MULTI-LINE 2
PARAMETER LIST



Generator Paralleling Controller, GPC-3/GPC-3 Gas/GPC-3 Hydro

Generator Protection Unit, GPU-3 Hydro

- Alarm list
- Parameter list

DEIF A/S · Frisenborgvej 33 · DK-7800 Skive
Tel.: +45 9614 9614 · Fax: +45 9614 9615
info@deif.com · www.deif.com

Document no.: 4189340580J
SW version: 3.1x.x or later

Table of contents

This document is valid for the following products:

GPC-3	Software version 3.1x.x or later
GPC-3 Gas	Software version 3.1x.x or later
GPC-3 Hydro	Software version 3.1x.x or later
GPU-3 Hydro	Software version 3.1x.x or later

1. About this document

This chapter includes general user information about this handbook concerning the general purpose, the intended users and the overall contents and structure.

General purpose

This document is the complete parameter list for DEIF's Multi-line units with software version 3. The document includes all parameters, which means that some of the option parameters included may not be accessible in the system in question.

Intended users

The parameter list is mainly intended for the person responsible for the unit parameter setup. In most cases, this would be a panel builder designer. Naturally, other users might also find useful information here.

Contents/overall structure

The Parameter List is divided into chapters and in order to make the structure of the document simple and easy to use, each chapter will begin from the top of a new page. The following will outline the contents of each of the chapters.

About this document

This first chapter includes general information about this handbook as a document. It deals with the general purpose and the intended users of the Parameter List. Furthermore, it outlines the overall contents and structure of the document.

Warnings and legal information

The second chapter includes information about general legal issues and safety precautions relevant in the handling of DEIF products. Furthermore, this chapter will introduce the note and warning symbols, which will be used throughout the handbook.

Alarm list

This chapter includes a complete standard alarm list for setup. Therefore, this chapter is to be used for reference, when information about specific alarms is needed.

Parameter list

This chapter includes a complete standard parameter list for setup. Therefore, this chapter is to be used for reference, when information about specific parameters is needed.

2. 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.

3. Alarm list

In the following, these abbreviations are used:
G: Generator
GB: Generator breaker
N/A: Not available

This chapter includes a complete alarm list, including all possible options. Therefore, this chapter is to be used for reference when specific information about the individual parameters is needed for the unit setup.

The table consists of the following possible adjustments:

Set point: The alarm set point is adjusted in the set point menu. The setting is a percentage of the nominal values.

Delay: The timer setting is the time that must expire from the alarm level is reached until the alarm occurs.

Relay output A: A relay can be activated by output A.

Relay output B: A relay can be activated by output B.

Enable: The alarm can be activated or deactivated. ON means always activated, RUN means that the alarm has run status. This means it is activated when the running signal is present.

Fail class: When the alarm occurs, the unit will react depending on the selected fail class.

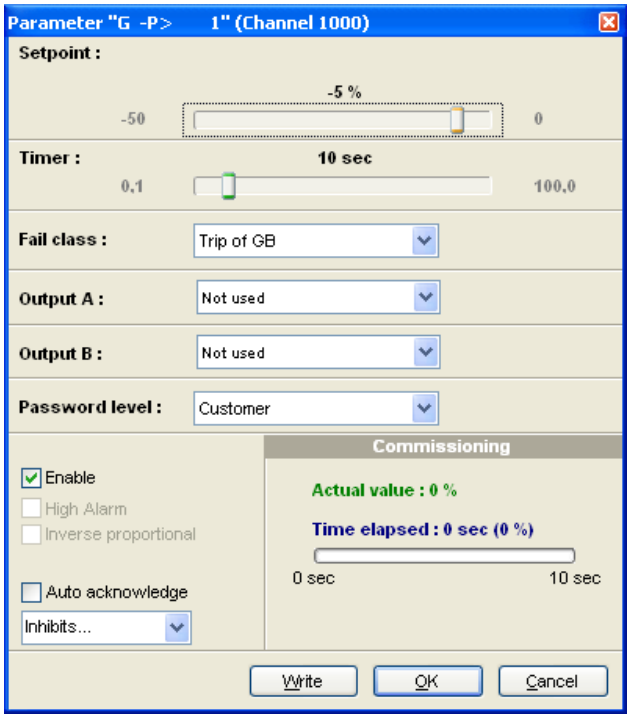
Fail classes are:

Fail class	Function
F1	Block
F2	Warning
F3	Trip GB
F4	Trip + stop
F5	Shutdown
F6	Safety stop

Small differences due to the character of the parameters may exist between the individual tables.

It is also possible to configure the parameters by using the PC utility software. It will be possible to make the same configurations as described above.

By using the PC utility software, extra functionality is available. For all the protections it is possible to make an automatic acknowledgement of the alarm.



Reverse power protection

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1000 G reverse power 1							
1001	G –P> 1	Set point	-110.0 % 0.0 %	-8.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the reverse power has been continuously above the programmed value during the programmed delay.
1002	G –P> 1	Delay	0.1 s 300.0 s	5.0 s			
1003	G –P> 1	Relay output A	Not used Option-dependent	Not used			
1004	G –P> 1	Relay output B	Not used Option-dependent	Not used			
1005	G –P> 1	Enable	OFF ON	ON			
1006	G –P> 1	Fail class	F1…F6	Trip GB (F3)			
1010 G reverse power 2							
1011	G –P> 2	Set point	-110.0 % 0.0 %	-15.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the reverse power has been continuously above the programmed value during the programmed delay.
1012	G –P> 2	Delay	0.1 s 300.0 s	2.0 s			
1013	G –P> 2	Relay output A	Not used Option-dependent	Not used			
1014	G –P> 2	Relay output B	Not used Option-dependent	Not used			
1015	G –P> 2	Enable	OFF ON	ON			
1016	G –P> 2	Fail class	F1…F6	Trip GB (F3)			
1020 G reverse power characteristic							
1021	G –P> 1 Char.	Char. 1	Definite Inverse			Designer's Reference Handbook	Selection of trip characteristics for reverse power protections (1000 and 1010)
1022	G –P> 2 Char.	Char. 2	Definite Inverse				

Over-current protection

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1030 G over-current 1							
1031	G I> 1	Set point	50.0 % 200.0 %	100.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1032	G I> 1	Delay	0.1 s 3200.0 s	20.0 s			
1033	G I> 1	Relay output A	Not used Option-dependent	Not used			
1034	G I> 1	Relay output B	Not used Option-dependent	Not used			
1035	G I> 1	Enable	OFF ON	ON			
1036	G I> 1	Fail class	F1…F6	Warning (F2)			
1040 G over-current 2							
1041	G I> 2	Set point	50.0 % 200.0 %	120.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1042	G I> 2	Delay	0.1 s 3200.0 s	10.0 s			
1043	G I> 2	Relay output A	Not used Option-dependent	Not used			
1044	G I> 2	Relay output B	Not used Option-dependent	Not used			
1045	G I> 2	Enable	OFF ON	ON			
1046	G I> 2	Fail class	F1…F6	Trip GB (F3)			
1050 G over-current 3							
1051	G I> 3	Set point	50.0 % 200.0 %	130.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1052	G I> 3	Delay	0.1 s 3200.0 s	3.0 s			
1053	G I> 3	Relay output A	Not used Option-dependent	Not used			
1054	G I> 3	Relay output B	Not used Option-dependent	Not used			
1055	G I> 3	Enable	OFF ON	ON			
1056	G I> 3	Fail class	F1…F6	Trip GB (F3)			
1060 G over-current 4							
1061	G I> 4	Set point	50.0 % 200.0 %	140.0 %		Designer's Reference	The alarm and fail class are activated when the

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1062	G I> 4	Delay	0.1 s 3200.0 s	1.0 s		Handbook	current has been continuously above the programmed value during the programmed delay.
1063	G I> 4	Relay output A	Not used Option-dependent	Not used			
1064	G I> 4	Relay output B	Not used Option-dependent	Not used			
1065	G I> 4	Enable	OFF ON	ON			
1066	G I> 4	Fail class	F1…F6	Trip GB (F3)			
1080 G inverse time over-current curve setting							
1081	G I> inv. type	Type	IEC Inverse Custom	IEC Inverse		Designer's Reference Handbook	Available curve types: - IEC Inverse - IEC Very inverse - IEC Extremely inv. - IEEE Moderately inv. - IEEE Very inverse - IEEE Extremely inv. - Custom
1082	G I> inv. limit	Set point	50.0 % 200.0 %	110.0 %			
1083	G I> inv. TMS	Set point	0.1 100.0	1.0			
1084	G I> inv. k	Set point	0.001 s 32.000 s	0.140 s			
1085	G I> inv. c	Set point	0.000 s 32.000 s	0.000 s			
1086	G I> inv. a	Set point	0.001 s 32.000 s	0.020 s			
1090 G inverse time over-current alarm							
1091	G I> inv.	Relay output A	Not used Option-dependent	Not used		Designer's Reference Handbook	
1092	G I> inv.	Relay output B	Not used Option-dependent	Not used			
1093	G I> inv.	Enable	OFF ON	OFF			
1094	G I> inv.	Fail class	F1…F6	Trip GB (F3)			
1100 Voltage-dependent over-current curve setting							
1101	G Iv> (50 %)	Set point I1	50.0 % 200.0 %	110.0 %	@50 % nom. voltage	Designer's Reference Handbook	Settings relate to nominal generator current. The condition has to be true, that is I1<I2<I3<I4<I5<I6. If this is not fulfilled, the worst-case set point I1 will be used.
1102	G Iv> (60 %)	Set point I2	50.0 % 200.0 %	125.0 %	@60 % nom. voltage		
1103	G Iv> (70 %)	Set point I3	50.0 % 200.0 %	140.0 %	@70 % nom. voltage		
1104	G Iv> (80 %)	Set point I4	50.0 % 200.0 %	155.0 %	@80 % nom. voltage		
1105	G Iv> (90 %)	Set point I5	50.0 % 200.0 %	170.0 %	@90 % nom. voltage		

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1106	G Iv> (100 %)	Set point I6	50.0 % 200.0 %	200.0 %	@100 % nom. voltage		
1110 Voltage-dependent over-current alarm							
1111	G Iv >	Timer	0.1 s 3200.0 s	1.0 s		Designer's Reference Handbook	The alarm and fail class are activated when the over-current has been continuously above the programmed value during the programmed delay. Values are set in parameters 1101-1106.
1112	G Iv >	Relay A	Not used Option-dependent	Not used			
1113	G Iv >	Relay B	Not used Option-dependent	Not used			
1114	G Iv >	Activate	OFF ON	ON			
1115	G Iv >	Fail class	F1…F6	Trip GB (F3)			
1130 G fast over-current 1							
1131	G I>> 1	Set point	150.0 % 350.0 %	200.0 %		Designer's Reference Handbook	The alarm settings relate to the nominal current setting. The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1132	G I>> 1	Delay	0.00 s 320.00 s	0.00 s			
1133	G I>> 1	Relay output A	Not used Option-dependent	Not used			
1134	G I>> 1	Relay output B	Not used Option-dependent	Not used			
1135	G I>> 1	Enable	OFF ON	OFF			
1136	G I>> 1	Fail class	F1…F6	Trip GB (F3)			
1140 G fast over-current 2							
1141	G I>> 2	Set point	50.0 % 200.0 %	300.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1142	G I>> 2	Delay	0.00 s 320.00 s	0.00 s			
1143	G I>> 2	Relay output A	Not used Option-dependent	Not used			
1144	G I>> 2	Relay output B	Not used Option-dependent	Not used			
1145	G I>> 2	Enable	OFF ON	OFF			
1146	G I>> 2	Fail class	F1…F6	Trip GB (F3)			

Voltage protections

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1150 G over-voltage 1							
1151	G U> 1	Set point	100.0 % 120.0 %	105.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay. Set point relates to the nominal voltage setting.
1152	G U> 1	Timer	0.1 s 3200.0 s	5.0 s			
1153	G U> 1	Relay output A	Not used Option-dep.	Not used			
1154	G U> 1	Relay output B	Not used Option-dep.	Not used			
1155	G U> 1	Enable	OFF ON	ON			
1156	G U> 1	Fail class	F1…F6	Warning (F2)			
1160 G over-voltage 2							
1161	G U> 2	Set point	100.0 % 120.0 %	115.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay. Set point relates to the nominal voltage setting.
1162	G U> 2	Timer	0.1 s 3200.0 s	1.0 s			
1163	G U> 2	Relay output A	Not used Option-dep.	Not used			
1164	G U> 2	Relay output B	Not used Option-dep.	Not used			
1165	G U> 2	Enable	OFF ON	ON			
1166	G U> 2	Fail class	F1…F6	Block (F1)			
1170 G under-voltage 1							
1171	G U< 1	Set point	40.0 % 100.0 %	95.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay. Set point relates to the nominal voltage setting.
1172	G U< 1	Timer	0.1 s 3200.0 s	5.0 s			
1173	G U< 1	Relay output A	Not used Option-dep.	Not used			
1174	G U< 1	Relay output B	Not used Option-dep.	Not used			
1175	G U< 1	Enable	OFF ON	ON			
1176	G U< 1	Fail class	F1…F6	Warning (F2)			
1180 G under-voltage 2							
1181	G U< 2	Set point	40.0 % 100.0 %	80.0 %		Designer's Reference	The alarm and fail class are activated when the

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1182	G U< 2	Timer	0.1 s 3200.0 s	3.0 s		Handbook	voltage has been continuously under the programmed value during the programmed delay. Set point relates to the nominal voltage setting.
1183	G U< 2	Relay output A	Not used Option-dep.	Not used			
1184	G U< 2	Relay output B	Not used Option-dep.	Not used			
1185	G U< 2	Enable	OFF ON	ON			
1186	G U< 2	Fail class	F1…F6	Trip GB (F3)			
1190 G under-voltage 3							
1191	G U< 3	Set point	40.0 % 100.0 %	70.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay. Set point relates to the nominal voltage setting.
1192	G U< 3	Timer	0.1 s 3200.0 s	1.0 s			
1193	G U< 3	Relay output A	Not used Option-dep.	Not used			
1194	G U< 3	Relay output B	Not used Option-dep.	Not used			
1195	G U< 3	Enable	OFF ON	OFF			
1196	G U< 3	Fail class	F1…F6	Trip GB (F3)			

Frequency protections

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1210 G over-frequency 1							
1211	G f> 1	Set point	100.0 % 120.0 %	105.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay. Frequency settings relate to nominal frequency setting.
1212	G f> 1	Timer	0.2 s 3200.0 s	3.0 s			
1213	G f> 1	Relay output A	Not used Option-dep.	Not used			
1214	G f> 1	Relay output B	Not used Option-dep.	Not used			
1215	G f> 1	Enable	OFF ON	ON			
1216	G f> 1	Fail class	F1…F6	Warning (F2)			
1220 G over-frequency 2							
1221	G f> 2	Set point	100.0 % 120.0 %	107.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay.
1222	G f> 2	Timer	0.2 s 100.0 s	3.0 s			
1223	G f> 2	Relay output A	Not used Option-dep.	Not used			
1224	G f> 2	Relay output B	Not used Option-dep.	Not used			
1225	G f> 2	Enable	OFF ON	ON			
1226	G f> 2	Fail class	F1…F6	Block (F1)			
1230 G over-frequency 3							
1231	G f> 3	Set point	100.0 % 120.0 %	110.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay.
1232	G f> 3	Timer	0.2 s 3200.0 s	1.0 s			
1233	G f> 3	Relay output A	Not used Option-dep.	Not used			
1234	G f> 3	Relay output B	Not used Option-dep.	Not used			
1235	G f> 3	Enable	OFF ON	OFF			
1236	G f> 3	Fail class	F1…F6	Block (F1)			
1240 G under-frequency 1							
1241	G f< 1	Set point	80.0 % 100.0 %	95.0 %		Designer's Reference	The alarm and fail class are activated when the

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1242	G f< 1	Timer	0.2 s 3200.0 s	5.0 s		Handbook	frequency has been continuously under the programmed value during the programmed delay.
1243	G f< 1	Relay output A	Not used Option-dep.	Not used			
1244	G f< 1	Relay output B	Not used Option-dep.	Not used			
1245	G f< 1	Enable	OFF ON	ON			
1246	G f< 1	Fail class	F1…F6	Warning (F2)			
1250 G under-frequency 2							
1251	G f< 2	Set point	80.0 % 100.0 %	93.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1252	G f< 2	Timer	0.2 s 3200.0 s	3.0 s			
1253	G f< 2	Relay output A	Not used Option-dep.	Not used			
1254	G f< 2	Relay output B	Not used Option-dep.	Not used			
1255	G f< 2	Enable	OFF ON	ON			
1256	G f< 2	Fail class	F1…F6	Block (F1)			
1260 G under-frequency 3							
1261	G f< 3	Set point	80.0 % 100.0 %	90.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1262	G f< 3	Timer	0.2 s 3200.0 s	1.0 s			
1263	G f< 3	Relay output A	Not used Option-dep.	Not used			
1264	G f< 3	Relay output B	Not used Option-dep.	Not used			
1265	G f< 3	Enable	OFF ON	OFF			
1266	G f< 3	Fail class	F1…F6	Block (F1)			

Busbar voltage protections

No.	Setting			Min. Max.	Factory setting	Notes	Ref.	Description
1270 Busbar over-voltage 1								
1271	BB U>	1	Set point	100.0 % 120.0 %	110.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay. Set point relates to the nominal BB voltage setting.
1272	BB U>	1	Timer	0.00 s 320.00 s	5.00 s			
1273	BB U>	1	Relay output A	Not used Option-dep.	Not used			
1274	BB U>	1	Relay output B	Not used Option-dep.	Not used			
1275	BB U>	1	Enable	OFF ON	ON			
1276	BB U>	1	Fail class	F1…F6	Warning (F2)			
1280 Busbar over-voltage 2								
1281	BB U>	2	Set point	100.0 % 120.0 %	120.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay. Set point relates to the nominal BB voltage setting.
1282	BB U>	2	Timer	0.00 s 320.00 s	3.00 s			
1283	BB U>	2	Relay output A	Not used Option-dep.	Not used			
1284	BB U>	2	Relay output B	Not used Option-dep.	Not used			
1285	BB U>	2	Enable	OFF ON	ON			
1286	BB U>	2	Fail class	F1…F6	Trip GB (F3)			
1290 Busbar over-voltage 3								
1291	BB U>	3	Set point	100.0 % 120.0 %	120.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay. Set point relates to the nominal BB voltage setting.
1292	BB U>	3	Timer	0.00 s 320.00 s	1.00 s			
1293	BB U>	3	Relay output A	Not used Option-dep.	Not used			
1294	BB U>	3	Relay output B	Not used Option-dep.	Not used			
1295	BB U>	3	Enable	OFF ON	OFF			
1296	BB U>	3	Fail class	F1…F6	Trip GB (F3)			
1300 Busbar under-voltage 1								
1301	BB U<	1	Set point	40.0 % 100.0 %	95.0 %		Designer's Reference	The alarm and fail class are activated when the

No.	Setting			Min. Max.	Factory setting	Notes	Ref.	Description
1302	BB U<	1	Timer	0.00 s 320.00 s	5.00 s		Handbook	voltage has been continuously under the programmed value during the programmed delay. Set point relates to the nominal BB voltage setting.
1303	BB U<	1	Relay output A	Not used Option-dep.	Not used			
1304	BB U<	1	Relay output B	Not used Option-dep.	Not used			
1305	BB U<	1	Enable	OFF ON	ON			
1306	BB U<	1	Fail class	F1…F6	Warning (F2)			
1310 Busbar under-voltage 2								
1311	BB U<	2	Set point	40.0 % 100.0 %	80.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay. Set point relates to the nominal BB voltage setting.
1312	BB U<	2	Timer	0.00 s 320.00 s	3.00 s			
1313	BB U<	2	Relay output A	Not used Option-dep.	Not used			
1314	BB U<	2	Relay output B	Not used Option-dep.	Not used			
1315	BB U<	2	Enable	OFF ON	ON			
1316	BB U<	2	Fail class	F1…F6	Warning (F2)			
1320 Busbar under-voltage 3								
1321	BB U<	3	Set point	40.0 % 100.0 %	70.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay. Set point relates to the nominal BB voltage setting.
1322	BB U<	3	Timer	0.00 s 320.00 s	2.00 s			
1323	BB U<	3	Relay output A	Not used Option-dep.	Not used			
1324	BB U<	3	Relay output B	Not used Option-dep.	Not used			
1325	BB U<	3	Enable	OFF ON	OFF			
1326	BB U<	3	Fail class	F1…F6	Trip GB (F3)			
1330 Busbar under-voltage 4								
1331	BB U<	4	Set point	40.0 % 100.0 %	60.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay. Set point relates to the
1332	BB U<	4	Timer	0.00 s 320.00 s	1.00 s			
1333	BB U<	4	Relay output A	Not used Option-dep.	Not used			

No.	Setting			Min. Max.	Factory setting	Notes	Ref.	Description
1334	BB U<	4	Relay output B	Not used Option-dep.	Not used			nominal BB voltage setting.
1335	BB U<	4	Enable	OFF ON	OFF			
1336	BB U<	4	Fail class	F1…F6	Trip GB (F3)			

Busbar frequency protections

No.	Setting			Min. Max.	Factory setting	Notes	Ref.	Description
1350 Busbar over-frequency 1								
1351	BB f>	1	Set point	100.0 % 120.0 %	105.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay. Set point relates to the nominal frequency setting.
1352	BB f>	1	Timer	0.00 s 320.00 s	5.00 s			
1353	BB f>	1	Relay output A	Not used Option-dep.	Not used			
1354	BB f>	1	Relay output B	Not used Option-dep.	Not used			
1355	BB f>	1	Enable	OFF ON	ON			
1356	BB f>	1	Fail class	F1…F6	Warning (F2)			
1360 Busbar over-frequency 2								
1361	BB f>	2	Set point	100.0 % 120.0 %	110.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay. Set point relates to the nominal frequency setting.
1362	BB f>	2	Timer	0.00 s 320.00 s	3.00 s			
1363	BB f>	2	Relay output A	Not used Option-dep.	Not used			
1364	BB f>	2	Relay output B	Not used Option-dep.	Not used			
1365	BB f>	2	Enable	OFF ON	ON			
1366	BB f>	2	Fail class	F1…F6	Trip GB (F3)			
1370 Busbar over-frequency 3								
1371	BB f>	3	Set point	100.0 % 120.0 %	120.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay. Set point relates to the nominal frequency setting.
1372	BB f>	3	Timer	0.00 s 320.00 s	3.00 s			
1373	BB f>	3	Relay output A	Not used Option-dep.	Not used			
1374	BB f>	3	Relay output B	Not used Option-dep.	Not used			
1375	BB f>	3	Enable	OFF ON	OFF			
1376	BB f>	3	Fail class	F1…F6	Trip GB (F3)			
1380 Busbar under-frequency 1								
1381	BB f<	1	Set point	80.0 % 100.0 %	96.0 %		Designer's Reference	The alarm and fail class are activated when the

No.	Setting			Min. Max.	Factory setting	Notes	Ref.	Description
1382	BB f<	1	Timer	0.00 s 320.00 s	5.00 s		Handbook	frequency has been continuously under the programmed value during the programmed delay. Set point relates to the nominal frequency setting.
1383	BB f<	1	Relay output A	Not used Option-dep.	Not used			
1384	BB f<	1	Relay output B	Not used Option-dep.	Not used			
1385	BB f<	1	Enable	OFF ON	ON			
1386	BB f<	1	Fail class	F1…F6	Warning (F2)			
1390 Busbar under-frequency 2								
1391	BB f<	2	Set point	80.0 % 100.0 %	93.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay. Set point relates to the nominal frequency setting.
1392	BB f<	2	Timer	0.00 s 320.00 s	3.00 s			
1393	BB f<	2	Relay output A	Not used Option-dep.	Not used			
1394	BB f<	2	Relay output B	Not used Option-dep.	Not used			
1395	BB f<	2	Enable	OFF ON	ON			
1396	BB f<	2	Fail class	F1…F6	Trip GB (F3)			
1400 Busbar under-frequency 3								
1401	BB f<	3	Set point	80.0 % 100.0 %	92.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay. Set point relates to the nominal frequency setting.
1402	BB f<	3	Timer	0.00 s 320.00 s	1.00 s			
1403	BB f<	3	Relay output A	Not used Option-dep.	Not used			
1404	BB f<	3	Relay output B	Not used Option-dep.	Not used			
1405	BB f<	3	Enable	OFF ON	OFF			
1406	BB f<	3	Fail class	F1…F6	Trip GB (F3)			
1410 Busbar under-frequency 4								
1411	BB f<	4	Set point	80.0 % 100.0 %	90.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1412	BB f<	4	Timer	0. 00 s 320.00 s	3.00 s			
1413	BB f<	4	Relay output A	Not used Option-dep.	Not used			

No.	Setting			Min. Max.	Factory setting	Notes	Ref.	Description
1414	BB f<	4	Relay output B	Not used Option-dep.	Not used			Set point relates to the nominal frequency setting.
1415	BB f<	4	Enable	OFF ON	OFF			
1416	BB f<	4	Fail class	F1…F6	Trip GB (F3)			

Mains failure protections

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1420 Df/dt (ROCOF)							
1421	Df/dt (ROCOF)	Set point	0.1 Hz/s 10.0 Hz/s	5.0 Hz/s		Option A1 GPU Hydro: Designer's Reference Handbook	The alarm and fail class are activated when the df/dt rate has been continuously above the programmed value during the programmed number of periods (delay).
1422	Df/dt (ROCOF)	Timer	3 per. 20 per.	6 per.			
1423	Df/dt (ROCOF)	Relay output A	Not used Option-dep.	Not used			
1424	Df/dt (ROCOF)	Relay output B	Not used Option-dep.	Not used			
1425	Df/dt (ROCOF)	Enable	OFF ON	OFF			
1426	Df/dt (ROCOF)	Fail class	F1…F6	Trip GB (F3)			
1430 Vector jump							
1431	Vector jump	Set point	1.0 deg. 90.0 deg.	10.0 deg.		Option A1 GPU Hydro: Designer's Reference Handbook	The alarm and fail class are activated when a vector jump is detected. The type selection (menu 1436) decides whether a vector jump should be present on one phase (individual phases) or all phases to be detected.
1432	Vector jump	Relay output A	Not used Option-dep.	Not used			
1433	Vector jump	Relay output B	Not used Option-dep.	Not used			
1434	Vector jump	Enable	OFF ON	OFF			
1435	Vector jump	Fail class	F1…F6	Trip GB (F3)			
1436	Vector jump	Type	Individual phases All phases	Individual			
1440 Busbar positive sequence voltage low							
1441	BB pos seq volt	Set point	10.0 % 110.0 %	70.0 %		Option A4 GPU Hydro: Designer's Reference Handbook	The alarm and fail class are activated when the symmetrical (positive sequence) voltage has been continuously below the programmed value during the programmed delay. The timer factory setting is set to two periods. This means that the error has to be active in two whole periods before the alarm
1442	BB pos seq volt	Timer	1 per. 9 per.	2 per.			
1443	BB pos seq volt	Relay output A	Not used Option-dep.	Not used			
1444	BB pos seq volt	Relay output B	Not used Option-dep.	Not used			
1445	BB pos seq volt	Enable	OFF ON	OFF			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1446	BB pos seq volt	Fail class	F1…F6	Trip GB (F3)			will be tripped. For example, in a 50 Hz system, the alarm will be activated if the positive sequence is below 70 % of U nominal voltage for 40 ms. The alarm will trip the fail class as soon as possible after this delay.

