ANNEX TO THE CERTIFICATE

2621/0254-CER

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Document Historical Revision:

Document Version	Date	Resume
Revision 0	29/12/2021	First issuance

**This document is created based on requirements of FGW Technical Guidelines for Power Generating Units, Systems and Storage Systems as well as for their Components.
Part 8 (TG8). Certification of the Electrical Characteristics of Power Generating Units, Systems and Storage Systems as well as their Components on the Grid.
Revision 09. Dated 01/02/2019.**

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1 OVERVIEW OF THE FGW TR8 EVALUATION REPORT

This point of this annex of the certificate no. 2621 / 0254 - CER contains the information of all items and documentation used for the evaluation of compliance of the certified product according to standards VDE-AR-N 4110: 2018-11, VDE-AR-N 4120:2018-11, FGW-Richlinie TR 3 Rev. 25 (including supplement 1, dated on 22/01/2019) and FGW-Richlinie TR 4 Rev. 9.

The information contained in this point is extracted from the SGS Evaluation Report Number: 2621 / 0254 with date on 23-12-2021 according of FGW TR8 rev. 9.

The evaluation performed by SGS comprises the checking in compliance with following requirements:

Evaluation:	Remarks	Result		
Keys: P……..Pass. NC……Not Comply NA……Not Applicable				
Checking of the PGU tested	**See point 1.1 of this document**	☒ P	☐ NC	☐ NA
Checking of the variant models to be included in the certification process	**See point 1.2 of this document**	☒ P	☐ NC	☐ NA
Review Test Report according FGW TG3 per VDE-AR-N 4110: 2018 certification	**See point 1.3 of this document**	☒ P	☐ NC	☐ NA
Review Test Report according FGW TG3 per VDE-AR-N 4120: 2018 certification	**See point 1.2 of this document**	☐ P	☐ NC	☒ NA
Review Test Report according FGW TG4.	**See point 1.4 of this document**	☒ P	☐ NC	☐ NA
Quality system certificate according ISO 9001	**See point 1.5 of this document**	☒ P	☐ NC	☐ NA
Compromise letter of maintain ISO 9001 certified during the validity period of VDE certificate.	**See point 1.6 of this document**	☒ P	☐ NC	☐ NA
Compromise letter of product to certify is the same that the product tested, and transferability acceptance of non-tested PGU.	**See point 1.7 of this document**	☒ P	☐ NC	☐ NA

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1.1 Information about the tested model.

Information appearing in the application form (CPR1FRM5):

- **Date of the application form:** 21/05/2021
- **Applicant:** Shenzhen SOFARSOLAR Co., Ltd.
- **License holder:** Shenzhen SOFARSOLAR Co., Ltd.
- **Factory:** Dongguan SOFAR SOLAR Co., Ltd.
  1F - 6F, Building E, No. 1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City, Guangdong Province, P.R. China.
- **Product:**
  - Type: Hybrid Inverter
  - Trademark: SofarSolar
  - Base model: HYD 15KTL-3PH
  - Input: 180 - 960 Vdc (1100 Vdc max.); 25/25 Adc Max
  - Batteries side: 180 – 800 Vdc; 25/25 Adc Max
  - Output: 3/N/PE, 230 V / 400 V; 50 Hz; 21.7 A (1) (24 A max.) 15 kW (16.5 kVA max.)
  - Control software version: V040021
  - Variant models: HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH, HYD 20KTL-3PH

  Certification service applied:

  Certification of PV Inverter according to VDE-AR-N 4110: 2018-11.

Information appearing in the test report according to FGW TG3:

- **Manufacturer:** Dongguan SOFAR SOLAR Co., Ltd.
- **Product:**
  - Type: Hybrid Inverter
  - Trademark: SofarSolar
  - Base model: HYD 15KTL-3PH
  - Input: 180 - 960 Vdc (1100 Vdc max.); 25/25 Adc Max
  - Batteries side: 180 – 800 Vdc; 25/25 Adc Max
  - Output: 3/N/PE, 230 V / 400 V; 50 Hz; 21.7 A (1) (24 A max.) 15 kW (16.5 kVA max.)
  - Control software version: V040021
  - Serial number: SP1ES115LC4025
  - Variant models: HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH, HYD 20KTL-3PH

1.2 Information about variant models to be included into the scope of the certification process.

Taking as reference the article 2.12.2 of the standard FGW TG8, revision 9, test results can be transferred from test reports to non-tested units taking into account following items:

a) The design and the control engineering critical to the electrical characteristics including the software used are equivalent in both PGUs from a technical perspective.
b) The test results for the smallest and the largest power version are available or alternatively the rated power of the power generation unit to be certified is between 1/√10 times and twice (for Type 2 systems) of the rated power of the power generation unit to be measured.

