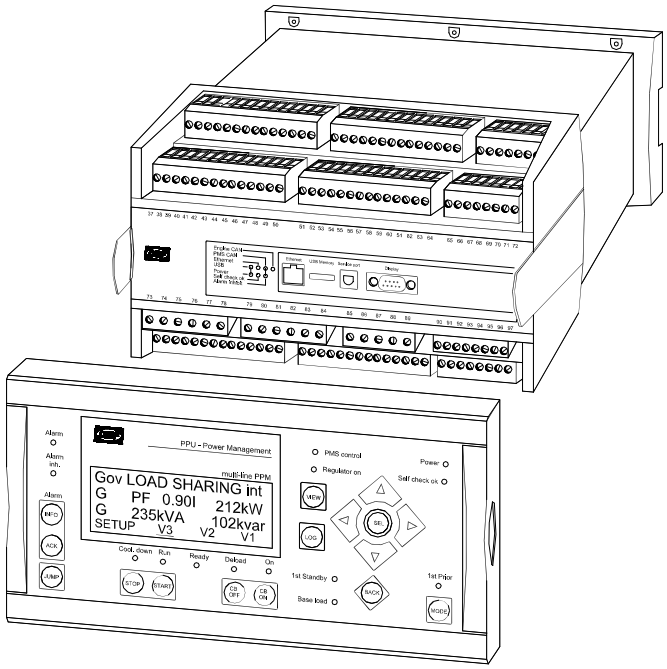
DEIF A/S

Description of options

Options E1, F1, EF2, EF4, Combination outputs for the PPU Power Management (PPM)

4189340414E
SW version 2.5X.X



- *Description of options*
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1. Warnings and legal information

Legal information and responsibility

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

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

Electrostatic discharge awareness

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

Safety issues

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

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

Definitions

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

Notes

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

Warning

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

2. Description of options

ANSI numbers

Function	ANSI no.
Selectable +/-25mA or relay output or PWM (for CAT engines) for speed control (governor)	77
Selectable +/-25mA or relay output for voltage control (AVR)	77
1 x 0(4)-20mA outputs	77
2 x 0(4)-20mA outputs	77

Option E1

Option E1 is a hardware option, and therefore a separate PCB is installed in slot #4. The PCB will replace the standard-installed relay PCB in slot #4.

Terminal description

Term.	Function	Description
65	Not used	
66	+/-25mA out	Speed governor, AVR or transducer output
67	0	
68	Not used	
69	Not used	
70	+/-25mA out	Speed governor, AVR or transducer output
71	0	
72	Not used	

AVR control is option D1.

Option F1

Option F1 is a hardware option, and therefore a separate PCB is installed in slot #6 in addition to the standard-installed hardware.

Terminal description

The outputs are active outputs. This means that they use the controller unit's power supply, and therefore no external supply can be connected.

Term.	Function	Description
90	Not used	
91	0	Transducer output
92	0(4)-20mA out	
93	Not used	
94	Not used	
95	0	Transducer output
96	0(4)-20mA out	
97	Not used	

Option EF2

Option EF2 is a hardware option, and therefore a separate PCB is installed in the slot #4. The PCB will replace the standard-installed relay PCB in slot #4.

Terminal description

Term.	Function	Description
65	Not used	
66	+/-25mA out	Speed governor
67	0	
68	Not used	
69	Not used	
70	0(4)-20mA	Transducer output
71	0	
72	Not used	

Transducer outputs are 0(4)-20mA outputs.

AVR control is option D1.

Option EF4

Option EF4 is a hardware option, and therefore a separate PCB is installed in the slot #4. The PCB will replace the standard-installed relay PCB in slot #4.

Terminal description

Term.	Function	Description
65	+/-25mA out	Speed governor, AVR or transducer output
66	0	
67	Not used	
68	Not used	
69	Relay 12	Speed governor, AVR or configurable
70		
71	Relay 13	Speed governor, AVR or configurable
72		

Transducer outputs are 0(4)-20mA outputs.