Overload protections

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1450 G overload 1							
1451	G P> 1	Set point	-200.0 % 200.0 %	95.0 %		Designer's Reference Handbook	Settings relate to nominal power. The alarm and fail class are activated when the power has been continuously above the programmed value during the programmed delay. Set point relates to the nominal power setting.
1452	G P> 1	Timer	0.1 s 3200.0 s	20.0 s			
1453	G P> 1	Relay output A	Not used Option-dep.	Not used			
1454	G P> 1	Relay output B	Not used Option-dep.	Not used			
1455	G P> 1	Enable	OFF ON	ON			
1456	G P> 1	Fail class	F1…F6	Warning (F2)			
1460 G overload 2							
1461	G P> 2	Set point	-200.0 % 200.0 %	110.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the power has been continuously above the programmed value during the programmed delay. Set point relates to the nominal power setting.
1462	G P> 2	Timer	0.1 s 3200.0 s	10.0 s			
1463	G P> 2	Relay output A	Not used Option-dep.	Not used			
1464	G P> 2	Relay output B	Not used Option-dep.	Not used			
1465	G P> 2	Enable	OFF ON	ON			
1466	G P> 2	Fail class	F1…F6	Trip GB (F3)			
1470 G overload 3							
1471	G P> 3	Set point	-200.0 % 200.0 %	115.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the power has been continuously above the programmed value during the programmed delay. Set point relates to the nominal power setting.
1472	G P> 3	Timer	0.1 s 3200.0 s	5.0 s			
1473	G P> 3	Relay output A	Not used Option-dep.	Not used			
1474	G P> 3	Relay output B	Not used Option-dep.	Not used			
1475	G P> 3	Enable	OFF ON	OFF			
1476	G P> 3	Fail class	F1…F6	Trip GB (F3)			
1480 G overload 4							
1481	G P> 4	Set point	-200.0 % 200.0 %	120.0 %		Designer's Reference	The alarm and fail class are activated when the

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1482	G P> 4	Timer	0.1 s 3200.0 s	3.0 s		Handbook	power has been continuously above the programmed value during the programmed delay. Set point relates to the nominal power setting.
1483	G P> 4	Relay output A	Not used Option-dep.	Not used			
1484	G P> 4	Relay output B	Not used Option-dep.	Not used			
1485	G P> 4	Enable	OFF ON	OFF			
1486	G P> 4	Fail class	F1…F6	Trip GB (F3)			
1490 G overload 5							
1491	G P> 5	Set point	-200.0 % 200.0 %	130.0 %		Designer's Reference Handbook	The alarm and fail class are activated when the power has been continuously above the programmed value during the programmed delay. Set point relates to the nominal power setting.
1492	G P> 5	Timer	0.1 s 3200.0 s	1.0 s			
1493	G P> 5	Relay output A	Not used Option-dep.	Not used			
1494	G P> 5	Relay output B	Not used Option-dep.	Not used			
1495	G P> 5	Enable	OFF ON	OFF			
1496	G P> 5	Fail class	F1…F6	Trip GB (F3)			

Current unbalance protection

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1500 G unbalanced I 1							
1501	G unbalance I1	Set point	0.0 % 100.0 %	30.0 %		Designer's Reference Handbook	Settings relate to nominal generator current. The alarm and fail class are activated when the difference between the max. reading and the min. reading of the three measured currents has been continuously above the programmed value during the programmed delay.
1502	G unbalance I1	Timer	0.1 s 3200.0 s	10.0 s			
1503	G unbalance I1	Relay output A	Not used Option-dep.	Not used			
1504	G unbalance I1	Relay output B	Not used Option-dep.	Not used			
1505	G unbalance I1	Enable	OFF ON	ON			
1506	G unbalance I1	Fail class	F1…F6	Trip GB (F3)			
1710 G unbalanced I 2							
1711	G unbalance curr. I2	Set point	0.0 % 100.0 %	30.0 %		Designer's Reference Handbook	Settings relate to nominal generator current. The alarm and fail class are activated when the difference between the max. reading and the min. reading of the three measured currents has been continuously above the programmed value during the programmed delay.
1712	G unbalance curr. I2	Timer	0.1 s 3200.0 s	10.0 s			
1713	G unbalance curr. I2	Relay output A	Not used Option-dep.	Not used			
1714	G unbalance curr. I2	Relay output B	Not used Option-dep.	Not used			
1715	G unbalance curr. I2	Enable	OFF ON	ON			
1716	G unbalance curr. I2	Fail class	F1…F6	Trip GB (F3)			

Voltage unbalance protection

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1510 G unbalanced voltage							
1511	G unbalance volt.	Set point	0.0 % 50.0 %	10.0 %		Designer's Reference Handbook	Settings relate to nominal voltage. The alarm and fail class are activated when the difference between the max. reading and the min. reading of the three measured generator voltages has been continuously above the programmed value during the programmed delay.
1512	G unbalance volt.	Timer	0.1 s 3200.0 s	10.0 s			
1513	G unbalance volt.	Relay output A	Not used Option-dep.	Not used			
1514	G unbalance volt.	Relay output B	Not used Option-dep.	Not used			
1515	G unbalance volt.	Enable	OFF ON	ON			
1516	G unbalance volt.	Fail class	F1…F6	Warning (F2)			

Reactive power import (loss of excitation) protection

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1520 G reactive power import (loss of excitation)							
1521	G –Q>	Set point	0.0 % 150.0 %	50.0 %		Designer's Reference Handbook	Settings relate to nominal power. The alarm and fail class are activated when imported var has been continuously above the programmed value during the programmed delay.
1522	G –Q>	Timer	0.1 s 3200.0 s	10.0 s			
1523	G –Q>	Relay output A	Not used Option-dep.	Not used			
1524	G –Q>	Relay output B	Not used Option-dep.	Not used			
1525	G –Q>	Enable	OFF ON	ON			
1526	G –Q>	Fail class	F1…F6	Trip GB (F3)			

Reactive power export (overexcitation) protection

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1530 G reactive power export (overexcitation)							
1531	G Q>	Set point	0.0 % 100.0 %	75.0 %		Designer's Reference Handbook	Settings relate to nominal power. The alarm and fail class are activated when exported var has been continuously above the programmed value during the programmed delay.
1532	G Q>	Timer	0.1 s 3200.0 s	10.0 s			
1533	G Q>	Relay output A	Not used Option-dep.	Not used			
1534	G Q>	Relay output B	Not used Option-dep.	Not used			
1535	G Q>	Enable	OFF ON	ON			
1536	G Q>	Fail class	F1…F6	Trip GB (F3)			

Negative sequence

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1540 G negative sequence current							
1541	G neg seq I	Set point	1.0 % 100.0 %	20.0 %		Option C2	Settings relate to nominal current. The alarm and fail class are activated when the negative sequence has been continuously above the programmed value during the programmed delay.
1542	G neg seq I	Timer	0.2 s 3200.0 s	0.5 s			
1543	G neg seq I	Relay output A	Not used Option-dep.	Not used			
1544	G neg seq I	Relay output B	Not used Option-dep.	Not used			
1545	G neg seq I	Enable	OFF ON	OFF			
1546	G neg seq I	Fail class	F1…F6	Trip GB (F3)			
1550 G negative sequence voltage							
1551	G neg seq U	Set point	1.0 % 100.0 %	5.0 %		Option C2	Settings relate to nominal voltage. The alarm and fail class are activated when the negative sequence has been continuously above the programmed value during the programmed delay.
1552	G neg seq U	Timer	0.2 s 3200.0 s	0.5 s			
1553	G neg seq U	Relay output A	Not used Option-dep.	Not used			
1554	G neg seq U	Relay output B	Not used Option-dep.	Not used			
1555	G neg seq U	Enable	OFF ON	OFF			
1556	G neg seq U	Fail class	F1…F6	Trip GB (F3)			

Zero sequence

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1570 G zero sequence current							
1571	G zero seq I	Set point	0.0 % 100.0 %	20.0 %		Option C2	Settings relate to nominal current. The alarm and fail class are activated when the zero sequence has been continuously above the programmed value during the programmed delay.
1572	G zero seq I	Timer	0.2 s 3200.0 s	0.5 s			
1573	G zero seq I	Relay output A	Not used Option-dep.	Not used			
1574	G zero seq I	Relay output B	Not used Option-dep.	Not used			
1575	G zero seq I	Enable	OFF ON	OFF			
1576	G zero seq I	Fail class	F1…F6	Trip GB (F3)			
1580 G zero sequence voltage							
1581	G zero seq U	Set point	0.0 % 100.0 %	5.0 %		Option C2	Settings relate to nominal voltage. The alarm and fail class are activated when the zero sequence has been continuously above the programmed value during the programmed delay.
1582	G zero seq U	Timer	0.2 s 3200.0 s	0.5 s			
1583	G zero seq U	Relay output A	Not used Option-dep.	Not used			
1584	G zero seq U	Relay output B	Not used Option-dep.	Not used			
1585	G zero seq U	Enable	OFF ON	OFF			
1586	G zero seq U	Fail class	F1…F6	Trip GB (F3)			

Directional over-current protection

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1600 G directional over-current 1							
1601	G I> direct 1	Set point	-200.0 % 200.0 %	120.0 %		Option A5	Settings relate to nominal current. The alarm and fail class are activated when the directional current has been continuously above the programmed value during the programmed delay. The current measurement is positive when current is supplied from the mains to the plant. The current measurement is negative when current is being supplied to the mains.
1602	G I> direct 1	Timer	0.0 s 3200.0 s	0.1 s			
1603	G I> direct 1	Relay output A	Not used Option-dep.	Not used			
1604	G I> direct 1	Relay output B	Not used Option-dep.	Not used			
1605	G I> direct 1	Enable	OFF ON	OFF			
1606	G I> direct 1	Fail class	F1…F6	Trip GB (F3)			
1610 G directional over-current 2							
1611	G I> direct 2	Set point	-200.0 % 200.0 %	130.0 %		Option A5	Settings relate to nominal current. The alarm and fail class are activated when the directional current has been continuously above the programmed value during the programmed delay. The current measurement is positive when current is supplied from the mains to the plant. The current measurement is negative when current is being supplied to the mains.
1612	G I> direct 2	Timer	0.0 s 3200.0 s	0.1 s			
1613	G I> direct 2	Relay output A	Not used Option-dep.	Not used			
1614	G I> direct 2	Relay output B	Not used Option-dep.	Not used			
1615	G I> direct 2	Enable	OFF ON	OFF			
1616	G I> direct 2	Fail class	F1…F6	Trip GB (F3)			

Busbar unbalance voltage

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1620 BB unbalance U							
1621	BB unbalance U	Set point	0.0 % 50.0 %	10.0 %		Designer's Reference Handbook	Settings relate to average actual voltage. The alarm and fail class are activated when the difference between the max. reading and the min. reading of the three measured busbar voltages has been continuously above the programmed value during the programmed delay.
1622	BB unbalance U	Timer	0.1 s 3200.0 s	10.0 s			
1623	BB unbalance U	Relay output A	Not used Option-dep.	Not used			
1624	BB unbalance U	Relay output B	Not used Option-dep.	Not used			
1625	BB unbalance U	Enable	OFF ON	OFF			
1626	BB unbalance U	Fail class	F1…F6	Warning (F2)			

Time-dependent under-voltage

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1630 Time-dependent under-voltage 1 1-3							
1631	Ut < 1	Setting 1	30.0 % 120.0 %	70.0 %		Option A1 GPU Hydro: Designer's Reference Handbook	Curve setting for time-dependent under-voltage. Settings relate to nominal generator voltage. The condition has to be true, that is Ut(1)1≤Ut(2)≤Ut(3)≤ Ut(4)≤Ut(5)≤Ut(6). If this is not fulfilled, the worst-case set point Ut(6) will be used.
1632	Ut < 1	Delay 1	0.00 s 20.00 s	0.15 s			
1633	Ut < 1	Setting 2	30.0 % 120.0 %	70.0 %			
1634	Ut < 1	Delay 2	0.00 s 20.00 s	0.40 s			
1635	Ut < 1	Setting 3	30.0 % 120.0 %	70.0 %			
1636	Ut < 1	Delay 3	0.00 s 20.00 s	0.70 s			
1640 Time-dependent under-voltage 1 4-6							
1641	Ut < 1	Setting 4	30.0 % 120.0 %	80.0 %		Option A1 GPU Hydro: Designer's Reference Handbook	Curve setting for time-dependent under-voltage. Settings relate to nominal generator voltage. The condition has to be true, that is Ut(1)1≤Ut(2)≤Ut(3)≤ Ut(4)≤Ut(5)≤Ut(6). If this is not fulfilled, the worst-case set point Ut(6) will be used.
1642	Ut < 1	Delay 4	0.00 s 20.00 s	1.10 s			
1643	Ut < 1	Setting 5	30.0 % 120.0 %	90.0 %			
1644	Ut < 1	Delay 5	0.00 s 20.00 s	1.50 s			
1645	Ut < 1	Setting 6	30.0 % 120.0 %	90.0 %			
1646	Ut < 1	Delay 6	0.00 s 20.00 s	2.00 s			
1650 Time-dependent under-voltage 1 activation							
1651	Ut < act 1	Activate	0.0 % 120.0 %	90 %		Option A1 GPU Hydro: Designer's Reference Handbook	Activate is the voltage value where the function timer starts. Reset is the value where the function timer is reset to 0 ms. Delay is the delay timer for the reset. The relay outputs will activate immediately when the function timer starts.
1652	Ut < act 1	Reset	0.0 % 120.0 %	95 %			
1653	Ut < act 1	Delay	0.0 s 320.0 s	1.0 s			
1654	Ut < act 1	Relay output A	Not used Option-dep.	Not used			
1655	Ut < act 1	Relay output B	Not used Option-dep.	Not used			
1656	Ut < act 1	Enable	OFF ON	OFF			
1660 Time-dependent under-voltage 1							
1661	Ut < 1	Relay output A	Not used Option-dep.	Not used		Option A1 GPU Hydro:	The alarm and fail class is activated instantaneously when

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1662	Ut < 1	Relay output B	Not used Option-dep.	Not used		Designer's Reference Handbook	the voltage value is under the programmed value curve.
1663	Ut < 1	Enable	OFF ON	OFF			
1664	Ut < 1	Fail class	F1…F6	Trip GB (F3)			
1670 Time-dependent under-voltage 2 1-3							
1671	Ut < 2	Setting 1	30.0 % 120.0 %	70.0 %		Option A1 GPU Hydro: Designer's Reference Handbook	Curve setting for time-dependent under-voltage. Settings relate to nominal generator voltage. The condition has to be true, that is Ut(1)1≤Ut(2)≤Ut(3)≤ Ut(4)≤Ut(5)≤Ut(6). If this is not fulfilled, the worst-case set point Ut(6) will be used.
1672	Ut < 2	Delay 1	0.00 s 20.00 s	0.15 s			
1673	Ut < 2	Setting 2	30.0 % 120.0 %	70.0 %			
1674	Ut < 2	Delay 2	0.00 s 20.00 s	0.40 s			
1675	Ut < 2	Setting 3	30.0 % 120.0 %	70.0 %			
1676	Ut < 2	Delay 3	0.00 s 20.00 s	0.70 s			
1680 Time-dependent under-voltage 2 4-6							
1681	Ut < 2	Setting 4	30.0 % 120.0 %	80.0 %		Option A1 GPU Hydro: Designer's Reference Handbook	Curve setting for time-dependent under-voltage. Settings relate to nominal generator voltage. The condition has to be true, that is Ut(1)1≤Ut(2)≤Ut(3)≤ Ut(4)≤Ut(5)≤Ut(6). If this is not fulfilled, the worst-case set point Ut(6) will be used.
1682	Ut < 2	Delay 4	0.00 s 20.00 s	1.10 s			
1683	Ut < 2	Setting 5	30.0 % 120.0 %	90.0 %			
1684	Ut < 2	Delay 5	0.00 s 20.00 s	1.50 s			
1685	Ut < 2	Setting 6	30.0 % 120.0 %	90.0 %			
1686	Ut < 2	Delay 6	0.00 s 20.00 s	2.00 s			
1690 Time-dependent under-voltage 2 activation							
1691	Ut < act 2	Activate	0.0 % 120.0 %	90 %		Option A1 GPU Hydro: Designer's Reference Handbook	Activate is the voltage value where the function timer starts. Reset is the value where the function timer is reset to 0 ms. Delay is the delay timer for the reset. The relay output will activate immediately when the function timer starts.
1692	Ut < act 2	Reset	0.0 % 120.0 %	95 %			
1693	Ut < act 2	Delay	0.0 s 320.0 s	1.0 s			
1694	Ut < act 2	Relay output A	Not used Option-dep.	Not used			
1695	Ut < act 2	Relay output B	Not used Option-dep.	Not used			
1696	Ut < act 2	Enable	OFF ON	OFF			
1700 Time-dependent under-voltage 2							

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1701	Ut < 2	Relay output A	Not used Option-dep.	Not used		Option A1 GPU Hydro: Designer's Reference Handbook	The alarm and fail class is activated instantaneously when the voltage value is under the programmed value curve.
1702	Ut < 2	Relay output B	Not used Option-dep.	Not used			
1703	Ut < 2	Enable	OFF ON	OFF			
1704	Ut < 2	Fail class	F1…F6	Trip GB (F3)			

Power-dependent reactive power

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1740 G P dep. reactive power import 1-3							
1741	G P dep Q< 1-3	Q1	0.0 % 100.0 %	20.0 %		Option C2	Curve setting for import of reactive power (capacitive running). Settings relate to nominal generator power. The condition has to be true, that is P1<P2<P3<P4<P5<P6. If this is not fulfilled, the worst-case set point P6 will be used.
1742	G P dep Q< 1-3	P1	0.0 % 100.0 %	0.0 %			
1743	G P dep Q< 1-3	Q2	0.0 % 100.0 %	22.0 %			
1744	G P dep Q< 1-3	P2	0.0 % 100.0 %	7.0 %			
1745	G P dep Q< 1-3	Q3	0.0 % 100.0 %	27.0 %			
1746	G P dep Q< 1-3	P3	0.0 % 100.0 %	12.0 %			
1750 G P dep. reactive power import 4-6							
1751	G P dep Q< 4-6	Q4	0.0 % 100.0 %	18.0 %		Option C2	Curve setting for import of reactive power (capacitive running). Settings relate to nominal generator power. The condition has to be true, that is P1<P2<P3<P4<P5<P6. If this is not fulfilled, the worst-case set point P6 will be used.
1752	G P dep Q< 4-6	P4	0.0 % 100.0 %	55.0 %			
1753	G P dep Q< 4-6	Q5	0.0 % 100.0 %	21.0 %			
1754	G P dep Q< 4-6	P5	0.0 % 100.0 %	97.0 %			
1755	G P dep Q< 4-6	Q6	0.0 % 100.0 %	1.0 %			
1756	G P dep Q< 4-6	P6	0.0 % 100.0 %	100.0 %			
1760 G Pdep. reactive power import							
1761	G Pdep. Q<	Timer	0.1 s 300.0 s	1.0 s		Option C2	The alarm and fail class are activated when the var import value has been continuously over the programmed value during the programmed delay.
1762	G Pdep. Q<	Relay output A	Not used Option-dep.	Not used			
1763	G Pdep. Q<	Relay output B	Not used Option-dep.	Not used			
1764	G Pdep. Q<	Enable	OFF ON	OFF			
1765	G Pdep. Q<	Fail class	F1…F6	Trip GB (F3)			
1766	G Pdep. Q<	Set point	10 kVA 32000 kVA	600 kVA			
1770 G P dep. reactive power export 1-3							
1771	G P dep Q> 1-3	Q1	0.0 % 100.0 %	88.0 %		Option C2	Curve setting for export of reactive power (inductive running).
1772	G P dep Q> 1-3	P1	0.0 % 100.0 %	0.0 %			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1773	G P dep Q> 1-3	Q2	0.0 % 100.0 %	86.0 %			Settings relate to nominal generator power. The condition has to be true, that is P1<P2<P3<P4<P5<P6. If this is not fulfilled, the worst-case set point P6 will be used.
1774	G P dep Q> 1-3	P2	0.0 % 100.0 %	24.0 %			
1775	G P dep Q> 1-3	Q3	0.0 % 100.0 %	77.0 %			
1776	G P dep Q> 1-3	P3	0.0 % 100.0 %	53.0 %			
1780 G P dep. reactive power export 4-6							
1781	G P dep Q> 4-6	Q4	0.0 % 100.0 %	60.0 %		Option C2	Curve setting for export of reactive power (inductive running). Settings relate to nominal generator power. The condition has to be true, that is P1<P2<P3<P4<P5<P6. If this is not fulfilled, the worst-case set point P6 will be used.
1782	G P dep Q> 4-6	P4	0.0 % 100.0 %	80.0 %			
1783	G P dep Q> 4-6	Q5	0.0 % 100.0 %	33.0 %			
1784	G P dep Q> 4-6	P5	0.0 % 100.0 %	95.0 %			
1785	G P dep Q> 4-6	Q6	0.0 % 100.0 %	1.0 %			
1786	G P dep Q> 4-6	P6	0.0 % 100.0 %	100.0 %			
1790 G P dep. reactive power export							
1791	G P dep. Q>	Timer	0.1 s 300.0 s	1.0 s		Option C2	The alarm and fail class are activated when the var export value has been continuously over the programmed value during the programmed delay.
1792	G P dep. Q>	Relay output A	Not used Option-dep.	Not used			
1793	G P dep. Q>	Relay output B	Not used Option-dep.	Not used			
1794	G P dep. Q>	Enable	OFF ON	OFF			
1795	G P dep. Q>	Fail class	F1…F6	Trip GB (F3)			
1796	G P dep. Q>	Set point	10 kVA 32000 kVA	600 kVA			

Non-essential load trip (load shedding)

Setting values relate to the generator nominal setting.

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1800 NEL 1 over-current							
1801	NEL 1 I>	Set point	50.0 % 200.0 %	100.0 %		Designer's Reference Handbook	Trip of non-essential load due to over-current. This function activates NEL group 1.
1802	NEL 1 I>	Timer	0.1 s 3200.0 s	5.0 s			
1803	NEL 1 I>	Relay output A	Not used Option-dep.	Not used			
1804	NEL 1 I>	Relay output B	Not used Option-dep.	Not used			
1805	NEL 1 I>	Enable	OFF ON	OFF			
1806	NEL 1 I>	Fail class	F1…F6	Warning (F2)			
1810 NEL 2 over-current							
1811	NEL 2 I>	Set point	50.0 % 200.0 %	100.0 %		Designer's Reference Handbook	Trip of non-essential load due to over-current. This function activates NEL group 2.
1812	NEL 2 I>	Timer	0.1 s 3200.0 s	8.0 s			
1813	NEL 2 I>	Relay output A	Not used Option-dep.	Not used			
1814	NEL 2 I>	Relay output B	Not used Option-dep.	Not used			
1815	NEL 2 I>	Enable	OFF ON	OFF			
1816	NEL 2 I>	Fail class	F1…F6	Warning (F2)			
1820 NEL 3 over-current							
1821	NEL 3 I>	Set point	50.0 % 200.0 %	100.0 %		Designer's Reference Handbook	Trip of non-essential load due to over-current. This function activates NEL group 3.
1822	NEL 3 I>	Timer	0.1 s 3200.0 s	10.0 s			
1823	NEL 3 I>	Relay output A	Not used Option-dep.	Not used			
1824	NEL 3 I>	Relay output B	Not used Option-dep.	Not used			
1825	NEL 3 I>	Enable	OFF ON	OFF			
1826	NEL 3 I>	Fail class	F1…F6	Warning (F2)			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1830 NEL 1 busbar under-frequency							
1831	NEL 1 bus f<	Set point	70.0 % 100.0 %	95.0 %		Designer's Reference Handbook	Trip of non-essential load due to low frequency. This function activates NEL group 1.
1832	NEL 1 bus f<	Timer	0.1 s 3200.0 s	5.0 s			
1833	NEL 1 bus f<	Relay output A	Not used Option-dep.	Not used			
1834	NEL 1 bus f<	Relay output B	Not used Option-dep.	Not used			
1835	NEL 1 bus f<	Enable	OFF ON	OFF			
1836	NEL 1 bus f<	Fail class	F1…F6	Warning (F2)			
1840 NEL 2 busbar under-frequency							
1841	NEL 2 bus f<	Set point	70.0 % 100.0 %	95.0 %		Designer's Reference Handbook	Trip of non-essential load due to low frequency. This function activates NEL group 2.
1842	NEL 2 bus f<	Timer	0.1 s 3200.0 s	8.0 s			
1843	NEL 2 bus f<	Relay output A	Not used Option-dep.	Not used			
1844	NEL 2 bus f<	Relay output B	Not used Option-dep.	Not used			
1845	NEL 2 bus f<	Enable	OFF ON	OFF			
1846	NEL 2 bus f<	Fail class	F1…F6	Warning (F2)			
1850 NEL 3 busbar under-frequency							
1851	NEL 3 bus f<	Set point	70.0 % 100.0 %	95.0 %		Designer's Reference Handbook	Trip of non-essential load due to low frequency. This function activates NEL group 3.
1852	NEL 3 bus f<	Timer	0.1 s 3200.0 s	10.0 s			
1853	NEL 3 bus f<	Relay output A	Not used Option-dep.	Not used			
1854	NEL 3 bus f<	Relay output B	Not used Option-dep.	Not used			
1855	NEL 3 bus f<	Enable	OFF ON	OFF			
1856	NEL 3 bus f<	Fail class	F1…F6	Warning (F2)			
1860 NEL 1 overload							
1861	NEL 1 P>	Set point	10.0 % 200.0 %	100.0 %		Designer's Reference Handbook	Trip of non-essential load due to overload. This function activates NEL group 1.
1862	NEL 1 P>	Timer	0.1 s 3200.0 s	5.0 s			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1863	NEL 1 P>	Relay output A	Not used Option-dep.	Not used			
1864	NEL 1 P>	Relay output B	Not used Option-dep.	Not used			
1865	NEL 1 P>	Enable	OFF ON	OFF			
1866	NEL 1 P>	Fail class	F1…F6	Warning (F2)			
1870 NEL 2 overload							
1871	NEL 2 P>	Set point	10.0 % 200.0 %	100.0 %		Designer's Reference Handbook	Trip of non-essential load due to overload. This function activates NEL group 2.
1872	NEL 2 P>	Timer	0.1 s 3200.0 s	8.0 s			
1873	NEL 2 P>	Relay output A	Not used Option-dep.	Not used			
1874	NEL 2 P>	Relay output B	Not used Option-dep.	Not used			
1875	NEL 2 P>	Enable	OFF ON	OFF			
1876	NEL 2 P>	Fail class	F1…F6	Warning (F2)			
1880 NEL 3 overload							
1881	NEL 3 P>	Set point	10.0 % 200.0 %	100.0 %		Designer's Reference Handbook	Trip of non-essential load due to overload. This function activates NEL group 3.
1882	NEL 3 P>	Timer	0.1 s 3200.0 s	10.0 s			
1883	NEL 3 P>	Relay output A	Not used Option-dep.	Not used			
1884	NEL 3 P>	Relay output B	Not used Option-dep.	Not used			
1885	NEL 3 P>	Enable	OFF ON	OFF			
1886	NEL 3 P>	Fail class	F1…F6	Warning (F2)			
1890 NEL 1 high overload							
1891	NEL 1 P>>	Set point	10.0 % 200.0 %	110.0 %		Designer's Reference Handbook	Trip of non-essential load due to high overload. This function activates NEL group 1.
1892	NEL 1 P>>	Timer	0.1 s 3200.0 s	1.0 s			
1893	NEL 1 P>>	Relay output A	Not used Option-dep.	Not used			
1894	NEL 1 P>>	Relay output B	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1895	NEL 1 P>>	Enable	OFF ON	OFF			
1896	NEL 1 P>>	Fail class	F1…F6	Warning (F2)			
1900 NEL 2 high overload							
1901	NEL 2 P>>	Set point	10.0 % 200.0 %	110.0 %		Designer's Reference Handbook	Trip of non-essential load due to high overload. This function activates NEL group 2.
1902	NEL 2 P>>	Timer	0.1 s 3200.0 s	1.0 s			
1903	NEL 2 P>>	Relay output A	Not used Option-dep.	Not used			
1904	NEL 2 P>>	Relay output B	Not used Option-dep.	Not used			
1905	NEL 2 P>>	Enable	OFF ON	OFF			
1906	NEL 2 P>>	Fail class	F1…F6	Warning (F2)			
1910 NEL 3 high overload							
1911	NEL 3 P>>	Set point	10.0 % 200.0 %	110.0 %		Designer's Reference Handbook	Trip of non-essential load due to high overload. This function activates NEL group 3.
1912	NEL 3 P>>	Timer	0.1 s 3200.0 s	1.0 s			
1913	NEL 3 P>>	Relay output A	Not used Option-dep.	Not used			
1914	NEL 3 P>>	Relay output B	Not used Option-dep.	Not used			
1915	NEL 3 P>>	Enable	OFF ON	OFF			
1916	NEL 3 P>>	Fail class	F1…F6	Warning (F2)			

Under-voltage and reactive power low

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1960 U and Q < 1							
1961	U and Q < 1	Set point	70.0 % 100.0 %	85.0 %		Option A1 GPU Hydro: Designer's Reference Handbook	The setting relates to the generator nominal voltage. The condition for trip is that the actual voltage drops below the setting value **and** that the reactive power is ≤ 0 kvar.
1962	U and Q < 1	Delay	0.0 s 10.0 s	0.5 s			
1963	U and Q < 1	Relay output A	Not used Option-dep.	Not used			
1964	U and Q < 1	Relay output B	Not used Option-dep.	Not used			
1965	U and Q < 1	Enable	OFF ON	OFF			
1966	U and Q < 1	Fail class	F1…F6	Warning (F2)			
1970 U and Q < 2							
1971	U and Q < 2	Set point	70.0 % 100.0 %	85.0 %		Option A1 GPU Hydro: Designer's Reference Handbook	The setting relates to the generator nominal voltage. The condition for trip is that the actual voltage drops below the setting value **and** that the reactive power is ≤ 0 kvar.
1972	U and Q < 2	Delay	1.0 s 10.0 s	0.5 s			
1973	U and Q < 2	Relay output A	Not used Option-dep.	Not used			
1974	U and Q < 2	Relay output B	Not used Option-dep.	Not used			
1975	U and Q < 2	Enable	OFF ON	OFF			
1976	U and Q < 2	Fail class	F1…F6	Warning (F2)			

Generator breaker external trip

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1980 GB external trip							
1981	GB ext. trip	Enable	OFF ON	ON		Designer's Reference Handbook	The generator breaker has been tripped by an external device.
1982	GB ext. trip	Relay output A	Not used Option-dep.	Not used			
1983	GB ext. trip	Relay output B	Not used Option-dep.	Not used			
1984	GB ext. trip	Fail class	F1…F6	Warning (F2)			

Under-voltage and reactive power low

Minimum current and Minimum Phi angle.

