37238D

GCP-30 Series
Genset Control

Function/Operation
Software version 4.3xxx

Manual 37238D

WARNING

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

The engine, turbine, or other type of prime mover should be equipped with an overspeed (overtemperature, or overpressure, where applicable) shutdown device(s), that operates totally independently of the prime mover control device(s) to protect against runaway or damage to the engine, turbine, or other type of prime mover with possible personal injury or loss of life should the mechanical-hydraulic governor(s) or electric control(s), the actuator(s), fuel control(s), the driving mechanism(s), the linkage(s), or the controlled device(s) fail.

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

CAUTION

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts.

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

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Important definitions

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, could result in damage to equipment.

NOTE

Provides other helpful information that does not fall under the warning or caution categories.

Revision History

Rev.	Date	Editor	Changes
NEW	04-06-02	Tr	Release
A	04-09-23	TP	Minor corrections, functionality from V4.3xxx updated
B	05-06-15	TP	Appendix Parameters and Set Points added, various minor corrections Description GCP-31 RPQ-SC08 (Rental Package) added
C	06-01-11	TP	Various minor corrections
D	07-02-07	TP	Various minor corrections; linguistic review

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Illustrations And Tables

Illustrations

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Chapter 1.
General Information

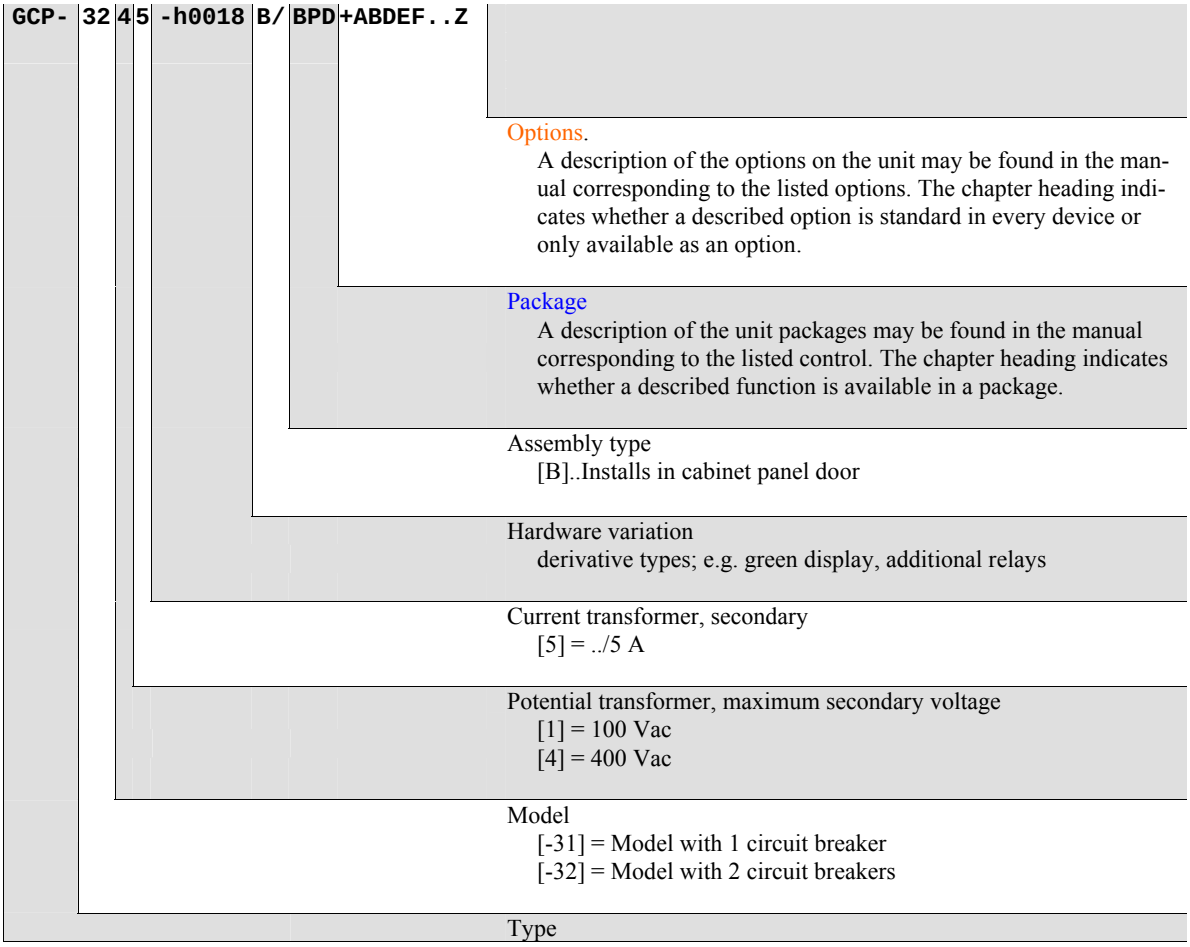
Type		English	German
GCP-31/32 Series			
GCP-31/32 Packages - Installation		37364	GR37364
GCP-31/32 Packages - Configuration		37365	GR37365
GCP-31/32 - Function/Operation	this manual ⇨	37238	GR37238
GCP-31/32 - Application		37240	GR37240
Option SB - Caterpillar CCM coupling		37200	GR37200
Option SC06/SC07/SC08 - CAN bus coupling		37313	GR37313
Option SC09/SC10 - CAN bus coupling		37382	GR37382
Additional Manuals			
IKD 1 - Manual		37135	GR37135
Discrete expansion board with 8 discrete inputs and 8 relay outputs that can be coupled via the CAN bus to the control unit. Evaluation of the discrete inputs as well as control of the relay outputs is done via the control unit.			
LeoPC1 - Manual		37146	GR37146
PC program for visualization, for configuration, for remote control, for data logging, for language upload, for alarm and user management and for management of the event recorder. This manual describes the use of the program.			
LeoPC1 - Manual		37164	GR37164
PC program for visualization, for configuration, for remote control, for data logging, for language upload, for alarm and user management and for management of the event recorder. This manual describes the programming of the program.			
GW 4 - Manual		37133	GR37133
Gateway for transferring the CAN bus to any other interface or bus.			
ST 3 - Manual		37112	GR37112
Control to govern the air fuel ratio of a gas engine. The ratio will be directly measured though a Lambda probe and controlled to a configured value.			

Table 1-1: Manual - Overview

The GCP-30 series generator set controllers provide the following functions:

- Engine and generator protection
- Engine data measurement -
  - including oil pressure and temperature, coolant temperature, battery voltage, speed, service hours, etc.
- Generator data measurement -
  - including. voltage, current, power, kvar, kW, kWh, etc.
- Engine start/stop logic
- Alarm display with breaker trip and engine shutdown
- Emergency operation for mains failure recognition and automatic engine start incl. transfer logic
- Control of voltage, frequency, real power and reactive power
- Real power and reactive power load sharing including load management with automatic start/stop of additional generators.
- Synchronization of one or two circuit breakers
- CAN bus communications to engine controllers and plant management systems

Type designation is as follows:



Examples:

- GCP-3245B/XPQ+SC10 (GCP-32 with 400 Vac PT inputs and ../5 A CT inputs, Package XPQ with Option SC10)
- GCP-3115B/BPQ (GCP-31 with 100 Vac PT inputs and ../5 A CT inputs, Package BPQ without options)

Intended Use The unit must only be operated according to the guidelines described in this manual. The prerequisite for a proper and safe operation of the product is correct transportation, storage, and installation as well as careful operation and maintenance.

NOTE

This manual has been developed for a unit fitted with all available options. Inputs/outputs, functions, configuration screens and other details described, which do not exist on your unit may be ignored.

The present manual has been prepared to enable the installation and commissioning of the unit. On account of the large variety of parameter settings, it is not possible to cover every possible combination. The manual is therefore only a guide. In case of incorrect entries or a total loss of functions, the default settings can be taken from the enclosed list of parameters.

Chapter 2.
Display And Operating Elements

The pressure-sensitive membrane of the front panel consists of a plastic coating. All keys have been designed as touch-sensitive membrane switch elements. The display is an LC display, comprised of two rows with 16 characters in each row that are indirectly illuminated in red. The contrast of the display can be infinitely adjusted via a rotary potentiometer positioned on the left side of the control. The direct configuration port is located on the left side of the unit. The direct configuration cable (DPC) will connect there.

