

TRANS-MINIATS
AUTOMATIC TRANSFER SWITCH
User Manual

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EU DECLARATION OF CONFORMITY

Manufacturer's Name : EMKO ELEKTRONIK A.S.
Manufacturer's Address : Bursa Organize Sanayi Bölgesi ,
Ali Osman Sönmez Bulvarı 2.Sokak No:3
16215 Bursa, TÜRKİYE

This declaration is issued under the sole responsibility of the manufacturer.

Product Name : Automatic Transfer Switch

Type Number : TRANS-MINIATS

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

The product(s) that are stated above are fully in conformity with the essential requirements of Council Directives:

2014 / 35 / EU The Low Voltage Directive

2014 / 30 / EU The Electromagnetic Compatibility Directive

2011 / 65 / EU The Restriction of Hazardous Substances (RoHS 2) Directive

2015 / 863 / EU Amendment to Annex II of Directive 2011/65/EU

2017 / 2102 / EU Amendment to Annex II of Directive 2011/65/EU

This declaration is based on the full compliance of the products with the following European standards:

EN 61010-1:2010 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use

EN 61326-1:2013 Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements

EN 60947-6-1:2005/A1:2014 Low - Voltage Switchgear and Controlgear - Part 6-1: Multiple Function Equipment - Transfer Switching Equipment

EN 50581:2012 Technical Documentation for The Assessment of Electrical and Electronic Products With Respect to The Restriction of Hazardous Substances

When and Where Issued

22Nd October 2021

BURSA-TÜRKİYE

Authorized Signature

Name : Arzu ATAN

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 RS-232 communication 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.

1.4 Order Information

Trans-MiniATS **:** Automatic Transfer Switch

Note: Device have time clock. If real time clock is needed, “RTC” expression must be added to end of order code.
Example: Trans-MiniATS.RTC

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 occured 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 seperate 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.

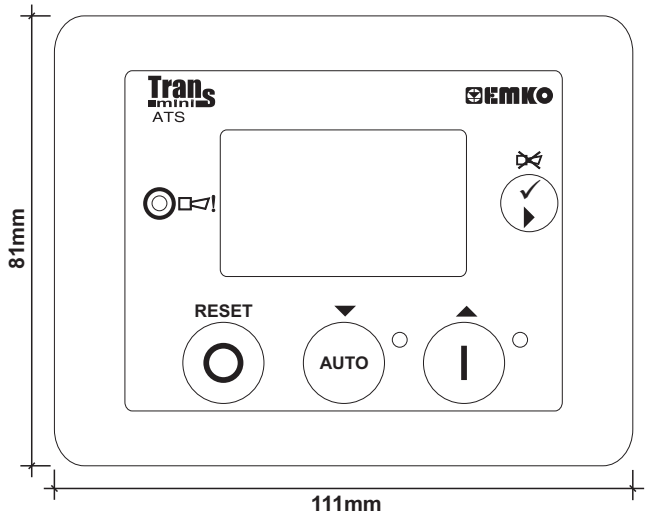


Figure 2.1 Front View

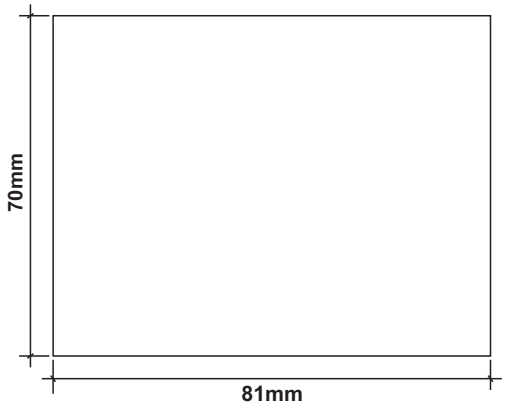
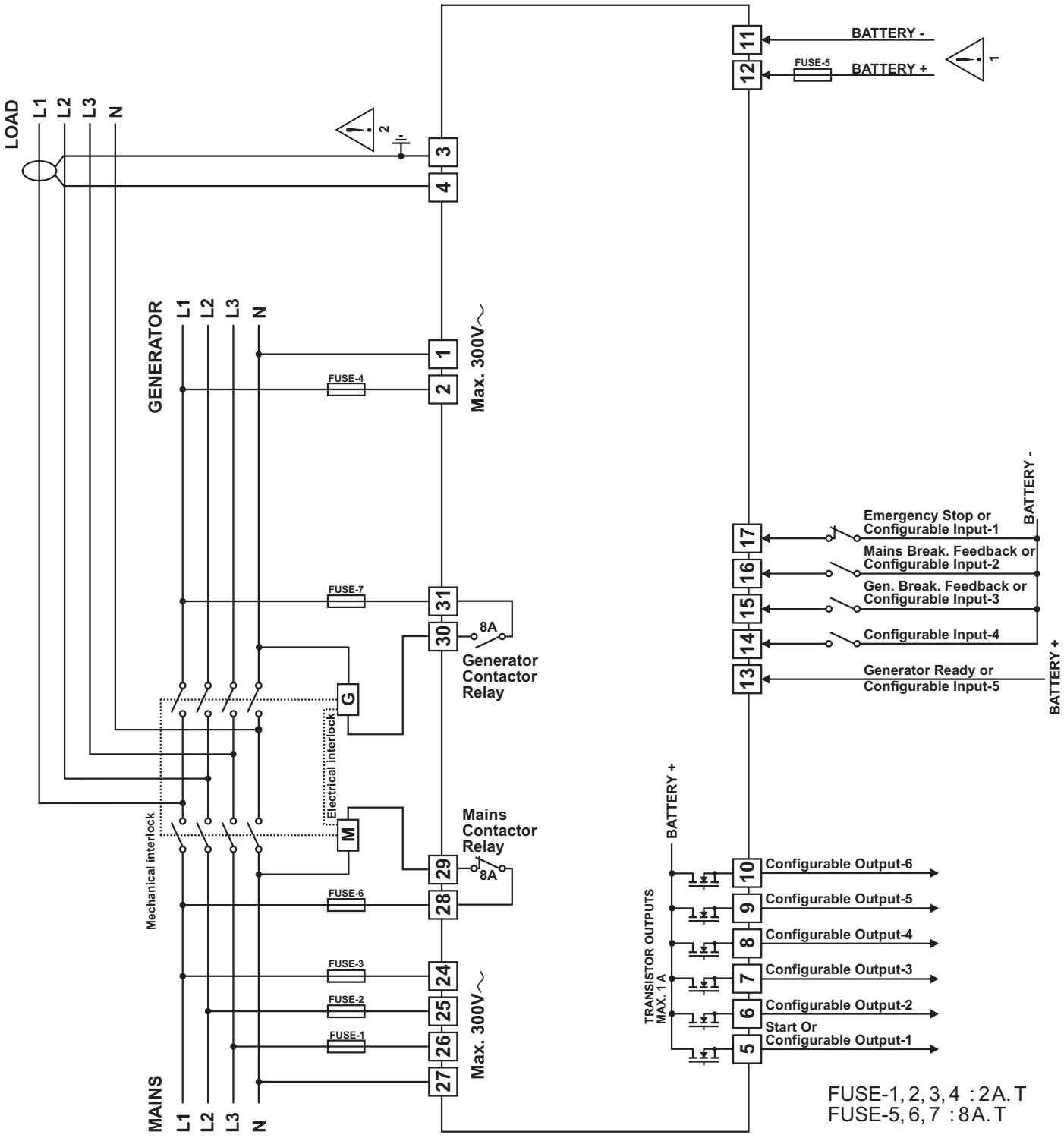


Figure 2.2 Panel Cut-Out

2.3 Electrical Connection

TRANS-MINIATS three phase connections schematic

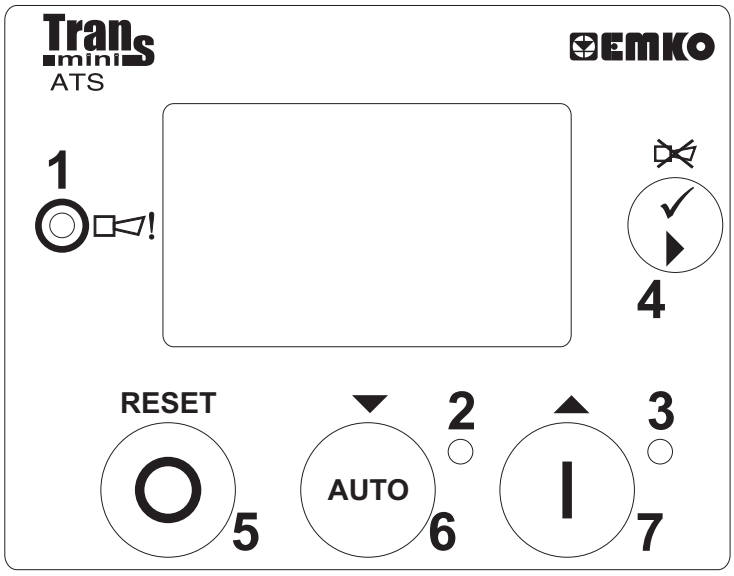


1- Connect the unit as shown in the appropriate diagram. Be sure to connect the battery supply the right way round and battery negative should be grounded. External fuse is recommended. Stranded cable cross section: 1,5mm², Solid cable cross section: 2,5mm², The stripping length is 7 to 9 mm. Supply cables must comply with the requirements of IEC 60277 or IEC 60245.

