AGC-4 Mk II

4189341273C

Parameter list

1. General information

2. Alarm list

1. General information

1.1 Warnings, legal information and safety

1.1.1 Symbols for hazard statements

DANGER!

This shows dangerous situations.

If the guidelines are not followed, these situations will result in death, serious personal injury, and equipment damage or destruction.

WARNING

This shows potentially dangerous situations.

If the guidelines are not followed, these situations could result in death, serious personal injury, and equipment damage or destruction.

CAUTION

This shows low level risk situation.

If the guidelines are not followed, these situations could result in minor or moderate injury.

NOTICE

This shows an important notice

Make sure to read this information.

1.1.2 Symbols for general notes

NOTE This shows general information.

More information
This shows where you can find more information.

Example

This shows an example.

How to ...
This shows a link to a video for help and guidance.

1.1.3 Third party equipment

DEIF takes no responsibility for the installation or operation of any third party equipment, including the **genset**.

1.1.4 Factory settings

The unit is delivered from the factory with default settings. These are not necessarily correct for the engine/generator set. Check all the settings before running the engine/generator set.

1.1.5 Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

1.2 About the Parameter list

1.2.1 Purpose of the Parameter list

The parameter list is a reference document. It includes the AGC-4 Mk II alarms and parameters. If your controller does not include the relevant option, the option-dependent parameters may not be accessible.

Parameters with numbers up to 9999 can generally be configured using the DU-2 display unit, TDU 107 or the utility software. Some of the JUMP menu parameters (9000 to 9250) can only be configured using the display unit.

Parameters with numbers above 10000 can only be configured from the TDU 107 or the utility software.

The utility software includes settings that do not have parameter numbers. These are described briefly under Utility software settings.

Parameters in other documents

The parameters related to **power management** are in **Option G5 Power management**.

The parameters related to **CAN bus engine communication** are in **Option H12 H13 Engine communication**.

More information
For some of the parameters, see the AGC-4 Mk II **Designer's handbook** and/or **Option** documents for more information.

1.2.2 Intended users

This 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.

1.3 Software version

This document is based on AGC-4 Mk II software version 6.10.

2. Alarm list

2.1 General information about the alarm list

2.1.1 Alarm list features and options

In the following, these abbreviations are used:

- G: Generator
- GB: Generator breaker
- TB: Tie breaker (for mains controller)
- MB: Mains breaker
- BTB: Bus tie breaker
- BA: Busbar A (BTB controller)
- BB: Busbar (BTB controller: Busbar B)
- -: Not available

Each alarm can include the following parameters:

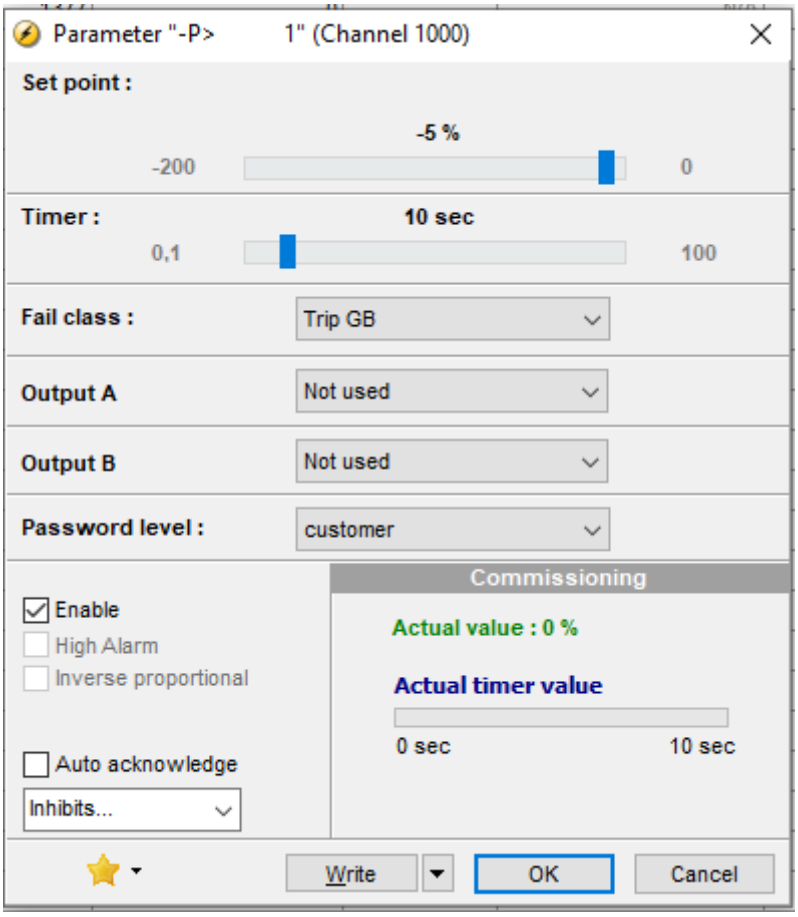
- **Set point**: The alarm set point. This is often a percentage of a nominal value. For menu XXX0, this is typically parameter XXX1.
- **Delay**: The timer setting is the time that the alarm condition must be present, from the set point is reached until the alarm is activated. This is typically parameter XXX2.
- **Relay output A/B**: When the alarm is activated, the selected relay(s) are activated.
  - Relay output A is typically parameter XXX3. Relay output B is typically parameter XXX4.
    - For an alarm without a configurable set point or a configurable timer: Relay output A is typically parameter XXX2. Relay output B is typically parameter XXX3.
    - For an alarm with neither a configurable set point nor a configurable timer: Relay output A is typically parameter XXX1. Relay output B is typically parameter XXX2.
    - Relay output A and relay output B are generally not included in this document.
  - The controller options determine which relays can be assigned to the relay outputs. By default, no relays are assigned.
  - To use the alarm in M-Logic (if the alarm function is available there), select *Limits* on *Relay output A* OR *Relay output B*.
  - If you select *Limits* for both *Relay output A* AND *Relay output B*:
    - The alarm is not shown on the display.
    - The controller does not do the fail class action.
    - The alarm function can still be used in M-Logic.
- **Enable**: The alarm can be enabled or not enabled. This is typically parameter XXX5.
- **Fail class**: When the alarm is activated the controller does the selected fail class action. This is typically parameter XXX6.

Fail class	DG (Diesel generator)	Mains controller	BTB (Bus tie breaker)
F1	Block	Block	Block
F2	Warning	Warning	Warning
F3	Trip GB	Trip TB	Trip BTB
F4	Trip + Stop	Trip MB	-
F5	Shutdown	-	-
F6	Trip MB	-	-
F7	Safety stop	-	-

Fail class	DG (Diesel generator)	Mains controller	BTB (Bus tie breaker)
F8	Trip MB/GB	-	-
F9	Controlled stop	-	-

NOTE There may be some small differences between alarms.

The utility software includes alarm functions that are not available from the display. For example, you can select inhibits and/or automatic acknowledgement of the alarm.



2.2 Protection parameters

2.2.1 Reverse power protections

1000 Reverse power 1 (-P>1)

No.	Setting	Range	Default	Description
1001	Set point	-200.0 to 0.0 %	-5.0 %	The alarm and fail class are activated when the reverse power has been continuously above the programmed value during the programmed delay.
1002	Timer	0.1 to 100.0 s	5.0 s	
1005	Enable	OFF ON	ON	
1006	Fail class	F1 to F9	F3 (Trip GB)	

1010 Reverse power 2 (-P>2)

No.	Setting	Range	Default	Description
1011	Set point	-200.0 to 0.0 %	-5.0 %	The alarm and fail class are activated when the reverse power has been continuously above the programmed value during the programmed delay.
1012	Timer	0.1 to 100.0 s	10.0 s	
1015	Enable	OFF ON	ON	
1016	Fail class	F1 to F9	F3 (Trip GB)	

2.2.2 Over-current protections

1030 Over-current 1 (I>1)

No.	Setting	Range	Default	Description
1031	Set point	50.0 to 200.0 %	115.0 %	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1032	Timer	0.1 to 3200.0 s	10.0 s	
1035	Enable	OFF ON	ON	
1036	Fail class	F1 to F9	F2 (Warning)	

1040 Over-current 2 (I>2)

No.	Setting	Range	Default	Description
1041	Set point	50.0 to 200.0 %	120.0 %	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1042	Timer	0.1 to 3200.0 s	5.0 s	
1045	Enable	OFF ON	ON	
1046	Fail class	F1 to F9	F3 (Trip GB)	

1050 Over-current 3 (I>3)

No.	Setting	Range	Default	Description
1051	Set point	50.0 to 200.0 %	115.0 %	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1052	Timer	0.1 to 3200.0 s	10.0 s	
1055	Enable	OFF ON	ON	
1056	Fail class	F1 to F9	F3 (Trip GB)	

1060 Over-current 4 (I>4)

No.	Setting	Range	Default	Description
1061	Set point	50.0 to 200.0 %	120.0 %	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1062	Timer	0.1 to 3200.0 s	5.0 s	
1065	Enable	OFF ON	ON	
1066	Fail class	F1 to F9	F3 (Trip GB)	

1080 G I> inverse

No.	Setting	Range	Default	Description
1081	G I> inv. Type	0 to 6	IEC Inverse	Type selections are: • 0. IEC Inverse • 1. IEC Very Inverse • 2. IEC Extremely Inv. • 3. IEEE Moderately Inv. • 4. IEEE Very Inverse • 5. IEEE Extremely Inv. • 6. Custom
1082	G I> inv. Limit	50 to 200 %	110 %	
1083	G I> inv. TMS	0.01 to 100.00	1.00	
1084	G I> inv. k	0.00 to 32 s	0.14 s	
1085	G I> inv. c	0.00 to 32 s	0 s	
1086	G I> inv. a	0.00 to 32 s	0.02 s	
1091	G I> inv. OA	Option-dependent	Not used	
1092	G I> inv. OB	Option-dependent	Not used	
1093	Enable	OFF ON	OFF	
1094	Fail class	F1 to F9	F3 (Trip GB)	

1100 Voltage-dependent over-current curve setting

No.	Setting		Range	Default	Description
1101	G Iv > (50%)	Set point I1	50.0 to 200.0 %	110.0 %	The different percentages in the specific parameters are related to the nominal voltage. Settings relate to nominal generator current. The condition has to be true, for example I1<I2<I3<I4<I5<I6. If this is not fulfilled, the worst-case set point I1 will be used. Set points 3 to 6 include Relay output A and B.
1102	G Iv > (60%)	Set point I2	50.0 to 200.0 %	125.0 %	
1103	G Iv > (70%)	Set point I3	50.0 to 200.0 %	140.0 %	
1104	G Iv > (80%)	Set point I4	50.0 to 200.0 %	155.0 %	
1105	G Iv > (90%)	Set point I5	50.0 to 200.0 %	170.0 %	
1106	G Iv > (100%)	Set point I6	50.0 to 200.0 %	200 %	

1110 Voltage-dependent over-current alarm (G Iv>)

No.	Setting	Range	Default	Description
1110	Set point	50.0 to 200.0 %	110.0 %	The alarm and fail class are activated when the over-current has been continuously above the programmed value during the programmed delay. The set point value is calculated automatically by the values in menus 1101 to 1106.
1111	Timer	0.1 to 300.0 s	1.0 s	
1114	Enable	OFF ON	ON	
1115	Fail class	F1 to F9	F3 (Trip GB)	

1130 Fast over-current 1 (I>> 1)

No.	Setting	Range	Default	Description
1131	Set point	150.0 to 350.0 %	150.0 %	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	Timer	0.0 to 3200.0 s	2.0 s	
1135	Enable	OFF ON	OFF	
1136	Fail class	F1 to F9	F3 (Trip GB)	

1140 Fast over-current 2 (I>> 2)

No.	Setting	Range	Default	Description
1141	Set point	150.0 to 350.0 %	200.0 %	The alarm and fail class are activated when the current has been continuously above the programmed value during the programmed delay.
1142	Timer	0.0 to 3200.0 s	0.5 s	
1145	Enable	OFF ON	OFF	
1146	Fail class	F1 to F9	F3 (Trip GB)	

2.2.3 Voltage protections

1150 G/M/BA over-voltage 1 (G/M/BA U> 1)

No.	Setting	Range	Default	Description
1151	Set point	100.0 to 120.0 %	103.0 %	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay.
1152	Timer	0.1 to 100.0 s	10.0 s	
1155	Enable	OFF ON	OFF	
1156	Fail class	F1 to F9	F2 (Warning)	

1160 G/M/BA over-voltage 2 (G/M/BA U> 2)

No.	Setting	Range	Default	Description
1161	Set point	100.0 to 120.0 %	105.0 %	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay.
1162	Timer	0.1 to 100.0 s	5.0 s	
1165	Enable	OFF ON	OFF	
1166	Fail class	F1 to F9	F2 (Warning)	

1170 G/M/BA under-voltage 1 (G/M/BA U< 1)

No.	Setting	Range	Default	Description
1171	Set point	10.0 to 100.0 %	97.0 %	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay.
1172	Timer	0.1 to 100.0 s	10.0 s	
1175	Enable	OFF ON	OFF	
1176	Fail class	F1 to F9	F2 (Warning)	

1180 G/M/BA under-voltage 2 (G/M/BA U< 2)

No.	Setting	Range	Default	Description
1181	Set point	10.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay.
1182	Timer	0.1 to 100.0 s	5.0 s	
1185	Enable	OFF ON	OFF	
1186	Fail class	F1 to F9	F2 (Warning)	

1190 G/M/BA under-voltage 3 (G/M/BA U< 3)

No.	Setting	Range	Default	Description
1191	Set point	10.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay.
1192	Timer	0.1 to 100.0 s	5.0 s	
1195	Enable	OFF ON	OFF	
1196	Fail class	F1 to F9	F2 (Warning)	

1200 Calculation method

No.	Setting		Range	Default	Description
1201	G/M/BA voltage trip	Set point	Ph-Ph Ph-N Ph-Ph OR Ph-N	Ph-Ph	Select 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	BB voltage trip	Set point	Ph-Ph Ph-N Ph-Ph OR Ph-N	Ph-Ph	
1203	Unbalance I	Set point	Ref. to nominal Ref. to average	Ref. to nominal	
1204	Frequency trip	Type	L1 L2 L3 L1 or L2 or L3 L1 and L2 and L3	L1 or L2 or L3	Selection of the phase the controller uses for over-/ under-frequency alarms.

2.2.4 Frequency protections

Frequency settings relate to the nominal frequency setting.

1210 G/M/BA over-frequency 1 (G/M/BA f> 1)

No.	Setting	Range	Default	Description
1211	Set point	100.0 to 120.0 %	103.0 %	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay.
1212	Timer	0.2 to 100.0 s	10.0 s	
1215	Enable	OFF ON	OFF	
1216	Fail class	F1 to F9	F2 (Warning)	

1220 G/M/BA over-frequency 2 (G/M/BA f> 2)

No.	Setting	Range	Default	Description
1221	Set point	100.0 to 120.0 %	105.0 %	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay.
1222	Timer	0.2 to 100.0 s	5.0 s	
1225	Enable	OFF ON	OFF	
1226	Fail class	F1 to F9	F2 (Warning)	

1230 G/M/BA over-frequency 3 (G/M/BA f> 3)

No.	Setting	Range	Default	Description
1231	Set point	100.0 to 120.0 %	105.0 %	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay.
1232	Timer	0.1 to 2000.0 s	5.0 s	
1235	Enable	OFF ON	OFF	
1236	Fail class	F1 to F9	F2 (Warning)	

1240 G/M/BA under-frequency 1 (G/M/BA f< 1)

No.	Setting	Range	Default	Description
1241	Set point	80.0 to 100.0 %	97.0 %	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1242	Timer	0.2 to 100.0 s	10.0 s	
1245	Enable	OFF ON	OFF	
1246	Fail class	F1 to F9	F2 (Warning)	

1250 G/M/BA under-frequency 2 (G/M/BA f< 2)

No.	Setting	Range	Default	Description
1251	Set point	80.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1252	Timer	0.2 to 100.0 s	5.0 s	
1255	Enable	OFF ON	OFF	
1256	Fail class	F1 to F9	F2 (Warning)	

1260 G/M/BA under-frequency 3 (G/M/BA f< 3)

No.	Setting	Range	Default	Description
1261	Set point	80.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1262	Timer	0.1 to 2000.0 s	5.0 s	
1265	Enable	OFF ON	OFF	
1266	Fail class	F1 to F9	F2 (Warning)	

2.2.5 Busbar voltage protections

Voltage settings relate to the nominal voltage setting.

1270 Busbar over-voltage 1 (BB U> 1)

No.	Setting	Range	Default	Description
1271	Set point	100.0 to 130.0 %	103.0 %	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay.
1272	Timer	0.0 to 99.99 s	10.0 s	
1275	Enable	OFF ON	OFF	
1276	Fail class	F1 to F9	F2 (Warning)	

1280 Busbar over-voltage 2 (BB U> 2)

No.	Setting	Range	Default	Description
1281	Set point	100.0 to 130.0 %	105.0 %	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay.
1282	Timer	0.0 to 99.99 s	5.0 s	
1285	Enable	OFF ON	OFF	
1286	Fail class	F1 to F9	F2 (Warning)	

1290 Busbar over-voltage 3 (BB U> 3)

No.	Setting	Range	Default	Description
1291	Set point	100.0 to 130.0 %	105.0 %	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay. * With option A10: Timer maximum is 2000.0 s, and the default is 100 s.
1292	Timer	0.0 to 99.99 s*	5.0 s*	
1295	Enable	OFF ON	OFF	
1296	Fail class	F1 to F9	F2 (Warning)	

1940 Busbar over-voltage 4 (BB U> 4)

No.	Setting	Range	Default	Description
1941	Set point	100.0 to 130.0 %	105.0 %	The alarm and fail class are activated when the voltage has been continuously above the programmed value during the programmed delay.
1942	Timer	1500 to 6000 s	5600 s	
1945	Enable	OFF ON	OFF	
1946	Fail class	F1 to F9	F2 (Warning)	

1300 Busbar under-voltage 1 (BB U< 1)

No.	Setting	Range	Default	Description
1301	Set point	40.0 to 100.0 %	97.0 %	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay.
1302	Timer	0.0 to 99.99 s	10.0 s	
1305	Enable	OFF ON	OFF	
1306	Fail class	F1 to F9	F2 (Warning)	

1310 Busbar under-voltage 2 (BB U< 2)

No.	Setting	Range	Default	Description
1311	Set point	40.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay.
1312	Timer	0.0 to 99.99 s	5.0 s	
1315	Enable	OFF ON	OFF	
1316	Fail class	F1 to F9	F2 (Warning)	

1320 Busbar under-voltage 3 (BB U< 3)

No.	Setting	Range	Default	Description
1321	Set point	40.0 to 100.0 %	97.0 %	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay. * With option A10: Timer maximum is 2000.0 s, and the default is 100 s.
1322	Timer	0.0 to 99.99 s*	10.0 s*	
1325	Enable	OFF ON	OFF	
1326	Fail class	F1 to F9	F2 (Warning)	

1330 Busbar under-voltage 4 (BB U< 4)

No.	Setting	Range	Default	Description
1331	Set point	40.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay. * With option A10: Timer maximum is 2000.0 s, and the default is 50 s.
1332	Timer	0.0 to 99.99 s*	5.0 s	
1335	Enable	OFF ON	OFF	
1336	Fail class	F1 to F9	F2 (Warning)	

1950 Busbar under-voltage 5 (BB U< 5)

No.	Setting	Range	Default	Description
1951	Set point	40.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the voltage has been continuously under the programmed value during the programmed delay.
1952	Timer	1500 to 6000 s	5600 s	
1955	Enable	OFF ON	OFF	
1956	Fail class	F1 to F9	F2 (Warning)	

2.2.6 Busbar frequency protections

Frequency settings relate to the nominal frequency setting.

1350 Busbar over-frequency 1 (BB f> 1)

No.	Setting	Range	Default	Description
1351	Set point	100.0 to 120.0 %	103.0 %	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay.
1352	Timer	0.0 to 99.99 s	10.0 s	
1355	Enable	OFF ON	OFF	
1356	Fail class	F1 to F9	F2 (Warning)	

1360 Busbar over-frequency 2 (BB f> 2)

No.	Setting	Range	Default	Description
1361	Set point	100.0 to 120.0 %	105.0 %	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay.
1362	Timer	0.0 to 99.99 s	5.0 s	
1365	Enable	OFF ON	OFF	
1366	Fail class	F1 to F9	F2 (Warning)	

1370 Busbar over-frequency 3 (BB f> 3)

No.	Setting	Range	Default	Description
1371	Set point	100.0 to 120.0 %	105.0 %	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay. *With option A10: Timer maximum is 2000.0 s.
1372	Timer	0.0 to 99.99 s*	5.0 s	
1375	Enable	OFF ON	OFF	
1376	Fail class	F1 to F9	F2 (Warning)	

1380 Busbar under-frequency 1 (BB f< 1)

No.	Setting	Range	Default	Description
1381	Set point	80.0 to 100.0 %	97.0 %	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1382	Timer	0.0 to 99.99 s	10.0 s	
1385	Enable	OFF ON	OFF	
1386	Fail class	F1 to F9	F2 (Warning)	

1390 Busbar under-frequency 2 (BB f< 2)

No.	Setting	Range	Default	Description
1391	Set point	80.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1392	Timer	0.0 to 99.99 s	5.0 s	
1395	Enable	OFF ON	OFF	
1396	Fail class	F1 to F9	F2 (Warning)	

1400 Busbar under-frequency 3 (BB f< 3)

No.	Setting	Range	Default	Description
1401	Set point	80.0 to 100.0 %	97.0 %	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay. *With option A10: Timer maximum is 2000.0 s.
1402	Timer	0.0 to 99.99 s*	10.0 s	
1405	Enable	OFF ON	OFF	
1406	Fail class	F1 to F9	F2 (Warning)	

1410 Busbar under-frequency 4 (BB f< 4)

No.	Setting	Range	Default	Description
1411	Set point	80.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay. *With option A10: Timer maximum is 2000.0 s.
1412	Timer	0.0 to 99.99 s*	5.0 s	
1415	Enable	OFF ON	OFF	
1416	Fail class	F1 to F9	F2 (Warning)	

1920 Busbar over-frequency 4 (BB f> 4)

No.	Setting	Range	Default	Description
1921	Set point	100.0 to 120.0 %	102.0 %	The alarm and fail class are activated when the frequency has been continuously above the programmed value during the programmed delay.
1922	Timer	1500 to 6000 s	5600 s	
1925	Enable	OFF ON	OFF	
1926	Fail class	F1 to F9	F2 (Warning)	

1930 Busbar under-frequency 5 (BB f< 5)

No.	Setting	Range	Default	Description
1931	Set point	80.0 to 100.0 %	95.0 %	The alarm and fail class are activated when the frequency has been continuously under the programmed value during the programmed delay.
1932	Timer	1500 to 6000 s	5600 s	
1935	Enable	OFF ON	OFF	
1936	Fail class	F1 to F9	F2 (Warning)	

2.2.7 Mains failure protections

1420 df/dt (ROCOF)

No.	Setting	Range	Default	Description
1421	Set point	1.0 to 10.0 Hz/s	5.0 Hz/s	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	Periods	3 to 20 periods	6 periods	
1423	Timer	0.00 to 3.00 s	0.00 s	
1424	Relay output A	Option-dependent	Not used	
1425	Enable	OFF ON	OFF	
1426	Fail class	F1 to F9	F6 (Trip MB)	

1430 Vector jump

No.	Setting	Range	Default	Description
1431	Set point	1.0 to 90.0 °	10.0 °	The alarm and fail class are activated when a vector jump is detected.
1434	Enable	OFF ON	OFF	
1435	Vector jump	F1 to F9	F6 (Trip MB)	

1440 Busbar positive sequence voltage low (BB pos seq voltage)

No.	Setting	Range	Default	Description
1441	Set point	10.0 to 110.0 %	70.0 %	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 default is 2 periods. This means that the error has to be active in 2 whole periods before the alarm 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.
1442	Timer	1 to 9 periods	2 periods	
1445	Enable	OFF ON	OFF	
1446	Fail class	F1 to F9	F6 (Trip MB)	

2.2.8 Overload protections

1450 P> 1

No.	Setting	Range	Default	Description
1451	Set point	-200.0 to 200.0 % of nominal power	100.0 %	The alarm is activated when the power exceeds the set point for the specified time. You can configure this as a low power alarm by deselecting *High alarm*. Use the translation tool in the utility software to change the alarm text to "P <".
1452	Timer	0.1 to 3200.0 s	10.0 s	
1455	Enable	OFF ON	OFF	
1456	Fail class	F1 to F9	F2 (Warning)	

1460 P> 2

No.	Setting	Range	Default	Description
1461	Set point	-200.0 to 200.0 %	110.0 %	The alarm is activated when the power exceeds the set point for the specified time. You can configure this as a low power alarm by deselecting *High alarm*. Use the translation tool in the utility software to change the alarm text to "P <".
1462	Timer	0.1 to 3200.0 s	5.0 s	
1465	Enable	OFF ON	OFF	
1466	Fail class	F1 to F9	F3 (Trip GB)	