- **Information of the base model:**

Brand name base model: HYD 15KTL-3PH
Rated output power base model [kW]: 15000 W
Firmware version base model: V040021

After the characteristic given for the tested unit (s), test results can be transferred to other non-tested units of complying with the previously mentioned clause a), having output active power comprised between:

- Lower limit: 4746 W (1/√10 x Base model's Rated output power), and
- Upper limit: 30000 kW (2 x Base model's Rated output power)

- **Information of the variant models:**

- Brand name variant model no. 1: HYD 5KTL-3PH
- Rated output power variant model no. 1 [kW]: 5 kW
- Firmware version variant model no.1: V040021

- Brand name variant model no. 2: HYD 6KTL-3PH
- Rated output power variant model no. 2 [kW]: 6 kW
- Firmware version variant model no.2: V040021

- Brand name variant model no. 3: HYD 8KTL-3PH
- Rated output power variant model no. 3 [kW]: 8 kW
- Firmware version variant model no.3: V040021

- Brand name variant model no. 4: HYD 10KTL-3PH
- Rated output power variant model no. 4 [kW]: 10 kW
- Firmware version variant model no.4: V040021

- Brand name variant model no. 5: HYD 20KTL-3PH
- Rated output power variant model no. 5 [kW]: 20 kW
- Firmware version variant model no.5: V040021

1.3 Summary of the evaluation of the test results

The following documentation is used for the evaluation:

Information of the test report:

- Test report number: 2221 / 0254
- Issuance date: 01/12/2021
- Testing laboratory: SGS Tecnos, S.A. (Electrical Testing Laboratory).
- Accreditation number of the laboratory: Nº 5/LE011.

Information of the manufacturer declaration:

- Document reference name: Sofar's declaration (TG8)
- Issuance date: 12/07/2021.
- Issued by: Shenzhen SOFARSOLAR Co., Ltd.
- Signed by: Jiancong Chen, Standard and Certification Engineer

<table>
<tr><th>FGW TG8</th><th colspan="4">Title</th><th>Result</th></tr>
<tr><td>A.1.2.1</td><td colspan="4">Physical part</td><td>--</td></tr>
<tr><td>A.1.2.1.1</td><td colspan="4">Dimensioning of the equipment at the substation</td><td>--</td></tr>
<tr><td></td><td colspan="4">Not applicable to PGU</td><td>NA</td></tr>
<tr><td>A.1.2.2</td><td colspan="4">Operating range</td><td>P</td></tr>
<tr><td>A.1.2.2.1</td><td colspan="4">Quasi-steady-state operation</td><td>--</td></tr>
<tr><td>A.1.2.2.1.1</td><td>VDE 4110 Requirement Cl.</td><td>VDE 4110 Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="2">P</td></tr>
<tr><td></td><td>10.2.1.2</td><td>11.2.3.1
11.2.4
11.2.5.5</td><td>TG3</td><td>☒ Manufacturer’s declaration
☒ Test report</td></tr>
<tr><td></td><td colspan="4">Evaluated documentation:

- Manufacturer declaration:
“Sofar's declaration (TG8)”. Dated on July 12th, 2021.
Compliance is evidenced by the information declared by the manufacturer in points 3.1.1 and 3.5.2 of this manufacturer declaration.

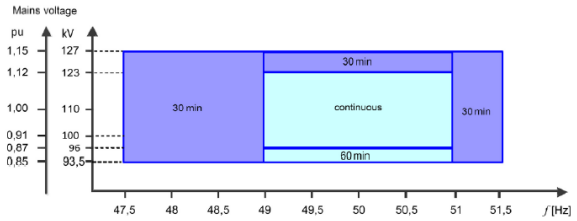
“For VDE-AR-N 4110, in the entire frequency range from 47.5Hz to 51.5Hz and voltages in the range of 85%Un to 115%Un at the 110KTL PV inverter AC connection terminal, while voltage gradient <5%Un/min and a frequency gradient of <0.5%fn/min, for quasi-stationary operation, HYD15KTL-3PH is able to in parallel operation with grid according to the minimum duration time Figure 4
Figure 4 for VDE-AR-N 4120:2018-11
 

Figure 4 – Minimum requirements for the quasi-static operation of power generating plants

In addition, the clause 3.5.2 of this manufacturer declaration contains details of the capability of the PGU as a voltage-time characteristic curve.

- Test Report:
Test report no. 2221 / 0254. Dated on December 1st, 2021.
Compliance is evidenced by test results provided in points 4.2.1.5 and 4.6 of this test report.</td></tr>
</table>

FGW TG8	Title				Result
A.1.2.2	**Operating range**				**P**
A.1.2.2.2	**Polar wheel and/or grid oscillation**				--
A.1.2.2.2.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	**NA**
	10.2.1.3	11.2.3.2 11.2.3.3	--	☐ Manufacturer's declaration	
	Remarks: For Type 2 PGU no proof of polar wheel oscillations is required.				
A.1.2.3	**System perturbations**				**P**
A.1.2.3.1	**Rapid voltage variations**				--
A.1.2.3.1.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	**P**
	5.4.2	11.2.2.1	TG3	☒ Test report	
	Evaluated documentation: - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in the point 4.3.1 of this test report.				
A.1.2.3.2	**Flicker**				--
A.1.2.3.2.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	**P**
	5.4.3	11.2.2.2	TG3	☒ Test report	
	Evaluated documentation: - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in the point 4.3.2 of this test report.				
A.1.2.3.3	**Harmonics and Interharmonics**				--
A.1.2.3.3.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	**P**
	5.4.4	11.2.2.3	TG3	☒ Test report	
	Evaluated documentation: - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in the points 4.3.3.1 to 4.3.3.4 of this test report.				