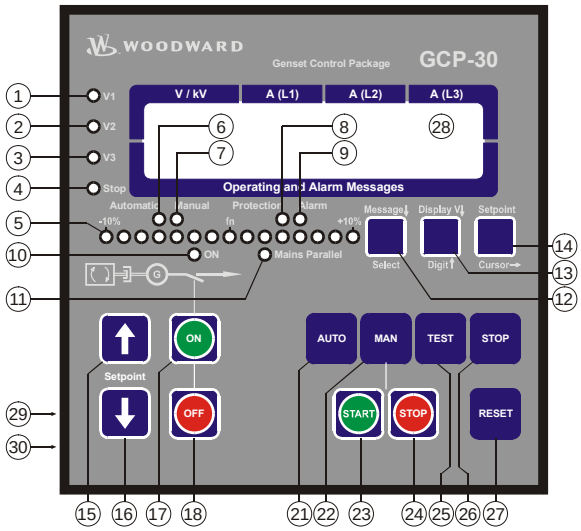


Figure 2-1: Front panel GCP-31

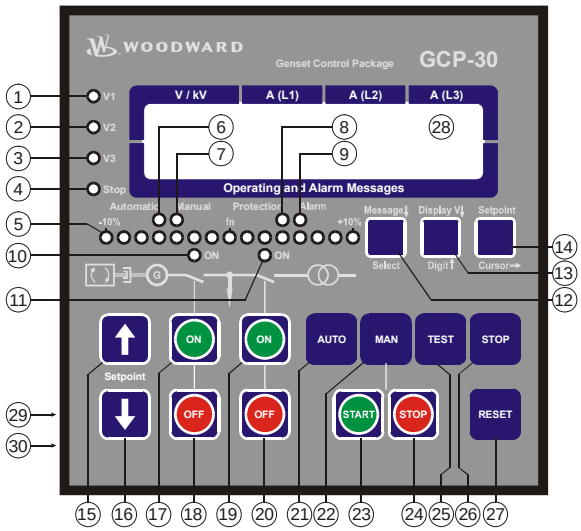


Figure 2-2: Front panel GCP-32

Brief Explanation Of The LEDs and Buttons

LEDs

No	Description	Function
1	V1	Voltage L1
2	V2	Voltage L2
3	V3	Voltage L3
4	Stop	"STOP" mode selected
5	-10%..fn..+10%	Synchroscope
6	Automatic	"AUTOMATIC" mode selected
7	Manual	"MANUAL" mode selected
8	Protection	Fault monitoring is enabled
9	Alarm	Alarm message present
10	ON (GCB ON)	Reply: GCB is closed
11	ON (MCB ON)	*[GCP-32]* Reply: MCB is closed *[GCP-31]* Status message: unit is operating in "Mains parallel"

Buttons

No	Description	Function
12	Message↓	Advance to next message/screen
12	Select	Confirm selection
13	Display↓	Switch display
13	Digit↑	Increase digit
14	Setpoint	Display set point value
14	Cursor→	Move cursor one position to the right
15	Setpoint↑	Increase displayed set point value
16	Setpoint↓	Reduce displayed set point value
17	ON (GCB ON)	Close GCB manually
18	OFF (GCB OFF)	Open GCB manually
19	ON (MCB ON)	*[GCP-32]* Close MCB manually
20	OFF (MCB OFF)	*[GCP-32]* Open MCB manually
21	AUTO	Enable "AUTOMATIC" mode
22	MAN	Enable "MANUAL" mode
23	START	Start engine manually
24	STOP	Stop engine manually
25	TEST	Activate "TEST" mode
26	STOP	Stop engine automatically
27	RESET	Acknowledge alarm messages

Others

No	Description	Function
28	LC-Display	LC-Display
29	DPC plug	Configuration plug
30	Potentiometer	Adjust LCD contrast

Functional Overview

Mode functions	Message	Display	Set point	Acknowledge	STOP	MANUAL	AUTOMATIC	TEST	Engine: Start	Engine: Stop	GCB: Close	GCB: Open	MCB: Close	MCB: Open	Setpoint: Raise	Setpoint: Lower
MANUAL Mode																
Start engine						❶			❷							
Stop engine					X	❶				❷						
Close GCB						❶					❷					
Open GCB						❶						❷				
[GCP-32] Close MCB						❶							❷			
[GCP-32] Open MCB						❶								❷		
Raise set point value			❷			❶									❸	
Lower set point value			❷			❶										❸
AUTOMATIC Mode																
**) Start engine							❶									
**) Stop engine					X		❶									
**) Close GCB							❶									
**) Open GCB							❶									
[GCP-32] **) Close MCB							❶									
[GCP-32] **) Open MCB							❶									
Raise set point value			❷				❶								❸	
Lower set point value			❷				❶									❸
TEST Mode																
Start engine								❶								
Start load test								❶			❷					
End load test												❶				
[GCP-32] *) End load test												❶*	❶*			
Raise set point value			❷					❶							❸	
Lower set point value			❷					❶								❸
Mode STOP					❶											
LED test															❶	❶

Configuration	Select	Digit	Cursor
Enable configuration mode		❶	❶
Confirm and advance to next screen	❶		
Return to previous screen	❶		❶
Next position/change text			❶
Increase digit		❶	
End configuration mode		❶	❶

*) Depending on configured breaker transfer logic

**) A discrete input must be energized or the operational mode will dictate a logical condition for the required action

❶ ❷ ❸ Press the buttons in the order indicated by the bullets

❶ ❶ Press the buttons simultaneously

X: Pressing the STOP button changes the operating mode and stops the generator

Table 2-1: Functional overview

LEDs

NOTE

The LEDs can be checked via a lamp test. In order to achieve this, the "Setpoint↑" and "Setpoint↓" buttons must be pressed simultaneously.

1 V1 - V2 - V3
2 Color: green
3

Voltage control

The LEDs "V1", "V2" and "V3" indicate which voltage (V_{L1N}, V_{L2N}, V_{L3N}, V_{L12}, V_{L23} or V_{L31}) is currently being displayed. This applies both to the generator and the mains voltage display.

4 Stop
Color: red

"STOP" operating mode

If the "STOP" LED is illuminated, the "STOP" mode has been enabled. If this LED is flashing, engine speed has been detected while the control is in the "STOP" mode.

5 -10%..f_N..+10%
Color: red/yellow/green

Phase angle / synchroscope

Normal operation: The LEDs between -10 % and +10 % display the generator frequency differential relative to the frequency of the system that the generator is synchronizing with. If the frequency differential is greater than +10 % or less than -10 % the corresponding outer LED will flash.

Configuration: If the control is in the configuration mode and the service display is configured "ON", the LEDs show the phase angle between the systems being synchronized when the double voltage/double frequency screen is displayed. The green LED in the center of the 15 LEDs indicates that the measured phase angle between the voltage systems displayed is less than 12 ° electrical. The phase angle is only displayed if the frequencies of the two voltages are within the following permissible limits:

Generator	88 to 112 % of rated frequency (f_N)
Mains	96 to 104 % of rated frequency (f_N)

A distinction is made between two directions of rotation:
-10 % → +10 % = If the LEDs illuminate from left to right, the generator frequency is greater than the synchronizing frequency (i.e. the generator is synchronizing in the fast direction).
+10 % → -10 % = If the LEDs illuminate from right to left, the generator frequency is lower than the synchronizing frequency (i.e. the generator is synchronizing in the slow direction).

6 Automatic
Color: yellow

"AUTOMATIC" operating mode

If the "AUTOMATIC" LED is illuminated, the "AUTOMATIC" operating mode is enabled. The "Setpoint↑", "Setpoint↓", "GCB ON", "GCB OFF", "MCB ON", "MCB OFF", "START", and "STOP" buttons are disabled.