1470 P> 3

No.	Setting	Range	Default	Description
1471	Set point	-200.0 to 200.0 %	100.0 %	The alarm is activated when the power exceeds the set point for the specified time. You can configure this as a low power alarm by deselecting *High alarm*. Use the translation tool in the utility software to change the alarm text to "P <".
1472	Timer	0.1 to 3200.0 s	10.0 s	
1475	Enable	OFF ON	OFF	
1476	Fail class	F1 to F9	F3 (Trip GB)	

1480 P> 4

No.	Setting	Range	Default	Description
1481	Set point	-200.0 to 200.0 %	110.0 %	The alarm is activated when the power exceeds the set point for the specified time. You can configure this as a low power alarm by deselecting *High alarm*. Use the translation tool in the utility software to change the alarm text to "P <".
1482	Timer	0.1 to 3200.0 s	5.0 s	
1485	Enable	OFF ON	OFF	
1486	Fail class	F1 to F9	F3 (Trip GB)	

1490 P< 5

No.	Setting	Range	Default	Description
1491	Set point	-200.0 to 200.0 %	100.0 %	The alarm is activated when the power is below the set point for the specified time. You can configure this as a high power alarm by selecting *High alarm*. Use the translation tool in the utility software to change the alarm text to "P >".
1492	Timer	0.1 to 3200.0 s	10.0 s	
1495	Enable	OFF ON	OFF	
1496	Fail class	F1 to F9	F3 (Trip GB)	

2.2.9 Current unbalance protection

1500 Unbalanced current 1

No.	Setting	Range	Default	Description
1501	Set point	0.0 to 100.0 %	30.0 %	Settings relate to nominal or average generator current, dependent on the settings in parameter 1203. The alarm and fail class are activated when the difference between the max. reading and the min. reading of the 3 measured currents has been continuously above the programmed value during the programmed delay.
1502	Timer	0.1 to 100.0 s	10.0 s	
1505	Enable	OFF ON	OFF	
1506	Fail class	F1 to F9	F3 (Trip GB)	

1710 Unbalanced current 2

No.	Setting	Range	Default	Description
1711	Set point	0.0 to 50.0 %	10.0 %	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 3 measured currents has been continuously above the programmed value during the programmed delay.
1712	Timer	0.1 to 100.0 s	10.0 s	
1715	Enable	OFF ON	OFF	
1716	Fail class	F1 to F9	F3 (Trip GB)	

2.2.10 Voltage unbalance protections

1510 Unbalanced voltage

No.	Setting	Range	Default	Description
1511	Set point	0.0 to 50.0 %	10.0 %	Settings relate to nominal generator voltage. The alarm and fail class are activated when the difference between the max. reading and the min. reading of the 3 measured voltages has been continuously above the programmed value during the programmed delay.
1512	Timer	0.1 to 100.0 s	10.0 s	
1515	Enable	OFF ON	OFF	
1516	Fail class	F1 to F9	F3 (Trip GB)	

2.2.11 Reactive power import (loss of excitation) protection

1520 Reactive power import (loss of excitation) (–Q>)

No.	Setting	Range	Default	Description
1521	Set point	0.0 to 150.0 %	50.0 %	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	Timer	0.1 to 100.0 s	10.0 s	
1525	Enable	OFF ON	OFF	
1526	Fail class	F1 to F9	F2 (Warning)	

2.2.12 Reactive power export (over-excitation) protection

1530 Reactive power export (over-excitation) (Q>)

No.	Setting	Range	Default	Description
1531	Set point	0.0 to 100.0 %	60.0 %	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	Timer	0.1 to 100.0 s	10.0 s	
1535	Enable	OFF ON	OFF	
1536	Fail class	F1 to F9	F2 (Warning)	

2.2.13 Negative sequence

1540 Negative sequence current (Negative seq. I)

No.	Setting	Range	Default	Description
1541	Set point	1.0 to 100.0 %	20.0 %	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	Timer	0.1 to 100.0 s	0.5 s	
1545	Enable	OFF ON	OFF	
1546	Fail class	F1 to F9	F6 (Trip MB)	

1550 G/M/BA negative sequence voltage (G/M/BA neg. seq. U)

No.	Setting	Range	Default	Description
1551	Set point	1.0 to 100.0 %	5.0 %	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	Timer	0.1 to 100.0 s	0.5 s	
1555	Enable	OFF ON	OFF	
1556	Fail class	F1 to F9	F6 (Trip MB)	

1560 Negative sequence selection

No.	Setting	Range	Default	Description
1561	Set point	G/M/BA measurement BB measurement	G/M/BA measurement	Selection between generator or busbar measurement of negative sequence voltage.

2.2.14 Zero sequence

1570 Zero sequence current (Zero seq. I)

No.	Setting	Range	Default	Description
1571	Set point	0.0 to 100.0 %	20.0 %	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	Timer	0.1 to 100.0 s	0.5 s	
1575	Enable	OFF ON	OFF	
1576	Fail class	F1 to F9	F6 (Trip MB)	

1580 G/M/BA zero sequence voltage (G/M/BAzero seq. U)

No.	Setting	Range	Default	Description
1581	Set point	0.0 to 100.0 %	5.0 %	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	Timer	0.1 to 100.0 s	0.5 s	
1585	Enable	OFF ON	OFF	
1586	Fail class	F1 to F9	F6 (Trip MB)	

1590 Zero sequence selection

No.	Setting	Range	Default	Description
1591	Set point	G/M/BA measurement BB measurement	G/M/BA measurement	Selection between generator or busbar measurement of zero sequence voltage.

2.2.15 Directional over-current protections

1600 Directional over-current 1 (I> direct 1)

No.	Setting	Range	Default	Description
1601	Set point	-200.0 to 200.0 %	120.0 %	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	Timer	0.0 to 3200.0 s	0.1 s	
1605	Enable	OFF ON	OFF	
1606	Fail class	F1 to F9	F6 (Trip MB)	

1610 Directional over-current 2 (I> direct 2)

No.	Setting	Range	Default	Description
1611	Set point	-200.0 to 200.0 %	130.0 %	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	Timer	0.0 to 3200.0 s	0.1 s	
1615	Enable	OFF ON	OFF	
1616	Fail class	F1 to F9	F6 (Trip MB)	

2.2.16 Busbar unbalance voltage

1620 BB unbalance U

No.	Setting	Range	Default	Description
1621	Set point	0.0 to 50.0 %	6.0 %	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 3 measured busbar voltages has been continuously above the programmed value during the programmed delay.
1622	Timer	0.1 to 100.0 s	10.0 s	
1625	Enable	OFF ON	OFF	
1626	Fail class	F1 to F9	F2 (Warning)	

2.2.17 HVRT

1630 HVRT (with option A10)

No.	Setting		Range	Default	Description
1631	HVRT Activate 1	Activate	30.0 to 130.0 %	110.0 %	The HVRT curve is configured on the *Advanced Protection* page in the utility software. See *FRT curves (LVRT and HVRT)* in **Option A10** for more information.
1632	HVRT Recovery 1	Set Point	30.0 to 130.0 %	105.0 %	
		Timer	0.0 to 320.0 s	1 s	
1634	HVRT Activate 1	Enable	OFF ON	OFF	
		Inhibits		Not parallel	

1640 HVRT 1 (with option A10)

No.	Setting	Range	Default	Description
1644	Enable	OFF ON	OFF	The HVRT curve is configured on the *Advanced Protection* page in the utility software.
1645	Fail class	F1 to F9	F6 (Trip MB)	

2.2.18 Time-dependent under-voltage (LVRT)

Configure the LVRT curves in the utility software (under *Advanced Protection*). In older AGC-4 controllers, this was done in parameter groups 1630 and 1640, and 1670 and 1680.

1650 Time-dependent under-voltage 1 activation (Ut< act 1)

No.	Setting	Range	Default	Description
1651	Activate	30.0 to 120.0 %	90.0 %	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 activate immediately when the function timer starts.
1652	Recovery	30.0 to 120.0 %	95.0 %	
1653	Delay	0.0 to 320.0 s	1.0 s	
1656	Enable	OFF ON	OFF	

1660 Time-dependent under-voltage 1 (Ut< 1)

No.	Setting	Range	Default	Description
1663	Enable	OFF ON	OFF	The alarm and fail class is activated instantaneously when the voltage value is under the programmed value curve.
1664	Fail class	F1 to F9	F6 (Trip MB)	

1690 Time-dependent under-voltage 2 activation (Ut< act 2)

No.	Setting	Range	Default	Description
1691	Activate	30.0 to 120.0 %	90.0 %	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 activate immediately when the function timer starts.
1692	Recovery	30.0 to 120.0 s	95.0 %	
1693	Delay	0.0 to 320.0 s	1.0 s	
1696	Enable	OFF ON	OFF	

1700 Time-dependent under-voltage 2 (Ut< 2)

No.	Setting	Range	Default	Description
1703	Enable	OFF ON	OFF	The alarm and fail class is activated instantaneously when the voltage value is under the programmed value curve.
1704	Fail class	F1 to F9	F6 (Trip MB)	

2.2.19 Power-dependent reactive power import

Configure the power-dependent reactive power import curve in the utility software (under *Advanced Protection*). To tune this protection, use the genset capability curve provided by the manufacturer. In older AGC-4 controllers, this was done in parameter groups 1740 and 1750.

1760 G P dep Q<

No.	Setting	Range	Default	Description
1761	Timer	0.1 to 300.0 s	1.0 s	Protects the generator from high reactive power (relative to its active power). This protection is an alternative to menu 1520 *Reactive power import (loss of excitation)*.
1764	Enable	OFF ON	OFF	
1765	Fail class	F1 to F9	F3 (Trip GB)	

2.2.20 Power-dependent reactive power export

Configure the power-dependent reactive power export curve in the utility software (under *Advanced Protection*). In older AGC-4 controllers, this was done in parameter groups 1770 and 1780.

1790 G P dep Q>

No.	Setting	Range	Default	Description
1791	Timer	0.1 to 300.0 s	1.0 s	Configuration of capability curve is done with the utility software in *Advanced Protection*.
1794	Enable	OFF ON	OFF	
1795	Fail class	F1 to F9	F3 (Trip GB)	

2.2.21 Non-essential load trip (load shedding)

NOTE Setting values relate to the nominal settings.

1800 NEL 1 over-current (NEL 1 I>)

No.	Setting	Range	Default	Description
1801	Set point	50.0 to 200.0 %	100.0 %	Trip of non-essential load due to over-current. This function activates NEL group 1.
1802	Timer	0.1 to 100.0 s	5.0 s	
1803	Enable	OFF ON	OFF	

1810 NEL 2 over-current (NEL 2 I>)

No.	Setting	Range	Default	Description
1811	Set point	50.0 to 200.0 %	100.0 %	Trip of non-essential load due to over-current. This function activates NEL group 2.
1812	Timer	0.1 to 100.0 s	8.0 s	
1813	Enable	OFF ON	OFF	

1820 NEL 3 over-current (NEL 3 I>)

No.	Setting	Range	Default	Description
1821	Set point	50.0 to 200.0 %	100.0 %	Trip of non-essential load due to over-current. This function activates NEL group 3.
1822	Timer	0.1 to 100.0 s	10.0 s	
1823	Enable	OFF ON	OFF	

1830 NEL 1 busbar under-frequency (NEL 1 bus f<)

No.	Setting	Range	Default	Description
1831	Set point	70.0 to 100.0 %	95.0 %	Trip of non-essential load due to low frequency. This function activates NEL group 1.
1832	Timer	0.1 to 100.0 s	5.0 s	
1833	Enable	OFF ON	OFF	

1840 NEL 2 busbar under-frequency (NEL 2 bus f<)

No.	Setting	Range	Default	Description
1841	Set point	70.0 to 100.0 %	95.0 %	Trip of non-essential load due to low frequency. This function activates NEL group 2.
1842	Timer	0.1 to 100.0 s	8.0 s	
1843	Enable	OFF ON	OFF	

1850 NEL 3 busbar under-frequency (NEL 3 bus f<)

No.	Setting	Range	Default	Description
1851	Set point	70.0 to 100.0 %	95.0 %	Trip of non-essential load due to low frequency. This function activates NEL group 3.
1852	Timer	0.1 to 100.0 s	10.0 s	
1853	Enable	OFF ON	OFF	

1860 NEL 1 overload (NEL 1 P>)

No.	Setting	Range	Default	Description
1861	Set point	10.0 to 200.0 %	100.0 %	Trip of non-essential load due to overload. This function activates NEL group 1.
1862	Timer	0.1 to 100.0 s	5.0 s	
1863	Enable	OFF ON	OFF	

1870 NEL 2 overload (NEL 2 P>)

No.	Setting	Range	Default	Description
1871	Set point	10.0 to 200.0 %	100.0 %	Trip of non-essential load due to overload. This function activates NEL group 2.
1872	Timer	0.1 to 100.0 s	8.0 s	
1873	Enable	OFF ON	OFF	

1880 NEL 3 overload (NEL 3 P>)

No.	Setting	Range	Default	Description
1881	Set point	10.0 to 200.0 %	100.0 %	Trip of non-essential load due to overload. This function activates NEL group 3.
1882	Timer	0.1 to 100.0 s	10.0 s	
1883	Enable	OFF ON	OFF	

1890 NEL 1 high overload (NEL 1 P>>)

No.	Setting	Range	Default	Description
1891	Set point	10.0 to 200.0 %	110.0 %	Trip of non-essential load due to high overload. This function activates NEL group 1.
1892	Timer	0.1 to 999.9 s	1.0 s	
1893	Enable	OFF ON	OFF	

1900 NEL 2 high overload (NEL 2 P>>)

No.	Setting	Range	Default	Description
1901	Set point	10.0 to 200.0 %	110.0 %	Trip of non-essential load due to high overload. This function activates NEL group 2.
1902	Timer	0.1 to 999.9 s	1.0 s	
1903	Enable	OFF ON	OFF	

1910 NEL 3 high overload (NEL 3 P>>)

No.	Setting	Range	Default	Description
1911	Set point	10.0 to 200.0 %	110.0 %	Trip of non-essential load due to high overload. This function activates NEL group 3.
1912	Timer	0.1 to 999.9 s	1.0 s	
1913	Enable	OFF ON	OFF	

2.2.22 Under-voltage and reactive power low

1960 U and Q < 1

No.	Setting	Range	Default	Description
1961	Set point	40.0 to 100.0 % of the generator nominal voltage	85.0 %	The alarm is activated when reactive power is consumed from the network (Q≤0 kvar) and the generator voltage drops below the set point for the specified time. If the generator is not able to generate reactive power and starts to consume it from the network, the alarm can be activated. See also menu 1990.
1962	Timer	0.1 to 3200.0 s	0.5 s	
1965	Enable	OFF ON	OFF	
1966	Fail class	F1 to F9	F2 (Warning)	

1970 U and Q < 2

No.	Setting	Range	Default	Description
1971	Set point	40.0 to 100.0 %	85.0 %	The alarm is activated when reactive power is consumed from the network (Q≤0 kvar) and the generator voltage drops below the set point for the specified time. If the generator is not able to generate reactive power and starts to consume it from the network, the alarm can be activated. See also menu 1990.
1972	Timer	0.1 to 3200.0 s	0.5 s	
1975	Enable	OFF ON	OFF	
1976	Fail class	F1 to F9	F2 (Warning)	

1980 GB/MB external trip

No.	Setting		Range	Default	Description
1981	GB ext. trip	Enable	OFF ON	ON	The generator breaker or the mains breaker has been tripped by an external device.
1982	GB ext. trip	Fail class	F1 to F9	F2 (Warning)	
1983	MB ext. trip	Enable	OFF ON	ON	
1984	MB ext. trip	Fail class	F1 to F9	F2 (Warning)	

1990 Minimum current and minimum Phi angle (U and Q< 1)

No.	Setting		Range	Default	Description
1991	I Min. 1	Set point	0 to 20 %	0 %	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 to 6 °	0 °	
1993	I Min. 2	Set point	0 to 20 %	0 %	
1994	Angle 2	Set point	0 to 6 °	0 °	

2.3 Control parameters: Synchronisation

2.3.1 Synchronisation and breaker alarms

2120 Synchronisation window (Sync. window)

No.	Setting	Range	Default	Description
2121	Set point	2.0 to 20.0 % of nominal voltage	15.0 %	The alarm activates if the difference between the measured busbar voltage and the nominal voltage exceeds the set point for the time delay.
2122	Timer	0.1 to 2.0 s	0.5 s	
2125	Enable	OFF ON	OFF	

2130 GB/TB/BTB breaker synchronisation failure (GB/TB/BTB sync. failure)

No.	Setting	Range	Default	Description
2131	Timer	5.0 to 999.9 s	60.0 s	The controller has unsuccessfully tried to synchronise the breaker to the busbar within the delay time.
2134	Enable	OFF ON	OFF	
2135	Fail class	F1 to F9	F1 (Block)	

2140 Mains breaker synchronisation failure (MB sync. failure)

No.	Setting	Range	Default	Description
2141	Timer	5.0 to 999.9 s	60.0 s	The controller has unsuccessfully tried to synchronise the breaker to the busbar within the delay time.
2144	Enable	OFF ON	ON	
2145	Fail class	F1 to F9	F2 (Warning)	

2150 Phase sequence error DG/Mains/Busbar A (Phase seq. error)

No.	Setting	Range	Default	Description
2153	Fail class	F1 to F9	F1 (Block)	The controller has detected that the rotation direction is the opposite of the selected direction. Compares phase rotation to expected direction at all times, not only during synchronisation.
2154	Set point	L1L2L3 L1L3L2	L1L2L3	

2155 Phase sequence error BB/Busbar B (Phase seq. error)

No.	Setting	Range	Default	Description
2155	Relay output A	Option-dependent	Not used	The controller has detected that the rotation direction is the opposite of the selected direction. Compares phase rotation to expected direction at all times, not only during synchronisation.
2156	Fail class	F1 to F9	F1 (Block)	

2160 GB/TB/BTB open failure

No.	Setting	Range	Default	Description
2161	Timer	1.0 to 10.0 s	2.0 s	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 within the delay time.
2164	Enable	OFF ON	ON	
2165	Fail class	F1 to F9	F2 (Warning)	

2170 GB/TB/BTB close failure

No.	Setting	Range	Default	Description
2171	Timer	1.0 to 5.0 s	2.0 s	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 within the delay time.
2174	Enable	OFF ON	ON	
2175	Fail class	F1 to F9	F2 (Warning)	

2180 GB/TB/BTB position failure (GB/TB/BTB pos. fail)

No.	Setting	Range	Default	Description
2181	Timer	1.0 to 5.0 s	1.0 s	This alarm will occur if the breaker feedbacks for ON and OFF are both missing or active for more than the time delay.
2184	Enable	OFF ON	ON	
2185	Fail class	F1 to F9	F2 (Warning)	

2200 MB open failure

No.	Setting	Range	Default	Description
2201	Timer	1.0 to 10.0 s	2.0 s	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 within the delay time.
2204	Enable	ON	ON	
2205	Fail class	F1 to F9	F2 (Warning)	

2210 MB close failure

No.	Setting	Range	Default	Description
2211	Timer	1.0 to 5.0 s	2.0 s	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 within the delay time.
2214	Enable	ON	ON	
2215	Fail class	F1 to F9	F2 (Warning)	

2220 MB position failure (MB pos. fail)

No.	Setting	Range	Default	Description
2221	Timer	1.0 to 5.0 s	1.0 s	This alarm will occur if the breaker feedbacks for ON and OFF are both missing or active for more than the delay time.
2224	Enable	ON	ON	
2225	Fail class	F1 to F9	F2 (Warning)	

2270 Close before excitation failure (Close before exc. fail)

No.	Setting	Range	Default	Description
2271	Timer	0.0 to 999.0 s	5.0 s	This alarm will occur if the generator and breaker are not operating within the limits of the Close Before Excitation. The alarm will open the generator breaker and enable the regulation synchronising the generator in a normal way.
2274	Enable	OFF ON	ON	
2275	Fail class	F1 to F9	F2 (Warning)	

2.3.2 Mains sync. inhibit

2280 Mains sync. inhibit settings

No.	Setting		Range	Default	Description
2281	Mains sync. inh. U	Low limit U	80 to 100 %	85 %	This function is used to inhibit the synchronising of the mains breaker after blackout.
2282	Mains sync. inh. U	High limit U	100 to 120 %	110 %	
2283	Mains sync. inh. F	Low limit F	90 to 100 %	95 %	
2284	Mains sync. inh. F	High limit F	100 to 110 %	101 %	
2285	Mains sync. inh.	Enable	OFF ON	OFF	
2286	Mains sync. inh.	Fail class	F1 to F9	F3 (Trip GB)	

2290 Mains sync. inhibit recovery settings

No.	Setting		Range	Default	Description
2291	Delay act. re2	Recovery sel. timer	0 to 20 s	3 s	After blackout, the timer in menu 2291 will start to run, and if the mains voltage and frequency are inside the tolerance ranges (menus 2281-2282) 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 delay 1	Delay time	0 to 60 s	5 s	
2293	Recovery delay 1	Relay output A	Option-dependent	Not used	
2294	Recovery delay 2	Delay time	0 to 2000 s	600 s	
2295	Recovery delay 2	Relay output A	Option-dependent	Not used	

2320 Busbar blocked

No.	Setting	Range	Default	Description
2321	Timer	1 to 5 s	1 s	See **Option G5** for details.
2324	Enable	Off, On	On	
2325	Fail class	F1 to F9	F2 (Warning)	

2.4 Control parameters: Regulation

2.4.1 Regulation alarms

2300 Section P> (with option T1)

No.	Setting	Range	Default	Description
2301	MW	0 to 30000 MW	0 MW	Short-circuit limitation: Used to limit the power on the busbar in a power management system. Set point in menus 2301 and 2302 are used as limit value for max. allowed power in the system. These values are all common set point in the power management system.
2302	kW	0 to 999 kW	0 kW	
2303	Delay	0 to 999 s	1 s	
2304	Relay output A	Option-dependent	Not used	
2305	Enable	OFF ON	OFF	
2306	Fail class	F1 to F9	F2 (Warning)	

2310 Section P> (with option T1)

No.	Setting	Range	Default	Description
2311	Factor	1.0 to 25.5	1.0	This value is used as a weighing factor for the P_{NOM} value kW of each transformer or generator in the power management system (in case of two equally sized).