FGW TG8	Title				Result
A.1.2.3	**System perturbations**				**P**
A.1.2.3.4	**Commutation notches**				--
A.1.2.3.4.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	**NA**
	5.4.5	11.2.2.4	TG3	☐ Test report	
	Remarks: Evidence only for converters with thyristors which use short-circuit current coming from the grid for commutation of the thyristors. The certified PV inverter doesn't have thyristors which use short-circuit current coming from the grid for commutation of the thyristors.				
A.1.2.3.5	**Asymmetries**				--
A.1.2.3.5.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	**P**
	5.4.6	11.2.2.5	TG3	☒ Test report	
	Evaluated documentation: - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in the point 4.3.4 of this test report.				
A.1.2.3.6	**Audio frequency ripple control**				--
	Not applicable to PGU				NA
A.1.2.3.7	**Carrier frequency use of the customer grid**				--
	Not applicable to PGU				NA

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<table>
<tr><th>FGW TG8</th><th colspan="4">Title</th><th>Result</th></tr>
<tr><td>A.1.2.4</td><td colspan="4">Reactive power</td><td>P</td></tr>
<tr><td>A.1.2.4.1</td><td colspan="4">Reactive power provision</td><td>--</td></tr>
<tr><td rowspan="3">A.1.2.4.1.1</td><td>VDE 4110 Requirement Cl.</td><td>VDE 4110 Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="3">P</td></tr>
<tr><td>10.2.2.1 to 10.2.2.3</td><td>11.2.4</td><td>TG3</td><td>☒ Manufacturer’s declaration
☒ Test report</td></tr>
<tr><td colspan="4">Evaluated documentation:
- Manufacturer declaration:
“Sofar's declaration (TG8)”. Dated on July 12th, 2021.
Compliance is evidenced by the information declared by the manufacturer in point 3.2.2 of this manufacturer declaration. Among others, main points detailed by the manufacturer are:
“In the strategy of reactive power control, priority of active power and reactive power is optional.”
“In the case of lost communication, inverter will response to the latest reactive demand.”
For further details see the points 4.2 and 4.4 of this document.
- Test Report:
Test report no. 2221 / 0254. Dated on December 1st, 2021.
Compliance is evidenced by test results provided in points 4.2.1.1, 4.2.1.5, 4.2.2 and 4.2.4 of this test report.
Remark: Test report 2221 / 0254 shown a maximum tolerance of ± 4,0 % P_{inst} for the steady state and deviation of ± 4,0 % P_{inst} between set-point and actual value. Therefore, based on clause 10.2.2.3 and 11.4.11. Certified product must be installed in power generating plants with a S_{Amax} < 300 kVA.</td></tr>
<tr><td>A.1.2.4.2</td><td colspan="4">Procedure for reactive power provision</td><td>--</td></tr>
<tr><td rowspan="3">A.1.2.4.2.1</td><td>VDE 4110 Requirement Cl.</td><td>VDE 4110 Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="3">P</td></tr>
<tr><td>10.2.2.4</td><td>--</td><td>TG3</td><td>☒ Manufacturer’s declaration
☒ Test report</td></tr>
<tr><td colspan="4">Evaluated documentation:
- Manufacturer declaration:
“Sofar's declaration (TG8)”. Dated on July 12th, 2021.
Compliance is evidenced by the information declared by the manufacturer in point 3.2.2 of this manufacturer declaration. Among others, main points detailed by the manufacturer are:
The following reactive power control mode functions are implemented on the PGU level:
- Pf: The reactive power can be regulated by the parameter PF (Power Factor).
- Qt: The reactive power can be regulated by the parameter Reactive Power Ratio (in %).
- Off: The PF is limited to +1.000, and the Reactive Power Ratio is limited to 0.0%
- Q(P): The reactive ratio or power factor changes with the output power of the inverter.
- Q(U): The reactive power changes with the grid voltage.
For further details see the points 4.2 and 4.4 of this document.
- Test Report:
Test report no. 2221 / 0254. Dated on December 1st, 2021.</td></tr>
</table>

FGW TG8	Title				Result
A.1.2.5	**Active power**				**P**
A.1.2.5.1	**General information and grid safety management**				**--**
A.1.2.5.1.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	
	10.2.4.1 and 10.2.4.2	11.2.7	TG3	☒ Manufacturer's declaration ☒ Test report	
	Evaluated documentation: - **Manufacturer declaration:** "Sofar's declaration (TG8)". Dated on July 12th, 2021. Compliance is evidenced by the information declared by the manufacturer in point 3.3.2 of this manufacturer declaration. For further details of control modes and interfaces see the points 4.2 and 4.4 of this document. - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in points 4.1.1 and 4.1.2.1 of this test report.				**P**
A.1.2.5.2	**Active power output as a function of grid frequency**				--
A.1.2.5.2.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	
	10.2.4.3	11.2.8	TG3	☒ Manufacturer's declaration ☒ Test report	
	Evaluated documentation: - **Manufacturer declaration:** "Sofar's declaration (TG8)". Dated on July 12th, 2021. Compliance is evidenced by the information declared by the manufacturer in point 3.3.2 of this manufacturer declaration. Among others, main points detailed by the manufacturer are: *"Normal active power gradients: 0.33%Pn/s~0.66%Pn/s for stationary connection and reconnection after grid fault trip"* *"When frequency returned to rated value（50Hz±0.2Hz）, for the first 10mins, the PGU didn't connect the grid, after 10mins quit from abnormal frequency, the active power gradients will back to normal active power gradients: 0.15%Pn/s."* *"In the case of mains frequencies f > 51,5 Hz, inverter can operate continuous if not conflict with other gird protection settings."* *"The ability of RoCoF is more than 2.5Hz/s if not conflict with other gird protection settings."* - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in the point 4.1.3 of this test report.				**P**