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1990 U and Q < 1							
1991	I Min 1	Set point	0 % 20 %	0 %		Option A1 GPU Hydro: Designer's Reference Handbook	Settings relate to U and Q< parameters 1960 and 1970. Condition for "U and Q <" trip is that the current exceeds the I Min set point. Min Phi angle expands the tripping window.
1992	Angle 1	Set point	0 degrees 6 degrees	0 degrees			
1993	I Min 2	Set point	0 % 20 %	0 %			
1994	Angle 2	Set point	0 degrees 6 degrees	0 degrees			

Synchronisation and breaker alarms

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2120 Synchronisation window							
2121	Sync window	Set point	2.0 % 20.0 %	15 %		Designer's Reference Handbook GPU Hydro: Option G2	The alarm will activate if the actual voltage deviates from nominal voltage with the set percentage.
2122	Sync window	Timer	0.1 s 2.0 s	0.5 s			
2123	Sync window	Relay output A	Not used Option-dep.	Not used			
2124	Sync window	Relay output B	Not used Option-dep.	Not used			
2125	Sync window	Enable	OFF ON	OFF			
2130 GB synchronisation failure							
2131	GB sync failure	Delay	30.0 s 300.0 s	60.0 s		Designer's Reference Handbook GPU Hydro: Option G2	GB: Generator breaker. The controller has unsuccessfully tried to synchronise the breaker to the busbar within the time delay.
2132	GB sync failure	Relay output A	Not used Option-dep.	Not used			
2133	GB sync failure	Relay output B	Not used Option-dep.	Not used			
2134	GB sync failure	Enable	OFF ON	ON			
2135	GB sync failure	Fail class	F1…F6	Warning (F2)			
2150 Phase sequence error							
2151	Phase seq error	Relay output A	Not used Option-dep.	Not used		Designer's Reference Handbook GPU Hydro: Option G2	During synchronisation, the controller has detected that the rotation direction of the generator phases is opposite direction as the busbar.
2152	Phase seq error	Relay output B	Not used Option-dep.	Not used			
2153	Phase seq error	Fail class	F1…F6	Block (F1)			
2160 GB open failure							
2161	GB open fail	Delay	1.0 s 5.0 s	2.0 s		Designer's Reference Handbook GPU Hydro: Option G2	The breaker open failure will occur, if the unit has transmitted a breaker open signal and the breaker feedback has not changed position from ON to OFF.
2162	GB open fail	Relay output A	Not used Option-dep.	Not used			
2163	GB open fail	Relay output B	Not used Option-dep.	Not used			
2164	GB open fail	Enable	OFF ON	ON			
2165	GB open fail	Fail class	F1…F6	Warning (F2)			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2170 GB close failure							
2171	GB close fail	Delay	1.0 s 5.0 s	2.0 s		Designer's Reference Handbook GPU Hydro: Option G2	The breaker close failure will occur, if the unit has transmitted a breaker close signal and the breaker feedback has not changed position from OFF to ON.
2172	GB close fail	Relay output A	Not used Option-dep.	Not used			
2173	GB close fail	Relay output B	Not used Option-dep.	Not used			
2174	GB close fail	Enable	OFF ON	ON			
2175	GB close fail	Fail class	F1…F6	Warning (F2)			
2180 GB position failure							
2181	GB pos fail	Delay	1.0 s 5.0 s	1.0 s		Designer's Reference Handbook GPU Hydro: Option G2	This alarm will occur if the GB feedbacks for ON and OFF are either missing or both activated.
2182	GB pos fail	Relay output A	Not used Option-dep.	Not used			
2183	GB pos fail	Relay output B	Not used Option-dep.	Not used			
2184	GB pos fail	Enable	OFF ON	ON			
2185	GB pos fail	Fail class	F1…F6	Warning (F2)			
2190 Vector mismatch							
2191	Vector mismatch	Set point	1 deg. 120 deg.	20 deg.		Designer's Reference Handbook GPU Hydro: Option G2	This alarm will occur during synchronisation if the angle between the generator and BB vectors L2 and L3 deviates more than the set point and longer than the delay. The measurement of L2 and L3 is done with the condition BBL1 = GL1 to get the absolute angles.
2192	Vector mismatch	Delay	1.0 s 60.0 s	10.0 s			
2193	Vector mismatch	Relay output A	Not used Option-dep.	Not used			
2194	Vector mismatch	Relay output B	Not used Option-dep.	Not used			
2195	Vector mismatch	Enable	OFF ON	ON			
2196	Vector mismatch	Fail class	F1…F6	Block (F1)			

Mains sync. inhibit

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2280 Mains sync. inhibit settings							
2281	M sync. inh.U	Low limit U	80 % 100 %	85 %		Designer's Reference Handbook	This function is used to inhibit the synchronising of the mains breaker after blackout.
2282	M sync. inh U	High limit U	100 % 120 %	110 %			
2283	M sync. inh F	Low limit F	90 % 100 %	95 %			
2284	M sync. inh F	High limit F	100 % 110 %	101 %			
2285	M sync. inh	Enable	OFF ON	OFF			
2286	M sync. inh	Fail class	F1…F6	Trip GB	See alarm list		
2290 Mains sync. inhibit recovery settings							
2291	Delay act. re2	Recovery selection timer	0 sec 20 sec	3 sec		Designer's Reference Handbook	After blackout, the timer in menu 2291 will start to run, and if the mains voltage and frequency are inside the tolerance ranges (menus 2281-82) before the timer runs out, the short interruption timer (menu 2292) will be started. When the timers have run out, the synchronising of MB will start.
2292	Recovery del. 1	Delay time	0 sec 60 sec	5 sec			
2293	Recovery del. 1	Relay output A	Not used Option-dependent	Not used			
2294	Recovery del. 2	Delay time	0 sec 900 sec	60 sec			
2295	Recovery del. 2	Relay output A	Not used Option-dependent	Not used			

BTB position failure

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2320 BTB A position failure							
2321	BTB A pos. fail	Delay	1.0 s 5.0 s	1.0 s		Option G9	This alarm will occur if the BTB feedbacks for ON and OFF are either missing or both activated.
2322	BTB A pos. fail	Relay output A	Not used Option-dep.	Not used			
2323	BTB A pos. fail	Relay output B	Not used Option-dep.	Not used			
2324	BTB A pos. fail	Enable	OFF ON	ON			
2325	BTB A pos. fail	Fail class	F1...F6	Warning (F2)			
2330 BTB B position failure							
2331	BTB B pos. fail	Delay	1.0 s 5.0 s	1.0 s		Option G9 GPU Hydro: Not available	This alarm will occur if the BTB feedbacks for ON and OFF are either missing or both activated.
2332	BTB B pos. fail	Relay output A	Not used Option-dep.	Not used			
2333	BTB B pos. fail	Relay output B	Not used Option-dep.	Not used			
2334	BTB B pos. fail	Enable	OFF ON	ON			
2335	BTB B pos. fail	Fail class	F1...F6	Warning (F2)			
2340 BTB C position failure							
2341	BTB C pos. fail	Delay	1.0 s 5.0 s	1.0 s		Option G9 GPU Hydro: Not available	This alarm will occur if the BTB feedbacks for ON and OFF are either missing or both activated.
2342	BTB C pos. fail	Relay output A	Not used Option-dep.	Not used			
2343	BTB C pos. fail	Relay output B	Not used Option-dep.	Not used			
2344	BTB C pos. fail	Enable	OFF ON	ON			
2345	BTB C pos. fail	Fail class	F1...F6	Warning (F2)			
2350 BTB D position failure							
2351	BTB D pos. fail	Delay	1.0 s 5.0 s	1.0 s		Option G9 GPU Hydro: Not available	This alarm will occur if the BTB feedbacks for ON and OFF are either missing or both activated.
2352	BTB D pos. fail	Relay output A	Not used Option-dep.	Not used			
2353	BTB D pos. fail	Relay output B	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2354	BTB D pos. fail	Enable	OFF ON	ON			
2355	BTB D pos. fail	Fail class	F1...F6	Warning (F2)			

Regulation alarms

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2560 Governor regulation fail							
2561	Gov. reg fail	Deadband	1.0 % 100.0 %	30.0 %		Designer's Reference Handbook GPU Hydro: Option G2	The alarm is activated, if the difference between the measured value and the set point is outside the deadband for a longer time period than specified by the delay set point.
2562	Gov. reg fail	Delay	10.0 s 300.0 s	60.0 s			
2563	Gov. reg fail	Relay output A	Not used Option-dep.	Not used			
2564	Gov. reg fail	Relay output B	Not used Option-dep.	Not used			
2565	Gov. reg fail	Fail class	F1…F6	Warning (F2)			
2630 De-load error							
2631	De-load error	Delay	0.0 s 60.0 s	10.0 s		Designer's Reference Handbook GPU Hydro: Not available	The alarm is activated, if the generator fails to de-load within the time delay.
2632	De-load error	Relay output A	Not used Option-dep.	Not used			
2633	De-load error	Relay output B	Not used Option-dep.	Not used			
2634	De-load error	Enable	OFF ON	ON			
2635	De-load error	Fail class	F1…F6	Warning (F2)			
2680 AVR regulation failure							
2681	AVR reg. failure	Deadband	1.0 % 100.0 %	30.0 %		Option D1	The alarm is activated, if the difference between the measured value and the set point is outside the setting "Deadband" for a longer time period than specified in the timer set point.
2682	AVR reg. failure	Delay	10.0 s 300.0 s	60.0 s			
2683	AVR reg. failure	Relay output A	Not used Option-dep.	Not used			
2684	AVR reg. failure	Relay output B	Not used Option-dep.	Not used			
2685	AVR reg. failure	Fail class	F1…F6	Warning (F2)			
2730 GOV mode undefined							
2731	GOV mode undef.	Delay	0.1 s 3200.0 s	1.0 s		Designer's Reference Handbook GPU Hydro: Not available	This alarm is activated in case no or more than one GOV mode input is active when the GB is closed.
2732	GOV mode undef.	Relay output A	Not used Option-dep.	Not used			
2733	GOV mode undef.	Relay output B	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2734	GOV mode undef.	Enable	ON OFF	ON			
2735	GOV mode undef.	Fail class	F1…F6	Warning (F2)			
2750 AVR mode undefined							
2751	AVR mode undef.	Delay	0.1 s 3200.0 s	1.0 s		Option D1 GPU Hydro: Not available	This alarm is activated in case no or more than one AVR mode input is active when the GB is closed.
2752	AVR mode undef.	Relay output A	Not used Option-dep.	Not used			
2753	AVR mode undef.	Relay output B	Not used Option-dep.	Not used			
2754	AVR mode undef.	Enable	ON OFF	ON			
2755	AVR mode undef.	Fail class	F1…F6	Warning (F2)			

Scaling of analogue inputs for external control

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2840 Scaling of analogue inputs for external control							
2841	Max P Range	Enable	-100 % 100 %	100 %		See DRH for more information	
2842	Min Range	Enable	-100 % 100 %	-100 %			
2843	Max f/P input	Enable	-10 V 10 V	10			
2844	Min f/P input	Enable	-10 V 10 V	-10			
2845	Max U/Q input	Enable	-10 V 10 V	10		See “Option D1 AVR regulation” for more information	
2846	Min U/Q input	Enable	-10 V 10 V	-10			

Load sharing supervision

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2960 Active load sharing failure							
2961	P loadsh. fail	Set point	2.0 % 30.0 %	15.0 %		Option G9 GPU Hydro: Not available	Supervision of the active load sharing between the generators.
2962	P loadsh. fail	Delay	5.0 s 999.0 s	30.0 s			
2963	P loadsh. fail	Relay output A	Not used Option-dep.	Not used			
2964	P loadsh. fail	Relay output B	Not used Option-dep.	Not used			
2965	P loadsh. fail	Enable	OFF ON	ON			
2966	P loadsh. fail	Fail class	F1...F6	Warning (F2)			
2970 Reactive load sharing failure							
2971	Q loadsh. fail	Set point	2.0 % 30.0 %	15.0 %		Option G9 GPU Hydro: Not available	Supervision of the reactive load sharing between the generators.
2972	Q loadsh. fail	Delay	5.0 s 999.0 s	30.0 s			
2973	Q loadsh. fail	Relay output A	Not used Option-dep.	Not used			
2974	Q loadsh. fail	Relay output B	Not used Option-dep.	Not used			
2975	Q loadsh. fail	Enable	OFF ON	ON			
2976	Q loadsh. fail	Fail class	F1...F6	Warning (F2)			

Digital input 23-25

These parameters are used when a digital input is used as protection input or to activate a limit relay.

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
3000 Digital input 23							
3001	Dig. input 23	Delay	0.0 s 3200.0 s	1.0 s		Designer's Reference Handbook	The input is configurable and can have different functions in different units.
3002	Dig. input 23	Relay output A	Not used Option-dep.	Not used			
3003	Dig. input 23	Relay output B	Not used Option-dep.	Not used			
3004	Dig. input 23	Enable	OFF ON	OFF			
3005	Dig. input 23	Fail class	F1…F6	Warning (F2)			
3006	Dig. input 23	N/X	N/O N/C	N/O			

The same settings apply to inputs 24-25, settings 3010 to 3020.

Digital inputs 26-27

Digital inputs 26 and 27 are only configurable for GPU.

3030 Digital input 26							
3031	Dig. input 26	Delay	0.0 s 3200.0 s	1.0 s		Designer's Reference Handbook	The input is configurable and can have different functions in different units. Option G2: Menu not available
3032	Dig. input 26	Relay output A	Not used Option-dep.	Not used			
3033	Dig. input 26	Relay output B	Not used Option-dep.	Not used			
3034	Dig. input 26	Enable	OFF ON	OFF			
3035	Dig. input 26	Fail class	F1…F6	Warning (F2)			
3036	Dig. input 26	N/X	N/O N/C	N/O			
3040 Digital input 27							
3041	Dig. input 27	Delay	0.0 s 3200.0 s	1.0 s		Designer's Reference Handbook	The input is configurable and can have different functions in different units. Option G2: Menu not available
3042	Dig. input 27	Relay output A	Not used Option-dep.	Not used			
3043	Dig. input 27	Relay output B	Not used Option-dep.	Not used			
3044	Dig. input 27	Enable	OFF ON	OFF			
3045	Dig. input 27	Fail class	F1…F6	Warning (F2)			
3046	Dig. input 27	N/X	N/O N/C	N/O			

Digital inputs 43-55

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
3130 Digital input 43							
3131	Dig. input 43	Delay	0.0 s 3200.0 s	1.0 s		Designer's Reference Handbook GPU Hydro: Option M12	The input is configurable and can have different functions in different units.
3132	Dig. input 43	Relay output A	Not used Option-dep.	Not used			
3133	Dig. input 43	Relay output B	Not used Option-dep.	Not used			
3134	Dig. input 43	Enable	OFF ON	OFF			
3135	Dig. input 43	Fail class	F1…F6	Warning (F2)			
3136	Dig. input 43	N/X	N/O N/C	N/O			

The same settings apply to inputs 44-55, settings 3140 to 3250.

Digital inputs 91-97

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
3330 Digital input 91							
3331	Dig. input 91	Delay	0.0 s 3200.0 s	1.0 s		Option M13.6	The input is configurable and can have different functions in different units.
3332	Dig. input 91	Relay output A	Not used Option-dep.	Not used			
3333	Dig. input 91	Relay output B	Not used Option-dep.	Not used			
3334	Dig. input 91	Enable	OFF ON	OFF			
3335	Dig. input 91	Fail class	F1…F6	Warning (F2)			
3336	Dig. input 91	N/O - N/C	N/O N/C	N/O			

The same settings apply to inputs 92-97, settings 3340 to 3390.

Digital inputs 102-108

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
3400 Digital input 102							
3401	Wire fail 102	Enable	OFF ON	OFF		Option M4	The input is configurable and can have different functions in different units. (Only available if multi-input 102 is configured to “digital”).
3402	Dig. input 102	Delay	0.0 s 3200.0 s	1.0 s			
3403	Dig. input 102	Relay output A	Not used Option-dep.	Not used			
3404	Dig. input 102	Relay output B	Not used Option-dep.	Not used			
3405	Dig. input 102	Enable	OFF ON	OFF			
3406	Dig. input 102	Fail class	F1…F6	Warning (F2)			
3410 Digital input 105							
3411	Wire fail 105	Enable	OFF ON	OFF		Option M4	The input is configurable and can have different functions in different units. (Only available if multi-input 105 is configured to “digital”).
3412	Dig. input 105	Delay	0.0 s 3200.0 s	1.0 s			
3413	Dig. input 105	Relay output A	Not used Option-dep.	Not used			
3414	Dig. input 105	Relay output B	Not used Option-dep.	Not used			
3415	Dig. input 105	Enable	OFF ON	OFF			
3416	Dig. input 105	Fail class	F1…F6	Warning (F2)			
3420 Digital input 108							
3421	Wire fail 108	Enable	OFF ON	OFF		Option M4	The input is configurable and can have different functions in different units. (Only available if multi-input 108 is configured to “digital”).
3422	Dig. input 108	Delay	0.0 s 3200.0 s	1.0 s			
3423	Dig. input 108	Relay output A	Not used Option-dep.	Not used			
3424	Dig. input 108	Relay output B	Not used Option-dep.	Not used			
3425	Dig. input 108	Enable	OFF ON	OFF			
3426	Dig. input 108	Fail class	F1…F6	Warning (F2)			

Digital inputs 112-117

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
3430 Digital input 112							
3431	Dig. input 112	Delay	0.0 s 3200.0 s	1.0 s		Option M4	The input is configurable and can have different functions in different units.
3432	Dig. input 112	Relay output A	Not used Option-dep.	Not used			
3433	Dig. input 112	Relay output B	Not used Option-dep.	Not used			
3434	Dig. input 112	Enable	OFF ON	OFF			
3435	Dig. input 112	Fail class	F1…F6	Warning (F2)			
3436	Dig. input 112	N/X	N/O N/C	N/O			

The same settings apply to inputs 113-117, settings 3440 to 3480.

Emergency stop

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
3490 Emergency stop							
3491	Emer. stop	Delay	0.0 s 3200.0 s	0.0 s		Option M4	Emergency stop input is intended for a normally closed contact.
3492	Emer. stop	Relay output A	Not used Option-dependent	Not used			
3493	Emer. stop	Relay output B	Not used Option-dependent	Not used			
3494	Emer. stop	Enable	OFF ON	ON			
3495	Emer. stop	Fail class	F1…F6	Shutdown (F5)			

Digital inputs 127-133

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
3500 Digital input 127							
3501	Dig. input 127	Delay	0.0 s 3200.0 s	1.0 s		Option M13.8	The input is configurable and can have different functions in different units.
3502	Dig. input 127	Relay output A	Not used Option-dep.	Not used			
3503	Dig. input 127	Relay output B	Not used Option-dep.	Not used			
3504	Dig. input 127	Enable	OFF ON	OFF			
3505	Dig. input 127	Fail class	F1…F6	Warning (F2)			
3506	Dig. input 127	N/X	N/O N/C	N/O			

The same settings apply to inputs 128-133, settings 3510 to 3560.

Analogue input alarms 91-97

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4000 4-20 mA 91.1							
4001	4-20 mA 91.1	Set point	4 mA 20 mA	10 mA		Option M15.6	Configurable analogue input.
4002	4-20 mA 91.1	Delay	0.0 s 3200.0 s	120.0 s			
4003	4-20 mA 91.1	Relay output A	Not used Option-dep.	Not used			
4004	4-20 mA 91.1	Relay output B	Not used Option-dep.	Not used			
4005	4-20 mA 91.1	Enable	OFF ON	OFF			
4006	4-20 mA 91.1	Fail class	F1…F6	Warning (F2)			
4010 4-20 mA 91.2							
4011	4-20 mA 91.2	Set point	4 mA 20 mA	10 mA		Option M15.6	Configurable analogue input.
4012	4-20 mA 91.2	Delay	0.0 s 3200.0 s	120.0 s			
4013	4-20 mA 91.2	Relay output A	Not used Option-dep.	Not used			
4014	4-20 mA 91.2	Relay output B	Not used Option-dep.	Not used			
4015	4-20 mA 91.2	Enable	OFF ON	OFF			
4016	4-20 mA 91.2	Fail class	F1…F6	Warning (F2)			
4020 Wire fail 4-20 mA 91							
4021	W. fail ana 91	Relay output A	Not used Option-dep.	Not used		Option M15.6	The wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated.
4022	W. fail ana 91	Relay output B	Not used Option-dep.	Not used			
4023	W. fail ana 91	Enable	OFF ON	OFF			
4024	W. fail ana 91	Fail class	F1…F6	Warning (F2)			
4030 4-20 mA 93.1							
4031	4-20 mA 93.1	Set point	4 mA 20 mA	10 mA		Option M15.6	Configurable analogue input.
4032	4-20 mA 93.1	Delay	0.0 s 3200.0 s	120.0 s			
4033	4-20 mA 93.1	Relay output A	Not used Option-dep.	Not used			
4034	4-20 mA 93.1	Relay output B	Not used Option-dep.	Not used			
4035	4-20 mA 93.1	Enable	OFF ON	OFF			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4036	4-20 mA 93.1	Fail class	F1…F6	Warning (F2)			
4040 4-20 mA 93.2							
4041	4-20 mA 93.2	Set point	4 mA 20 mA	10 mA		Option M15.6	Configurable analogue input.
4042	4-20 mA 93.2	Delay	0.0 s 3200.0 s	120.0 s			
4043	4-20 mA 93.2	Relay output A	Not used Option-dep.	Not used			
4044	4-20 mA 93.2	Relay output B	Not used Option-dep.	Not used			
4045	4-20 mA 93.2	Enable	OFF ON	OFF			
4046	4-20 mA 93.2	Fail class	F1…F6	Warning (F2)			
4050 Wire fail 4-20 mA 93							
4051	W. fail ana 93	Relay output A	Not used Option-dep.	Not used		Option M15.6	The wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated.
4052	W. fail ana 93	Relay output B	Not used Option-dep.	Not used			
4053	W. fail ana 93	Enable	OFF ON	OFF			
4054	W. fail ana 93	Fail class	F1…F6	Warning (F2)			
4060 4-20 mA 95.1							
4061	4-20 mA 95.1	Set point	4 mA 20 mA	10 mA		Option M15.6	Configurable analogue input.
4062	4-20 mA 95.1	Delay	0.0 s 3200.0 s	120.0 s			
4063	4-20 mA 95.1	Relay output A	Not used Option-dep.	Not used			
4064	4-20 mA 95.1	Relay output B	Not used Option-dep.	Not used			
4065	4-20 mA 95.1	Enable	OFF ON	OFF			
4066	4-20 mA 95.1	Fail class	F1…F6	Warning (F2)			
4070 4-20 mA 95.2							
4071	4-20 mA 95.2	Set point	4 mA 20 mA	10 mA		Option M15.6	Configurable analogue input.
4072	4-20 mA 95.2	Delay	0.0 s 3200.0 s	120.0 s			
4073	4-20 mA 95.2	Relay output A	Not used Option-dep.	Not used			
4074	4-20 mA 95.2	Relay output B	Not used Option-dep.	Not used			
4075	4-20 mA 95.2	Enable	OFF ON	OFF			
4076	4-20 mA 95.2	Fail class	F1…F6	Warning (F2)			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4080 Wire fail 4-20 mA 95							
4081	W. fail ana 95	Relay output A	Not used Option-dep.	Not used		Option M15.6	The wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated.
4082	W. fail ana 95	Relay output B	Not used Option-dep.	Not used			
4083	W. fail ana 95	Enable	OFF ON	OFF			
4084	W. fail ana 95	Fail class	F1…F6	Warning (F2)			
4090 4-20 mA 97.1							
4091	4-20 mA 97.1	Set point	4 mA 20 mA	10 mA		Option M15.6	Configurable analogue input.
4092	4-20 mA 97.1	Delay	0.0 s 3200.0 s	120.0 s			
4093	4-20 mA 97.1	Relay output A	Not used Option-dep.	Not used			
4094	4-20 mA 97.1	Relay output B	Not used Option-dep.	Not used			
4095	4-20 mA 97.1	Enable	OFF ON	OFF			
4096	4-20 mA 97.1	Fail class	F1…F6	Warning (F2)			
4100 4-20 mA 97.2							
4101	4-20 mA 97.2	Set point	4 mA 20 mA	10 mA		Option M15.6	Configurable analogue input.
4102	4-20 mA 97.2	Delay	0.0 s 3200.0 s	120.0 s			
4103	4-20 mA 97.2	Relay output A	Not used Option-dep.	Not used			
4104	4-20 mA 97.2	Relay output B	Not used Option-dep.	Not used			
4105	4-20 mA 97.2	Enable	OFF ON	OFF			
4106	4-20 mA 97.2	Fail class	F1…F6	Warning (F2)			
4110 Wire fail 4-20 mA 97							
4111	W. fail ana 97	Relay output A	Not used Option-dep.	Not used		Option M15.6	The wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated.
4112	W. fail ana 97	Relay output B	Not used Option-dep.	Not used			
4113	W. fail ana 97	Enable	OFF ON	OFF			
4114	W. fail ana 97	Fail class	F1…F6	Warning (F2)			

Multi-functional analogue inputs

Multi-input no. 102

The available menus for multi-input no. 102 depend on the input type configured in the PC utility software (menu 10980).