2560 Governor regulation failure (Gov. reg fail)

No.	Setting	Range	Default	Description
2561	Deadband	1.0 to 100.0 %	30.0 %	The alarm is activated if the difference between the measured value and the set point is outside the deadband for longer than the delay time.
2562	Timer	10.0 to 300.0 s	60.0 s	
2565	Fail class	F1 to F9	F2 (Warning)	

2630 De-load error

No.	Setting	Range	Default	Description
2631	Timer	0.0 to 60.0 s	10.0 s	The alarm is activated if the generator fails to de-load within the delay time.
2634	Enable	OFF ON	ON	
2635	Fail class	F1 to F9	F2 (Warning)	

2680 AVR regulation failure (AVR reg fail)

No.	Setting	Range	Default	Description
2681	Set point	1.0 to 100.0 %	30.0 %	The alarm is activated if the difference between the measured value and the set point is outside the deadband for longer than the delay time.
2682	Timer	10.0 to 300.0 s	60.0 s	
2685	Fail class	F1 to F9	F2 (Warning)	

2.5 Input/output alarms: Digital inputs

2.5.1 Digital input 23-27 alarms

3000 Digital input 23

No.	Setting	Range	Default	Description
3001	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3004	Enable	OFF ON	OFF	
3005	Fail class	F1 to F9	F2 (Warning)	
3006	High alarm	OFF ON	ON	

3010 Digital input 24

No.	Setting	Range	Default	Description
3011	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable. Input 24 is by default used for breaker feedback (only available if no MB is present in the application).
3014	Enable	OFF ON	OFF	
3015	Fail class	F1 to F9	F2 (Warning)	
3016	High alarm	OFF ON	ON	

3020 Digital input 25

No.	Setting	Range	Default	Description
3021	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable. Input 25 is by default used for breaker feedback (only available if no MB is present in the application).
3024	Enable	OFF ON	OFF	
3025	Fail class	F1 to F9	F2 (Warning)	
3026	High alarm	OFF ON	ON	

3030 Digital input 26

No.	Setting	Range	Default	Description
3031	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable. Input 26 is by default used for breaker feedback (only available in a mains controller if no TB is present in the application).
3034	Enable	OFF ON	OFF	
3035	Fail class	F1 to F9	F2 (Warning)	
3036	High alarm	OFF ON	ON	

3040 Digital input 27

No.	Setting	Range	Default	Description
3041	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable. Input 27 is by default used for breaker feedback (only available in a mains controller if no TB is present in the application).
3044	Enable	OFF ON	OFF	
3045	Fail class	F1 to F9	F2 (Warning)	
3046	High alarm	OFF ON	ON	

2.5.2 Digital input 43-55 alarms (option M12)

3130 Digital input 43

No.	Setting	Range	Default	Description
3131	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3134	Enable	OFF ON	OFF	
3135	Fail class	F1 to F9	F2 (Warning)	
3136	High alarm	OFF ON	ON	

3140 Digital input 44

No.	Setting	Range	Default	Description
3141	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3144	Enable	OFF ON	OFF	
3145	Fail class	F1 to F9	F2 (Warning)	
3146	High alarm	OFF ON	ON	

3150 Digital input 45

No.	Setting	Range	Default	Description
3151	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3154	Enable	OFF ON	OFF	
3155	Fail class	F1 to F9	F2 (Warning)	
3156	High alarm	OFF ON	ON	

3160 Digital input 46

No.	Setting	Range	Default	Description
3161	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3164	Enable	OFF ON	OFF	
3165	Fail class	F1 to F9	F2 (Warning)	
3166	High alarm	OFF ON	ON	

3170 Digital input 47

No.	Setting	Range	Default	Description
3171	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3174	Enable	OFF ON	OFF	
3175	Fail class	F1 to F9	F2 (Warning)	
3176	High alarm	OFF ON	ON	

3180 Digital input 48

No.	Setting	Range	Default	Description
3181	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3184	Enable	OFF ON	OFF	
3185	Fail class	F1 to F9	F2 (Warning)	
3186	High alarm	OFF ON	ON	

3190 Digital input 49

No.	Setting	Range	Default	Description
3191	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3194	Enable	OFF ON	OFF	
3195	Fail class	F1 to F9	F2 (Warning)	
3196	High alarm	OFF ON	ON	

3200 Digital input 50

No.	Setting	Range	Default	Description
3201	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3204	Enable	OFF ON	OFF	
3205	Fail class	F1 to F9	F2 (Warning)	
3206	High alarm	OFF ON	ON	

3210 Digital input 51

No.	Setting	Range	Default	Description
3211	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3214	Enable	OFF ON	OFF	
3215	Fail class	F1 to F9	F2 (Warning)	
3216	High alarm	OFF ON	ON	

3220 Digital input 52

No.	Setting	Range	Default	Description
3221	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3224	Enable	OFF ON	OFF	
3225	Fail class	F1 to F9	F2 (Warning)	
3226	High alarm	OFF ON	ON	

3230 Digital input 53

No.	Setting	Range	Default	Description
3231	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3234	Enable	OFF ON	OFF	
3235	Fail class	F1 to F9	F2 (Warning)	
3236	High alarm	OFF ON	ON	

3240 Digital input 54

No.	Setting	Range	Default	Description
3241	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3244	Enable	OFF ON	OFF	
3245	Fail class	F1 to F9	F2 (Warning)	
3246	High alarm	OFF ON	ON	

3250 Digital input 55

No.	Setting	Range	Default	Description
3251	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3254	Enable	OFF ON	OFF	
3255	Fail class	F1 to F9	F2 (Warning)	
3256	High alarm	OFF ON	ON	

2.5.3 Digital input 91-97 alarms (option M13.6)

3330 Digital input 91

No.	Setting	Range	Default	Description
3331	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3334	Enable	OFF ON	OFF	
3335	Fail class	F1 to F9	F2 (Warning)	
3336	High alarm	OFF ON	ON	

3340 Digital input 92 (requires option M13.6)

No.	Setting	Range	Default	Description
3341	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3344	Enable	OFF ON	OFF	
3345	Fail class	F1 to F9	F2 (Warning)	
3346	High alarm	OFF ON	ON	

3350 Digital input 93

No.	Setting	Range	Default	Description
3351	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3354	Enable	OFF ON	OFF	
3355	Fail class	F1 to F9	F2 (Warning)	
3356	High alarm	OFF ON	ON	

3360 Digital input 94

No.	Setting	Range	Default	Description
3361	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3364	Enable	OFF ON	OFF	
3365	Fail class	F1 to F9	F2 (Warning)	
3366	High alarm	OFF ON	ON	

3370 Digital input 95

No.	Setting	Range	Default	Description
3371	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3374	Enable	OFF ON	OFF	
3375	Fail class	F1 to F9	F2 (Warning)	
3376	High alarm	OFF ON	ON	

3380 Digital input 96

No.	Setting	Range	Default	Description
3381	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3384	Enable	OFF ON	OFF	
3385	Fail class	F1 to F9	F2 (Warning)	
3386	High alarm	OFF ON	ON	

3390 Digital input 97

No.	Setting	Range	Default	Description
3391	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3394	Enable	OFF ON	OFF	
3395	Fail class	F1 to F9	F2 (Warning)	
3396	High alarm	OFF ON	ON	

2.5.4 Digital input 112-117 alarms

3430 Digital input 112

No.	Setting	Range	Default	Description
3431	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3434	Enable	OFF ON	OFF	
3435	Fail class	F1 to F9	F2 (Warning)	
3436	High alarm	OFF ON	ON	

3440 Digital input 113

No.	Setting	Range	Default	Description
3441	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3444	Enable	OFF ON	OFF	
3445	Fail class	F1 to F9	F2 (Warning)	
3446	High alarm	OFF ON	ON	

3450 Digital input 114

No.	Setting	Range	Default	Description
3451	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3454	Enable	OFF ON	OFF	
3455	Fail class	F1 to F9	F2 (Warning)	
3456	High alarm	OFF ON	ON	

3460 Digital input 115

No.	Setting	Range	Default	Description
3461	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3464	Enable	OFF ON	OFF	
3465	Fail class	F1 to F9	F2 (Warning)	
3466	High alarm	OFF ON	ON	

3470 Digital input 116

No.	Setting	Range	Default	Description
3471	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3474	Enable	OFF ON	OFF	
3475	Fail class	F1 to F9	F2 (Warning)	
3476	High alarm	OFF ON	ON	

3480 Digital input 117

No.	Setting	Range	Default	Description
3481	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3484	Enable	OFF ON	OFF	
3485	Fail class	F1 to F9	F2 (Warning)	
3486	High alarm	OFF ON	ON	

2.5.5 Emergency stop

3490 Emergency stop

No.	Setting	Range	Default	Description
3491	Timer	0.0 to 60.0 s	0.0 s	The alarm is activated if there is no input signal. You should therefore use a normally closed contact. This alarm stays active during a *Shutdown override*.
3494	Enable	OFF ON	ON	
3495	Fail class	F1 to F9	F5 (Shutdown)	

2.5.6 Digital input 127-133 alarms (option M13.8)

3500 Digital input 127

No.	Setting	Range	Default	Description
3501	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3504	Enable	OFF ON	OFF	
3505	Fail class	F1 to F9	F2 (Warning)	
3506	High alarm	OFF ON	ON	

3510 Digital input 128

No.	Setting	Range	Default	Description
3511	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3514	Enable	OFF ON	OFF	
3515	Fail class	F1 to F9	F2 (Warning)	
3516	High alarm	OFF ON	ON	

3520 Digital input 129

No.	Setting	Range	Default	Description
3521	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3524	Enable	OFF ON	OFF	
3525	Fail class	F1 to F9	F2 (Warning)	
3526	High alarm	OFF ON	ON	

3530 Digital input 130

No.	Setting	Range	Default	Description
3531	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3534	Enable	OFF ON	OFF	
3535	Fail class	F1 to F9	F2 (Warning)	
3536	High alarm	OFF ON	ON	

3540 Digital input 131

No.	Setting	Range	Default	Description
3541	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3544	Enable	OFF ON	OFF	
3545	Fail class	F1 to F9	F2 (Warning)	
3546	High alarm	OFF ON	ON	

3550 Digital input 132

No.	Setting	Range	Default	Description
3551	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3554	Enable	OFF ON	OFF	
3555	Fail class	F1 to F9	F2 (Warning)	
3556	High alarm	OFF ON	ON	

3560 Digital input 133

No.	Setting	Range	Default	Description
3561	Timer	0.0 to 3200.0 s	10.0 s	The input is configurable.
3564	Enable	OFF ON	OFF	
3565	Fail class	F1 to F9	F2 (Warning)	
3566	High alarm	OFF ON	ON	

2.5.7 M-Logic alarms 1 to 5

3570 M-Logic alarm 1

No.	Setting	Range	Default	Description
3570	Timer	0.0 to 3200.0 s	10.0 s	Select the event(s) to activate the alarm timer in M-Logic. If the event(s) remain active until the timer runs out, the alarm is activated.
3573	Enable	OFF ON	OFF	
3574	Fail class	F1 to F9	F2 (Warning)	
3575	High alarm	OFF ON	ON	

NOTE The same settings apply to M-Logic alarms 2-5, menus 3580 to 3610.

2.5.8 M-Logic extended timer alarms 1 to 4

3620 M-Logic extended timer alarm 1

No.	Setting	Range	Default	Description
3621	Set point	Minute(s) - manual reset Hours(s) - manual reset Days(s) - manual reset Minute(s) - auto reset Hour(s) - auto reset Day(s) - auto reset	Minute(s) - auto reset	See **Application Notes M-Logic AGC-4 Mk II** for more information.
3622	Set point	1 to 3200	50	The alarm timer set point. Parameter 3621 determines the timer units. Select the event(s) to activate the alarm timer in M-Logic.
3625	Enable	OFF ON	OFF	
3626	Fail class	F1 to F9	F2 (Warning)	
3627	High alarm	OFF ON	ON	

NOTE The same settings apply to M-Logic extended timer alarms 2-5, menus 3630-3650.

2.6 Input/output alarms: Analogue inputs

2.6.1 Optional analogue input alarms (option M15.6 or M16.6)

These alarms can also be configured in the utility software under **I/O setup**. Changes made (and written to the controller) under **I/O setup** change the values for these parameters. Similarly, parameter changes that are written to the controller change the values under I/O setup.

Option M15.6 has four inputs. These inputs all have the input type *4-20 mA*.

For the four M16 inputs, the input type chosen in **I/O setup** determines the alarm set point range and default. The option M16.6 input types are:

- 4-20 mA
- 0-5 V
- Pt100

4000 Analogue input alarm 91.1

No.	Setting	Range	Default	Description
4001	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4002	Timer	0.0 to 600.0 s	120.0 s	
4005	Enable	OFF ON	OFF	
4006	Fail class	F1 to F9	F2 (Warning)	

4010 Analogue input alarm 91.2

No.	Setting	Range	Default	Description
4011	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4012	Timer	0.0 to 600.0 s	120.0 s	
4015	Enable	OFF ON	OFF	
4016	Fail class	F1 to F9	F2 (Warning)	

4020 W. fail ana 91

No.	Setting	Range	Default	Description
4023	Enable	OFF ON	OFF	For option M15, the wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated. For option M16, for the wire fail function description, see the **Option M16 manual**.
4024	Fail class	F1 to F9	F2 (Warning)	

4030 Analogue input alarm 93.1

No.	Setting	Range	Default	Description
4031	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4032	Timer	0.0 to 600.0 s	120.0 s	
4035	Enable	OFF ON	OFF	
4036	Fail class	F1 to F9	F2 (Warning)	

4040 Analogue input alarm 93.2

No.	Setting	Range	Default	Description
4041	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4042	Timer	0.0 to 600.0 s	120.0 s	
4045	Enable	OFF ON	OFF	
4046	Fail class	F1 to F9	F2 (Warning)	

4050 W. fail ana 93

No.	Setting	Range	Default	Description
4053	Enable	OFF ON	OFF	For option M15, the wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated. For option M16, for the wire fail function description, see the **Option M16 manual**.
4054	Fail class	F1 to F9	F2 (Warning)	

4060 Analogue input alarm 95.1

No.	Setting	Range	Default	Description
4061	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4062	Timer	0.0 to 600.0 s	120.0 s	
4065	Enable	OFF ON	OFF	
4066	Fail class	F1 to F9	F2 (Warning)	

4070 Analogue input alarm 95.2

No.	Setting	Range	Default	Description
4071	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4072	Timer	0.0 to 600.0 s	120.0 s	
4075	Enable	OFF ON	OFF	
4076	Fail class	F1 to F9	F2 (Warning)	

4080 W. fail ana 95

No.	Setting	Range	Default	Description
4083	Enable	OFF ON	OFF	For option M15, the wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated. For option M16, for the wire fail function description, see the **Option M16 manual**.
4084	Fail class	F1 to F9	F2 (Warning)	

4090 Analogue input alarm 97.1

No.	Setting	Range	Default	Description
4091	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4092	Timer	0.0 to 600.0 s	120.0 s	
4095	Enable	OFF ON	OFF	
4096	Fail class	F1 to F9	F2 (Warning)	

4100 Analogue input alarm 97.2

No.	Setting	Range	Default	Description
4101	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4102	Timer	0.0 to 600.0 s	120.0 s	
4105	Enable	OFF ON	OFF	
4106	Fail class	F1 to F9	F2 (Warning)	

4110 W. fail ana 97

No.	Setting	Range	Default	Description
4113	Enable	OFF ON	OFF	For option M15, the wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated. For option M16, for the wire fail function description, see the **Option M16 manual**.
4114	Fail class	F1 to F9	F2 (Warning)	

2.6.2 Optional analogue input alarms (option M15.8 or M16.8)

These alarms can also be configured in the utility software under **I/O setup**. Changes made (and written to the controller) under **I/O setup** change the values for these parameters. Similarly, parameter changes that are written to the controller change the values under I/O setup.

Option M15.8 has four inputs. These inputs all have the input type *4-20 mA*.

For the four M16 inputs, the input type chosen in **I/O setup** determines the alarm set point range and default. The option M16.8 input types are:

- 4-20 mA
- 0-5 V
- Pt100

4800 Analogue input alarm 127.1

No.	Setting	Range	Default	Description
4801	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4802	Timer	0.0 to 600.0 s	120.0 s	
4805	Enable	OFF ON	OFF	
4806	Fail class	F1 to F9	F2 (Warning)	

4810 Analogue input alarm 127.2

No.	Setting	Range	Default	Description
4811	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4812	Timer	0.0 to 600.0 s	120.0 s	
4815	Enable	OFF ON	OFF	
4816	Fail class	F1 to F9	F2 (Warning)	

4820 W. fail ana 127

No.	Setting	Range	Default	Description
4823	Enable	OFF ON	OFF	For option M15, the wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated. For option M16, for the wire fail function description, see the **Option M16 manual**.
4824	Fail class	F1 to F9	F2 (Warning)	

4830 Analogue input alarm 129.1

No.	Setting	Range	Default	Description
4831	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4832	Timer	0.0 to 600.0 s	120.0 s	
4835	Enable	OFF ON	OFF	
4836	Fail class	F1 to F9	F2 (Warning)	

4840 Analogue input alarm 129.2

No.	Setting	Range	Default	Description
4841	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4842	Timer	0.0 to 600.0 s	120.0 s	
4845	Enable	OFF ON	OFF	
4846	Fail class	F1 to F9	F2 (Warning)	

4850 W. fail ana 129

No.	Setting	Range	Default	Description
4853	Enable	OFF ON	OFF	For option M15, the wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated. For option M16, for the wire fail function description, see the **Option M16 manual**.
4854	Fail class	F1 to F9	F2 (Warning)	

4860 Analogue input alarm 131.1

No.	Setting	Range	Default	Description
4861	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4862	Timer	0.0 to 600.0 s	120.0 s	
4865	Enable	OFF ON	OFF	
4866	Fail class	F1 to F9	F2 (Warning)	

4870 Analogue input alarm 131.2

No.	Setting	Range	Default	Description
4871	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4872	Timer	0.0 to 600.0 s	120.0 s	
4875	Enable	OFF ON	OFF	
4876	Fail class	F1 to F9	F2 (Warning)	

4880 W. fail ana 131

No.	Setting	Range	Default	Description
4883	Enable	OFF ON	OFF	For option M15, the wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated. For option M16, for the wire fail function description, see the **Option M16 manual**.
4884	Fail class	F1 to F9	F2 (Warning)	

4890 Analogue input alarm 133.1

No.	Setting	Range	Default	Description
4891	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4892	Timer	0.0 to 600.0 s	120.0 s	
4895	Enable	OFF ON	OFF	
4896	Fail class	F1 to F9	F2 (Warning)	

4900 Analogue input alarm 133.2

No.	Setting	Range	Default	Description
4901	Set point	M15: 4 to 20 mA M16: 4 to 20 mA M16: 0 to 5 V M16: -49 to 482 °C	M15: 10 mA M16: 10 mA M16: 2 V M16: 80 °C	Configurable analogue input. The input type selected in **I/O setup** determines the set point values shown for option M16.
4902	Timer	0.0 to 600.0 s	120.0 s	
4905	Enable	OFF ON	OFF	
4906	Fail class	F1 to F9	F2 (Warning)	

4910 W. fail ana 133

No.	Setting	Range	Default	Description
4913	Enable	OFF ON	OFF	For option M15, the wire fault will detect if the current drops below 2 mA or exceeds 22 mA. In both cases the alarm will be activated. For option M16, for the wire fail function description, see the **Option M16 manual**.
4914	Fail class	F1 to F9	F2 (Warning)	

2.7 Multi-functional analogue inputs

2.7.1 Multi-inputs 102, 105 and 108

Configure the alarms for multi-inputs 102, 105 and 108 under *I/O setup* in the utility software. See Input and output setup for more information.

2.7.2 Speed and running feedback setup

4510 Overspeed 1

No.	Setting	Range	Default	Description
4511	Set point	100 to 150 % of nominal speed	110 %	The alarm is inhibited during *Shutdown override*.
4512	Timer	0.0 to 3200.0 s	5.0 s	
4515	Enable	OFF ON	OFF	
4516	Fail class	F1 to F9	F2 (Warning)	

4520 Overspeed 2

No.	Setting	Range	Default	Description
4521	Set point	100 to 150 % of nominal speed	120 %	The alarm is inhibited during *Shutdown override*.
4522	Timer	0.0 to 3200.0 s	1.0 s	
4525	Enable	OFF ON	OFF	
4526	Fail class	F1 to F9	F5 (Shutdown)	

4530 Crank failure

No.	Setting	Range	Default	Description
4531	Set point	1 to 400 RPM	50 RPM	If MPU is chosen as the primary running feedback, this alarm will be raised if the specified RPM is not reached before the delay time has expired.
4532	Timer	0.0 to 20.0 s	2.0 s	
4535	Enable	OFF ON	OFF	
4536	Fail class	F1 to F9	F2 (Warning)	

4540 Running feedback failure

No.	Setting	Range	Default	Description
4541	Timer	0.0 to 20.0 s	2.0 s	If running is detected on the frequency (secondary), but the primary running feedback (for example, a digital input) has not detected running, this alarm will be raised after the adjusted delay time.
4544	Enable	OFF ON	ON	
4545	Fail class	F1 to F9	F2 (Warning)	

4550 Magnetic pick-up wire break (MPU wire break)

No.	Setting	Range	Default	Description
4553	Enable	OFF ON	OFF	The wire break monitoring is only active when the engine is at stand still.
4554	Fail class	F1 to F9	F2 (Warning)	

4560 Hz/voltage failure (Hz/V failure)

No.	Setting	Range	Default	Description
4561	Timer	1.0 to 99.0 s	30.0 s	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. Limits are placed in menu 2110 (Sync. blackout).
4564	Enable	OFF ON	ON	
4565	Fail class	F1 to F9	F5 (Shutdown)	

4570 Start failure

No.	Setting	Range	Default	Description
4573	Fail class	F1 to F9	F1 (Block)	The start failure alarm occurs if the genset has not started after the number of start attempts.

4580 Stop failure

No.	Setting	Range	Default	Description
4581	Timer	10.0 to 120.0 s	30.0 s	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.
4584	Enable	OFF ON	ON	
4585	Fail class	F1 to F9	F5 (Shutdown)	

4590 Underspeed 1

No.	Setting	Range	Default	Description
4591	Set point	50 to 100 %	90 %	The set point in percentage relates to nominal RPM.
4592	Timer	0.0 to 3200.0 s	5.0 s	
4595	Enable	OFF ON	OFF	
4596	Fail class	F1 to F9	F2 (Warning)	

2.7.3 Differential measurement

Input type

No.	Setting	Range	Default	Description
4601	Delta Ana1 Input A	Analogue input [91, 93, 95, 97, 127, 129, 131, 133] Multi-input [102, 105, 108] CIO 308 [1.08, 1.11, 1.14, 1.17, 1.20, 1.23, 1.26, 1.29] CIO 308 [2.08, 2.11, 2.14, 2.17, 2.20, 2.23, 2.26, 2.29] CIO 308 [3.08, 3.11, 3.14, 3.17, 3.20, 3.23, 3.26, 3.29] Ext. Ana. In [1 to 8] (option H12) EIC oil pressure (SPN 100) EIC cooling water temp. (SPN 110) EIC oil temp. (SPN 175) EIC ambient temp. (SPN 171) EIC intercool temp. (SPN 52) EIC fuel temp. (SPN 174) EIC fuel delivery press (SPN 94) EIC air filter f1 diff. press. (SPN 107) EIC air filter f2 diff. press. (SPN 2809) EIC fuel supply pump press. (SPN 1381) EIC fuel filter diff. press. SS (SPN 1382) EIC oil filter diff. press. (SPN 99) EIC T. exhaust left (SPN 2434) EIC T. exhaust right (SPN 2433) EIC Fuel filter diff. pres. (SPN 95) EIC Percent Load At Current Speed (SPN 92) EIC T. Winding Highest EIC T. Winding Lowest EIC T. Winding [1 to 3] EIC DEF Level (SPN 1761/ECU specific) EIC DEF Temp. (SPN 3031) DEIF DVC 550 PT100_[1 to 5] KWG ISO5 insulation resistance EIC Estimated Percent Fan Speed (SPN 975) EIC Fan speed RPM (SPN 1639)	Multi-input 102	Inputs for differential measurements.
4602	Delta Ana1 Input B			
4603	Delta Ana2 Input A			
4604	Delta Ana2 Input B			
4605	Delta Ana3 Input A			
4606	Delta Ana3 Input B			
4671	Delta Ana4 Input A			
4672	Delta Ana4 Input B			
4673	Delta Ana5 Input A			
4674	Delta Ana5 Input B			
4675	Delta Ana6 Input A			
4676	Delta Ana6 Input B			
4741	Delta Ana7 Input A			
4742	Delta Ana7 Input B			
4743	Delta Ana8 Input A			
4744	Delta Ana8 Input B			
4745	Delta Ana9 Input A			
4746	Delta Ana9 Input B			

4610 Delta analogue 1.1

No.	Setting	Range	Default	Description
4611	Set point	-9999 to 9999	10	Delta analogue alarm setting 1.1.
4612	Timer	0.0 s to 999.0 s	5.0 s	
4615	Enable	OFF ON	OFF	
4616	Fail class	F1 to F9	F2 (Warning)	

4620 Delta analogue 1.2

No.	Setting	Range	Default	Description
4621	Set point	-9999 to 9999	10	Delta analogue alarm setting 1.2.
4622	Timer	0.0 s to 999.0 s	5.0 s	
4625	Enable	OFF ON	OFF	
4626	Fail class	F1 to F9	F2 (Warning)	

4630 Delta analogue 2.1

No.	Setting	Range	Default	Description
4631	Set point	-9999 to 9999	10	Delta analogue alarm setting 2.1.
4632	Timer	0.0 s to 999.0 s	5.0 s	
4635	Enable	OFF ON	OFF	
4636	Fail class	F1 to F9	F2 (Warning)	

4640 Delta analogue 2.2

No.	Setting	Range	Default	Description
4641	Set point	-9999 to 9999	10	Delta analogue alarm setting 2.2.
4642	Timer	0.0 s to 999.0 s	5.0 s	
4645	Enable	OFF ON	OFF	
4646	Fail class	F1 to F9	F2 (Warning)	

4650 Delta analogue 3.1

No.	Setting	Range	Default	Description
4651	Set point	-9999 to 9999	10	Delta analogue alarm setting 3.1.
4652	Timer	0.0 s to 999.0 s	5.0 s	
4655	Enable	OFF ON	OFF	
4656	Fail class	F1 to F9	F2 (Warning)	

4660 Delta analogue 3.2

No.	Setting	Range	Default	Description
4661	Set point	-9999 to 9999	10	Delta analogue alarm setting 3.2.
4662	Timer	0.0 s to 999.0 s	5.0 s	
4665	Enable	OFF ON	OFF	
4666	Fail class	F1 to F9	F2 (Warning)	

4680 Delta analogue 4.1

No.	Setting	Range	Default	Description
4681	Set point	-9999 to 9999	10	Delta analogue alarm setting 4.1.
4682	Timer	0.0 s to 999.0 s	5.0 s	
4685	Enable	OFF ON	OFF	
4686	Fail class	F1 to F9	F2 (Warning)	

4690 Delta analogue 4.2

No.	Setting	Range	Default	Description
4691	Set point	-9999 to 9999	10	Delta analogue alarm setting 4.2.
4692	Timer	0.0 s to 999.0 s	5.0 s	
4695	Enable	OFF ON	OFF	
4696	Fail class	F1 to F9	F2 (Warning)	

4700 Delta analogue 5.1

No.	Setting	Range	Default	Description
4701	Set point	-9999 to 9999	10	Delta analogue alarm setting 5.1.
4702	Timer	0.0 s to 999.0 s	5.0 s	
4705	Enable	OFF ON	OFF	
4706	Fail class	F1 to F9	F2 (Warning)	

4710 Delta analogue 5.2

No.	Setting	Range	Default	Description
4711	Set point	-9999 to 9999	10	Delta analogue alarm setting 5.2.
4712	Timer	0.0 s to 999.0 s	5.0 s	
4715	Enable	OFF ON	OFF	
4716	Fail class	F1 to F9	F2 (Warning)	

4720 Delta analogue 6.1

No.	Setting	Range	Default	Description
4721	Set point	-9999 to 9999	10	Delta analogue alarm setting 6.1.
4722	Timer	0.0 s to 999.0 s	5.0 s	
4725	Enable	OFF ON	OFF	
4726	Fail class	F1 to F9	F2 (Warning)	

4730 Delta analogue 6.2

No.	Setting	Range	Default	Description
4731	Set point	-9999 to 9999	10	Delta analogue alarm setting 6.2.
4732	Timer	0.0 s to 999.0 s	5.0 s	
4735	Enable	OFF ON	OFF	
4736	Fail class	F1 to F9	F2 (Warning)	

