	The Escape button is used for exit previous section in programming mode.
23	When this button is pressed, the unit goes into its PROGRAMMING Mode.
24	This button will silence the alarm horn after a failure has been detected.
25	This button opens or closes the mains contactor, only operative when manual mode is selected.
26	This button opens or closes the gen. contactor, only operative when manual mode is selected.
27	This button will reset the controller after a failure has been detected.
28	The AUTO button is used for changing operating mode of the unit to the AUTO Mode.
29	The TEST button is used for changing operating mode of the unit to the TEST Mode.
30	The MAN button is used for changing operating mode of the unit to the MANUAL Mode.
31	The START button is used for starting the engine when the unit is in the Manual Mode.
32	The STOP button is used for changing operating mode of the unit to the STOP Mode. The generator is stopped.

LCD display Description



128x64 Dot-matrix LCD display.

Use the Next and Previous buttons to select which Data display page (screen) is to be displayed.

When the Alarm (!) shortcut button is pressed, the Warning & Alarm display page is displayed.

When the Event log (LOG) shortcut button is pressed, the Event Log display page is displayed.

Data display pages on the LCD display;

Mains Page1:

MAINS			
V12:	380V	V1:	220V
V23:	380V	V2:	220V
V31:	380V	V3:	220V
Mains okay			

V12: Mains voltage L1-L2
V23: Mains voltage L2-L3
V31: Mains voltage L3-L1
V1: Mains voltage L1-N
V2: Mains voltage L2-N
V3: Mains voltage L3-N

Mains Page2:

MAINS	
Fq: 50.0Hz	
Mains okay	

Fq: Mains frequency

Generator Page1:

GENERATOR			
V12:	380V	V1:	220V
V23:	380V	V2:	220V
V31:	380V	V3:	220V
On load			

V12: Generator voltage L1-L2
V23: Generator voltage L2-L3
V31: Generator voltage L3-L1
V1: Generator voltage L1-N
V2: Generator voltage L2-N
V3: Generator voltage L3-N

Generator Page2:

GENERATOR	
Fq: 50.0Hz	
Phase seq.: L1 L2 L3	
On load	

Fq: Generator frequency
Phase Seq.: Generator phase sequence

Generator Page3:

GENERATOR	
kWh :	30600
kVArh:	7200
On load	

kWh: Generator active energy
kVArh: Generator reactive energy

Load Page1:

LOAD			
I1:	26A	PF1:	0.84
I2:	23A	PF2:	0.80
I3:	25A	PF3:	0.82
On load			

I1: Load Current L1
I2: Load Current L2
I3: Load Current L3
PF1: Load power factor L1
PF2: Load power factor L2
PF3: Load power factor L3

Load Page2:

LOAD	
P1:	170kW
P2:	170kW
P3:	170kW
On load	

P1: Load active power L1
P2: Load active power L2
P3: Load active power L3

Load Page3:

LOAD	
Q1:	40kVAr
Q2:	40kVAr
Q3:	40kVAr
On load	

Q1: Load reactive power L1
Q2: Load reactive power L2
Q3: Load reactive power L3

Load Page4:

LOAD	
S1:	210kVA
S2:	210kVA
S3:	210kVA
On load	

S1: Load apparent power L1
S2: Load apparent power L2
S3: Load apparent power L3

Load Page5:

LOAD	
P:	510kW
Q:	120kVAr
S:	630kVA
On load	

P: Load total active power
Q: Load total reactive power
S: Load total apparent power

Power Supply Page:

POWER SUPPLY	
Battery volt: 12.0Vdc	
On load	

Battery volt: Battery supply voltage

Input & Output Status Page:

INPUT & OUTPUT	
	1 4 5 8
Inputs :	0000 0000
Outputs:	0000 0000
On load	

Inputs: Input status information. If an input is active, related digit is displayed as "1" else it is displayed as "0".
1: Conf. in-1, **2:** Conf. in-2, **3:** Conf. in-3, **4:** Conf. in-4,
5: Conf. in-5, **6:** Conf. in-6, **7:** Conf. in-7, **8:** Conf. In-8.
Outputs: Output status information. If an output is active, related digit is displayed as "1" else it is displayed as "0".
1: Conf. out-1, **2:** Conf. out-2, **3:** Conf. out-3, **4:** Conf. out-4,
5: Conf. out-5, **6:** Conf. out-6, **7:** Generator contactor,
8: Mains contactor.

Exp. Input & Output Status Page:

EXP. INPUT & OUTPUT ◀▶				
	1	4	5	8
Inputs :	0000	0000		
Outputs:	0000	0000		
On load				

Inputs: Exp. input status information. If an input is active, related digit is displayed as "1" else it is displayed as "0".

1: Exp. conf. in-1, 2: Exp. conf. in-2, 3: Exp. conf. in-3,
4: Exp. conf. in-4, 5: Exp. conf. in-5, 6: Exp. conf. in-6,
7: Exp. conf. in-7, 8: Exp. conf. in-8.

Outputs: Exp. output status information. If an output is active, related digit is displayed as "1" else it is displayed as "0".

1: Exp. conf. out-1, 2: Exp. conf. out-2, 3: Exp. conf. out-3,
4: Exp. conf. out-4, 5: Exp. conf. out-5, 6: Exp. conf. out-6,
7: Exp. conf. out-7, 8: Exp. conf. out-8.

Date & Time Page:

DATE & TIME ◀▶	
15/02/2011	
13:32:28	

Date: Day, Month, Year.

Time: Hour, minute, second.

Warning & Alarm display pages on the LCD display;

Warning & Alarm Page:

WARNING&ALARM 1/3 ◀▶	
Emergency stop!	

1/3: The first message of current alarms.

Emergency stop!: This message indicates that an emergency stop alarm has occurred.

Event Log display pages on the LCD display;

Event Log Page1:

EVENT LOG 1.1 ◀▶	
15/02/2011 14:26:08	
Emergency stop	
V1: 220V	I1: 26A
V2: 220V	I2: 23A

1.1: The first page of related event log

Emergency stop: This message indicates that an emergency stop alarm has occurred. (Event history: 15/02/2011 date, 14:26:08 time).

V1: Generator voltage L1-N

I1: Load Current L1

V2: Generator voltage L2-N

I2: Load Current L2

Event Log Page2:

EVENT LOG 1.2 ◀▶	
V3: 220V	I3: 25A
Fq: 50.0Hz	kW: 510
Mains	

1.2: The second page of related event log

V3: Generator voltage L3-N

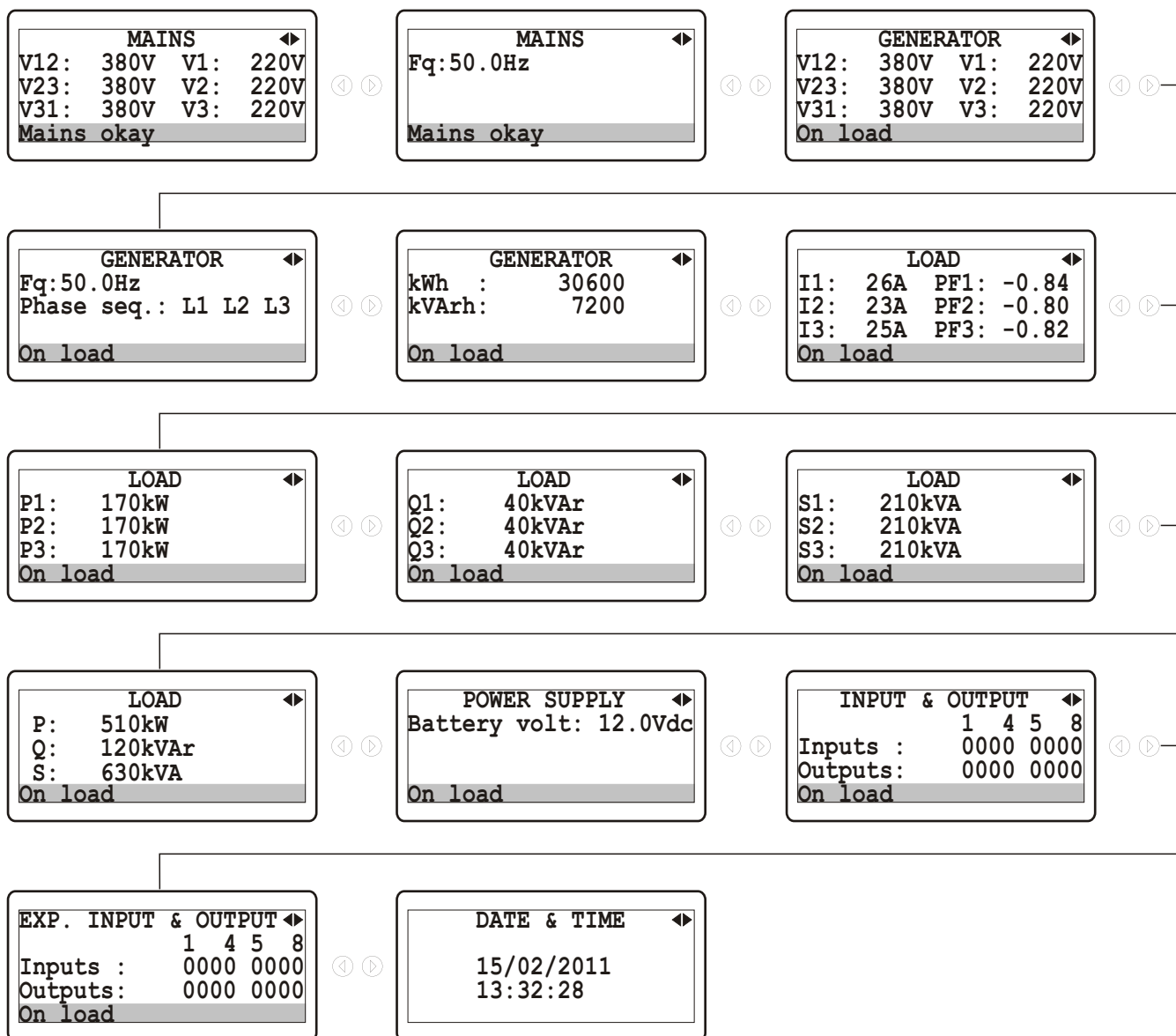
I3: Load Current L3

Fq: Generator frequency

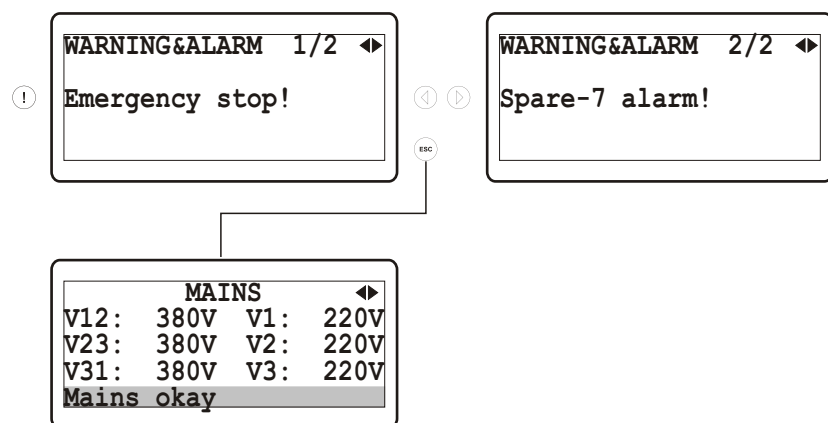
kW: Generator total active power

Mains: This message indicates that load is supplied from mains

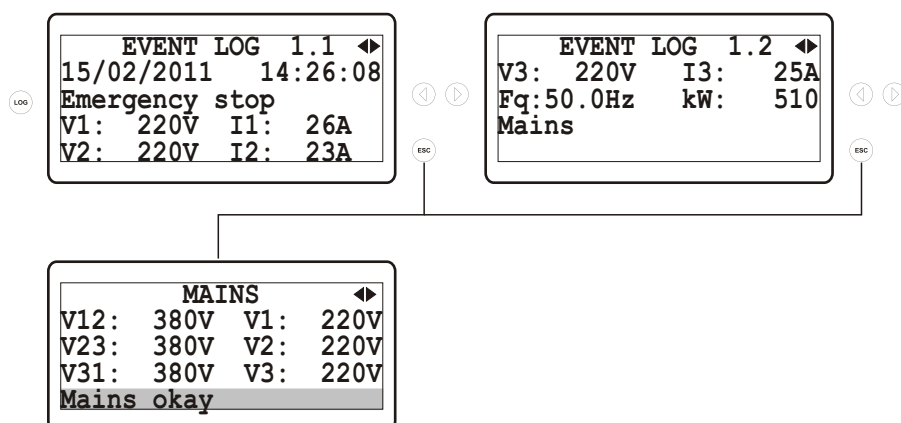
Example-1: Displaying all Data display pages.



