DEIF A/S

Application note

2 generators, auto start/stop
Multi-line 2 – version 2

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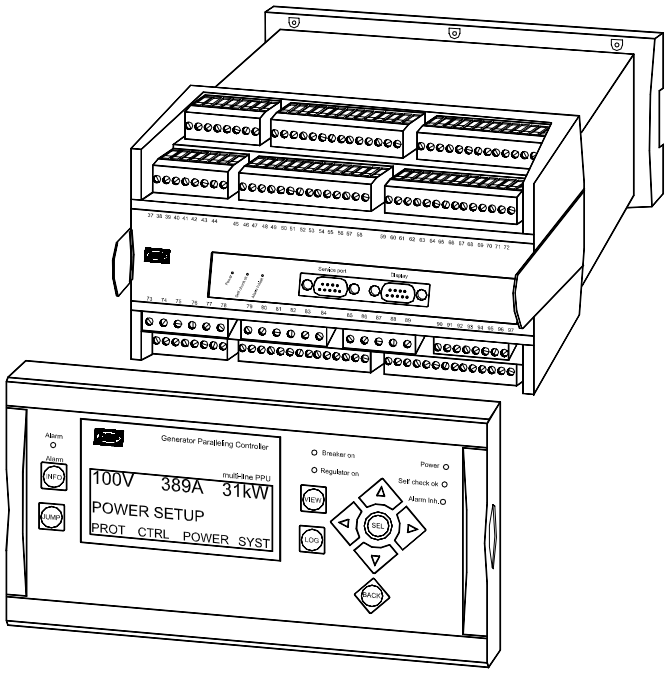

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These application notes refer to multi-line 2 PPU or GPC version 2.20.0 or later.

1. Warnings and legal information

This chapter includes important information about general legal issues relevant in the handling of DEIF products. Furthermore, some overall safety precautions will be introduced and recommended. Finally, the highlighted notes and warnings, which will be used throughout this handbook, are presented.

Legal information and responsibility

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the generator set controlled by the unit, the company responsible for the installation or the operation of the set must be contacted.

The units are not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

Safety issues

Installing the unit implies work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.

Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.

Definitions

Throughout this document a number of notes and warnings will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.

Notes

The notes provide general information which will be helpful for the reader to bear in mind.

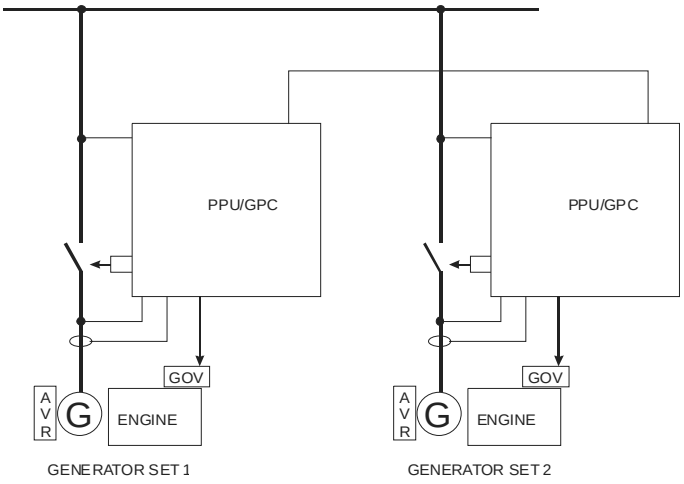
Warnings

The warnings indicate a potentially dangerous situation which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

2. Application description

System overview

The system is intended for 2 generators only, creating all the automatic functions using relay logic. This makes the system very simple and robust.



This application describes how to make a 2DG plant with the following functionality:

1. Automatic load dependent start and stop
2. Priority selection
3. Collective fault interruption

Automatic load dependent start and stop

The load dependent start of the 2nd priority gen-set will be initiated at high load (power). The start level can be adjusted between 50-150% load. The load dependent stop of the 2nd priority gen-set will be initiated at low load (power). The stop level can be adjusted between 0-100% load.

Priority selection

It is possible to select the 1st priority between DG1 and DG2.

Collective fault

When a collective fault appears then the DG will not be ready for automatic operation.