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4120 4-20 mA 102.1							
4121	4-20 mA 102.1	Set point	4 mA 20 mA	10 mA		Option M4	The multi-input 102 has been configured as 4-20 mA.
4122	4-20 mA 102.1	Delay	0.0 s 3200.0 s	120.0 s			
4123	4-20 mA 102.1	Relay output A	Not used Option-dep.	Not used			
4124	4-20 mA 102.1	Relay output B	Not used Option-dep.	Not used			
4125	4-20 mA 102.1	Enable	OFF ON	OFF			
4126	4-20 mA 102.1	Fail class	F1…F6	Warning (F2)			
4130 4-20 mA 102.2							
4131	4-20 mA 102.2	Set point	4 mA 20 mA	10 mA		Option M4	The multi-input 102 has been configured as 4-20 mA.
4132	4-20 mA 102.2	Delay	0.0 s 3200.0 s	120.0 s			
4133	4-20 mA 102.2	Relay output A	Not used Option-dep.	Not used			
4134	4-20 mA 102.2	Relay output B	Not used Option-dep.	Not used			
4135	4-20 mA 102.2	Enable	OFF ON	OFF			
4136	4-20 mA 102.2	Fail class	F1…F6	Warning (F2)			
4140 V DC 102.1							
4141	V DC 102.1	Set point	0.0 V DC 40.0 V DC	20.0 V DC		Option M4	The multi-input 102 has been configured as V DC.
4142	V DC 102.1	Delay	0.2 s 3200.0 s	10.0 s			
4143	V DC 102.1	Relay output A	Not used Option-dep.	Not used			
4144	V DC 102.1	Relay output B	Not used Option-dep.	Not used			
4145	V DC 102.1	Enable	OFF ON	OFF			
4146	V DC 102.1	Fail class	F1…F6	Warning (F2)			
4150 V DC 102.2							
4151	V DC 102.2	Set point	0.0 V DC 40.0 V DC	20.0 V DC		Option M4	The multi-input 102 has been configured as V

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4152	V DC 102.2	Delay	0.2 s 3200.0 s	10.0 s			DC.
4153	V DC 102.2	Relay output A	Not used Option-dep.	Not used			
4154	V DC 102.2	Relay output B	Not used Option-dep.	Not used			
4155	V DC 102.2	Enable	OFF ON	OFF			
4156	V DC 102.2	Fail class	F1…F6	Warning (F2)			
4160 Pt100 102.1							
4161	Pt 102.1	Set point	-49 482	80		Option M4	The multi-input 102 has been configured as Pt100. Pt100 set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4162	Pt 102.1	Delay	0.0 s 3200.0 s	5.0 s			
4163	Pt 102.1	Relay output A	Not used Option-dep.	Not used			
4164	Pt 102.1	Relay output B	Not used Option-dep.	Not used			
4165	Pt 102.1	Enable	OFF ON	OFF			
4166	Pt 102.1	Fail class	F1…F6	Warning (F2)			
4170 Pt100 102.2							
4171	Pt 102.2	Set point	-49 482	80		Option M4	The multi-input 102 has been configured as Pt100. Pt100 set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4172	Pt 102.2	Delay	0.0 s 3200.0 s	10.0 s			
4173	Pt 102.2	Relay output A	Not used Option-dep.	Not used			
4174	Pt 102.2	Relay output B	Not used Option-dep.	Not used			
4175	Pt 102.2	Enable	OFF ON	OFF			
4176	Pt 102.2	Fail class	F1…F6	Warning (F2)			
4180 RMI oil 102.1							
4181	RMI oil 102.1	Set point	0.0 145.0	4.0		Option M4	The multi-input 102 has been configured as RMI oil pressure. Oil pressure set point can be in Bar or PSI, dependent on the unit selection (setting 10970).
4182	RMI oil 102.1	Delay	0.0 s 3200.0 s	5.0 s			
4183	RMI oil 102.1	Relay output A	Not used Option-dep.	Not used			
4184	RMI oil 102.1	Relay output B	Not used Option-dep.	Not used			
4185	RMI oil 102.1	Enable	OFF ON	OFF			
4186	RMI oil 102.1	Fail class	F1…F6	Warning (F2)			
4190 RMI oil 102.2							

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4191	RMI oil 102.2	Set point	0.0 145.0	5.0		Option M4	The multi-input 102 has been configured as RMI oil pressure. Oil pressure set point can be in Bar or PSI, dependent on the unit selection (setting 10970).
4192	RMI oil 102.2	Delay	0.0 s 3200.0 s	5.0 s			
4193	RMI oil 102.2	Relay output A	Not used Option-dep.	Not used			
4194	RMI oil 102.2	Relay output B	Not used Option-dep.	Not used			
4195	RMI oil 102.2	Enable	OFF ON	OFF			
4196	RMI oil 102.2	Fail class	F1…F6	Warning (F2)			
4200 RMI water 102.1							
4201	RMI water 102.1	Set point	-49 482	100		Option M4	The multi-input 102 has been configured as RMI water temperature. Water temperature set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4202	RMI water 102.1	Delay	0.0 s 3200.0 s	5.0 s			
4203	RMI water 102.1	Relay output A	Not used Option-dep.	Not used			
4204	RMI water 102.1	Relay output B	Not used Option-dep.	Not used			
4205	RMI water 102.1	Enable	OFF ON	OFF			
4206	RMI water 102.1	Fail class	F1…F6	Warning (F2)			
4210 RMI water 102.2							
4211	RMI water 102.2	Set point	-49 482	110		Option M4	The multi-input 102 has been configured as RMI water temperature. Water temperature set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4212	RMI water 102.2	Delay	0.0 s 3200.0 s	5.0 s			
4213	RMI water 102.2	Relay output A	Not used Option-dep.	Not used			
4214	RMI water 102.2	Relay output B	Not used Option-dep.	Not used			
4215	RMI water 102.2	Enable	OFF ON	OFF			
4216	RMI water 102.2	Fail class	F1…F6	Warning (F2)			
4220 RMI fuel level 102.1							
4221	RMI fuel 102.1	Set point	0 % 100 %	10 %		Option M4	The multi-input 102 has been configured as RMI fuel level.
4222	RMI fuel 102.1	Delay	0.0 s 3200.0 s	10.0 s			
4223	RMI fuel 102.1	Relay output A	Not used Option-dep.	Not used			
4224	RMI fuel 102.1	Relay output B	Not used Option-dep.	Not used			
4225	RMI fuel 102.1	Enable	OFF ON	OFF			
4226	RMI fuel 102.1	Fail class	F1…F6	Warning (F2)			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4230 RMI fuel level 102.2							
4231	RMI fuel 102.2	Set point	0 % 100 %	5 %		Option M4	The multi-input 102 has been configured as RMI fuel level.
4232	RMI fuel 102.2	Delay	0.0 s 3200.0 s	10.0 s			
4233	RMI fuel 102.2	Relay output A	Not used Option-dep.	Not used			
4234	RMI fuel 102.2	Relay output B	Not used Option-dep.	Not used			
4235	RMI fuel 102.2	Enable	OFF ON	OFF			
4236	RMI fuel 102.2	Fail class	F1…F6	Warning (F2)			
4240 Wire fail 102							
4241	W. fail 102	Relay output A	Not used Option-dep.	Not used		Option M4	The wire break fault detection is activated.
4242	W. fail 102	Relay output B	Not used Option-dep.	Not used			
4243	W. fail 102	Enable	OFF ON	OFF			
4244	W. fail 102	Fail class	F1…F6	Warning (F2)			

Multi-input no. 105

The available menus for multi-input no. 105 depend on the input type configured in the PC utility software (menu 10990).

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4250 4-20 mA 105.1							
4251	4-20 mA 105.1	Set point	4 mA 20 mA	10 mA		Option M4	The multi-input 105 has been configured as 4-20 mA.
4252	4-20 mA 105.1	Delay	0.0 s 3200.0 s	120.0 s			
4253	4-20 mA 105.1	Relay output A	Not used Option-dep.	Not used			
4254	4-20 mA 105.1	Relay output B	Not used Option-dep.	Not used			
4255	4-20 mA 105.1	Enable	OFF ON	OFF			
4256	4-20 mA 105.1	Fail class	F1…F6	Warning (F2)			
4260 4-20 mA 105.2							
4261	4-20 mA 105.2	Set point	4 mA 20 mA	10 mA		Option M4	The multi-input 105 has been configured as 4-20 mA.
4262	4-20 mA 105.2	Delay	0.0 s 3200.0 s	120.0 s			
4263	4-20 mA 105.2	Relay output A	Not used Option-dep.	Not used			
4264	4-20 mA 105.2	Relay output B	Not used Option-dep.	Not used			
4265	4-20 mA 105.2	Enable	OFF ON	OFF			
4266	4-20 mA 105.2	Fail class	F1…F6	Warning (F2)			
4270 V DC 105.1							
4271	V DC 105.1	Set point	0.0 V DC 40.0 V DC	20.0 V DC		Option M4	The multi-input 105 has been configured as V DC.
4272	V DC 105.1	Delay	0.2 s 3200.0 s	10.0 s			
4273	V DC 105.1	Relay output A	Not used Option-dep.	Not used			
4274	V DC 105.1	Relay output B	Not used Option-dep.	Not used			
4275	V DC 105.1	Enable	OFF ON	OFF			
4276	V DC 105.1	Fail class	F1…F6	Warning (F2)			
4280 V DC 105.2							
4281	V DC 105.2	Set point	0.0 V DC 40.0 V DC	20.0 V DC		Option M4	The multi-input 105 has been configured as V DC.
4282	V DC 105.2	Delay	0.2 s 3200.0 s	10.0 s			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4283	V DC 105.2	Relay output A	Not used Option-dep.	Not used			
4284	V DC 105.2	Relay output B	Not used Option-dep.	Not used			
4285	V DC 105.2	Enable	OFF ON	OFF			
4286	V DC 105.2	Fail class	F1…F6	Warning (F2)			
4290 Pt100 105.1							
4291	Pt 105.1	Set point	-49 482	80		Option M4	The multi-input 105 has been configured as Pt100. Pt100 set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4292	Pt 105.1	Delay	0.0 s 3200.0 s	5.0 s			
4293	Pt 105.1	Relay output A	Not used Option-dep.	Not used			
4294	Pt 105.1	Relay output B	Not used Option-dep.	Not used			
4295	Pt 105.1	Enable	OFF ON	OFF			
4296	Pt 105.1	Fail class	F1…F6	Warning (F2)			
4300 Pt100 105.2							
4301	Pt 105.2	Set point	-49 482	80		Option M4	The multi-input 105 has been configured as Pt100. Pt100 set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4302	Pt 105.2	Delay	0.0 s 3200.0 s	10.0 s			
4303	Pt 105.2	Relay output A	Not used Option-dep.	Not used			
4304	Pt 105.2	Relay output B	Not used Option-dep.	Not used			
4305	Pt 105.2	Enable	OFF ON	OFF			
4306	Pt 105.2	Fail class	F1…F6	Warning (F2)			
4310 RMI oil 105.1							
4311	RMI oil 105.1	Set point	0.0 145.0	4.0		Option M4	The multi-input 105 has been configured as RMI oil pressure. Oil pressure set point can be in Bar or PSI, dependent on the unit selection (setting 10970).
4312	RMI oil 105.1	Delay	0.0 s 3200.0 s	5.0 s			
4313	RMI oil 105.1	Relay output A	Not used Option-dep.	Not used			
4314	RMI oil 105.1	Relay output B	Not used Option-dep.	Not used			
4315	RMI oil 105.1	Enable	OFF ON	OFF			
4316	RMI oil 105.1	Fail class	F1…F6	Warning (F2)			
4320 RMI oil 105.2							
4321	RMI oil 105.2	Set point	0.0 145.0	5.0		Option M4	The multi-input 105 has been configured as

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4322	RMI oil 105.2	Delay	0.0 s 3200.0 s	5.0 s			RMI oil pressure. Oil pressure set point can be in Bar or PSI, dependent on the unit selection (setting 10970).
4323	RMI oil 105.2	Relay output A	Not used Option-dep.	Not used			
4324	RMI oil 105.2	Relay output B	Not used Option-dep.	Not used			
4325	RMI oil 105.2	Enable	OFF ON	OFF			
4326	RMI oil 105.2	Fail class	F1…F6	Warning (F2)			
4330 RMI water 105.1							
4331	RMI water 105.1	Set point	-49 482	100		Option M4	The multi-input 105 has been configured as RMI water temperature. Water temperature set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4332	RMI water 105.1	Delay	0.0 s 3200.0 s	5.0 s			
4333	RMI water 105.1	Relay output A	Not used Option-dep.	Not used			
4334	RMI water 105.1	Relay output B	Not used Option-dep.	Not used			
4335	RMI water 105.1	Enable	OFF ON	OFF			
4336	RMI water 105.1	Fail class	F1…F6	Warning (F2)			
4340 RMI water 105.2							
4341	RMI water 105.2	Set point	-49 482	110		Option M4	The multi-input 105 has been configured as RMI water temperature. Water temperature set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4342	RMI water 105.2	Delay	0.0 s 3200.0 s	5.0 s			
4343	RMI water 105.2	Relay output A	Not used Option-dep.	Not used			
4344	RMI water 105.2	Relay output B	Not used Option-dep.	Not used			
4345	RMI water 105.2	Enable	OFF ON	OFF			
4346	RMI water 105.2	Fail class	F1…F6	Warning (F2)			
4350 RMI fuel level 105.1							
4351	RMI fuel 105.1	Set point	0 % 100 %	10 %		Option M4	The multi-input 105 has been configured as RMI fuel level.
4352	RMI fuel 105.1	Delay	0.0 s 3200.0 s	10.0 s			
4353	RMI fuel 105.1	Relay output A	Not used Option-dep.	Not used			
4354	RMI fuel 105.1	Relay output B	Not used Option-dep.	Not used			
4535	RMI fuel 105.1	Enable	OFF ON	OFF			
4356	RMI fuel 105.1	Fail class	F1…F6	Warning (F2)			
4360 RMI fuel level 105.2							

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4361	RMI fuel 105.2	Set point	0 % 100 %	5 %		Option M4	The multi-input 105 has been configured as RMI fuel level.
4362	RMI fuel 105.2	Delay	0.0 s 3200.0 s	10.0 s			
4363	RMI fuel 105.2	Relay output A	Not used Option-dep.	Not used			
4364	RMI fuel 105.2	Relay output B	Not used Option-dep.	Not used			
4365	RMI fuel 105.2	Enable	OFF ON	OFF			
4366	RMI fuel 105.2	Fail class	F1…F6	Warning (F2)			
4370 Wire fail 105							
4371	W. fail 105	Relay output A	Not used Option-dep.	Not used		Option M4	The wire break fault detection is activated.
4372	W. fail 105	Relay output B	Not used Option-dep.	Not used			
4373	W. fail 105	Enable	OFF ON	OFF			
4374	W. fail 105	Fail class	F1…F6	Warning (F2)			

Multi-input no. 108

The available menus for multi-input no. 108 depend on the input type configured in the PC utility software (menu 11000).

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4380 4-20 mA 108.1							
4381	4-20 mA 108.1	Set point	4 mA 20 mA	10 mA		Option M4	The multi-input 108 has been configured as 4-20 mA.
4382	4-20 mA 108.1	Delay	0.0 s 3200.0 s	120.0 s			
4383	4-20 mA 108.1	Relay output A	Not used Option-dep.	Not used			
4384	4-20 mA 108.1	Relay output B	Not used Option-dep.	Not used			
4385	4-20 mA 108.1	Enable	OFF ON	OFF			
4386	4-20 mA 108.1	Fail class	F1…F6	Warning (F2)			
4390 4-20 mA 108.2							
4391	4-20 mA 108.2	Set point	4 mA 20 mA	10 mA		Option M4	The multi-input 108 has been configured as 4-20 mA.
4392	4-20 mA 108.2	Delay	0.0 s 3200.0 s	120.0 s			
4393	4-20 mA 108.2	Relay output A	Not used Option-dep.	Not used			
4394	4-20 mA 108.2	Relay output B	Not used Option-dep.	Not used			
4395	4-20 mA 108.2	Enable	OFF ON	OFF			
4396	4-20 mA 108.2	Fail class	F1…F6	Warning (F2)			
4400 V DC 108.1							
4401	V DC 108.1	Set point	0.0 V DC 40.0 V DC	20.0 V DC		Option M4	The multi-input 108 has been configured as V DC.
4402	V DC 108.1	Delay	0.2 s 3200.0 s	10.0 s			
4403	V DC 108.1	Relay output A	Not used Option-dep.	Not used			
4404	V DC 108.1	Relay output B	Not used Option-dep.	Not used			
4405	V DC 108.1	Enable	OFF ON	OFF			
4406	V DC 108.1	Fail class	F1…F6	Warning (F2)			
4410 V DC 108.2							
4411	V DC 108.2	Set point	0.0 V DC 40.0 V DC	20.0 V DC		Option M4	The multi-input 108 has been configured as V DC.
4412	V DC 108.2	Delay	0.2 s 3200.0 s	10.0 s			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4413	V DC 108.2	Relay output A	Not used Option-dep.	Not used			
4414	V DC 108.2	Relay output B	Not used Option-dep.	Not used			
4415	V DC 108.2	Enable	OFF ON	OFF			
4416	V DC 108.2	Fail class	F1…F6	Warning (F2)			
4420 Pt100 108.1							
4421	Pt 108.1	Set point	-49 482	80		Option M4	The multi-input 108 has been configured as Pt100. Pt100 set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4422	Pt 108.1	Delay	0.0 s 3200.0 s	5.0 s			
4423	Pt 108.1	Relay output A	Not used Option-dep.	Not used			
4424	Pt 108.1	Relay output B	Not used Option-dep.	Not used			
4425	Pt 108.1	Enable	OFF ON	OFF			
4426	Pt 108.1	Fail class	F1…F6	Warning (F2)			
4430 Pt100 108.2							
4431	Pt 108.2	Set point	-49 482	80		Option M4	The multi-input 108 has been configured as Pt100. Pt100 set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4432	Pt 108.2	Delay	0.0 s 3200.0 s	10.0 s			
4433	Pt 108.2	Relay output A	Not used Option-dep.	Not used			
4434	Pt 108.2	Relay output B	Not used Option-dep.	Not used			
4435	Pt 108.2	Enable	OFF ON	OFF			
4436	Pt 108.2	Fail class	F1…F6	Warning (F2)			
4440 RMI oil 108.1							
4441	RMI oil 108.1	Set point	0.0 145.0	4.0		Option M4	The multi-input 108 has been configured as RMI oil pressure. Oil pressure set point can be in Bar or PSI, dependent on the unit selection (setting 10970).
4442	RMI oil 108.1	Delay	0.0 s 3200.0 s	5.0 s			
4443	RMI oil 108.1	Relay output A	Not used Option-dep.	Not used			
4444	RMI oil 108.1	Relay output B	Not used Option-dep.	Not used			
4445	RMI oil 108.1	Enable	OFF ON	OFF			
4446	RMI oil 108.1	Fail class	F1…F6	Warning (F2)			
4450 RMI oil 108.2							
4451	RMI oil 108.2	Set point	0.0 145.0	5.0		Option M4	The multi-input 108 has been configured as

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4452	RMI oil 108.2	Delay	0.0 s 3200.0 s	5.0 s			RMI oil pressure. Oil pressure set point can be in Bar or PSI, dependent on the unit selection (setting 10970).
4453	RMI oil 108.2	Relay output A	Not used Option-dep.	Not used			
4454	RMI oil 108.2	Relay output B	Not used Option-dep.	Not used			
4455	RMI oil 108.2	Enable	OFF ON	OFF			
4456	RMI oil 108.2	Fail class	F1…F6	Warning (F2)			
4460 RMI water 108.1							
4461	RMI water 108.1	Set point	-49 482	100		Option M4	The multi-input 108 has been configured as water temperature. Water temperature set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4462	RMI water 108.1	Delay	0.0 s 3200.0 s	5.0 s			
4463	RMI water 108.1	Relay output A	Not used Option-dep.	Not used			
4464	RMI water 108.1	Relay output B	Not used Option-dep.	Not used			
4465	RMI water 108.1	Enable	OFF ON	OFF			
4466	RMI water 108.1	Fail class	F1…F6	Warning (F2)			
4470 RMI water 108.2							
4471	RMI water 108.2	Set point	-49 482	110		Option M4	The multi-input 108 has been configured as RMI water temperature. Water temperature set point can be in deg. C or Fahrenheit, dependent on the unit selection (setting 10970).
4472	RMI water 108.2	Delay	0.0 s 3200.0 s	5.0 s			
4473	RMI water 108.2	Relay output A	Not used Option-dep.	Not used			
4474	RMI water 108.2	Relay output B	Not used Option-dep.	Not used			
4475	RMI water 108.2	Enable	OFF ON	OFF			
4476	RMI water 108.2	Fail class	F1…F6	Warning (F2)			
4480 RMI fuel level 108.1							
4481	RMI fuel 108.1	Set point	0 % 100 %	10 %		Option M4	The multi-input 108 has been configured as RMI fuel level.
4482	RMI fuel 108.1	Delay	0.0 s 3200.0 s	10.0 s			
4483	RMI fuel 108.1	Relay output A	Not used Option-dep.	Not used			
4484	RMI fuel 108.1	Relay output B	Not used Option-dep.	Not used			
4485	RMI fuel 108.1	Enable	OFF ON	OFF			
4486	RMI fuel 108.1	Fail class	F1…F6	Warning (F2)			
4490 RMI fuel level 108.2							

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4491	RMI fuel 108.2	Set point	0 % 100 %	5 %		Option M4	The multi-input 108 has been configured as RMI fuel level.
4492	RMI fuel 108.2	Delay	0.0 s 3200.0 s	10.0 s			
4493	RMI fuel 108.2	Relay output A	Not used Option-dep.	Not used			
4494	RMI fuel 108.2	Relay output B	Not used Option-dep.	Not used			
4495	RMI fuel 108.2	Enable	OFF ON	OFF			
4496	RMI fuel 108.2	Fail class	F1…F6	Warning (F2)			
4500 Wire fail 108							
4501	W. fail 108	Relay output A	Not used Option-dep.	Not used		Option M4	The wire break fault detection is activated.
4502	W. fail 108	Relay output B	Not used Option-dep.	Not used			
4503	W. fail 108	Enable	OFF ON	OFF			
4504	W. fail 108	Fail class	F1…F6	Warning (F2)			

Speed and running feedback alarm

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4510 Overspeed 1							
4511	Overspeed 1	Set point	100.0 % 250.0 %	110.0 %		Option M4	The set point in percentage relates to nominal RPM.
4512	Overspeed 1	Delay	0.0 s 3200.0 s	5.0 s			
4513	Overspeed 1	Relay output A	Not used Option-dep.	Not used			
4514	Overspeed 1	Relay output B	Not used Option-dep.	Not used			
4515	Overspeed 1	Enable	OFF ON	ON			
4516	Overspeed 1	Fail class	F1…F6	Warning (F2)			
4520 Overspeed 2							
4521	Overspeed 2	Set point	100.0 % 250.0 %	120.0 %		Option M4	The set point in percentage relates to nominal RPM.
4522	Overspeed 2	Delay	0.0 s 3200.0 s	1.0 s			
4523	Overspeed 2	Relay output A	Not used Option-dep.	Not used			
4524	Overspeed 2	Relay output B	Not used Option-dep.	Not used			
4525	Overspeed 2	Enable	OFF ON	ON			
4526	Overspeed 2	Fail class	F1…F6	Shutdown (F5)			
4530 Crank failure							
4531	Crank failure	Set point	1 RPM 400 RPM	50 RPM		Option M4	If MPU is chosen as the primary running feedback, this alarm will be raised if the specified RPM is not reached before the delay has expired.
4532	Crank failure	Delay	0.0 s 3200.0 s	2.0 s			
4533	Crank failure	Relay output A	Not used Option-dep.	Not used			
4534	Crank failure	Relay output B	Not used Option-dep.	Not used			
4535	Crank failure	Enable	OFF ON	OFF			
4536	Crank failure	Fail class	F1…F6	Warning (F2)			
4540 Running feedback failure							
4541	Run feedb. fail	Delay	0.0 s 3200.0 s	2.0 s		Option M4	If running is detected on the frequency (secondary), but the primary running feedback, for example digital input, has not
4542	Run feedb. fail	Relay output A	Not used Option-dep.	Not used			
4543	Run feedb. fail	Relay output B	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4544	Run feedb. fail	Enable	OFF ON	ON			detected running, this alarm will be raised after the adjusted delay time.
4545	Run feedb. fail	Fail class	F1…F6	Warning (F2)			
4550 Magnetic pickup wire break							
4551	MPU wire break	Relay output A	Not used Option-dep.	Not used		Option M4	The wire break monitoring is only active when the engine is at standstill.
4552	MPU wire break	Relay output B	Not used Option-dep.	Not used			
4553	MPU wire break	Enable	OFF ON	OFF			
4554	MPU wire break	Fail class	F1…F6	Warning (F2)			
4560 Hz/voltage failure							
4561	Hz/V failure	Delay	1.0 s 3200.0 s	30.0 s		Option M4	If the frequency and voltage are not within the limits after the running feedback is received, this alarm will be raised when the delay time has expired.
4562	Hz/V failure	Relay output A	Not used Option-dep.	Not used			
4563	Hz/V failure	Relay output B	Not used Option-dep.	Not used			
4564	Hz/V failure	Enable	OFF ON	ON			
4565	Hz/V failure	Fail class	F1…F6	Warning (F2)			
4570 Start failure							
4571	Start failure	Relay output A	Not used Option-dep.	Not used		Option M4	The start failure alarm occurs, if the genset has not started after the number of start attempts.
4572	Start failure	Relay output B	Not used Option-dep.	Not used			
4573	Start failure	Fail class	F1…F6	Block (F1)			
4580 Stop failure							
4581	Stop failure	Delay	10.0 s 3200.0 s	30.0 s		Option M4	A stop failure alarm will appear if the primary running feedback or the generator voltage and frequency are still present after the delay time has expired.
4582	Stop failure	Relay output A	Not used Option-dep.	Not used			
4583	Stop failure	Relay output B	Not used Option-dep.	Not used			
4584	Stop failure	Enable	OFF ON	ON			
4585	Stop failure	Fail class	F1…F6	Shutdown (F5)			
4590 Underspeed 1							
4591	Underspeed 1	Set point	50.0 % 100.0 %	90.0 %		Option M4	An alarm will appear if the speed measured with the MPU is below the set point longer than the delay. If menu 6171 “Number
4592	Underspeed 1	Delay	0.0 s 3200.0 s	5.0 s			
4593	Underspeed 1	Relay output A	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4594	Underspeed 1	Relay output B	Not used Option-dep.	Not used			of teeth" is set to zero, this alarm is deactivated.
4595	Underspeed 1	Enable	OFF ON	OFF			
4596	Underspeed 1	Fail class	F1…F6	Warning (F2)			