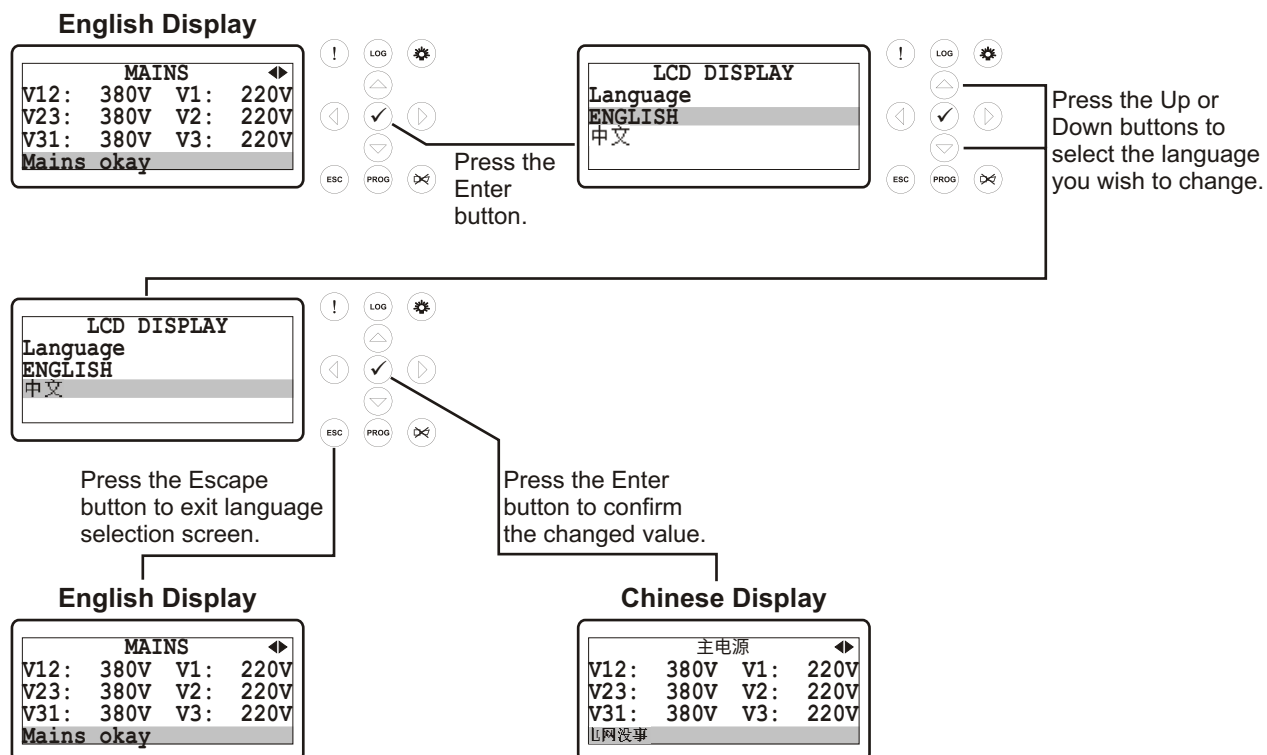
Example-2: Displaying all Warning&Alarm display pages



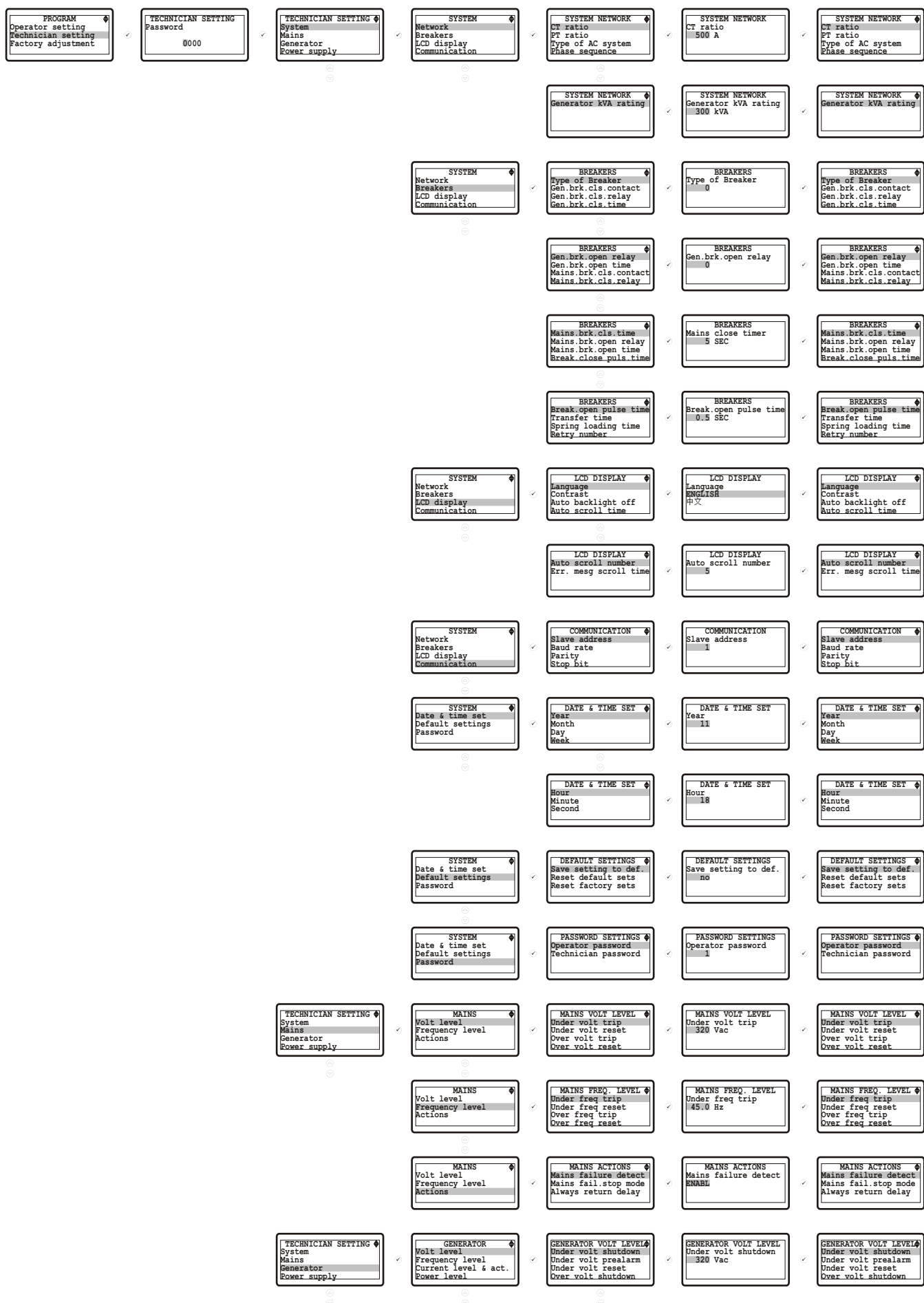
Example-3: Displaying all Event Log display pages



LCD display language selection

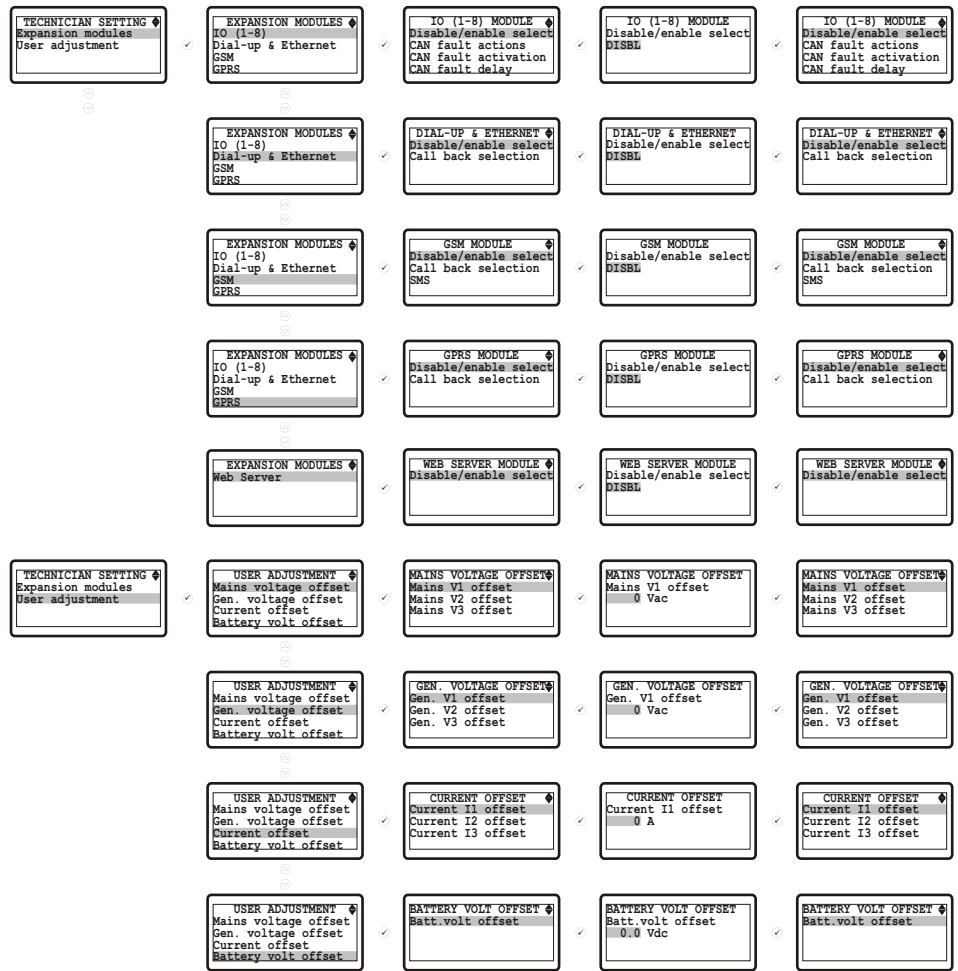


3.3 Accessing To The Technician Parameters



		GENERATOR VOLT LEVEL Over volt prealarm Over volt reset Shutdown delay time	✓	GENERATOR VOLT LEVEL Over volt prealarm 340 Vac	✓	GENERATOR VOLT LEVEL Over volt prealarm Over volt reset Shutdown delay time
GENERATOR Volt level Frequency level Current level & act. Power level	✓	GENERATOR FREQ LEVEL Under freq shutdown Under freq prealarm Under freq reset Over freq shutdown	✓	GENERATOR FREQ LEVEL Under freq shutdown 43.0 Hz	✓	GENERATOR FREQ LEVEL Under freq shutdown Under freq prealarm Under freq reset Over freq shutdown
		GENERATOR FREQ LEVEL Over freq prealarm Over freq reset Shutdown delay time	✓	GENERATOR FREQ LEVEL Over freq prealarm 55.0 Hz	✓	GENERATOR FREQ LEVEL Over freq prealarm Over freq reset Shutdown delay time
GENERATOR Volt level Frequency level Current level & act. Power level	✓	GEN CUR LEVEL & ACT Under cur. set Under cur. prealarm Under cur. reset Under cur. act.	✓	GEN CUR LEVEL & ACT Under cur. set 20 A	✓	GEN CUR LEVEL & ACT Under cur. set Under cur. prealarm Under cur. reset Under cur. act.
		GEN CUR LEVEL & ACT Under act. delay time Over cur. set Over cur. prealarm Over cur. reset	✓	GEN CUR LEVEL & ACT Under act. delay time 2 SEC	✓	GEN CUR LEVEL & ACT Under act. delay time Over cur. set Over cur. prealarm Over cur. reset
		GEN CUR LEVEL & ACT Over cur. act. Over act. delay time Short circuit cur.	✓	GEN CUR LEVEL & ACT Over cur. act. DISBL	✓	GEN CUR LEVEL & ACT Over cur. act. Over act. delay time Short circuit cur.
GENERATOR Volt level Frequency level Current level & act. Power level	✓	GEN POWER LEVEL Under power shutdown Under power prealarm Under power reset Over power shutdown	✓	GEN POWER LEVEL Under power shutdown 150 kVA	✓	GEN POWER LEVEL Under power shutdown Under power prealarm Under power reset Over power shutdown
		GEN POWER LEVEL Over power prealarm Over power reset Shutdown delay time Reverse power set	✓	GEN POWER LEVEL Over power prealarm 280 kVA	✓	GEN POWER LEVEL Over power prealarm Over power reset Shutdown delay time Reverse power set
		GEN POWER LEVEL Reverse power act. Rv.pow.act.delay time	✓	GEN POWER LEVEL Reverse power act. DISBL	✓	GEN POWER LEVEL Reverse power act. Rv.pow.act.delay time
GENERATOR Working calendar General	✓	GEN WORKING CALENDAR Disable/enable select Start time on monday Stop time on monday Start time on tues.	✓	GEN WORKING CALENDAR Disable/enable select DISBL	✓	GEN WORKING CALENDAR Disable/enable select Start time on monday Stop time on monday Start time on tues.
		GEN WORKING CALENDAR Stop time on tuesday Start time on wednes. Stop time on wednes. Start time on thurs.	✓	GEN WORKING CALENDAR Stop time on tuesday 17:30 Hour.Min	✓	GEN WORKING CALENDAR Stop time on tuesday Start time on wednes. Stop time on wednes. Start time on thurs.
		GEN WORKING CALENDAR Stop time on thursday Start time on friday Stop time on friday Start time on satur.	✓	GEN WORKING CALENDAR Stop time on thursday 18:30 Hour.Min	✓	GEN WORKING CALENDAR Stop time on thursday Start time on friday Stop time on friday Start time on satur.
		GEN WORKING CALENDAR Stop time on saturday Start time on sunday Stop time on sunday	✓	GEN WORKING CALENDAR Stop time on saturday 14:20 Hour.Min	✓	GEN WORKING CALENDAR Stop time on saturday Start time on sunday Stop time on Sunday
GENERATOR Working calendar General	✓	GENERATOR GENERAL Sens.option gen.freq All warning are latch	✓	GENERATOR GENERAL Sens.option gen.freq DISBL	✓	GENERATOR GENERAL Sens.option gen.freq All warning are latch
TECHNICIAN SETTING System Mains Generator Power supply	✓	POWER SUPPLY Battery	✓	POWER SUPPLY BATTERY Under volt Under volt reset Under volt delay Over volt	✓	POWER SUPPLY BATTERY Under volt 10.0 Vdc Under volt reset Under volt delay Over volt
		ENGINE PLANT BATTERY Over volt reset Over volt delay	✓	ENGINE PLANT BATTERY Over volt reset 29.5 Vdc	✓	ENGINE PLANT BATTERY Over volt reset Over volt delay