AVR control is option D1.

3. Functional description

Analogue outputs

The analogue outputs are active and galvanically separated. No external supply can be connected.

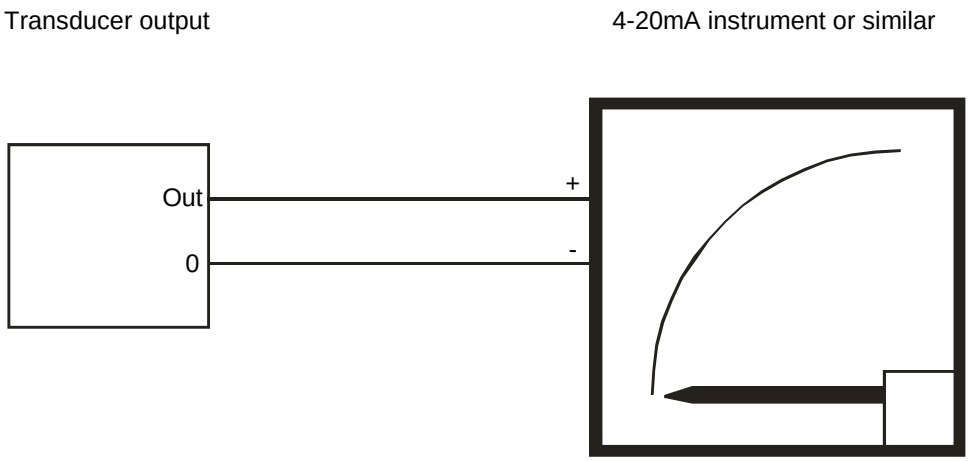
The current outputs can be converted to any voltage in the range +/-10V DC by mounting a resistor across the terminals.

Example: A 200Ω resistor across the terminals of a +/-25mA output will supply a range of +/-5V DC.

The choice of resistor depends on the specific governor. Please refer to the DEIF documents 'Interfacing DEIF Equipment with Governors and AVRs' and 'General Guidelines for Commissioning' for detailed information.

Place the resistor at the governor/AVR end to avoid the signal being disturbed by noise.

When used as transducer outputs, the signal can be connected directly to 4-20mA instruments as shown below.



It is recommended to use instruments from the DQ-series of DEIF instruments. Please refer to www.deif.com for more information.