7	**Manual** Color: yellow	**"MANUAL" operating mode** If the "Manual" LED is illuminated, the "MANUAL" operating mode has been enabled. The circuit breaker control, "START", and "STOP" buttons are enabled.
8	**Protection** Color: green	**Engine monitoring** If the "Monitoring" LED is illuminated, the engine delayed protective monitoring (protective functions configured to be ignored during start up) is actively monitored by the control. Generator underspeed, underfrequency, undervoltage and reverse power are also monitored. The protective monitoring (i.e. overcurrent) that cannot be delayed by engine speed will always be monitored.
9	**Alarm** Color: red	**Alarm** If the "Alarm" LED illuminates, the control has detected a fault condition. The control will respond according to the assigned alarm class of the fault. If the "RESET" button is pressed and released, the alarm is acknowledged, the centralized alarm (horn) is discontinued, and the "Alarm" LED becomes continuously illuminated. An alarm message is shown in the LC display as well. Table 4-4 lists all standard alarm messages for this control.
10	**GCB on** Color: green	**Reply: GCB is closed** The GCB is closed when the "GCB ON" LED is illuminated.
11	*[GCP-32]* **MCB on** *[GCP-31]* **Mains parallel** Color: green	**Reply: MCB is closed / Mains parallel** *[GCP-32]* Units that control two power circuit breakers: The MCB is closed when the "MCB ON" LED is illuminated. *[GCP-31]* Units that control only one circuit breaker may be used with system breaker control units (LS 4). These breaker control units use the load sharing CAN bus to communicate the status of circuit breakers and disconnectors to the GCP-31. When the MCB is closed, the LS 4 transmits this status and The "Mains parallel" LED is illuminated when the MCB and the GCB are closed simultaneously.

Buttons

In order to facilitate configuring the control parameters, the buttons are equipped with a "AUTOROLL" function. This permits the user to rapidly advance the display to the next setting, configuration screen, digit, or cursor position. The "AUTOROLL" function is only enabled when the user presses and holds the corresponding button.

General / Configuration

12 **Message↓ / Select**
Color: blue

Message↓ / Select

Normal operation: Message↓ - By pressing this button, the user will advance to the next display screen of measured values and alarm messages.
Configuration: Select - By pressing this button, the user will advance to the next configuration screen. If the original displayed value has been changed by pressing either the "Digit↑" or "Cursor→" buttons, the new value is saved by pressing the "Select" button once. Pressing this button again will advance the display to the next configuration screen.

13 **Display V↓ / Digit↑**
Color: blue

Display V↓ / Digit↑

Normal operation: Display V↓ - By pressing this button, the user will advance to the next generator and mains voltage display screen.
Note: Pressing and holding this button for at least 5 seconds while a counter (kWh, start, running hours) is being displayed will result in that counter being reset.
Configuration: Digit↑ - By pressing this button, the user will increase the number over the cursor by one digit. The numbers in the display may only be increased to the maximum permissible limit (refer to the list of parameters located in the Appendix of manual 37365). If a number has been increased to the maximum permissible limit, the number automatically reverts to the lowest permissible limit.

14 **Setpoint / Cursor →**
Color: blue

Setpoint / Cursor →

Normal operation Setpoint - By pressing this button, the user will be able to display individual set point values. The displayed set point values may be adjusted by pressing the "Setpoint↑" or "Setpoint↓" buttons. Certain set point values, which are entered into the unit from external sources, can only be viewed. The set points that may be viewed in each code level can be found in Appendix A on page 38.
Configuration Cursor→ - By pressing this button, the user will move the cursor one position to the right. The cursor automatically returns to the extreme left position when the "Cursor→" button is pressed while the cursor is in the extreme right position.

15 **Setpoint↑ / Setpoint↓**
16 Color: blue

Setpoint↑ / Setpoint↓

By pressing the "Setpoint↑" or "Setpoint↓" buttons, the displayed set point will be changed accordingly. Only values that have been enabled during configuration and are accessible in the current operating mode may be changed. If the set point raise and lower buttons are pressed and held simultaneously, the lamp test function is activated.

Circuit Breaker Operation

17 **GCB ON / GCB OFF** **Close GCG / open GCB**
18 Color: green/red

Note: These buttons function only if either the MANUAL or TEST operating mode has been enabled.

GCB ON ..... This function is dependent upon the configured breaker logic. Pressing the "GCB ON" button will result in the mains circuit breaker closing. The breaker closure process will be aborted if the either "GCB OFF" or "MCB ON" button is pressed or the operating mode is changed.

GCB OFF .... This function is dependent upon the configured breaker logic. Pressing the "GCB OFF" button will result in the generator circuit breaker opening. The breaker synchronization and closing process can be aborted by pressing this button as well.

19 *[GCP-32]* **MCB ON /** **Close MCB / open MCB** (only available in *[GCP-32]*)
20 **MCB OFF**
Color: green/red

Note: These buttons function only if either the MANUAL or TEST operating mode has been enabled.

MCB ON..... This function is dependent upon the configured breaker logic. Pressing the "MCB ON" button will result in the mains circuit breaker closing. The breaker closure process will be aborted if the either "MCB OFF" or "GCB ON" button is pressed or the operating mode is changed.

MCB OFF.... This function is dependent upon the configured breaker logic. Pressing the "MCB OFF" button will result in the mains circuit breaker opening. The breaker synchronization and closing process can be aborted by pressing this button as well.

Operating Mode Selection

21 **AUTO** (Color: blue) — **AUTOMATIC operating mode**

The engine is automatically started/stopped and the circuit breakers are automatically actuated. The control inputs "Automatic 1" and "Automatic 2" are used to control the generator output to a configured level while in the "AUTOMATIC" operating mode (refer to the description of the discrete inputs in the configuration manual). The control monitors for conditions requiring an emergency power and/or sprinkler operation to be initiated regardless of the status of the "Automatic 1" and "Automatic 2"discrete inputs.

Discrete input "Automatic 1" energized:
The generator is loaded with real power to the level configured for set point 1.

Discrete input "Automatic 2" energized:
The generator is loaded with real power to the level configured for set point 2 or to the level that corresponds to the external set point via the analog input (0/4 to 20 mA, 0 to 5/10 Vdc) or interface.

NOTE

Energizing discrete input 2 (terminal 63) will prohibit the operating mode from being changed from the mode currently enabled.

22 **MAN** (Color: blue) — **MANUAL operating mode**

The "MANUAL" operating mode enables the buttons on the control to be used for manual operations of the unit. The automatic operation functionality of the generator and the breakers is disabled. The protective functions (i.e. low oil pressure, underfrequency, overvoltage, etc.) of the control remain enabled. The control does not monitor for conditions requiring an emergency power and sprinkler operation to be initiated. If an emergency power and sprinkler operation was initiated prior to changing the operation mode to "MANUAL", the emergency power or sprinkler operation will continue.

23 **START / STOP**
24 (Color: green/red) — **Engine start/stop**

START ..... Pushing this button while the control is in the MANUAL operation mode will start the engine. The starter and fuel solenoid/gas valve are enabled when the START button is pressed. The fuel solenoid/gas valve remains energized and the starter disengages after the engine reaches the configured firing speed.

STOP ..... Pressing this button stops the engine by de-energizing the fuel solenoid/gas valve relay output.

25 **TEST** Color: blue

TEST operating mode

Pressing the "TEST" button will start the engine and enable engine protective functions. The circuit breakers may be operated manually to conduct load tests. If a mains failure occurs while in the TEST mode, the controller will initiate an emergency and/or sprinkler operation depending on how the control is configured.

Initiate a load test After the "TEST" mode has been enabled, a load test may be initiated by pressing the "GCB ON" button. The GCB will synchronize or the MCB will open in accordance with how the circuit breaker logic is configured. Once the generator is synchronized or the bus is dead, the GCB will close. The generator load can be increased or decreased by changing the load reference point with the "SETPOINT" buttons.

Terminate a load test The load test will be terminated immediately when the "GCB OFF" or "MCB ON" button is pressed (depending upon the configured circuit breaker logic). A power reduction will not be performed when the load test is terminated in this manner. The generator will perform a power reduction if the "STOP" or "AUTOMATIC" mode buttons are pressed and the controller is not receiving a run request signal.

26 **STOP** Color: blue

STOP operating mode

Pressing the "STOP" button will shut the generator down. The following sequence is performed when the STOP mode is enabled:

Stopping process:
- The "STOP" button is pressed **once**
- The generator load is reduced
- The GCB is opened once the measured load reaches 5 % of the rated generator real power
- A cool down period is carried out according to the configured engine cool down

Shutdown process:
- The "STOP" button is pressed **twice**
- The GCB is opened immediately without performing a power reduction
- The generator shuts down immediately without performing a cool down

If discrete input 6 (terminal 63) is energized **and** configured as a control input by setting parameter "Op.mode blocked by Ter.63" as YES, it is possible for XPD and XPQ Package units with version 4.3010 software or higher to select the operation mode via an external source. Energizing and/or de-energizing terminals 127 and 128 in accordance with Table 2-2 will change the operating mode of the unit. It is assumed that the controller has supply power applied.