Differential measurement

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4600 Delta analogue input 1, 2, 3							
4601	Delta ana1 InpA	Input	Multi-input 102 - EIC	Multi-input 102		Designer's Reference Handbook	Inputs for differential measurements can be chosen as shown in the list below: Input: - Multi-input 102 - Multi-input 105 - Multi-input 108 - Ext. I/O Analog In 1-8 (option H8) - EIC oil pressure - EIC cooling water temp - EIC oil temp - EIC Ambient temp - EIC Intercool temp - EIC fuel temp - EIC fuel delivery press - EIC Air filter f1 diff. press. - EIC Air filter f2 diff. press. - EIC Fuel supply pump press - EIC Fuel filter diff. press - EIC Oil filter diff. press - EIC T. Exhaust Left - EIC T. Exhaust Right - EIC P. Fuel f diff
4602	Delta ana1 InpB	Input	Multi-input 102 - EIC	Multi-input 102			
4603	Delta ana2 InpA	Input	Multi-input 102 - EIC	Multi-input 102			
4604	Delta ana2 InpB	Input	Multi-input 102 - EIC	Multi-input 102			
4605	Delta ana3 InpA	Input	Multi-input 102 - EIC	Multi-input 102			
4606	Delta ana3 InpB	Input	Multi-input 102 - EIC	Multi-input 102			
4610 Delta analogue 1.1							
4611	Delta Ana1.1	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 1.1 level 1.
4612	Delta Ana1.1	Timer	0.0 s 999.0 s	5.0 s			
4613	Delta Ana1.1	Relay output A	Not used Option-dep.	Not used			
4614	Delta Ana1.1	Relay output B	Not used Option-dep.	Not used			
4615	Delta Ana1.1	Enable	OFF ON	OFF			
4616	Delta Ana1.1	Fail class	F1…F8	Warning (F2)			
4620 Delta analogue 1.2							
4621	Delta Ana1.2	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 1.2 level 2.
4622	Delta Ana1.2	Timer	0.0 s 999.0 s	5.0 s			
4623	Delta Ana1.2	Relay output A	Not used Option-dep.	Not used			
4624	Delta Ana1.2	Relay output B	Not used Option-dep.	Not used			
4625	Delta Ana1.2	Enable	OFF ON	OFF			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4626	Delta Ana1.2	Fail class	F1…F8	Warning (F2)			
4630 Delta analogue 2.1							
4631	Delta Ana2.1	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 2.1 level 1.
4632	Delta Ana2.1	Timer	0.0 s 999.0 s	5.0 s			
4633	Delta Ana2.1	Relay output A	Not used Option-dep.	Not used			
4634	Delta Ana2.1	Relay output B	Not used Option-dep.	Not used			
4635	Delta Ana2.1	Enable	OFF ON	OFF			
4636	Delta Ana2.1	Fail class	F1…F8	Warning (F2)			
4640 Delta analogue 2.2							
4641	Delta Ana2.2	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 2.2 level 2.
4642	Delta Ana2.2	Timer	0.0 s 999.0 s	5.0 s			
4643	Delta Ana2.2	Relay output A	Not used Option-dep.	Not used			
4644	Delta Ana2.2	Relay output B	Not used Option-dep.	Not used			
4645	Delta Ana2.2	Enable	OFF ON	OFF			
4646	Delta Ana2.2	Fail class	F1…F8	Warning (F2)			
4650 Delta analogue 3.1							
4651	Delta Ana3.1	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 3.1 level 1.
4652	Delta Ana3.1	Timer	0.0 s 999.0 s	5.0 s			
4653	Delta Ana3.1	Relay output A	Not used Option-dep.	Not used			
4654	Delta Ana3.1	Relay output B	Not used Option-dep.	Not used			
4655	Delta Ana3.1	Enable	OFF ON	OFF			
4656	Delta Ana3.1	Fail class	F1…F8	Warning (F2)			
4660 Delta analogue 3.2							
4661	Delta Ana3.2	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 3.2 level 2.
4662	Delta Ana3.2	Timer	0.0 s 999.0 s	5.0 s			
4663	Delta Ana3.2	Relay output A	Not used Option-dep.	Not used			
4664	Delta Ana3.2	Relay output B	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4665	Delta Ana3.2	Enable	OFF ON	OFF			
4666	Delta Ana3.2	Fail class	F1…F8	Warning (F2)			
4670 Delta analogue input 4, 5, 6							
4671	Delta ana4 InpA	Input	Multi-input 102 - EIC	Multi-input 102		Designer's Reference Handbook	Inputs for differential measurements can be chosen as shown in the list below: Input: - Multi-input 102 - Multi-input 105 - Multi-input 108 - Ext. I/O Analog 1-8 (option H8) - EIC oil pressure - EIC cooling water temp - EIC oil temp - EIC Ambient temp - EIC Intercool temp - EIC fuel temp - EIC fuel delivery press - EIC Air filter f1 diff. press. - EIC Air filter f2 diff. press. - EIC Fuel supply pump press - EIC Fuel filter diff. press - EIC Oil filter diff. press - EIC T. Exhaust Left - EIC T. Exhaust Right - EIC P. Fuel f diff.
4672	Delta ana4 InpB	Input	Multi-input 102 - EIC	Multi-input 102			
4673	Delta ana5 InpA	Input	Multi-input 102 - EIC	Multi-input 102			
4674	Delta ana5 InpB	Input	Multi-input 102 - EIC	Multi-input 102			
4675	Delta ana6 InpA	Input	Multi-input 102 - EIC	Multi-input 102			
4676	Delta ana6 InpB	Input	Multi-input 102 - EIC	Multi-input 102			
4680 Delta analogue 4.1							
4681	Delta Ana4.1	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 4.1 level 1.
4682	Delta Ana4.1	Timer	0.0 s 999.0 s	5.0 s			
4683	Delta Ana4.1	Relay output A	Not used Option-dep.	Not used			
4684	Delta Ana4.1	Relay output B	Not used Option-dep.	Not used			
4685	Delta Ana4.1	Enable	OFF ON	OFF			
4686	Delta Ana4.1	Fail class	F1…F8	Warning (F2)			
4690 Delta analogue 4.2							
4691	Delta Ana4.2	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 4.2 level 2.
4692	Delta Ana4.2	Timer	0.0 s 999.0 s	5.0 s			
4693	Delta Ana4.2	Relay output A	Not used Option-dep.	Not used			
4694	Delta Ana4.2	Relay output B	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4695	Delta Ana4.2	Enable	OFF ON	OFF			
4696	Delta Ana4.2	Fail class	F1…F8	Warning (F2)			
4700 Delta analogue 5.1							
4701	Delta Ana5.1	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 5.1 level 1.
4702	Delta Ana5.1	Timer	0.0 s 999.0 s	5.0 s			
4703	Delta Ana5.1	Relay output A	Not used Option-dep.	Not used			
4704	Delta Ana5.1	Relay output B	Not used Option-dep.	Not used			
4705	Delta Ana5.1	Enable	OFF ON	OFF			
4706	Delta Ana5.1	Fail class	F1…F8	Warning (F2)			
4710 Delta analogue 5.2							
4711	Delta Ana5.2	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 5.2 level 2.
4712	Delta Ana5.2	Timer	0.0 s 999.0 s	5.0 s			
4713	Delta Ana5.2	Relay output A	Not used Option-dep.	Not used			
4714	Delta Ana5.2	Relay output B	Not used Option-dep.	Not used			
4715	Delta Ana5.2	Enable	OFF ON	OFF			
4716	Delta Ana5.2	Fail class	F1…F8	Warning (F2)			
4720 Delta analogue 6.1							
4721	Delta Ana6.1	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 6.1 level 1.
4722	Delta Ana6.1	Timer	0.0 s 999.0 s	5.0 s			
4723	Delta Ana6.1	Relay output A	Not used Option-dep.	Not used			
4724	Delta Ana6.1	Relay output B	Not used Option-dep.	Not used			
4725	Delta Ana6.1	Enable	OFF ON	OFF			
4726	Delta Ana6.1	Fail class	F1…F8	Warning (F2)			
4730 Delta analogue 6.2							
4731	Delta Ana6.2	Set point	-9999.1 9999.1	10		Designer's Reference Handbook	Delta analogue alarm setting 6.2 level 2.
4732	Delta Ana6.2	Timer	0.0 s 999.0 s	5.0 s			
4733	Delta Ana6.2	Relay output A	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4734	Delta Ana6.2	Relay output B	Not used Option-dep.	Not used			
4735	Delta Ana6.2	Enable	OFF ON	OFF			
4736	Delta Ana6.2	Fail class	F1…F8	Warning (F2)			

Analogue input alarms 127-133

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4800 4-20 mA 127.1							
4801	4-20 mA 127.1	Set point	4 mA 20 mA	10 mA		Option M15.8	Configurable analogue input.
4802	4-20 mA 127.1	Delay	0.0 s 3200.0 s	120.0 s			
4803	4-20 mA 127.1	Relay output A	Not used Option-dep.	Not used			
4804	4-20 mA 127.1	Relay output B	Not used Option-dep.	Not used			
4805	4-20 mA 127.1	Enable	OFF ON	OFF			
4806	4-20 mA 127.1	Fail class	F1…F6	Warning (F2)			
4810 4-20 mA 127.2							
4811	4-20 mA 127.2	Set point	4 mA 20 mA	10 mA		Option M15.8	Configurable analogue input.
4812	4-20 mA 127.2	Delay	0.0 s 3200.0 s	120.0 s			
4813	4-20 mA 127.2	Relay output A	Not used Option-dep.	Not used			
4814	4-20 mA 127.2	Relay output B	Not used Option-dep.	Not used			
4815	4-20 mA 127.2	Enable	OFF ON	OFF			
4816	4-20 mA 127.2	Fail class	F1…F6	Warning (F2)			
4820 wire fail 4-20 mA 127							
4821	W. fail ana 127	Relay output A	Not used Option-dep.	Not used		Option M15.8	The wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated.
4822	W. fail ana 127	Relay output B	Not used Option-dep.	Not used			
4823	W. fail ana 127	Enable	OFF ON	OFF			
4824	W. fail ana 127	Fail class	F1…F6	Warning (F2)			
4830 4-20 mA 129.1							
4831	4-20 mA 129.1	Set point	4 mA 20 mA	10 mA		Option M15.8	Configurable analogue input.
4832	4-20 mA 129.1	Delay	0.0 s 3200.0 s	120.0 s			
4833	4-20 mA 129.1	Relay output A	Not used Option-dep.	Not used			
4834	4-20 mA 129.1	Relay output B	Not used Option-dep.	Not used			
4835	4-20 mA 129.1	Enable	OFF ON	OFF			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4836	4-20 mA 129.1	Fail class	F1…F6	Warning (F2)			
4840 4-20 mA 129.2							
4841	4-20 mA 129.2	Set point	4 mA 20 mA	10 mA		Option M15.8	Configurable analogue input.
4842	4-20 mA 129.2	Delay	0.0 s 3200.0 s	120.0 s			
4843	4-20 mA 129.2	Relay output A	Not used Option-dep.	Not used			
4844	4-20 mA 129.2	Relay output B	Not used Option-dep.	Not used			
4845	4-20 mA 129.2	Enable	OFF ON	OFF			
4846	4-20 mA 129.2	Fail class	F1…F6	Warning (F2)			
4850 Wire fail 4-20 mA 129.2							
4851	W. fail ana 129	Relay output A	Not used Option-dep.	Not used		Option M15.8	The wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated.
4852	W. fail ana 129	Relay output B	Not used Option-dep.	Not used			
4853	W. fail ana 129	Enable	OFF ON	OFF			
4854	W. fail ana 129	Fail class	F1…F6	Warning (F2)			
4860 4-20 mA 131.1							
4861	4-20 mA 131.1	Set point	4 mA 20 mA	10 mA		Option M15.8	Configurable analogue input.
4862	4-20 mA 131.1	Delay	0.0 s 3200.0 s	120.0 s			
4863	4-20 mA 131.1	Relay output A	Not used Option-dep.	Not used			
4864	4-20 mA 131.1	Relay output B	Not used Option-dep.	Not used			
4865	4-20 mA 131.1	Enable	OFF ON	OFF			
4866	4-20 mA 131.1	Fail class	F1…F6	Warning (F2)			
4870 4-20 mA 131.2							
4871	4-20 mA 131.2	Set point	4 mA 20 mA	10 mA		Option M15.8	Configurable analogue input.
4872	4-20 mA 131.2	Delay	0.0 s 3200.0 s	120.0 s			
4873	4-20 mA 131.2	Relay output A	Not used Option-dep.	Not used			
4874	4-20 mA 131.2	Relay output B	Not used Option-dep.	Not used			
4875	4-20 mA 131.2	Enable	OFF ON	OFF			
4876	4-20 mA 131.2	Fail class	F1…F6	Warning (F2)			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4880 Wire fail 4-20 mA 131							
4881	W. fail ana 131	Relay output A	Not used Option-dep.	Not used		Option M15.8	The wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated.
4882	W. fail ana 131	Relay output B	Not used Option-dep.	Not used			
4883	W. fail ana 131	Enable	OFF ON	OFF			
4884	W. fail ana 131	Fail class	F1…F6	Warning (F2)			
4890 4-20 mA 133.1							
4891	4-20 mA 133.1	Set point	4 mA 20 mA	10 mA		Option M15.8	Configurable analogue input.
4892	4-20 mA 133.1	Delay	0.0 s 3200.0 s	120.0 s			
4893	4-20 mA 133.1	Relay output A	Not used Option-dep.	Not used			
4894	4-20 mA 133.1	Relay output B	Not used Option-dep.	Not used			
4895	4-20 mA 133.1	Enable	OFF ON	OFF			
4896	4-20 mA 133.1	Fail class	F1…F6	Warning (F2)			
4900 4-20 mA 133.2							
4901	4-20 mA 133.2	Set point	4 mA 20 mA	10 mA		Option M15.8	Configurable analogue input.
4902	4-20 mA 133.2	Delay	0.0 s 3200.0 s	120.0 s			
4903	4-20 mA 133.2	Relay output A	Not used Option-dep.	Not used			
4904	4-20 mA 133.2	Relay output B	Not used Option-dep.	Not used			
4905	4-20 mA 133.2	Enable	OFF ON	OFF			
4906	4-20 mA 133.2	Fail class	F1…F6	Warning (F2)			
4910 Wire fail 4-20 mA 133							
4911	W. fail ana 133	Relay output A	Not used Option-dep.	Not used		Option M15.8	The wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated.
4912	W. fail ana 133	Relay output B	Not used Option-dep.	Not used			
4913	W. fail ana 133	Enable	OFF ON	OFF			
4914	W. fail ana 133	Fail class	F1…F6	Warning (F2)			

Aux. supply

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4960 U< auxiliary power supply terminal 1							
4961	U< aux. term. 1	Set point	8.0 V DC 32.0 V DC	18.0 V DC		Designer's Reference Handbook	The power supply on terminals 1 and 2 has been continuously below the adjusted set point until the delay timer has expired.
4962	U< aux. term. 1	Delay	0.0 s 3200.0 s	1.0 s			
4963	U< aux. term. 1	Relay output A	Not used Option-dep.	Not used			
4964	U< aux. term. 1	Relay output B	Not used Option-dep.	Not used			
4965	U< aux. term. 1	Enable	OFF ON	ON			
4966	U< aux. term. 1	Fail class	F1…F6	Warning (F2)			
4970 U> auxiliary power supply terminal 1							
4971	U> aux. term. 1	Set point	12.0 V DC 36.0 V DC	30.0 V DC		Designer's Reference Handbook	The power supply on terminals 1 and 2 has been continuously above the adjusted set point until the delay timer has expired.
4972	U> aux. term. 1	Delay	0.0 s 3200.0 s	1.0 s			
4973	U> aux. term. 1	Relay output A	Not used Option-dep.	Not used			
4974	U> aux. term. 1	Relay output B	Not used Option-dep.	Not used			
4975	U> aux. term. 1	Enable	OFF ON	ON			
4976	U> aux. term. 1	Fail class	F1…F6	Warning (F2)			
4980 U< auxiliary power supply terminal 98							
4981	U< aux. term. 98	Set point	8.0 V DC 32.0 V DC	18.0 V DC		Option M4	The power supply on terminals 98 and 99 has been continuously below the adjusted set point until the delay timer has expired.
4982	U< aux. term. 98	Delay	0.0 s 3200.0 s	1.0 s			
4983	U< aux. term. 98	Relay output A	Not used Option-dep.	Not used			
4984	U< aux. term. 98	Relay output B	Not used Option-dep.	Not used			
4985	U< aux. term. 98	Enable	OFF ON	ON			
4986	U< aux. term. 98	Fail class	F1…F6	Warning (F2)			
4990 U> auxiliary power supply terminal 98							
4991	U> aux. term. 98	Set point	8.0 V DC 32.0 V DC	30.0 V DC		Option M4	The power supply on terminals 98 and 99 has been continuously above the adjusted set point until the delay timer has expired.
4992	U> aux. term. 98	Delay	0.0 s 3200.0 s	1.0 s			
4993	U> aux. term. 98	Relay output A	Not used Option-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
4994	U> aux. term. 98	Relay output B	Not used Option-dep.	Not used			
4995	U> aux. term. 98	Enable	OFF ON	ON			
4996	U> aux. term. 98	Fail class	F1…F6	Warning (F2)			

Stop coil wire break and internal communication alarms

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6270 Stop coil wire break							
6271	Stop coil wire break	Relay output A	Not used Option-dep.	Not used		Option M4	The wire break monitoring is only active when the stop coil output is deactivated.
6272	Stop coil wire break	Relay output B	Not used Option-dep.	Not used			
6273	Stop coil wire break	Enable	OFF ON	OFF			
6274	Stop coil wire break	Fail class	F1…F6	Warning (F2)			
6280 Internal communication fail							
6281	Int. comm. fail	Relay output A	Not used Option-dep.	Not used		Option M4	This is the alarm for communication fail between the main processor and the engine interface processor.
6282	Int. comm. fail	Relay output B	Not used Option-dep.	Not used			
6283	Int. comm. fail	Fail class	F1…F6	Warning (F2)			

Engine heater failure

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6330 Engine heater 1							
6331	Engine heater 1	Set point	10 deg. 250 deg.	30 deg.		Option M4	Engine temperature has been continuously below the adjusted set point until the timer has expired.
6332	Engine heater 1	Timer	0.0 s 3200.0 s	10.0 s			
6333	Engine heater 1	Relay output A	Not used Option-dep.	Not used			
6334	Engine heater 1	Relay output B	Not used Option-dep.	Not used			
6335	Engine heater 1	Enable	OFF ON	OFF			
6336	Engine heater 1	Fail class	F1…F6	Warning (F2)			

Not in remote

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6370 Not in remote							
6371	Not in remote	Timer	10.0 s 900.0 s	1.0 s		Designer's Reference Handbook GPU Hydro: Option M4 or G2	The unit has not been switched into remote mode from local mode within the allowed time.
6372	Not in remote	Relay output A	Not used Option-dep.	Not used			
6373	Not in remote	Relay output B	Not used Option-dep.	Not used			
6374	Not in remote	Enable	OFF ON	OFF			
6375	Not in remote	Fail class	F1…F6	Warning (F2)			

Battery tests

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6410 Battery test							
6411	Battery test	Set point	8.0 V 32.0 V	18.0 V		Option M4	If the battery voltage drops below the set point during crank test, the alarm is activated.
6412	Battery test	Timer	1 s 300 s	20 s			
6413	Battery test	Type	Power supply Multi-input 102 Multi-input 105 Multi-input 108	Power supply			
6414	Battery test	Relay output A	Not used Option-dep.	Not used			
6415	Battery test	Enable	OFF ON	OFF			
6416	Battery test	Fail class	F1…F6	Warning (F2)			
6420 Auto battery test							
6421	Auto batt test	Enable	On Off	Off		Option M4	Automatic battery test time setting.
6422	Auto batt test	Day	Monday Sunday	Monday			
6423	Auto batt test	Hours	0 h 23 h	10 h			
6424	Auto batt test	Week	1 52	52			
6425	Auto batt test	Relay	Start relay Option-dep.	Start relay			
6430 Battery asymmetry							
6431	Batt. asymmetry	T1	Power supply Multi-input 102 Multi-input 105 Multi-input 108	Multi-input 105		Option M4	Battery asymmetry input selections.
6432	Batt. asymmetry	RF1	Power supply Multi-input 102 Multi-input 105 Multi-input 108	Power supply			
6433	Batt. asymmetry	T2	Power supply Multi-input 102 Multi-input 105 Multi-input 108	Multi-input 108			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6434	Batt. asymmetry	RF2	Power supply Multi-input 102 Multi-input 105 Multi-input 108	Multi-input 102			
6440 Battery asymmetry 1							
6441	Battery asym 1	Set point	0.1 V 15.0 V	1.0 V		Option M4	If the battery voltage asymmetry between the single batteries exceeds the setting, the alarm will be activated.
6442	Battery asym 1	Timer	0.0 s 10.0 s	1.0 s			
6443	Battery asym 1	Relay output A	Not used Option-dep.	Not used			
6444	Battery asym 1	Relay output B	Not used Option-dep.	Not used			
6445	Battery asym 1	Enable	OFF ON	OFF			
6450 Battery asymmetry 2							
6451	Battery asym 2	Set point	0.1 V 15.0 V	1.0 V		Option M4	If the battery voltage asymmetry between the single batteries exceeds the setting, the alarm will be activated.
6452	Battery asym 2	Timer	0.0 s 10.0 s	1.0 s			
6453	Battery asym 2	Relay output A	Not used Option-dep.	Not used			
6454	Battery asym 2	Relay output B	Not used Option-dep.	Not used			
6455	Battery asym 2	Enable	OFF ON	OFF			

Max. ventilation

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6470 Max vent 1							
6471	Max vent 1	Set point	20 deg. 250 deg.	95 deg.		Option M4	If the cooling fans fail to operate and the coolant temperature exceeds the setting, the alarm will be activated.
6472	Max vent 1	Timer	0.0 s 60.0 s	1.0 s			
6473	Max vent 1	Relay output A	Not used Option-dep.	Not used			
6474	Max vent 1	Relay output B	Not used Option-dep.	Not used			
6475	Max vent 1	Enable	OFF ON	OFF			
6476	Max vent 1	Fail class	F1…F6	Warning (F2)			
6480 Max vent 2							
6481	Max vent 2	Set point	20 deg. 250 deg.	98 deg.		Option M4	If the cooling fans fail to operate and the coolant temperature exceeds the setting, the alarm will be activated.
6482	Max vent 2	Timer	0.0 s 60.0 s	1.0 s			
6483	Max vent 2	Relay output A	Not used Option-dep.	Not used			
6484	Max vent 2	Relay output B	Not used Option-dep.	Not used			
6485	Max vent 2	Enable	OFF ON	OFF			
6486	Max vent 2	Fail class	F1…F6	Shutdown (F5)			

Average busbar over-voltage

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7480 Avg U BB > 1							
7481	Avg U BB > 1	Set point	100 % 120 %	110 %		Option A1	The alarm “Avg U BB >” will be activated if the measured average value is above the set point in menu 7481 and has exceeded the time delay in menu 7482.
7482	Avg U BB > 1	Timer	0.1 sec. 3200.0 sec.	10.0 sec.			
7483	Avg U BB > 1	Relay output A	Not used Option-dep	Not used			
7484	Avg U BB > 1	Enable	OFF ON	OFF			
7485	Avg U BB > 1	Fail class	F1…F6	Warning (F2)			
7486	Avg U BB > 1	Timer	30 sec. 900 sec.	600 sec.			
7490 Avg U BB > 2							
7491	Avg U BB > 2	Set point	100 % 120 %	110 %		Option A1	The alarm “Avg U BB >” will be activated if the measured average value is above the set point in menu 7491 and has exceeded the time delay in menu 7492.
7492	Avg U BB > 2	Timer	0.1 sec. 3200.0 sec.	10.0 sec.			
7493	Avg U BB > 2	Relay output A	Not used Option-dep	Not used			
7494	Avg U BB > 2	Enable	OFF ON	OFF			
7495	Avg U BB > 2	Fail class	F1…F6	Warning (F2)			
7496	Avg U BB > 2	Timer	30 sec. 900 sec.	600 sec.			