4750 Delta analogue 7.1

No.	Setting	Range	Default	Description
4751	Set point	-9999 to 9999	10	Delta analogue alarm setting 7.1.
4752	Timer	0.0 s to 999.0 s	5.0 s	
4755	Enable	OFF ON	OFF	
4756	Fail class	F1 to F9	F2 (Warning)	

4760 Delta analogue 7.2

No.	Setting	Range	Default	Description
4761	Set point	-9999 to 9999	10	Delta analogue alarm setting 7.2.
4762	Timer	0.0 s to 999.0 s	5.0 s	
4765	Enable	OFF ON	OFF	
4766	Fail class	F1 to F9	F2 (Warning)	

4770 Delta analogue 8.1

No.	Setting	Range	Default	Description
4771	Set point	-9999 to 9999	10	Delta analogue alarm setting 8.1.
4772	Timer	0.0 s to 999.0 s	5.0 s	
4775	Enable	OFF ON	OFF	
4776	Fail class	F1 to F9	F2 (Warning)	

4780 Delta analogue 8.2

No.	Setting	Range	Default	Description
4781	Set point	-9999 to 9999	10	Delta analogue alarm setting 8.2.
4782	Timer	0.0 s to 999.0 s	5.0 s	
4785	Enable	OFF ON	OFF	
4786	Fail class	F1 to F9	F2 (Warning)	

4790 Delta analogue 9.1

No.	Setting	Range	Default	Description
4791	Set point	-9999 to 9999	10	Delta analogue alarm setting 9.1.
4792	Timer	0.0 s to 999.0 s	5.0 s	
4795	Enable	OFF ON	OFF	
4796	Fail class	F1 to F9	F2 (Warning)	

4800 Delta analogue 9.2

No.	Setting	Range	Default	Description
4801	Set point	-9999 to 9999	10	Delta analogue alarm setting 9.2.
4802	Timer	0.0 s to 999.0 s	5.0 s	
4805	Enable	OFF ON	OFF	
4806	Fail class	F1 to F9	F2 (Warning)	

2.7.4 Aux. supply setup

4960 U< auxiliary power supply terminal 1 (U< aux. term. 1)

No.	Setting	Range	Default	Description
4961	Set point	8.0 to 32.0 V DC	18.0 V DC	The power supply on terminal 1 and 2 has continuously been below the adjusted set point during the programmed delay time.
4962	Timer	0.0 s to 999.0 s	1.0 s	
4965	Enable	OFF ON	ON	
4966	Fail class	F1 to F9	F2 (Warning)	

4970 U> auxiliary power supply terminal 1 (U> aux. term. 1)

No.	Setting	Range	Default	Description
4971	Set point	12.0 to 36.0 V DC	30.0 V DC	The power supply on terminal 1 and 2 has continuously been above the adjusted set point during the programmed delay time.
4972	Timer	0.0 s to 999.0 s	1.0 s	
4975	Enable	OFF ON	ON	
4976	Fail class	F1 to F9	F2 (Warning)	

4980 U< auxiliary power supply terminal 98 (U< aux. term. 98)

No.	Setting	Range	Default	Description
4981	Set point	8.0 to 32.0 V DC	18.0 V DC	The power supply on terminal 98 and 99 has continuously been below the adjusted set point during the programmed delay time.
4982	Timer	0.0 s to 999.0 s	1.0 s	
4985	Enable	OFF ON	ON	
4986	Fail class	F1 to F9	F2 (Warning)	

4990 U> auxiliary power supply terminal 98 (U> aux. term. 98)

No.	Setting	Range	Default	Description
4991	Set point	8.0 to 32.0 V DC	30.0 V DC	The power supply on terminal 98 and 99 has continuously been above the adjusted set point during the programmed delay time.
4992	Timer	0.0 s to 999.0 s	1.0 s	
4995	Enable	OFF ON	ON	
4996	Fail class	F1 to F9	F2 (Warning)	

2.8 System alarms: General setup

2.8.1 Stop coil wirebreak and internal communication alarms

6270 Stop coil wire break

No.	Setting	Range	Default	Description
6273	Enable	OFF ON	OFF	The wire break monitoring is only active when the stop coil output is deactivated.
6274	Fail class	F1 to F9	F2 (Warning)	

6280 Internal communication fail (Int. comm. fail)

No.	Setting	Range	Default	Description
6283	Fail class	F1 to F9	F2 (Warning)	This is the alarm for communication fail between the main processor and the engine interface processor. The alarm will also occur if there is no supply on terminal 98-99 for option M4.

2.8.2 Engine heater failure

6330 Engine heater 1

No.	Setting	Range	Default	Description
6331	Set point	10 to 250 °	30 °	-
6332	Timer	1.0 s to 300.0 s	10.0 s	
6335	Enable	OFF ON	OFF	
6336	Fail class	F1 to F9	F2 (Warning)	

2.8.3 Running detection

6350 Running detection

No.	Setting	Range	Default	Description
6351	Running detection - Timer	1.0 s to 1200.0 s	10.0 s	Timer 6351 is the maximum time that the genset has to reach operating speed. The timer starts after the starter is turned off. This alarm requires a speed signal in the controller. The *External stop* alarm is activated if the engine is stopped (no running detection) without a command from the controller.
6352	Ext. engine Stop - Timer	1.0 s to 1200.0 s	10.0 s	
6353	Ext. engine Stop - Enable	OFF ON	ON	
6354	Ext. engine Stop	F1 to F9	F2 (Warning)	

2.8.4 Battery tests

6410 Battery test

No.	Setting	Range	Default	Description
6411	Set point	8.0 to 32.0 V	18.0 V	If the battery voltage drops below set point during crank test the alarm activates. If the type is configured with *+ Start Sequence*, the timer is disabled and the number of start attempts configured in *Start attempts* (parameter 6190) is run without activating the run coil. After the sequence, the alarm *Start failure* (parameter 4570) is activated.
6412	Timer	1.0 to 300.0 s	20.0 s	
6413	Type	Power supply Multi-input 102 Multi-input105 Multi-input 108 Power supply 98/99 (*+ Start Sequence*)	Power supply	
6414	Relay output A	Option-dependent	Not used	
6415	Enable	OFF ON	OFF	
6416	Fail class	F1 to F9	F2 (Warning)	

6420 Auto battery test

No.	Setting	Range	Default	Description
6421	Enable	OFF ON	OFF	Automatic battery test time setting.
6422	Day	Monday to Sunday	Monday	
6423	Hours	0 to 23 h	10 h	
6424	Week	1 to 52	52	
6425	Relay output A	Option-dependent	Not used	

6430 Battery asymmetry

No.	Setting	Range	Default	Description
6431	T1	Power supply Multi-input 102 Multi-input 105 Multi-input 108 Power supply 98/99	Multi-input 105	Battery asymmetry input selections.
6432	RF1		Power supply	
6433	T2		Multi-input 108	
6434	RF2		Multi-input 102	

6440 Battery asymmetry 1

No.	Setting	Range	Default	Description
6441	Set point	0.1 to 15.0 V	1.0 V	If the battery voltage asymmetry between the single batteries exceeds the setting, the alarm will activate.
6442	Timer	0.0 to 10.0 s	1.0 s	
6445	Enable	OFF ON	OFF	

6450 Battery asymmetry 2

No.	Setting	Range	Default	Description
6451	Set point	0.1 to 15.0 V	1.0 V	If the battery voltage asymmetry between the single batteries exceeds the setting, the alarm will activate.
6452	Timer	0.0 to 10.0 s	1.0 s	
6455	Enable	OFF ON	OFF	

2.8.5 Max. ventilation

6470 Max. ventilation 1

No.	Setting	Range	Default	Description
6471	Set point	20 to 250 °C	95 °C	If the cooling fans fail to operate and the coolant temperature exceeds the setting, the alarm will activate.
6472	Timer	0.0 to 60.0 s	1.0 s	
6475	Enable	OFF ON	OFF	
6476	Fail class	F1 to F9	F2 (Warning)	

6480 Max. ventilation 2

No.	Setting	Range	Default	Description
6481	Set point	20 to 250 °C	98 °C	If the cooling fans fail to operate and the coolant temperature exceeds the setting, the alarm will activate.
6482	Timer	0.0 to 60.0 s	1.0 s	
6485	Enable	OFF ON	OFF	
6486	Fail class	F1 to F9	F5 (Shutdown)	

2.8.6 Switchboard error: Block and Stop

6500 Block switchboard error (Blk. swbd error)

No.	Setting	Range	Default	Description
6501	Timer	0.0 to 999.0 s	10.0 s	If the *Switchboard error* digital input is activated, a stopped genset is immediately blocked and cannot start. You can disable this alarm using parameter 6505, however, the digital input will still block the genset. Parallel (parameter 6502) (affects 6500 and 6510) • **OFF**: Only AMF start is affected. • **ON**: All starts are affected.
6502	Parallel	OFF ON	OFF	
6505	Enable	OFF ON	OFF	
6506	Fail class	F1 to F9	F2 (Warning)	

6510 Stop switchboard error (Stp. swbd error)

No.	Setting	Range	Default	Description
6511	Timer	0.0 to 999.0 s	1.0 s	If the *Switchboard error* digital input is activated for the specified time (6511), the alarm is activated. By default, when the alarm is activated, the controller stops the genset (6515). Parameter 6202 determines which starts are affected.
6514	Enable	OFF ON	OFF	
6515	Fail class	F1 to F9	F5 (Shutdown)	

2.8.7 Switchboard error: Not in auto

6540 Not in auto

No.	Setting	Range	Default	Description
6541	Timer	10.0 to 900.0 s	300.0 s	Activated when the controller is not in auto mode.
6544	Enable	OFF ON	OFF	
6545	Fail class	F1 to F9	F2 (Warning)	

2.8.8 Oil renewal

6890 Oil renewal

No.	Setting	Range	Default	Description
6891	Oil renewal - Set point	1 to 999 h	750 h	Oil change alarm. By default, the relay (6892) is activated when the engine run time reaches the set point (6891). However, if you select *Inverse proportional* in the utility software, the relay is activated until the set point is reached.
6892	Oil renewal - Relay output A	Option-dependent	Not used	
6893	Adj. reset value - Password level	Basic Customer Service	Basic	

2.8.9 Avg U BB

7480 Avg U BB> 1

No.	Setting	Range	Default	Description
7481	Set point	100.0 to 120.0 %	110.0 %	Busbar over-voltage alarm based on average measurement of the voltage of the busbar. See **Option A1** for more information.
7482	Timer	0.1 to 3200.0 s	10 s	
7483	Relay output A	Option-dependent	Not used	
7484	Enable	OFF ON	OFF	
7485	Fail class	F1 to F9	F2 (Warning)	
7486	AVG timer	30.0 to 900.0 s	600.0 s	

7490 Avg U BB> 2

No.	Setting	Range	Default	Description
7491	Set point	100.0 to 120.0 %	110.0 %	Busbar over-voltage alarm based on average measurement of the voltage of the busbar.
7492	Timer	0.1 to 3200.0 s	10 s	
7493	Relay output A	Option-dependent	Not used	
7494	Enable	OFF ON	OFF	
7495	Fail class	F1 to F9	F2 (Warning)	
7496	AVG timer	30.0 to 900.0 s	600.0 s	

2.9 System alarms: Communication

2.9.1 External communication error

7520 External communication error (with option H2 or H3) (Ext. comm. error)

No.	Setting	Range	Default	Description
7521	Delay	1.0 to 100.0 s	10.0 s	Supervision of the external communication line. The alarm will occur when there has been no communication during the delay time.
7524	Enable	OFF ON	OFF	
7525	Fail class	F1 to F9	F2 (Warning)	

2.9.2 Internal CAN communication error

7930 CAN1 communication error (CAN1 com error)

No.	Setting	Range	Default	Description
7931	Timer	10.0 to 600.0 s	10.0 s	Option: • External I/O modules (H12.2) Note: If both options H12.x are present, an error on any of these will activate the alarm.
7934	Enable	OFF ON	ON	
7935	Fail class	F1 to F9	F2 (Warning)	

7940 CAN2 communication error (CAN2 com error)

No.	Setting	Range	Default	Description
7941	Timer	10.0 to 600.0 s	10.0 s	Option: • External I/O modules (H12.2) Note: If both options H12.x are present, an error on any of these will activate the alarm.
7944	Enable	OFF ON	ON	
7945	Fail class	F1 to F9	F2 (Warning)	

2.10 External I/O alarms

2.10.1 External I/O alarm setup

Alarms based on external I/O modules can only be configured with the PC utility software.

2.10.2 Analogue inputs (requires option H12.x)

12000 Ext. Ain 1.1

No.	Setting	Range	Default	Description
	Set point	0 to 10	10	
	Timer	0.0 to 600.0 s	10.0 s	
	Enable	OFF ON	OFF	
	Fail class	F1 to F9	F2 (Warning)	

12010 Ext. Ain 1.1

No.	Setting	Range	Default	Description
	Set point	0 to 10	10	
	Timer	0.0 to 600.0 s	10.0 s	
	Enable	OFF ON	OFF	
	Fail class	F1 to F9	F2 (Warning)	

NOTE The same settings apply to external analogue inputs 2-8, menus 12030-12220.

2.10.3 External analogue input scale (requires option H12.x)

12230 4-20 mA Ext in 1 scale

No.	Setting	Range	Default	Description
	Set point	No decimal One decimal Two decimals	One decimal	Set *Enable* to *ON* and write the new set point to automatically scale the associated min., max. and value.
	Enable	OFF ON	OFF	

NOTE The same settings apply to external analogue inputs 2-8, menus 12240-12300.

2.10.4 Digital inputs (requires option H12.x)

12540 Ext. dig. in 1

No.	Setting		Range	Default	Description
	Ext. dig. in 1	Timer	0.0 to 100.0 s	10.0 s	
	Ext. dig. in 1	Enable	OFF ON	OFF	
	Ext. dig. in 1	High alarm	OFF ON	ON	
	Ext. dig. in 1	Fail class	F1 to F9	F2 (Warning)	

NOTE The same settings apply to all external digital inputs. That is, they also apply to digital inputs 2 to 16, in menus 12550 to 12690.

3. System parameters

3.1 General setup

3.1.1 Nominal settings

6000 Nominal settings 1

No.	Setting	Range	Default	Description
6001	Frequency	48.0 to 62.0 Hz	50.0 Hz	The source (genset, mains, or busbar A) nominal parameters. These are used in AC protection set points, regulator operation, and power plant control. *Voltage and power range and default depend on the scaling set in parameter 9030.
6002	Power	1 to 900,000 kW*	480 kW*	
6003	Current	0 to 9000 A	867 A	
6004	Voltage	10 to 250,000 V*	400 V*	
6005	RPM	100 to 4000 RPM	1500 RPM	
6006	Setting	1 to 4	1	The set of nominal settings to use. Alternatively, use a digital input or M-Logic.

6010 Nominal settings 2

No.	Setting	Range	Default	Description
6011	Frequency	48.0 to 62.0 Hz	50.0 Hz	*Voltage and power range and default depend on the scaling set in parameter 9030.
6012	Power	1 to 900,000 kW*	230 kW*	
6013	Current	0 to 9000 A	345 A	
6014	Voltage	10 to 250,000 V*	480 V*	
6015	RPM	100 to 4000 RPM	1500 RPM	

6020 Nominal settings 3

No.	Setting	Range	Default	Description
6021	Frequency	48.0 to 62.0 Hz	60.0 Hz	*Voltage and power range and default depend on the scaling set in parameter 9030.
6022	Power	1 to 900,000 kW*	230 kW*	
6023	Current	0 to 9000 A	345 A	
6024	Voltage	10 to 250,000 V*	480 V*	
6025	RPM	100 to 4000 RPM	1800 RPM	

6030 Nominal settings 4

No.	Setting	Range	Default	Description
6031	Frequency	48.0 to 62.0 Hz	60.0 Hz	*Voltage and power range and default depend on the scaling set in parameter 9030.
6032	Power	1 to 900,000 kW*	230 kW*	
6033	Current	0 to 9000 A	345 A	
6034	Voltage	10 to 250,000 V*	480 V*	
6035	RPM	100 to 4000 RPM	1800 RPM	

6040 Gen/Mains/busbar A transformer (G/M/BA transformer)

No.	Setting	Range	Default	Description
6041	U primary	10 to 250,000 V*	400 V*	If there is no voltage transformer, set the primary and secondary side values to the generator nominal value. *Gen/mains/busbar primary voltage range and default depend on the scaling set in parameter 9030.
6042	U secondary	100 to 690 V	400 V	
6043	I primary	5 to 9000 A	1000 A	
6044	I secondary	1 to 5 A	5 A	

6050 Busbar settings 1 (BB setting 1)

No.	Setting	Range	Default	Description
6051	U primary	10 to 250,000 V*	400 V*	The transformation ratio for the voltage measuring transformers on the busbar side. If 6053 is not the same as 6004, the AGC assumes that a voltage transformer is installed between the generator and the busbars. If there is no voltage transformer, set the primary (6051) and secondary side (6052) values to the generator nominal (6004) value. *BB primary and nominal voltage range and default depend on the scaling set in parameter 9030.
6052	U secondary	100 to 690 V	400 V	
6053	Nominal U 1	10 to 250,000 V*	400 V*	
6054	Bus nom. set	Param set 1 Param set 2	Param set 1	The set of busbar nominal settings to use. Alternatively, use a digital input, M-Logic, or a Modbus command to change this setting.

NOTICE

System disruption

Make sure that the transformer ratios are set correctly, since errors here can disrupt the whole system.

6060 Busbar settings 2 (BB setting 2)

No.	Setting	Range	Default	Description
6061	U primary	10 to 250,000 V*	400 V*	See 6050.
6062	U secondary	100 to 690 V	400 V	
6063	Nominal U 2	10 to 250,000 V*	400 V*	

3.1.2 Breaker control

6230 Gen/Mains/Tie/Bus tie breaker control

No.	Setting	Range	Default	Description
6231	GB close delay	0.0 to 30.0 s	2.0 s	If there is a blackout, this is the close delay after the voltage and frequency are okay.
6232	GB Load time	0.0 to 30.0 s	0.0 s	For compact breakers, which need to charge their spring before closing. If the load time is > 0 s, the breaker can only re-close after the timer expires. The timer starts as soon as the breaker is opened. If there is a close command, the breaker LED on the DU-2 flashes yellow until the timer expires. Alternatively, use the digital input *GB spring loaded*. Breaker closing is blocked until the input is activated. When there is a close command, the breaker LED on the DU-2 also flashes yellow. Finally, the *GB OFF and block* digital input can be used to block the breaker closing. Closing then is only possible after the input is deactivated. There is no DU-2 indication when using this input.

3.1.3 Date and time

6090 Date and time

No.	Setting	Range	Default	Description
6091	Year	2001 to 2100	2008	Used to set up the clock in the unit. Only available from the display.
6092	Month	1 to 12	1	
6093	Date	1 to 31	1	
6094	Week day	1 to 7	1	
6095	Hour	0 to 23	3	
6096	Minute	0 to 59	5	

3.1.4 Master clock

6400 Master clock

No.	Setting	Range	Default	Description
6401	Start hour	0 to 23 h	8 h	Compensation for frequency variation related clock time in the system.
6402	Stop hour	0 to 23 h	8 h	
6403	Difference	1 to 999 s	20 s	
6404	Compensation	0.1 to 1.0 Hz	0.1 Hz	
6405	Enable	OFF ON	OFF	

3.1.5 Summer/winter time

6490 Summer/winter time

No.	Setting	Range	Default	Description
6491	Sum/win time - Enable	OFF ON	OFF	The summer/winter time changes follow mainland Europe rules.

3.1.6 Counters

6100 Counters

No.	Setting	Range	Default	Description
6101	Running hour	0 to 999 hrs	0 hrs	Use 6101 and 6102 to set an initial running time value ([6101] + 1000 x [6102] hours).
6102	Running, th. hours	0 to 999 th. hrs	0 thousand hrs	
6103	GB/TB/BTB operations	0 to 20000	0	Set an initial number in the breaker operations counter.
6104	MB operations	0 to 20000	0	
6105	Reset kWh coun.	OFF ON	OFF	Reset the kWh counter to 0. After the reset, the parameter automatically changes to OFF.
6106	Start attempts	0 to 20000	0	Set an initial number in the start attempts counter.

3.1.7 Pulse counter

6850 Pulse counter 1

No.	Setting	Range	Default	Description
6851	Set point	0 to 1000	1	Setup of pulse counter.
6852	Unit	Unit/Pulse Pulse/Unit	Unit/Pulse	
6853	Decimals	No decimals One decimal Two decimals Three decimals	No decimals	

6860 Pulse counter 2

No.	Setting	Range	Default	Description
6861	Set point	0 to 1000	1	Setup of pulse counter.
6862	Unit	Unit/Pulse Pulse/Unit	Unit/Pulse	
6863	Decimals	No decimals One decimal Two decimals Three decimals	No decimals	

3.1.8 Timers

6110 Service timer 1

No.	Setting	Range	Default	Description
6111	Enable	OFF ON	ON	The timer is reset by setting parameter 6116 to ON. After reset, the parameter automatically changes to OFF. See *Service timers* in the **Designer's handbook** for more information.
6112	Running hours	0 to 9000 hrs	500 hrs	
6113	Days	1 to 1000 days	365 days	
6114	Fail class	F1 to F9	F2 (Warning)	
6115	Output A	Option-dependent	Not used	
6116	Reset	OFF ON	OFF	

6120 Service timer 2

No.	Setting	Range	Default	Description
6121	Enable	OFF ON	ON	The timer is reset by setting parameter 6126 to ON. After reset, the parameter automatically changes to OFF.
6122	Running hours	0 to 9000 hrs	500 hrs	
6123	Days	1 to 1000 days	365 days	
6124	Fail class	F1 to F9	F2 (Warning)	
6125	Output A	Option-dependent	Not used	
6126	Reset	OFF ON	OFF	

6300 Service timer 3

No.	Setting	Range	Default	Description
6301	Enable	OFF ON	ON	The timer is reset by setting parameter 6306 to ON. After reset, the parameter automatically changes to OFF.
6302	Running hours	0 to 9000 hrs	500 hrs	
6303	Days	1 to 1000 days	365 days	
6304	Fail class	F1 to F9	F2 (Warning)	
6305	Output A	Option-dependent	Not used	
6306	Reset	OFF ON	OFF	

6310 Service timer 4

No.	Setting	Range	Default	Description
6311	Enable	OFF ON	ON	The timer is reset by setting parameter 6316 to ON. After reset, the parameter automatically changes to OFF.
6312	Running hours	0 to 9000 hrs	500 hrs	
6313	Days	1 to 1000 days	365 days	
6314	Fail class	F1 to F9	F2 (Warning)	
6315	Output A	Option-dependent	Not used	
6316	Reset	OFF ON	OFF	

3.1.9 Command timers

6960 Command start/stop timer 1

No.	Setting		Range	Default	Description
6961	Start timer 1 days	Set point	OFF MO TU WE TH FR SA SU MO-TU-WE-TH MO-TU-WE-TH-FR SA-SU MO-TU-WE-TH-FR-SA-SU	OFF	Start/stop timers can be used in M-Logic.
6962	Start timer 1 hour	Set point	0 to 23 h	10 h	
6963	Start timer 1 min	Set point	0 to 59 min	0 min	
6964	Stop timer 1 days	Set point	MO TU WE TH FR SA SU MO-TU-WE-TH MO-TU-WE-TH-FR SA-SU MO-TU-WE-TH-FR-SA-SU	MO-TU-WE-TH-FR- SA-SU	
6965	Stop timer 1 hour	Set point	0 to 23 h	10 h	
6966	Stop timer 1 min	Set point	0 to 59 min	0 min	

6970 Command start/stop timer 2

No.	Setting		Range	Default	Description
6971	Start timer 2 days	Set point	OFF MO TU WE TH FR SA SU MO-TU-WE-TH MO-TU-WE-TH-FR SA-SU MO-TU-WE-TH-FR-SA-SU	OFF	Start/stop timers can be used in M-Logic.
6972	Start timer 2 hour	Set point	0 to 23 h	10 h	
6973	Start timer 2 min	Set point	0 to 59 min	0 min	
6974	Stop timer 2 days	Set point	MO TU WE TH FR SA SU MO-TU-WE-TH MO-TU-WE-TH-FR SA-SU MO-TU-WE-TH-FR-SA-SU	MO-TU-WE-TH-FR- SA-SU	
6975	Stop timer 2 hour	Set point	0 to 23 h	10 h	
6976	Stop timer 2 min	Set point	0 to 59 min	0 min	

6980 Command start/stop timer 3

No.	Setting		Range	Default	Description
6981	Start timer 3 days	Set point	OFF MO TU WE TH FR SA SU MO-TU-WE-TH MO-TU-WE-TH-FR SA-SU MO-TU-WE-TH-FR-SA-SU	OFF	Start/stop timers can be used in M-Logic.
6982	Start timer 3 hour	Set point	0 to 23 h	10 h	
6983	Start timer 3 min	Set point	0 to 59 min	0 min	
6984	Stop timer 3 days	Set point	MO TU WE TH FR SA SU MO-TU-WE-TH MO-TU-WE-TH-FR SA-SU MO-TU-WE-TH-FR-SA-SU	MO-TU-WE-TH-FR- SA-SU	
6985	Stop timer 3 hour	Set point	0 to 23 h	10 h	
6986	Stop timer 3 min	Set point	0 to 59 min	0 min	

6990 Command start/stop timer 4

No.	Setting		Range	Default	Description
6991	Start timer 4 days	Set point	OFF MO TU WE TH FR SA SU MO-TU-WE-TH MO-TU-WE-TH-FR SA-SU MO-TU-WE-TH-FR-SA-SU	OFF	Start/stop timers can be used in M-Logic.
6992	Start timer 4 hour	Set point	0 to 23 h	10 h	
6993	Start timer 4 min	Set point	0 to 59 min	0 min	
6994	Stop timer 4 days	Set point	MO TU WE TH FR SA SU MO-TU-WE-TH MO-TU-WE-TH-FR SA-SU MO-TU-WE-TH-FR-SA-SU	MO-TU-WE-TH-FR- SA-SU	
6995	Stop timer 4 hour	Set point	0 to 23 h	10 h	
6996	Stop timer 4 min	Set point	0 to 59 min	0 min	

3.1.10 Language

6080 Language

No.	Setting	Selection	Default	Description
6081	Language	English Language 1 to 11	English	The master language is English. 11 additional languages can be configured with the PC utility software.
6082	LED colours	LED colour scheme 1 LED colour scheme 2	LED colour scheme 1	LED colour scheme 1 is standard. Active elements are green. LED colour scheme 2 corresponds to US medium voltage colour scheme. The LED colour schemes are only available on the display unit (DU-2). See the **Operator's manual** for more information.