Configuration of transducer outputs

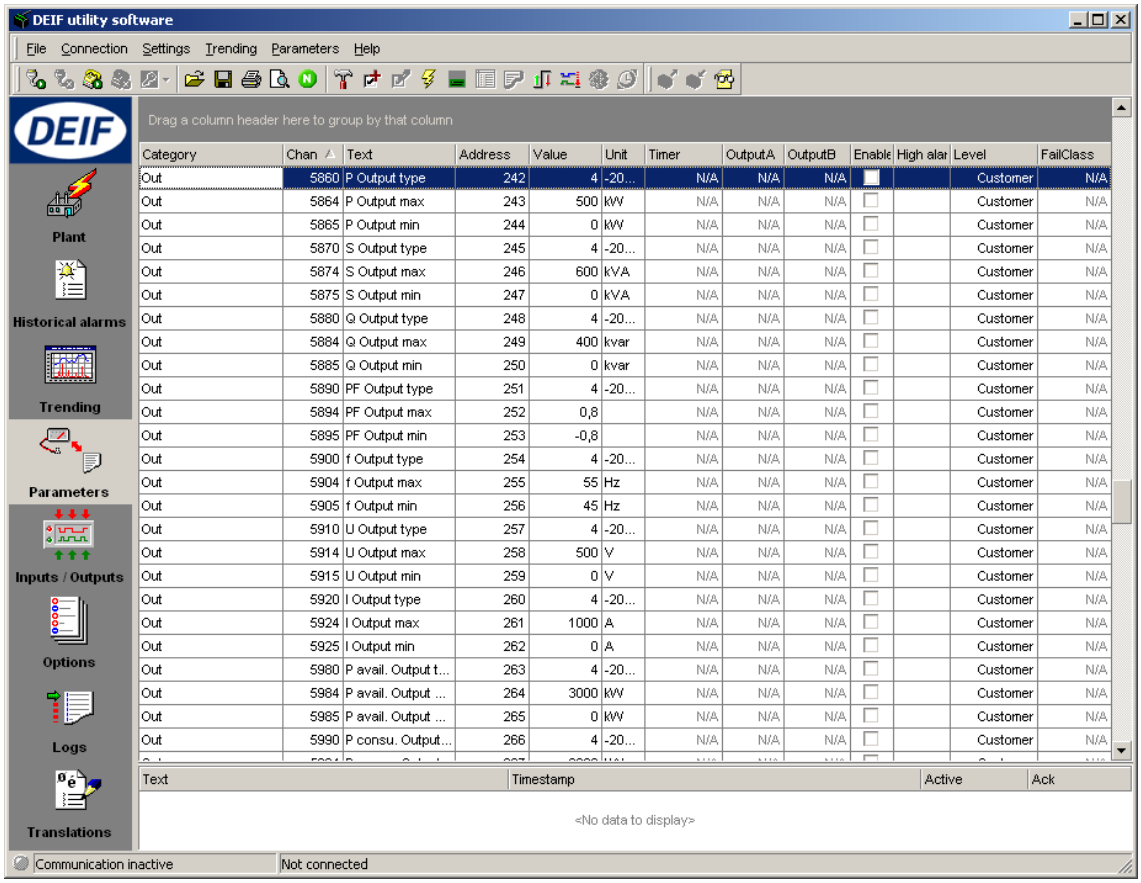
Configuration of the transducer outputs can be done from the PC utility software or from the display.

Configuration from the utility software

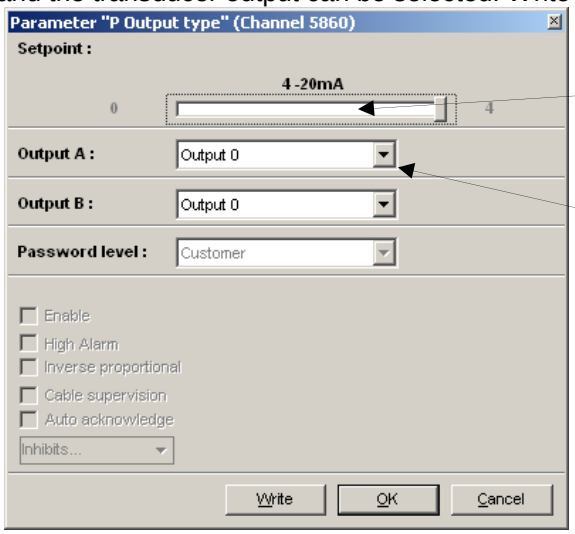
When the configuration of the transducer outputs is made from the PC utility software, the configuration is done in four steps.

In this example, the transducer output must relate to the power measurement (kW).

Step 1:
Upload the parameters from the PPM unit.



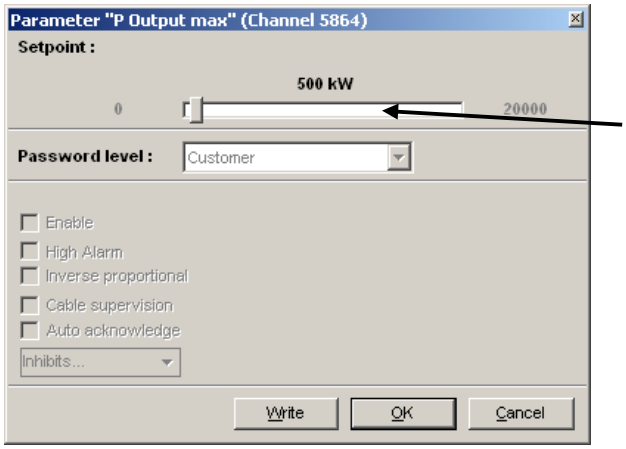
Step 2:
Locate menu 4502 in the list below and double-click the marked line. A dialogue box appears and the transducer output can be selected. Write the value to the Multi-line 2.