Operation mode blocked (terminal 63)	Input STOP (terminal 127)	Input AUTOMATIC (terminal 128)	Function
de-energized	nonfunctional	nonfunctional	The operation mode selection buttons at the front of the GCP are enabled and are used to change the operational mode (terminals 127/128 have no effect).
energized	de-energized	de-energized	The controller is locked into the operation mode that the unit is in at the moment terminal 63 is energized. The operation mode selection buttons at the front of the GCP are disabled and cannot be used to change the operational mode.
energized	energized	de-energized	The STOP operation mode is activated. The operation mode selection buttons at the front of the GCP are disabled and cannot be used to change the operational mode.
energized	de-energized	energized	The AUTOMATIC operation mode is activated. The operation mode selection buttons at the front of the GCP are disabled and cannot be used to change the operational mode.
energized	energized	energized	The STOP operation mode is activated. The operation mode selection buttons at the front of the GCP are disabled and cannot be used to change the operational mode.

Table 2-2: Function – external operation mode selection

WARNING

Acknowledging an alarm, which has shut the engine down, while the control is still enabled (i.e. a run signal is still enabled) before to discovering the cause of the fault condition may result in an unintentional restart of the engine. Prior to acknowledging the alarm, verify the fault condition has cleared in order to protect against injury of personnel in the vicinity and damage or destruction effected equipment.

⇒ **If the cause of the alarm is unknown or unclear, NEVER press the RESET button! The result may be destruction of the engine or equipment!**

27 **RESET** Color: blue — **Acknowledgement**

Pressing this button acknowledges alarm messages. The alarm text in the display is cleared and the "Alarm" LED is turned off. The control display is returned to the basic operating screen. F2 and F3 class alarms may only be acknowledged in either the "STOP" or "MANUAL" operating modes.

LC Display

28 LC-Display Liquid Crystal Display

The LC display shows messages and measured values, depending on the mode or function currently enabled. In the configuration mode, individual parameters are displayed and may be changed. In the AUTOMATIC mode the measured operating values (e.g. voltage and current values) may be displayed.

Chapter 3.
Display

Measured Values

Top Display Line

NOTE

By using the "Display V" button will display the different measured voltages.

```
xxxx yyy yyy yyy
----------------
```

Display in automatic mode, top line: measured values

The following measured values are displayed (LEDs V1/V2/V3 indicate the measured conductor(s)):

- "xxxx" - generator voltage depending of the LEDs V1/V2/V3:

V1 illuminates	line-to-neutral voltage	V_{L1-N}
V2 illuminates	line-to-neutral voltage	V_{L2-N}
V3 illuminates	line-to-neutral voltage	V_{L3-N}
V1+V2 illum.	line-to-line voltage	V_{L1-L2}
V2+V3 illum.	line-to-line voltage	V_{L2-L3}
V3+V1 illum.	line-to-line voltage	V_{L3-L1}

- "yyy" - generator currents (line currents I_{L1}, I_{L2} and I_{L3}).

Bottom Display Line

NOTE

Pressing the "Message↓" button will advance the bottom line of the display. Pressing the "Message↓" button will also advance through any alarm text that may be present.

The following screens may be viewed in succession by pressing the "Message↓" button. When the last display screen has been reached, the display returns to the basic screen. If alarms have occurred, the message texts are displayed in the sequence of occurrence in the display screens before the basic screen. If control functions are active (i.e. synchronization of the GCB), the basic screen is superimposed with the corresponding message (i.e. " synchronization"). Following the termination of the control function, the basic screen is displayed again.

```
----------------
xxxxxxxxxxxxxxxx
```

Display in automatic mode, bottom line: measured values

Instead of "**xxxxxxxxxx**" the following measuring values are displayed:

- The maximum generator current (slave pointer)
- The first four alarm messages that occurred
- The time and date (XPD and XPQ Packages only)
- The energy counter (kWh)

Succession	Display	Description
0 (basic screen)	`--- --- --- ---` `Gen  0.00 0000kW`	Generator power factor Generator actual real power
1	`--- --- --- ---` `max. Gen.current`	Slave pointer (maximum generator current [the measured values are displayed above the text])
2	`--- --- --- ---` `Time`	Date and time (XPD and XPQ Packages only)
3 (MPU = ON)	`--- --- --- ---` `Gen.   0000 rpm`	Engine speed (Pickup input is configured YES)
4.1 (alternative to 4.2/4.3)	`--- --- --- ---` `Ma       E0000kW`	Mains measured real power (measured via analog input; E = Export, I = Import)
4.2 (alternative to 4.1/4.3)	`--- --- --- ---` `Ma  0.00 E0000kW`	Mains power factor Mains measured real power (calculated; E = Export, I = Import)
4.3 (alternative to 4.1/4.2)	`--- --- --- ---` `Ma LS4:  00000kW`	Mains measured real power (measured by LS 4; GCP-31/XPD and XPQ Packages only)
5	`--- --- --- ---` `Mainscurr.0000 A`	Mains measured current L1
6.1 (alternative to 6.2)	`--- --- --- ---` `Mainsvolt.0000 V`	Mains measured voltage (pressing the "Display V↓" button will change the mains phase displayed)
6.2 (alternative to 6.1)	`--- --- --- ---` `M-decoupl:0000 V`	Mains voltage after the mains decoupling (measured by LS 4; GCP-31/XPD and XPQ Packages only)

Succession	Display	Description
7	`--- --- --- --- xxxxxxxxxxxxxxx`	Measured value of the analog inputs (this display depends on the configuration of the analog input; XPD and XPQ Packages only)
8	`--- --- --- --- Gen. = 0000kvar`	Generator reactive power (is calculated via the current of phase L1; even if power measurement is selected "three-phase"),
9	`--- --- --- --- Energy=000000kWh`	Generator real energy counter
10.1	`--- --- --- --- L: So0.00 Is0.00`	Set and actual Lambda values (Option SC07/SC10)
10.2	`--- --- --- --- P.actu: 000.00%`	Position of the actuator in % (Option SC07/SC10)
11	`--- --- --- --- running: 000000h`	Operating hours
12	`--- --- --- --- Rent.TM:0000:00h`	Rental duty time (RPQ Package only)
13	`--- --- --- --- Service in 0000h`	Time remaining until the next maintenance call
14	`--- --- --- --- Startno. 00000`	Engine start counter
15	`--- --- --- --- Battery: 00.0 V`	Battery voltage (supply voltage)
16	`--- --- --- --- Comunicators: 00`	CAN bus participants (load share line)
17	`--- --- --- --- xxxxxxxxxxxxxxx`	MDEC and J1939 text/messages (Option SC07/SC08/SC09/SC10)
18	`--- --- --- --- xxxxxxxxxxxxxxx`	CCM text/messages (Option SB03)
19	`--- --- --- --- xxxxxxxxxxxxxxx`	IKD 1 text/messages (Option SC07/SC08/SC09/SC108)
20	`--- --- --- --- xxxxxxxxxxxxxxx`	Alarm messages (maximum of 4 displayed). Alarms are display sequentially from first to occur to last. Additional messages will be displayed as alarm messages are acknowledged.
21	`--- --- --- --- xxxxxxxxxxxxxxxx`	Active control functions (i.e. synchronization) or current alarm. Refer to the description on page 32.

Direction Of Power

If the current transformers for the controller are wired according to the pin diagram shown, the following values are displayed:

- Positive generator real power..... The generator supplied real power.
- Inductive gen. power factor φ..... The generator supplied inductive re-active power.
- Positive mains real power ..... Real power supplied to the mains.
- Inductive mains power factor φ ..... The inductive re-active power supplied to the mains.