TECHNICIAN SETTING Engine Inputs Outputs Timers	ENGINE Load test Exercise Engine general	LOAD TEST Disable/enable select	LOAD TEST Disable/enable select DISBL	LOAD TEST Disable/enable select
	ENGINE Load test Exercise Engine general	EXERCISE Time of period Week Start time	EXERCISE Time of period 30 MIN	EXERCISE Time of period Week Start time
	ENGINE Load test Exercise Engine general	GENERAL Engine running volt Engine running freq.	GENERAL Engine running volt 300 Vac	GENERAL Engine running volt Engine running freq.
TECHNICIAN SETTING Engine Inputs Outputs Timers	INPUTS Conf. input-1 Conf. input-2 Conf. input-3 Conf. input-4	CONF. INPUT-1 Dis,user conf.or list Polarity Indication Activation	CONF. INPUT-1 Dis,user conf.or list 2	CONF. INPUT-1 Dis,user conf.or list Polarity Indication Activation
	INPUTS Conf. input-5 Conf. input-6 Conf. input-7 Conf. input-8	CONF. INPUT-5 Dis,user conf.or list Polarity Indication Activation	CONF. INPUT-5 Dis,user conf.or list 1	CONF. INPUT-5 Dis,user conf.or list Polarity Indication Activation
	INPUTS Conf. Exp. input-1 Conf. Exp. input-2 Conf. Exp. input-3 Conf. Exp. input-4	CONF. EXP. INPUT-1 Dis,user conf.or list Hardware type Polarity Indication	CONF. EXP. INPUT-1 Dis,user conf.or list 1	CONF. EXP. INPUT-1 Dis,user conf.or list Hardware type Polarity Indication
TECHNICIAN SETTING Engine Inputs Outputs Timers	INPUTS Conf. Exp. input-5 Conf. Exp. input-6 Conf. Exp. input-7 Conf. Exp. input-8	CONF. EXP. INPUT-5 Dis,user conf.or list Hardware type Polarity Indication	CONF. EXP. INPUT-5 Dis,user conf.or list 1	CONF. EXP. INPUT-5 Dis,user conf.or list Hardware type Polarity Indication
	INPUTS Conf. Exp. input-5 Conf. Exp. input-6 Conf. Exp. input-7 Conf. Exp. input-8	CONF. EXP. INPUT-5 Dis,user conf.or list Hardware type Polarity Indication	CONF. EXP. INPUT-5 Dis,user conf.or list 1	CONF. EXP. INPUT-5 Dis,user conf.or list Hardware type Polarity Indication
	INPUTS Conf. Exp. input-5 Conf. Exp. input-6 Conf. Exp. input-7 Conf. Exp. input-8	CONF. EXP. INPUT-5 Dis,user conf.or list Hardware type Polarity Indication	CONF. EXP. INPUT-5 Dis,user conf.or list 1	CONF. EXP. INPUT-5 Dis,user conf.or list Hardware type Polarity Indication
TECHNICIAN SETTING Engine Inputs Outputs Timers	OUTPUTS Conf. output-1 Conf. output-2 Conf. output-3 Conf. output-4	CONF. OUTPUT-1 Polarity Function	CONF. OUTPUT-1 Polarity NO	CONF. OUTPUT-1 Polarity Function
	OUTPUTS Conf. output-5 Conf. output-6 Conf. Exp. output-1 Conf. Exp. output-2	CONF. OUTPUT-5 Polarity Function	CONF. OUTPUT-5 Polarity NO	CONF. OUTPUT-5 Polarity Function
	OUTPUTS Conf. Exp. output-3 Conf. Exp. output-4 Conf. Exp. output-5 Conf. Exp. output-6	CONF. EXP. OUTPUT-3 Polarity Function	CONF. EXP. OUTPUT-3 Polarity NO	CONF. EXP. OUTPUT-3 Polarity Function
TECHNICIAN SETTING Engine Inputs Outputs Timers	OUTPUTS Conf. Exp. output-5 Conf. Exp. output-6 Conf. Exp. output-7 Conf. Exp. output-8	CONF. EXP. OUTPUT-5 Polarity Function	CONF. EXP. OUTPUT-5 Polarity NO	CONF. EXP. OUTPUT-5 Polarity Function
	START TIMERS Mains transient delay Mains fail start delay Remote start delay Generator fail delay	START TIMERS Mains transient delay Mains fail start delay Remote start delay Generator fail delay	START TIMERS Mains transient delay 2.0 SEC	START TIMERS Mains transient delay Mains fail start delay Remote start delay Generator fail delay
	START TIMERS Safety on delay Warming up time Horn duration Cooling fan time	START TIMERS Safety on delay Warming up time Horn duration Cooling fan time	START TIMERS Safety on delay 5 SEC	START TIMERS Safety on delay Warming up time Horn duration Cooling fan time
TECHNICIAN SETTING Engine Inputs Outputs Timers	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay	STOPPING TIMERS Mains return delay 5 SEC	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay
	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay	STOPPING TIMERS Mains return delay 5 SEC	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay
	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay	STOPPING TIMERS Mains return delay 5 SEC	STOPPING TIMERS Mains return delay Remote stop delay Fail to stop delay



3.4 Changing And Saving Parameters Values

Operation Screen

MAINS
V12: 380V V1: 220V
V23: 380V V2: 220V
V31: 380V V3: 220V
Mains okay



When the Prog button is pressed, the parameters section is asked for accessing to parameters.

PROGRAM
Operator setting
Technician setting
Factory adjustment



Press the Up or Down buttons to select the section you wish to view/change.

PROGRAM
Operator setting
Technician setting
Factory adjustment



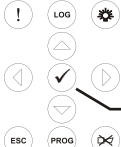
Press the Enter button.

TECHNICIAN SETTING
Password
0000



Enter password with cursor (Right, Left, Up and Down) buttons.

TECHNICIAN SETTING
Password
0162



Note1: If Enter button is pressed and the technician password is zero, Password screen is ignored.

Press the Enter button to confirm password. If the password is incorrect, the unit will drop out of program mode.

TECHNICIAN SETTING
System
Mains
Generator
Power supply



Press the Up or Down buttons to select the main parameter group you wish to view/change.

TECHNICIAN SETTING
System
Mains
Generator
Power supply



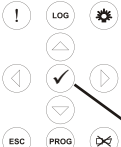
Press Enter button to access to all parameters page in currently main parameter group.

GENERATOR
Volt level
Frequency level
Current level & act.
Power level



Press Enter button to access to all parameters in currently parameter page.

GENERATOR VOLT LEVEL
Under volt shutdown
Under volt prealarm
Under volt reset
Over volt shutdown



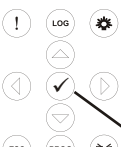
Press the Enter button to view parameter value.

GENERATOR VOLT LEVEL
Under volt shutdown
320 Vac



Parameter can be changed with Up and Down buttons.

GENERATOR VOLT LEVEL
Under volt shutdown
325 Vac



Press Enter button to confirm the changed value.

GENERATOR VOLT LEVEL
Under volt shutdown
Under volt prealarm
Under volt reset
Over volt shutdown



To exit from programming mode any time, press Prog button.

GENERATOR
Volt level
Frequency level
Current level & act.
Power level

When the Escape button is pressed any time, previous page can be accessed.

MAINS
V12: 380V V1: 220V
V23: 380V V2: 220V
V31: 380V V3: 220V
Mains okay

Operation Screen

4. Parameters

4.1 Operator Parameters

4.1.1 Mains

MAINS VOLT LEVEL (<i>Mains->Volt level</i>)		Min	Max	Default	Unit
Under volt trip	Mains Under Voltage	60	600	320	V $\sim$
Under volt reset	Mains Under Voltage Reset	60	600	340	V $\sim$
Over volt trip	Mains Over Voltage	60	600	440	V $\sim$
Over volt reset	Mains Over Voltage Reset	60	600	420	V $\sim$

MAINS FREQ. LEVEL (<i>Mains->Frequency level</i>)		Min	Max	Default	Unit
Under freq trip	Mains Under Frequency	20.0	75.0	45.0	Hz
Under freq reset	Mains Under Frequency Reset	20.0	75.0	48.0	Hz
Over freq trip	Mains Over Frequency	20.0	75.0	55.0	Hz
Over freq reset	Mains Over Frequency Reset	20.0	75.0	52.0	Hz

4.1.2 Generator

GENERATOR VOLT LEVEL (<i>Generator->Volt level</i>)		Min	Max	Default	Unit
Under volt shutdown	Generator Under Voltage Shutdown	60(dis)	600	320	V $\sim$
Under volt prealarm	Generator Under Voltage Pre-Alarm	60(dis)	600	340	V $\sim$
Under volt reset	Generator Under Voltage Pre-Alarm Reset	60	600	350	V $\sim$
Over volt shutdown	Generator Over Voltage Shutdown	60	600	440	V $\sim$
Over volt prealarm	Generator Over Voltage Pre-Alarm	60(dis)	600	420	V $\sim$
Over volt reset	Generator Over Voltage Pre-Alarm Reset	60	600	400	V $\sim$
Shutdown delay time	Generator Voltage Shutdown Delay Time	0.0	10.0	1.0	Sec

GENERATOR FREQ LEVEL (<i>Generator->Frequency level</i>)		Min	Max	Default	Unit
Under freq shutdown	Generator Under Frequency Shutdown	30.0(dis)	75.0	43.0	Hz
Under freq prealarm	Generator Under Frequency Pre-Alarm	30.0(dis)	75.0	45.0	Hz
Under freq reset	Generator Under Frequency Pre-Alarm Reset	30.0	75.0	46.0	Hz
Over freq shutdown	Generator Over Frequency Shutdown	30.0(dis)	75.0	58.0	Hz
Over freq prealarm	Generator Over Frequency Pre-Alarm	30.0(dis)	75.0	55.0	Hz
Over freq reset	Generator Over Frequency Pre-Alarm Reset	30.0	75.0	54.0	Hz
Shutdown delay time	Generator Frequency Shutdown Delay Time	0.0	10.0	1.0	Sec

GENERATOR CUR LEVEL (<i>Generator->Current level</i>)		Min	Max	Default	Unit
Under cur. set	Generator Under Current Set	0	9999	1	A $\sim$
Under cur. prealarm	Generator Under Current Pre-Alarm	0(dis)	9999	dis	A $\sim$
Under cur. reset	Generator Under Current Pre-Alarm Reset	0	9999	5	A $\sim$
Over cur. set	Generator Over Current Set	0	9999	9999	A $\sim$
Over cur. prealarm	Generator Over Current Pre-Alarm	0(dis)	9999	9990	A $\sim$
Over cur. reset	Generator Over Current Pre-Alarm Reset	0	9999	9980	A $\sim$

Note: dis = disable

GEN POWER LEVEL (<i>Generator->Power level</i>)		Min	Max	Default	Unit
Under power shutdown	Generator Under Power Shutdown	0(dis)	9999	dis	kVA
Under power prealarm	Generator Under Power Pre-Alarm	0(dis)	9999	dis	kVA
Under power reset	Generator Under Power Pre-Alarm Reset	0	9999	5	kVA
Over power shutdown	Generator Over Power Shutdown	0(dis)	9999	dis	kVA
Over power prealarm	Generator Over Power Pre-Alarm	0(dis)	9999	dis	kVA
Over power reset	Generator Over Power Pre-Alarm Reset	0	9999	0	kVA
Shutdown delay time	Generator Power Shutdown Delay Time	0	99	2	Sec
Reverse power set	Reverse Power Set	-9999	0	0	kW

GEN WORKING CALENDAR (<i>Generator->Working calendar</i>)		Min	Max	Default	Unit
Disable/enable select	Working Calendar Disable or Enable	DISBL/ENABL		DISBL	
Start time on monday	Working Calendar Work Start Time on Monday	0.00	23.59	0.00	H.Min
Stop time on monday	Working Calendar Work Stop Time on Monday	0.00	23.59	23.59	H.Min
Start time on tues.	Working Calendar Work Start Time on Tuesday	0.00	23.59	0.00	H.Min
Stop time on tuesday	Working Calendar Work Stop Time on Tuesday	0.00	23.59	23.59	H.Min
Start time on wednes.	Working Calendar Work Start Time on Wednesday	0.00	23.59	0.00	H.Min
Stop time on wednes.	Working Calendar Work Stop Time on Wednesday	0.00	23.59	23.59	H.Min
Start time on thurs.	Working Calendar Work Start Time on Thursday	0.00	23.59	0.00	H.Min
Stop time on thursday	Working Calendar Work Stop Time on Thursday	0.00	23.59	23.59	H.Min
Start time on friday	Working Calendar Work Start Time on Friday	0.00	23.59	0.00	H.Min
Stop time on friday	Working Calendar Work Stop Time on Friday	0.00	23.59	23.59	H.Min
Start time on satur.	Working Calendar Work Start Time on Saturday	0.00	23.59	0.00	H.Min
Stop time on saturday	Working Calendar Work Stop Time on Saturday	0.00	23.59	23.59	H.Min
Start time on sunday	Working Calendar Work Start Time on Sunday	0.00	23.59	0.00	H.Min
Stop time on sunday	Working Calendar Work Stop Time on Sunday	0.00	23.59	23.59	H.Min

Please enter the days of the weekly workdays for Working Function. Example:

Disable/enable select

DISBL The working calendar is disable

ENABL The working calendar is enable

Start time on monday

08.30 The working function is every Monday started at 08.30 o'clock
(if it is enabled)

Stop time on monday

17.30 The working function is every Monday stopped at 17.30 o'clock
(if it is enabled)

Start time on tues.

08.30 The working function is every Tuesday started at 08.30 o'clock
(if it is enabled)

Stop time on tuesday

17.30 The working function is every Tuesday stopped at 17.30 o'clock
(if it is enabled)

Start time on wednes.

08.30 The working function is every Wednesday started at 08.30 o'clock
(if it is enabled)

Stop time on wednes.

17.30 The working function is every Wednesday stopped at 17.30 o'clock
(if it is enabled)

Start time on thurs.

08.30 The working function is every Thursday started at 08.30 o'clock
(if it is enabled)

Stop time on thursday

17.30 The working function is every Thursday stopped at 17.30 o'clock
(if it is enabled)

Start time on friday

08.30 The working function is every Friday started at 08.30 o'clock
(if it is enabled)

Stop time on friday

17.30 The working function is every Friday stopped at 17.30 o'clock
(if it is enabled)

Start time on satur.

08.30 The working function is every Saturday started at 08.30 o'clock
(if it is enabled)

Stop time on saturday

17.30 The working function is every Saturday stopped at 17.30 o'clock
(if it is enabled)

Start time on sunday

08.30 The working function is every Sunday started at 08.30 o'clock
(if it is enabled)

Stop time on sunday

17.30 The working function is every Sunday stopped at 17.30 o'clock
(if it is enabled)

4.2 Technician Parameters

4.2.1 System

SYSTEM NETWORK (<i>System->Network</i>)		Min	Max	Default	Unit
CT ratio	Current Transformer Ratio	5	9999	100	
PT ratio	Voltage Transformer Ratio	1	100	1	
Type of AC system	Select AC system; 0- 1 Phase 2 Wire 1- 3 Phase 4 Wire 2- 2 Phase 3 Wire L1-L2 3- 2 Phase 3 Wire L1-L3	0	3	1	
Phase sequence	Generator Phase Sequence (dis, L123 or L321)	DISBL, L123, L321		DISBL	
Generator kVA rating	Generator kVA rating set	0	9999	300	kVA

CT ratio

Load current transformers transfer ratio(Primary current/Secondary current) value must be entered to this parameter.

Example:

If Current Transformer Primary=500A and Current Transformer Secondary=5A, Current Transformer Ratio should be entered CT Primary/CT Secondary=100.

PT ratio

Defines the scaling factor applied to voltage readout and associated fault conditions.

This PT ratio is for additional voltage transformers mounted the unit.