Select output type 0-20mA or 4-20mA.

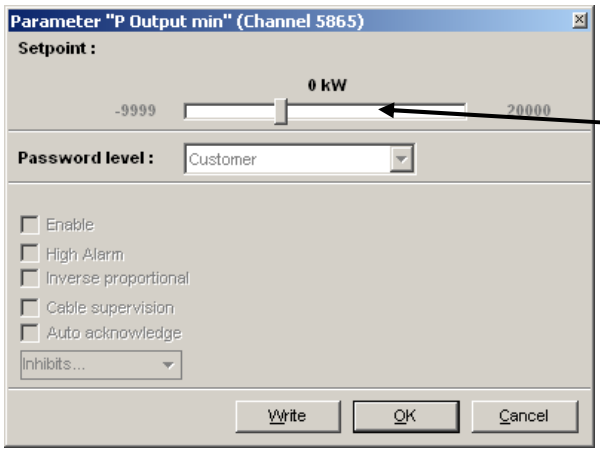
Select output #1 to #4 to activate the transducer output.

Step 3:
Locate menu 5864 in the parameter list and double-click the line. Now, adjust the value that corresponds to 20mA and write the value to the Multi-line 2.



Adjust the value in kW that represents 20mA.

Step 4:
Locate menu 5865 in the parameter list and double-click the line. Now, adjust the value that corresponds to 4mA and write the value to the Multi-line 2.

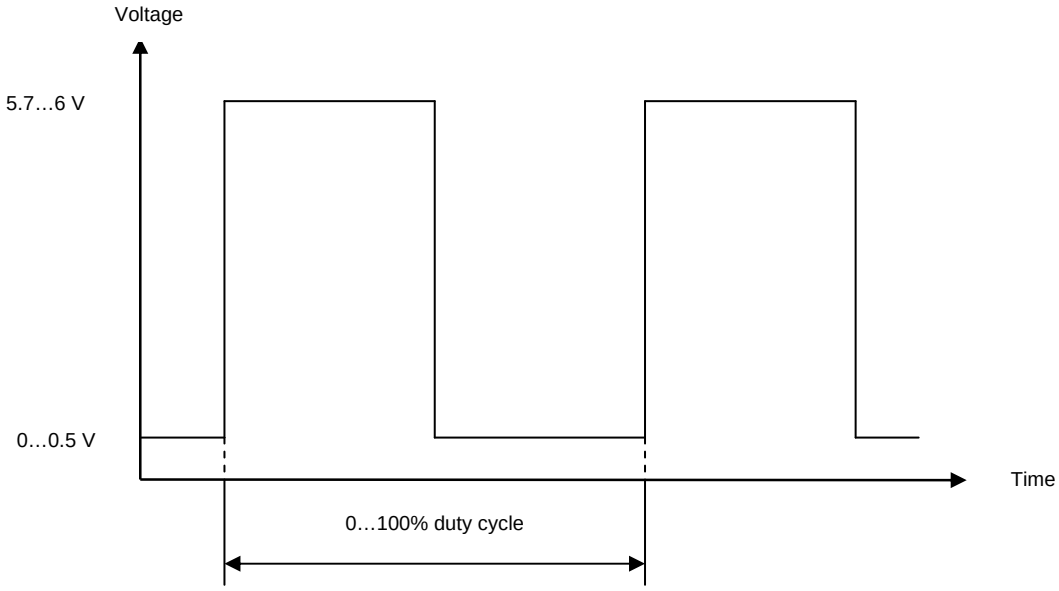


Adjust the value in kW that represents 4mA.