Needed options

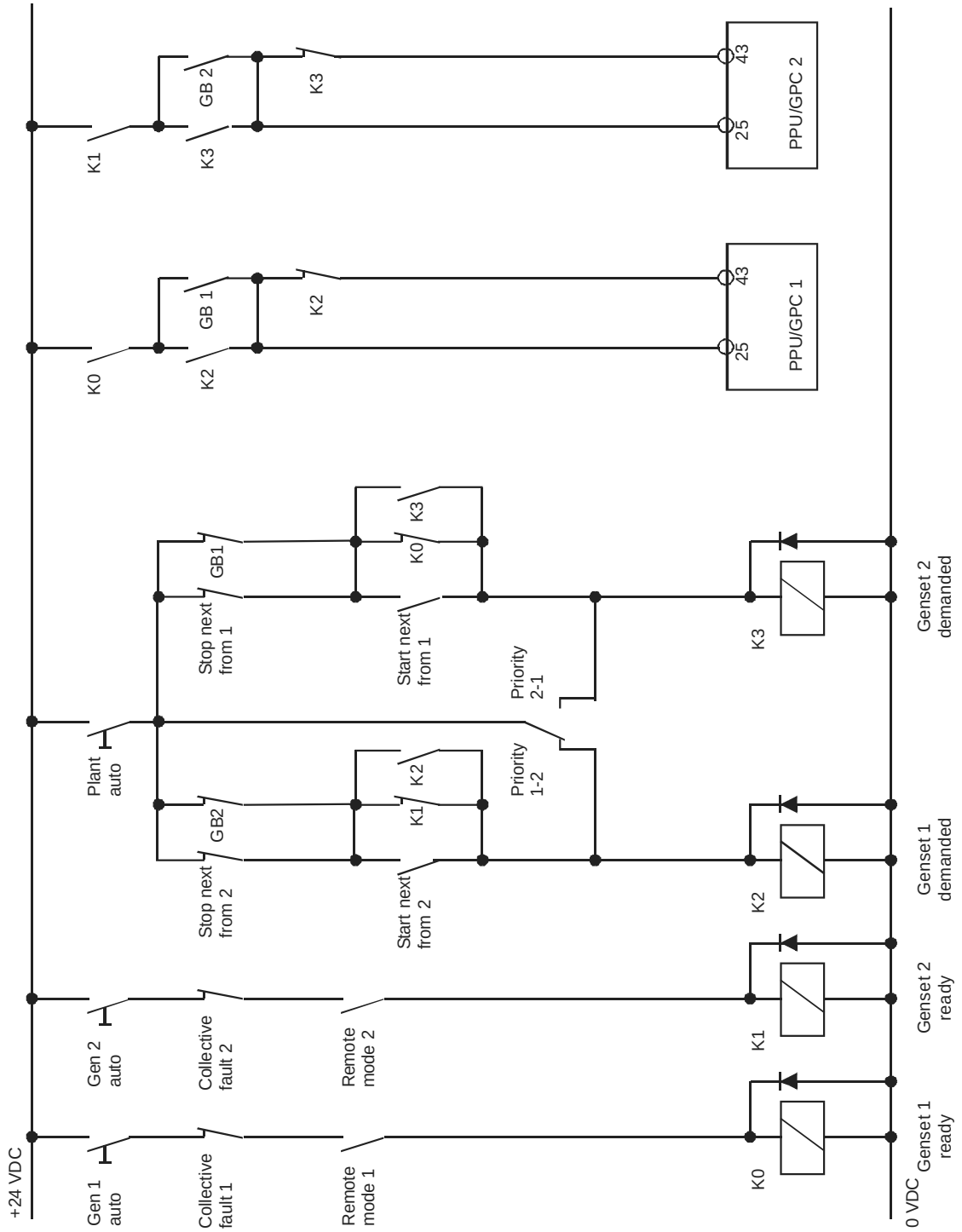
The PPU/GPC units must be equipped with the option M1 or M2 (engine control) in order to carry out the start/stop functions.

All other available options can be applied as requested. Attention must be paid to governor (AVR) interface and required protections.

Please refer to the data sheet for specific information about the possible options selection.