External communication error

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7520 External communication error							
7521	Ext. comm. error	Delay	1.0 s 100.0 s	10.0 s		Option: Modbus (H2) Profibus (H3)	Supervision of the external communication line. The alarm will occur when there has not been any communication during the time delay.
7522	Ext. comm. error	Relay output A	Not used Option-dep.	Not used			
7523	Ext. comm. error	Relay output B	Not used Option-dep.	Not used			
7524	Ext. comm. error	Enable	OFF ON	OFF			
7525	Ext. comm. error	Fail class	F1…F6	Warning (F2)			

Engine interface communication alarms

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7570 EI Comm. error							
7571	EI Comm. error	Timer	0.0 s 100.0 s	0.0 s		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	Supervision of the EIC communication line. The alarm will occur when there has not been any communication during the time delay.
7572	EI Comm. error	Relay output A	Not used Option-dep.	Not used			
7573	EI Comm. error	Relay output B	Not used Option-dep.	Not used			
7574	EI Comm. error	Enable	OFF ON	ON			
7575	EI Comm. error	Fail class	F1…F6	Warning (F2)			
7580 EIC Warning							
7581	EIC Warning	Timer	0.0 s 100.0 s	0.0 s		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7582	EIC Warning	Relay output A	Not used Option-dep.	Not used			
7583	EIC Warning	Relay output B	Not used Option-dep.	Not used			
7584	EIC Warning	Enable	OFF ON	ON			
7585	EIC Warning	Fail class	F1…F6	Warning (F2)			
7590 EIC Shutdown							
7591	EIC Shutdown	Timer	0.0 s 100.0 s	0.0 s		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7592	EIC Shutdown	Relay output A	Not used Option-dep.	Not used			
7593	EIC Shutdown	Relay output B	Not used Option-dep.	Not used			
7594	EIC Shutdown	Enable	OFF ON	ON			
7595	EIC Shutdown	Fail class	F1…F6	Shutdown (F5)			
7600 EIC Overspeed							
7601	EIC Overspeed	Set point	100.0 % 150.0 %	110.0 %		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7602	EIC Overspeed	Timer	0.0 s 100.0 s	5.0 s			
7603	EIC Overspeed	Relay output A	Not used Option-dep.	Not used			
7604	EIC Overspeed	Relay output B	Not used Option-dep.	Not used			
7605	EIC Overspeed	Enable	OFF ON	ON			
7606	EIC Overspeed	Fail class	F1…F6	Warning (F2)			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7610 EIC Coolant temp. 1							
7611	EIC Coolant t. 1	Set point	-40 deg. 410 deg.	100 deg.		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7612	EIC Coolant t. 1	Timer	0.0 s 100.0 s	5.0 s			
7613	EIC Coolant t. 1	Relay output A	Not used Option-dep.	Not used			
7614	EIC Coolant t. 1	Relay output B	Not used Option-dep.	Not used			
7615	EIC Coolant t. 1	Enable	OFF ON	ON			
7616	EIC Coolant t. 1	Fail class	F1…F6	Warning (F2)			
7620 EIC Coolant temp. 2							
7621	EIC Coolant t. 2	Set point	-40 deg. 410 deg.	110 deg.		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7622	EIC Coolant t. 2	Timer	0.0 s 100.0 s	5.0 s			
7623	EIC Coolant t. 2	Relay output A	Not used Option-dep.	Not used			
7624	EIC Coolant t. 2	Relay output B	Not used Option-dep.	Not used			
7625	EIC Coolant t. 2	Enable	OFF ON	ON			
7626	EIC Coolant t. 2	Fail class	F1…F6	Warning (F2)			
7630 EIC Oil pressure 1							
7631	EIC Oil press. 1	Set point	0.0 bar 145.0 bar	2.0 bar		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7632	EIC Oil press. 1	Timer	0.0 s 100.0 s	5.0 s			
7633	EIC Oil press. 1	Relay output A	Not used Option-dep.	Not used			
7634	EIC Oil press. 1	Relay output B	Not used Option-dep.	Not used			
7635	EIC Oil press. 1	Enable	OFF ON	ON			
7636	EIC Oil press. 1	Fail class	F1…F6	Warning (F2)			
7640 EIC Oil pressure 2							
7641	EIC Oil press. 2	Set point	0.0 bar 145.0 bar	1.0 bar		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7642	EIC Oil press. 2	Timer	0.0 s 100.0 s	5.0 s			
7643	EIC Oil press. 2	Relay output A	Not used Option-dep.	Not used			
7644	EIC Oil press. 2	Relay output B	Not used Option-dep.	Not used			
7645	EIC Oil press. 2	Enable	OFF ON	ON			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7646	EIC Oil press. 2	Fail class	F1…F6	Shutdown (F5)			
7650 EIC Oil temp. 1							
7651	EIC Oil temp. 1	Set point	0 deg. 410 deg.	40 deg.		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7652	EIC Oil temp. 1	Timer	0.0 s 100.0 s	5.0 s			
7653	EIC Oil temp. 1	Relay output A	Not used Option-dep.	Not used			
7654	EIC Oil temp. 1	Relay output B	Not used Option-dep.	Not used			
7655	EIC Oil temp. 1	Enable	OFF ON	ON			
7656	EIC Oil temp. 1	Fail class	F1…F6	Warning (F2)			
7660 EIC Oil temp. 2							
7661	EIC Oil temp. 2	Set point	0 deg. 410 deg.	50 deg.		Option: J1939 and MTU ADEC/ MDEC (H5) Cummins Modbus (H6) J1939 (H7)	
7662	EIC Oil temp. 2	Timer	0.0 s 100.0 s	5.0 s			
7663	EIC Oil temp. 2	Relay output A	Not used Option-dep.	Not used			
7664	EIC Oil temp. 2	Relay output B	Not used Option-dep.	Not used			
7665	EIC Oil temp. 2	Enable	OFF ON	ON			
7666	EIC Oil temp. 2	Fail class	F1…F6	Shutdown (F5)			
7670 EIC coolant level 1							
7671	EIC coolant level 1	Set point	0 % 100 %	20 %		Option: Cummins Modbus (H6) J1939 and MTU ADEC/ MDEC (H5) J1939 (H7)	
7672	EIC coolant level 1	Timer	0.0 s 100.0 s	5.0 s			
7673	EIC coolant level 1	Relay output A	Not used Variant-dep.	Not used			
7674	EIC coolant level 1	Relay output B	Not used Variant-dep.	Not used			
7675	EIC coolant level 1	Enable	OFF ON	OFF			
7676	EIC coolant level 1	Fail class	F1…F6	Warning (F2)			
7680 EIC coolant level 2							
7681	EIC coolant level 2	Set point	0 % 100 %	10 %		Option: Cummins Modbus (H6) J1939 and MTU ADEC/ MDEC (H5) J1939 (H7)	
7682	EIC coolant level 2	Timer	0.0 s 100.0 s	5.0 s			
7683	EIC coolant level 2	Relay output A	Not used Variant-dep.	Not used			
7684	EIC coolant level 2	Relay output B	Not used Variant-dep.	Not used			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7685	EIC coolant level 2	Enable	OFF ON	OFF			
7686	EIC coolant level 2	Fail class	F1…F6	Shutdown (F5)			

CANshare supervision

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7860 CAN ID missing							
7861	CAN ID missing	Delay	1.0 s 3200.0 s	1.0 s		Option G9 GPU Hydro: Not available	Supervision of the CANshare communication. In case this alarm is activated, the unit is forced into the mode selected in menu 7865.
7862	CAN ID missing	Relay output A	Not used Option-dep.	Not used			
7863	CAN ID missing	Relay output B	Not used Option-dep.	Not used			
7864	CAN ID missing	Fail class	F1…F6	Warning (F2)			
7865	CAN fail mode	Mode	Manual SWBD	Manual SWBD No mode change Force analogue LS			
Duplicate CAN ID							
N/A	Duplicate CAN ID	Delay	0.1 s	0.1 s		Option G9 GPU Hydro: Not available	Supervision of duplicate CAN bus IDs on the CANshare line. When activated the unit is forced into the mode selected in menu 7865. This alarm is not configurable.
N/A	Duplicate CAN ID	Fail class	Warning	Warning			

Internal CAN communication error

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7930 CAN1 communication error							
7931	CAN1 com error	Delay	2.0 s 600.0 s	10.0 s		Option: External I/O modules (H8.2)	If both options H8.x are present, an error on any of these will activate the alarm.
7932	CAN1 com error	Relay output A	Not used Option-dep.	Not used			
7933	CAN1 com error	Relay output B	Not used Option-dep.	Not used			
7934	CAN1 com error	Enable	OFF ON	OFF			
7935	CAN1 com error	Fail class	F1…F6	Block (F1)			
7940 CAN2 communication error							
7941	CAN2 comm error	Delay	2.0 s 600.0 s	10.0 s		Option: External I/O modules (H8.8)	If both options H8.x are present, an error on any of these will activate the alarm.
7942	CAN2 comm error	Relay output A	Not used Option-dep.	Not used			
7943	CAN2 comm error	Relay output B	Not used Option-dep.	Not used			
7944	CAN2 comm error	Enable	OFF ON	OFF			
7945	CAN2 comm error	Fail class	F1…F6	Block (F1)			

External I/O alarm setup

The alarms based on external I/O modules can only be configured using the PC utility software.

Analogue inputs

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
12000 Ext. Ain 1.1							
12000	Ext. Ain 1.1	Set point	-3100 3100	10		Option: External I/O modules (H8.x)	
	Ext. Ain 1.1	Delay	0.1 s 600.0 s	10.0 s			
	Ext. Ain 1.1	Fail class	F1…F6	Warning (F2)			
	Ext. Ain 1.1	Relay output A	Not used Option-dep.	Not used			
	Ext. Ain 1.1	Relay output B	Not used Option-dep.	Not used			
	Ext. Ain 1.1	Enable	OFF ON	OFF			
12010 Ext. Ain 1.2							
12010	Ext. Ain 1.2	Set point	-3100 3100	10		Option: External I/O modules (H8.x)	
	Ext. Ain 1.2	Delay	0.1 s 600.0 s	10.0 s			
	Ext. Ain 1.2	Fail class	F1…F6	Warning (F2)			
	Ext. Ain 1.2	Relay output A	Not used Option-dep.	Not used			
	Ext. Ain 1.2	Relay output B	Not used Option-dep.	Not used			
	Ext. Ain 1.2	Enable	OFF ON	OFF			

The same order for external analogue inputs 2-8, settings 12030-12220.

Digital inputs

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
12540 Ext. dig. in 1							
12540	Ext. dig. in 1	Delay	1.0 s 600.0 s	10.0 s		Option: External I/O modules (H8.x)	
	Ext. dig. in 1	Fail class	F1…F6	Warning (F2)			
	Ext. dig. in 1	Relay output A	Not used Option-dep.	Not used			
	Ext. dig. in 1	Relay output B	Not used Option-dep.	Not used			
	Ext. dig. in 1	Enable	OFF ON	OFF			
	Ext. dig. in 1	N/X	N/O N/C	N/O			

The same order for external digital inputs 2-16, settings 12550-12690.

4. Parameter list

The parameter list contains settings for regulators and other non-alarm related settings.

Protections

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
1200 G voltage trip							
1201	G voltage trip	Set point	Ph-Ph Ph-N	Ph-Ph		Designer's Reference Handbook	Selection between phase-phase or phase-neutral voltage detection. When phase-phase tripping is selected, the voltage alarms relate to the nominal voltage. When phase-neutral tripping is selected, the voltage alarms relate to the nominal voltage divided by √3.
1202 I Unbal. calc							
1203	I Unbal. calc	Set point	"Ref. to nominal" "Ref. to average"	"Ref. to nominal"		Designer's Reference Handbook	"Ref. to nominal" Method based on a % calculation with reference to the "I" nominal value. "Ref to average" Value of "currents unbalance" in % is based on: measured current of each phase in comparison to the average value of all phase currents.
1340 Busbar voltage trip							
1341	BB voltage trip	Set point	Ph-Ph Ph-N	Ph-Ph		Designer's Reference Handbook	Selection between phase-phase or phase-neutral voltage detection.
1560 G negative sequence selection							
1561	G neg seq select	Set point	G measurement BB measurement	G measurement		Option C2	Selection between generator or busbar measurement of negative sequence voltage.
1590 G zero sequence selection							
1591	G zero seq select	Set point	G measurement BB measurement	G measurement		Option C2	Selection between generator or busbar measurement of zero sequence voltage.

Synchronisation

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2000 Sync. type							
2001	Sync. type	Type	Static Dynamic	Dynamic		Designer's Reference Handbook GPU Hydro: Option G2	Static sync. aims at a frequency difference of 0 Hz. Dynamic sync. aims at a frequency difference with a set point calculated as the midpoint between setting 2021 dfMax. and 2022 dfMin.
2010 Asynchronous sync.							
2011	Async. sync.	Max. slip	-10.0 % 10.0 %	1.0 %		Option M4	Setting 2010 is only available if "Asynchronous" is selected in setting 6361.
2012	Async. sync.	Min. slip	-10.0 % 10.0 %	0.0 %			
2020 Synchronisation							
2021	Synchronisation	dfMax.	0.0 Hz 0.5 Hz	0.3 Hz		Designer's Reference Handbook GPU Hydro: Option G2	Setting 2020 is only available if "Dynamic sync." is selected in setting 2001.
2022	Synchronisation	dfMin.	-0.5 Hz 0.3 Hz	0.0 Hz			
2023	Synchronisation	dUMax.	2 % 10 %	5 %			
2024	Synchronisation	Sync t. GB	40 ms 300 ms	50 ms			
2025	Synchronisation	Sync t. MB	40 ms 300 ms	50 ms			
2030 Static sync.							
2031	Static sync.	dfMax.	0.00 Hz 0.50 Hz	0.10 Hz		Designer's Reference Handbook GPU Hydro: Option G2	Setting 2030 is only available if "Static sync." is selected in setting 2001.
2032	Static sync.	dUMax.	2 % 10 %	5 %			
2033	Static sync.	Close window	0.1 deg. 20.0 deg.	10.0 deg.			
2034	Static sync.	Delay	0.1 s 99.0 s	1.0 s			
2035	Static sync.	GB set point	"Sync check" "Breaker sync" "Infinite sync"	"Breaker sync"		Designer's Reference Handbook	"Breaker sync" will give the breaker closing signal when the genset is inside the closing window. A breaker closing feedback is required. "Sync check" will operate like a synchroscope. It will give a close signal when the genset is
2036	Static type	MB set point	"Sync check" "Breaker sync"	"Breaker sync"			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
			“Infinite sync”				inside the closing window. This sync. type does not need a breaker close feedback. “Infinite sync” will synchronise the genset and keep it synchronised infinitely. No breaker closing signal is given.
2040 Frequency synchronisation control analogue							
2041	f sync. control	f Kp	0.00 60.00	0.50		Option E1, E2, EF2, EF4, EF5	PID controller for dynamic sync. This setting is only available if “analogue” or “PWM” or “EIC” is selected in setting 2780.
2042	f sync. control	f Ti	0.00 s 60.00 s	5.00 s			
2043	f sync. control	f Td	0.00 s 2.00 s	0.00 s			
2050 Frequency synchronisation control relay							
2051	f sync ctrl rel	Kp	0 100	10		Designer’s Reference Handbook GPU Hydro: Option G2	This setting is only available if “relay” is selected in setting 2780.
2060 Phase synchronisation control analogue							
2061	Phase control	Phase Kp	0.00 60.00	0.50		Option E1, E2, EF2, EF4, EF5	PID controller for static sync. This setting is only available if “analogue” or “PWM” or “EIC” is selected in setting 2780.
2062	Phase control	Phase Ti	0.00 s 60.00 s	5.00 s			
2063	Phase control	Phase Td	0.00 s 2.00 s	0.00 s			
2070 Phase control relay							
2071	Phase ctrl rel.	Kp	0 100	10		Designer’s Reference Handbook GPU Hydro: Option G2	This setting is only available if “relay” is selected in setting 2780.
2080 RPM synchronisation control analogue							
2081	RPM sync ctrl	Kp	0.00 60.00	0.50		Option E1, E2, EF2, EF4, EF5	PID controller for dynamic sync. This setting is only available if “analogue” or “PWM” or “EIC” is selected in setting 2780.
2082	RPM sync ctrl	Ti	0.00 s 60.00 s	5.00 s			
2083	RPM sync ctrl	Td	0.00 s 2.00 s	0.00 s			
2090 RPM synchronisation control relay							

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2091	RPM sync relay	Kp	0.00 60.00	10		Option M4	PID controller for dynamic sync. This setting is only available if “analogue” or “PWM” or “EIC” is selected in setting 2780.
2110 Synchronisation blackout							
2111	Sync. blackout	dfMax.	0.0 Hz 5.0 Hz	3.0 Hz		Designer’s Reference Handbook GPU Hydro: Option G2	Settings are accepted limits for closing of the breaker, referring to nominal frequency and voltage.
2112	Sync. blackout	dUMax.	2 % 10 %	5 %			
2240 Separate synchronisation relay							
2241	Sep sync relay	Relay GB	Not used Option-dep.	Not used		Designer’s Reference Handbook GPU Hydro: Option G2	The output activates during synchronisation and thereby a separate synchronising unit can be activated.

Regulation

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2500 Regulation modes active							
2501	Reg. modes act.	Modes	Sync Sync+GOV+AVR	Sync+GOV+AVR		Designer's Reference Handbook GPU Hydro: Not available	
2510 Frequency control analogue							
2511	f control	f Kp	0.00 60.00	2.50		Option E1, E2, EF2, EF4, EF5	PID controller for frequency control. This menu is only available if "analogue" is selected in menu 2781.
2512	f control	f Ti	0.00 s 60.00 s	2.50 s			
2513	f control	f Td	0.00 s 2.00 s	0.00 s			
2514	f control	f droop	0.0 % 10.0 %	4.0 %			
2530 Power control analogue							
2531	P control	P Kp	0.00 60.00	2.50		Option E1, E2, EF2, EF4, EF5 GPU Hydro: Not available	PID controller for power control. This menu is only available if "analogue" is selected in menu 2781.
2532	P control	P Ti	0.00 s 60.00 s	2.50 s			
2533	P control	P Td	0.00 s 2.00 s	0.00 s			
2540 Power load sharing control analogue							
2541	P LS ctrl	f Kp	0.00 60.00	2.50		Option E1, E2, EF2, EF4, EF5 GPU Hydro: Not available	PID controller for load sharing control. This menu is only available if "analogue" is selected in menu 2781.
2542	P LS ctrl	f Ti	0.00 s 60.00 s	2.50 s			
2543	P LS ctrl	f Td	0.00 s 2.00 s	0.00 s			
2544	P LS ctrl	P weight	0.0 % 100.0 %	15.0 %			
2550 GOV out offset							
2551	Analogue GOV	Offset	0 % 100 %	50 %		Option E1, E2, EF2, EF4, EF5	PID controller for power control. This menu is only available if "analogue" is selected in menu 2781.
2552	GOV out offset	Manual slope	0.0 %/s 100.0 %/s	1.0 %/s			
2570 Frequency control relay							
2571	f control relay	Deadband	0.2 % 10.0 %	1.0 %		Designer's Reference Handbook	This menu is only available if "relay" is selected in menu 2781.
2572	f control relay	Kp	0 100	10			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2573	f control relay	Droop	0.0 % 10.0 %	4.0 %		GPU Hydro: Option G2	
2580 Power control relay							
2581	P control relay	Deadband	0.2 % 10.0 %	2.0 %		Designer's Reference Handbook GPU Hydro: Not available	This menu is only available if "relay" is selected in menu 2781.
2582	P control relay	Kp	0 100	10			
2590 Load sharing control relay							
2591	P LS ctrl rel	f deadband	0.2 % 10.0 %	1.0 %		Designer's Reference Handbook GPU Hydro: Not available	This menu is only available if "relay" is selected in menu 2781.
2592	P LS ctrl rel	f Kp	0 100	10			
2593	P LS ctrl rel	P deadband	0.2 % 10.0 %	2.0 %			
2594	P LS ctrl rel	P weight	0.0 % 100.0 %	15.0 %			
2600 Relay control							
2601	Relay control	GOV ON time	10 ms 6500 ms	200 ms		Designer's Reference Handbook GPU Hydro: Option G2	This menu is only available if "relay" is selected in menu 2781. Menu 2605: when set to "ON", the GOV up relay is activated for the duration of the setting in 2601.
2602	Relay control	GOV period time	50 ms 32500 ms	1500 ms			
2603	Relay control	Increase relay	Not used Option-dep.	Not used			
2604	Relay control	Decrease relay	Not used Option-dep.	Not used			
2605	Relay control	GOV ON time test	ON OFF	OFF			
2610 Power ramp up							
2611	Power ramp up	Speed	0.1 %/s 20.0 %/s	2.0 %/s		Designer's Reference Handbook GPU Hydro: Not available	The delay point determines when the generator will make a temporary stop ramping up after closing of the generator breaker to preheat the engine before commencing load taking. If the delay function is not needed, set this time to 0. Power % settings relate to nominal generator power.
2612	Power ramp up	Delay point	1 % 100 %	10 %			
2613	Power ramp up	Delay time	0 s 9900 s	10 s			
2614	Power ramp up	Load share ramp	OFF ON	OFF			
2615	Power ramp up	Steps	0 100	1			
2616	Power ramp up	Deadband	0.1 % 20.0 %	2.0 %			
2620 Power ramp down							
2621	Power ramp down	Speed	0.1 %/s 20.0 %/s	10.0 %/s		Designer's Reference	The breaker open point determines

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2622	Power ramp down	Breaker open point	1 % 20 %	5 %		Handbook GPU Hydro: Not available	when the “open breaker” relay output is activated to open the generator breaker before reaching 0 kW. Power % settings relate to nominal generator power. 2623: During de-load in load sharing mode, the breaker will be opened in case the frequency deviation from nominal exceeds this setting.
2623	Breaker open df	Breaker open frequency deviation	0.1 Hz 5.0 Hz	1.0 Hz			
2640 Voltage control analogue							
2641	U control	U Kp	0.00 60.00	2.50		Option: AVR control (D1)	PID controller for voltage control. This menu is only available if analogue output is selected in menu 2782.
2642	U control	U Ti	0.00 s 60.00 s	2.50 s			
2643	U control	U Td	0.00 s 2.00 s	0.00 s			
2644	U control	U droop	0.0 % 10.0 %	4.0 %			
2650 Reactive power control analogue							
2651	Q control	Q Kp	0.00 60.00	2.50		Option: AVR control (D1) GPU Hydro: Not available	PID controller for reactive power control. The reactive power control is used for power factor as well as reactive power control. This menu is only available if analogue output is selected in menu 2782.
2652	Q control	Q Ti	0.00 s 60.00 s	2.50 s			
2653	Q control	Q Td	0.00 s 2.00 s	0.00 s			
2660 Reactive power load sharing control analogue							
2661	Q LS ctrl	U Kp	0.00 60.00	2.50		Option: AVR control (D1) GPU	The var (Q) load sharing is based on a mix of voltage and var control. The setting 2664 is
2662	Q LS ctrl	U Ti	0.00 s 60.00 s	2.50 s			
2663	Q LS ctrl	U Td	0.00 s 2.00 s	0.00 s			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2664	Q LS ctrl	Q weight	0.0 % 100.0 %	15.0 %		Hydro: Not available	setting the impact of the var controller over the voltage controller. This menu is only available if analogue output is selected in menu 2782.
2670 AVR out offset							
2671	AVR out offset	Offset	0 % +100 %	50 %		Option: AVR control (D1)	Setting 2671 sets the offset of the analogue output when starting the generator. This menu is only available if analogue output is selected in menu 2782.
2690 Voltage control relay							
2691	U control	U deadband	0.0 % 10.0 %	2.0 %		Option: AVR control (D1)	PI controller for voltage control. This menu is only available if “relay” is selected in menu 2782.
2692	U control	U Kp	0 100	10			
2693	U control	U droop	0.0 % 10.0 %	4.0 %			
2700 Reactive power control relay							
2701	Q control	Deadband	0.0 % 10.0 %	2.0 %		Option: AVR control (D1) GPU Hydro: Not available	PI controller for reactive power control. The reactive power control is used for power factor as well as reactive power control. This menu is only available if “relay” is selected in menu 2782.
2702	Q control	Q Kp	0 100	10			
2710 Reactive power load sharing control relay							
2711	Q LS ctrl rel.	U deadband	0.0 % 10.0 %	1.0 %		Option: AVR control (D1) GPU Hydro: Not available	The var (Q) load sharing is based on a mix of voltage and var control. The setting 2664 is setting the impact of the var controller over the voltage controller. This menu is only available if “relay” is selected in menu 2782.
2712	Q LS ctrl rel.	U Kp	0 100	10			
2713	Q LS ctrl rel.	Q deadband	0.0 % 10.0 %	2.0 %			
2714	Q LS ctrl rel.	Q weight	0.0 % 100.0 %	15.0 %			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2720 Relay control (AVR)							
2721	Relay control	AVR ON time t_N	10 ms 3000 ms	100 ms		Option: AVR control (D1)	Relay outputs for voltage/var/power factor control. This menu is only available if “relay” is selected in menu 2782. Menu 2725: when set to “ON”, the AVR up relay is activated for the duration of the setting in 2721.
2722	Relay control	AVR per time t_P	50 ms 1500 ms	500 ms			
2723	Relay control	U increase	Not used Option-dep.	Not used			
2724	Relay control	U decrease	Not used Option-dep.	Not used			
2725	Relay control	AVR ON time test	ON OFF	OFF			
2740 Delay regulation							
2741	Delay reg.	Delay	0 s 9900 s	0 s		Designer’s Reference Handbook GPU Hydro: Option G2	Delay regulation is the waiting time before synchronising after the engine has started. It is used if the engine needs to stabilise after start before attempting to synchronise.
2742	Delay reg.	Relay output A	Not used Option-dep.	Not used			
2743	Delay reg.	Relay output B	Not used Option-dep.	Not used			
2770 EIC control							
2771	Scania control	Droop	0.0 % 25.0 %	0.0 %	Only available if “Scania” is selected in menu 7561.	Option: J1939 (H5 or H7)	Setting of speed control via engine communication interface.
2772	Scania control	RPM	User 1500 RPM 1800 RPM Low idle	User			
2773	Cummins Gain	Kp	0.00 10.00	5.00	Only available if “Cummins” is selected in menu 7561.		
2780 Regulator output							
2781	Reg. output	GOV	Relay EIC	Relay		Designer’s Reference Handbook GPU Hydro: Option G2	Selection of the speed output: Relay, analogue or engine interface communication. Analogue and EIC are option-dependent.

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
2782	Reg. output	AVR	Relay Analogue EIC	Relay		Option: AVR control (D1)	Generator voltage control based on relay, analogue or EIC output signals. Analogue selection is only available if option E1, E2, EF2, EF4 or F2 is present. EIC selection requires option H5 or H7.
2790 EIC speed demand switch							
2791	EIC speed dem. Sw.	Local norm sw.	Ana. CAN Up/Down ECU Up/Down CAN Ana. ECU Ana. ECU rel. Frequency	Analogue CAN	Only MTU J1939 Smart Connect	Option: J1939 and MTU ADEC/ MDEC (H5) J1939 (H7)	Selection of used method of speed control for normal and emergency operation in either local or remote modes of the ECU8. Select Analogue CAN for J1939 control. Select Up/Down ECU for relay control. Select Analogue ECU relative for analogue control.
2792	EIC speed dem. Sw.	Local Emerg sw.	Ana. CAN Up/Down ECU Up/Down CAN Ana. ECU Ana. ECU rel. Frequency	Analogue CAN	Only MTU J1939 Smart Connect		
2793	EIC speed dem. Sw.	Remote norm sw.	Ana. CAN Up/Down ECU Up/Down CAN Ana. ECU Ana. ECU rel. Frequency	Analogue CAN	Only MTU J1939 Smart Connect		
2794	EIC speed dem. Sw.	Remote Emerg sw.	Ana. CAN Up/Down ECU Up/Down CAN Ana. ECU Ana. ECU rel. Frequency	Analogue CAN	Only MTU J1939 Smart Connect		

Relay output setup

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5000 Relay 05							
5001	Relay 05	Function	Alarm Horn	Horn		Designer's Reference Handbook	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5002	Relay 05	OFF delay	0.0 s 3200.0 s	5.0 s			
5010 Relay 08							
5011	Relay 08	Function	Alarm Horn	Alarm		Designer's Reference Handbook	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5012	Relay 08	OFF delay	0.0 s 3200.0 s	5.0 s			
5020 Relay 11							
5021	Relay 11	Function	Alarm Horn	Alarm		Designer's Reference Handbook	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5022	Relay 11	OFF delay	0.0 s 3200.0 s	5.0 s			
5030 Relay 14							
5031	Relay 14	Function	Alarm Horn	Alarm		Designer's Reference Handbook	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5032	Relay 14	OFF delay	0.0 s 3200.0 s	5.0 s			
5040 Relay 17							
5041	Relay 17	Function	Alarm Horn	Alarm		Option G4 and G5	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5042	Relay 17	OFF delay	0.0 s 3200.0 s	5.0 s			
5050 Relay 20							
5051	Relay 20	Function	Alarm Horn	Alarm		Designer's Reference	Function selections: - Alarm NE

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5052	Relay 20	OFF delay	0.0 s 3200.0 s	5.0 s		Handbook	- Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5060 Relay 21							
5061	Relay 21	Function	Alarm Horn	Alarm		Designer's Reference Handbook	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5062	Relay 21	OFF delay	0.0 s 3200.0 s	5.0 s			
5110 Relay 57							
5111	Relay 57	Function	Alarm Horn	Alarm		Option M12	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5112	Relay 57	OFF delay	0.0 s 3200.0 s	5.0 s			
5120 Relay 59							
5121	Relay 59	Function	Alarm Horn	Alarm		Option M12	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5122	Relay 59	OFF delay	0.0 s 3200.0 s	5.0 s			
5130 Relay 61							
5131	Relay 61	Function	Alarm Horn	Alarm		Option M12	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5132	Relay 61	OFF delay	0.0 s 3200.0 s	5.0 s			
5140 Relay 63							
5141	Relay 63	Function	Alarm Horn	Alarm		Option M12	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5142	Relay 63	OFF delay	0.0 s 3200.0 s	5.0 s			
5150 Relay 65							
5151	Relay 65	Function	Alarm Horn	Alarm		Designer's Reference	Normally used for governor UP command