2- Current transformers secondary should be grounded. The CT of 5VA is recommended. The unit has a burden of 0.5VA on the CT.

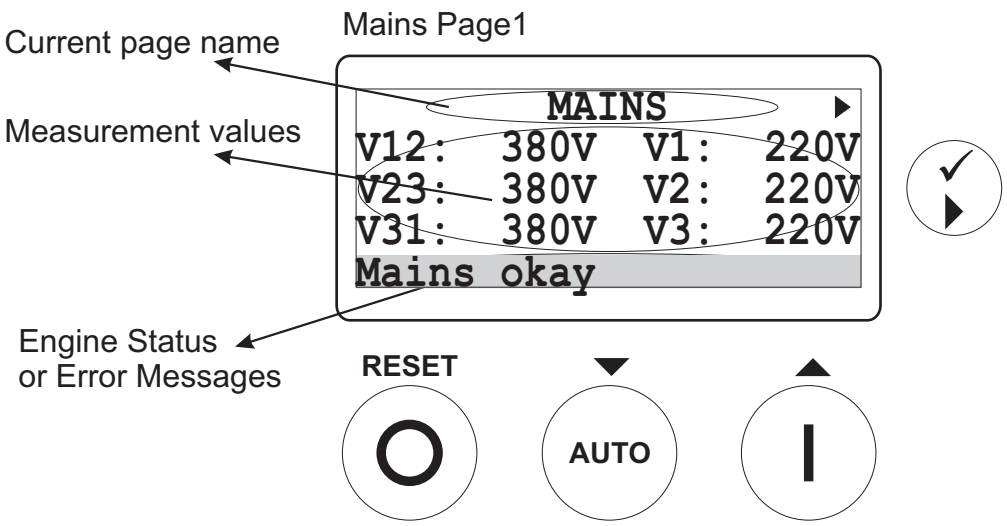
3. Front Panel Description And Accessing To The Parameters

3.1 Front Panel Description



Number	Comment
1	This LED indicates that any alarm was detected.
2	This LED shows that the unit is in the AUTO mode.
3	In the Manual and Auto modes, this LED indicates that the engine is starting up or is running.
4	This button is used for showing next page in normal operation.In Programming mode it is used for entering parameter edit section, saving parameter value and showing next parameters on the currently selected page.This button will also silence the alarm horn after a failure has been detected.
5	The RESET button will reset the controller after a failure has been detected. The STOP button is used for changing operating mode of the unit to the Stop Mode. The generator is stopped.
6	The AUTO button is used for changing operating mode of the unit to the Auto Mode. In Programming mode, it operates as an Down button (changing cursor position) or Decrement button (decrease parameter value).
7	The START button is used for starting the engine when the unit is in the Manual Mode. In Programming mode, it operates as an Up button (changing cursor position) or Increment button (increase parameter value).

LCD display Description



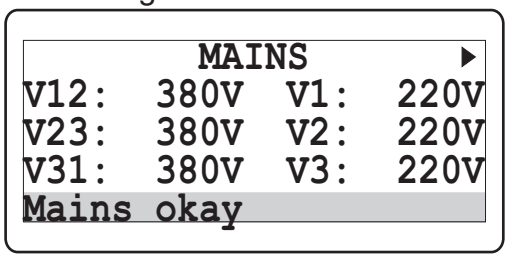
128x64 Dot-matrix LCD display.

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

When enter button pressed for 2 seconds, menu options displayed.

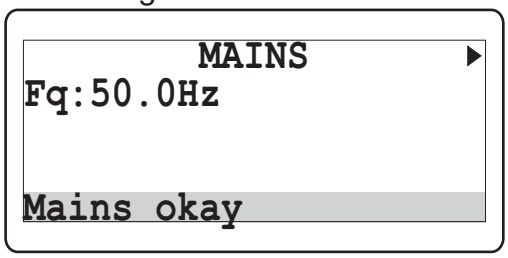
Data display pages on the LCD display;

Mains Page1:



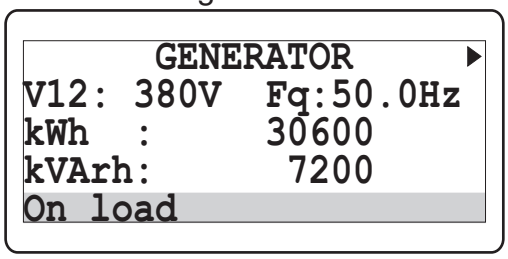
V12: Mains voltage L1-L2
V23: Mains voltage L2-L3
V31: Mains voltage L3-L1
V1: Mains voltage L1-N
V2: Mains voltage L2-N
V3: Mains voltage L3-N

Mains Page2:



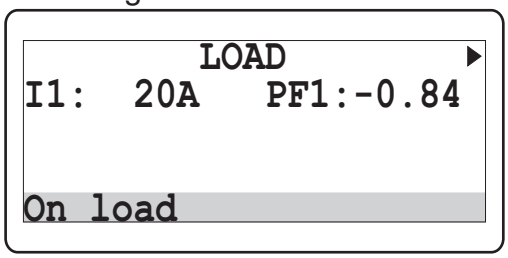
Fq: Mains frequency

Generator Page:



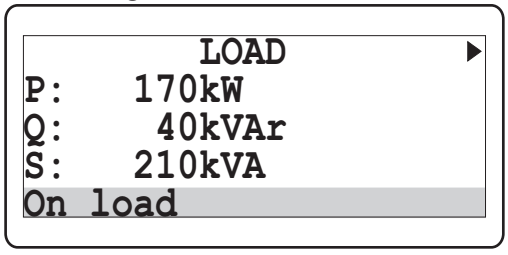
V12: Generator voltage L1-L2
Fq: Generator frequency
kWh: Generator active energy
KVArh: Generator reactive energy

Load Page1:



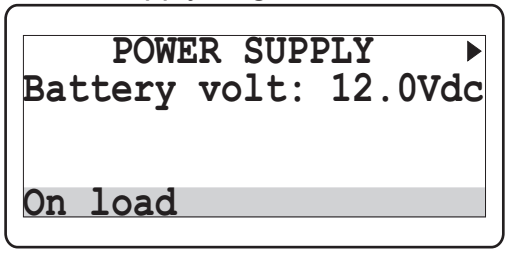
I1: Load Current L1
PF1: Load power factor L1

Load Page2:



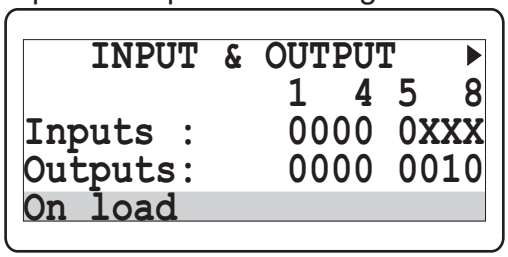
P: Load active power
Q: Load reactive power
S: Load apparent power

Power Supply Page:



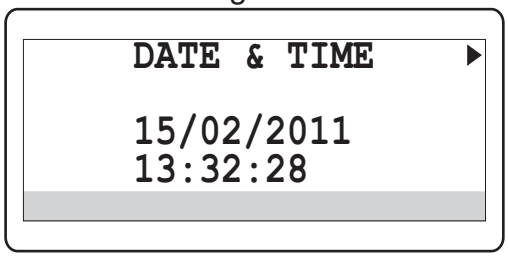
Battery volt: Battery supply voltage

Input & Output Status Page:



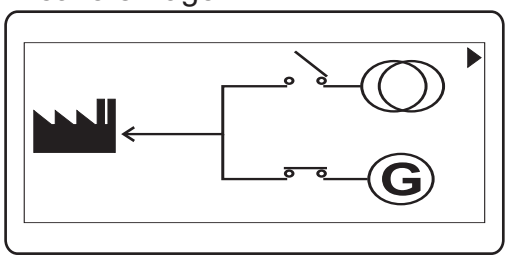
Inputs: Input status information. If an input is active, related digit is displayed as "1" else it is displayed as "0".
1: Conf. in-1, **2:** Conf. in-2, **3:** Conf. in-3, **4:** Conf. in-4,
5: Conf. In-5, **6:** Not available, **7:** Not available, **8:** Not available
Outputs: Output status information. 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.