BREAKERS (<i>System->Breakers</i>)		Min	Max	Default	Unit
Type of Breaker	Hardware Breaker Selection	0	2	0	
Gen.brk.cls.contact	Gen Close Breaker Contact Type	NO / NC		0	
Gen.brk.cls.relay	Gen Close Breaker Relay Type	NOR / PULS		0	
Gen.brk.cls.time	Gen Close Timer	1	250	5	Sec
Gen.brk.open relay	Gen Open Breaker Relay Type	NOR / PULS		0	
Gen.brk.open time	Gen Open Timer	1	250	5	Sec
Mains.brk.cls.contact	Mains Close Breaker Contact Type	NO / NC		0	
Mains.brk.cls.relay	Mains Close Breaker Relay Type	NOR / PULS		0	
Mains.brk.cls.time	Mains Close Timer	1	250	5	Sec
Mains.brk.open relay	Mains Open Breaker Relay Type	NOR / PULS		0	
Mains.brk.open time	Mains Open Timer	1	250	5	Sec
Break.close puls.time	Breaker Close Pulse Time	0.0	10.0	0.5	Sec
Break.open pulse time	Breaker Open Pulse Time	0.0	10.0	0.5	Sec
Transfer time	Transfer Time	0	250	2	Sec
Spring loading time	Spring Loading Time	1	250	3	Sec
Retry number	Retry Number	1	250	5	

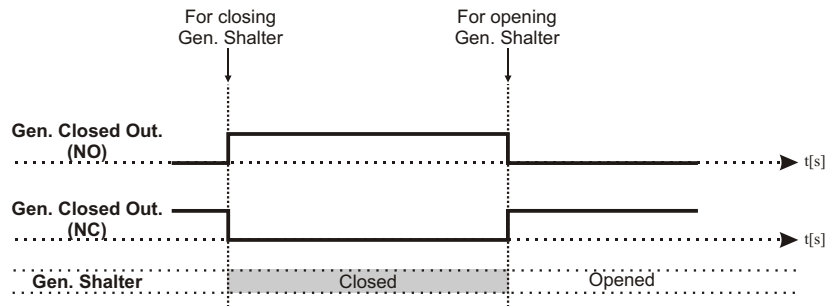
Hardware Breaker Selection

0- Breakers: Mains and Gen breakers have only close drives and if close drive off breaker will open. Parameters; GEN CLOSE BREAKER CONTACT TYPE, GEN CLOSE TIMER(if gen closed input selected), GEN OPEN TIMER(if gen closed input selected), MAIN CLOSE BREAKER CONTACT TYPE, MAINS CLOSE TIMER(if mains closed input selected), MAINS OPEN TIMER(if mains closed input selected), TRANSFER TIME.

Note-1 : NO / NC : Normally Open / Normally Close

2 : NOR / PULS : Normal / Pulse

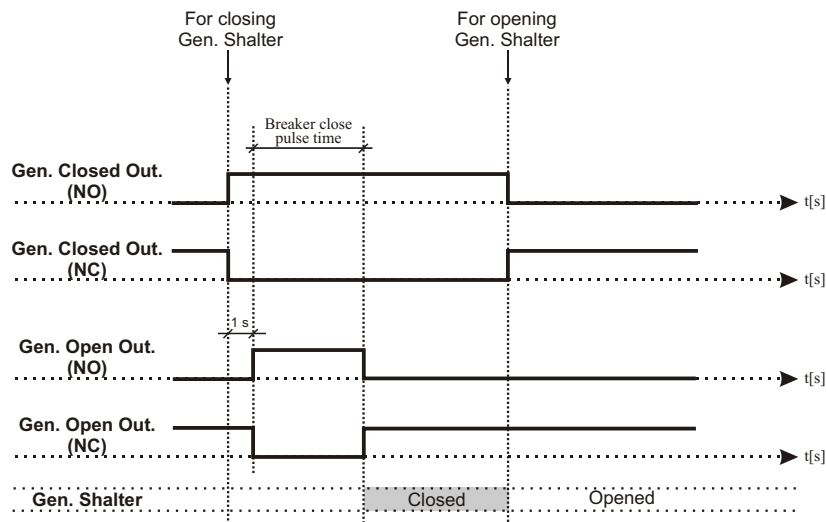
Example: If Hardware Breaker Selection parameter is selected as 0;



1- User Configured: Mains and Gen breakers have only close drives, when want to breaker close, close breaker output on and after 1 sec. open breaker output on and after breaker close pulse time open breaker output will off. When want to breaker open close breaker output and open breaker output will off.

Parameters; GEN CLOSE BREAKER CONTACT TYPE, GEN CLOSE TIMER(if gen closed input selected), GEN OPEN TIMER(if gen closed input selected), MAIN CLOSE BREAKER CONTACT TYPE, MAINS CLOSE TIMER(if mains closed input selected), MAINS OPEN TIMER(if mains closed input selected), BREAKER CLOSE PULSE TIME, TRANSFER TIME.

Example: If Hardware Breaker Selection parameter is selected as 1;



2- Motorised Breakers: User can select all the breaker types.

Parameters; GEN CLOSE BREAKER CONTACT TYPE, GEN CLOSE BREAKER RELAY TYPE, GEN CLOSE TIMER(if gen closed input selected), GEN OPEN BREAKER RELAY TYPE, GEN OPEN TIMER(if gen closed input selected), MAIN CLOSE BREAKER CONTACT TYPE, MAIN CLOSE BREAKER RELAY TYPE, MAINS CLOSE TIMER(if mains closed input selected), MAIN OPEN BREAKER RELAY TYPE, MAINS OPEN TIMER(if mains closed input selected), BREAKER CLOSE PULSE TIME(if Gen Close Breaker Relay Type or Main Close Breaker Relay Type parameter is selected as 1), BREAKER OPEN PULSE TIME(if Gen Open Breaker Relay Type or Main Open Breaker Relay Type parameter is selected as 1), TRANSFER TIME, SPRING LOADING TIME, RETRY NUMBER.

Example-1: GCB Close Diagram.

If Hardware Breaker Selection parameter is selected as 2 (Motorised Breakers), Gen. Close Breaker Relay Type parameter is selected as 1 (PULSE) and Gen. Open Breaker Relay Type parameter is selected as 1 (PULSE);

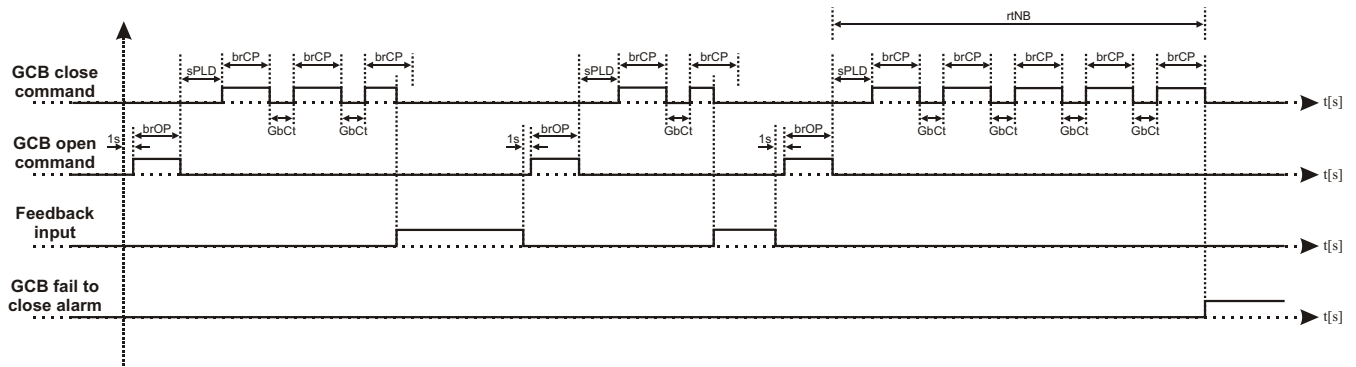
GbCt: Gen close timer

brCP: Breaker close pulse time

brOP: Breaker open pulse time

sPLD: Spring loading time

rtNB: Retry number

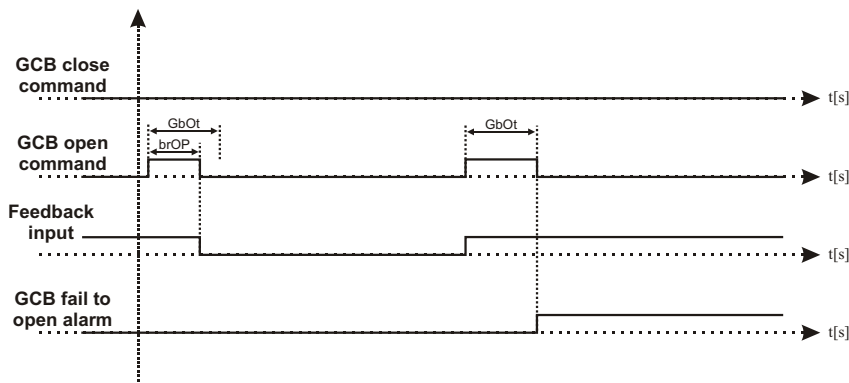


Example-2: GCB Open Diagram.

If Hardware Breaker Selection parameter is selected as 2 (Motorised Breakers), Gen. Close Breaker Relay Type parameter is selected as 1 (PULSE) and Gen. Open Breaker Relay Type parameter is selected as 1 (PULSE);

GbOt: Gen open timer

brOP: Breaker open pulse time



Gen Close Timer

This is used to monitor the closure of the generator contactor or breaker. It will only operate if an auxiliary input is configured as 'Generator Closed Auxiliary' and connected to the auxiliary on the generator contactor or breaker. Once a generator closed signal is issued the 'gen close timer' is initiated. Should the 'Generator Closed Auxiliary' input become active the timer the 'gen close timer' is cancelled. If the timer expires and the 'Generator Closed Auxiliary' has not become active the module will issue a 'generator failed to close' alarm.

Gen Open Timer

This is used to monitor the opening of the generator contactor or breaker. It will only operate if an auxiliary input is configured as 'Generator Closed Auxiliary' and connected to the auxiliary on the generator contactor or breaker. Once a generator open signal is issued the 'gen open timer' is initiated. Should the 'Generator Closed Auxiliary' input become in-active the timer 'gen open timer' is cancelled. If the timer expires and the 'Generator Closed Auxiliary' has not become in-active the module will issue a 'generator failed to open' alarm.

Mains Close Timer

This is used to monitor the closure of the mains contactor or breaker. It will only operate if an auxiliary input is configured as 'Mains Closed Auxiliary' and connected to the auxiliary on the mains contactor or breaker. Once a mains closed signal is issued the 'mains close timer' is initiated. Should the 'Mains Closed Auxiliary' input become active the timer the 'mains close timer' is cancelled. If the timer expires and the 'Mains Closed Auxiliary' has not become active the module will issue a 'mains failed to close' alarm.

Mains Open Timer

This is used to monitor the opening of the mains contactor or breaker. It will only operate if an auxiliary input is configured as 'Mains Closed Auxiliary' and connected to the auxiliary on the mains contactor or breaker. Once a mains open signal is issued the 'mains open timer' is initiated. Should the 'Mains Closed Auxiliary' input become in-active the timer the 'mains open timer' is cancelled. If the timer expires and the 'Mains closed auxiliary' has not become in-active the module will issue a 'mains failed to open' alarm.

Breaker Close Pulse Time

This is used to determine the duration of the Mains and Generator close signals. This timer is only used if Pulsed outputs are configured to be used.

Breaker Open Pulse Time

This is used to determine the duration of the Mains and Generator close signals. This timer is only used if Pulsed outputs are configured to be used.

Transfer Time

This is used to allow for fixed duration transfer breaks when switching from mains to generator and back. It can be used to ensure that the supply is removed from the load for fixed period of time to allow pumps/motors to come to rest etc.

Spring Loading Time

When the unit give open command to the (GCB or MCB) breaker and after that the unit want to give close command the same breaker, this time for between open and close commands, because if there is no delay between open and close commands can be problem the motorized switches.

Retry Number

The unit try to close (GCB or MCB) breaker number of this parameter. If each try there is no close feedback, after last try the alarm will be activated.

LCD DISPLAY (<i>System->LCD display</i>)		Min	Max	Default	Unit
Language* ¹	Language Selection	ENGLISH/CHINESE		ENGLISH	
Contrast	Contrast Setting	4	9	5	
Auto backlight off	Auto Backlight Off	ENABL/DISBL		DISBL	
Auto scroll time	Auto Scroll Time	0 (dis)	250	0	Sec
Auto scroll number	Auto Scroll Number	1	14	5	
Err. mesg scroll time	Scroll Time For Error Messages	1	250	2	Sec

Language Selection

Language selection: English or Chinese.

Digital Contrast

It is used to change contrast of LCD Display.

Auto Backlight Off

ENABL: If any button is not pressed during 120 secs, LCD backlight is automatically changed power safety mode.

DISBL: LCD backlight is on continuously.

Auto Scroll Time

The scroll time between all data display pages.

Auto Scroll Number

The number of data display pages that will be scrolled.

Scroll Time For Error Messages

Error messages are displayed the last line of LCD Display. If more than one error condition is present, each of them is displayed during time defined by Auto Scroll Timer parameter.

Note: *¹=Selectable value of this parameter is "ENGLISH/TURKCE" at TRANS-AMF (TR) devices, "ENGLISH/РУССКИЙ" at TRANS-AMF (RU) devices.
dis = disable

COMMUNICATION (System->Communication)		Min	Max	Default	Unit
Slave address	Slave Address	1	247	1	
Baud rate	Baud Rate 0 - 1200 baud 1 - 2400 baud 2 - 4800 baud 3 - 9600 baud 4 - 19200 baud 5 - 38400 baud	0	5	3	
Parity	Parity 0 - NONE 1 - ODD 2 - EVEN	0	2	0	
Stop bit	Stop Bit (0-> 1 stop bit,1-> 2 stop bit)	0	1	0	

DATE & TIME SET (System->Date & time set)		Min	Max	Default	Unit
Year	Year	0	99		
Month	Month	1	12		
Day	Date	1	31		
Week	Day of week	1	7		
Hour	Hour	0	23		
Minute	Minute	0	59		
Second	Second	0	59		

Day of week 1=Monday,2=Tuesday,3=Wednesday,4=Thursday,5=Friday,6=Saturday,7=Sunday

DEFAULT SETTINGS (System->Default settings)		Min	Max	Default	Unit
Save setting to def.	Save setting to default	YES / NO		NO	
Reset default sets	Reset default sets	YES / NO		NO	
Reset factory sets	Reset factory sets	YES / NO		NO	

Save setting to default

If this parameter is selected as “Yes”, the unit’s currently parameters save as default sets.
After this parameter is reset automatically to “No”.