<table>
<tr><th>FGW TG8</th><th colspan="4">Title</th><th>Result</th></tr>
<tr><td>A.1.2.6</td><td colspan="4">Connection</td><td>--</td></tr>
<tr><td>A.1.2.6.1</td><td colspan="4">Black start capability</td><td>--</td></tr>
<tr><td></td><td colspan="4">Not applicable to PGU</td><td>NA</td></tr>
<tr><td>A.1.2.6.2</td><td colspan="4">Switching-in conditions</td><td>--</td></tr>
<tr><td>A.1.2.6.2.1</td><td>VDE 4110 Requirement Cl.</td><td>VDE 4110 Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="3">P</td></tr>
<tr><td></td><td>10.4</td><td>11.2.11</td><td>TG 3</td><td>☒ Manufacturer’s declaration
☒ Test report</td></tr>
<tr><td colspan="4"><u>Evaluated documentation:</u>

- Manufacturer declaration:
“Sofar's declaration (TG8)”. Dated on July 12th, 2021.
Compliance is evidenced by the information declared by the manufacturer in point 3.4.1 of this manufacturer declaration.
Among others, main points detailed by the manufacturer are:
“We verify that connection of HYD15KTL-3PH is possible at 47,5-50.2Hz (± 0.1 Hz), 90% -110%Un (± 2%Un) for VDE-AR-N 4110.”
“Normal active power gradients: 0.33%Pn/s~0.66%Pn/s (default is 0.66%Pn/s) for stationary connection and reconnection after grid fault trip.”
“After the inverter trip for protection, when the voltage recovers to at least 95%Un and frequency is between 49.9~50.1Hz, until the stated stabilization time has passed, HYD15KTL-3PH has the setting of the delay time of recovery for both VDE-AR-N 4110, the setting range is from 0 to 60 mins, default setting is 10 mins.”

For further details of control modes and interfaces see the point 4.2 of this document.

- Test Report:
Test report no. 2221 / 0254. Dated on December 1st, 2021.
Compliance is evidenced by test results provided in points 4.1.4, 4.5.1 and 4.5.2 of this test report.</td></tr>
<tr><td>A.1.2.7</td><td colspan="4">FRT</td><td>P</td></tr>
<tr><td>A.1.2.7.1</td><td colspan="4">Loss of static stability</td><td>--</td></tr>
<tr><td>A.1.2.7.1.1</td><td>VDE 4110 Requirement Cl.</td><td>VDE 4110 Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="3">NA</td></tr>
<tr><td></td><td>10.2.1.3
10.5.2</td><td>11.2.12</td><td>--</td><td>--</td></tr>
<tr><td colspan="4"><u>Remarks:</u>
No evidence necessary.</td></tr>
</table>

<table>
<tr><th>FGW TG8</th><th colspan="4">Title</th><th>Result</th></tr>
<tr><td>A.1.2.7</td><td colspan="4">FRT</td><td>P</td></tr>
<tr><td>A.1.2.7.2</td><td colspan="4">Island and partial grid operation capability</td><td>--</td></tr>
<tr><td rowspan="3">A.1.2.7.2.1</td><td>VDE 4110 Requirement Cl.</td><td>VDE 4110 Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="3">NA</td></tr>
<tr><td>10.2.1.4</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td colspan="4">Remarks:
No requirements for island operation have been defined.

Partial grid operation capability does not constitute a minimum requirement. The distribution grid operator may however require partial grid operation capability and the controller stability in individual cases. Only in this case do the following requirements apply. Here only optional characteristics of the PGU are shown, however not a declaration of conformity.

Evaluated documentation:
- Manufacturer declaration:
“Sofar's declaration (TG8)”. Dated on July 12th, 2021.
Compliance is evidenced by the information declared by the manufacturer in point 3.5.1 of this manufacturer declaration.
“The certified product detects island by reactive power disturbance. Once island detected, PGU disconnect from the grid.”</td></tr>
<tr><td>A.1.2.7.3</td><td colspan="4">Dynamic grid support</td><td>--</td></tr>
<tr><td rowspan="3">A.1.2.7.3.1</td><td>VDE 4110 Requirement Cl.</td><td>VDE 4110 Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="3">P</td></tr>
<tr><td>10.2.1.2
10.2.3</td><td>11.2.5</td><td>TG 3</td><td>☒ Manufacturer’s declaration
☒ Test report</td></tr>
<tr><td colspan="4">Evaluated documentation:

- Manufacturer declaration:
“Sofar's declaration (TG8)”. Dated on July 12th, 2021.
Compliance is evidenced by the information declared by the manufacturer in point 3.5.2 of this manufacturer declaration.