3.1.11 Alarm horn

6130 Alarm horn

No.	Setting	Range	Default	Description
6131	ON time	0.0 to 990.0 s	20.0 s	If the setting is adjusted to 0 s, the horn relay will be activated continuously until the alarm is acknowledged.

3.1.12 Alarm jump

6900 Alarm jump

No.	Setting	Range	Default	Description
6901	Enable	OFF ON	ON	If an alarm appears: • ON: Jump to alarm list view on the display • OFF: stay at present display view.

3.1.13 Diagnostics

6700 Diagnostics

No.	Setting	Range	Default	Description
6701	Timer	0 to 30 s	30 s	Activates diagnostics mode to read ECU data without starting the engine.
6702	Enable	OFF ON	OFF	

3.1.14 I thermal demand

6840 I thermal demand

No.	Setting	Range	Default	Description
6841	I thermal demand - Timer	0 to 20 min.	8 min.	Setup of I thermal period.
6842	I thermal demand - Enable	OFF ON	OFF	Enabled is used for reset.
6843	I max. demand - Enable	OFF ON	OFF	Reset I max. demand.

3.2 Genset setup

3.2.1 Genset mode

6070 Genset mode (Genset controller only)

No.	Setting	Range	Default	Description
6071	Genset mode	Island Auto Mains Failure Peak shaving Fixed power Mains power export Load take over Power management*		This parameter can also be set from the utility software, *Application supervision, Plant settings*.

No.	Setting	Range	Default	Description
		Remote maintenance Dry alternator Ventilation		

NOTE * Requires option G5.

3.2.2 Test

7040 Test (Genset controller)

No.	Setting	Range	Default	Description
7041	Set point	1 to 100 %	80 %	Simple test: Engine run only. Load test: Parallel to mains. Full test: Disconnects mains.
7042	Test time	0 to 999 min	5 min	
7043	Return mode	Semi-auto mode Auto mode No mode change Manual	Auto mode	
7044	Test type	Simple test Load test Full test	Simple test	

3.2.3 Run coil setup

6150 Run coil setup

No.	Setting	Range	Default	Description
6151	ON time	0.0 to 600.0 s	1.0 s	The time between opening the fuel valve and starting the starter.
6152	Type	Pulse Continuous	Pulse	**Pulse**: Reset for each start attempt. **Continuous**: High throughout all start attempts.

3.2.4 Running, start and stop

6160 Run status

No.	Setting	Range	Default	Description
6161	Timer	0.0 to 300.0 s	5.0 s	The *Run* state is activated when there is running detection (see 6170). If a relay output is used, set the relay to *Limits*. Otherwise, an alarm is activated when the conditions are met.
6164	Enable	OFF ON	OFF	
6165	Freq. Det. Lvl	10 to 35 Hz	32 Hz	The frequency at which the genset is regarded as running.

6170 Running detection

No.	Setting	Range	Default	Description
6171	No. of teeth	0 to 500 teeth	0 teeth	If this is 0, the magnetic pickup input is not used.
6172	Type	Binary input MPU input Frequency EIC rpm Multi input 102 Multi input 105 Multi input 108	Frequency	Running detection always uses frequency, and can use several signals simultaneously. If at least one signal meets its requirement, the genset is regarded as running. The engine LED on the DU-2 glows green.
6173	Running RPM	0 to 4000 RPM	1000 RPM	
6174	Remove starter	1 to 2000 RPM	400 RPM	
6175	Pressure level	0.0 to 150.0 bar	0.0 bar	If parameter 6175 is set to 0.0, the oil pressure running detection is OFF.

6180 Starter

No.	Setting	Range	Default	Description
6181	Start prepare	0.0 to 600.0 s	5.0 s	When preparing to start, the Prepare relay is activated. After the preparation, the relay deactivates and the fuel valve relay is activated (see 6151 too). If 6182 is >0, the start preparation relay remains on for this time and works simultaneously with the fuel valve and starter relays.
6182	Ext. prepare	0.0 to 600.0 s	0.0 s	
6183	Start ON time	1.0 to 180.0 s	5.0 s	Duration of starter operation.
6184	Start OFF time	1.0 to 99.0 s	5.0 s	Pause between start attempts.
6185	Input type	Multi-input 102 Multi-input 105 Multi-input 108	Multi-input 102	During start preparation, if the input (6185) has not reached the threshold (6186), the start does not start.
6186	Start threshold	0.0 to 300.0	0.0	

6190 Start attempts

No.	Setting	Range	Default	Description
6191	Start attempts	1 to 10	3	Number of start attempts.
6192	Double attempts	0 to 10	2	See *Double starter* in the **Designer's handbook**.

6200 Shutdown override

No.	Setting	Range	Default	Description
6201	Attempts	1 to 10	7	Start attempts when shutdown override is enabled.
6202	Cooling down	0.0 to 9900.0 s	240.0 s	Engine cooling time when shutdown override is enabled.
6203	Enable	Off ON	OFF	Shutdown override turns all shutdown alarm actions into

No.	Setting	Range	Default	Description
				warnings, except for overspeed (4510 and 4520) and emergency stop (3490).

6210 Stop

No.	Setting	Range	Default	Description
6211	Cooling down	0.0 to 9900.0 s	240.0 s	Engine cool down timer.
6212	Extended stop	1.0 to 99.0 s	5.0 s	The extended stop timer starts when there is no running feedback. It is not possible to start the engine while the timer is running.
6213	Type	Multi-input 102 EIC	Multi-input 102	Engine cool down stop based on coolant temperature.
6214	Set point	0 to 482 °	0°	

6220 Hz/V OK

No.	Setting	Range	Default	Description
6221	Timer	1.0 to 99.0 s	5.0 s	Before the breaker can be closed, the voltage and frequency must be okay while this timer runs. When the voltage and frequency are okay (within the range in 2110), the LED on DU-2 is green.

3.2.5 Idle start

6290 Idle running

No.	Setting		Range	Default	Description
6291	Idle start	Start timer	0.0 to 59940.0 s	18000.0 s	
6292	Idle start	Enable start	OFF ON	OFF	
6293	Idle stop	Stop timer	0.0 to 59940.0 s	18000.0 s	
6294	Idle stop	Enable stop	OFF ON	OFF	
6295	Idle active	Relay output A	Not used (option dependent)	Not used	To invert the output relay (6295), change *High alarm* (6297) to **OFF**.
6296	Idle active	Enable	OFF ON	OFF	
6297	Idle active	High alarm	ON OFF	ON	

3.2.6 Analogue load sharing lines output

6380 Load share out (requires option M12)

No.	Setting		Range	Default	Description
6381	Load share out	Set point	1.0 to 5.0 V	4.0 V	Adjustment of the analogue load sharing line max. value.

6390 Load share type (requires option M12)

No.	Setting		Range	Default	Description
6391	Load share type	Set point	Adjustable Selco T4800 Cummins PCC Woodward SPM-D11	Adjustable	Selection between adjustable load sharing line max. value (parameter 6381) or adaptation to the selected load sharing line.

3.2.7 Power derate

6240 Power derate 1

No.	Setting	Range	Default	Description
6241	Input	Multi-input, M-Logic, EIC or CIO*	Multi-input 102	The derate function lowers the max. power of the generator set based on the input.
6242	Start derate	0 to 20000 units	16 units	
6243	Derate slope	0.1 to 100.0 %/unit	5.0 %/unit	
6244	Proportional	OFF ON	OFF	
6245	Enable	OFF ON	OFF	
6246	Limit	0.0 to 100.0 %	80.0 %	

6250 Power derate 2

No.	Setting	Range	Default	Description
6251	Input	Multi-input, M-Logic, EIC or CIO*	Multi-input 102	The derate function lowers the max. power of the generator set based on the input.
6252	Start derate	0 to 20000 units	16 units	
6253	Derate slope	0.1 to 100.0 %/unit	5.0 %/unit	
6254	Proportional	OFF ON	OFF	
6255	Enable	OFF ON	OFF	
6256	Limit	0.0 to 100.0 %	80.0 %	

6260 Power derate 3

No.	Setting	Range	Default	Description
6261	Input	Multi-input, M-Logic, EIC or CIO*	Multi-input 102	The derate function lowers the max. power of the generator set based on the input.
6262	Start derate	0 to 20000 units	16 units	
6263	Derate slope	0.1 to 100.0 %/unit	5.0 %/unit	
6264	Proportional	OFF ON	OFF	
6265	Enable	OFF ON	OFF	
6266	Limit	0.0 to 100.0 %	80.0 %	

*** Inputs**

- Multi-input 102/105/108
- M-Logic
- EIC Cooling water temp. (SPN 110)
- EIC Oil temp. (SPN 175)
- EIC Ambient temp. (SPN 171)
- EIC Intercool temp. (SPN 52)
- EIC Fuel temp. (SPN 174)
- EIC Derate request (SPN 3644)
- Multi-input 91/93/95/97
- CIO 308 1.08/1.11/1.14/1.17/1.20/1.23/1.26/1.29
- CIO 308 2.08/2.11/2.14/2.17/2.20/2.23/2.26/2.29
- CIO 308 3.08/3.11/3.14/3.17/3.20/3.23/3.26/3.29

3.2.8 Cooling ventilation

6460 Max. ventilation

No.	Setting	Range	Default	Description
6461	Set point	20 to 250 °	90 °	Ventilation is based on the analogue input selected in *Engine heater* (6323). The selected relay is activated when the set point is exceeded, and deactivated when the temperature falls below (6461-6463).
6462	Relay output A	Option-dependent	Not used	
6463	Hysteresis	1 to 70 °	5 °	
6464	Enable	OFF ON	OFF	Enable ventilation fan control.

3.2.9 Fan logic

6560 Fan input settings

No.	Setting		Range	Default	Description
6561	Fan input	Type	See description	Multi-input 102	Selection of fan input: • Multi-input 102 • Multi-input 105 • Multi-input 108 • EIC ◦ Water/oil temp. ◦ Water temp. ◦ Oil temp. ◦ Ambient temp. ◦ Inter cool temp. ◦ Fuel temp. • Ext. analog input: 1 to 8 (requires option H12) • CIO (There is a range of values for this.)
6562	Fan prio update	Priority	0 to 200 h	0 h	
6563	1st prio fan	Set point start	20 to 250 °	70 °	
6564	1st pr. fan	Hysteresis	0 to 50 °	10 °	
6565	2nd prio fan	Set point start	20 to 250 °	80 °	
6566	2nd pr. fan	Hysteresis	0 to 50 °	10 °	

6570 3rd prio fan

No.	Setting		Range	Default	Description
6571	3rd prio fan	Set point start	20 to 250 °	90 °	
6572	3rd prio fan	Hysteresis	0 to 50 °	10 °	
6573	4th prio fan	Set point start	20 to 250 °	100 °	
6574	4th prio fan	Hysteresis	0 to 50 °	10 °	

6580 Fan outputs

No.	Setting		Range	Default	Description
6581	Fan A output	Relay output A	Option-dependent	Not used	Selection of relays for activating fans.
6582	Fan B output	Relay output B	Option-dependent	Not used	
6583	Fan C output	Relay output C	Option-dependent	Not used	
6584	Fan D output	Relay output D	Option-dependent	Not used	
6585	Fan run. hour reset	Reset	OFF ON	OFF	
6586	Fan start delay	Timer	0.0 to 30.0 s	10.0 s	

6590 Fan A failure

No.	Setting	Range	Default	Description
6591	Timer	0.1 to 300.0 s	10.0 s	
6592	Output A	Option-dependent	Not used	
6593	Output B	Option-dependent	Not used	
6594	Enable	OFF ON	OFF	
6595	Fail class	F1 to F9	F2 (Warning)	

6600 Fan B failure

No.	Setting	Range	Default	Description
6601	Timer	0.1 to 300.0 s	10.0 s	
6602	Output A	Option-dependent	Not used	
6603	Output B	Option-dependent	Not used	
6604	Enable	OFF ON	OFF	
6605	Fail class	F1 to F9	F2 (Warning)	

6610 Fan C failure

No.	Setting	Range	Default	Description
6611	Timer	0.1 to 300.0 s	10.0 s	
6612	Output A	Option-dependent	Not used	
6613	Output B	Option-dependent	Not used	
6614	Enable	OFF ON	OFF	
6615	Fail class	F1 to F9	F2 (Warning)	

6620 Fan D failure

No.	Setting	Range	Default	Description
6621	Timer	0.1 to 300.0 s	10.0 s	
6622	Output A	Option-dependent	Not used	
6623	Output B	Option-dependent	Not used	
6624	Enable	OFF ON	OFF	
6625	Fail class	F1 to F9	F2 (Warning)	

3.2.10 Engine heater

6320 Engine heater

No.	Setting	Range	Default	Description
6321	Set point	20 to 250 °	40 °	Heater function for standstill. See *Engine heater* in the **Designer's handbook** for more information.
6322	Relay output A	Option-dependent	Not used	
6323	Type	Multi-input 102 Multi-input 105 Multi-input 108 EIC* CIO*	Multi-input 102	
6324	Hysteresis	1 to 70 °	3 °	
6325	Enable	OFF ON	OFF	

NOTE * There is a range of values for each of these.

3.2.11 Fuel transfer pump logic

6550 Fuel pump logic

Parameter	Name	Range	Default	Details
6551	Fuel pump logic	0 to 100 % 1 to 10 s	20 % 1 s	Fuel transfer pump start point.
6552	Fuel pump logic	0 to 100 %	80 %	Fuel transfer pump stop point.
6553	Fuel fill check	0.1 to 999.9 s Fail classes	60 s Warning	Fuel transfer pump alarm timer and fail class. The alarm is activated if the fuel pump relay is activated, but the fuel level does not increase by 2 % within the delay time.
6554	Fuel pump logic	Multi input [102/105/108], Ext. Ana. In [1 to 8], Auto detection	Auto detection	The multi-input or external analogue input for the fuel level sensor. Configure the input in the utility software under *I/O & Hardware setup*. Select the multi-input if 4-20 mA is used. Select *Auto detection* if a multi input with RMI fuel level is used.

NOTE * There is a range of values for this.

3.2.12 Tank capacity

6910 Tank capacity

No.	Setting	Range	Default	Description
6911	Tank capacity	0 to 9999 L	1250 L	Set the capacity of the day tank. The controller uses this value and the fuel level to calculate the fuel volume. The fuel volume is shown in the utility software in **Application supervision**, *Genset data, General*.

3.2.13 DEF pump logic

6720 DEF pump logic

Parameter	Name	Range	Default	Details
6721	DEF pump log. start	0 to 100 % 1 to 10 s	20 % 1 s	DEF transfer pump start point.
6722	DEF pump log. stop	0 to 100 %	80 %	DEF transfer pump stop point.
6723	DEF fill check	0.1 to 999.9 s Fail classes	60 s Warning	DEF transfer pump alarm timer and fail class. The alarm is activated if the DEF pump relay is activated, but the DEF level does not increase by the DEF fill slope (see 6724) within the delay time.
6724	DEF fill slope	1 to 10 %	2 %	When the DEF pump relay is activated, this is the amount by which the DEF level must increase in the time defined in 6723.

3.2.14 Generic pump logic

6730 Generic pump logic

Parameter	Name	Range	Default	Details
6731	Fluid pump start	0 to 100 % 1 to 10 s	20 % 1 s	Fluid transfer pump start point.
6732	Fluid pump stop	0 to 100 %	80 %	Fluid transfer pump stop point.
6733	Fluid check	0.1 to 999.9 s Fail classes	60 s Warning	Fluid transfer pump alarm timer and fail class. The alarm is activated if the fluid pump relay is activated, but the fluid level does not increase by the fluid fill slope (see 6735) within the delay time.
6734	Fluid pump log.	Multi input [102/105/108], Ext. Ana. In [1 to 8]	Multi input 102	Select the analogue input for the fluid level. Configure the input in the utility software under *I/O & Hardware setup*.
6735	Fluid fill slope	1 to 10 %	2 %	When the fluid pump relay is activated, this is the amount by which the fluid level must

Parameter	Name	Range	Default	Details
				increase in the time defined in 6733.

3.2.15 Digital AVR parameters

For DVC 550, the parameters are included in the **DVC 550 Designer's handbook**.

The digital AVR is affected by nominal parameters 6004, 6014, 6024, 6034, 6041, 6042, 6051, 6052, 6061 and 6062. For more information, see Nominal settings.

No.	Setting	Range	Default	Description
2262	Soft-start timer for CBE	0.0 to 999.0 s	5.0 s	This setting determines the slope of the soft-start during a CBE start.
7564	EIC Auto view	OFF ON	OFF	Enables the AGC 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 AGC will still display the readings, if any readings are available.
7565	Digital AVR	OFF Caterpillar CDVR Leroy Somer D510C DEIF DVC 310 DEIF DVC 550 DEIF DVC 550 PSS NIDEC D550	OFF	Selects the CAN bus protocol for interfacing between a digital AVR and the AGC. Parameter 7565 "Caterpillar CDVR" will not work if MTU protocols are selected in parameter 7561. For *DEIF DVC 550 PSS*, see Digital AVR PSS parameters.
7741	DAVR primary voltage	400 to 32000 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).
7742	DAVR secondary voltage	50 to 600 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 digital AVR).
7743	DAVR busbar primary voltage	400 to 32000 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	50 to 600 V	400 V	Decides the secondary side of a voltage transformer to the busbar. (This is the transformer

No.	Setting	Range	Default	Description
				side that is in contact with the digital AVR).
7745	DAVR VT enable	OFF ON	OFF	When set to ON, the digital AVR expects voltage measurements on the busbar.
7746	DAVR AC config	0: Use the AGC AC setting 1: 2-phase (W-U) 2: 2-phase (V-W) 3: 3-phase (U-V-W)	0	Phase selection for the DAVR. See the **DVC 550 Designer's handbook** for more information.
7751	PWM threshold	0.00 to 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 to 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 to 120.0 s	2.0 s	Decides the slope of the soft-start function.
7761	DAVR warning	OFF ON	OFF	Enables the AGC to receive warnings from the digital AVR.
7762	DAVR warning fail class	Warning Trip GB	Warning	Decides the fail class if a warning is sent from the digital AVR.
7763	DAVR trip	OFF ON	OFF	Enables the AGC to receive trip alarms from the digital AVR.
7764	DAVR trip fail class	Warning Trip GB	Warning	Decides the fail class if a trip alarm is sent from the digital AVR.
7771	Knee set point percent of nominal frequency	70.0 to 100.0 %	96.0 %	Sets the knee set point, from which the digital AVR will lower the voltage set point.
7772	U/F slope	1.0 to 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 to 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 to 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.

No.	Setting	Range	Default	Description
7776	Load Acceptance Module	OFF ON	OFF	Enables the Load Acceptance Module.
7781	Q droop compensation	0.0 to 10.0 %	2.0 %	Decides the slope of the Q droop compensation. A higher value allows more droop.
7782	U droop compensation	0.0 to 10.0 %	2.0 %	Decides the slope of the U droop compensation. A higher value allows more droop.
7783	Droop compensation type	OFF Q load droop U line droop	Q load droop	Only one of the droop types can be enabled.
7791	I excitation reference for Dry Alternator mode	0.0 to 20.0 A	1.5 A	Decides the excitation current in Dry Alternator mode.
7792	I excitation reference for Close Before Excitation	0.0 to 0.5 A	0.0 A	Decides how much excitation is allowed in a Close Before Excitation sequence. This is during the remanence phase.
7793	Magentization: Transformer excitation current limit	0.0 to 300.0 %	100.0 %	Current maximum during transformer excitation sequence. The value is percentage of nominal current.
7794	Induction motor starting current limit	0.0 to 300.0 %	100.0 %	Current maximum during an induction motor starting sequence. The value is percentage of nominal current.
7795	I stator limitation function enable	OFF Magnetization Inductive motor	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 to 200	20	Makes it possible to make the AVR regulation faster or slower.
7803	Write all settings	OFF ON	OFF	When set to ON, the AGC will send all the relevant parameters to the digital AVR.
7804	DAVR bias range	1.0 to 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 digital AVR is controlled by the AGC. • When set to OFF, the digital AVR can be controlled by EasyReg, and the digital AVR will not receive any parameters from the AGC.
7806	DAVR bias analogue range	4 to 20 mA Pot 0 to 10 V	0 to 10 V	If the digital AVR uses analogue bias for regulation, this defines the type of analogue interfacing

No.	Setting	Range	Default	Description
				for the digital AVR. The analogue input on the digital AVR is hard coded to be at terminal AI1.
7811	PT100_1 threshold	50 to 200 °C	160 °C	Determines the maximum temperature of the winding in phase 1 of the alternator.
7812	PT100_2 threshold	50 to 200 °C	160 °C	Determines the maximum temperature of the winding in phase 2 of the alternator.
7813	PT100_3 threshold	50 to 200 °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 to 100.0 s	0.0 s	A timer for an alarm for communication error to the digital AVR.
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 digital AVR and the AGC.
7835	DAVR communication error alarm fail class	Warning Trip GB	Warning	Decides what the AGC should do, if the DAVR communication alarm occurs.

3.2.16 Digital AVR PSS parameters

The following PSS parameters can be configured when *DEIF DVC 550 PSS* is selected in parameter 7565. Selecting PSS affects about 30 other DAVR parameters. These parameters are listed in the utility software when the change is made.

No.	Setting	Range	Default	Description
7851	PSS Enable	OFF ON at GB pos ON ON at mains parallel	OFF	**OFF**: The PSS function cannot be active. **ON at GB pos ON**: The PSS function can be active if the generator breaker is closed. **ON at mains parallel**: The PSS function can be active if the genset is parallel to the mains/ grid.

No.	Setting	Range	Default	Description
				The configuration of this parameter can also be changed using M-Logic commands.
7852	PSS Control	OFF ON	OFF	**OFF**: The PSS function cannot be active. **ON**: If all the conditions are met, the PSS function can be active.
7853	PSS Ks1 Gain	0 to 3276.7	5	The gain (k) for PSS regulation.
7854	PSS On Threshol	0 to 100 % of nominal power	15 %	The load must rise above this threshold to activate the PSS function.
7855	PSS Off Thresho	0 to 100 % of nominal power	10 %	The load must fall below this threshold to deactivate the PSS function.

3.3 Engine interface communication

3.3.1 Engine interface communication

7560 Engine I/F

No.	Setting	Range	Default	Description
7561	Engine I/F	See description.	OFF	See **Option H12 and H13** for the supported controllers and engines.
		OFF Cummins QSX15 Cummins QSK23/45/60/78 Cummins QST30	OFF	Requires option H6. The setting affects the displayed data, but not the Modbus data (option H2).

More information
See the **Option H12 and H13 Engine communication** document for all the engine communication parameters.

3.4 Mains setup

3.4.1 Mains setup

6070 Plant mode (Mains controller only)

No.	Range	Default	Description
6071	Auto Mains Failure Peak shaving Fixed power Mains power export Load take over		This parameter can also be set from the utility software, *Application supervision, Plant settings*.

7000 Mains power

No.	Setting	Range	Default	Description
7001	Day	-20000 to 20000 kW	750 kW	Peak shaving/mains power export, set values in the mains controller. Parameter 7001/7002 must be a positive value for mains power export or peak shaving. Parameter 7001/7002 must be a negative value for mains power import. Use menu 7260 to set up the transducer.
7002	Night	-20000 to 20000 kW	1000 kW	
7003	Scale	1 kW : 1 kW 1 kW : 10 kW 1 kW : 100 kW 1 kW : 1000 kW	1 kW : 1 kW	

7003 Mains power scaling

If you need a mains power set point of 100 MW, this does not fit in the range available in 7001. Configure the set point in 7001 as 10000 kW (10 MW), and use 1 kW : 10 kW in 7003.