Reset default sets

If this parameter is selected as “Yes”, the unit’s parameters back to default sets.
After this parameter is reset automatically to “No”.

Reset factory sets

If this parameter is selected as “Yes”, the unit’s parameters back to factory sets.
After this parameter is reset automatically to “No”.

PASSWORD SETTINGS (System->Password settings)		Min	Max	Default	Unit
Operator password	Operator Password	0	9999	0	
Technician password	Technician Password	0	9999	0	

Operator Password

Use this option to change the Operator password. This password allows access to operator parameters section.

Technician Password

Use this option to change the Technician password. It allows access to both operator and technician parameters section.

Note: dis = disable

4.2.2 Mains

MAINS VOLT LEVEL (<i>Mains->Volt level</i>)		Min	Max	Default	Unit
Under volt trip	Mains Under Voltage	60	600	320	V~
Under volt reset	Mains Under Voltage Reset	60	600	340	V~
Over volt trip	Mains Over Voltage	60	600	440	V~
Over volt reset	Mains Over Voltage Reset	60	600	420	V~

MAINS FREQ. LEVEL (<i>Mains->Frequency level</i>)		Min	Max	Default	Unit
Under freq trip	Mains Under Frequency	20.0	75.0	45.0	Hz
Under freq reset	Mains Under Frequency Reset	20.0	75.0	48.0	Hz
Over freq trip	Mains Over Frequency	20.0	75.0	55.0	Hz
Over freq reset	Mains Over Frequency Reset	20.0	75.0	52.0	Hz

MAINS ACTIONS (<i>Mains->Actions</i>)		Min	Max	Default	Unit
Mains failure detect	Mains Failure Detection En/Dis	ENABL/DISBL		ENABL	
Mains fail.stop mode	Look Mains Failure at Stop Mode En/Dis	ENABL/DISBL		ENABL	
Always return delay	Always Look Mains Return Delay	ENABL/DISBL		DISBL	

Mains Failure Detection En/Dis

ENABLE: The module will monitor the mains supply. If the mains supply go out side of limits, the module will initiate its automatic mains failure sequence.

Look Mains Failure at Stop Mode En/Dis

ENABLE: As soon as the module detects a mains failure the mains contactor or breaker relay will be opened to remove the supply from the load. This is to prevent damage to the load in case of single-phase failure.

DISABLE: In the event of a mains failure the unit will attempt to maintain the supply to the load for the incoming AC mains supply until the generator is available to go on load. In the event of a generator failure the module will default back to the incoming AC mains supply.

Always Look Mains Return Delay

ENABLE: The module will always wait the Mains Return Delay parameter before transferring the load back to mains.

DISABLE: The module will wait the Mains Return Delay parameter while only the engine is running and the generator is available to go on load before transferring the load back to mains.

4.2.3 Generator

GENERATOR VOLT LEVEL (<i>Generator->Volt level</i>)		Min	Max	Default	Unit
Under volt shutdown	Generator Under Voltage Shutdown	60(dis)	600	320	V~
Under volt prealarm	Generator Under Voltage Pre-Alarm	60(dis)	600	340	V~
Under volt reset	Generator Under Voltage Pre-Alarm Reset	60	600	350	V~
Over volt shutdown	Generator Over Voltage Shutdown	60	600	440	V~
Over volt prealarm	Generator Over Voltage Pre-Alarm	60(dis)	600	420	V~
Over volt reset	Generator Over Voltage Pre-Alarm Reset	60	600	400	V~
Shutdown delay time	Generator Voltage Shutdown Delay Time	0.0	10.0	1.0	Sec

GENERATOR FREQ LEVEL (<i>Generator->Frequency level</i>)		Min	Max	Default	Unit
Under freq shutdown	Generator Under Frequency Shutdown	30.0(dis)	75.0	43.0	Hz
Under freq prealarm	Generator Under Frequency Pre-Alarm	30.0(dis)	75.0	45.0	Hz
Under freq reset	Generator Under Frequency Pre-Alarm Reset	30.0	75.0	46.0	Hz
Over freq shutdown	Generator Over Frequency Shutdown	30.0(dis)	75.0	58.0	Hz
Over freq prealarm	Generator Over Frequency Pre-Alarm	30.0(dis)	75.0	55.0	Hz
Over freq reset	Generator Over Frequency Pre-Alarm Reset	30.0	75.0	54.0	Hz
Shutdown delay time	Generator Frequency Shutdown Delay Time	0.0	10.0	1.0	Sec

GEN CUR LEVEL & ACT (<i>Generator->Current level & act.</i>)		Min	Max	Default	Unit
Under cur. set	Generator Under Current Set	0	9999	1	A~
Under cur. prealarm	Generator Under Current Pre-Alarm	0(dis)	9999	dis	A~
Under cur. reset	Generator Under Current Pre-Alarm Reset	0	9999	5	A~
Under cur. act.	Generator Under Current Actions 0 - Disable 1 - Warning (Alarm Only, No Shutdown) 2 - Electrical Trip (Alarm/Off Load Generator Followed By Shutdown After Cooling) 3 - Shutdown (Alarm And Shutdown)	0(dis)	3	dis	
Under act. delay time	Generator Under Current Actions Delay Time	0	99	2	Sec
Over cur. set	Generator Over Current Set	0	9999	9999	A~
Over cur. prealarm	Generator Over Current Pre-Alarm	0(dis)	9999	9990	A~
Over cur. reset	Generator Over Current Pre-Alarm Reset	0	9999	9980	A~
Over cur. act.	Generator Over Current Actions 0 - Disable 1 - Warning (Alarm Only, No Shutdown) 2 - Electrical Trip (Alarm/Off Load Generator Followed By Shutdown After Cooling) 3 - Shutdown (Alarm And Shutdown)	0(dis)	3	dis	
Over act. delay time	Generator Over Current Actions Delay Time	0	99	2	Sec
Short circuit cur.	Generator Short Circuit Current Set	0	9999	9999	A~

GEN POWER LEVEL (<i>Generator->Power level</i>)		Min	Max	Default	Unit
Under power shutdown	Generator Under Power Shutdown	0(dis)	9999	dis	kVA
Under power prealarm	Generator Under Power Pre-Alarm	0(dis)	9999	dis	kVA
Under power reset	Generator Under Power Pre-Alarm Reset	0	9999	5	kVA
Over power shutdown	Generator Over Power Shutdown	0(dis)	9999	dis	kVA
Over power prealarm	Generator Over Power Pre-Alarm	0(dis)	9999	dis	kVA
Over power reset	Generator Over Power Pre-Alarm Reset	0	9999	0	kVA
Shutdown delay time	Generator Power Shutdown Delay Time	0	99	2	Sec
Reverse power set	Reverse Power Set	-9999	0	0	kW
Reverse power act.	Reverse Power Actions 0 - Disable 1 - Warning (Alarm Only, No Shutdown) 2 - Electrical Trip (Alarm/Off Load Generator Followed By Shutdown After Cooling) 3 - Shutdown (Alarm And Shutdown)	0(dis)	3	0(dis)	
Rv.pow.act.delay time	Reverse Power Action Delay Time	0	99	2	Sec

GEN WORKING CALENDAR (<i>Generator->Working calendar</i>)		Min	Max	Default	Unit
Disable/enable select	Working Calendar Disable or Enable	DISBL/ENABL		DISBL	
Start time on monday	Working Calendar Work Start Time on Monday	0.00	23.59	0.00	H.Min
Stop time on monday	Working Calendar Work Stop Time on Monday	0.00	23.59	23.59	H.Min
Start time on tues.	Working Calendar Work Start Time on Tuesday	0.00	23.59	0.00	H.Min
Stop time on tuesday	Working Calendar Work Stop Time on Tuesday	0.00	23.59	23.59	H.Min
Start time on wednes.	Working Calendar Work Start Time on Wednesday	0.00	23.59	0.00	H.Min
Stop time on wednes.	Working Calendar Work Stop Time on Wednesday	0.00	23.59	23.59	H.Min
Start time on thurs.	Working Calendar Work Start Time on Thursday	0.00	23.59	0.00	H.Min
Stop time on thursday	Working Calendar Work Stop Time on Thursday	0.00	23.59	23.59	H.Min
Start time on friday	Working Calendar Work Start Time on Friday	0.00	23.59	0.00	H.Min
Stop time on friday	Working Calendar Work Stop Time on Friday	0.00	23.59	23.59	H.Min
Start time on satur.	Working Calendar Work Start Time on Saturday	0.00	23.59	0.00	H.Min
Stop time on saturday	Working Calendar Work Stop Time on Saturday	0.00	23.59	23.59	H.Min
Start time on sunday	Working Calendar Work Start Time on Sunday	0.00	23.59	0.00	H.Min
Stop time on sunday	Working Calendar Work Stop Time on Sunday	0.00	23.59	23.59	H.Min

GENERATOR GENERAL (<i>Generator->General</i>)		Min	Max	Default	Unit
Sens.option gen.freq	Sensing Options Generator Frq En/Dis	ENABL/DISBL		ENABL	
All warning are latch	All Warnings Are Latched En/Dis	ENABL/DISBL		DISBL	

Sensing Options Generator Frq En/Dis

ENABLE: Speed sensing will be derived from the generator output frequency.

DISABLE: Speed sensing not will be derived from the generator output frequency.

All Warnings Are Latched En/Dis

ENABLE: Warnings and pre-alarms will latched when triggered. To reset the alarm either an external reset must be applied to one of the inputs or the 'Reset' pushbutton operated, once the triggering condition has cleared.

DISABLE: Normal operation, the warnings and pre-alarms (except spare inputs, because they have their latching or non-latching selections) will automatically reset once the triggering condition has cleared.

4.2.4 Power supply

POWER SUPPLY BATTERY (<i>Power supply->Battery</i>)		Min	Max	Default	Unit
Under volt	Battery Undervolts Warning	6.0(dis)	30.0	10.0	V ₋₋₋
Under volt reset	Battery Undervolts Warning Reset	6.0	30.0	10.5	V ₋₋₋
Under volt delay	Battery Undervolts Volts Delay	0.0	9.9	1.0	Sec
Over volt	Battery Overvolts Warning	6.0(dis)	30.0	30.0	V ₋₋₋
Over volt reset	Battery Overvolts Warning Reset	6.0	30.0	29.5	V ₋₋₋
Over volt delay	Battery Overvolts Delay	0.0	9.9	1.0	Sec

The parameters in this page are used for the battery voltage low and high alarms.

Note: dis = disable

4.2.5 Engine

LOAD TEST (<i>Engine->Load test</i>)		Min	Max	Default	Unit
Disable/enable select	Disable, No Load or On Load Selection	0-DISABLE 1-NO LOAD 2-ON LOAD		1-NO LOAD	

Disable, No Load or On Load Selection

DISABLE: Test mode disable.

NO LOAD: The generator will be running without taking the load in test mode.

ON LOAD: The generator will be running with load in test mode.

EXERCISE (<i>Engine->Exercise</i>)		Min	Max	Default	Unit
Time of Period	Generator exercise working period on related day	0(dis)	99	dis	Min
Week	Generator exercise working day of week	1	7	1	
Start time	Generator exercise work start time on related day	0.0	23.59	0.00	H.Min

Please enter the day of the week for Exercise Function. Example:

Period (dis)0 The exercise function is disabled.
(10) The exercise function is enabled for 10 minutes.
Day of week 1=Monday,2=Tuesday,3=Wednesday,4=Thursday,5=Friday,6=Saturday,7=Sunday
Start time 12.20 The exercise function is started at 12.20 o'clock
(If it is enabled)

ENGINE GENERAL (<i>Engine->General</i>)		Min	Max	Default	Unit
Engine running volt	Engine Running Voltage	60(dis)	600	300	V~
Engine running freq.	Engine Running Frequency	25.0	75.0	30.0	Hz

Engine Running Voltage & Frequency

If the alternator voltage bigger than the Engine Running Voltage parameter and the alternator frequency bigger than the Engine Running Frequency parameter, the Engine Running LED lights on. (if not one of the configurable inputs is configured as "Engine Running").

Note: dis = disable

4.2.6 Inputs

CONF. INPUT-1 (<i>Inputs->Conf. input-1</i>)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	2	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	1	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 0-Remote Start On Load 1-Remote Start Off Load 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator 22-Remote Inhibit 23-Engine Running 24-Generator Ready 25-Emergency Stop	0	25	25	
Active delay	Input active delay	0	250	0	Sec

Note: dis = disable

CONF. INPUT-2 (<i>Inputs->Conf. input-2</i>)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	0	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 0-Remote Start On Load 1-Remote Start Off Load 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator 22-Remote Inhibit 23-Engine Running 24-Generator Ready	0	24	13	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-3 (<i>Inputs->Conf. Input-3</i>)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	0	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 0-Remote Start On Load 1-Remote Start Off Load 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator 22-Remote Inhibit 23-Engine Running 24-Generator Ready	0	24	11	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-4 (<i>Inputs->Conf. Input-4</i>)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	0	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 0-Remote Start On Load 1-Remote Start Off Load 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator 22-Remote Inhibit 23-Engine Running 24-Generator Ready	0	24	19	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-5 (<i>Inputs->Conf. Input-5</i>)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	0	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 0-Remote Start On Load 1-Remote Start Off Load 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator 22-Remote Inhibit 23-Engine Running 24-Generator Ready	0	24	3	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-6 (<i>Inputs->Conf. Input-6</i>)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	0	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 0-Remote Start On Load 1-Remote Start Off Load 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator 22-Remote Inhibit 23-Engine Running 24-Generator Ready	0	24	7	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-7 (Inputs->Conf. Input-7)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	0	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 0-Remote Start On Load 1-Remote Start Off Load 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator 22-Remote Inhibit 23-Engine Running 24-Generator Ready	0	24	23	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-8 (<i>Inputs->Conf. Input-8</i>)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	2	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 0-Remote Start On Load 1-Remote Start Off Load 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator 22-Remote Inhibit 23-Engine Running 24-Generator Ready	0	24	24	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. EXP. INPUT-1 (Inputs->Conf. exp. input-1)		Min	Max	Default	Unit
Dis,user conf.or list	0- Disable 1- User Configured 2- Select From List	0(dis)	2	1	
Hardware type	0-> -Ve (Switched To Battery -) 1-> +Ve (Switched To Battery +)	0	1	0	
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Indication	If User Configured 0- Status 1- Warning Non-Latching 2- Warning Latching 3- Electrical Trip 4- Shutdown	0	4	0	
Activation	If User Configured 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	2	
Select from list	If Select From List 2-Auxiliary Mains Fail 3-Simulate Lamp Test Button 4-Simulate Horn Reset Button 5-Simulate Alarm Reset Button 6-Simulate Auto Button 7-Simulate Test Button 8-Simulate Manual Button 9-Simulate Start Button 10-Simulate Stop Button 11-Generator Closed Auxiliary 12-Generator Load Inhibit 13-Mains Closed Auxiliary 14-Mains Load Inhibit 15-Auto Restore Inhibit 16-Auto Start Inhibit 17-Panel Lock 18-Scheduled Runs(Exercise) Inhibited 19-Reserved 20-Transfer To Generator/Open Mains 21-Transfer To Mains/Open Generator	2	21	2	
Active delay	Input active delay	0	250	5	Sec