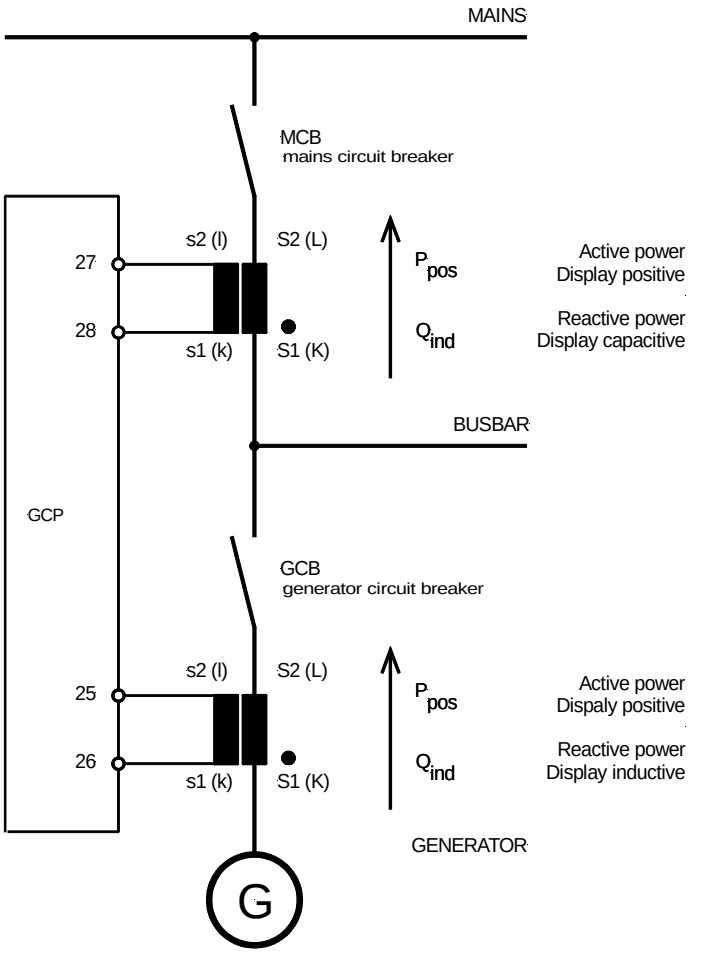


Figure 3-1: Direction of power

Power Factor Definition

The phasor diagram is used from the generator's view. This defines the following definitions.

Power Factor is defined as a ratio of the real power to apparent power. In a purely resistive circuit, the voltage and current waveforms are instep resulting in a ratio or power factor of 1.00 (often referred to as unity). In an inductive circuit the current lags behind the voltage waveform resulting in usable power (real power) and unusable power (reactive power). This results in a positive ratio or lagging power factor (i.e. 0.85lagging). In a capacitive circuit the current waveform leads the voltage waveform resulting in usable power (real power) and unusable power (reactive power). This results in a negative ratio or a leading power factor (i.e. 0.85leading).

Inductive: Electrical load whose current waveform lags the voltage waveform thus having a lagging power factor. Some inductive loads such as electric motors have a large startup current requirement resulting in lagging power factors.	Capacitive: Electrical load whose current waveform leads the voltage waveform thus having a leading power factor. Some capacitive loads such as capacitor banks or buried cable result in leading power factors.

Different power factor displays at the unit:

i0.91 (inductive) lg.91 (lagging)	c0.93 (capacitive) ld.93 (leading)

Reactive power display at the unit:

70 kvar (positive)	-60 kvar (negative)

Output at the interface:

+ (positive)	- (negative)

In relation to the voltage, the current is

lagging	leading

The generator is

over excited	under excited

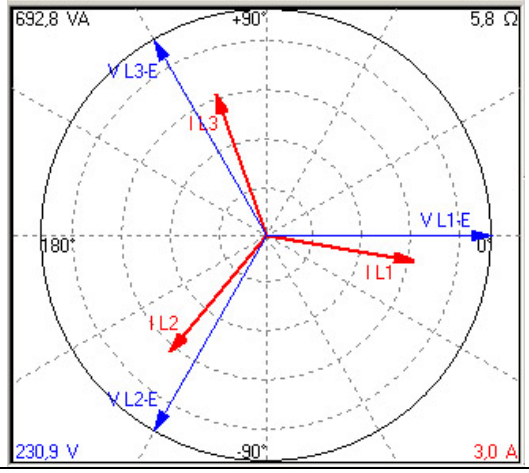
Control: If the control unit is equipped with a power factor controller

A voltage lower "-" signal is output as long as the measured value is "more inductive" than the reference set point Example: measured = i0.91; set point = i0.95	A voltage raise "+" signal is output as long as the measured value is "more capacitive" than the reference set point Example: measured = c0.91; set point = c0.95

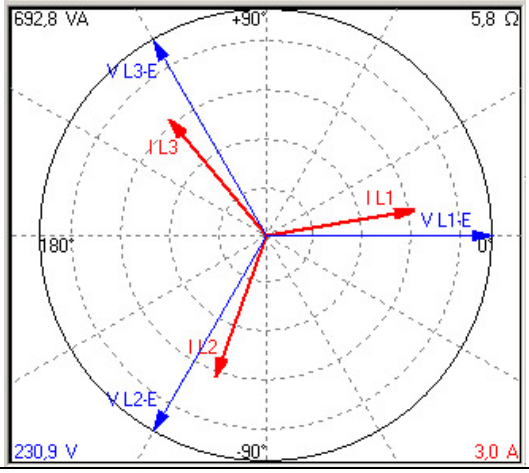
Phasor diagram:

inductive	capacitive

Signal	Magnitude	Phase	Real	Imaginary
V L1-E	230,9 V	0,00 °	230,9 V	0,000 V
V L2-E	230,9 V	-120,00 °	-115,5 V	-200,0 V
V L3-E	230,9 V	120,00 °	-115,5 V	200,0 V
I L1	2,000 A	-10,00 °	1,970 A	-347,3 mA
I L2	2,000 A	-130,00 °	-1,286 A	-1,532 A
I L3	2,000 A	110,00 °	-684,0 mA	1,879 A



Signal	Magnitude	Phase	Real	Imaginary
V L1-E	230,9 V	0,00 °	230,9 V	0,000 V
V L2-E	230,9 V	-120,00 °	-115,5 V	-200,0 V
V L3-E	230,9 V	120,00 °	-115,5 V	200,0 V
I L1	2,000 A	10,00 °	1,970 A	347,3 mA
I L2	2,000 A	-110,00 °	-684,0 mA	-1,879 A
I L3	2,000 A	130,00 °	-1,286 A	1,532 A



Service Display

```
Service display
            ON
```

only visible while configuration mode is active

Service display **ON/OFF**

ON .....The service display is enabled and the following three screens are displayed. The voltages displayed in the screens will differ depending how the controller is configured and if potential transformers are utilized.

OFF .....The service screens are disabled and the following screen are not displayed.

```
B 00.0kV 00.00Hz
G 00.0kV 00.00Hz
```

only visible while configuration mode is active

Double voltage and double frequency display

The generator and busbar voltage and frequency are displayed. The phase angle between the generator and busbar is displayed by the synchroscope (LED strip):

B .....Busbar voltage and frequency.

G.....Generator voltage and frequency.

```
M 00.0kV 00.00Hz
B 00.0kV 00.00Hz
```

only visible while configuration mode is active

Double voltage and double frequency display

The mains and busbar voltage and frequency are displayed. The phase angle between the mains and busbar is displayed by the synchroscope (LED strip):

M .....Mains voltage and frequency.

B .....Busbar voltage and frequency.

```
Relay:   MCB
 f   V   GCB
```

only visible while configuration mode is active

Status of circuit breakers and controller output relays

The display shows the relay states of the controller outputs and the signals to the circuit breakers during synchronization.

f.....+		Frequency controller RAISE	Terminal 8/9
.....-		Frequency controller LOWER	Terminal 8/10
V .....+		Voltage controller RAISE	Terminal 11/12
.....-		Voltage controller LOWER	Terminal 11/13
MCB.....On		Connect pulse to the MCB	Terminal 16/17
.....Off		Disconnect pulse to the MCB	Terminal 39/40
GCB .....On		Connect pulse to the GCB	Terminal 14/15
.....Off		Disconnect pulse to the GCB	Terminal 41/42

Control Function Messages

EN **Synchron. GCB**
DE **Synchron. GLS**

Control function: GCB is synchronizing

The GCB is synchronizing and will be closed when the synchronous conditions are met. Synchronization will be carried out, if generator and busbar voltages are measured.