7010 Daytime period

No.	Setting	Range	Default	Description
7011	Start hour	0 to 23 h	8 h	Peak shaving/mains power export. The period outside the daytime period is defined as the night period.
7012	Start minute	0 to 59 min	0 min	
7013	Stop hour	0 to 23 h	16 h	
7014	Stop minute	0 to 59 min	0 min	

7020 Start generator

No.	Setting	Range	Default	Description
7021	Set point	5 to 100 % of mains power (7001/7002)	80 %	Set point and timer for automatic start of peak shaving/mains power export.
7022	Timer	0.0 to 990.0 s	10.0 s	
7023	Minimum load for a single genset	0 to 100 % of genset nominal power	5 %	

7030 Stop generator

No.	Setting	Range	Default	Description
7031	Set point	0 to 80 % of mains power (7001/7002)	60 %	Set point and timer for automatic stop of peak shaving/mains power export.
7032	Timer	0.0 to 990.0 s	30.0 s	

3.4.2 Test

7040 Test (Mains controller)

No.	Setting	Range	Default	Description
7041	Set point	1 to 20 000 kW	500 kW	Simple test: Engine run only. Load test: Parallel to mains. Full test: Disconnects mains.
7042	Test time	0 to 999 min	5 min	
7043	Return mode	Semi-auto mode Auto mode No mode change	Auto mode	
7044	Test type	Simple test Load test Full test	Simple test	

3.4.3 Controller settings

7050 Fixed power settings (Genset controller)

No.	Setting		Range	Default	Description
7051	Fixed power settings	Power	0 to 100 %	100 %	Fixed power parallel with mains settings. Visibility of these parameters depends on the genset mode selected in parameter 6070. Parameter 7052 has no effect if the setting of parameter 2811 is *Capability curve Q*. For information on how parameter 7055 works, see Option A10.
7052	Fixed power settings	Cos phi	0.10 to 1.00	0.90	
7053	Fixed power settings	Cos phi	Inductive Capacitive	Inductive	
7054	Q control settings	Fixed Q set point	-100 to 100 %	0 %	
7055	Q control settings	Type	OFF Superior Fixed Q	OFF	

7050 Fixed power settings (Mains controller)

No.	Setting		Range	Default	Description
7051	Fixed power settings	Power	0 to 20000 kW	500 kW	Fixed power parallel with mains settings. Visibility of these parameters depends on the mode selected in parameter 6070. For information on how parameter 7055 works, see Option A10.
7052	Fixed power settings	Cos phi	0.10 to 1.00 s	0.90	
7053	Fixed power settings	Cos phi	Inductive Capacitive	Inductive	
7054	Cos phi reference	Cos phi	OFF Fixed for DG(s) Fixed for imp/exp	OFF	
7055	Fixed power settings	Reference	1 kW : 1 kW 10 kW : 10 kW 100 kW : 100 kW 1000 kW : 1000 kW	1 kW : 1 kW	

3.4.4 Mains failure

7060 U Mains Failure

No.	Setting	Range	Default	Description
7061	Failure delay	0.5 to 990.0 s	5.0 s	There is a mains voltage failure if the voltage is outside the range for the failure delay. If the voltage has been inside the range (also see 7090) for the mains OK delay, there is no longer a mains voltage failure. A voltage or frequency failure can cause a mains failure.
7062	Mains OK delay	2 to 9900 s	60 s	
7063	U<	30 to 100 % of nominal voltage	90 %	
7064	U>	100 to 130 % of nominal voltage	110 %	
7065	Mains failure control	Start engine + open MB Start engine	Start engine + open MB	
7066	U unbalance	2 to 100 % of the average busbar voltage	100 %	

7070 f Mains Failure

No.	Setting	Range	Default	Description
7071	Failure delay	0.5 to 990.0 s	5.0 s	There is a mains frequency failure if the frequency is outside the range for the failure delay. If the frequency has been inside the range (also see 7090) for the mains OK delay, there is no longer a mains frequency failure.
7072	Mains OK delay	2 to 9900 s	60 s	
7073	f<	80.0 to 100.0 % of nominal frequency	95.0 %	
7074	f>	100.0 to 120.0 % of nominal frequency	105.0 %	

7080 MB control

No.	Setting	Range	Default	Description
7081	Mode shift	OFF ON	OFF	**ON**: A mains failure automatically changes the mains controller to AMF.
7082	MB close delay	0.0 to 30.0 s	0.5 s	
7083	Back sync.	OFF ON	OFF	**ON**: Synchronisation and connection to the mains in parallel with the genset(s) is allowed if the mains parameters are normal.
7084	Sync to Mains	OFF ON	ON	**ON**: Genset(s) can be synchronised and connected in parallel with the mains.
7085	Load time	0.0 to 30.0 s	0.0 s	How long the mains breaker must be charged after disconnection. This is used for compact breakers. See also 6232.

7090 Mains failure hysteresis

No.	Setting	Range	Default	Description
7091	Low volt. hysteresis	0 to 70 %	0 %	Hysteresis for when mains is healthy again.
7092	High volt. hysteresis	0 to 20 %	0 %	
7093	Low freq. hysteresis	0.0 to 20.0 %	0.0 %	
7094	High freq. hysteresis	0.0 to 20.0 %	0.0 %	

3.4.5 Y1(X1) droop curve

Configure the Y1(X1) droop curve in the utility software (under *Advanced Protection*). In older AGC-4 controllers, this was done in parameter groups 7120, 7130 and 7140.

3.4.6 Y2(X2) droop curve

Configure the Y2(X2) droop curve in the utility software (under *Advanced Protection*). In older AGC-4 controllers, this was done in parameter groups 7150, 7160, 7170 and 7180.

3.4.7 Power offset

7220 Power offset

No.	Setting	Range	Default	Description
7221	Power offset 1 - Set point	-20,000 to 20,000 kW	0 kW	The offset is added to the power set point. The power set point for a genset must be between the minimum load (7023/8005) and the nominal power (60X2). Offsets can be enabled/disabled using M-Logic and/or Modbus commands.
7222	Power offset 1 - Enable	OFF ON	OFF	
7223	Power offset 2 - Set point	-20,000 to 20,000 kW	0 kW	
7224	Power offset 2 - Enable	OFF ON	OFF	
7225	Power offset 3 - Set point	-20,000 to 20,000 kW	0 kW	
7226	Power offset 3 - Enable	OFF ON	OFF	

3.4.8 Cos phi offset

7240 Cos phi offset

No.	Setting	Range	Default	Description
7241	Cos phi offset 1 - Set point	-0.8 to 0.8	0	The offset is added to the cos phi set point (7052). The reactive power of the genset may be limited by Y2 (X2). Offsets can be enabled/disabled using M-Logic and/or Modbus commands.
7242	Cos phi offset 1 - Enable	OFF ON	OFF	
7243	Cos phi offset 2 - Set point	-0.8 to 0.8	0	
7244	Cos phi offset 2 - Enable	OFF ON	OFF	
7245	Cos phi offset 3 - Set point	-0.8 to 0.8	0	
7246	Cos phi offset 3 - Enable	OFF ON	OFF	

3.4.9 Mains ATS function

7250 Mains ATS

No.	Setting	Range	Default	Description
7251	Set point	0 1	0	Setup of Mains ATS Function. 0 = ON; 1 = OFF.
7252	Timer	0 to 30 s	0.5 s	

3.4.10 Mains transducers

NOTE *Scaling* (parameter 9030) affects the range and defaults for the following parameters*. The values below are based on **100V-25000V**.

7260 Mains power

No.	Setting	Range	Default	Description
7261	Transducer max.	0 to 20 000 kW*	0 kW	Equal to max. transducer output.
7262	Transducer min.	-20 000 to 0 kW*	0 kW	Equal to min. transducer output.
7263	Ana. input	Multi-input 102 (transducer) CIO 308 1.14 (transducer) CIO 308 2.14 (transducer) CIO 308 3.14 (transducer)	Multi-input 102 (transducer)	M-Logic *Output, Command, Mains P measurement for droop reference* activates the selection in 7263 as reference for grid support droop, else the 3-phase internal measurement is used as droop reference.

7270 Mains reactive power

No.	Setting	Range	Default	Description
7271	Transducer max.	-20 000 to 20 000 kvar*	0 kvar	Equal to max. transducer output.
7272	Transducer min.	-20 000 to 20 000 kvar*	0 kvar	Equal to min. transducer output.
7273	Ana. input	Multi-input 102 CIO 308 1.17 (transducer)	Multi-input 102	M-Logic *Output, Command, Mains Q measurement for droop reference* activates the selection

No.	Setting	Range	Default	Description
		CIO 308 2.17 (transducer) CIO 308 3.17 (transducer)		in 7273 as reference for grid support droop, else the 3-phase internal measurement is used as droop reference.

7280 Mains voltage

No.	Setting	Range	Default	Description
7281	Transducer max.	0 to 25 000 V*	0 V	Equal to max. transducer output.
7282	Transducer min.	0 to 25 000 V*	0 V	Equal to min. transducer output.
7283	Ana. input	Multi-input 102 CIO 308 1.17 (transducer) CIO 308 2.17 (transducer) CIO 308 3.17 (transducer)	Multi-input 102	M-Logic *Output, Command, Mains U measurement for droop reference* activates the selection in 7283 as reference for grid support droop, else the 3-phase internal measurement is used as droop reference.
7284	Ext. nominal voltage	100 to 25000 V*	400 V*	

3.5 External communication setup

3.5.1 CAN port setup

7840 CAN select

No.	Setting	Range	Default	Description
7841	CAN A	0, 2, 3, 6	PMS Primary	0. Off 1. External I/O 2. PMS Primary* 3. EIC 6. PMS Secondary* 11. Ext. modules DEIF *Requires option G5.
7842	CAN B	0, 2, 3, 6	PMS Secondary	
7843	CAN C	0, 1, 3, 11	Off	
7844	CAN D	0, 1, 3, 11	Off	
7845	CAN E	0, 1, 3, 11	EIC	
7846	CAN F	0, 1, 3, 11	Off	

3.5.2 Modbus/Profibus communication (option H2 or H3)

7500 Communication control

No.	Setting	Range	Default	Description
7501	Power	OFF ON	OFF	These settings must be ON if commands are to be sent via Modbus communication. When enabled, the Modbus values overrule external and internal settings. Voltage, power factor and reactive power control requires AVR control.
7502	Frequency	OFF ON	OFF	
7503	Voltage	OFF ON	OFF	
7504	Cos phi	OFF ON	OFF	
7505	Reactive power	OFF ON	OFF	

7510 External communication

No.	Setting	Range	Default	Description
7511	Ext. comm. ID	1 to 247	1	The mode ASCII is used for modem communication (ASCII: 7 data bit, RTU: 8 data bit).
7512	Ext. Comm. speed	9600 Baud 19200 Baud	9600 Baud	
7513	Ext. Comm. Mode	RTU ASCII	RTU	

3.5.3 External I/O communication setup

7890 CIO configuration

No.	Setting	Range	Default	Description
7891	CIO enable	OFF ON	OFF	Enabling CIO communication.

7950 KL320x config (requires option H12)

No.	Setting	Range	Default	Description
7951	KL320x config M1 Setup	Pt100 (2 or 3 wire) Pt1000 (2 or 3 wire) 10-3200 Ω (2 wire) 10-1200 Ω (2 wire)	Pt100 (2 or 3 wire)	Selection for analogue modules. The selections for KL 3202/3204 cannot be changed. After changing module type, the parameter list in the utility software must be uploaded again.
7952	KL320x config M2 Setup			
7953	KL320x config M3 Setup			
7954	KL320x config M4 Setup			

7970 CAN 1 (requires option H12.2)

No.	Setting	Range	Default	Description
7971	CAN 1 Type	OFF Beckhoff comm.	OFF	This menu is only active if option H12.2 is activated. After changing type, the parameter list in the utility software must be uploaded again. Menu 7974 is for reestablishing communication after a fault/ disconnection.
7972	CAN1 Baudrate	50k Baud 125k Baud 250k Baud	125k Baud	
7973	CAN1 ID	10 to 64	10	
7974	CAN1 Reset	OFF ON	OFF	

7980 CAN 2 (requires option H12.8)

No.	Setting	Range	Default	Description
7981	CAN2 Type	OFF Beckhoff comm.	OFF	This menu is only active if option H12.8 is activated. After changing type, the parameter list in the utility software must be uploaded again. Menu 7984 is for reestablishing communication after a fault/ disconnection.
7982	CAN2 Baudrate	50k Baud 125k Baud 250k Baud	125k Baud	
7983	CAN2 ID	10 to 64	10	
7984	CAN2 Reset	OFF ON	OFF	

7990 Eth. comm err.

No.	Setting	Range	Default	Description
7981	Timer	1 to 100 s	10 s	The *Ethernet communication error* alarm is activated if the Ethernet connection fails to initialise.
7982	Enable	OFF, ON	OFF	
7983	Fail class	F1 to F9	F2 (Warning)	

3.6 Other

3.6.1 Engineering units

10970 Engineering units

No.	Setting	Range	Default	Description
10970	Engineering units	Bar/Celsius Psi/Fahrenheit	Bar/Celsius	

3.6.2 Parameter name

11200 Parameter name

No.	Setting	Range	Default	Description
11201	Set point	*Insert text*	*Insert text*	Setup of parameter ID.
11202	Password level	Customer Service Master	Customer	

3.7 External digital outputs

3.7.1 External digital outputs (requires option H12)

12790 Ext. dig. out 1 (requires option H12)

No.	Setting	Range	Default	Description
12790	Ext. dig. out 1 - Function	Alarm relay ND M-Logic / Limit relay Horn Siren Alarm relay NE Modbus control relay OFF Modbus control relay ON	Alarm relay ND	
	Ext. dig. out 1 - OFF delay	0.0 to 999.9 s	5.0 s	

NOTE The same settings apply to menus 12800 to 12940.

3.7.2 External module status

12950 External module status (requires option H12)

No.	Setting	Range	Default	Description
12950	Ext. module 0 STATUS	- 32768 to 32767		This is a number read in the external module and displayed in the utility software only. Please

No.	Setting	Range	Default	Description
				refer to option H12 (external IO modules) description for details.

NOTE The same settings apply to menus 12951 to 12983 (external modules 1 to 33).

3.7.3 Supervision

The following menus define the data used for the *Supervision* page in the utility software.

13000 Fuel consumption

No.	Setting		Range	Default	Description
13000	F. cons. 0 % load	Set point	0 to 3000 l/h	2 l/h	
13001	F. cons. 50 % load	Set point	0 to 3000 l/h	114.8 l/h	
13002	F. cons. optimum load	Set point	0 to 3000 l/h	168.7 l/h	
13003	F. cons. 100 % load	Set point	0 to 3000 l/h	228.5 l/h	
13004	Optimum load	Set point	51 to 99 %	75 %	
13005	Fuel rate expected	Enable	OFF ON	OFF	Parameter 13005 activates display of the expected fuel rate in the utility software Supervision page.

13010 Oil pressure, coolant temp, fuel level input

No.	Setting		Range	Default	Description
13010	Oil pressure input	Set point	Multi-in 102 Multi-input 105 Multi-input 108 Auto detection EIC oil pressure	Auto detection	
13011	Cool water input	Set point	Multi-in 102 Multi-input 105 Multi-input 108 Auto detection EIC oil pressure	Auto detection	
13012	Fuel level input	Set point	Multi-in 102 Multi-input 105 Multi-input 108 Auto detection EIC oil pressure	Auto detection	

3.7.4 AC average

The following menus define the data used for the *AC average* page in the utility software. Note that these menus are only available in the utility software.

14000 Average generator over-voltage L-L 1 (Avg. G U> L-L 1)

No.	Setting	Range	Default	Description
14001	Set point	100.0 to 120.0 %	103.0 %	
14002	Timer	0.1 to 100.0 s	10.0 s	
14005	Enable	OFF ON	OFF	
14006	Fail class	F1 to F9	F2 (Warning)	

14010 Average generator over-voltage L-L 2 (Avg. G U> L-L 2)

No.	Setting	Range	Default	Description
14011	Set point	100.0 to 120.0 %	105.0 %	
14012	Timer	0.1 to 100.0 s	5.0 s	
14015	Enable	OFF ON	OFF	
14016	Fail class	F1 to F9	F2 (Warning)	

14020 Average generator under-voltage L-L 1 (Avg. G U< L-L 1)

No.	Setting	Range	Default	Description
14021	Set point	100.0 to 120.0 %	97.0 %	
14022	Timer	0.1 to 100.0 s	10.0 s	
14025	Enable	OFF ON	OFF	
14026	Fail class	F1 to F9	F2 (Warning)	

14030 Average generator under-voltage L-L 2 (Avg. G U< L-L 2)

No.	Setting	Range	Default	Description
14031	Set point	100.0 to 120.0 %	95.0 %	
14032	Timer	0.1 to 100.0 s	5.0 s	
14035	Enable	OFF ON	OFF	
14036	Fail class	F1 to F9	F2 (Warning)	

14040 Average generator over-voltage L-N 1 (Avg. G U> L-N 1)

No.	Setting	Range	Default	Description
14041	Set point	100.0 to 120.0 %	103.0 %	
14042	Timer	0.1 to 100.0 s	10.0 s	
14045	Enable	OFF ON	OFF	
14046	Fail class	F1 to F9	F2 (Warning)	

14050 Average generator over-voltage L-N 2 (Avg. G U> L-N 2)

No.	Setting	Range	Default	Description
14051	Set point	100.0 to 120.0 %	105.0 %	
14052	Timer	0.1 to 100.0 s	5.0 s	

No.	Setting	Range	Default	Description
14055	Enable	OFF ON	OFF	
14056	Fail class	F1 to F9	F2 (Warning)	

14060 Average generator under-voltage L-N 1 (Avg. G U< L-N 1)

No.	Setting	Range	Default	Description
14061	Set point	100.0 to 120.0 %	97.0 %	
14062	Timer	0.1 to 100.0 s	10.0 s	
14065	Enable	OFF ON	OFF	
14066	Fail class	F1 to F9	F2 (Warning)	

14070 Average generator under-voltage L-N 2 (Avg. G U< L-N 2)

No.	Setting	Range	Default	Description
14071	Set point	100.0 to 120.0 %	95.0 %	
14072	Timer	0.1 to 100.0 s	5.0 s	
14075	Enable	OFF ON	OFF	
14076	Fail class	F1 to F9	F2 (Warning)	

14080 Average generator over-frequency 1 (Avg. G f> 1)

No.	Setting	Range	Default	Description
14081	Set point	100.0 to 120.0 %	103.0 %	
14082	Timer	0.1 to 100.0 s	10.0 s	
14085	Enable	OFF ON	OFF	
14086	Fail class	F1 to F9	F2 (Warning)	

14090 Average generator over-frequency 2 (Avg. G f> 2)

No.	Setting	Range	Default	Description
14091	Set point	100.0 to 120.0 %	105.0 %	
14092	Timer	0.1 to 100.0 s	5.0 s	
14095	Enable	OFF ON	OFF	
14096	Fail class	F1 to F9	F2 (Warning)	

14100 Average generator under-frequency 1 (Avg. G f< 1)

No.	Setting	Range	Default	Description
14101	Set point	100.0 to 120.0 %	97.0 %	
14102	Timer	0.1 to 100.0 s	10.0 s	
14105	Enable	OFF ON	OFF	
14106	Fail class	F1 to F9	F2 (Warning)	

14110 Average generator under-frequency 2 (Avg. G f< 2)

No.	Setting	Range	Default	Description
14111	Set point	100.0 to 120.0 %	95.0 %	
14112	Timer	0.1 to 100.0 s	5.0 s	
14115	Enable	OFF ON	OFF	
14116	Fail class	F1 to F9	F2 (Warning)	

14120 Average over-current 1 (Avg. I> 1)

No.	Setting	Range	Default	Description
14121	Set point	50.0 to 200.0 %	115.0 %	
14122	Timer	0.1 to 3200.0 s	10.0 s	
14125	Enable	OFF ON	OFF	
14126	Fail class	F1 to F9	F2 (Warning)	

14130 Average over-current 2 (Avg. I> 2)

No.	Setting	Range	Default	Description
14131	Set point	50.0 to 200.0 %	120.0 %	
14132	Timer	0.1 to 3200.0 s	5.0 s	
14135	Enable	OFF ON	OFF	
14136	Fail class	F1 to F9	F2 (Warning)	

3.8 Jump menus

A number of menus can only be entered by using the Jump menu.

3.8.1 Software version

Check the application software version in the unit before contacting DEIF regarding service and support matters. This menu also shows the clock and the date in the unit.

W1 displays the IP address and Subnet mask, and *W2* displays the Gateway address and software image version.

9000 Software version

Parameter	Description
9000	Shows the software version of the unit. Also shows the date and clock in the unit.
9001	Shows the revision of the software in the unit.
9002	Shows the IP address and the subnet mask.
9003	Shows the gateway and the image version.

3.8.2 Display character test

Menu 9010 shows a test print of the character set in the display.

3.8.3 Service port

The service port (9020) can be set up to use the ASCII communication. The ASCII communication is used when the utility software is connected through a modem.

Selection "0" must be used for cable connection between an AGC and a PC. Selection "1" must be used for modem connection between the AGC and a PC.

3.8.4 Scaling

This parameter can also be configured from the utility software.

9030 Scaling of voltage reference

No.	Setting	Range	Default	Description
9030	Scaling	10 to 2500 V 100 to 25000 V 10 to 250 kV 0.4 to 75 kV	100 to 25000 V	This parameter is used to scale the voltage reference. The selection affects the display accuracy for voltage measurements, as well as the power range that can be selected in the controller. If the power is over 20 MW, use a higher voltage range.

NOTICE

Wrong configuration possible

Changing parameter 9030 affects a number of other parameters (for example, voltages, power, output ranges). After changing parameter 9030, carefully check and correct these parameters.

3.8.5 M4 software version

Information about the software version in the engine interface printed circuit board placed in slot 7.

9070 M4 software version

No.	Description
9070	Shows the M4 software version.
9071	Shows the M4 protocol version.
9072	Shows the M4 software revision.
9073	Shows the internal protocol version.

3.8.6 Device type

9100 Device type

No.	Setting	Range	Default	Description
9100	Type	DG controller Mains controller* BTB controller* Genset Grp. Tie controller** Plant controller**	DG controller	This setting is only accessible using the JUMP button on the display.

NOTE * Requires option G5.
NOTE ** Requires option G7.

NOTICE
Configuration is reset The AGC returns to the defaults when the selection in parameter 9100 is changed.

3.8.7 Password

These parameters can also be configured from the utility software.

911x Password

No.	Setting	Range	Default	Description
9116	Customer Password	0 to 32000	2000	It is recommended to change the password levels of the user, service and master password if access to parameter settings must be restricted.
9117	Service Password	0 to 32000	2001	
9118	Master Password	0 to 32000	2002	

3.8.8 Service menu

This menu shows the different timer values, the digital in- and outputs, and the status of the different lines in M-Logic.

9120 Service menu

No.	Description
9121	Shows the values of differential timers.
9123	Shows the status of the digital inputs of the unit.
9124	Shows the status of the outputs of the unit.
9125	Shows the status of the different lines in M-Logic.

3.8.9 AC configuration

This menu is used to choose the AC configuration. These parameters can also be configured from the utility software.

9130 AC config.

No.	Setting	Range	Default	Description
9131	Setting	3 phase L1L2L3 2 phase L1L3 2 phase L1L2 1 phase L1	3 phase L1L2L3	Phase angles: • L1L2L3: 120 degrees with neutral. • L1L3: 180 degrees (split phase, neutral in the centre). • L1L2: 120 degrees with neutral. • L1: Single phase with phase-neutral.

9132 Q calc method

No.	Setting	Range	Default	Description
9132	Set point	Q via Ph-Ph and I Q via Ph-N and I	Q via Ph-Ph and I*	By default, the reactive power is based on the phase-phase voltage measurement and the current measurement. Use *Q via Ph-N and I* to use the phase-neutral voltage measurement for the Q calculation.

NOTE * *Q via Ph-Ph and I* is activated if option A20 (IEEE 1547 US grid code compliance) is activated.

3.8.10 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. These parameters can also be configured from the utility software.

9140 Angle comp. BB/G

No.	Setting	Range	Default	Description
9140	Angle comp. BB/ G 1	-179.0 to 179.0 °	0.0	
9142	Angle comp. BB/ G 2	-179.0 to 179.0 °	0.0	

3.8.11 Backlight dimmer

In this menu, it is possible to change the dim of the backlight in the display.

9150 Backlight dim

No.	Setting	Description
9150		Sets the light intensity for the display.

3.8.12 Application drawing

This menu is used to change between different applications. In the bottom right corner, it is shown which application is active. When placed on active application, it will say ACT in bottom right corner of the display, otherwise INACT if not placed on active application.

9160 User-defined application

No.	Setting	Range	Default	Description
9160	Application	A1 A2 A3 A4	A1	The four different applications available make it possible to shift between different plant types.