Date & Time Page:



Date: Day, Month, Year.
Time: Hour, minute, second.

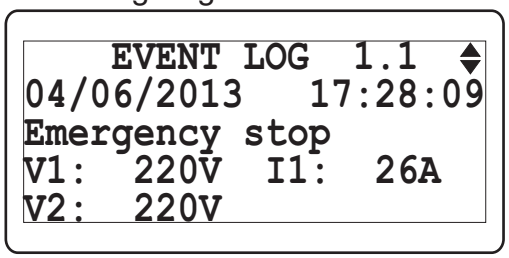
Breakers Page:



This page shows the status of Mains and Generator Breakers

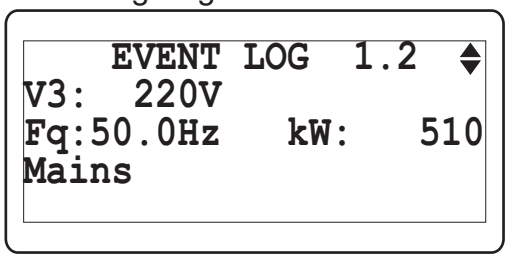
Event Log display pages on the LCD display;

Event Log Page1:



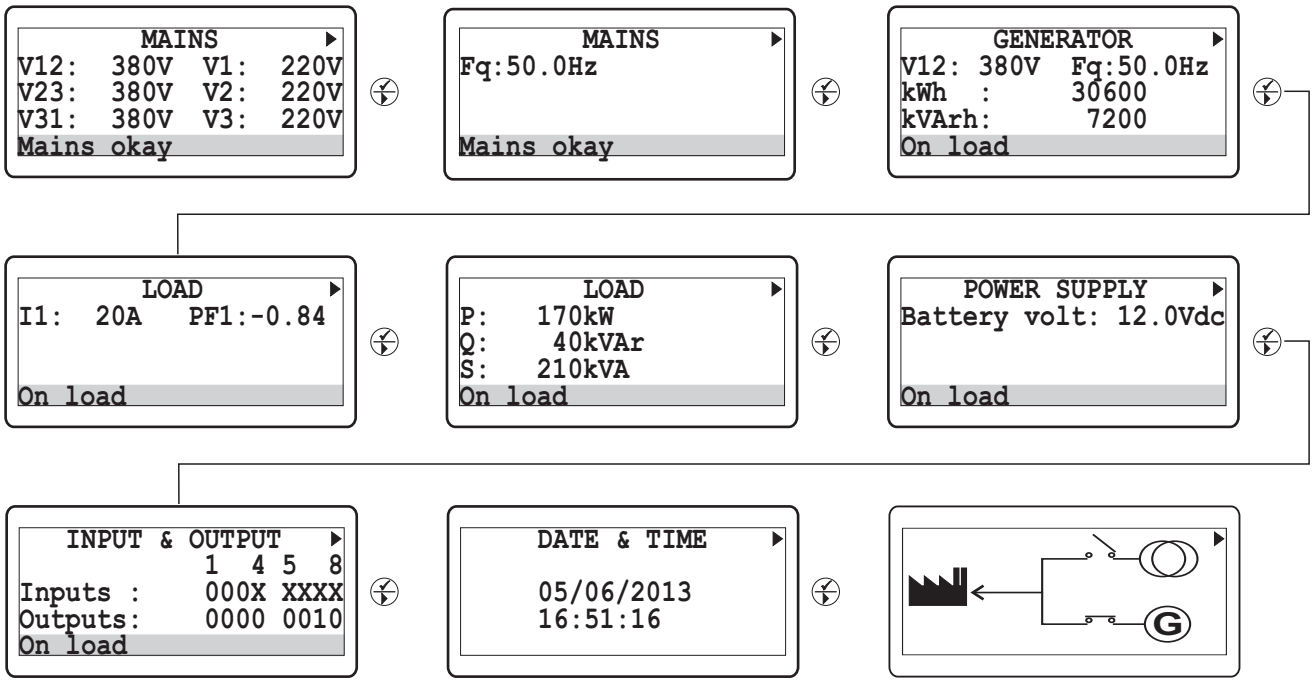
1.1: The first page of related event log
Emergency stop: This message indicates that an emergency stop alarm has occurred. (Event history: 04/06/2013 date, 17:28:09 time).
V1: Generator voltage L1-N
I1: Load Current L1

Event Log Page2:

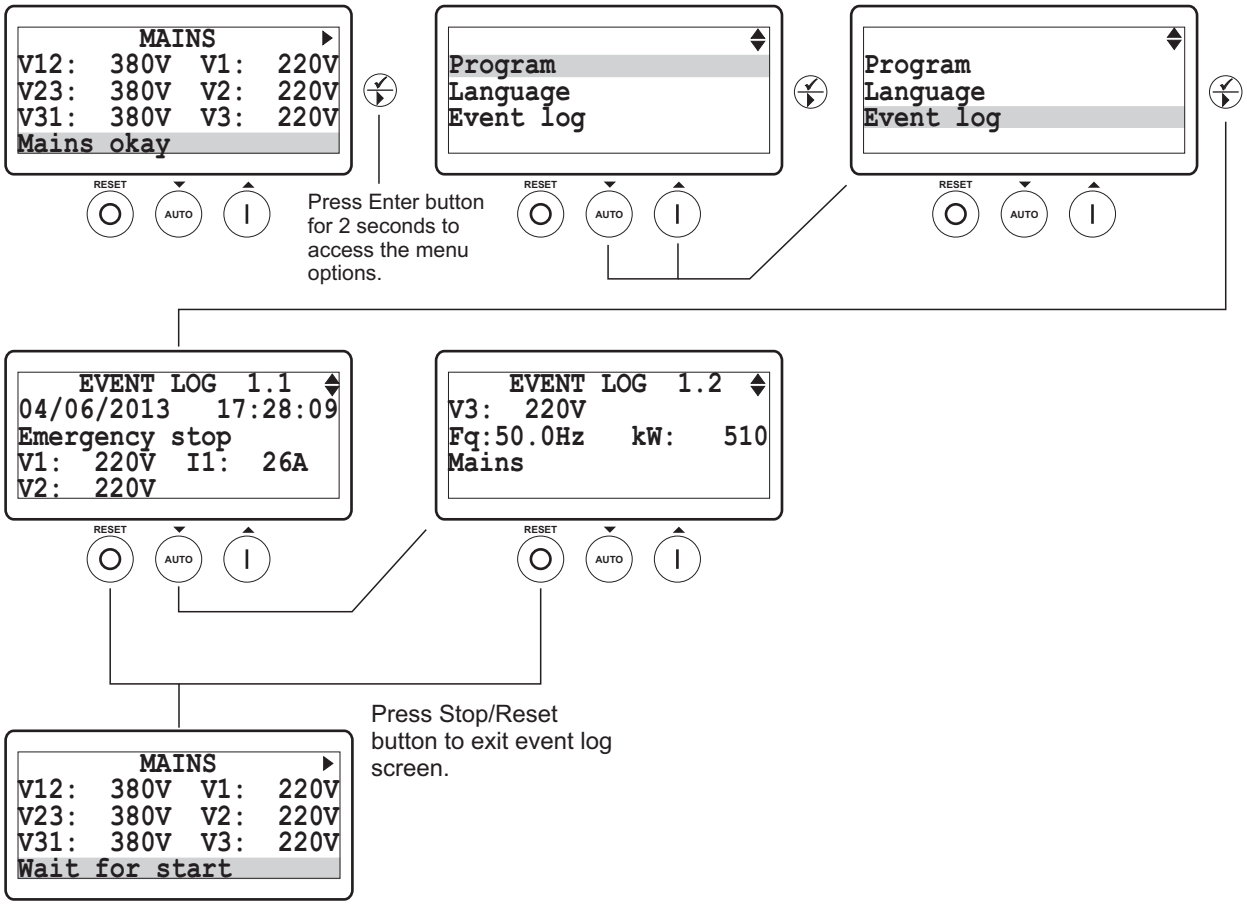


1.2: The second page of related event log
Fq: Generator frequency
kW: Generator total active power
Mains: This message indicates that Load is supplied by mains