“The certified product meets all requirements mentioned above except the paragraph for PGU with double-fed asynchronous machine, Sofar VRT curve is shown as below, more details can be found in TR3 test report.”.

For further details of control modes and interfaces see the point 4.2 of this document.

- Test Report:
Test report no. 2221 / 0254. Dated on December 1st, 2021.
Compliance is evidenced by test results provided in points 4.6 and 4.7 of this test report. The point 4.6 of the test report refers to the attachment I of the report: 2221 / 0254 - ATTACHMENT I which includes calculations of short-circuit AC currents.</td></tr>
</table>

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<table>
<tr><th>FGW TG8</th><th colspan="4">Title</th><th>Result</th></tr>
<tr><td>A.1.2.7</td><td colspan="4">FRT</td><td>P</td></tr>
<tr><td>A.1.2.7.4</td><td colspan="4">Contribution to short-circuit current</td><td>--</td></tr>
<tr><td>A.1.2.7.4</td><td>VDE 4110 Requirement Cl.</td><td>VDE 4110 Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="2">P</td></tr>
<tr><td></td><td>10.2.5.2</td><td>11.2.9</td><td>TG 3</td><td>☒ Manufacturer’s declaration
☒ Test report</td></tr>
<tr><td></td><td colspan="4">Evaluated documentation:
- Manufacturer declaration:
“Sofar's declaration (TG8)”. Dated on July 12th, 2021.
Compliance is evidenced by the information declared by the manufacturer in point 3.5.3 of this manufacturer declaration.
Declared short-circuit currents for certified models are stated below:
• For HYD5KTL-3PH:
- R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 14.5 A
- R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 14.5 A
- R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 14.5 A
• For HYD6KTL-3PH:
- R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 17.4 A
- R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 17.4 A
- R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 17.4 A
• For HYD8KTL-3PH:
- R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 23.19 A
- R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 23.19 A
- R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 23.19 A
• For HYD10KTL-3PH:
- R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 28.99 A
- R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 28.99 A
- R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 28.99 A
• For HYD15KTL-3PH:
- R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 43.47 A
- R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 43.47 A
- R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 43.47 A</td></tr>
</table>

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FGW TG8	Title	Result
	• For HYD20KTL-3PH: - R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 43.47 A - R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 43.47 A - R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 43.47 A - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in the point 4.6 of this test report. The point 4.6 of the test report refers to the attachment I of the report: 2221 / 0254 - ATTACHMENT I which includes calculations of short-circuit AC currents.	

FGW TG8	Title				Result
A.1.2.8	**Protection**				**P**
A.1.2.8.1	**Reserve protection concept**				**--**
	Not applicable to PGU				**NA**
A.1.2.8.2	**Readability of protection settings**				**--**
	VDE 4110 Requirement Cl.	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	**P**
	6.3.3	11.2.10	--	☒ Manufacturer's declaration ☐ Or component certificate	
	Evaluated documentation: - **Manufacturer declaration:** "Sofar's declaration (TG8)". Dated on July 12th, 2021. Compliance is evidenced by the information declared by the manufacturer in point 3.6.1 of this manufacturer declaration. *"protection settings can be easily read and set by PC monitor"*				

FGW TG8	Title				Result
A.1.2.8	**Protection**				**P**
A.1.2.8.3	**Test terminal**				**--**
A.1.2.8.3.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	
	6.3.4.5	11.2.10	--	☒ Manufacturer's declaration	
	Evaluated documentation: - **Manufacturer declaration:** "Sofar's declaration (TG8)". Dated on July 12th, 2021. Compliance is evidenced by the information declared by the manufacturer in point 3.6.2 of this manufacturer declaration. *"The certified product didn't provide testing terminal for protection test without disconnect the wires."* The following deviation is stated in the main certificate, as informative: *"The certified product does not provide test terminal. A connecting terminal plate has to be installed separately, if necessary"*				**P**
A.1.2.8.4	**Operating range**				**--**
A.1.2.8.4.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	
	10.3.4.2.2	11.2.10	TG 3	☒ Manufacturer's declaration ☒ Test report	
	Evaluated documentation: - **Manufacturer declaration:** "Sofar's declaration (TG8)". Dated on July 12th, 2021. Compliance is evidenced by the information declared by the manufacturer in point 3.6.3 of this manufacturer declaration. *"There is no additional protection equipment present in certified products".* - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in the point 4.4 of this test report.				**P**
A.1.2.8.5	**Voltage protection device and Q(U) protection**				**--**
	Not applicable to PGU				**NA**
A.1.2.8.6	**Accuracy**				**--**
A.1.2.8.6.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	
	10.3.3.2	11.2.10	TG 3	☒ Test report	
	Evaluated documentation: - **Test Report:** Test report no. 2221 / 0254. Dated on December 1st, 2021. Compliance is evidenced by test results provided in the point 4.4 of this test report. For further details of control modes and interfaces see the point 4.2 of this document.				**P**