Duty cycle

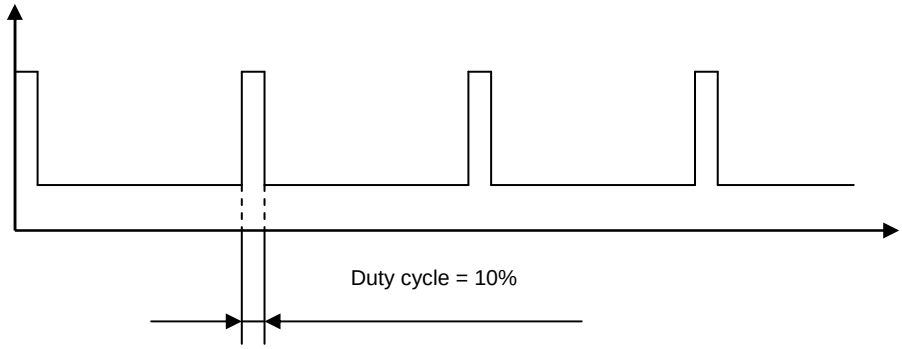
The PWM signal has a frequency of 500Hz +/- 50Hz. The resolution of the duty cycle is 12 bits, which gives output 4095 different levels. The output is an open collector output with a 1k-ohm pull-up resistor.

The low level of the signal is between 0 and 0.05 volt, whereas the high level is between 5.7 and 6 volt.

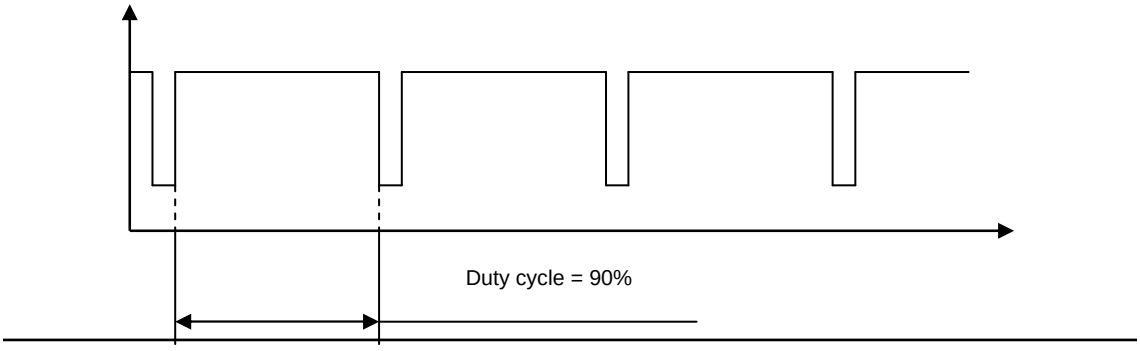


Principle of duty cycles

The drawing below shows an example of a 10% duty cycle:



The drawing below shows an example of a 90% duty cycle:



4. Parameter list

The setup of parameters is done via the display or the PC utility software (USW).

Regulator output

2640 Governor/AVR setup

No.	Setting		Min. setting	Max. setting	Factory setting
2641	Type	Type	GOV = Ana AVR = Bin	GOV = Bin AVR = Ana	GOV = Ana AVR = Bin

Bin means binary (= relay).
Ana means analogue (= +/-20mA).

If PWM control is enabled in menu 2274, then only AVR selection can be made.

AVR control is option D1.