3. Wiring

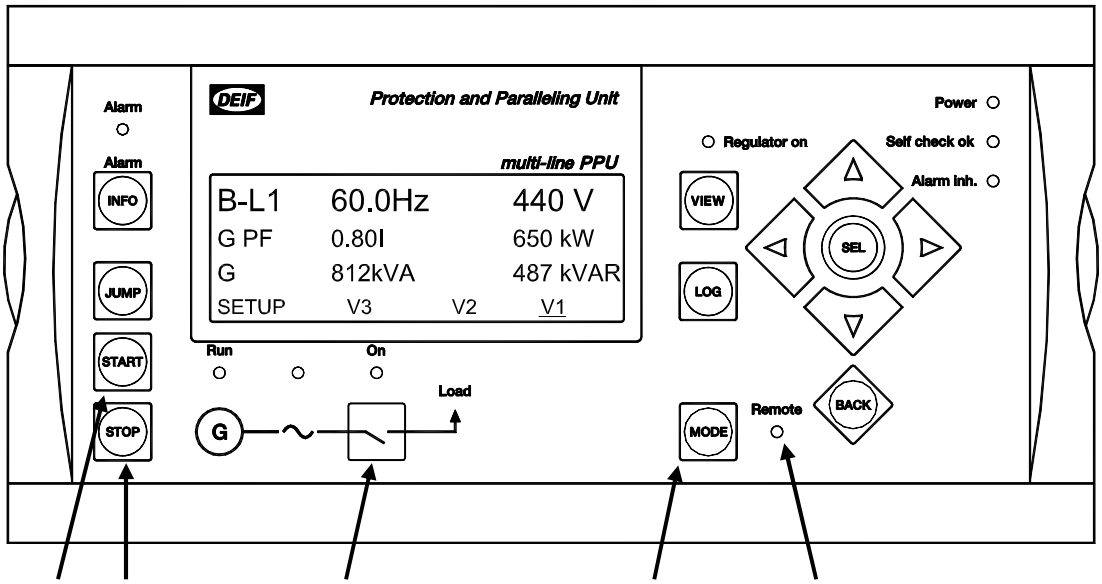
Control wiring



4. Functional description

Display

The display of the GPC/PPU used in this application looks like this:



Start/stop buttons	Breaker button	MODE button	Remote LED

Selector switches

On the switchboard, four selector switches must be installed. The purpose is to be able to change between AUTO and MANUAL as well as the priority selection.

Function / **Switch**	**Switch functionality**
Plant auto	Activating this switch puts the gen-set plant in AUTO mode
Priority switch	Selection of the 1st priority between DG1 and DG2
Gen 1 Auto	Allows DG1 to be operated in AUTO mode
Gen 2 Auto	Allows DG2 to be operated in AUTO mode

Collective fault

The collective fault relay is a common alarm relay that can be activated by specific alarms. These alarms must be configured in the parameter file and they must be adjusted to activate the same relay. (The relay used for the collective fault indication).

Should a collective fault occur during automatic operation of the DGs, then notice that the defective DG is stopped if the circuit breaker is opened. If the circuit breaker remains closed, then the DG continues to operate without further regulation.

Running mode selections

The operation of the gen-sets depends on the selected running mode. The running mode is selected on a selector switch and on the display. This explanation presumes that the generators are ready to run and therefore they are put into AUTO mode:

Set switch 'GEN 1 AUTO' in position AUTO
Set switch 'GEN 2 AUTO' in position AUTO

AUTOMATIC

Set switch 'PLANT AUTO' in position AUTO
Set display mode in REMOTE.

The Remote LED on the display must be ON.

This will enable the automatic generator running, meaning the generators will run load dependent start/stop.

MANUAL

Set switch 'PLANT AUTO' in position OFF (manual)
Set display mode in LOCAL

The Remote LED on the display must be OFF.

Manual mode will enable the operator to use the START, STOP and generator breaker buttons on the display for start/stop and generator breaker synchronising/open.

REMEMBER:

Set the mode on the display back to remote (LED ON) and PLANT AUTO back in AUTO again when finished with manual operation. Failure to do so means that the generator will not participate in the automatic functions.

Manual speed control

In manual running mode, to adjust the speed (frequency) up and down, binary command inputs must be used.

- Input terminal 44: Raise speed
- Input terminal 45: Lower speed

Breaker operation

If the breaker is open, pressing the breaker button will make the GPC/PPU act as a check synchroniser (it will close the breaker when the conditions are OK), but the speed must be controlled with the binary inputs (or by other means).

If the breaker is in closed position and the breaker button is pressed, the breaker will open immediately in the manual running mode.

Parameter settings

The following settings are specifically used in this application note and must therefore be adjusted:

4260 Start next generator
4270 Stop next generator
4430 Remote mode

In addition to these parameters, the gen-set specific parameters must also be adjusted.

For instructions about configuration of the parameters, please refer to the Designer's Reference Handbook.

5. Flowchart

AUTO load dependent start/stop