FGW TG8	Title				Result
A.1.2.8	**Protection**				**P**
A.1.2.8.7	**Independence of the protection functions**				**--**
A.1.2.8.7.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	
	10.3.3.1	11.2.10	--	☒ Manufacturer's declaration	
	Evaluated documentation: - **Manufacturer declaration:** "Sofar's declaration (TG8)". Dated on July 12th, 2021. Compliance is evidenced by the information declared by the manufacturer in point 3.6.4 of this manufacturer declaration. *"Inverter integrated self-protection function of the certified product is independent of any control functions".* For further details of control modes and interfaces see the point 4.3 of this document.				**P**
A.1.2.8.8	**Protection monitoring**				**--**
	Not applicable to PGU				**NA**
A.1.2.8.9	**Own and auxiliary power supply**				**--**
A.1.2.8.9.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	
	10.3.3.6	11.2.10	TG 3	☒ Manufacturer's declaration ☐ Component certificate	
	Evaluated documentation: - **Manufacturer declaration:** "Sofar's declaration (TG8)". Dated on July 12th, 2021. Compliance is evidenced by the information declared by the manufacturer in point 3.6.5 of this manufacturer declaration. *"The protection system of the certified product is power supplied by DC side, it's Network-independent auxiliary power supply to the protection equipment for at least 5 seconds. Failure of the auxiliary power supply of the protection equipment or the equipment control, respectively, causes the power generation to be switched off without delay and triggering of the PGU's main switch. The protection equipment provided for meets the requirements for accuracy and setting ranges. (Voltage and current accuracy are ±1%, frequency accuracy is 0.01Hz) Operability of the protection functions shall be provided before the power generating units start feeding in power. Functionality of protection function in the normal frequency operating ranges(Figure 4) is starting from 45Hz up to 55Hz.*				**P**
A.1.2.8.9.4	**Fault logger**				**--**
A.2.2.8.9.10	Not applicable to PGU				**NA**

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FGW TG8	Title				Result
A.1.2.8	**Protection**				**P**
A.1.2.8.10	**Coupling switch**				**--**
A.1.2.8.9.1	**VDE 4110 Requirement Cl.**	**VDE 4110 Verification Cl.**	**Associated documents**	**Requirement needed**	
	10.3 10.4.5	--	--	☒ Manufacturer's declaration	
	Evaluated documentation: - **Manufacturer declaration:** ""Sofar's declaration (TG8)". Dated on July 12th, 2021. Compliance is evidenced by the information declared by the manufacturer in point 3.6.6 of this manufacturer declaration.				**P**

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1.4 Summary of the evaluation of the validation results

The following documentation is used for the evaluation:

Information of the test report:

- Validation report number: 2221/0254-TG4
- Issuance date: 28/12/2021
- Issued by: SGS Tecnos, S.A. (Electrical Testing Laboratory)
- Simulation model name: ES15kW3ph_PGU.slx
- - Version of the simulation model: V2
- - MD5 Checksum: CC86AB742714DC27068C31C28E341B25
- - Simulation platform: Matlab Simulink
- - Simulation platform version: R2021b.

Information of the user manual documentation of the dynamic simulation model:

- Document reference name: User Manual and Model Description of Matlab Model of Hybrid Inverte.
- Version: V2
- Issuance date: 12/10/2021
- Issued by: SofarSolar

<table>
<tr><th>FGW TG8</th><th colspan="4">Title</th><th>Result</th></tr>
<tr><td>A.1.2.9
A.2.2.9</td><td colspan="4">Simulation models</td><td>P</td></tr>
<tr><td>A.1.2.9.1
A.2.2.9.1</td><td colspan="4">Requirements for simulation models</td><td>--</td></tr>
<tr><td rowspan="3">A.1.2.9.1.1
A.2.2.9.1.1</td><td>VDE 4110
Requirement Cl.</td><td>VDE 4110
Verification Cl.</td><td>Associated documents</td><td>Requirement needed</td><td rowspan="3">P</td></tr>
<tr><td>10.6</td><td>11.2.6</td><td>TG4</td><td>☒ Validated model
☒ Validation report
☒ Model documentation</td></tr>
<tr><td colspan="4">Evaluated documentation:

- Model Documentation:
“User Manual and Model Description of Matlab Model of Hybrid Inverte”. Rev. 2 dated on September 09th, 2021.

- Validation Report:
Test report no. 2221 / 0254 – TG4. Dated on December 23rd, 2021.</td></tr>
</table>

Information about the transferability of validation results to derived models:

The validation process according to FGW TG4 (rev. 9) has been completed over the dynamic simulation model for the PV inverter model HYD 15KTL-3PH. However, evaluation requirements detailed in the point 5.8.2 of FGW TG4 (Rev. 9), *"Transfer to other PGUs"*, and the chapter 2.12.2 of FGW TG8 (rev. 9) have been considered for the transferability of this validation process to derived models, HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH, HYD 20KTL-3PH.