EN **Synchron. MCB**
DE **Synchron. NLS**
[GCP-32]

Control function: MCB is synchronizing

The MCB is synchronizing and will be closed when the synchronous conditions are met. Synchronization will be carried out, if generator and busbar voltages are measured.

EN **Synchron. Extern**
DE **Synchron. Extern**
[GCP-31]

Control function: MCB is synchronizing

In order to enable the synchronization of an external circuit breaker, the busbar frequency will be controlled at a slightly higher frequency (df max/2) than the measured mains frequency.

EN **Dead bus st.GCB**
DE **Schwarzst. GLS**

Control function: Close GCB to a de-energized bus

The GCB is closed to the de-energized bus when voltage is measured from the generator but not measured from the bus.

EN **Dead bus st.MCB**
DE **Schwarzst. NLS**
[GCP-32]

Control function: Close MCB to a de-energized bus

The MCB is closed to the de-energized bus when voltage is measured from the mains but not measured from the bus.

EN **Start**
DE **Anlassen**

Control function: Start engine

The GCP has received a start command while in AUTOMATIC (mains failure, terminal 6 "Start engine" is energize, etc.) or MANUAL modes (engine start button was pressed).

EN **Preglow**
DE **Vorglühen**

Control function: Preheating (Diesel engine)

The diesel engine is preheated for the specified time. Relay output 6 contacts are closed for the designated time.

EN **Turning**
DE **Spülvorgang**

Control function: Purging operation (Gas engine)

The starter is engaged to rotate the engine prior to enabling the ignition and completely purge any remaining gas in the engine (and to prevent a backfiring or deflagration when switching on the ignition).

EN **Ignition**
DE **Zündung**

Control function: Ignition ON (Gas engine)

The ignition is enabled.

EN **Governor down**
DE **Grundstellung**

Control function: Drive governor down (Diesel engine)

The GCP issues a speed lower signal to the speed controller prior to starting the engine. This ensures that the speed controller is at the start speed reference point and prevents the engine from following a steep start speed ramp rate and shutting down for overspeed.

EN **Aux.serv.prerun**
DE **Vorl.Hilfsbetr.**

Control function: Auxiliary operation pre-run

Prior to starting the engine (excluding emergency operation starts) the configured relay output remains enabled for the configured time. This message is displayed for the configured time as well. This function permits external pre-start operations to be performed (i.e. open louvers, enable pre-lube oil pump, etc.).

EN **Aux.serv.postrun**
DE **Nachl.Hilfsbetr.**

Control function: Auxiliary operation post-run

After the engine has stopped, the configured relay output remains enabled for the configured time. his message is displayed for the configured time as well. This function permits external post-run operations to be performed (i.e. close louvers, enable external cooling pump, etc.).

EN **Start-Pause**
DE **Start-Pause**

Control function: Time delay between start attempts

In order to protect the starting circuit from overheating, a delay time between start attempts may be configured. This message will be displayed for the configured delay time.

EN **Testmode**
DE **Probebetrieb**

Control function: TEST

The operating mode TEST has been enabled and this message is displayed appears intermittently with other control functions that are being performed.

EN **Load test**
DE **Lastprobebetrieb**

Control function: Load test

This message will be displayed when the GCP is in the TEST mode and the GCB button has been pressed and the GCB has closed. This function is performed when the generator is to be load tested.

EN **Emergency run**
DE **Notstrom**

Control function: Emergency run operation

The conditions for an "emergency run" operation have been met (i.e. the mains have failed while the unit is in AUTOMATIC).

EN **Mains settl.000s**
DE **Netzber. 000s**

Control function: Mains settling time

The GCP will wait for the configured time after the mains are restored following a mains failure. The time remaining in the mains settling time is displayed in this screen.

EN **Sprinkler**
DE **Sprinklerbetrieb**

Control function: Sprinkler operation

This message is displayed if the GCP has been configured for sprinkler operations and the conditions for a sprinkler operation have been met.

EN **Sprinkler shutd.**
DE **Sprinkler Nachl.**

Control function: Sprinkler coasting

The engine will operate without load for 10 minutes following the conclusion of a sprinkler operation and the GCP will display this message.

EN **Cool down 000s**
DE **Nachlauf 000s**

Control function: Engine coasting

A no-load (cool down) operation may be configured prior to the engine stopping. The time remaining in the cool down period is displayed in this message.

EN **Stop engine!**
DE **Motor Stop!**

Control function: Engine stop!

This message is displayed while the engine is being shutdown. When the engine speed drops below the configured firing speed set point, the starting functions are disabled for 10 seconds.

EN **Unloading**
DE **Leistungsred.**

Control function: Power reduction

A power reduction is generally performed when a generator is being taken off line. The load on the generator is reduced according to the configured ramp rate. This message is displayed while the load is being reduced.

NOTE

The texts "Sprinkler operation", "Emergency power", "Test", "Load test" and "Sprinkler+Emergency power" are intermittently displayed with the basic display screen. If one of these texts is active, pressing the "Select" button will change the display so that only the basic display screen is shown. The "Sprinkler operation", "Emergency power", "Test", "Load test" and "Sprinkler+Emergency power" texts may be displayed again by pressing the "RESET" button.

EN **Sprinkler+Emerg.**
DE **Sprinkler+Notstr**

Control function: Sprinkler operation and emergency operation

Both the sprinkler operation and the emergency power functions are active. Both functions are initiated according to the parameters specific to each operation.

EN **Start without CB**
DE **Start ohne GLS**

Control function: Start engine without closing GCB

The engine is started without closing the GCB when terminal 6 is energized (normally after the period of delayed engine monitoring the GCB will be closed either after synchronizing or with a dead bus start).

Counters

Reset Maintenance Call

```
----------------
SERVICE
```

Reset maintenance call

The alarm message to the left is displayed when the configured maintenance interval has expired. The maintenance interval is configured when the unit is commissioned. In addition to the alarm message being displayed, the "Alarm" LED will flash and the "Centralized alarm" relay (horn) is energized.

To acknowledge this alarm message and to reset the service counter back to the configured time, utilize the following procedure:

1.) Acknowledge the alarm by pressing (short acknowledgement) the "RESET" button This will de-energize the "Centralized alarm" relay. At this point it is not possible to acknowledge/clear the "Maintenance" alarm. It will be possible to accomplish this after the maintenance counter has been reset.

2.) Perform the scheduled generator maintenance.

3.) Acknowledge the maintenance call as follows:
- Using the "Message↓" button, advance the bottom line of the display to the "**`Service in 000h`**" screen.
- Press and hold the "Digit" button for 10 seconds.
- The indicated maintenance interval should revert to the configured maintenance interval.
- Press the "RESET" button and the alarm should clear.

Notes:
- The maintenance counter may be reset according to the procedure described above if the generator maintenance is performed prior to the maintenance interval counter expiring (the Service message does not appear).
- If the number of hours until the next maintenance call shall be changed, please contact the service staff (and notice the configuration manual). If the maintenance interval counter must be changed, code level 2 access rights are required to access the configuration menus.
- The maintenance interval counter may be disabled by configuring 0 hours for the maintenance interval.
- If the unit is equipped with Option SC07/SC08/SC09/SC10 and the MDEC or J1939 communication is enabled, the operating hours will be taken from the engine control unit. Please refer to manual 37313 or 37382 for further information.

Chapter 4.
Alarm Messages

Alarm Classes

NOTE

If terminal 6 is energized and configured for "Sprinkler operation", alarm classes F2 and F3 are converted to alarm class F1. The exception to this is if terminal 34 is energized (terminal 61 if terminal 34 is not available) and overspeed faults.

Alarm class F2 and alarm class F3 ⇒ Alarm class F1

The monitoring functions are divided into four alarm classes:

F0 - Warning alarm - When faults of this alarm class are monitored an alarm message is displayed without issuing a centralized alarm. This alarm class does not lead to an interruption of the generator operation.
→ Alarm text.

F1 - Warning alarm - When faults of this alarm class are monitored an alarm message is displayed and a centralized alarm is issued. This alarm class does not lead to an interruption of the generator operation.
→ Alarm text + flashing "alarm" LED + centralized alarm relay (horn).