4. Control parameters

4.1 Synchronisation

2000 Sync. type

No.	Setting	Range	Default	Description
2001	Static sync - Enable	Off, On	Off	Static sync aims at a frequency difference of 0 Hz. Dynamic sync aims at a frequency difference (mid-point between 2021 dfMax. and 2022 dfMin.). OFF = dynamic sync ON = static sync

2020 Dynamic sync.

No.	Setting	Range	Default	Description
2021	Sync. dfMax	0.0 to 0.5 Hz	0.3 Hz	These parameters are only used if *Dynamic sync.* is chosen (parameter 2001 is *Off*). Parameters 2021-2024 define the required voltage and frequency range for the breaker to close. The controller uses the breaker closing time (parameter 2025/2026) to determine when to send the close command.
2022	Sync. dfMin	-0.5 to 0.3 Hz	0.0 Hz	
2023	Sync. dUMax	2 to 10 %	5 %	
2024	Sync. dUMin	-10 to 0 %	-5 %	
2025	Sync. t GB/BTB/TB	40 to 300 ms	50 ms	
2026	Sync. t MB	40 to 300 ms	50 ms	

2030 Static sync.

No.	Setting	Range	Default	Description
2031	Maximum df	0.0 to 0.5 Hz	0.1 Hz	These parameters are only applicable if *Static sync.* is chosen in parameter 2001.
2032	Maximum dU	1 to 10 %	5 %	
2033	Closing window	0.1 to 20.0 °	10 °	
2034	Static sync - Timer	0.1 to 99.0 s	1.0 s	
2035	Static type (GB)	Breaker Infinite sync.	Breaker	
2036	Static type (MB)	Breaker Infinite sync.	Breaker	

2040 Frequency synchronisation control analogue (requires option EF5) (f sync.)

No.	Setting	Range	Default	Description
2041	f sync. Kp	0.00 to 60.00	2.50	PID controller for dynamic sync. This controller is also used during static synchronisation to get the frequency into the required range. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2780. The close breaker command starts the PID controller.
2042	f sync. Ti	0.00 to 60.00 s	1.50 s	
2043	f sync. Td	0.00 to 2.00 s	0.00 s	

2050 Frequency synchronisation control relay (f sync.)

No.	Setting	Range	Default	Description
2051	f sync Kp relay	0 to 100	10	This parameter is only applicable if *Relay* is selected in parameter 2780.

2060 Phase sync. analogue (Phase sync.)

No.	Setting	Range	Default	Description
2061	Phase Kp	0.00 to 60.00	0.50	PID controller for static sync. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2780. Before this controller starts, the frequency synchronisation controller (2040) must bring the frequency into the static synchronisation window.
2062	Phase Ti	0.00 to 60.00 s	3.00 s	
2063	Phase Td	0.00 to 2.00 s	0.00 s	

2070 Phase control relay (Phase)

No.	Setting	Range	Default	Description
2071	Phase Kp relay	0 to 100	10	This parameter is only applicable if *Relay* is selected in parameter 2780.

2110 Synchronisation blackout (Sync. blackout)

No.	Setting	Range	Default	Description
2111	Blackout dfMin	0.0 to 5.0 Hz	3.0 Hz	Accepted limits for black closing of the breaker (or start of synchronisation) in each direction of nominal frequency and voltage.
2112	Blackout dfMax	0.0 to 5.0 Hz	3.0 Hz	
2113	Blackout dUMin	2 to 20 %	5 %	
2114	Blackout dUMax	2 to 20 %	5 %	

2240 Separate synchronisation relay (Sep. sync. relay)

No.	Setting	Range	Default	Description
2241	Relay output A	Option-dependent	Not used	The output activates during synchronisation. This can be used to activate a separate synchronising unit.
2242	Relay output B	Option-dependent	Not used	

4.1.1 Close before excitation

More information
See **Close before excitation** in the **AGC-4 Mk II Designer's handbook** for details, diagrams and flowcharts.

2250 Close before excitation (Close bef. exc.)

No.	Setting	Range	Default	Description
2251	Close bef. exc. - Set point Enable	0 to 4000 RPM OFF, ON	400 RPM OFF	If ON, the function closes the breaker at the selected speed. The relay output is used for the excitation ON signal. Remember to select *Limits* in the selected relay.
2252	CBE Break. Lim.	0.0 to 999.0 s	5.0 s	
2253	CBE AVR Relay	Option-dependent	Not used	

2260 Breaker sequence

No.	Setting	Range	Default	Description
2261	Breaker seq.	Close GB Close GB + TB	Close GB	The sequence is used for the close before excitation function. Excitation is activated at the speed selected in parameter 2263.
2262	CBE Softstart	0.0 to 999.0 s	5.0 s	
2263	Exc. Start RPM	0 to 4000 RPM	1450 RPM	
2264	Volt. discharge	1.0 to 20.0 s	5.0 s	
2265	Volt. rerun lvl	30 to 100 %	30 %	
2266	ExcCtr cooldown	Excitation follow U busbar Excitation constant ON Excitation constant OFF	Excitation follow U busbar	

2230 CBE re-run fail

No.	Setting	Range	Default	Description
2231	Set point	1	1	Activated if the CBE re-run fails.
2252	Timer	0.0 to 999.0 s	120 s	
2255	Enable	OFF, ON	ON	
2256	Fail class	F1 to F9	F4 (Trip + stop)	

4.2 Regulation

2510 Frequency control analogue (f control)

No.	Setting	Range	Default	Description
2511	f Kp	0.00 to 60.00	2.50	PID controller for frequency control. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2781.
2512	f Ti	0.00 to 60.00 s	1.50 s	
2513	f Td	0.00 to 2.00 s	0.00 s	
2514	Droop setting	0 to 10 %	0 %	The droop setting will be applied on top of the regulation output.

2530 Power control analogue (P control)

No.	Setting	Range	Default	Description
2531	P Kp	0.00 to 60.00	2.50	PID controller for power control. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2781.
2532	P Ti	0.00 to 60.00 s	1.50 s	
2533	P Td	0.00 to 2.00 s	0.00 s	

2540 Power load sharing control analogue (P LS control)

No.	Setting	Range	Default	Description
2541	P LS Kp	0.00 to 60.00	2.50	PID controller for load sharing control. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2781. The regulator ensures the nominal frequency is maintained while also distributing the load between the gensets.
2542	P LS Ti	0.00 to 60.00 s	1.50 s	
2543	P LS Td	0.00 to 2.00 s	0.00 s	

2550 Analogue governor offset (Analogue GOV)

No.	Setting	Range	Default	Description
2551	GOV output offset 1	0 to 100 %	50 %	PID controller for frequency control. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2781.
2552	GOV output offset 2	0 to 100 %	50 %	
2553	GOV output offset 3	0 to 100 %	50 %	
2554	GOV output offset 4	0 to 100 %	50 %	

2570 Frequency control relay output

No.	Setting		Range	Default	Description
2571	f control relay	Dead band	0.2 to 10.0 %	1.0 %	These parameters are only applicable if *Relay* is selected in parameter 2781. The droop setting will be applied on top of the regulation output.
2572	f control relay	Kp	0 to 100	10	
2573	f droop relay	Droop setting	0 to 10 %	0 %	

2580 Power control relay output (P control relay)

No.	Setting	Range	Default	Description
2581	Dead band	0.2 to 10.0 %	2.0 %	These parameters are only applicable if *Relay* is selected in parameter 2781.
2582	Kp	0 to 100	10	

2590 Load sharing control relay output (LS ctrl. relay)

No.	Setting	Range	Default	Description
2591	f dead band	0.2 to 10.0 %	1.0 %	These parameters are only applicable if *Relay* is selected in parameter 2781.
2592	LS Kp	0 to 100	10	
2593	P dead band	0.2 to 10.0 %	2.0 %	
2594	P weight	0.0 to 100.0 %	10.0 %	

2600 Relay control

No.	Setting	Range	Default	Description
2601	GOV ON time	10 to 6500 ms	500 ms	These parameters are only applicable if *Relay* is selected in parameter 2781. Note: In the PC utility software, settings 2603/2604 are found under menu 2602.
2602	GOV period time	50 to 32500 ms	2500 ms	
2603	Relay output A (Increase relay)	Option-dependent	Not used	
2604	Relay output B (Decrease relay)	Option-dependent	Not used	

2610 Power ramp up

No.	Setting		Range	Default	Description
2611	Power ramp up	Speed	0.1 to 20.0 %/s	2.0 %/s	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 to 100 %	10 %	
2613	Power ramp up	Delay time	0 to 9900 s	10 s	
2614	Island ramp	Enable	OFF ON	OFF	
2615	Power ramp up	Steps	0 to 100	1	
2616	Power ramp up 2	Speed	0.1 to 20.0 %/s	0.1 %/s	Can be activated by parameter 2624 or M-Logic. With option A10: Ramp 3 and 4 are available in menu 2800.

2620 Power ramp down

No.	Setting		Range	Default	Description
2621	Power ramp down	Speed	0.1 to 20.0 %/s	3.3 %/s	The breaker open point determines when the Open breaker relay output is activated to open the generator breaker before reaching 0 kW. Power % settings relate to nominal generator power.
2622	Power ramp down	Breaker open point	1 to 20 %	5 %	
2623	Power ramp down 2	Speed	0.1 to 20.0 %/s	0.1 %/s	Slope of Ramp 2, when ramping down (not used for deload). With option A10: Ramp 3 and 4 are available in menu 2800.
2624	Auto ramp select	Enable	OFF ON	ON	ON: Ramp 2 is used with Freq. dependent P droop. OFF: Ramp 2 is enabled via M-Logic.

2640 Voltage control analogue

No.	Setting		Range	Default	Description
2641	U control	U Kp	0.00 to 60.00	2.50	PID controller for voltage control. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2783. The droop setting will be applied on top of the regulation output.
2642	U control	U Ti	0.00 to 60.00 s	1.50 s	
2643	U control	U Td	0.00 to 2.00 s	0.00 s	
2644	U droop	Droop setting	0 to 10 %	0 %	

2650 Reactive power control analogue (Q control)

No.	Setting	Range	Default	Description
2651	Q Kp	0.00 to 60.00	2.50	PID controller for reactive power control. The reactive power control is used for power factor as well as reactive power control. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2783.
2652	Q Ti	0.00 to 60.00 s	1.50 s	
2653	Q Td	0.00 to 2.00 s	0.00 s	

2660 Reactive power load sharing control analogue (Q load share ctrl)

No.	Setting	Range	Default	Description
2661	Q LS Kp	0.00 to 60.00	2.50	The VAr (Q) load sharing is based on a mix of voltage and VAr control. Parameter 2664 is setting the impact of the VAr controller over the voltage controller. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2783.
2662	Q LS Ti	0.00 to 60.00 s	1.50 s	
2663	Q LS Td	0.00 to 2.00 s	0.00 s	
2664	Q weight	0.0 to 100.0 %	10.0 %	

2670 Analogue AVR output offset (Analogue AVR)

No.	Setting	Range	Default	Description
2671	AVR outp offset 1	0 to 100 %	50.0 %	The parameters set the initial value of the analogue output (when starting the generator). When the set of nominal parameters (1 to 4) is changed, the offset also automatically changes. Alternatively, you can change the selected offset using M-Logic and/or Modbus commands. These parameters are only applicable if *Analogue* or *EIC* is selected in parameter 2783.
2672	AVR outp offset 2	0 to 100 %	50.0 %	
2673	AVR outp offset 3	0 to 100 %	50.0 %	
2674	AVR outp offset 4	0 to 100 %	50.0 %	

2690 Voltage control relay

No.	Setting		Range	Default	Description
2691	U control	U dead band	0.0 to 10.0 %	2.0 %	PI controller for voltage control. These parameters are only applicable if *Relay* is selected in parameter 2783. The droop setting will be applied on top of the regulation output.
2692	U control	U Kp	0 to 100	10	
2693	U droop relay	Droop setting	0 to 10 %	0 %	

2700 Reactive power control relay (Q control)

No.	Setting	Range	Default	Description
2701	Q dead band	0.0 to 10.0 %	2.0 %	PI controller for reactive power control. The reactive power control is used for power factor as well as reactive power control. These parameters are only applicable if *Relay* is selected in parameter 2783.
2702	Q Kp	0 to 100	10	

2710 Reactive power load sharing control relay (Q load share ctrl)

No.	Setting	Range	Default	Description
2711	U dead band	0.0 to 10.0 %	1.0 %	The VAr (Q) load sharing is based on a mix of voltage and VAr control. Parameter 2664 is setting the impact of the VAr controller over the voltage controller. These parameters are only applicable if *Relay* is selected in parameter 2783.
2712	U Kp	0 to 100	10	
2713	Q dead band	0.0 to 10.0 %	2.0 %	
2714	Q weight	0.0 to 100.0 %	10.0 %	

2720 Relay control setup (AVR) (Relay control)

No.	Setting	Range	Default	Description
2721	AVR ON time t_N	10 to 3000 ms	100 ms	Relay outputs for voltage/ VAr/ power factor control. These parameters are only applicable if *Relay* is selected in parameter 2783.
2722	AVR period time t_P	50 to 15000 ms	500 ms	
2723	Relay output A (U increase)	Option-dependent	Not used	
2724	Relay output B (U decrease)	Option-dependent	Not used	

2740 Delay regulation

No.	Setting	Range	Default	Description
2741	Timer	0 to 9900 s	3 s	Delay of activating regulation after running feedback has been detected. To disable the delay, set the timer to 0 s.
2744	Enable	OFF ON	OFF	

2760 Overlap

No.	Setting	Range	Default	Description
2761	Set point	OFF ON	OFF	If ON, the generator and mains breaker will never both be closed for a longer time period than the selected.
2722	Timer	0.10 to 99.90 s	0.30 s	

2780 Regulator output

No.	Setting		Range	Default	Description
2781	Reg. output	GOV	Relay EIC Analogue	Relay	Selection of the speed output: Relay, analogue or engine interface communication. Analogue and EIC are option dependent. If *Inverse proportional* is selected, the analogue output is high when less power is needed, and low when more power is needed. Inverse proportional does not affect relay and EIC.
2782	Man. step	GOV	0.1 to 10.0 s	5.0 s	This timer is used to define how long the governor up/down pulse should be, by activating an AOP button or a digital input.
2783	Reg. output	AVR	Relay EIC Analogue	Relay	Generator voltage control based on relay, analogue or EIC output signals. EIC requires J1939 (option H12). Analogue selection is only available with option EF6.
2784	Man. step	AVR	0.1 to 10.0 s	5.0 s	This timer is used to define how long the AVR up/down pulse should be, by activating an AOP button or a digital input.

2790 EIC speed demand switch (requires option H12) (EIC speed dem. sw.)

No.	Setting	Range	Default	Description
2791	Local norm sw.	Analogue CAN Up/Down ECU Up/Down CAN Analogue ECU Analogue ECU relative Frequency	Analogue CAN	EIC speed demand switch setup: local normal switch position. See **Option H12, H13 CANbus engine interface communication** for more information.
2792	Local emerg. sw.	Analogue CAN Up/Down ECU Up/Down CAN Analogue ECU Analogue ECU relative Frequency	Analogue CAN	
2793	Remote norm sw.	Analogue CAN Up/Down ECU Up/Down CAN Analogue ECU Analogue ECU relative Frequency	Analogue CAN	
2794	Remote Emerg. sw.	Analogue CAN Up/Down ECU Up/Down CAN Analogue ECU Analogue ECU relative Frequency	Analogue CAN	

2800 Power ramp 3 and 4 (requires option A10)

No.	Setting		Range	Default	Description
2801	Power ramp up 3	Ramp up slope	0.1 to 20.0 %	0.1 %	
2802	Power ramp down 3	Ramp down slope	0.1 to 20.0 %	0.1 %	
2803	Power ramp up 4	Ramp up slope	0.1 to 20.0 %	0.1 %	
2804	Power ramp down 4	Ramp down slope	0.1 to 20.0 %	0.1 %	

2810 AVR limiting

No.	Setting	Range	Default	Description
2811	Limit type	OFF Droop curve Capability curve Q	Droop curve	Capability curve limiting uses option C2.
2812	Set point	20 to 100 %	95 %	The limiting set point is for capability curve limiting.

2820 Reactive power ramp

No.	Setting		Range	Default	Description
2821	Q ramp to setp.	Ramp up slope	0.1 to 20.0 %/s	2 %/s	Activation of this will allow the reactive power to be ramped up and down, to stabilise the system.
2822	Q ramp to zero	Ramp down slope	0.1 to 20.0 %/s	2 %/s	
2823	Q ramp enable		OFF Linear Time constant	OFF	**OFF**: Deactivate the ramp. **Linear**: Parameters 2821 and 2822 are used. **Time constant**: Parameter 2824 is used.
2824	Q time constant		2 s	1 to 30 s	PT1-based time constant, used if **Time constant** is selected in parameter 2823.

2950 Base load

No.	Setting	Range	Default	Description
2951	Power set	10.0 to 120.0 %	90 %	Setting and enabling of base load running. Base load is only possible in semi auto mode. See **Option G5** for more information.
2952	Enable	OFF ON	OFF	
2953	Return mode	Semi-auto mode Auto mode	Auto mode	The return mode after base load is completed is specified in parameter 2953.

2960 Warm up ramp

No.	Setting		Range	Default	Description
2960	Warm up type	Set point	Option-dependent	Multi-input 102	When the function input is activated, it ramps to the set point from *Power ramp up* (parameter 2612) and disables the Power ramp up function. When the input is set low again, it ramps beyond the limitation.
2961	Warm up thresh.	Set point	0 to 482 °	0 °	
2962	Warm up type	Enable	OFF ON	OFF	

7290 Frequency offset

No.	Setting	Range	Default	Description
7291	f offset Tmax	0 to 2.5 Hz	0 Hz	For testing, a frequency offset can be created for stand-alone genset regulation, using a 4 to 20 mA signal.
7292	f offset Tmin	-2.5 to 0 Hz	0 Hz	
7293	f offset meas	Multi input 102 (transducer) Multi input 105 (transducer) Multi input 108 (transducer)	Multi input 102 (transducer)	

4.2.1 Regulator step tests

2971 GOV step test

No.	Setting	Range	Default	Description
2971	GOV step test	-100 to 100 % 1 to 50 s	0 % 4 s	This is a genset controller commissioning function. It is useful for regulator tuning. Advanced users can use a step test to see the system response and/or the reaction of the regulator. When ON, the specified value is added to the governor offset for the specified time. If the controller is in SEMI mode, during the step test the AGC adjusts its regulation to try to get back to its set point. The AGC thus works against the step test change. In manual mode, the controller's regulation is disabled.
2972	GOV step enable	OFF ON	OFF	

2973 AVR step test

No.	Setting	Range	Default	Description
2973	AVR step test	-100 to 100 % 1 to 50 s	0 % 4 s	This is a genset controller commissioning function. It is useful for regulator tuning. Advanced users can use a step test to see the system response and/or the reaction of the regulator. When ON, the specified value is added to the AVR offset for the specified time. If the controller is in SEMI mode, during the step test the AGC adjusts its regulation to try to get back to its set point. The AGC thus works against the step test change. In manual mode, the controller's regulation is disabled.
2974	AVR step enable	OFF ON	OFF	

4.3 Output setup

4.3.1 Digital output setup

You can also configure these outputs under *I/O setup* in the utility software. See Input and output setup for more information.

Digital output functions

- Alarm relay ND
- M-Logic / Limit relay

- Horn relay
- Siren relay
- Alarm relay NE
- Modbus control relay OFF
- Modbus control relay ON

5000 Relay 05

No.	Setting	Range	Default	Description
5001	Function	See *Digital output functions*	Horn relay	
5002	OFF delay	0.0 to 999.9 s	5.0 s	

5010 Relay 08

No.	Setting	Range	Default	Description
5011	Function	See *Digital output functions*	Alarm relay ND	Only available if no mains breaker is controlled by the AGC.
5012	OFF delay	0.0 to 999.9 s	5.0 s	

5020 Relay 11

No.	Setting	Range	Default	Description
5021	Function	See *Digital output functions*	Alarm relay ND	Only available if no mains breaker is controlled by the AGC.
5022	OFF delay	0.0 to 999.9 s	5.0 s	

5030 Relay 14

No.	Setting	Range	Default	Description
5031	Function	See *Digital output functions*	Alarm relay ND	Only available if no mains breaker is controlled by the AGC.
5032	OFF delay	0.0 to 999.9 s	5.0 s	

5040 Relay 17

No.	Setting	Range	Default	Description
5041	Function	See *Digital output functions*	Alarm relay ND	Only available if no mains breaker is controlled by the AGC.
5042	OFF delay	0.0 to 999.9 s	5.0 s	

5050 Relay 20

No.	Setting	Range	Default	Description
5051	Function	See *Digital output functions*	Alarm relay ND	Only available if *Relay* is selected in parameter 5271.
5052	OFF delay	0.0 to 999.9 s	5.0 s	

5060 Relay 21

No.	Setting	Range	Default	Description
5061	Function	See *Digital output functions*	Alarm relay ND	Only available if *Relay* is selected in parameter 5272.
5062	OFF delay	0.0 to 999.9 s	5.0 s	

5070 Relay 29 (requires option M14.2)

No.	Setting	Range	Default	Description
5071	Function	See *Digital output functions*	Alarm relay ND	
5072	OFF delay	0.0 to 999.9 s	5.0 s	

5080 Relay 31 (requires option M14.2)

No.	Setting	Range	Default	Description
5081	Function	See *Digital output functions*	Alarm relay ND	
5082	OFF delay	0.0 to 999.9 s	5.0 s	

5090 Relay 33 (requires option M14.2)

No.	Setting	Range	Default	Description
5091	Function	See *Digital output functions*	Alarm relay ND	
5092	OFF delay	0.0 to 999.9 s	5.0 s	

5100 Relay 35 (requires option M14.2)

No.	Setting	Range	Default	Description
5101	Function	See *Digital output functions*	Alarm relay ND	
5102	OFF delay	0.0 to 999.9 s	5.0 s	

5110 Relay 57 (requires option M12)

No.	Setting	Range	Default	Description
5111	Function	See *Digital output functions*	Alarm relay ND	
5112	OFF delay	0.0 to 999.9 s	5.0 s	

5120 Relay 59 (requires option M12)

No.	Setting	Range	Default	Description
5121	Function	See *Digital output functions*	Alarm relay ND	
5122	OFF delay	0.0 to 999.9 s	5.0 s	

5130 Relay 61 (requires option M12)

No.	Setting	Range	Default	Description
5131	Function	See *Digital output functions*	Alarm relay ND	
5132	OFF delay	0.0 to 999.9 s	5.0 s	

5140 Relay 63 (requires option M12)

No.	Setting	Range	Default	Description
5141	Function	See *Digital output functions*	Alarm relay ND	
5142	OFF delay	0.0 to 999.9 s	5.0 s	

5150 Relay 65

No.	Setting	Range	Default	Description
5151	Function	See *Digital output functions*	Alarm relay ND	Used for GOV UP command if *Relay* is selected in parameter 2781.
5152	OFF delay	0.0 to 999.9 s	5.0 s	

5160 Relay 67

No.	Setting	Range	Default	Description
5161	Function	See *Digital output functions*	Alarm relay ND	Used for GOV DOWN command if *Relay* is selected in parameter 2781.
5162	OFF delay	0.0 to 999.9 s	5.0 s	

5170 Relay 69

No.	Setting	Range	Default	Description
5171	Function	See *Digital output functions*	Alarm relay ND	Used for AVR UP command if *Relay* is selected in parameter 2783.
5172	OFF delay	0.0 to 999.9 s	5.0 s	

5180 Relay 71

No.	Setting	Range	Default	Description
5181	Function	See *Digital output functions*	Alarm relay ND	Used for AVR DOWN command if *Relay* is selected in parameter 2783.
5182	OFF delay	0.0 to 999.9 s	5.0 s	

5190 Relay 90 (requires option M14.6)

No.	Setting	Range	Default	Description
5191	Function	See *Digital output functions*	Alarm relay ND	Option M14.6: 4 x relay output, slot 6.
5192	OFF delay	0.0 to 999.9 s	5.0 s	

5200 Relay 92 (requires option M14.6)

No.	Setting	Range	Default	Description
5201	Function	See *Digital output functions*	Alarm relay ND	Option M14.6: 4 x relay output, slot 6.
5202	OFF delay	0.0 to 999.9 s	5.0 s	

5210 Relay 94 (requires option M14.6)

No.	Setting	Range	Default	Description
5211	Function	See *Digital output functions*	Alarm relay ND	Option M14.6: 4 x relay output, slot 6.
5212	OFF delay	0.0 to 999.9 s	5.0 s	

5220 Relay 96 (requires option M14.6)

No.	Setting	Range	Default	Description
5221	Function	See *Digital output functions*	Alarm relay ND	Option M14.6: 4 x relay output, slot 6.
5222	OFF delay	0.0 to 999.9 s	5.0 s	

5230 Relay 126 (requires option M14.8)

No.	Setting	Range	Default	Description
5231	Function	See *Digital output functions*	Alarm relay ND	Option M14.8: 4 x relay output, slot 8.
5232	OFF delay	0.0 to 999.9 s	5.0 s	

5240 Relay 128 (requires option M14.8)

No.	Setting	Range	Default	Description
5241	Function	See *Digital output functions*	Alarm relay ND	Option M14.8: 4 x relay output, slot 8.
5242	OFF delay	0.0 to 999.9 s	5.0 s	

5250 Relay 130 (requires option M14.8)

No.	Setting	Range	Default	Description
5251	Function	See *Digital output functions*	Alarm relay ND	Option M14.8: 4 x relay output, slot 8.
5252	OFF delay	0.0 to 999.9 s	5.0 s	

5260 Relay 132 (requires option M14.8)

No.	Setting	Range	Default	Description
5261	Function	See *Digital output functions*	Alarm relay ND	Option M14.8: 4 x relay output, slot 8.
5262	OFF delay	0.0 to 999.9 s	5.0 s	

5270 Transistor output setup

No.	Setting	Range	Default	Description
5271	Transistor 20	kWh pulse Relay	kWh pulse	The transistor outputs on terminals 20 and 21 can be configured as relay outputs or pulse signals. If *Relay* is selected, the relays 20 and 21 will be available. If *Relay* is selected, external relays are needed due to limited current output, max. 10 mA.
5272	Transistor 21	kvarh pulse Relay	kvarh pulse	