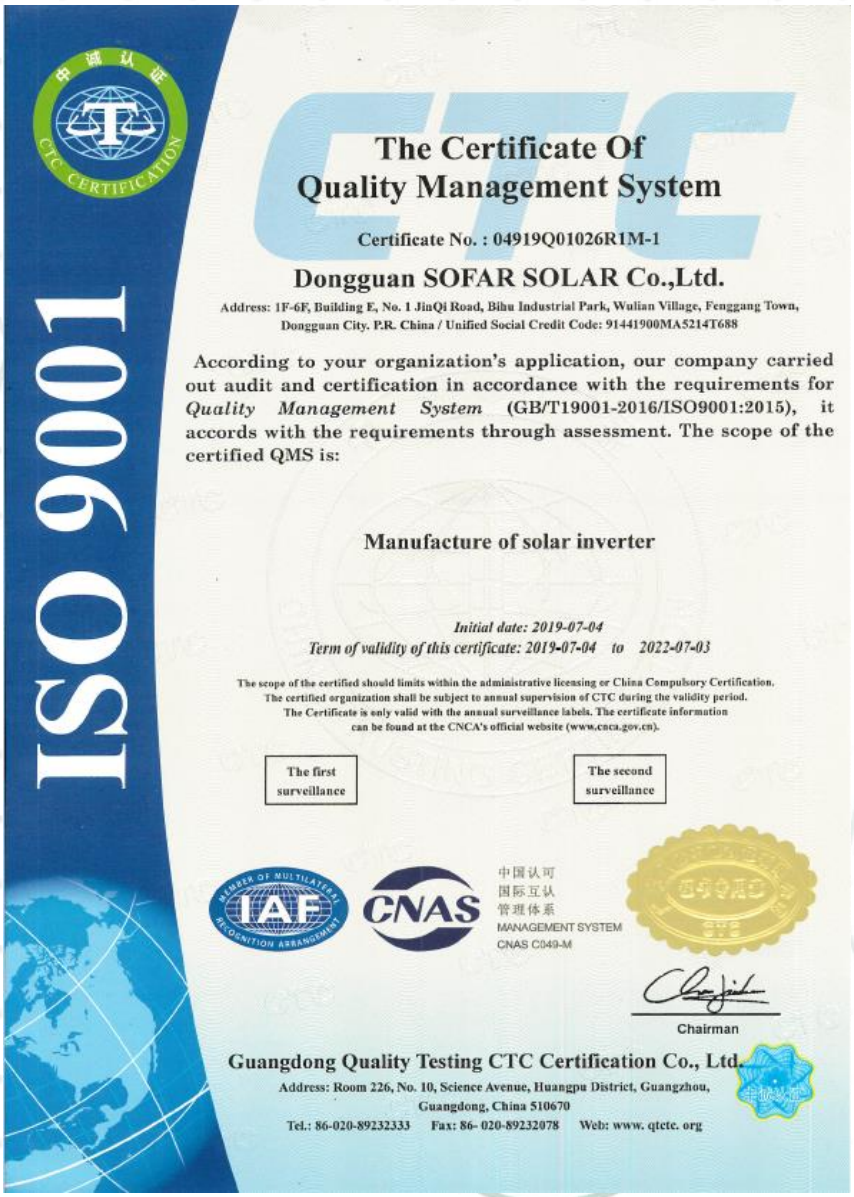
As detailed in the validation report no. 2221 / 0254 – TG4, validation results obtained on the simulation model for HYD 15KTL-3PH are essentially valid for derived models, HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH, HYD 20KTL-3PH. This is ensured since all these referred PV models are based on the same architecture and use the same control strategy. The different model types are achieved by modification of the nominal data in the simulation model.

As a basis for this evaluation, they have also been considered simulations of plausibility tests performed according to FGW TG4 (rev. 9) over the validated simulation model with repetitions of tests at reduced power levels which includes rated power levels of derived models. This includes the verification of following simulation cases over the dynamic simulation model of HYD 15KTL-3PH adapted to operate with generation capabilities of derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH, HYD 20KTL-3PH.

- Verification of Voltage-Dependent PQ diagrams.

1.5 Evaluation of the ISO 9001 Quality Management System Certificate of manufacturers

Dongguan SOFAR SOLAR Co., Ltd
Address1F - 6F, Building E, No. 1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City,Guangdong Province,P.R. China



ISO 9001

The Certificate Of Quality Management System

Certificate No. : 04919Q01026R1M-1

Dongguan SOFAR SOLAR Co.,Ltd.

Address: 1F-6F, Building E, No. 1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City. P.R. China / Unified Social Credit Code: 91441900MA5214T688

According to your organization's application, our company carried out audit and certification in accordance with the requirements for *Quality Management System* (GB/T19001-2016/ISO9001:2015), it accords with the requirements through assessment. The scope of the certified QMS is:

Manufacture of solar inverter

Initial date: 2019-07-04
Term of validity of this certificate: 2019-07-04 to 2022-07-03

The scope of the certified should limits within the administrative licensing or China Compulsory Certification.
The certified organization shall be subject to annual supervision of CTC during the validity period.
The Certificate is only valid with the annual surveillance labels. The certificate information can be found at the CNCA's official website (www.cnca.gov.cn).

The first surveillance

The second surveillance

IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

CNAS

中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C049-M

Chairman

Guangdong Quality Testing CTC Certification Co., Ltd.