F2 - Triggering alarm - When faults of this alarm class are monitored an alarm message is displayed, a centralized alarm is issued, the generator load is shed prior to opening the GCB, and the engine is shutdown after the cool down period expires. Operations are interrupted.
→ Alarm text + flashing "alarm" LED + centralized alarm relay (horn) + soft shutdown.

F3 - Triggering alarm - When faults of this alarm class are monitored the GCB is immediately opened and the engine shutdown. Load reduction is not performed. Operations are interrupted.
→ Alarm text + flashing "alarm" LED + centralized alarm relay (horn) + hard shutdown.

Acknowledge Alarm Messages

WARNING

Acknowledging an alarm, which has shut the engine down, while the control is still enabled (i.e. a run signal is still enabled) before to discovering the cause of the fault condition may result in an unintentional restart of the engine. Prior to acknowledging the alarm, verify the fault condition has cleared in order to protect against injury of personnel in the vicinity and damage or destruction effected equipment.

⇒ **If the cause of the alarm is unknown or unclear, NEVER press the RESET button! The result may be destruction of the engine or equipment!**

By pressing the "RESET" push-button, the output of the centralized alarm and the alarm messages on the LC display are acknowledged according to the following logic:

Horn: After 2 minutes the horn is reset regardless of the acknowledgement of an alarm.
Interface: All internal errors are conveyed via the interface.

NOTE

In order to acknowledge alarm messages via terminal 6, the "acknowledgement" function must be configured for this terminal. Refer to the description in manual 37365.

An alarm cannot be acknowledged until the cause of the fault condition has been corrected.

NOTE

When alarms are acknowledging via the CAN bus interface, no differentiation is made between a "short acknowledge" and "long acknowledge". All input signals over 0.1 seconds are recognized as a "long acknowledge".

Short Acknowledgement (< 2,5 s)

Methods to perform a short acknowledgement

- The "RESET"button is pressed for more than 0.5 seconds but less than 2.5 seconds
- Terminal 6 is energized more than 0.5 s seconds but less than 2.5 seconds

Result

- The "Alarm" LED changes from flashing to continuous illumination

Acknowledgement via		Operating mode			
Button "RESET"	Terminal 6	STOP	AUTO	TEST	MANUAL
1	x	1	1	1	1
0	1	1	1	0	0

1 = energized/pressed, 0 = de-energized/not pressed, x = 0 or 1 irrelevant

Table 4-1: Alarms – Short acknowledgement

Long Acknowledgement (> 2,5 s)

Methods to perform a long acknowledgement

- The "RESET" button is pressed for more than 2.5 seconds
- Terminal 6 is energized more than 2.5 seconds
- The acknowledgement bit is received via the CAN bus interface.

Result

- The LED "Alarm" turns off (alarm classes F1 through F3)
- The group alarm relays F1 and F3 are reset
- The displayed alarm messages are acknowledged if the corresponding fault condition is no longer present. Alarm messages cannot be acknowledged if the fault condition that initiated the alarm is still present.

Table for **warning alarms** (alarm class F0 and F1) provided no F2 or F3 class alarms are present						
Acknowledgement via			Operating mode			
Button "RESET"	Terminal 6	Interface	STOP	AUTO	TEST	MANUAL
1	x	x	1	1	1	1
0	1	x	1	1	0	0
0	0	1	0	1	0	0

1 = energized/pressed, 0 = de-energized/not pressed, x = 0 or 1 irrelevant

Table 4-2: Alarms – Long acknowledgement - Table for warning alarms

Table for **alarms causing a shutdown** (alarm class F2 and F3)						
Acknowledgement via			Operating mode			
Button "RESET"	Terminal 6	Interface	STOP	AUTO	TEST	MANUAL
1	x	x	1	0	1	1
0	1	x	1	1	0	0
0	0	1 *)	0	1	0	0

1 = energized/pressed, 0 = de-energized/not pressed, x = 0 or 1 irrelevant

Table 4-3: Alarms – Long acknowledgement - Table for alarms causing a shutdown

*) Only if the parameter "Ackn. F2, F3 via interf." is enabled

Alarm Messages

NOTE

Pressing the "Message↓" button will advance the bottom line of the display to the next alarm message.

```
----------------
yyyyyyyyyyyyyyyy
```

Display in automatic mode, second line: Alarms

When an alarm is initiated, the corresponding alarm message is displayed in the bottom line of the LC display according to the following list:

Type of alarm	Alarm class	Alarm text	Relay output (Terminal)
Engine overspeed (Pickup)	F3	**Over speed**	**Refer to the Relay Outputs Section in the Configuration Manual for detailed info** Group alarm via the Relay manager with the parameter 85
Generator overfrequency	F3	**Over frequency**	
Generator underfrequency	F3	**Low frequency**	
Generator overvoltage	F3	**Gen.overvolt.**	
Generator undervoltage	F3	**Gen.undervolt.**	
Generator overcurrent level 1	F3	**Gen.overcurr. 1**	
Generator overcurrent level 2	F3	**Gen.overcurr. 2**	
Reverse/reduced load	F3	**Revers/min.power**	
Overload	F2	**Gen.overload**	
Unbalanced load	F3	**Load unbalanced**	
Mains overvoltage	F0	**Mains-overvolt**	
Mains undervoltage	F0	**Mains-undervolt.**	
Mains overfrequency	F0	**Mains-overfreq.**	
Mains underfrequency	F0	**Mains-underfreq.**	
Mains phase shift	F0	**Phase shift**	
Battery undervoltage	F1	**Batt.undervolt.**	
GCB synchronization time monitoring expired	F1	**GCB syn.failure**	
MCB synchronization time monitoring expired	F1	**MCB syn.failure**	
Switching to de-energized busbar time monitoring expired	F1	**Failure df/dVmax.**	
GCB closing malfunction	F1	**GCB close failure**	
MCB closing malfunction	F1	**MCB close failure**	
GCB opening malfunction	F1	**GCB open failure**	
MCB opening malfunction	F1	**MCB open failure**	
MCB opened before zero power transfer occurred w/ GCB synch interch.	F1	**Import power <> 0**	
Maintenance call timer expired	F1	**Service**	
Interface monitoring error X1/X5	F1	**Interf.err.X1X5**	
Interface monitoring error Y1/Y5	F1	**Interf.err.Y1Y5**	
Engine speed/generator frequency mismatch	F3	**Pickup/Gen.freq.**	
Engine shutdown malfunction	F3	**Stop failure**	
Engine start failure	F3	**Start failure**	
Unintended stop of engine	F3	**Unintended stop**	
[GCP-31] External mains decoupling failure via terms. 39/40	F1	**EXT open failure**	
Power ramp did not reach set point prior to the breaker open timer expired	F1	**P-ramp: open GCB**	

Table 4-4: Alarms – Text messages

NOTE

Discrete input – If a discrete input has been configured as alarm input, the alarm and configured text will be displayed when the input is enabled.

Analog input – An "!" and the text configured for the analog input screen is displayed as the alarm message when a fault is detected (i.e. !Coolant). If the control detects a broken wire for the analog input, the measured value is overwritten with "- -". An alarm is issued in accordance with the configured alarm class at the same time.

EN `Gen.undervoltage`
DE `Gen.-Unterspg.`

Alarm message: Generator undervoltage **Alarm class: F3**

The monitored generator voltage has fallen below the undervoltage limit for the configured delay time.

EN `Gen.overvoltage`
DE `Gen.-Überspg.`

Alarm message: Generator overvoltage **Alarm class: F3**

The monitored generator voltage has exceeded the overvoltage limit for the configured delay time.

EN `Low frequency`
DE `Gen.-Unterfreq.`

Alarm message: Generator underfrequency **Alarm class: F3**

The monitored generator frequency has fallen below the underfrequency limit for the configured delay time.

EN `Over frequency`
DE `Gen.-Überfreq.`

Alarm message: Generator overfrequency **Alarm class: F3**

The monitored generator frequency has exceeded the overfrequency limit for the configured delay time.

EN `Mains-undervolt.`
DE `Netz-Unterspg.`

Alarm message: Mains undervoltage **Alarm class: F0**

The monitored mains voltage has fallen below the undervoltage limit for the configured delay time.

EN `Mains-overvolt.`
DE `Netz-Überspg.`

Alarm message: Mains overvoltage **Alarm class: F0**

The monitored mains voltage has exceeded the overvoltage limit for the configured delay time.