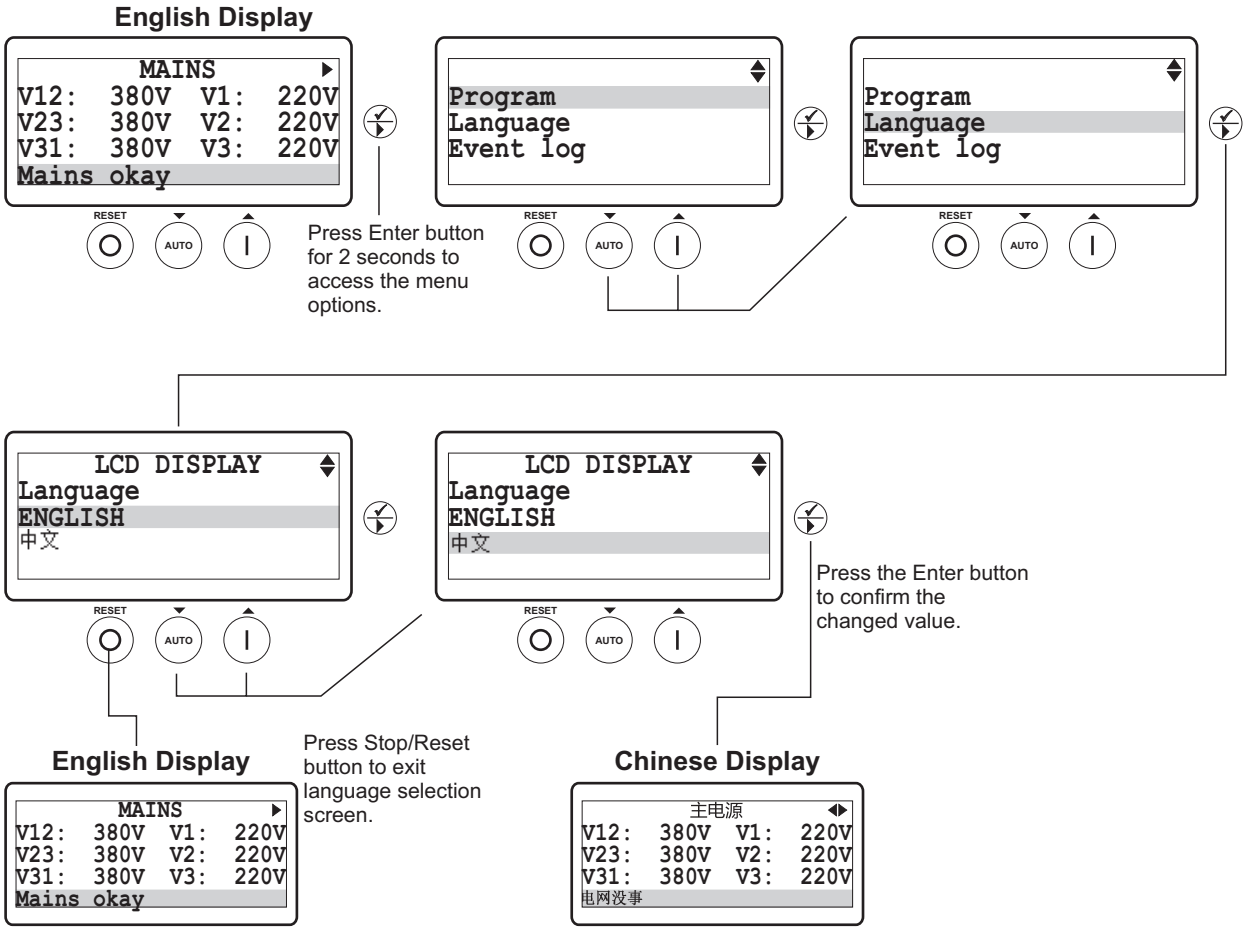
Example-1: Displaying all Data display pages.



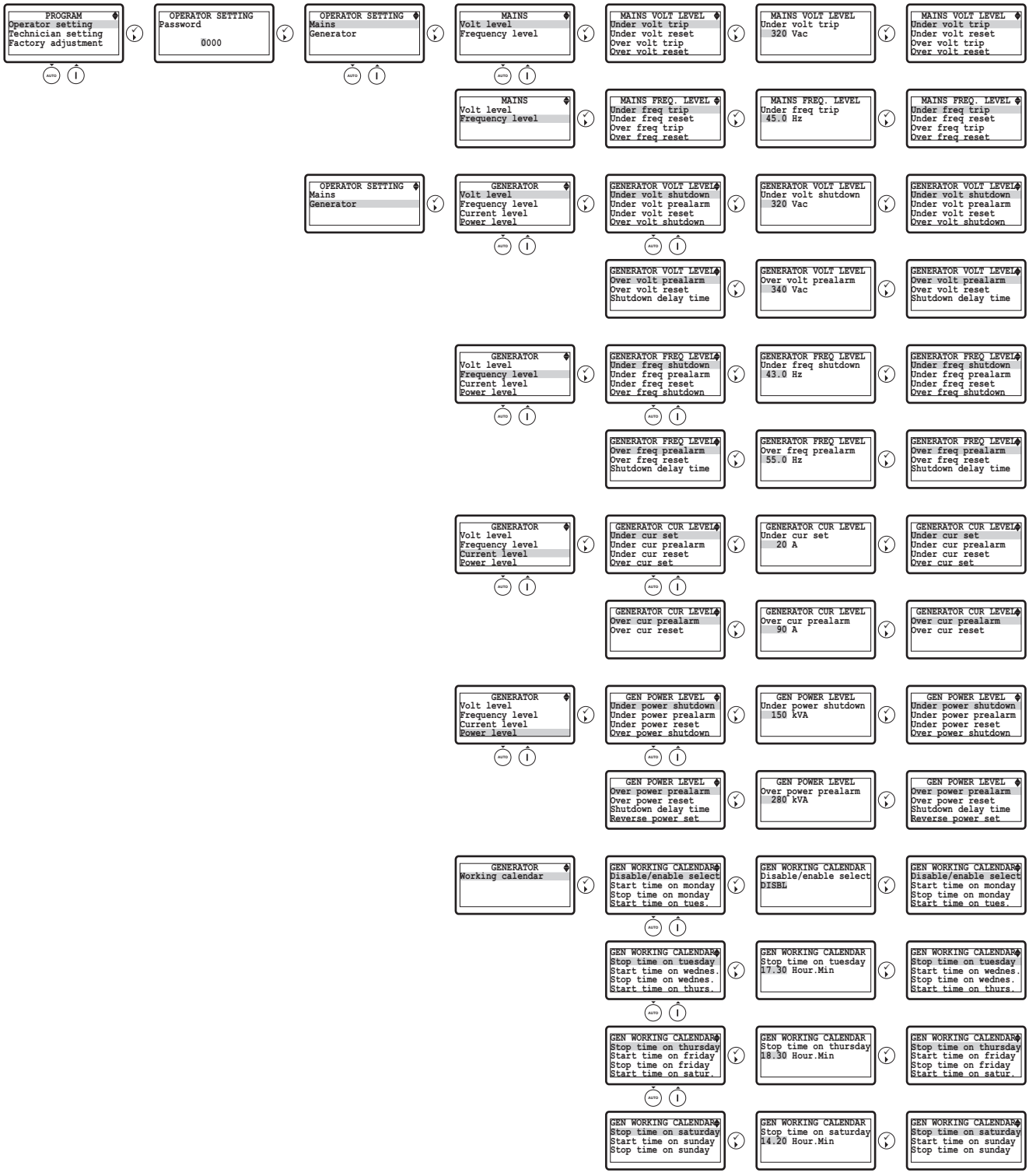
Example-2: Displaying all Event Log display pages