CONF. EXP. INPUT-2 (Inputs->Conf. exp. input-2)		Min	Max	Default	Unit
Dis,user conf.or list	The same as Expansion Config. Input-1 options	0(dis)	2	1	
Hardware type	The same as Expansion Config. Input-1 options	0	1	0	
Polarity	The same as Expansion Config. Input-1 options	0	1	0	
Indication	The same as Expansion Config. Input-1 options	0	4	0	
Activation	The same as Expansion Config. Input-1 options	0	2	2	
Select from list	The same as Expansion Config. Input-1 options	2	21	2	
Active delay	Input active delay	0	250	5	Sec

CONF. EXP. INPUT-3 (Inputs->Conf. exp. input-3)		Min	Max	Default	Unit
Dis,user conf.or list	The same as Expansion Config. Input-1 options	0(dis)	2	1	
Hardware type	The same as Expansion Config. Input-1 options	0	1	0	
Polarity	The same as Expansion Config. Input-1 options	0	1	0	
Indication	The same as Expansion Config. Input-1 options	0	4	0	
Activation	The same as Expansion Config. Input-1 options	0	2	2	
Select from list	The same as Expansion Config. Input-1 options	2	21	2	
Active delay	Input active delay	0	250	5	Sec

CONF. EXP. INPUT-4 (<i>Inputs->Conf. exp. input-4</i>)		Min	Max	Default	Unit
Dis,user conf.or list	The same as Expansion Config. Input-1 options	0(dis)	2	1	
Hardware type	The same as Expansion Config. Input-1 options	0	1	0	
Polarity	The same as Expansion Config. Input-1 options	0	1	0	
Indication	The same as Expansion Config. Input-1 options	0	4	0	
Activation	The same as Expansion Config. Input-1 options	0	2	2	
Select from list	The same as Expansion Config. Input-1 options	2	21	2	
Active delay	Input active delay	0	250	5	Sec

CONF. EXP. INPUT-5 (<i>Inputs->Conf. exp. input-5</i>)		Min	Max	Default	Unit
Dis,user conf.or list	The same as Expansion Config. Input-1 options	0(dis)	2	1	
Hardware type	The same as Expansion Config. Input-1 options	0	1	0	
Polarity	The same as Expansion Config. Input-1 options	0	1	0	
Indication	The same as Expansion Config. Input-1 options	0	4	0	
Activation	The same as Expansion Config. Input-1 options	0	2	2	
Select from list	The same as Expansion Config. Input-1 options	2	21	2	
Active delay	Input active delay	0	250	5	Sec

CONF. EXP. INPUT-6 (<i>Inputs->Conf. exp. input-6</i>)		Min	Max	Default	Unit
Dis,user conf.or list	The same as Expansion Config. Input-1 options	0(dis)	2	1	
Hardware type	The same as Expansion Config. Input-1 options	0	1	0	
Polarity	The same as Expansion Config. Input-1 options	0	1	0	
Indication	The same as Expansion Config. Input-1 options	0	4	0	
Activation	The same as Expansion Config. Input-1 options	0	2	2	
Select from list	The same as Expansion Config. Input-1 options	2	21	2	
Active delay	Input active delay	0	250	5	Sec

CONF. EXP. INPUT-7 (<i>Inputs->Conf. exp. input-7</i>)		Min	Max	Default	Unit
Dis,user conf.or list	The same as Expansion Config. Input-1 options	0(dis)	2	1	
Hardware type	The same as Expansion Config. Input-1 options	0	1	0	
Polarity	The same as Expansion Config. Input-1 options	0	1	0	
Indication	The same as Expansion Config. Input-1 options	0	4	0	
Activation	The same as Expansion Config. Input-1 options	0	2	2	
Select from list	The same as Expansion Config. Input-1 options	2	21	2	
Active delay	Input active delay	0	250	5	Sec

CONF. EXP. INPUT-8 (<i>Inputs->Conf. exp. input-8</i>)		Min	Max	Default	Unit
Dis,user conf.or list	The same as Expansion Config. Input-1 options	0(dis)	2	1	
Hardware type	The same as Expansion Config. Input-1 options	0	1	0	
Polarity	The same as Expansion Config. Input-1 options	0	1	0	
Indication	The same as Expansion Config. Input-1 options	0	4	0	
Activation	The same as Expansion Config. Input-1 options	0	2	2	
Select from list	The same as Expansion Config. Input-1 options	2	21	2	
Active delay	Input active delay	0	250	5	Sec

Note: dis = disable

CONFIGURABLE INPUTS SELECTIONS

0 REMOTE START ON LOAD

In AUTO mode, if one of the configurable inputs are selected as 0 (Remote Start On Load), the unit doesn't perform the mains failure control in order to start the generator. In AUTO mode, if one of the configurable inputs are selected as 0 (Remote Start On Load) and this input is active, then the unit will perform the start sequence and transfer load to the generator. If the input is passive, the unit will perform the stop sequence.

1 REMOTE START OFF LOAD

If this input is active, operation will be similar to the 'Remote Start On Load' function except that the generator will not be instructed to take the load. This function can be used where an engine only run is required e.g. for exercise.

2 AUXILIARY MAINS FAIL

The unit will monitor the incoming single or three phase supply for Over Voltage, Under Voltage, Over Frequency or Under Frequency. It may be required to monitor a different mains supply or some aspect of the incoming mains not monitored by the unit. If the devices providing this additional monitoring are connected to operate this input, the unit will operate as if the incoming mains supply has fallen outside of limits, the generator will be instructed to start and take load. Removal of the input signal will cause the unit to act if the mains has returned to within limits.

3 SIMULATE LAMP TEST BUTTON

This input mimics the operation of the 'Lamp Test' button and is used to provide a remotely located Lamp Test push button.

4 SIMULATE HORN RESET BUTTON

This input mimics the operation of the 'Horn Reset' button and is used to provide a remotely located Horn Reset push button.

5 SIMULATE ALARM RESET BUTTON

This input mimics the operation of the 'Alarm Reset' button and is used to provide a remotely located Alarm Reset push button.

6 SIMULATE AUTO BUTTON

This input mimics the operation of the 'Auto' button and is used to provide a remotely located Auto mode push button.

7 SIMULATE TEST BUTTON

This input mimics the operation of the 'Test' button and is used to provide a remotely located Test mode push button.

8 SIMULATE MANUAL BUTTON

This input mimics the operation of the 'Manual' button and is used to provide a remotely located Manual mode push button.

9 SIMULATE START BUTTON

This input mimics the operation of the 'Start' button and is used to provide a remotely located start push button.

10 SIMULATE STOP BUTTON

This input mimics the operation of the 'Stop' button and is used to provide a remotely located Stop push button.

11 GENERATOR CLOSED AUXILIARY

This input is used to provide feedback to allow the unit to give true indication of the contactor or circuit breaker switching status. It should be connected to the generator load switching device auxiliary contact.

12 GENERATOR LOAD INHIBIT

This input is used to prevent the unit from loading the generator. If the generator is already on load, activating this input will cause the unit to unload the generator. Removing the input will allow the generator to be loaded again. **Note:** This input only operates to control the generator-switching device if the unit load switching logic is attempting load the generator. It will not control the generator-switching device when the mains is on load.

13 MAINS CLOSED AUXILIARY

This input is used to provide feedback to allow the unit to give true indication of the contactor or circuit breaker switching status. It should be connected to the generator load switching device auxiliary contact.

14 MAINS LOAD INHIBIT

This input is used to prevent the unit from loading the mains supply. If the mains supply is already on load, activating this input will cause the unit to unload the mains supply. Removing the input will allow the mains to be loaded again. **Note:** This input only operates to control the mains-switching device if the unit load switching logic is attempting to load the mains. It will not control the mains-switching device when the generator is on load.

15 AUTO RESTORE INHIBIT

When module in the AUTO mode. In the event of a remote start or mains failure, the generator will be instructed to start and take load. On removal of the remote start signal or mains return, the module will continue to run the generator on load until this AUTO RESTORE INHIBIT input is removed. Once the input is removed the unit will transfer the load back to the mains supply and follow a normal generator stop sequence. This input allows the module to be fitted as part of a system where the manual restoration to mains is controlled remotely or by an automated system.

16 AUTO START INHIBIT

This input is used to provide an over-ride function to prevent the unit from starting the generator in the event of a remote start or mains out of limits condition occurring. If this input is active and a remote start signal or mains failure occurs the unit will not give a start command to the generator. If this input signal is then removed, the unit will operate as if a remote start or mains failure has occurred, starting and loading the generator. This function can be used to give an 'AND' function so that a generator will only be called to start if the mains fails and another condition exists which requires the generator to run. If the 'Auto Start Inhibit' signal become active once more it will be ignored until the unit has returned the mains supply on load and shutdown.

17 PANEL LOCK

This input is used to provide security to the installation. If the panel lock input is active, the unit will not respond to operation of the mode select or start buttons. This allows the unit to be placed into a specific mode (such as Auto) and then secured. The operation of the unit is not affected and the operator will still be able to view the various instrumentation pages etc. **Note:** External control sources (i.e. Simulate Start Button) are not affected by the panel lock input and will continue to operate normally.

18 SCHEDULED RUNS(EXERCISE) INHIBITED

This input is used to prevent the generator from starting in the event of a programmed scheduled (exercise) run occurring. While the input is active no scheduled runs will occur. If the input is active when a schedule run is called for, and is removed during the running period the gen-set will start and complete any remaining scheduled running time.

19 RESERVED

20 TRANSFER TO GENERATOR/OPEN MAINS

This input is used to transfer the load to the generator when running in Manual mode.

21 TRANSFER TO MAINS/OPEN GENERATOR

This input is used to transfer the load to the mains supply when running in Manual mode.

22 REMOTE INHIBIT

In AUTO mode, if one of the configurable inputs are selected as 22 (Remote Inhibit) and this input is active, the module will inhibit the generator from starting. In the other hand, if this input is active while the generator was starting, the module will stop the generator.

23 ENGINE RUNNING

If one of the configurable inputs are selected as Engine Running and this input is active, the Engine Running LED lights on.

24 GENERATOR READY

Allows an Auto Start module to instruct the ATS unit that the system is available to take load. The ATS unit then monitors the voltage and frequency to check they are within acceptable limits before performing the load transfer function.

25 EMERGENCY STOP (FOR CONFIGURABLE INPUT-1)

This input is used as the emergency stop input.

4.2.7 Outputs

CONF. OUTPUT-1 (<i>Outputs->Conf. output-1</i>)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	0-NOT USED 1-AIR FLAP CONTROL 2-ALARM RESET 3-AUDIBLE ALARM 4-AUTO START INHIBIT 5-AUXILIARY MAINS FAILURE 6-BATTERY HIGH VOLTAGE 7-BATTERY LOW VOLTAGE 8-CALLING FOR SCHEDULED RUN(EXERCISE) 9-RESERVED 10-RESERVED 11-RESERVED 12-COMMON ALARM 13-COMMON ELECTRICAL TRIP ALARM 14-COMMON SHUTDOWN ALARM 15-COMMON WARNING ALARM 16-COOLING FAN AFTER START 17-COOLING FAN AFTER STOP 18-RESERVED 19-RESERVED 20-COOLING DOWN TIMER IN PROGRESS 21-RESERVED 22-DELAYED ALARMS ACTIVE 23-DIGITAL INPUT1 ALARM 24-DIGITAL INPUT2 ALARM 25-DIGITAL INPUT3 ALARM 26-DIGITAL INPUT4 ALARM 27-DIGITAL INPUT5 ALARM 28-DIGITAL INPUT6 ALARM 29-DIGITAL INPUT7 ALARM 30-EXPANSION INPUT1 ALARM 31-EXPANSION INPUT2 ALARM 32-EXPANSION INPUT3 ALARM 33-EXPANSION INPUT4 ALARM 34-EXPANSION INPUT5 ALARM 35-EXPANSION INPUT6 ALARM 36-EXPANSION INPUT7 ALARM 37-EXPANSION INPUT8 ALARM 38-DIGITAL INPUT8 ALARM 39-EMERGENCY STOP 40-FAIL TO START ALARM 41-FAIL TO STOP ALARM 42-RESERVED 43-RESERVED 44-RESERVED 45-GENERATOR AT REST 46-GENERATOR AVAILABLE 47-GENERATOR CLOSED AUXILIARY 48-GENERATOR FAILED TO CLOSE 49-GENERATOR FAILED TO OPEN 50-GENERATOR HIGH FREQUENCY PRE-ALARM 51-GENERATOR HIGH FREQUENCY SHUTDOWN 52-GENERATOR HIGH VOLTAGE PRE-ALARM 53-GENERATOR HIGH VOLTAGE SHUTDOWN 54-GENERATOR LOAD INHIBIT 55-GENERATOR LOW FREQUENCY PRE-ALARM 56-GENERATOR LOW FREQUENCY SHUTDOWN 57-GENERATOR LOW VOLTAGE PRE-ALARM 58-GENERATOR LOW VOLTAGE SHUTDOWN 59-GENERATOR STOPPING 60-GENERATOR OPEN BREAKER 61-HORN OUTPUT LATCHED 62-HORN OUTPUT PULSED 63-LAMP TEST 64-RESERVED 65-RESERVED 66-RESERVED 67-RESERVED 68-MAINS CLOSED AUXILIARY 69-MAINS FAILED TO CLOSE 70-MAINS FAILED TO OPEN 71-MAINS FAILURE 72-MAINS HIGH FREQUENCY 73-MAINS HIGH VOLTAGE 74-MAINS LOAD INHIBIT 75-MAINS LOW FREQUENCY 76-MAINS LOW VOLTAGE 77-MAINS OPEN BREAKER 78-NO LOADING COMMAND 79-RESERVED 80-RESERVED 81-RESERVED 82-RESERVED 83-OVER CURRENT PRE-ALARM 84-OVER CURRENT 85-OVER POWER PRE-ALARM 86-OVER POWER SHUTDOWN 87-RESERVED 88-RESERVED 89-PANEL LOCK 90-RESERVED 91-RESERVED 92-RESERVED 93-RESERVED 94-REMOTE START PRESENT 95-RESERVED 96-SHORT CIRCUIT 97-RESERVED 98-RESERVED 99-STARTING ALARMS ARMED 100-RESERVED 101-SYSTEM IN AUTO MODE 102-SYSTEM IN MANUAL MODE 103-SYSTEM IN STOP MODE 104-SYSTEM IN TEST MODE 105-UNDER CURRENT PRE-ALARM 106-UNDER CURRENT 107-UNDER POWER PRE-ALARM 108-UNDER POWER SHUTDOWN 109-RESERVED 110-RESERVED 111-WAITING FOR GENERATOR 112-RESERVED 113-LOAD SUPPLY FROM GENERATOR 114-LOAD SUPPLY FROM MAINS 115-RESERVED 116-RESERVED 117-RESERVED 118-RESERVED 119-RESERVED 120-RESERVED 121-RESERVED 122-REMOTE CONTROL ACTIVE 123-REVERSE POWER 124-RESERVED 125-RESERVED 126-RESERVED 127-RESERVED 128-RESERVED 129-REMOTE OUTPUT	0	129	43	