2650 Pulse width modulation

No.	Setting		Min. setting	Max. setting	Factory setting
2651	PWM control	Minimum value	0.0%	50.0%	10.0%
2652	PWM control	Init. value	0.0%	100.0%	35.0%
2653	PWM control	Maximum value	50.0%	100.0%	90.0%
2654	PWM control	Enable	OFF	ON	OFF
2655	PWM control	Droop duty cycle	0.0%	100.0%	50.0%

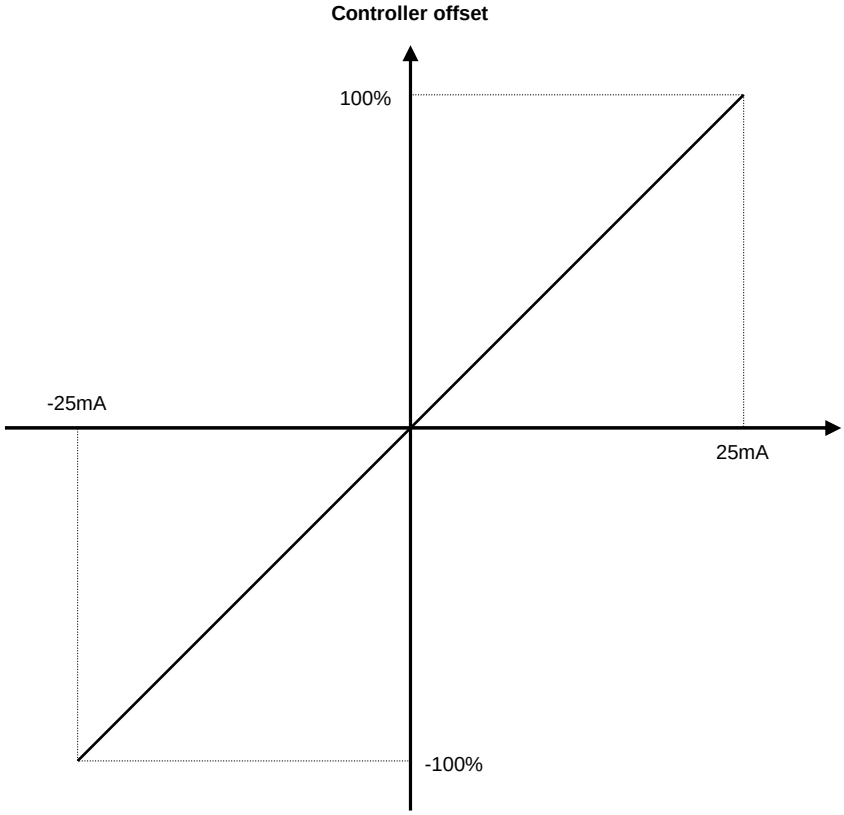
These are the settings for the PWM output:

No.	Setting	Comment
2651	Minimum value	This is the minimum output level of the PWM signal
2652	Init. Value	This is the initial output level, which is the level where the PWM signal will start the regulation. The init. value refers to the range obtained by maximum value – minimum value. That means that the above factory settings actually give a resulting init. value of ((90.0-10.0)*35.0)/100 = 28.0% PWM output.
2653	Maximum value	This is the maximum output level of the PWM signal
2654	Enable	Enables or disables the PWM control. If the PWM control is disabled, the menu group 2640 is displayed, and governor and AVR output must be selected
2655	Droop	This is selection of the engine droop. The range is 2-95% equal to 10-0% droop, i.e. it is inversed. No connection gives droop=0.

Analogue controller offset

In addition to the controller parameters described above, the analogue offset setting can be used. The purpose is to give the analogue output an offset value when powering up the unit. Furthermore, a binary input can be used to reset the output to the offset value. The offset value must be adjusted, so the gen-set will start up at the correct speed and voltage.

Typically, the speed/voltage adjustment is made on the speed governor/AVR itself.



2580 Analogue GOV

No.	Setting		Min. setting	Max. setting	Factory setting
2581	Analogue GOV	Offset	0%	100%	50%

2600 Analogue AVR offset

No.	Setting		Min. setting	Max. setting	Factory setting
2601	Analogue AVR	Offset	0%	100%	50%

Menu 2680 is only available when option D1 is chosen.

After adjusting the analogue offset values, the controller unit must be reset (power off) in order to use the new adjustment.

When the engine is stopped, the controller outputs are reset to the analogue offset value.