4.4 Analogue output

4.4.1 Regulation reference output

5690 P ref output (requires option F1)

No.	Setting	Range	Default	Description
5691	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Power range and default depend on the scaling set in parameter 9030.
5692	Transducer B	Option-dependent	Disabled	
5693	Set point	See description	Disabled	
5694	Max. value	0 to 20,000 kW*	500 kW*	
5695	Min. value	-9999 to 20,000 kW*	0 kW	

5700 Q ref output (requires option F1 combined with A10)

No.	Setting	Range	Default	Description
5701	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Reactive power range and default depend on the scaling set in parameter 9030.
5702	Transducer B	Option-dependent	Disabled	
5703	Set point	See description	Disabled	
5704	Max. value	0 to 16,000 kvar*	400 kvar*	
5705	Min. value	-8000 to 16,000 kW*	0 kvar	

5710 Cos phi ref output (requires option F1)

No.	Setting	Range	Default	Description
5711	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V
5712	Transducer B	Option-dependent	Disabled	
5713	Set point	See description	Disabled	
5714	Max. value	0.50 to 0.99 cos phi	0.80 cos phi	
5715	Min. value	-0.99 to -0.50 cos phi	-0.80 cos phi	

4.4.2 Analogue output limits

5720 PWM 68 limits (requires option EF5)

No.	Setting	Range	Default	Description
5721	Min.	0 to 50 %	10 %	For Caterpillar engines.
5722	Max.	50 to 100 %	90 %	

5780 AOut 68 limits (requires option EF6)

No.	Setting	Range	Default	Description
5781	Min.	-25 to 10 mA	-20 mA	Option EF6: 2 x analogue outputs.
5782	Max.	10 to 25 mA	20 mA	

5790 AOut 72 limits (requires option EF6)

No.	Setting	Range	Default	Description
5791	Min.	-25 to 10 mA	-20 mA	Option EF6: 2 x analogue outputs.
5792	Max.	10 to 25 mA	20 mA	

5800 AOut 91 limits (requires option F1)

No.	Setting	Range	Default	Description
5801	Min.	0 to 10 mA	0 mA	Option F1: 2 x analogue outputs.
5802	Max.	10 to 20 mA	20 mA	

5810 AOut 95 limits (requires option F1)

No.	Setting	Range	Default	Description
5811	Min.	0 to 10 mA	0 mA	Option F1: 2 x analogue outputs.
5812	Max.	10 to 20 mA	20 mA	

4.5 Transducer outputs

5820 P output 1 (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5821	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Power range and default depend on the scaling set in parameter 9030.
5822	Transducer B	Option-dependent	Disabled	
5823	Set point	See description	Disabled	
5824	Max. value	0 to 20,000 kW*	500 kW*	
5825	Min. value	-9999 to 20,000 kW*	0 kW	

5830 P output 2 (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5831	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Power range and default depend on the scaling set in parameter 9030.
5832	Transducer B	Option-dependent	Disabled	
5833	Set point	See description	Disabled	
5834	Max. value	0 to 20,000 kW*	500 kW*	
5835	Min. value	-9999 to 20,000 kW*	0 kW	

5840 P output 3 (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5841	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Power range and default depend on the scaling set in parameter 9030.
5842	Transducer B	Option-dependent	Disabled	
5843	Set point	See description	Disabled	
5844	Max. value	0 to 20,000 kW*	500 kW*	
5845	Min. value	-9999 to 20,000 kW*	0 kW	

5850 S output (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5851	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Apparent power range and default depend on the scaling set in parameter 9030.
5852	Transducer B	Option-dependent	Disabled	
5853	Set point	See description	Disabled	
5854	Max. value	0 to 20,000 kVA*	600 kVA*	
5855	Min. value	-9999 to 20,000 kVA*	0 kVA	

5860 Q output (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5861	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Reactive power range and default depend on the scaling set in parameter 9030.
5862	Transducer B	Option-dependent	Disabled	
5863	Set point	See description	Disabled	
5864	Max. value	0 to 16,000 kVAr*	400 kVAr*	
5865	Min. value	8000 to 16,000 kVAr*	0 kVAr	

5870 Cosphi output (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5871	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V Cosphi output: • Positive value = inductive. • Negative value = capacitive.
5872	Transducer B	Option-dependent	Disabled	
5873	Set point	See description	Disabled	
5874	Max. value	0.50 to 0.99	0.80	
5875	Min. value	-0.99 to -0.50	-0.80	

5880 f output (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5881	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V
5882	Transducer B	Option-dependent	Disabled	
5883	Set point	See description	Disabled	
5884	Max. value	0.0 to 70.0 Hz	55.0 Hz	
5885	Min. value	0.0 to 70.0 Hz	45.0 Hz	

5890 U output (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5891	Transducer A	Option-dependent	Disabled	The voltage output represents L1-L2 voltage. Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Voltage range and default depend on the scaling set in parameter 9030.
5892	Transducer B	Option-dependent	Disabled	
5893	Set point	See description	Disabled	
5894	Max. value	0 to 28,000 V*	500 V*	
5895	Min. value	0 to 28,000 V*	0 V	

5900 I output (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5901	Transducer A	Option-dependent	Disabled	The current output represents L1 current. Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V
5902	Transducer B	Option-dependent	Disabled	
5903	Set point	See description	Disabled	
5904	Max. value	0 to 9000 A	1000 A	
5905	Min. value	0 to 9000 A	0 A	

5910 U BB output (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5911	Transducer A	Option-dependent	Disabled	The voltage output represents L1-L2 voltage. Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Voltage range and default depend on the scaling set in parameter 9030.
5912	Transducer B	Option-dependent	Disabled	
5913	Set point	See description	Disabled	
5914	Max. value	0 to 28,000 V*	500 V*	
5915	Min. value	0 to 28,000 V*	0 V	

5920 f BB output (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5921	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V
5922	Transducer B	Option-dependent	Disabled	
5923	Set point	See description	Disabled	
5924	Max. value	0.0 to 70.0 Hz	55.0 Hz	
5925	Min. value	0.0 to 70.0 Hz	45.0 Hz	

5930 Multi-input 102 (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5931	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Voltage range and default depend on the scaling set in parameter 9030.
5932	Transducer B	Option-dependent	Disabled	
5933	Set point	See description	Disabled	
5934	Max. value	0 to 28,000 V*	500 V*	
5935	Min. value	0 to 28,000 V*	0 V	

5940 Multi-input 105 (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5941	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Voltage range and default depend on the scaling set in parameter 9030.
5942	Transducer B	Option-dependent	Disabled	
5943	Set point	See description	Disabled	
5944	Max. value	0 to 28,000 V*	500 V*	
5945	Min. value	0 to 28,000 V*	0 V	

5950 Multi-input 108 (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5951	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Voltage range and default depend on the scaling set in parameter 9030.
5952	Transducer B	Option-dependent	Disabled	
5953	Set point	See description	Disabled	
5954	Max. value	0 to 28,000 V*	500 V*	
5955	Min. value	0 to 28,000 V*	0 V	

5960 P total consumed (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5961	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Power range and default depend on the scaling set in parameter 9030.
5962	Transducer B	Option-dependent	Disabled	
5963	Set point	See description	Disabled	
5964	Max. value	0 to 20,000 kW*	500 kW*	
5965	Min. value	-9999 to 20,000 kW*	0 kW	

5970 P total available (requires option EF6 or F1)

No.	Setting	Range	Default	Description
5971	Transducer A	Option-dependent	Disabled	Set point: • Disabled • 0-20 mA • 4-20 mA • 0-10 V • -10-0-10 V *Power range and default depend on the scaling set in parameter 9030.
5972	Transducer B	Option-dependent	Disabled	
5973	Set point	See description	Disabled	
5974	Max. value	0 to 20,000 kW*	500 kW*	
5975	Min. value	-9999 to 20,000 kW*	0 kW	

4.6 Analogue regulator output setup

4.6.1 Regulator output selection

These parameters are used to select which analogue output to use for governor/AVR control.

5980 Governor output (requires option EF5 or EF6)

No.	Setting	Range	Default	Description
5981	Transducer A	Disabled Transducer 68 Transducer 70 PWM Transducer 72	Disabled	

5990 AVR output (requires option EF5 or EF6)

No.	Setting	Range	Default	Description
5991	Transducer A	Disabled Transducer 68 Transducer 70 PWM Transducer 72	Disabled	

5. Utility software settings

The utility software includes settings that do not have parameter numbers. This chapter gives a brief overview of these settings.

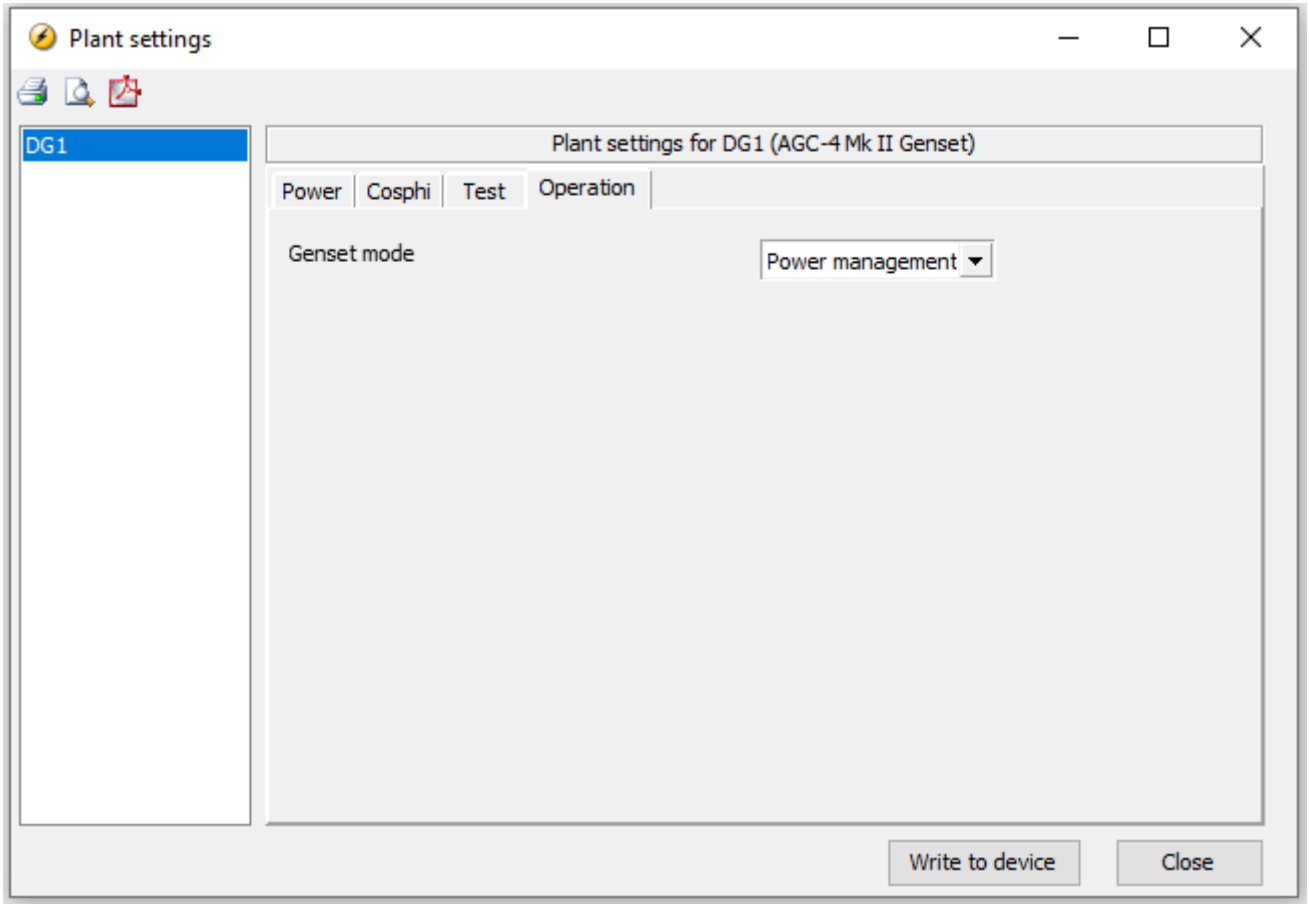
5.1 Application supervision

Access the **Application supervision** page from the left menu. You can change some parameters from here.

5.1.1 Plant settings

In **Application supervision**, access the plant settings from the icon on the top bar: . In the *Plant settings* box you can change the values of some parameters.

Example of Plant settings box



Changing the *Genset mode* in the example changes parameter 6070. Similarly, changing parameter 6070 changes the selection shown in *Plant settings*.

5.2 Input and output setup

In the utility software, in the left menu, under *Configuration*, open the *I/O & Hardware setup* page.

Alternatively, inputs and outputs can be set up using parameters. Parameter changes that are written to the controller change the values on the I/O setup page. Changes to the I/O setup page that are written to the controller also change the parameters.

Set up an analogue input and configure its curve

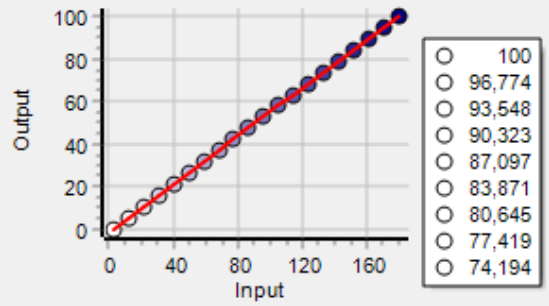
MI 102 | MI 105 | MI 108 | MI 91 (M16_6) | MI 93 (M16_6) | MI 95 (M16_6) | MI 97 (M16_6) | Digital input 23 to 27 (STD) | Digital input 43 to 55 (M12)

Multi input 102
1st alarm: Parameter: 4120. Modbus address: 268
2nd alarm: Parameter: 4130. Modbus address: 269
Wire break: Parameter: 4140. Modbus address: 274

Input type: RMI fuel level
Scaling: No unit 1/1

RMI type: Configurable | Bar/celsius

Selected curve



Configurable curve

	Input	Output
Set point 1	3	0
Set point 2	12,3	5,5
Set point 3	21,6	10,7
Set point 4	30,9	16
Set point 5	40,2	21,2
Set point 6	49,5	26,5
Set point 7	58,8	31,7
Set point 8	68,1	36,9
Set point 9	77,4	42,2
Set point 10	86,7	47,5
Set point 11	96	52,7
Set point 12	105,3	58
Set point 13	114,6	63,2
Set point 14	123,9	68,5
Set point 15	133,2	73,7
Set point 16	142,5	79
Set point 17	151,8	84,2
Set point 18	161,1	89,5
Set point 19	170,4	94,7
Set point 20	180	100

1st Alarm: Disable
Alarm when input is: High
Set point: 50
Delay: 10 Sec.
Fail class: Warning
Output A: Not used
Output B: Not used
Auto acknowledge: OFF
Inhibits: Inhibits...

2nd Alarm: Disable
Alarm when input is: High
Set point: 50
Delay: 10 Sec.
Fail class: Warning
Output A: Not used
Output B: Not used
Auto acknowledge: OFF
Inhibits: Inhibits...

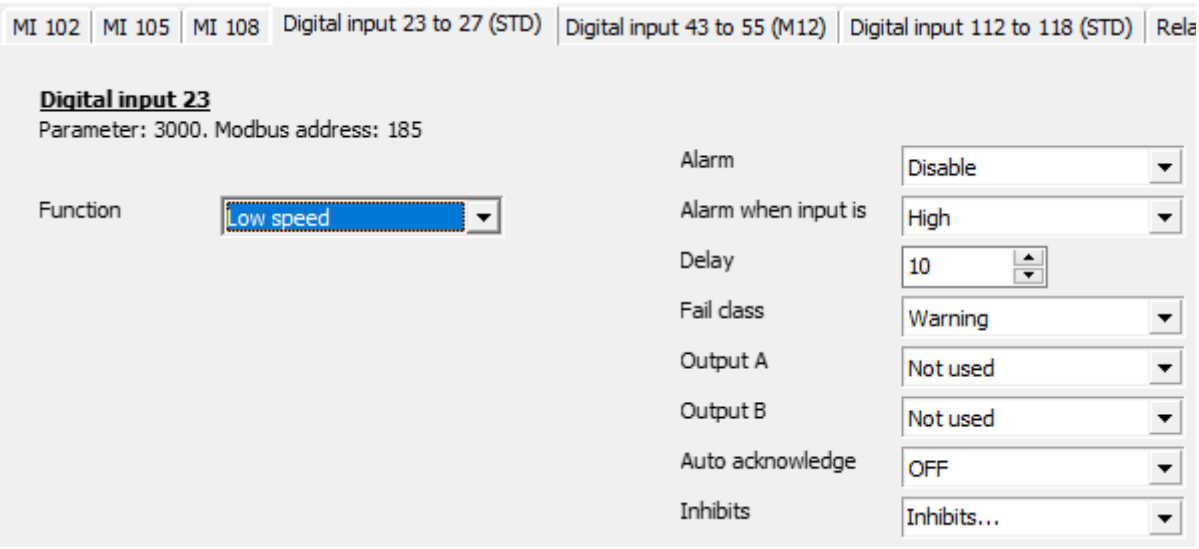
Wire break detection: Disable
Wire break fail class: Warning
Output A: Not used
Output B: Not used

The configuration is similar for M15 and M16 analogue inputs. The input types that can be configured depend on the hardware.

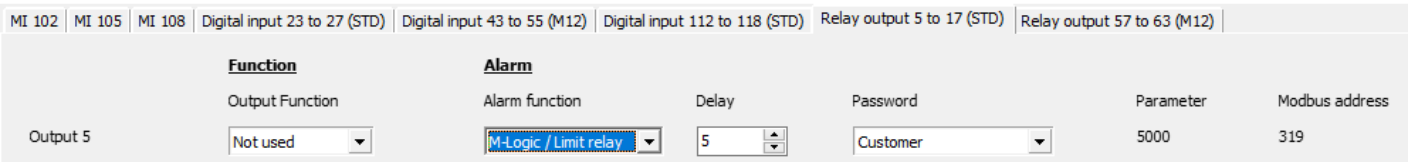
NOTE If the *Input type* is **4-20mA**, you can change the *Scaling*. If you select **No unit 1/10**, then the curve output with one decimal place is shown for this input on the display unit. If you select **No unit 1/100**, then the curve output with two decimal places is shown for this input on the display unit.

How to set up a multi-input
See our tutorial on How to setup a multi-input on AGC-4 Mk II for help and guidance.

Set up a digital input



Set up a digital output



5.2.1 AC averaging

In *I/O & Hardware setup*, use the **AC meas AVG** tab to average the AC measurements that are shown on the display on by Modbus.

More information
See **AC measurement averaging** in the **Designer's handbook**.

5.2.2 AGC-4 I/O setup parameters

The input and output setup for AGC-4 Mk II can be done from the utility software. The following AGC-4 parameter groups are therefore not used in the AGC-4 Mk II:

- Digital input 102 alarm: 3400
- Digital input 105 alarm: 3410
- Digital input 108 alarm: 3420
- Multi input 102 configuration: 4120 to 4240
- Multi input 105 configuration: 4250 to 4370
- Multi input 108 configuration: 4380 to 4500
- RMI 102 type and curve configuration: 10460 to 10620
- RMI 105 type and curve configuration: 10630 to 10790
- RMI 108 type and curve configuration: 10800 to 10960

- Selection of multi-input 102 input type: 10980
- Selection of multi-input 105 input type: 10990
- Selection of multi-input 108 input type: 11000
- Selection of M16.6 input type: 11120, 11130, 11140, 11150
- Selection of M16.8 input type: 11160, 11170, 11180, 11190

5.3 Advanced protection

Access the **Advanced protection** page from the left menu. **Advanced protection** includes:

Capability curve

This includes the following parameters used in older AGC-4 controllers: 1741, 7142, 7143, 1744, 1745, 1746, 1751, 1752, 1753, 1754, 1755, 1756, 1766, 1771, 1772, 1773, 1774, 1775, 1776, 1781, 1782, 1783, 1784, 1785, 1786, 1796.

You can also configure the capability curve from the TDU 107.

More information
See **Option C2, Generator add-on protection package** and **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

FRT setup

More information
See **Option A1, Mains protection package** and **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

LVRT 1

This includes the following parameters used in older AGC-4 controllers: 1631, 1632, 1633, 1634, 1635, 1636, 1641, 1642, 1643, 1644, 1645, 1646.

More information
See **Option A1, Mains protection package** and **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

LVRT 2

This includes the following parameters used in older AGC-4 controllers: 1671, 1672, 1673, 1674, 1675, 1676, 1681, 1682, 1683, 1684, 1685, 1686.

More information
See **Option A1, Mains protection package** and **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

HVRT 1

More information
See **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

Droop curve 1

This includes the following parameters used in older AGC-4 controllers: 7121, 7122, 7123, 7124, 7131, 7132, 7133, 7134, 7141, 7142, 7143.

More information
See **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

Droop curve 2

This includes the following parameters used in older AGC-4 controllers: 7151, 7152, 7153, 7154, 7161, 7162, 7163, 7164, 7171, 7172, 7173, 7174, 7175, 7176, 7181, 7182, 7183.

More information
See **Option D1, Voltage, var, or cos phi regulation**, **Option C2, Generator add-on protection package** and **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

var(Q) grid support

This includes the following parameters used in older AGC-4 controllers: 7151, 7152, 7153, 7154, 7161, 7162, 7163, 7164, 7171, 7172, 7173, 7174, 7175, 7176, 7181, 7182, 7183.

More information
See **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

PM: Mains-Unit

More information
See **Option A10, VDE AR-N 4110/4105 and G99 grid protection**.

DFR

More information
See **Dynamic frequency response** in the **Designer's handbook**.

5.4 PID settings

Access the **General Purpose PID** page from the left menu. These PID settings are for the customisable general purpose PID controllers.

More information
See **General purpose PID** in the **Designer's handbook**.

NOTE The governor and AVR regulation PID control is not included here. This is configured using parameters.

5.5 CIO settings

Access the **External I/O (CIO)** page from the left menu.

More information
See **Communication** in the relevant **CIO Installation and commissioning guide**.

How to configure a CIO
See our tutorial on How to configure a CIO on AGC-4 for help and guidance.

5.6 RRCR settings

Access the RRCR settings from the icon on the top bar: 

More information
See **Additional functions, RRCR external set point control** in the **Designer's handbook**.

5.7 Counters

Access the counters from the icon on the top bar: 

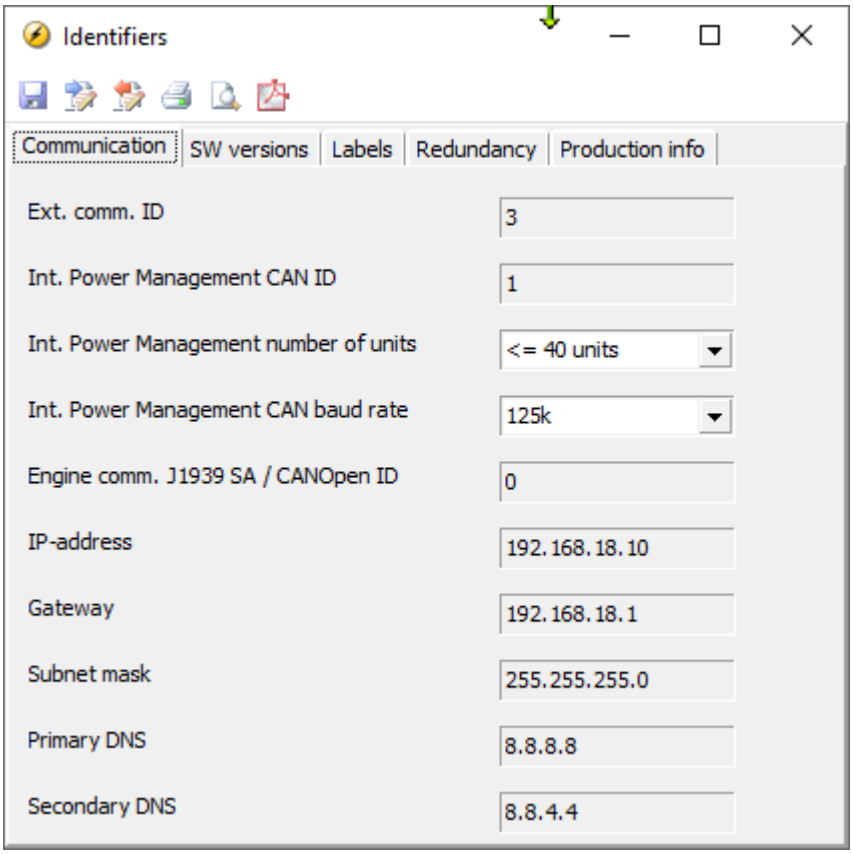
More information
See **Additional functions, Counters** in the **Designer's handbook**.

5.8 Identifiers

Access the identifiers settings from the icon on the top bar: .

In the *Identifiers* box you can change the values of some parameters.

Example of Identifiers box



Changing *Int. Power Management number of units* in the example changes parameter 9171. Similarly, changing parameter 9171 changes the selection shown in *Identifiers*.

The *Identifiers* box is also used to configure the controller identifiers for Option T1.

More information
See **Application supervision** in **Option T1, Critical power**.