CONF. OUTPUT-2 (Outputs->Conf. output-2)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	21	

CONF. OUTPUT-3 (Outputs->Conf. output-3)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	62	

CONF. OUTPUT-4 (Outputs->Conf. output-4)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	9	

CONF. OUTPUT-5 (Outputs->Conf. output-5)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONF. OUTPUT-6 (Outputs->Conf. output-6)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	94	

CONF. EXP. OUTPUT-1 (Outputs->Conf. exp. output-1)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONF. EXP. OUTPUT-2 (Outputs->Conf. exp. output-2)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONF. EXP. OUTPUT-3 (Outputs->Conf. exp. output-3)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONF. EXP. OUTPUT-4 (Outputs->Conf. exp. output-4)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONF. EXP. OUTPUT-5 (Outputs->Conf. exp. output-5)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONF. EXP. OUTPUT-6 (Outputs->Conf. exp. output-6)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONF. EXP. OUTPUT-7 (Outputs->Conf. exp. output-7)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONF. EXP. OUTPUT-8 (Outputs->Conf. exp. output-8)		Min	Max	Default	Unit
Polarity	0- Normally Open (Close To Activate) 1- Normally Close (Open To Activate)	0	1	0	
Function	The same as Configurable Output-1 options	0	129	12	

CONFIGURABLE OUTPUTS SELECTIONS

0 NOT USED

Output is not used

1 AIR FLAP CONTROL

Normally used to control an air flap, this output becomes active upon an Engine shutdown failure situation. Inactive when the set has come to rest.

2 ALARM RESET

The output indicates that an alarm reset being performed. Once the alarm reset has been completed, the output become inactive again. The output could be used to give an external reset signal to external systems.

3 AUDIBLE ALARM

The output indicates that the internal sounder is operating. It may be use for external sounder.

4 AUTO START INHIBIT

This output indicates that a digital input that has been configured as 'auto start inhibit' is active.

5 AUXILIARY MAINS FAILURE

This output indicates that a digital input that has been configured as 'auxiliary mains failure' is active.

6 BATTERY HIGH VOLTAGE

This output indicates that a battery high voltage alarm has occurred.

7 BATTERY LOW VOLTAGE

This output indicates that a battery low voltage alarm has occurred.

8 CALLING FOR SCHEDULED RUN(EXERCISE)

This output indicates that a scheduled run(exercise) has been called for. If the unit is in the 'auto' and mains okay, the unit will change mode to 'test' and the generator will run if no shutdown alarms are present.

9 RESERVED

10 RESERVED

11 RESERVED

12 COMMON ALARM

This output indicates that a warning, electrical trip or shutdown alarm has been activated.

13 COMMON ELECTRICAL TRIP ALARM

This output indicates that an electrical trip alarm has been activated. This output can only be reset by removal of the fault and by then pressing the RESET button.

14 COMMON SHUTDOWN ALARM

This output indicates that a shutdown alarm has been activated. This output can only be reset by removal of the fault and by then pressing the RESET button or by using an external 'alarm reset' input.

15 COMMON WARNING ALARM

This output indicates that a warning alarm has been activated. This output is normally self-resetting on removal of the fault.

16 COOLING FAN AFTER START

This output should energise as soon as engine has started so the fan should be running when the engine is running. This output should continue to operate for Cooling Fan Time parameter after engine has stopped.

17 COOLING FAN AFTER STOP

This output indicates that can be made to energise for Cooling Fan Time parameter after the engine shuts down (to run an electric cooling fan on the radiator).

18 RESERVED**19 RESERVED****20 COOLING DOWN TIMER IN PROGRESS**

This output source will be active when the cooling off-load timer is running.

21 RESERVED**22 DELAYED ALARMS ACTIVE**

The output indicates that the delayed alarms now enabled. Can be used to control external logic circuitry.

23 DIGITAL INPUT1 ALARM

This output indicates that digital input 1 alarm has occurred.

24 DIGITAL INPUT2 ALARM

This output indicates that digital input 2 alarm has occurred.

25 DIGITAL INPUT3 ALARM

This output indicates that digital input 3 alarm has occurred.

26 DIGITAL INPUT4 ALARM

This output indicates that digital input 4 alarm has occurred.

27 DIGITAL INPUT5 ALARM

This output indicates that digital input 5 alarm has occurred.

28 DIGITAL INPUT6 ALARM

This output indicates that digital input 6 alarm has occurred.

29 DIGITAL INPUT7 ALARM

This output indicates that digital input 7 alarm has occurred.

30 EXPANSION CONFIGURABLE INPUT1 ALARM

This output indicates that expansion configurable input 1 alarm has occurred.

31 EXPANSION CONFIGURABLE INPUT2 ALARM

This output indicates that expansion configurable input 2 alarm has occurred.

32 EXPANSION CONFIGURABLE INPUT3 ALARM

This output indicates that expansion configurable input 3 alarm has occurred.

33 EXPANSION CONFIGURABLE INPUT4 ALARM

This output indicates that expansion configurable input 4 alarm has occurred.

34 EXPANSION CONFIGURABLE INPUT5 ALARM

This output indicates that expansion configurable input 5 alarm has occurred.

35 EXPANSION CONFIGURABLE INPUT6 ALARM

This output indicates that expansion configurable input 6 alarm has occurred.

36 EXPANSION CONFIGURABLE INPUT7 ALARM

This output indicates that expansion configurable input 7 alarm has occurred.

37 EXPANSION CONFIGURABLE INPUT8 ALARM

This output indicates that expansion configurable input 8 alarm has occurred.

38 DIGITAL INPUT8 ALARM

This output indicates that digital input 8 alarm has occurred.

39 EMERGENCY STOP

This output indicates that an emergency stop alarm has occurred.

40 FAIL TO START ALARM

This output indicates that the engine has not started after the specified number of attempts.

41 FAIL TO STOP ALARM

This output indicates that the generator has failed to stop within the selected time

42 RESERVED**43 RESERVED****44 RESERVED****45 GENERATOR AT REST**

The output indicates that the generator is not running.

46 GENERATOR AVAILABLE

This output indicates when the generator is ready to accept load, i.e. after safety on and warm up timers have timed out.

47 GENERATOR CLOSED AUXILIARY

This output indicates that a digital input that has been configured as 'generator closed auxiliary' is active.

48 GENERATOR FAILED TO CLOSE

This output source has intended to be used to indicate a failure of the generator contactor or breaker. It can only be used if the unit is configured to use 'generator closed auxiliary' feedback.

49 GENERATOR FAILED TO OPEN

This output source has intended to be used to indicate a failure of the generator contactor or breaker. It can only be used if the unit is configured to use 'generator closed auxiliary' feedback.

50 GENERATOR HIGH FREQUENCY PRE-ALARM

This output indicates that a generator high frequency warning (pre-alarm) has occurred.

51 GENERATOR HIGH FREQUENCY SHUTDOWN

This output indicates that a generator high frequency shutdown has occurred.

52 GENERATOR HIGH VOLTAGE PRE-ALARM

This output indicates that a generator high voltage warning (pre-alarm) has occurred.

53 GENERATOR HIGH VOLTAGE SHUTDOWN

This output indicates that a generator high voltage shutdown has occurred.

54 GENERATOR LOAD INHIBIT

This output indicates that a digital input has been configured as 'generator load inhibit' is active.

55 GENERATOR LOW FREQUENCY PRE-ALARM

This output indicates that a generator low frequency warning (pre-alarm) has occurred.

56 GENERATOR LOW FREQUENCY SHUTDOWN

This output indicates that a generator low frequency shutdown has occurred.

57 GENERATOR LOW VOLTAGE PRE-ALARM

This output indicates that a generator low voltage warning (pre-alarm) has occurred.

58 GENERATOR LOW VOLTAGE SHUTDOWN

This output indicates that a generator low voltage shutdown has occurred.

59 GENERATOR STOPPING

This output indicates that the engine has been instructed to stop but has not come to rest.

60 GENERATOR OPEN BREAKER

This output used to control the load switching device. For Details see: "BREAKERS Page" section.

61 HORN OUTPUT LATCHED

This output indicates that the latched horn alarm has occurred.

62 HORN OUTPUT PULSED

This output indicates that the pulsed horn alarm has occurred.

63 LAMP TEST

This output indicates that the module is performing a lamp test. Once the lamp test completed, the output will become inactive again. The output can be used to feed a lamp test on external modules or panel lamps.

64 RESERVED**65 RESERVED****66 RESERVED****67 RESERVED****68 MAINS CLOSED AUXILIARY**

This output indicates that a digital input that has been configured as 'mains closed auxiliary' is active.

69 MAINS FAILED TO CLOSE

This output source has intended to be used to indicate a failure of the mains contactor or breaker. It can only be used if the unit is configured to use 'mains closed auxiliary' feedback.

70 MAINS FAILED TO OPEN

This output source has intended to be used to indicate a failure of the mains contactor or breaker. It can only be used if the unit is configured to use 'mains closed auxiliary' feedback.

71 MAINS FAILURE

This output indicates that the unit has sensed that a failure of the incoming AC mains supply. This output will become active whenever the mains voltage or frequency goes out of limits, or if the auxiliary mains failure input active (if used) and the mains transient timer has expired.

72 MAINS HIGH FREQUENCY

This output indicates that the unit has sensed that the incoming AC mains supply frequency has exceeded the frequency limit setting.

73 MAINS HIGH VOLTAGE

This output indicates that the unit has sensed that the incoming AC mains supply voltage has exceeded the voltage limit setting.

74 MAINS LOAD INHIBIT

This output indicates that a digital input has been configured as 'mains load inhibit' is active.

75 MAINS LOW FREQUENCY

This output indicates that the unit has sensed that the incoming AC mains supply frequency has fallen below the frequency setting.

76 MAINS LOW VOLTAGE

This output indicates that the unit has sensed that the incoming AC mains supply voltage has fallen below the voltage limit setting.

77 MAINS OPEN BREAKER

This output used to control the load switching device. For Details see: "BREAKERS Page" section.

78 NO LOADING COMMAND

This output indicates that the unit is not calling of the generator contactor or breaker to be closed. Should the unit close the generator contactor this output will become inactive.

79 RESERVED**80 RESERVED****81 RESERVED****82 RESERVED****83 OVER CURRENT PRE-ALARM**

This output indicates that the over current pre-alarm has been reached.

84 OVER CURRENT ALARM

This output indicates that the over current trip level has been reached.

85 OVER POWER PRE-ALARM

This output indicates that the over power pre-alarm has been reached.

86 OVER POWER SHUTDOWN

This output indicates that the over power shutdown has been reached.

87 RESERVED**88 RESERVED****89 PANEL LOCK**

This output indicates that the unit 'panel lock' is active. If the panel lock input is active, the unit will not respond to operation of the Mode select or start buttons. This allows the unit to be placed into a specific mode (such as auto) and then secured.

90 RESERVED**91 RESERVED****92 RESERVED****93 RESERVED****94 REMOTE START PRESENT**

This output indicates that a digital input that has been configured as 'remote start' is active. This output could be used to pass the remote start signal on to else where in the control system.

95 RESERVED**96 SHORT CIRCUIT**

This output indicates that the module has detected a short circuit on the generator output.

97 RESERVED**98 RESERVED****99 STARTING ALARMS ARMED**

The output indicates that the starting alarms are now enabled. It can be used to control external logic circuitry. Starting alarms are armed as soon as the unit commences starting of the engine and remain armed until the engine at rest.

100 RESERVED**101 SYSTEM IN AUTO MODE**

The output indicates that the unit is in the Auto mode.

102 SYSTEM IN MANUAL MODE

The output indicates that the unit is in the Manual mode.

103 SYSTEM IN STOP MODE

The output indicates that the unit is in the Stop mode.

104 SYSTEM IN TEST MODE

The output indicates that the unit is in the Test mode.

105 UNDER CURRENT PRE-ALARM

This output indicates that the under current pre-alarm has been reached.

106 UNDER CURRENT ALARM

This output indicates that the under current trip level has been reached.

107 UNDER POWER PRE-ALARM

This output indicates that the under power pre-alarm has been reached.

108 UNDER POWER SHUTDOWN

This output indicates that the under power shutdown has been reached.

109 RESERVED

110 RESERVED

111 WAITING FOR GENERATOR

This output indicates that the engine has been instructed to start but has not yet become available. Once the generator becomes available this output will be in-active.

112 RESERVED

113 LOAD SUPPLY FROM GENERATOR

This output indicates that the load is supplying from generator.

114 LOAD SUPPLY FROM MAINS

This output indicates that the load is supplying from mains.

115 RESERVED

116 RESERVED

117 RESERVED

118 RESERVED

119 RESERVED

120 RESERVED

121 RESERVED

122 REMOTE CONTROL ACTIVE

This output indicates that the engine is being controlled remotely.

123 REVERSE POWER

This output becomes active when generator's active power drops below the Reverse Power Set value.