Transducer outputs

The analogue output option consists of two independent 0(4)…20mA outputs. Each of the two outputs can be chosen to represent any of the following values:

5860 Power (P kW) output

No.	Setting		Min. setting	Max. setting	Factory setting
5861	Power output	Output A	0	Option dependent	0
5862	Power output	Output B	0		0
5863	Power output	Type	0-20mA	4-20mA	4-20mA
5864	Power output	Max. value	0 kW	20000 kW	500 kW
5865	Power output	Min. value	-9999 kW	20000 kW	0 kW

5870 Apparent power (S kVA) output

No.	Setting		Min. setting	Max. setting	Factory setting
5871	S output	Output A	0	Option dependent	0
5872	S output	Output B	0		0
5873	S output	Type	0-20mA	4-20mA	4-20mA
5874	S output	Max. value	0 kVA	20000 kVA	600 kVA
5875	S output	Min. value	-9999 kVA	20000 kVA	0 kVA

5880 Reactive power (Q kVAr) output

No.	Setting		Min. setting	Max. setting	Factory setting
5881	React. power output	Output A	0	Option dependent	0
5882	React. power output	Output B	0		0
5883	React. power output	Type	0-20mA	4-20mA	4-20mA
5884	React. power output	Max. value	0 kVAr	16000 kVAr	400 kVAr
5885	React. power output	Min. value	-8000 kVAr	16000 kVAr	0 kVAr

5890 Power factor (PF) output

No.	Setting		Min. setting	Max. setting	Factory setting
5891	Power factor output	Output A	0	Option dependent	0
5892	Power factor output	Output B	0		0
5893	Power factor output	Type	0-20mA	4-20mA	4-20mA
5894	Power factor output	Max. value	0.50	0.99	0.80
5895	Power factor output	Min. value	-0.99	-0.50	-0.80

5900 Frequency output

No.	Setting		Min. setting	Max. setting	Factory setting
5901	Frequency output	Output A	0	Option dependent	0
5902	Frequency output	Output B	0		0
5903	Frequency output	Type	0-20mA	4-20mA	4-20mA
5904	Frequency output	Max. value	0.0Hz	70.0Hz	55.0Hz
5905	Frequency output	Min. value	0.0Hz	70.0Hz	45.0Hz

5910 Voltage output

No.	Setting		Min. setting	Max. setting	Factory setting
5911	Voltage output	Output A	0	Option dependent	0
5912	Voltage output	Output B	0		0
5913	Voltage output	Type	0-20mA	4-20mA	4-20mA
5914	Voltage output	Max. value	0 V	28000 V	500 V
5915	Voltage output	Min. value	0 V	28000 V	0 V

The voltage output represents the L1-L2 voltage.

5920 Current output

No.	Setting		Min. setting	Max. setting	Factory setting
5921	Current output	Output A	0	Option dependent	0
5922	Current output	Output B	0		0
5923	Current output	Type	0-20mA	4-20mA	4-20mA
5924	Current output	Max. value	0 A	9000 A	1000 A
5925	Current output	Min. value	0 A	9000 A	0 A

The current output represents the L1 current.

5980 Total available power (P kW) output

No.	Setting		Min. setting	Max. setting	Factory setting
5981	Power avail. output	Output A	0	Option dependent	0
5982	Power avail. output	Output B	0		0
5983	Power avail. output	Type	0-20mA	4-20mA	4-20mA
5984	Power avail. output	Max. value	0 kW	20000 kW	500 kW
5985	Power avail. output	Min. value	-9999 kW	20000 kW	0 kW

5990 Total consumed power (P kW) output

No.	Setting		Min. setting	Max. setting	Factory setting
5991	Power cons. output	Output A	0	Option dependent	0
5992	Power cons. output	Output B	0		0
5993	Power cons. output	Type	0-20mA	4-20mA	4-20mA
5994	Power cons. output	Max. value	0 kW	20000 kW	500 kW
5995	Power cons. output	Min. value	-9999 kW	20000 kW	0 kW