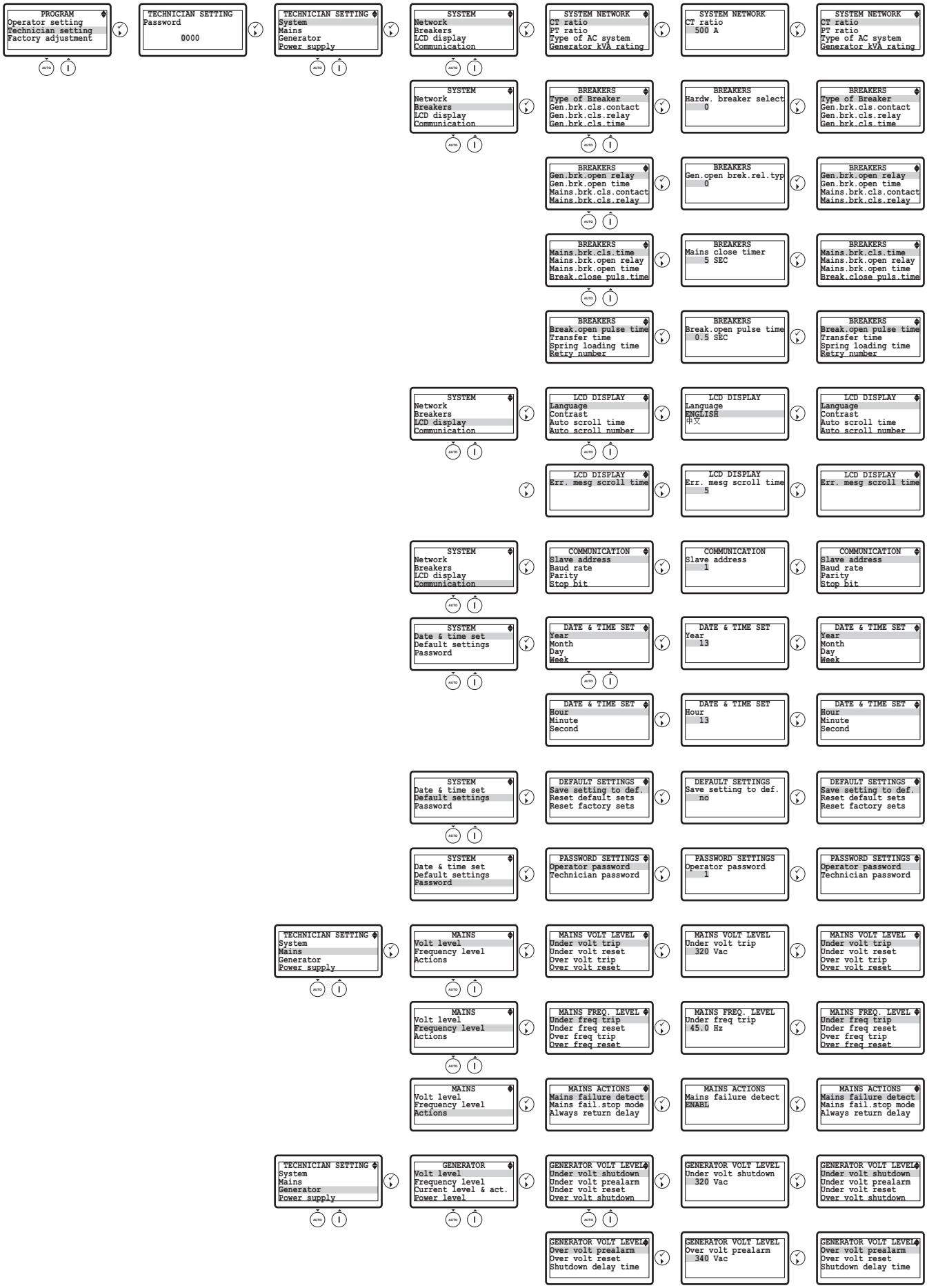
LCD display language selection

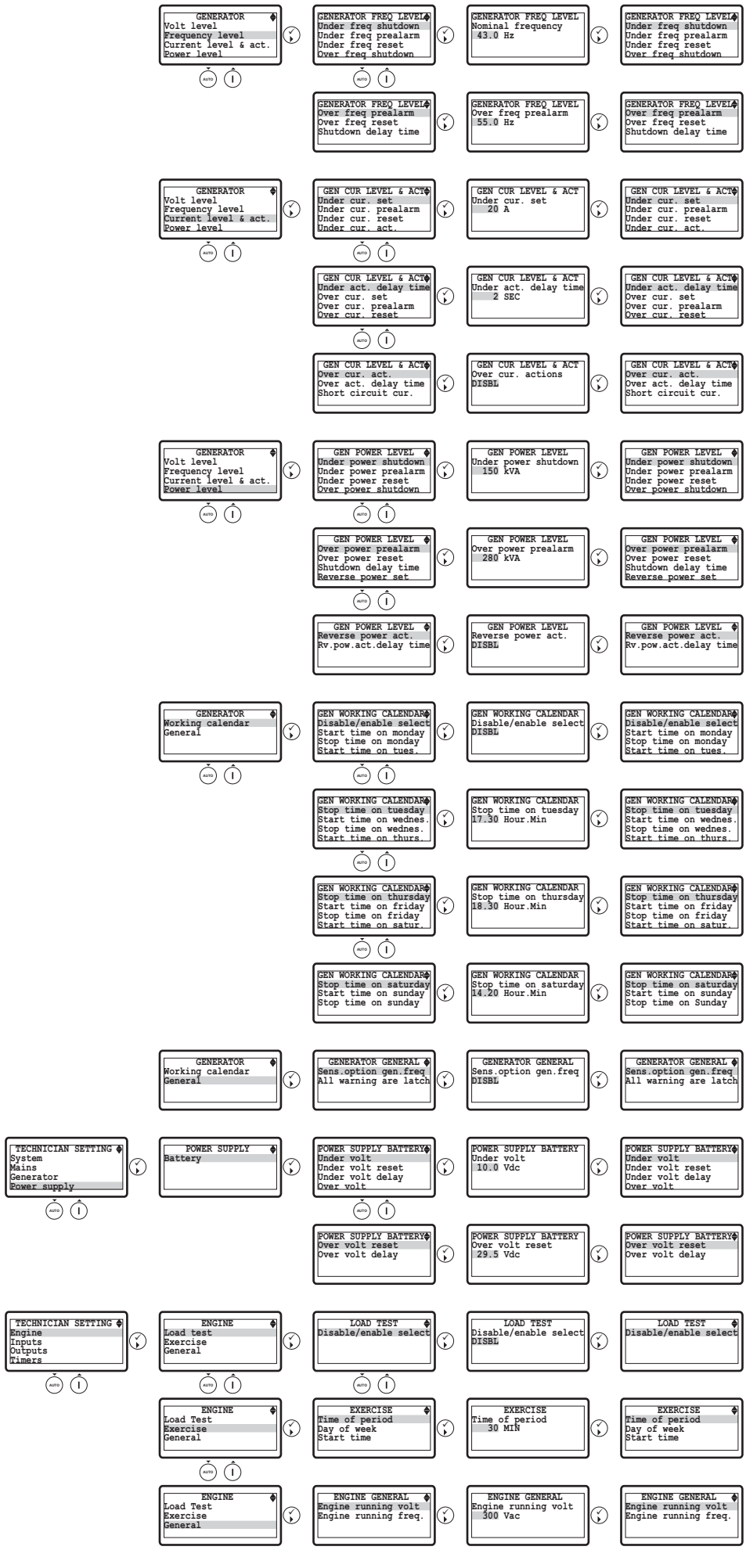


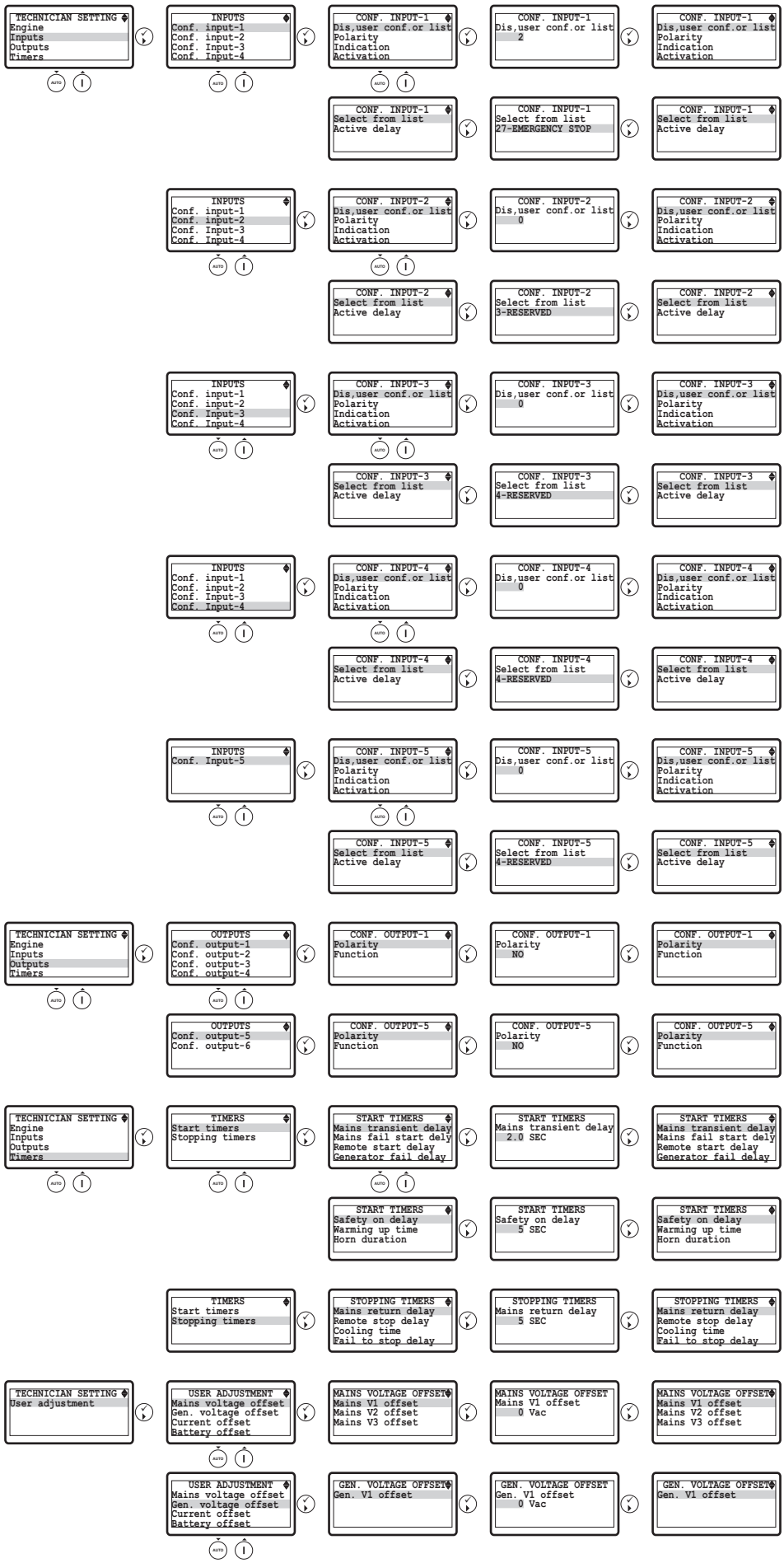
3.2 Accessing To The Operator Parameters

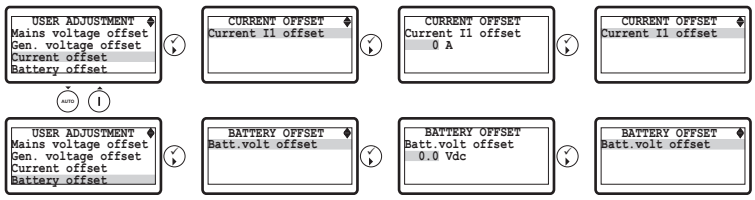


3.3 Accessing To The Technician Parameters

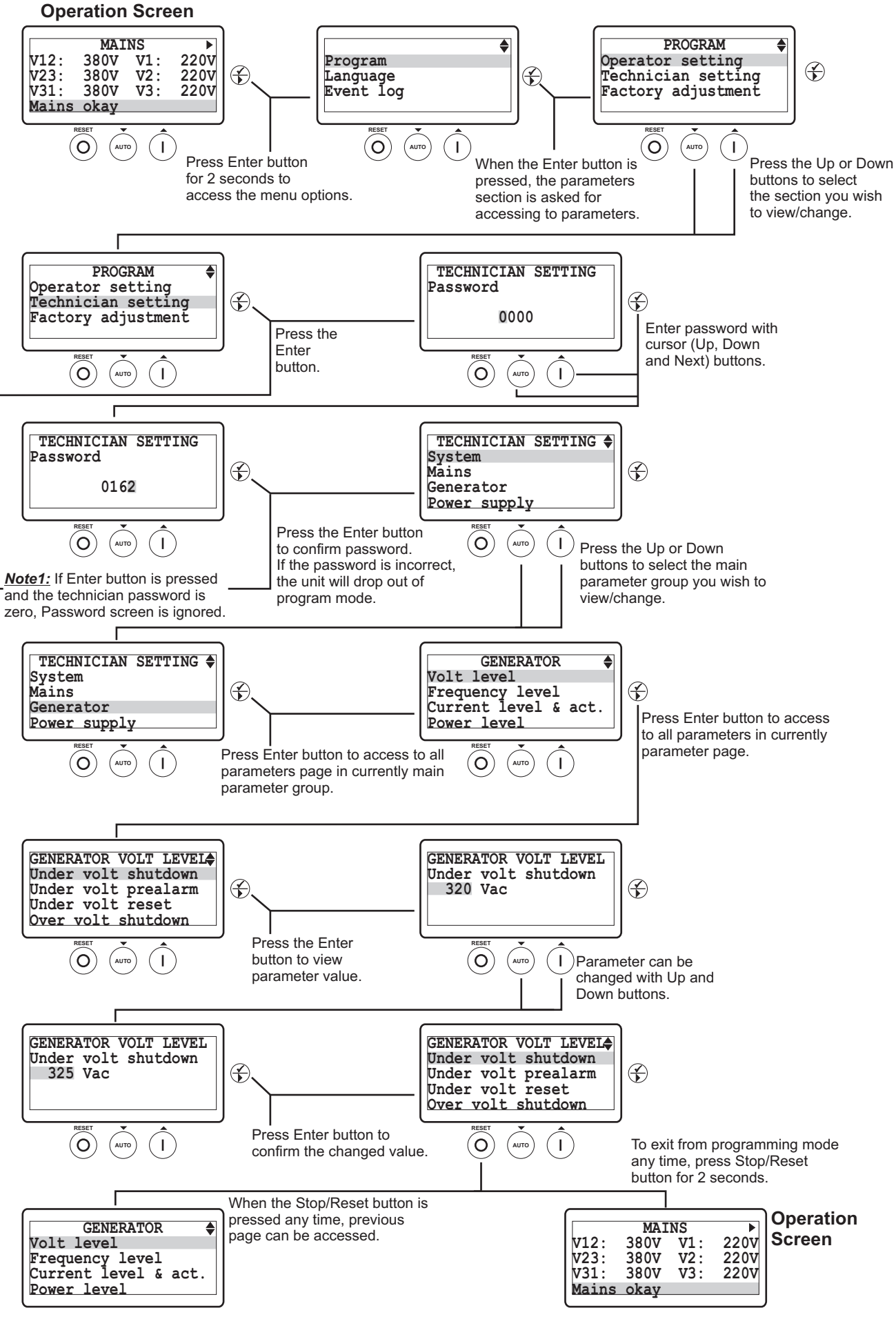



GENERATOR
Volt level
Frequency level
Current level & act.
Power level
GENERATOR FREQ LEVEL
Under freq shutdown
Under freq prealarm
Under freq reset
Over freq shutdown
GENERATOR FREQ LEVEL
Nominal frequency
43.0 Hz
GENERATOR FREQ LEVEL
Under freq shutdown
Under freq prealarm
Under freq reset
Over freq 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. actions
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
POWER SUPPLY BATTERY
Under volt
Under volt reset
Under volt delay
Over volt
POWER SUPPLY BATTERY
Over volt reset
Over volt delay
POWER SUPPLY BATTERY
Over volt reset
29.5 Vdc
POWER SUPPLY BATTERY
Over volt reset
Over volt delay
TECHNICIAN SETTING
Engine
Inputs
Outputs
Timers
ENGINE
Load test
Exercise
General
LOAD TEST
Disable/enable select
LOAD TEST
Disable/enable select
DISBL
LOAD TEST