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5152	Relay 65	OFF delay	0.0 s 3200.0 s	5.0 s		Handbook GPU Hydro: Option M14.4	(menu 2600). Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5160 Relay 67							
5161	Relay 67	Function	Alarm Horn	Alarm		Designer's Reference Handbook GPU Hydro: Option M14.4	Normally used for governor DOWN command (menu 2600). Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5162	Relay 67	OFF delay	0.0 s 3200.0 s	0.0 s			
5170 Relay 69							
5171	Relay 69	Function	Alarm Horn	Alarm		Designer's Reference Handbook GPU Hydro: Option M14.4	Normally used for AVR UP command (menu 2720). Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5172	Relay 69	OFF delay	0.0 s 3200.0 s	5.0 s			
5180 Relay 71							
5181	Relay 71	Function	Alarm Horn	Alarm		Designer's Reference Handbook GPU Hydro: Option M14.4	Normally used for AVR DOWN command (menu 2720). Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5182	Relay 71	OFF delay	0.0 s 3200.0 s	5.0 s			
5190 Relay 90							
5191	Relay 90	Function	Alarm Limit Horn	Alarm		Option M14.6: 4 × relay output, slot #6	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5192	Relay 90	OFF delay	0.0 s 3200.0 s	5.0 s			
5200 Relay 92							

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5201	Relay 92	Function	Alarm Limit Horn	Alarm		Option M14.6: 4 × relay output, slot #6	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5202	Relay 92	OFF delay	0.0 s 3200.0 s	5.0 s			
5210 Relay 94							
5211	Relay 94	Function	Alarm Limit Horn	Alarm		Option M14.6: 4 × relay output, slot #6	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5212	Relay 94	OFF delay	0.0 s 3200.0 s	5.0 s			
5220 Relay 96							
5221	Relay 96	Function	Alarm Limit Horn	Alarm		Option M14.6: 4 × relay output, slot #6	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5222	Relay 96	OFF delay	0.0 s 3200.0 s	5.0 s			
5230 Relay 126							
5231	Relay 126	Function	Alarm Limit Horn	Alarm		Option M14.8: 4 × relay output, slot #8	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5232	Relay 126	OFF delay	0.0 s 3200.0 s	5.0 s			
5240 Relay 128							
5241	Relay 128	Function	Alarm Limit Horn	Alarm		Option M14.8: 4 × relay output, slot #8	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5242	Relay 128	OFF delay	0.0 s 3200.0 s	5.0 s			
5250 Relay 130							
5251	Relay 130	Function	Alarm Limit Horn	Alarm		Option M14.8: 4 × relay output, slot #8	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5252	Relay 130	OFF delay	0.0 s 3200.0 s	5.0 s			
5260 Relay 132							

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5261	Relay 132	Function	Alarm Limit Horn	Alarm		Option M14.8: 4 x relay output, slot #8	Function selections: - Alarm NE - Alarm/reset - Limit - Horn - Siren relay - Alarm ND - Common alarm
5262	Relay 132	OFF delay	0.0 s 3200.0 s	5.0 s			
5270 Transistor output setup							
5271	Transistor 20	T20	Relay kWh	Relay		Designer's Reference Handbook	The transistor outputs on terminals 21 and 22 can be configured as relay outputs or pulse signals. If "Relay" is selected, the relays 20 and 21 will be available. If set to "Relay", external relays are needed due to limited current output. Max. 10 mA.
5272	Transistor 21	T21	Relay kvarh	Relay			

Analogue output limits

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5720 PWM 68 limits (option EF5)							
5721	PWM 68 limits	Min.	0 % 50 %	10 %		Option E and F	For Caterpillar engines. Offset is adjusted in menu 2551.
5722	PWM 68 limits	Max.	50 % 100 %	90 %			
5780 AOut 66 limits (option EF5)							
5781	AOut 66 limits	Min.	-25/0 mA 10 mA	-20/0 mA		Option E and F	Min. range and factory setting value is option-dependent.
5782	AOut 66 limits	Max.	10 mA 25 mA	20 mA			
5790 AOut 71 limits (option EF5)							
5791	AOut 71 limits	Min.	-25/0 mA 10 mA	-20/0 mA		Option E and F	Min. range and factory setting value is option-dependent.
5792	AOut 71 limits	Max.	10 mA 25 mA	20 mA			
5720 PWM 70 limits (option EF6)							
5721	PWM 70 limits	Min.	0 % 50 %	10 %		Option E and F	Min. range and factory setting value is option-dependent.
5722	PWM 70 limits	Max.	50 % 100 %	90 %			
5780 AOut 68 limits (option EF6)							
5781	AOut 68 limits	Min.	-25/0 mA 10 mA	-20/0 mA		Option E and F	For Caterpillar engines.
5782	AOut 68 limits	Max.	10 mA 25 mA	20 mA			
5790 AOut 72 limits (option EF6)							
5791	AOut 72 limits	Min.	-25/0 mA 10 mA	-20/0 mA		Option E and F	Min. range and factory setting value is option-dependent.
5792	AOut 72 limits	Max.	10 mA 25 mA	20 mA			
5800 AOut 91 limits							
5801	AOut 91 limits	Min.	0 mA 10 mA	0 mA		Option E and F	Min. range and factory setting value is option-dependent.
5802	AOut 91 limits	Max.	10 mA 25 mA	20 mA			
5810 AOut 95 limits							
5811	AOut 95 limits	Min.	0 mA 10 mA	0 mA		Option E and F	Min. range and factory setting value is option-dependent.
5812	AOut 95 limits	Max.	10 mA 25 mA	20 mA			

Fuel limiter output

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5740 Fuel limiter							
5741	Fuel limiter	Output A	Disabled Option-dep.	Disabled		Option M4	
5742	Fuel limiter	Output B	Disabled Option-dep.	Disabled			
5743	Fuel limiter	Type	Disabled 0-20 mA	Disabled			
5750 Fuel limiter 1-3							
5751	Fuel limiter 1-3	R1	0 RPM 4000 RPM	834 RPM		Option M4	Curve setting for fuel limiter output. The condition has to be true, that is R1<R2<R3<R4<R5<R6<R7<R8<R9 If this is not fulfilled, the worst-case set point R9 will be used.
5752	Fuel limiter 1-3	AO1	0.0 mA 20.0 mA	0.0 mA			
5753	Fuel limiter 1-3	R2	0 RPM 4000 RPM	963 RPM			
5754	Fuel limiter 1-3	AO2	0.0 mA 20.0 mA	0.1 mA			
5755	Fuel limiter 1-3	R3	0 RPM 4000 RPM	1085 RPM			
5756	Fuel limiter 1-3	AO3	0.0 mA 20.0 mA	3.3 mA			
5760 Fuel limiter 4-6							
5761	Fuel limiter 4-6	R4	0 RPM 4000 RPM	1214 RPM		Option M4	Curve setting for fuel limiter output. The condition has to be true, that is R1<R2<R3<R4<R5<R6<R7<R8<R9 If this is not fulfilled, the worst-case set point R9 will be used.
5762	Fuel limiter 4-6	AO4	0.0 mA 20.0 mA	6.4 mA			
5763	Fuel limiter 4-6	R5	0 RPM 4000 RPM	1351 RPM			
5764	Fuel limiter 4-6	AO5	0.0 mA 20.0 mA	9.3 mA			
5765	Fuel limiter 4-6	R6	0 RPM 4000 RPM	1486 RPM			
5766	Fuel limiter 4-6	AO6	0.0 mA 20.0 mA	12.2 mA			
5770 Fuel limiter 7-9							
5771	Fuel limiter 7-9	R7	0 RPM 4000 RPM	1639 RPM		Option M4	Curve setting for fuel limiter output. The condition has to be true, that is R1<R2<R3<R4<R5<R6<R7<R8<R9 If this is not fulfilled, the worst-case set point R9 will be used.
5772	Fuel limiter 7-9	AO7	0.0 mA 20.0 mA	14.8 mA			
5773	Fuel limiter 7-9	R8	0 RPM 4000 RPM	1793 RPM			
5774	Fuel limiter 7-9	AO8	0.0 mA 20.0 mA	17.5 mA			
5775	Fuel limiter 7-9	R9	0 RPM 4000 RPM	1800 RPM			
5776	Fuel limiter 7-9	AO9	0.0 mA 20.0 mA	20.0 mA			

Transducer outputs

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5820 P output 1							
5821	P output 1	Output A	Disabled Option-dep.	Disabled		Option E and F	
5822	P output 1	Output B	Disabled Option-dep.	Disabled			
5823	P output 1	Type	0-20 mA 4-20 mA	4-20 mA			
5824	P output 1	Max. value	0 kW 20000 kW	500 kW			
5825	P output 1	Min. value	-9999 kW 20000 kW	0 kW			
5830 P output 2							
5831	P output 2	Output A	Disabled Option-dep.	Disabled		Option E and F	
5832	P output 2	Output B	Disabled Option-dep.	Disabled			
5833	P output 2	Type	0-20 mA 4-20 mA	4-20 mA			
5834	P output 2	Max. value	0 kW 20000 kW	500 kW			
5835	P output 2	Min. value	-9999 kW 20000 kW	0 kW			
5840 P output 3							
5841	P output 3	Output A	Disabled Option-dep.	Disabled		Option E and F	
5842	P output 3	Output B	Disabled Option-dep.	Disabled			
5843	P output 3	Type	0-20 mA 4-20 mA	4-20 mA			
5844	P output 3	Max. value	0 kW 20000 kW	500 kW			
5845	P output 3	Min. value	-9999 kW 20000 kW	0 kW			
5850 S output							
5851	S output	Output A	Disabled Option-dep.	Disabled		Option E and F	
5852	S output	Output B	Disabled Option-dep.	Disabled			
5853	S output	Type	0-20 mA 4-20 mA	4-20 mA			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5854	S output	Max. value	0 kVA 20000 kVA	600 kVA			
5855	S output	Min. value	-9999 kVA 20000 kVA	0 kVA			
5860 Q output							
5861	Q output	Output A	Disabled Option-dep.	Disabled		Option E and F	
5862	Q output	Output B	Disabled Option-dep.	Disabled			
5863	Q output	Type	0-20 mA 4-20 mA	4-20 mA			
5864	Q output	Max. value	0 kvar 16000 kvar	400 kvar			
5865	Q output	Min. value	8000 kvar 16000 kvar	0 kvar			
5870 PF output							
5871	PF output	Output A	Disabled Option-dep.	Disabled		Option E and F	Positive value means inductive. Negative value means capacitive.
5872	PF output	Output B	Disabled Option-dep.	Disabled			
5873	PF output	Type	0-20 mA 4-20 mA	4-20 mA			
5874	PF output	Max. value	0.5 0.99	0.80			
5875	PF output	Min. value	-0.99 -0.50	-0.80			
5880 f output							
5881	f output	Output A	Disabled Option-dep.	Disabled		Option E and F	
5882	f output	Output B	Disabled Option-dep.	Disabled			
5883	f output	Type	0-20 mA 4-20 mA	4-20 mA			
5884	f output	Max. value	0.0 Hz 70.0 Hz	55.0 Hz			
5885	f output	Min. value	0.0 Hz 70.0 Hz	45.0 Hz			
5890 U output							
5891	U output	Output A	Disabled Option-dep.	Disabled		Option E and F	The voltage output represents L1-L2 voltage.
5892	U output	Output B	Disabled Option-dep.	Disabled			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5893	U output	Type	0-20 mA 4-20 mA	4-20 mA			
5894	U output	Max. value	0 V 28000 V	500 V			
5895	U output	Min. value	0 V 28000 V	0 V			
5900 I output							
5901	I output	Output A	Disabled Option-dep.	Disabled		Option E and F	The current output represents L1 current.
5902	I output	Output B	Disabled Option-dep.	Disabled			
5903	I output	Type	0-20 mA 4-20 mA	4-20 mA			
5904	I output	Max. value	0 A 9000 A	1000 A			
5905	I output	Min. value	0 A 9000 A	0 A			
5910 U BB output							
5911	U BB output	Output A	Disabled Option-dep.	Disabled		Option E and F	The voltage output represents L1-L2 voltage.
5912	U BB output	Output B	Disabled Option-dep.	Disabled			
5913	U BB output	Type	0-20 mA 4-20 mA	4-20 mA			
5914	U BB output	Max. value	0 V 28000 V	500 V			
5915	U BB output	Min. value	0 V 28000 V	0 V			
5920 f BB output							
5921	f BB output	Output A	Disabled Option-dep.	Disabled		Option E and F	
5922	f BB output	Output B	Disabled Option-dep.	Disabled			
5923	f BB output	Type	0-20 mA 4-20 mA	4-20 mA			
5924	f BB output	Max. value	0.0 Hz 70.0 Hz	55.0 Hz			
5925	f BB output	Min. value	0.0 Hz 70.0 Hz	45.0 Hz			
5930 Multi-input 102							
5931	Multi-input 102	Output A	Disabled Option-dep.	Disabled		Option E and F	

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5932	Multi-input 102	Output B	Disabled Option-dep.	Disabled			
5933	Multi-input 102	Type	0-20 mA 4-20 mA	4-20mA			
5934	Multi-input 102	Max. value	0 28000	500			
5935	Multi-input 102	Min. value	0 28000	0			
5940 Multi-input 105							
5941	Multi-input 105	Output A	Disabled Option-dep.	Disabled		Option E and F	
5942	Multi-input 105	Output B	Disabled Option-dep.	Disabled			
5943	Multi-input 105	Type	0-20 mA 4-20 mA	4-20 mA			
5944	Multi-input 105	Max. value	0 28000	500			
5945	Multi-input 105	Min. value	0 28000	0			
5950 Multi-input 108							
5951	Multi-input 108	Output A	Disabled Option-dep.	Disabled		Option E and F	.
5952	Multi-input 108	Output B	Disabled Option-dep.	Disabled			
5953	Multi-input 108	Type	0-20 mA 4-20 mA	4-20 mA			
5954	Multi-input 108	Max. value	0 28000	500			
5955	Multi-input 108	Min. value	0 28000	0			
5960 P total consumed							
5961	P total consumed	Output A	Disabled Option-dep.	Disabled		Option E and F	
5962	P total consumed	Output B	Disabled Option-dep.	Disabled			
5963	P total consumed	Type	0-20 mA 4-20 mA	4-20 mA			
5964	P total consumed	Max. value	0 kW 20000 kW	500 kW			
5965	P total consumed	Min. value	-9999 kW 20000 kW	0 kW			
5970 P total available							

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
5971	P total available	Output A	Disabled Option-dep.	Disabled		Option E and F	
5972	P total available	Output B	Disabled Option-dep.	Disabled			
5973	P total available	Type	0-20 mA 4-20 mA	4-20 mA			
5974	P total available	Max. value	0 kW 20000 kW	500 kW			
5975	P total available	Min. value	-9999 kW 20000 kW	0 kW			

Regulator output selection

These menus are used to select which analogue output to use for governor/AVR (option D) control.

No.	Setting		Available settings	Factory setting	Notes	Ref.	Description
5980 Governor output							
5981	Governor output	Output A	Disabled AO66 AO71	Disabled		Option E and F	
5990 AVR output							
5991	AVR output	Output A	Disabled AO66 AO71	Disabled		Option D	

General setup

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6000 Nominal settings 1							
6001	Nom. settings 1	Frequency	48.0 Hz 62.0 Hz	50.0 Hz		Designer's Reference Handbook	The selection of nominal settings to be used is set in 6006. A binary input or selection in M-Logic can also be used. The range of nom. voltage and nom. power depends on the selected range in "9030 Scaling".
6002	Nom. settings 1	Power	10 kW 20000 kW	480 kW			
6003	Nom. settings 1	Current	0 A 9000 A	867 A			
6004	Nom. settings 1	Voltage	100 V 25000 V	400 V			
6005	Nom. settings 1	RPM	100 RPM 4000 RPM	1500 RPM			
6006	Nom. settings 1	Set	1 4	1			
6010 Nominal settings 2							
6011	Nom. settings 2	Frequency	48.0 Hz 62.0 Hz	50.0 Hz		Designer's Reference Handbook	The range of nom. voltage and nom. power depends on the selected range in "9030 Scaling".
6012	Nom. settings 2	Power	10 kW 20000 kW	230 kW			
6013	Nom. settings 2	Current	0 A 9000 A	345 A			
6014	Nom. settings 2	Voltage	100 V 25000 V	480 V			
6015	Nom. settings 2	RPM	100 RPM 4000 RPM	1500 RPM			
6020 Nominal settings 3							
6021	Nom. settings 3	Frequency	48.0 Hz 62.0 Hz	60.0 Hz		Designer's Reference Handbook	The range of nom. voltage and nom. power depends on the selected range in "9030 Scaling".
6022	Nom. settings 3	Power	10 kW 20000 kW	230 kW			
6023	Nom. settings 3	Current	0 A 9000 A	345 A			
6024	Nom. settings 3	Voltage	100 V 25000 V	480 V			
6025	Nom. settings 3	RPM	100 RPM 4000 RPM	1800 RPM			
6030 Nominal settings 4							
6031	Nom. settings 4	Frequency	48.0 Hz 62.0 Hz	60.0 Hz		Designer's Reference Handbook	The range of nom. voltage and nom. power depends on the selected range in "9030 Scaling".
6032	Nom. settings 4	Power	10 kW 20000 kW	230 kW			
6033	Nom. settings 4	Current	0 A 9000 A	345 A			
6034	Nom. settings 4	Voltage	100 V 25000 V	480 V			
6035	Nom. settings 4	RPM	100 RPM 4000 RPM	1800 RPM			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6040 G transformer							
6041	G transformer	U primary	100 V 25000 V	400 V		Designer's Reference Handbook	If no voltage transformer is present, the primary and secondary side values are set to generator nominal value.
6042	G transformer	U secondary	100 V 690 V	400 V			
6043	G transformer	I primary	5 A 9000 A	1000 A			
6044	G transformer	I secondary	1 A 5 A	5 A			
6050 Busbar settings 1							
6051	BB settings 1	U primary	10 V 160 kV	400 V		Designer's Reference Handbook	If no voltage transformer is present, the primary and secondary side values are set to generator nominal value. Selection between busbar nominal settings 1 and 2 can be done in M-Logic or by menu 6054. BB primary voltage range depends on scaling setting in menu 9030.
6052	BB settings 1	U secondary	100 V 690 V	400 V			
6053	BB settings 1	U BB nom.	10 V 160 kV	400 V			
6054	BB settings 1	BB nominal settings	Nominal setting 1 Nominal setting 2	Nominal setting 1			
6060 Busbar settings 2							
6061	BB settings 2	U primary	10 V 160 kV	400 V		Designer's Reference Handbook	If no voltage transformer is present, the primary and secondary side values are set to generator nominal value. BB primary voltage range depends on scaling setting in menu 9030.
6062	BB settings 2	U secondary	100 V 690 V	400 V			
6063	BB settings 2	U BB nom.	10 V 160 kV	400 V			
6080 Language							
6081	Language		English Language 1-11	English		Designer's Reference Handbook	The master language is English. Additionally, 11 different languages can be configured with the PC utility software.

Counters and timers

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6090 Date and time							
6091	Date and time	Year	2001 2100	2008		Designer's Reference Handbook	Used to set up the clock in the unit.
6092	Date and time	Month	1 12	1			
6093	Date and time	Date	1 31	1			
6094	Date and time	Day of week	1 7	1			
6095	Date and time	Hour	0 23	3			
6096	Date and time	Minute	0 59	5			
6100 Counters							
6101	Counters	Running hours	0 hrs 999 hrs	0 hrs		Designer's Reference Handbook	Setting 6105 resets the kWh counter to 0. It reverts to OFF automatically after being set ON.
6102	Counters	Running, th. hours	0 th. hrs 999 th. hrs	0 th. hrs			
6103	Counters	GB operations	0 20000	0			
6104	Counters	Not available					
6105	Counters	kWh	OFF ON	OFF			
6106	Counters	Start attempts	0 20000	0			
6110 Service timer 1							
6111	Service timer 1	Enable	OFF ON	ON		Option M4	The timer is reset by enabling menu 6116. The menu goes OFF automatically.
6112	Service timer 1	Running hours	0 hrs 9000 hrs	500 hrs			
6113	Service timer 1	Days	1 day 1000 days	365 days			
6114	Service timer 1	Fail class	F1…F6	F2 (warning)			
6115	Service timer 1	Output A	Not used Option-dep.	Not used			
6116	Service timer 1	Reset	OFF ON	OFF			
6120 Service timer 2							
6121	Service timer 2	Enable	OFF ON	ON		Option M4	The timer is reset by enabling menu 6126. The menu goes OFF automatically.
6122	Service timer 2	Running hours	0 hrs 9000 hrs	500 hrs			
6123	Service timer 2	Days	1 day 1000 days	365 days			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6124	Service timer 2	Fail class	F1…F6	F2 (warning)			
6125	Service timer 2	Relay output A	Not used Option-dep.	Not used			
6126	Service timer 2	Reset	OFF ON	OFF			

Alarm horn

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6130 Alarm horn							
6131	Alarm horn	ON time	0.0 s 3200.0 s	0.0 s		Designer's Reference Handbook	If the setting is adjusted to 0.0 s, the horn relay will be activated continuously until the alarm is acknowledged.

Local/remote mode selection

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6140 Local/remote							
6141	Local/remote	Fixed mode	OFF REMOTE LOCAL	OFF		Designer's Reference Handbook	Is used to lock the unit into a specific operation mode.

Running, start and stop

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6160 Run status							
6161	Run status	Delay	0.0 s 3200.0 s	5.0 s		Option M4	If a relay output is used, the relay in question must be set to “limit”.
6162	Run status	Relay output A	Not used Option-dep.	Not used			
6163	Run status	Relay output B	Not used Option-dep.	Not used			
6164	Run status	Enable	OFF ON	OFF			
6170 Running detection							
6171	Running detect.	No of teeth	0 teeth 500 teeth	0 teeth		Option M4	If menu 6171 is set to 0, the magnetic pickup input is not active. Available running detection types: - Digital input - Magnetic pickup - Frequency - EIC (engine communication) - Multi-input 102 - Multi-input 105 - Multi-input 106 If menu 6175 is set to 0.0, the oil pressure running detection is OFF.
6172	Running detect.	Type	Digital in Multi-input	Frequency			
6173	Running detect.	Running RPM	0 RPM 4000 RPM	1000 RPM			
6174	Running detect.	Remove starter	1 RPM 2000 RPM	400 RPM			
6175	Running detect.	Pressure level	0.0 bar 15.0 bar	0.0 bar			
6180 Starter							
6181	Starter	Start prepare	0.0 s 600.0 s	5.0 s		Option M4	Menus 6185 and 6186 relate to using multi-input as running feedback.
6182	Starter	Ext. prepare	0.0 s 600.0 s	0.0 s			
6183	Starter	Start ON time	1.0 s 180.0 s	5.0 s			
6184	Starter	Start OFF time	1.0 s 99.0 s	5.0 s			
6185	Starter	Input type	Multi-input 102 Multi-input 108	Multi-input 102			
6186	Starter	Set point	0.0 300.0	0.0			
6190 Start attempts							
6191	Start attempts	Set point	1 10	3		Option M4	Number of start attempts.
6192	Change starter	Set point	0 5	0			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6193	Change starter	Relay output A	Not used Option-dep.	Not used			
6200 Shutdown override							
6201	Shutdown override	Attempts	1 10	7		Option M4	Shutdown override turns all shutdowns into warnings. The only exceptions are overspeed and emergency stop.
6202	Shutdown override	Cooling down	0 s 32000 s	240 s			
6203	Shutdown override	Enable	OFF ON	OFF			
6210 STOP							
6211	STOP	Cooling down	0 s 32000 s	240 s		Option M4	The extended stop timer starts when the running feedback disappears. During the delay time it is not possible to start the engine. Menus 6213 and 6214 are used for temperature-dependent cooling down.
6212	STOP	Extended stop	1.0 s 3200.0 s	5.0 s			
6213	STOP	TYPE	Multi-input 102 M-Logic	Multi-input 102			
6214	STOP	Set point	0 dec. 482 dec.	0 dec.			
6220 Hz/V OK							
6221	HZ/V OK	Delay	1.0 s 3200.0 s	2.0 s		GPU Hydro: Option G2	The voltage and frequency have to be continuously within their limits (2111/2112) before the breaker can be closed.

Breaker control

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6230 Generator breaker control							
6231	GB control	N/A				Designer's Reference Handbook GPU Hydro: Option G2	Menu 6212 is for compact breakers (need to charge spring before closing). Available GB types: - Pulse - Continuous - Compact
6232	GB control	Load time	0.0 s 30.0 s	0.0 s			
6233	GB control	Type	Pulse Compact	Pulse			

Power derate

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6260 Power derate							
6261	Power derate	Input	Multi-in 102 M-Logic	Multi-in 102		Option M4	The derate function lowers the max. power of the generator set based on, for example, water temperature. Input: - Multi-input 102 - Multi-input 105 - Multi-input 108 - M-Logic - EIC
6262	Power derate	Start derate	0 units 20000 units	16 units			
6263	Power derate	Derate slope	0.1 %/unit 100.0 %/unit	5.0 %/unit			
6264	Power derate	Proportional	OFF ON	OFF			
6265	Power derate	Enable	OFF ON	OFF			
6266	Power derate	Limit	0.0 % 100.0 %	80.0 %			

Idle start

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6290 Idle start							
6291	Idle start	Start timer	0.0 min 999.0 min	300.0 min		Option M4	
6292	Idle start	Enable start	OFF ON	OFF			
6293	Idle stop	Stop timer	0.0 min 999.0 min	300.0 min			
6294	Idle stop	Enable stop	OFF ON	OFF			
6295	Idle running	Relay output A	Not used Option-dep.	Not used			
6296	Idle running	Enable	OFF ON	OFF			

Engine heater

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6320 Engine heater							
6321	Engine heater	Set point	20 deg. 250 deg.	40 deg.		Option M4	Heater function for standstill. Type: - Multi-input 102 - Multi-input 105 - Multi-input 108 - EIC
6322	Engine heater	Relay output A	Not used Option-dep.	Not used			
6323	Engine heater	Type	Multi-inp 102 Multi-inp 108	Multi-inp 102			
6324	Engine heater	Hysteresis	1 deg. 70 deg.	3 deg.			
6325	Engine heater	Enable	OFF ON	OFF			

Generator type

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6360 Generator type							
6361	Generator type	Type	Synchronous Asynchronous	Synchronous		Option M4	

Analogue load sharing lines output

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6380 Loadshare out							
6381	Loadshare out	Set point	1.0 V 5.0 V	4.0 V		Designer's Reference Handbook GPU Hydro: Not available	Adjustment of the analogue load sharing line max. value.
6390 Loadshare type							
6391	Loadshare type	Set point	Adjustable Selco T4800 Cummins PCC Woodward SPM-D11			Designer's Reference Handbook GPU Hydro: Not available	Selection between selectable load sharing line max. value (setting 6381) or adaptation to Selco T4800 load sharing line.

Max. ventilation

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6460 Max. ventilation							
6461	Max. ventilation	Set point	20 deg. 250 deg.	90 deg.		Option M4	
6462	Max. ventilation	Relay output A	Not used Option-dep	Not used			
6463	Max. ventilation	Hysteresis	1 deg. 70 deg.	5 deg.			
6464	Max. ventilation	Enable	OFF ON	OFF			

Start/stop next generator

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6520 Start next gen							
6521	Start next gen	Set point	0 % 100 %	80 %		Designer's Reference Handbook	Start signal to the next generator. Set the selected relay to "Limit" mode.
6522	Start next gen	Timer	0.0 s 3200.0 s	10.0 s			
6523	Start next gen	Output A	Not used Option-dep.	Not used			
6524	Start next gen	Output B	Not used Option-dep.	Not used			
6525	Start next gen	Enable	OFF ON	OFF			
6530 Stop next gen							
6531	Stop next gen	Set point	50 % 100 %	20 %		Designer's Reference Handbook	Stop signal to the next generator. Set the selected relay to "Limit" mode.
6532	Stop next gen	Timer	0.0 s 3200.0 s	30.0 s			
6533	Stop next gen	Output A	Not used Option-dep.	Not used			
6534	Stop next gen	Output B	Not used Option-dep.	Not used			
6535	Stop next gen	Enable	OFF ON	OFF			

Fuel transfer pump logic

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6550 Fuel pump logic							
6551	Fuel pump logic	Set point start	0 % 100 %	20 %		Option M4	Type: - Multi-input 102 - Multi-input 105 - Multi-input 108
6552	Fuel pump logic	Set point stop	0 % 100 %	80 %			
6553	Fuel pump logic	Fill check time	0.1 s 300.0 s	60.0 s			
6554	Fuel pump logic	Relay output A	Not used Option-dep.	Not used			
6555	Fuel pump logic	Type	Multi-in 102 Multi-in 108	Multi-in 102			
6556	Fuel pump logic	Fail class	F1…F6	Warning (F2)			

Alarm jump

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
6900 Alarm jump							
6901	Alarm jump	Enable	OFF ON	ON		Designer's Reference Handbook	Selection of jump to alarm list view on the display if an alarm appears (ON), or stay at present view (OFF).