EN `Mains-underfreq.`
DE `Netz-Unterfreq.`

Alarm message: Mains underfrequency **Alarm class: F0**

The mains frequency has been measured below the underfrequency limit for the configured delay time.

EN `Mains-overfreq.`
DE `Netz-Überfreq.`

Alarm message: Mains overfrequency **Alarm class: F0**

The monitored mains frequency has exceeded the overfrequency limit for the configured delay time.

EN **Phase shift**
DE **Phasensprung**

Alarm message: Phase shift **Alarm class: F0**

The monitored measured phase shift has exceeded the limit for the configured delay time.

EN **Over speed**
DE **Überdrehzahl**

Alarm message: Engine overspeed **Alarm class: F3**

The monitored engine speed has exceeded the engine overspeed limit for the configured delay time.

EN **Gen.overload**
DE **Gen.-Überlast**

Alarm message: Generator overload **Alarm class: F3**

The monitored generator load has exceeded the generator overload limit for the configured delay time.

EN **Revers/min.power**
DE **Rück/Minderleist**

Alarm message: Generator reverse-/-reduced load **Alarm class: F3**

The monitored generator reverse power / reduced load has exceeded / fallen below the generator reverse power / reduced load limit for the configured delay time.

EN **Load unbalanced**
DE **Schieflast**

Alarm message: Load unbalanced **Alarm class: F1**

The monitored generator load has exceeded the asymmetric load limit for the configured delay time.

EN **Gen.overcurr. 1**
DE **Gen.-Überstrom 1**

Alarm message: Generator overcurrent, limit value 1 **Alarm class: F3**

The monitored generator current has exceeded the generator overcurrent limit 1 for the configured delay time.

EN **Gen.overcurr. 2**
DE **Gen.-Überstrom 2**

Alarm message: Generator overcurrent, limit value 2 **Alarm class: F3**

The monitored generator current has exceeded the generator overcurrent limit 2 for the configured delay time.

EN **Batt.undervolt.**
DE **Batt.-Unterspg.**

Alarm message: Battery undervoltage **Alarm class: F1**

The monitored battery voltage has fallen below the battery undervoltage limit for the configured delay time.

EN **Pickup/Gen.Freq**
DE **Pickup/Gen.Freq**

Alarm message: Engine speed/frequency mismatch **Alarm class: F3**

The monitored engine speed (MPU) has deviated by more than 10 Hz from the monitored generator frequency.

EN **Interf.err. X1X5**
DE **Fehl.Schnit.X1X5**

Alarm message: Interface fault X1-X5 **Alarm class: F1**

The load share CAN bus interface (terminals X1-X5) has malfunctioned. External control signals cannot be received.

EN **Interf.err. Y1Y5**
DE **Fehl.Schnit.Y1Y5**

Alarm message: Interface fault Y1-Y5 **Alarm class: F1**

The ECU CAN bus interface (terminals Y1-Y5) has malfunction. ECU messages cannot be received.

EN **GCB syn.failure**
DE **Synch.Zeit GLS**

Alarm message: GCB synchronization time exceeded **Alarm class: F1**

The configured time for synchronization of the GCB has expired.

EN **MCB syn.failure**
DE **Synch.Zeit NLS**

Alarm message: MCB synchronization time exceeded **Alarm class: F1**

The configured time for synchronization of the MCB has expired.

EN **EXT open failure**
DE **Störung EXT AUF**

Alarm message: Malfunction when opening an external breaker **Alarm class: F1**

GCP-31 only: The external circuit breaker reply has failed to signal that the breaker opened after the GCP-31 (terminals 39/40) issued an open command.

EN DE **GCBclose failure** / **Störung GLS ZU**

Alarm message: Malfunction when closing GCB **Alarm class: F1**

The GCB has attempted to close 5 times and the circuit breaker reply fails to signal that the breaker has closed.

EN DE **GCB open failure** / **Störung GLS AUF**

Alarm message: Malfunction when opening GCB **Alarm class: F1**

The GCP has issued a GCB open command and the circuit breaker reply fails to signal that the breaker has open within 2 seconds following the open command was issued.

EN DE **MCBclose failure** / **Störung NLS ZU**

Alarm message: Malfunction when closing MCB **Alarm class: F1**

The MCB has attempted to close 5 times and the circuit breaker reply fails to signal that the breaker has closed.

EN DE **MCB open failure** / **Störung NLS AUF**

Alarm message: Malfunction when opening MCB **Alarm class: F1**

The GCP has issued a MCB open command and the circuit breaker reply fails to signal that the breaker has open within 2 seconds following the open command was issued.

EN DE **Import power<>0** / **Bezugsleist.<>0**

Alarm message: Incoming power "Zero" not reached **Alarm class: F1**

The GCP has opened the MCB prior to a zero power transfer being achieved when "CLOSED TRANSITION" circuit breaker logic has been configured and the time configured for "Max. start/stop ramp time" has expired.

EN DE **Failure df/dVmax** / **Stör. df/dU-max.**

Alarm message: Time for dead bus start exceeded **Alarm class: F1**

The generator voltage or frequency has failed to reach the configured window for a dead bus closure and the configured time for "GCB dead bus op. max. time" has expired.

EN DE **Start failure** / **Fehlstart**

Alarm message: Start fail **Alarm class: F3**

The GCP has unsuccessfully attempted to start the engine three times. The GCP does not initiate further start attempts.

EN DE **Stop failure** / **Abstellstörung**

Alarm message: Stop failure **Alarm class: F3**

The GCP has detected speed via generator frequency, the MPU input, or discrete input 5 (terminal 62/firing speed detected) 30 seconds after issuing a stop command.

EN Service
DE Wartung

Alarm message: Maintenance call **Alarm class: F1**

The configured maintenance interval time has expired.

⇒ Also refer to "Reset Maintenance Call" on page 28.

EN Unintended stop
DE ungewollter Stop

Alarm message: Unintended stop **Alarm class: F3**

The engine has ceased running without being issued a stop running command from the GCP.

Note: The engine may cease running due to mechanical damage, overloading, running out of fuel and the engine R.P.M. fall below the configured firing speed. This alarm will not be issued if delayed by engine speed monitoring is enabled.

EN P-ramp: open GCB
DE P-Rampe: GLS auf

Alarm message: Shutdown failure **Alarm class: F3**

The GCP has issued a stop command but the GCB has not opened prior to the configured time expiring for "add/stop ramp max. time".

NOTE

The following message is not an alarm message. It is displayed for information purposes only. Due to the fact it an informative message and not an alarm message, it does not require the operator to acknowledge the message and will not result in a shutdown of the generator set. The message will automatically clear when the rotating fields match.

EN Phase sequence!
DE Drehfeld falsch!

Alarm message: generator/mains rotating field mismatch **display only**

The generator and the mains have counter rotating fields. Closing GCB/MCB is blocked.

Appendix A.
Code Level Access Permissions

Code Level 0 or No Code Level

Configuration screen
- Software version
- Enter code
- Language first/second
- Service display

Set point in display mode
- Psetmanual only in "Manual" or "Test" operation mode

Code Level 1

Configuration screen
- Software version
- Enter code
- Language first/second
- Service display
- View event logger
- Real power controller Pset1
- Real power controller Pset 2
- Power factor controller set point Cset
- Horn reset after
- Maintenance call remaining time
- Time
- Year, Moth
- Day/weekday

Set point in display mode
- Psetmanual only in "Manual" or "Test" operation mode
- Pset1 only in "Automatic" or "Stop" operation mode
- Pset2 only in "Automatic" or "Stop" operation mode
- Cset

Code Level 2

Configuration screen
- complete access

Set point in display mode
- Psetmanual only in "Manual" or "Test" operation mode
- Pset1 only in "Automatic" or "Stop" operation mode
- Pset2 only in "Automatic" or "Stop" operation mode
- Cset
- Fset
- Uset

Set points are only visible when the respective controller is enabled!

We appreciate your comments about the content of our publications.

Please send comments to: stgt-documentation@woodward.com

Please include the manual number from the front cover of this publication.

Woodward
Handwerkstrasse 29 - 70565 Stuttgart - Germany
Phone +49 (0) 711 789 54-0 • Fax +49 (0) 711 789 54-100
sales-stuttgart@woodward.com

Homepage

http://www.woodward.com/power

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