Disable/enable select
ENGINE
Load Test
Exercise
General
EXERCISE
Time of period
Day of week
Start time
EXERCISE
Time of period
30 MIN
EXERCISE
Time of period
Day of week
Start time
ENGINE
Load Test
Exercise
General
ENGINE GENERAL
Engine running volt
Engine running freq.
ENGINE GENERAL
Engine running volt
300 Vac
ENGINE 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
Select from list
Active delay
2
27-EMERGENCY STOP
CONF. INPUT-2
0
3-RESERVED
CONF. INPUT-3
4-RESERVED
CONF. INPUT-4
Conf. Input-5
CONF. INPUT-5
OUTPUTS
Conf. output-1
Conf. output-2
Conf. output-3
Conf. output-4
Conf. output-5
Conf. output-6
CONF. OUTPUT-1
Function
NO
CONF. OUTPUT-5
TIMERS
Start timers
Stopping timers
START TIMERS
Mains transient delay
Mains fail start dely
Remote start delay
Generator fail delay
2.0 SEC
Safety on delay
Warming up time
Horn duration
5 SEC
STOPPING TIMERS
Mains return delay
Remote stop delay
Cooling time
Fail to stop delay
User adjustment
USER ADJUSTMENT
Mains voltage offset
Gen. voltage offset
Current offset
Battery offset
MAINS VOLTAGE OFFSET
Mains V1 offset
Mains V2 offset
Mains V3 offset
0 Vac
GEN. VOLTAGE OFFSET
Gen. V1 offset