124 RESERVED

125 RESERVED

126 RESERVED

127 RESERVED

128 RESERVED

129 REMOTE OUTPUT

This output indicates that the output can be energised or de-energised remotely.

4.2.8 Timers

START TIMERS (<i>Timers->Start timers</i>)		Min	Max	Default	Unit
Mains transient delay	Mains Transient Delay	0.0	20.0	2.0	Sec
Mains fail start delay	Mains Fail Start Delay	0	9999	0	Sec
Remote start delay	Remote Start Delay	0	3600	4	Sec
Generator fail delay	Generator Fail Delay	0	250	45	Sec
Safety on delay	Safety On Delay	0	99	5	Sec
Warming up time	Warmup Time	0	250	3	Sec
Horn duration	Horn Duration	0 (dis)	999	60	Sec

Mains Transient Delay

The unit uses this parameter to decide the mains fail.

Mains Fail Start Delay

This timer dictates how long the unit will wait after it has received a mains failure signal before it will attempt to start. This prevent un-necessary starting on a fluctuating mains supply etc.

Remote Start Delay

This timer dictates how long the unit will wait after it has received a remote start signal before it will attempt to start. This prevent un-necessary starting on a fluctuating mains supply etc.

Generator Fail Delay

The unit instructs the generator to start and waits for the period of this timer for the generator to become available. If it isn't available when the timer expires, the generator start failure alarm is occurred.

Safety On Delay

This timer dictates how long the unit will ignore the Low Oil Pressure, High Engine Temperature, Underspeed, Undervolts and any other inputs configured as active from safety on. It allows the values such as oil pressure to rise to their operating values on starting without triggering an alarm. Once the timer has expired all alarm conditions are monitored again. If configured to use 'fast loading', should all the monitored conditions, such as oil pressure, come to expected state prior to the end of the safety on timer, the timer will be terminated prematurely ensuring maximum protection as soon as possible.

Warmup Time

This timer is initiated once the engine is up and running. It delays loading the generator until it has stabilised. Once this timer is expired the 'Close generator' signal will be given and the generator is available to be loaded.

Horn Duration

This timer dictates how long the external horn and the internal sounder will work after the last error detected. Once after this timer ended unit will do the external horn and the internal sounder reset.

Note: dis = disable

STOPPING TIMERS (<i>Timers->Stopping timers</i>)		Min	Max	Default	Unit
Mains return delay	Mains Return Delay	0	3600	5	Sec
Remote stop delay	Remote Stop Delay	0	250	4	Sec
Cooling time	Cooling Time	0 (dis)	3600	60	Sec
Fail to stop delay	Fail To Stop Time	15	999	30	Sec

Mains Return Delay

This timer dictates how long the unit will wait before it will un-load the generator (back to the mains supply if AMF) and initialise it's run-on and shutdown cycle. This is ensure that the mains supply has stabilised before transferring the load back to mains.

Remote Stop Delay

This timer dictates how long the unit will wait after it has received a remote stop signal before it will attempt to stop. This prevent un-necessary stopping on a fluctuating mains supply etc.

Cooling Timer

This is the time the generator is to run off-load once the load transfer signal has ceased. This gives the engine time to cool down before shutdown.

Fail To Stop Time

Once the unit has given a shutdown signal to the engine it expects the engine to come to rest. It monitors the Oil pressure and speed sensing sources and if they still indicate engine movement when this timer expires a 'Fail To Stop' alarm signal is generated. **Note:** if this parameter was selected as maximum value (999), the unit doesn't monitor a 'Fail To Stop' alarm signal and it accepts that the engine to come to rest.

4.2.9 Expansion Modules

IO (1-8) MODULE (<i>Expansion modules->IO (1-8)</i>)		Min	Max	Default	Unit
Disable/enable select	Expansion I/O Module Selection	ENABL/DISBL		DISBL	
CAN fault actions	Can Fault Actions: 0- Disable 1- Warning Non-Latching 2- Warning (Alarm Only, No Shutdown) 3- Electrical Trip (Alarm/Off Load Generator Followed By Shutdown After Cooling) 4- Shutdown (Alarm And Shutdown)	0(dis)	4	0	
CAN fault activation	Can Fault Activation: 0- Active From Starting 1- Active From Safety On 2- Always Active	0	2	0	
CAN fault delay	Can Fault Delay	2	250	10	Sec

DIAL-UP & ETHERNET (<i>Expansion modules->Dial-up & Ethernet</i>)		Min	Max	Default	Unit
Disable/enable select	Expansion Dal-up&Ethernet Module Selection	ENABL/DISBL		DISBL	
Call back selection	Call Back Selection	ENABL/DISBL		DISBL	

GSM MODULE (<i>Expansion modules->GSM</i>)		Min	Max	Default	Unit
Disable/enable select	Expansion GSM Module Selection	ENABL/DISBL		DISBL	
Call back selection	Call Back Selection	ENABL/DISBL		DISBL	
SMS	SMS Feature Enable or Disable	ENABL/DISBL		DISBL	

Note: dis = disable

GPRS MODULE (<i>Expansion modules->GPRS</i>)		Min	Max	Default	Unit
Disable/enable select	Expansion GPRS Module Selection	ENABL/DISBL		DISBL	
Call back selection	Call Back Selection	ENABL/DISBL		DISBL	

WEB SERVER MODULE (<i>Expansion modules->Web Server</i>)		Min	Max	Default	Unit
Disable/enable select	Web Server Module Selection	ENABL/DISBL		DISBL	

4.2.10 User Adjustment

MAINS VOLTAGE OFFSET (<i>User adjustment->Mains voltage offset</i>)		Min	Max	Default	Unit
Mains V1 offset	Mains V1 Offset	-20	20	0	V $\sim$
Mains V2 offset	Mains V2 Offset	-20	20	0	V $\sim$
Mains V3 offset	Mains V3 Offset	-20	20	0	V $\sim$

GEN. VOLTAGE OFFSET (<i>User adjustment->Gen. voltage offset</i>)		Min	Max	Default	Unit
Gen. V1 offset	Generator V1 Offset	-20	20	0	V $\sim$
Gen. V2 offset	Generator V2 Offset	-20	20	0	V $\sim$
Gen. V3 offset	Generator V3 Offset	-20	20	0	V $\sim$

CURRENT OFFSET (<i>User adjustment->Current offset</i>)		Min	Max	Default	Unit
Current I1 offset	Current I1 Offset	-20	20	0	A $\sim$
Current I2 offset	Current I2 Offset	-20	20	0	A $\sim$
Current I3 offset	Current I3 Offset	-20	20	0	A $\sim$

BATTERY OFFSET (<i>User adjustment->Battery offset</i>)		Min	Max	Default	Unit
Batt.volt offset	Battery Voltage Offset	-5.0	5.0	0	V $\equiv$

Note: dis = disable

Error Messages And Explanations:

Battery high warning! : Battery high error
Battery low warning! : Battery low error
Can bus warning! : Can bus error
Emergency stop! : Emergency stop error
Exp.spare-1 alarm! : Expansion module spare 1 error
Exp.spare-2 alarm! : Expansion module spare 2 error
Exp.spare-3 alarm! : Expansion module spare 3 error
Exp.spare-4 alarm! : Expansion module spare 4 error
Exp.spare-5 alarm! : Expansion module spare 5 error
Exp.spare-6 alarm! : Expansion module spare 6 error
Exp.spare-7 alarm! : Expansion module spare 7 error
Exp.spare-8 alarm! : Expansion module spare 8 error
Fail to start alarm! : Fail to start alarm
Gen break.close fail! : Generator breaker not closed alarm
Gen break.open fail! : Generator breaker not opened alarm
Gen over frq.prealr! : Generator over frequency pre-alarm
Gen over frq.shutdwn! : Generator over frequency shutdown
Gen over vol.shutdwn! : Generator over voltage shutdown
Gen over volt.prealr! : Generator over voltage prealarm
Gen phase seq.wrong! : Generator phase sequence wrong
Gen stop fail! : Generator stop error
Gen under frq.prealr! : Generator under frequency pre-alarm
Gen under frq.shtdwn! : Generator under frequency shutdown
Gen under vol.shtdwn! : Generator under voltage shutdown
Gen under volt.prealr! : Generator under voltage pre-alarm
Mains break.cls fail! : Mains breaker not closed alarm
Mains break.opn fail! : Mains breaker not opened alarm
Over curr.trip cool.! : Over current electrical trip
Over current prealr! : Over current pre-alarm
Over current trip! : Over current error
Over current warnng! : Over current warning
Over power alarm! : Under power error
Over power prealarm! : Under power pre-alarm
Reverse power warnng! : Reverse power Warning
Rev.power trip cool.! : Reverse power Electrical Trip
Reverse power trip! : Reverse power Error
Short circuit trip! : Short circuit error
Spare-1 alarm! : Spare 1 error
Spare-2 alarm! : Spare 2 error
Spare-3 alarm! : Spare 3 error
Spare-4 alarm! : Spare 4 error
Spare-5 alarm! : Spare 5 error
Spare-6 alarm! : Spare 6 error
Spare-7 alarm! : Spare 7 error
Spare-8 alarm! : Spare 8 error
Under curr.trip cool! : Under current electrical trip
Under current prealr! : Under current pre-alarm
Under current trip! : Under Current Error
Under current warnng! : Under Current Warning
Under power prealarm! : Under power prealarm
Under power trip! : Under power Error

Event Messages And Explanations:

Battery high warning : Battery high error
Battery low warning : Battery low error
Can bus warning : Can bus error
Changed mode to auto : Changed mode to auto
Changed mode to man : Changed mode to manual
Changed mode to stop : Changed mode to off
Changed mode to test : Changed mode to test
Emergency stop : Emergency stop error
Engine started
Engine stopped
Exp.spare-1 alarm : Expansion module spare 1 error
Exp.spare-2 alarm : Expansion module spare 2 error
Exp.spare-3 alarm : Expansion module spare 3 error
Exp.spare-4 alarm : Expansion module spare 4 error
Exp.spare-5 alarm : Expansion module spare 5 error
Exp.spare-6 alarm : Expansion module spare 6 error
Exp.spare-7 alarm : Expansion module spare 7 error
Exp.spare-8 alarm : Expansion module spare 8 error
Fail to start alarm : Fail to start alarm
Gen break.close fail : Generator breaker not closed alarm
Gen break.open fail : Generator breaker not opened alarm
Gen over frq.prealr : Generator over frequency pre-alarm
Gen over frq.shutdwn : Generator over frequency shutdown
Gen over vol.prealr : Generator over voltage pre-alarm
Gen over vol.shutdwn : Generator over voltage shutdown
Gen phase seq.wrong : Generator phase sequence wrong
Gen stop fail : Generator stop error
Gen under frq.preal : Generator under frequency pre-alarm
Gen under frq.shtdwn : Generator under frequency shutdown
Gen under vol.preal : Generator under voltage pre-alarm
Gen under vol.shtdwn : Generator under voltage shutdown
GPRS IP not found : Gprs no IP alarm
GPRS reset fail : Gprs reset fail
Mains break.cls fail : Mains breaker not closed alarm
Mains break.opn fail : Mains breaker not opened alarm
Modem response: error : Gprs error response alarm
No respons.from modem : Gprs no response alarm
Over current alarm : Over current alarm
Over current prealr : Over current pre-alarm
Over power alarm : Under power error
Over power prealarm : Under power pre-alarm
Reverse power alarm : Reverse power alarm
Short circuit alarm : Short circuit alarm
SMS was not sent : Sms wasn't sent
SMS was sent : Sms was successfully sent
Spare-1 alarm : Spare 1 error
Spare-2 alarm : Spare 2 error
Spare-3 alarm : Spare 3 error
Spare-4 alarm : Spare 4 error
Spare-5 alarm : Spare 5 error
Spare-6 alarm : Spare 6 error
Spare-7 alarm : Spare 7 error
Spare-8 alarm : Spare 8 error
Under current alarm : Under current error
Under current prealr : Under current pre-alarm
Under power alarm : Under power error
Under power prealarm : Under power pre-alarm

5. Specifications

Equipment use	: Electrical control equipment for generating sets.
Housing & Mounting	: 229 mm x 152 mm x 41 mm. (including connectors). Plastic housing for panel mounting.
Panel Cut-Out	: 182mm x 135mm.
Protection	: IP65 at front panel.
Weight	: Approximately 0,53 Kg.
Environmental rating	: Standard, indoor at an altitude of less then 2000 meters with non-condensing humidity.
Operating/Storage Temperature	: -20°C to +70°C / -30°C to +80°C
Operating/Storage Humidity	: 90 % max. (non-condensing)
Installation Over Volt. Category	: II Appliances, portable equipment
Pollution Degree	: II, Normal office or workplace, non conductive pollution
Mode of Operation	: Continuous.
DC Battery Supply Voltage	: 8 to 32 V $\overline{\text{---}}$. Max. operating current is 360 mA.
Cranking Dropouts	: Battery voltage can be "0" VDC for max. 50 ms during cranking (battery voltage should be at least nominal voltage before cranking).
Battery Voltage Measurement	: 8 to 32 V $\overline{\text{---}}$, accuracy: 1 % FS, resolution: 0,1 V
Mains Voltage Measurement	: 3 to 300 VAC Ph-N, 5 to 99.9 Hz. Accuracy: 1 % FS, Resolution: 1 V.
Mains Frequency	: 5 to 99.9Hz (min. 20 VAC Ph-N) Accuracy: 0,25 % FS, Resolution: 0,1 Hz.
Generator Voltage Measurement	: 3 to 300 VAC Ph-N, 5 to 99.9 Hz. Accuracy: 1 % FS, Resolution: 1 V.
Generator Frequency	: 5 to 99.9Hz (min. 20 VAC Ph-N) Accuracy: 0,25 % FS, Resolution: 0,1 Hz.
CT secondary	: 5A.
Communication interface	: USB programming and communication port.
Optional Expansion I/O Module	: Expansion I/O module including 8 inputs and 8 outputs.
Optional Comm. Modules	: Ethernet/Dial-up, GSM/GPRS and Web Server modules.
Relay Outputs	: Generator contactor relay output 8A@250V $\sim$ Mains contactor relay output 8A@250V $\sim$ Configurable output-5 5A@250V $\sim$ Configurable output-6 5A@250V $\sim$
Transistor Outputs	: Configurable output-1 1A at DC supply voltage Configurable output-2 1A at DC supply voltage Configurable output-3 1A at DC supply voltage Configurable output-4 1A at DC supply voltage All transistor outputs supplied from DC supply terminal 22

6. Other Informations

Manufacturer Information:

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