Controller settings

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7050 Fixed power settings							
7051	Fixed power set	Power	0 % 100 %	100 %		Designer's Reference Handbook GPU Hydro: Not available	Parallel with mains set-tings.
7052	Fixed power set	Power factor	0.60 1.00	0.90			
7053	Fixed power set	Power factor	Inductive Capacitive	Inductive			
7054	Fixed power set	Reactive power	0 % 100 %	100 %			

Y1(x1) droop curve

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7120 Y1(x1) Deadband							
7121	Y1(x1) Deadband	Deadband low	0.00 % 99.99 %	0.40 %		Designer's Reference Handbook GPU Hydro: Not available	
7122	Y1(x1) Deadband	Deadband high	0.00 % 99.99 %	0.50 %			
7123	Y1(x1) Deadband	Hysteresis low	0.00 % 99.99 %	0.50 %			
7124	Y1(x1) Deadband	Hysteresis high	0.00 % 99.99 %	0.50 %			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7130 P(x1) Slope							
7131	P(x1) Slope	MIN	0 kW 20000 kW	200 kW		Designer's Reference Handbook GPU Hydro: Not available	
7132	P(x1) Slope	MAX	0 kW 20000 kW	480 kW			
7133	P(x1) Slope	Slope low	-20000 kW 20000 kW	50 kW			
7134	P(x1) Slope	Slope high	-20000 kW 20000 kW	-50 kW			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7140 Droop curve 1							
7141	Droop curve 1	P(x1)	P(x1) P(x1)	P(x1)		Designer's Reference Handbook GPU: Not available	
7142	Droop curve 1	X1	f f	f			
7143	Droop curve 1	Enable	OFF ON	OFF			

Y2 (X2) droop curve

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7150 Y2(x2) Deadband							
7151	Y2(x2) Deadband	Deadband low	0.00 % 99.99 %	2.00 %		Option D1 GPU Hydro: Not available	
7152	Y2(x2) Deadband	Deadband high	0.00 % 99.99 %	2.00 %			
7153	Y2(x2) Deadband	Hysteresis low	0.00 % 99.99 %	2.10 %			
7154	Y2(x2) Deadband	Hysteresis high	0.00 % 99.99 %	2.10 %			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7160 Q(x2) Slope							
7161	Q(x2) Slope	MIN	-20000 kvar 20000 kvar	200 kvar		Option D1 GPU Hydro: Not available	
7162	Q(x2) Slope	MAX	-20000 kvar 20000 kvar	480 kvar			
7163	Q(x2) Slope	Slope low	-20000 kvar 20000 kvar	50 kvar			
7164	Q(x2) Slope	Slope high	-20000 kvar 20000 kvar	-50 kvar			

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7170 PF(x2) Slope							
7171	PF(x2) Slope	MIN	0.60 1.00	0.80	PF	Option D1 GPU Hydro: Not available	
7172	PF(x2) Slope	I/C	Inductive Capacitive	Inductive			
7173	PF(x2) Slope	MAX	0.60 1.00	1.00	PF		
7174	PF(x2) Slope	I/C	Inductive Capacitive	Inductive			
7175	PF(x2) Slope	Slope low	- 1.000 1.000	0.005	PF		
7176	PF(x2) Slope	Slope high	-1.000 1.000	0.005	PF		

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7180 Droop curve 2							
7181	Droop curve 2	PF(x2)	PF(x2) Q(x2)	PF(x2)		Option D1 GPU Hydro: Not available	
7182	Droop curve 2	X2	U P	U			
7183	Droop curve 2	Enable	OFF ON	OFF			

External communication

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7500 Communication control							
7501	Comm. control	Power	OFF ON	OFF		Option H2 or H3	These settings must be ON if commands are to be sent over the Modbus communication. This will overrule external and internal settings. Voltage, power factor and reactive power control requires AVR control (option D1).
7502	Comm. control	Frequency	OFF ON	OFF			
7503	Comm. control	Voltage	OFF ON	OFF			
7504	Comm. control	PF	OFF ON	OFF			
7505	Comm. control	Reactive power	OFF ON	OFF			
7510 External communication							
7511	Ext. communication	ID	1 247	1		Option H2 and H9 or H3	The mode ASCII is used for modem communication (ASCII: 7 data bit, RTU: 8 data bit).
7512	Ext. communication	Baud rate	9600 19200	9600		Option H2 and H9	
7513	Ext. communication	Mode	RTU ASCII	RTU		Option H2 and H9	

Engine interface communication

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7560 Engine I/F							
7561	Engine I/F	Engine type	OFF QSX15 QSK23/45/60/78 QST30	OFF		Option: Cummins Modbus (H6)	The setting affects the displayed data, but not the Modbus data (option H2).
7561	Engine I/F	Engine type	OFF DDEC EMR JDEC Iveco Perkins Caterpillar Volvo Penta EMS Volvo Penta EMS 2 Scania EMS Scania EMS S6 MDEC 2000/4000 M.302 MDEC 2000/4000 M.303 MTU ADEC Cummins Generic J1939 MTU J1939 Smart Connect	OFF		Option: J1939/MTU ADEC/ MTU MDEC (H5) J1939 (H7)	MTU MDEC is only available in option H5. Choose MDEC 2000/4000 M.303 when M.201 or M.304 is required. Menu 7562 is only available when MTU ADEC is selected as engine type. Menu 7563 is for enabling the EIC commands transmission. Menu 7564: When set to “ON”, up to 19 extra views (of 3 lines) are added to the 15 original V1 views (of 3 lines). These extra views are displaying all the present engine com. values broadcasted on this CAN communication when this function is set to “ON”. Menu 7565 is for selecting the AVR that is controlled via CAN.
7562	CANopen ID	Node ID	0 16	6			
7563	EIC Controls	Enable	OFF ON	ON			
7564	EIC Auto view	Enable	OFF ON	OFF			
7565	EIC AVR control	AVR type	OFF CAT CDVR	OFF			

Digital AVR parameters (option T2)

Menu	Description	Min. value Max. value	Default value	Comment
6004	Generator nominal voltage - nominal set 1	100 V 160 kV	400 V	The nominal voltage for the generator. Nominal set 1.
6014	Generator nominal voltage - nominal set 2	100 V 160 kV	480 V	The nominal voltage for the generator. Nominal set 2.
6024	Generator nominal voltage - nominal set 3	100 V 160 kV	480 V	The nominal voltage for the generator. Nominal set 3.
6034	Generator nominal voltage - nominal set 4	100 V 160 kV	480 V	The nominal voltage for the generator. Nominal set 4.
6041	Generator voltage transformer primary side	100 V 160 kV	400 V	The nominal voltage for the voltage transformer's primary side. Placed on generator side of breaker.
6042	Generator voltage transformer secondary side	100 V 690 V	400 V	The nominal voltage for the voltage transformer's secondary side. Placed on generator side of breaker.
6051	Busbar voltage transformer primary side – busbar nominal set 1	100 V 160 kV	400 V	The nominal voltage for the voltage transformer's primary side. Placed on busbar side of breaker. Busbar nominal set 1.
6052	Busbar voltage transformer secondary side – busbar nominal set 1	100 V 160 kV	400 V	The nominal voltage for the voltage transformer's secondary side. Placed on busbar side of breaker. Busbar nominal set 1.
6061	Busbar voltage transformer primary side – busbar nominal set 2	100 V 160 kV	400 V	The nominal voltage for the voltage transformer's primary side. Placed on busbar side of breaker. Busbar nominal set 2.
6062	Busbar voltage transformer secondary side – busbar nominal set 2	100 V 690 V	400 V	The nominal voltage for the voltage transformer's secondary side. Placed on busbar side of breaker. Busbar nominal set 2.
7564	EIC Auto view	OFF ON	OFF	Enables a Multi-line 2 unit to display readings from the digital AVR. If a reading is not available, the unit will display N.A. When this setting has been set to ON, the setting will be set to OFF afterwards. This is only a pulse that has been sent, but the Multi-line 2 unit will still display the readings, if any readings are available.
7565	Digital AVR	OFF DEIF DVC 310	OFF	Selects the CAN bus protocol for interfacing between a digital AVR and a Multi-line 2 unit.
7741	DAVR primary voltage	100 V 25000 V	400 V	Decides the primary side of a voltage transformer for the DVC. (This is the transformer side that is in contact with the generator voltage).

Menu	Description	Min. value Max. value	Default value	Comment
7742	DAVR secondary voltage	100 V 690 V	400 V	Decides the secondary side of a voltage transformer for the DVC. (This is the transformer side that is in contact with the DVC 310).
7743	DAVR busbar primary voltage	100 V 25000 V	400 V	Decides the primary side of a voltage transformer to the busbar. (This is the transformer side that is in contact with the busbar).
7744	DAVR busbar secondary voltage	100 V 690 V	400 V	Decides the secondary side of a voltage transformer to the busbar. (This is the transformer side that is in contact with the DVC 310).
7745	DAVR enable	OFF ON	OFF	When set to ON, the DVC 310 expects voltage measurements on the busbar.
7751	PWM threshold	0.00 % 100.00 %	10.00 %	Decides the output of the start-on threshold function. A higher number will give a steeper slope on the start-on threshold function.
7752	Activation threshold	0.00 % 100.00 %	35.00 %	Decides the upper limit of the start-on threshold function. When this limit has been reached, the soft-start function will take action. The percentage is of nominal voltage.
7753	Soft-start ramp	0.1 s 120.0 s	2.0 s	This parameter decides the slope of the soft-start function.
7761	DAVR warning	OFF ON	OFF	Enables the Multi-line 2 to receive warnings from the DVC 310.
7762	DAVR warning fail class	Warning Trip GB	Warning	Decides the fail class if a warning is sent from the DVC 310.
7763	DAVR trip	OFF ON	OFF	Enables the Multi-line 2 to receive trip alarms from the DVC 310.
7764	DAVR trip fail class	Warning Trip GB	Warning	Decides the fail class if a trip alarm is sent from the DVC 310.
7771	Knee set point percent of nominal frequency	70.0 % 100.0 %	96.0 %	Sets the knee set point, from which the DVC 310 will lower the voltage set point.
7772	U/F slope	1.0 3.0	1.0	Decides the slope for the U/F. A higher value will make the slope steeper.
7773	Soft voltage recovery adjustment	0.1 s/10 Hz 30.0 s/10 Hz	2.0 s/10 Hz	Decides how fast the voltage should recover from a load impact. It is required to have the Load Acceptance Module activated to use this. A lower value will make a steeper slope.
7774	Soft voltage recovery	OFF ON	OFF	Enables the soft voltage recovery.
7775	Adjustment of Load Acceptance Module	70 % 100 %	90 %	Decides how much the voltage is allowed to drop instantaneously, when a load impact is applied. A lower value allows a bigger voltage drop.

Menu	Description	Min. value Max. value	Default value	Comment
7776	Load Acceptance Module	OFF ON	OFF	Enables the Load Acceptance Module.
7781	Q droop compensation	0.0 % 10.0 %	2.0 %	Decides the slope of the Q droop compensation. A higher value allows more droop.
7782	U droop compensation	0.0 % 10.0 %	2.0 %	Decides the slope of the U droop compensation. A higher value allows more droop.
7783	Droop compensation type	Q droop compen-sation OFF	Q droop compen-sation	Only one of the droop types can be enabled.
7793	Transformer excitation current limit	0.0 % 350.0 %	100.0 %	Current maximum during transformer excitation sequence. The value is percentage of nominal current.
7794	Induction motor starting current limit	0.0 % 350.0 %	100.0 %	Current maximum during an induction motor starting sequence. The value is percentage of nominal current.
7795	I stator limitation function enable	OFF Magneti-sation	OFF	Makes it possible to have the stator current limitation functions disabled, only induction motor starting, or both induction motor starting and transformer excitation.
7801	PID factor	1 100	20	Makes it possible to make the AVR regulation faster or slower.
7802	PID average or True RMS	Average RMS	Average	Decides whether the DVC 310 should make the voltage readings as average or true RMS values.
7803	Write all settings to DVC 310	OFF ON	OFF	When set to ON, the Multi-line 2 unit will send all the relevant parameters to the DVC 310.
7804	DAVR bias range	1.0 % 30.0 %	10.0 %	This setting control defines the outer limits for the regulation. 10 % on a 400 V generator means that voltage can be regulated from 360 to 440 V.
7805	DAVR controls	OFF ON	ON	Decides who has the control. When set to ON, the DVC 310 is controlled by the Multi-line 2, and when set to OFF, the DVC 310 can be controlled by EasyReg, and the DVC 310 will not receive any parameters from the Multi-line 2 unit.
7806	DAVR bias analogue range	4 to 20 mA -10 to 0 to 10 V	-10 to 0 to 10 V	If the DVC 310 uses analogue bias for regulation, this defines the type of analogue interfacing for the DVC 310. The analogue input on the DVC 310 is hardcoded to be at terminal AI1.

Menu	Description	Min. value Max. value	Default value	Comment
7811	Pt100_1 threshold	50 °C 250 °C	160 °C	Determines the maximum temperature of the winding in phase 1 of the alternator.
7812	Pt100_2 threshold	50 °C 250 °C	160 °C	Determines the maximum temperature of the winding in phase 2 of the alternator.
7813	Pt100_3 threshold	50 °C 250 °C	160 °C	Determines the maximum temperature of the winding in phase 3 of the alternator.
7821	Voltage loss detection enable	OFF ON	OFF	Enables the voltage loss protection.
7822	Excitation current protection	OFF ON	OFF	Enables the excitation current protection.
7823	Over-voltage protection	OFF ON	OFF	Enables the over-voltage protection.
7824	Diode fault	OFF ON	OFF	Enables the diode fault protection.
7825	Shutdown diodes	OFF ON	OFF	Enables the shutdown diodes function.
7831	DAVR communication error timer	0.0 s 100.0 s	0.0 s	A timer for an alarm for communication error to the DVC 310.
7832	DAVR communication error output A	Not used Relay 63	Not used	If the DAVR communication fails, it is possible to activate a relay.
7833	DAVR communication error output B	Not used Relay 63	Not used	If the DAVR communication fails, it is possible to activate a relay.
7834	DAVR communication error alarm enable	OFF ON	OFF	Enables/disables the alarm for communication error between the DVC 310 and the Multi-line 2 unit.
7835	DAVR communication error alarm fail class	Warning Trip GB	Warning	Decides what the Multi-line 2 unit should do, if the DAVR communication alarm occurs.

CANshare configuration

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7850 CANshare							
7851	CANshare ID	ID	1 32	1		Option G9	7852: “M-LOGIC” enables change of CANshare section from M-Logic. 7854: When set to “OFF”, menus 7851, 7852 and 7853 are disregarded.
7852	CANshare section	Section	1 M-LOGIC	1			
7853	CANshare reset	Reset	OFF ON	OFF			
7854	CANshare superv.	Enable	OFF ON	ON			

External I/O communication setup

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
7950 KL320x config							
7951	KL320x config	Module 1	Pt100 (2/3-wire) 10-1200 Ω (2-wire)			Option: External I/O modules (H8.x)	Selection for analogue modules. The selections for KL 3202/3204 cannot be changed. After changing module type, the parameter list in the PC USW must be uploaded again.
7952	KL320x config	Module 2					
7953	KL320x config	Module 3					
7954	KL320x config	Module 4					
7970 CAN 1							
7971	CAN 1	Type	OFF Beckhoff	OFF		Option: External I/O modules (H8.x)	This menu is only activated if option H8.2 is activated. After changing type, the parameter list in the PC USW must be uploaded again. Menu 7974 is for re-establishing communication after a fault/disconnection.
7972	CAN 1	Baud	50 k 125 k 250 k	125 k			
7973	CAN 1	ID	1 to 64	1			
7974	CAN 1	Reset	NO YES	NO			
7980 CAN 2							
7981	CAN 2	Type	OFF Beckhoff	OFF		Option: External I/O modules (H8.x)	This menu is only activated if option H8.8 is activated. After changing type, the parameter list in the PC USW must be uploaded again. Menu 7984 is for re-establishing communication after a fault/disconnection.
7982	CAN 2	Baud	50 k 125 k 250 k	125 k			
7983	CAN 2	ID	1 to 64	1			
7984	CAN 2	Reset	NO YES	NO			

Jump menus

A number of menus can only be entered using the jump menu:

9000 Software version

Information about the actual software downloaded to the unit. Check this before contacting DEIF regarding service and support matters.

9010 Display character test

Shows a test print of the character set in the display.

Scaling

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
9030 Scaling							
9030	Scaling	Range	10 V – 2500 V 10 kV – 160 kV	100 V – 25000 V		Designer's Reference Handbook	This setting will change the scaling of the measurements shown in the display.

Hysteresis

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
9040 Reset ratio							
9041	Reset ratio f		0.0 % 10.0 %	0.5 %		Designer's Reference Handbook	
9042	Reset ratio P/Q		0.0 % 10.0 %	1.0 %			
9043	Reset ratio I		0.0 % 10.0 %	1.0 %			
9044	Reset ratio U		0.0 % 10.0 %	1.0 %			

Alarm test mode

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
9050 Alarm test mode							
9051	Alarm test mode	Enable	ON OFF	OFF		Designer's Reference Handbook	Used to activate a specific alarm or all alarms at once. Alarm test mode is automatically disabled when the delay has run out.
9052	Alarm test mode	Delay	0.1 s 3200.0 s	60.0 s			
9053	Alarm test mode	Activate one alarm	0 9999	0			
9054	Alarm test mode	Activate all alarms	ON OFF	OFF			

Emulation

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
9060 Emulation							
9060	Emulation	Enable	ON OFF	OFF		Option G9	Activation of the emulation mode.

9070 M4 SW version

Information about the software version in the engine I/F PCB placed in slot #8.

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
9080 Engine logic							
9080	Engine logic	Enable	ON OFF	ON		Option M4	

Passwords

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
911x Password							
9116	User password	Setting	0 32000	2000		Designer's Reference Handbook	It is recommended to change the password levels of the user, service and master passwords, if access to parameter settings is to be restricted.
9117	Service password	YYYYY setting	0 32000	2001			
9118	Master password	XXXXX setting	0 32000	2002			

Service menu

The service menu can only be entered using the "JUMP" push-button. This menu is used in service situations.

In the alarm selection you can see all the alarm timers and their remaining time if they are counting.

The input and output selections show the present status of the inputs and outputs, for example mode inputs, relay outputs and load sharing lines.

No.	Setting		Description
9120 Service menu			
9121	Service menu	Timers	Shows remaining alarm delay time
9122	NA	NA	
9123	Service menu	Digital inputs	Shows digital input status
9124	Service menu	Digital outputs	Shows digital output status
9125	Service menu	Miscellaneous	Shows miscellaneous information

AC configuration

This menu is used to choose between the different AC measurement systems.

No.	Setting		Min. Max.	Factory setting	Ref.	Description
9130 AC config.						
9130	AC config.	Setting	1 phase L1 3 phase L1L2L3	3 phase L1L2L3	Designer's Reference Handbook	Available settings: 3 phase L1L2L3 (1) 2 phase L1L3 (2) 2 phase L1L2 (3) 1 phase L1 (4) 3 phase UL1L2 IL1

9140 Angle compensation BB/G

This menu is used to compensate the transformer phase angle when the generator and busbar measurements are made on each side of a transformer.

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
9140 Angle comp. BB/G							
9140	Angle comp. BB/G 1	Angle	-179 deg. 179 deg.	0.0 deg.			Angle comp. BB/G 1 and 2 refer to BB set 1 and 2, which is chosen in parameter 6054 (BB nom set)
9142	Angle comp. BB/G 2	Angle	-179 deg. 179 deg.	0.0 deg.			

Dimmer

No.	Setting		Ref.	Description
9150 Backlight dim.				
9150	Backlight dim.		Operator's manual	Sets the light intensity of the display

Breaker feedback

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
9240 CB ON Feedback							
9240	CB ON Feedback		YES NO	YES		Designer's Reference Handbook	

GSM settings

GSM settings are only accessible in the utility software.

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
10320 GSM pin code							
10320	GSM pin code	Function	0 9999	1933		Option H9	
10330 Telephone no. 1							
10330	Telephone 1	Function	0 99999999999	12345678903		Option H9	

Menus similar to menu 10330 are available for telephone nos. 2-5 with the menu numbers 10340-10370.

Passwords

Password settings are only accessible in the utility software.

No.	Setting	Min. Max.	Factory setting	Notes	Ref.	Description
10390 Password language page						
10390	Passw. lang. page	None Customer	None		Designer's Reference Handbook	Selections are: - None - Master - Service - Customer
10400 Password log page						
10400	Passw. log page	None Customer	None		Designer's Reference Handbook	Selections are: - None - Master - Service - Customer
10410 Password control page						
10410	Passw. control page	None Customer	None		Designer's Reference Handbook	Selections are: - None - Master - Service - Customer

Power limit set point

No.	Setting	Min. Max.	Factory setting	Notes	Ref.	Description
Power Limit						
10420	P limit value 1	0 100	0		Designer's Reference Handbook	The set point value is percentage of nominal power
10421	P limit value 2	0 100	30			
10422	P limit value 3	0 100	60			
10423	P limit value 4	0 100	100			

RMI 102

RMI 102 settings are only accessible in the utility software.

No.	Setting	Min. Max.	Factory setting	Notes	Ref.	Description
10460 RMI 1 type						
10460	RMI 1 type	Sensor type 1 Configurable	Sensor type 1		Option M4	Selections are: -Sensor type 1 -Sensor type 2 -Sensor type 3 -Configurable
10470 RMI 1 input set point 1						
10470	RMI 1 inp. setp. 1	0 Ohm 480 Ohm	10 Ohm		Option M4	Configurable RMI curve.
10480 RMI 1 output set point 1						
10480	RMI 1 outp. setp. 1	-49 482	40		Option M4	Configurable RMI curve.
10490 RMI 1 input set point 2						
10490	RMI 1 inp. setp. 2	0 Ohm 480 Ohm	44.9 Ohm		Option M4	Configurable RMI curve.
10500 RMI 1 output set point 2						
10500	RMI 1 outp. setp. 2	-49 482	50		Option M4	Configurable RMI curve.
10510 RMI 1 input set point 3						
10510	RMI 1 inp. setp. 3	0 Ohm 480 Ohm	81 Ohm		Option M4	Configurable RMI curve.
10520 RMI 1 output set point 3						
10520	RMI 1 outp. setp. 3	-49 482	60		Option M4	Configurable RMI curve.
10530 RMI 1 input set point 4						
10530	RMI 1 inp. setp. 4	0 Ohm 480 Ohm	134.7 Ohm		Option M4	Configurable RMI curve.
10540 RMI 1 output set point 4						
10540	RMI 1 outp. setp. 4	-49 482	80		Option M4	Configurable RMI curve.
10550 RMI 1 input set point 5						
10550	RMI 1 inp. setp. 5	0 Ohm 480 Ohm	184 Ohm		Option M4	Configurable RMI curve.

No.	Setting	Min. Max.	Factory setting	Notes	Ref.	Description
10560 RMI 1 output set point 5						
10560	RMI 1 outp. setp. 5	-49 482	100		Option M4	Configurable RMI curve.
10570 RMI 1 input set point 6						
10570	RMI 1 inp. setp. 6	0 Ohm 480 Ohm	200 Ohm		Option M4	Configurable RMI curve.
10580 RMI 1 output set point 6						
10580	RMI 1 outp. setp. 6	-49 482	110		Option M4	Configurable RMI curve.
10590 RMI 1 input set point 7						
10590	RMI 1 inp. setp. 7	0 Ohm 480 Ohm	210 Ohm		Option M4	Configurable RMI curve.
10600 RMI 1 output set point 7						
10600	RMI 1 outp. setp. 7	-49 482	115		Option M4	Configurable RMI curve.
10610 RMI 1 input set point 8						
10610	RMI 1 inp. setp. 8	0 Ohm 480 Ohm	220 Ohm		Option M4	Configurable RMI curve.
10620 RMI 1 output set point 8						
10620	RMI 1 outp. setp. 8	-49 482	120		Option M4	Configurable RMI curve.

RMI 105

RMI 105 settings are only accessible in the utility software.

Settings 10630-10790 equal the settings for RMI 102 (10460-10620).

RMI 108

RMI 108 settings are only accessible in the utility software.

Settings 10800-10960 equal the settings for RMI 102 (10460-10620).

Multi-input selections

No.	Setting	Min. Max.	Factory setting	Notes	Ref.	Description
10970 Engineering units						
10970	Engineering units	Bar/Celsius Psi/Fahrenheit	Bar/Celsius		Option M4	
10980 Multi-input configuration 102						
10980	Multi-inp.conf. 102	4-20 mA Binary	0-40 V DC		Option M4	Possible selections: 4-20 mA 0-40 V DC Pt100 Pt1000 RMI oil pressure RMI water temp. RMI fuel level Binary
10990 Multi-input configuration 105						
10990	Multi-inp.conf. 105	4-20 mA Binary	0-40 V DC		Option M4	Possible selections: 4-20 mA 0-40 V DC Pt100 Pt1000 RMI oil pressure RMI water temp. RMI fuel level Binary
11000 Multi-input configuration 108						
11000	Multi-inp.conf. 108	4-20 mA Binary	0-40 V DC		Option M4	Possible selections: 4-20 mA 0-40 V DC Pt100 Pt1000 RMI oil pressure RMI water temp. RMI fuel level Binary

No.	Setting	Min. Max.	Factory setting	Notes	Ref.	Description
11010 4-20 mA input scale 102						
11011	4-20 mA input scale 102	"No decimal" "One decimal" "Two decimals"	"No decimal"		Option M4	
11012	4-20 mA input scale 102	Enable				
11020 4-20 mA input scale 105						
11021	4-20 mA input scale 105	"No decimal" "One decimal" "Two decimals"	"No decimal"		Option M4	
11022	4-20 mA input scale 105	Enable				
11030 4-20 mA input scale 108						
11031	4-20 mA input scale 108	"No decimal" "One decimal" "Two decimals"	"No decimal"		Option M4	
11032	4-20 mA input scale 108	Enable				

External digital outputs

No.	Setting		Min. Max.	Factory setting	Notes	Ref.	Description
12790 Ext. dig. out 1							
	Ext. dig. out 1	Function	Alarm Limit	Alarm		Option: External I/O modules (H8)	
	Ext. dig. out 1	OFF delay	0.0 s 999.9 s	5.0 s			

The same applies to settings 12800-12940.

External module status

No.	Setting	Min. Max.	Notes	Ref.	Description
12950	Ext module 0 STATUS	-32768 +32767		Option: External I/O modules (H8)	This is a number read in the external module and displayed in the USW only. Refer to the option H8 description for details.

The same applies to settings 12951-12983 (external modules 1 to 33).

DEIF A/S reserves the right to change any of the above.