USER ADJUSTMENT
Mains voltage offset
Gen. voltage offset
Current offset
Battery offset
CURRENT OFFSET
Current I1 offset
CURRENT OFFSET
Current I1 offset
0 A
CURRENT OFFSET
Current I1 offset
AUTO
I
USER ADJUSTMENT
Mains voltage offset
Gen. voltage offset
Current offset
Battery offset
BATTERY OFFSET
Batt.volt offset
BATTERY OFFSET
Batt.volt offset
0.0 Vdc
BATTERY OFFSET
Batt.volt offset

3.4 Changing And Saving Parameters Values



4. Parameters

4.1 Operator Parameters

4.1.1 Mains

MAINS VOLT LEVEL (*Mains->Volt level*)		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 (*Mains->*Frequency *level*)		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 (*Generator->Volt level*)		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 (*Generator->Frequency level*)		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 (*Generator->Current level*)		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~
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~

Note: dis = disable

GEN POWER LEVEL (*Generator->Power level*)		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 (*Generator->Working calendar*)		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 (*System->Network*)		Min	Max	Default	Unit
CT ratio	Current Transformer Ratio	5	9999	100	
PT ratio	Voltage Transformer Ratio	1	50	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	
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.

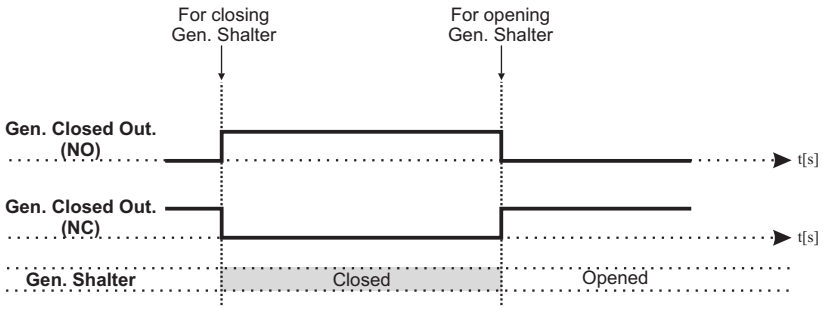
PT ratio
Defines the scaling factor applied to voltage readout and associated fault conditions.
This PT ratio is for additional voltage transformers mounted the unit.

BREAKERS (*System->Breakers*)		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.

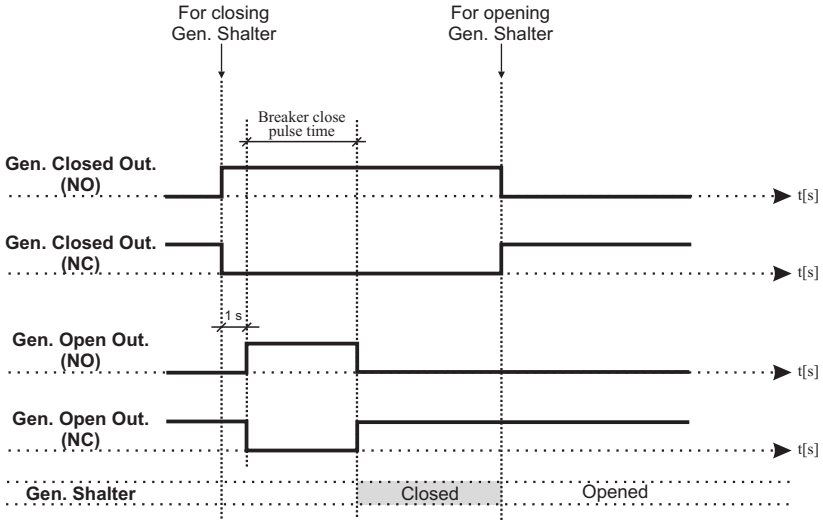
Note-1 : NO / NC : Normally Open / Normally Close
2 : NOR / PULS : Normal / Pulse

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.

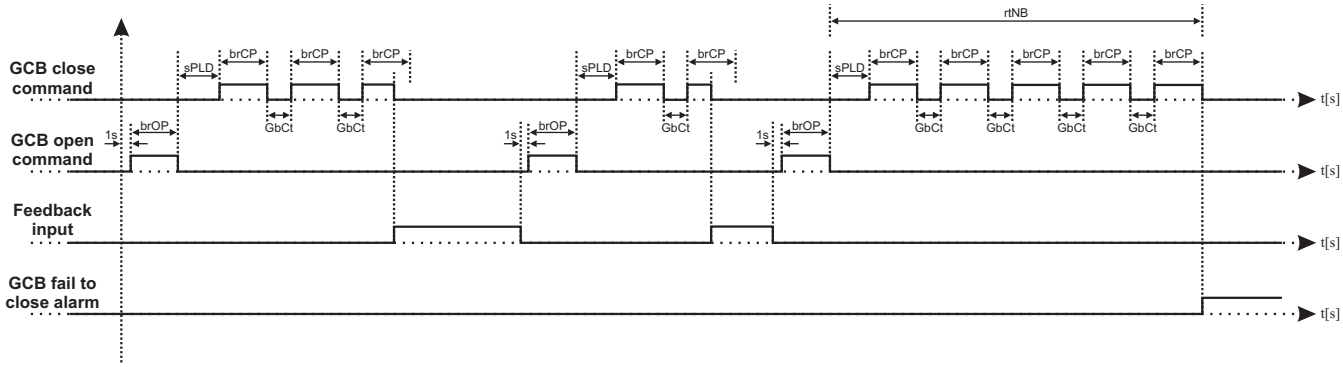
Example: If Hardware Breaker Selection parameter is selected as 1;



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.

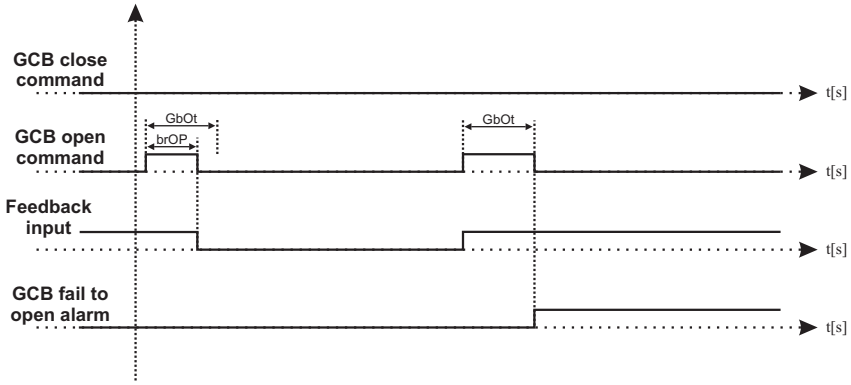
Example-1: GCB Close Diagram.
If Hardware Breaker Selection parameter is selected as 2 (user configured), Gen. Close Breaker Relay Type parameter is selected as 1 (PULSE) and Gen. Open Breaker Relay Type parameter is selected as 1 (PULSE);

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 (user configured), 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 (*System->LCD display*)		**Min**	**Max**	**Default**	**Unit**
Language*	Language Selection	ENGLISH/CHINESE		ENGLISH	
Contrast	Digital Contrast	4	9	5	
Auto backlight off	Auto Backlight Off	DISBL/ENABL		DISBL	
Auto scroll time	Auto Scroll Time	0 (dis)	250	0	Sec
Auto scroll number	Auto Scroll Number	1	8	3	
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 for 60 secs, LCD backlight will be automatically changed to power saving 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: * = Selectable value of this parameter is "ENGLISH/TURKISH" at Trans-MiniATS.XXX (TR) 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 (*Mains->Volt level*)		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 (*Mains->*Frequency *level*)		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 (*Mains->*Actions)		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 goes outside 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 (*Generator->Volt level*)		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 (*Generator->Frequency level*)		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 (*Generator->Current level & act.*)		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 (*Generator->Power level*)		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

Note: dis = disable

GEN WORKING CALENDAR (*Generator->Working calendar*)		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 (*Generator->General*)		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 (Power Supply->*Battery*)		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 (*Engine->Load test*)		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 (*Engine->Exercise*)		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 (*Engine->General*)		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 (*Inputs->Conf. input-1*)		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-Reserved 4-Reserved 5-Reserved 6-Simulate Auto Button 7-Simulate Test Button 8-Reserved 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-Reserved 21-Reserved 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 (*Inputs->Conf. input-2*)		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-Reserved 4-Reserved 5-Reserved 6-Simulate Auto Button 7-Simulate Test Button 8-Reserved 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-Reserved 21-Reserved 22-Remote Inhibit 23-Engine Running 24-Generator Ready 25-Emergency Stop	0	25	13	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-3 (*Inputs->Conf. input-3*)		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-Reserved 4-Reserved 5-Reserved 6-Simulate Auto Button 7-Simulate Test Button 8-Reserved 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-Reserved 21-Reserved 22-Remote Inhibit 23-Engine Running 24-Generator Ready 25-Emergency Stop	0	25	11	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-4 (*Inputs->Conf. Input-4*)		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-Reserved 4-Reserved 5-Reserved 6-Simulate Auto Button 7-Simulate Test Button 8-Reserved 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-Reserved 21-Reserved 22-Remote Inhibit 23-Engine Running 24-Generator Ready 25-Emergency Stop	0	25	23	
Active delay	Input active delay	0	250	1	Sec

Note: dis = disable

CONF. INPUT-5 (*Inputs->Conf. Input-5*)		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-Reserved 4-Reserved 5-Reserved 6-Simulate Auto Button 7-Simulate Test Button 8-Reserved 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-Reserved 21-Reserved 22-Remote Inhibit 23-Engine Running 24-Generator Ready 25-Emergency Stop	0	25	24	
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 RESERVED

4 RESERVED

5 RESERVED

6 SIMULATE AUTO BUTTON
This input mimic's the operation of the 'Auto' button and is used to provide a remotely located Auto mode push button.

7 SIMULATE TEST BUTTON
This input mimic's the operation of the 'Test' button and is used to provide a remotely located Test mode push button.

8 RESERVED

9 SIMULATE START BUTTON
This input mimic's the operation of the 'Start' button and is used to provide a remotely located start push button.

10 SIMULATE STOP BUTTON
This input mimic's 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 manis 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 whish 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 spesific mode (such as Auto) and than 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 for 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 RESERVED

21 RESERVED

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 for 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
This input is used as the emergency stop input.

4.2.7 Outputs

CONF. OUTPUT-1 (*Outputs->Conf. output-1*)		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-RESERVED 17-RESERVED 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-RESERVED 29-RESERVED 30-RESERVED 31-RESERVED 32-RESERVED 33-RESERVED 34-RESERVED 35-RESERVED 36-RESERVED 37-RESERVED 38-RESERVED 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-REVERSE POWER 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	0	122	94	

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	122	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	122	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	122	12	

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	122	13	

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	122	14	

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 RESERVED

17 RESERVED

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 RESERVED

29 RESERVED

30 RESERVED

31 RESERVED

32 RESERVED

33 RESERVED

34 RESERVED

35 RESERVED

36 RESERVED

37 RESERVED

38 RESERVED

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.

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 REVERSE POWER
This ouput becomes active when generator’s active power drops below the Reverse Power Set value.

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 controled remotely.

4.2.8 Timers

START TIMERS (*Timers->Start timers*)		Min	Max	Default	Unit
Mains transient delay	Mains Transient Delay	0.0	20.0	2.0	Sec
Mains fail start dely	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 horn will work after the last error detected. Once after this timer ended unit will do horn reset.

Note: dis = disable cont = continuous

STOPPING TIMERS (*Timers->Stopping timers*)		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: dis = disable

4.2.9 User Adjustment

MAINS VOLTAGE OFFSET (*User adjustment->Mains voltage offset*)		Min	Max	Default	Unit
Mains V1 offset	Mains V1 Offset	-20	20	0	V~
Mains V2 offset	Mains V2 Offset	-20	20	0	V~
Mains V3 offset	Mains V3 Offset	-20	20	0	V~

GEN. VOLTAGE OFFSET (*User adjustment->Gen. voltage offset*)		Min	Max	Default	Unit
Gen. V1 offset	Generator V1 Offset	-20	20	0	V~

CURRENT OFFSET (*User adjustment->Current offset*)		Min	Max	Default	Unit
Current I1 offset	Current I1 Offset	-20	20	0	A~

BATTERY OFFSET (*User adjustment->Battery offset*)		Min	Max	Default	Unit
Batt.volt offset	Battery Voltage Offset	-5.0	5.0	0	V⎓

Error Messages And Explanations:

Battery high warning! : Battery high error
Battery low warning! : Battery low error
Emergency stop! : Emergency stop 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 prealarm
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 stop fail! : Generator stop error
Gen under frq.prealr! : Generator under frequency prealarm
Gen under frq.shtdwn! : Generator under frequency shutdown
Gen under vol.shtdwn! : Generator under voltage shutdown
Gen under volt.preal! : Generator under voltage prealarm
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 prealarm
Over current trip! : Over current error
Over current warnng! : Over current warning
Over power alarm! : Over power error
Over power prealarm! : Over power prealarm
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
Under curr.trip cool! : Under current electrical trip
Under current prealr! : Under current prealarm
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
Changed mode to auto : Changed mode to auto
Changed mode to man : Changed mode to manual
Changed mode to stop : Changed mode to stop
Changed mode to test : Changed mode to test
Emergency stop : Emergency stop 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 prealarm
Gen over frq.shutdwn : Generator over frequency shutdown
Gen over vol.prealr : Generator over voltage prealarm
Gen over vol.shutdwn : Generator over voltage shutdown
Gen stop fail : Generator stop error
Gen under frq.preal : Generator under frequency prealarm
Gen under frq.shtdwn : Generator under frequency shutdown
Gen under vol.preal : Generator under voltage prealarm
Gen under vol.shtdwn : Generator under voltage shutdown
Mains break.cls fail : Mains breaker not closed alarm
Mains break.opn fail : Mains breaker not opened alarm
Over current alarm : Over current alarm
Over current prealr : Over current prealarm
Over power alarm : Over power error
Over power prealarm : Over power prealarm
Reverse power alarm : Reverse power alarm
Short circuit alarm : Short circuit alarm
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
Under current alarm : Under current error
Under current prealr : Under current prealarm
Under power alarm : Under power error
Under power prealarm : Under power prealarm

5. Specifications

Equipment use	: Electrical control equipment for generating sets.
Housing & Mounting	:111 mm x 81 mm x 61 mm. (including connectors). Plastic housing for panel mounting.
Panel Cut-Out	: 81mm x 70mm.
Protection Against Mech. Impacts	: 1Joule (IK06).
Protection Class	: IP65 at front panel.
Weight	: Approximately 0,3 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	: 95 % max. (non-condensing)
Vibration	: EN 60068-2-6 Ten sweeps in each of three major axes 5Hz to 8Hz @ +/-7.5mm, 8Hz to 500Hz @ 2gn.
Shock	: EN 60068-2-27 Three shocks in each of three major axes 15gn in 11mS.
Installation Over Volt. Category	: II Appliances, portable equipment
Pollution Degree	: II, Normal office or workplace, non conductive pollution
Mode of Operation	: Continuous.
Supply Voltage and Power	: 8 to 32 V⎓ (Peak: 36 V⎓) - 3.2W
Battery Voltage Measurement	: 8 to 32 V ⎓, accuracy: 1 % FS, resolution: 0,1 V
Mains Voltage Measurement	: 10 to 300 VAC Ph-N, 5 to 99.9 Hz. Accuracy: 1 % FS, Resolution: 1 V, Harmonics: Up to 11^{th}.
Mains Frequency	: 5 to 99.9Hz (min. 20 VAC Ph-N) Accuracy: 0,25 % FS, Resolution: 0,1 Hz.
Generator Voltage Measurement	: 10 to 300 VAC Ph-N, 5 to 99.9 Hz. Accuracy: 1 % FS, Resolution: 1 V, Harmonics: Up to 11^{th}.
Generator Frequency	: 5 to 99.9Hz (min. 20 VAC Ph-N) Accuracy: 0,25 % FS, Resolution: 0,1 Hz.
CT secondary	: 5A.
Communication interface	: RS-232
Relay Outputs	: Generator contactor relay output 8A@250V~ Mains contactor relay output 8A@250V~
Transistor Outputs	: Start or 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 Configurable output-5 1A at DC supply voltage Configurable output-6 1A at DC supply voltage All transistor ouputs supplied from DC supply terminal 12
Approvals	: EAC , CE

6. Other Informations

Manufacturer Information:
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