Address: Room 226, No. 10, Science Avenue, Huangpu District, Guangzhou, Guangdong, China 510670
Tel.: 86-020-89232333 Fax: 86- 020-89232078 Web: www. qtctc. org

1.6 Compromise letter to maintain ISO 9001 during the validity period of certificate

Compromise letter

We **Shenzhen SOFARSOLAR Co., Ltd.**

Declare the maintenance of the quality system certified by a certification accredited company, according to the requirements of ISO 9001:2015, during the validity period of the certificate, at least 5 years.

We are also committed to require our assemblers to comply with the same standards of quality during that period.

Brand: Sofar Solar

Model:

- HYD 5KTL-3PH;
- HYD 6KTL-3PH;
- HYD 8KTL-3PH;
- HYD 10KTL-3PH;
- HYD 15KTL-3PH;
- HYD 20KTL-3PH

Date: 20th Dec., 2021

Signature:

Name: Wanghui

Charger: Certificate Manager

1.7 Compromise letter of the certified product.

Product declaration

We **Shenzhen SOFARSOLAR Co., Ltd.**

Declare that the product,

- HYD 15KTL-3PH

tested by the SGS Tecnos E&E Laboratory Testing, according to the standards,

- VDE-AR-N 4110:2018
- FGW TG3 (rev.25) according to test report 2221 / 0254
- FGW TG4 (rev 9) according to test report 2221 / 0254 – TG4
- FGW TG8 (rev 9)

as the same to the model to certify according to above-mentioned standards.

The variant models,

- HYD 5KTL-3PH;
- HYD 6KTL-3PH;
- HYD 8KTL-3PH;
- HYD 10KTL-3PH;
- HYD 10KTL-3PH-A;
- HYD 15KTL-3PH;
- HYD 20KTL-3PH

can be added under scoped of the certification having the same hardware topology and firmware of the tested model.

Date：28th Oct.2021

Name：Wanghui
Charge：Standard and Certification
Signature：

2 OVERVIEW OF RESULTS OF THE FGW TR3 TEST REPORT

Test Report Number: 2221 / 0254 with date 01-12-2021 according of FGW TR3 rev. 25.

Period of measurement: The necessary testing has been performed between July 5th of 2021 and November 18th of 2021.

Tests in compliance with FGW TR3 rev. 25 have entirely been performed over the PV Storage Inverter model HYD 15KTL-3PH. However, test requirements of clauses 4.3.2, 4.3.3 and 4.3.4 of FGW TG3 have been repeated to get corresponding results over variant models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH.

2.1 NENNDATEN / RATED DATA:

For the model HYD 5KTL-3PH:

Nennscheinleistung Sn	5000 kW	**Nennstrom In**	7.2 A
Nennfrequenz f_n **rated frequency f_n**	50 Hz	**Nennspannung Un** **rated Voltage Un**	3/N/PE, 230/400Vac

Note: The maximum apparent power of the certified unit HYD 5KTL-3PH is 5500 kVA.
The rated current is calculated by rated power and voltage: 5000 W / 230 Vac / 3 = 7.2 A

For the model HYD 6KTL-3PH:

Nennscheinleistung Sn	6000 kW	**Nennstrom In**	8.7 A
Nennfrequenz f_n **rated frequency f_n**	50 Hz	**Nennspannung Un** **rated Voltage Un**	3/N/PE, 230/400Vac

Note: The maximum apparent power of the certified unit HYD 6KTL-3PH is 6600 kVA.
The rated current is calculated by rated power and voltage: 6000 W / 230 Vac / 3 = 8.7 A

For the model HYD 8KTL-3PH:

Nennscheinleistung Sn	8000 kW	**Nennstrom In**	11.6 A
Nennfrequenz f_n **rated frequency f_n**	50 Hz	**Nennspannung Un** **rated Voltage Un**	3/N/PE, 230/400Vac

Note: The maximum apparent power of the certified unit HYD 8KTL-3PH is 8800 kVA.
The rated current is calculated by rated power and voltage: 8000 W / 230 Vac / 3 = 11.6 A

For the model HYD 10KTL-3PH:

Nennscheinleistung Sn	10000 kW	**Nennstrom In**	14.5 A
Nennfrequenz f_n rated frequency f_n	50 Hz	**Nennspannung Un rated Voltage Un**	3/N/PE, 230/400Vac

Note: The maximum apparent power of the certified unit HYD 10KTL-3PH is 11000 kVA.
The rated current is calculated by rated power and voltage: 10000 W / 230 Vac / 3 = 14.5 A

For the model HYD 15KTL-3PH:

Nennscheinleistung Sn	15000 kW	**Nennstrom In**	21.7 A
Nennfrequenz f_n rated frequency f_n	50 Hz	**Nennspannung Un rated Voltage Un**	3/N/PE, 230/400Vac

Note: The maximum apparent power of the certified unit HYD 15KTL-3PH is 16500 kVA.
The rated current is calculated by rated power and voltage: 15000 W / 230 Vac / 3 = 21.7 A

For the model HYD 20KTL-3PH:

Nennscheinleistung Sn	20000 kW	**Nennstrom In**	29 A
Nennfrequenz f_n rated frequency f_n	50 Hz	**Nennspannung Un rated Voltage Un**	3/N/PE, 230/400Vac

Note: The maximum apparent power of the certified unit HYD 20KTL-3PH is 22000 kVA.
The rated current is calculated by rated power and voltage: 20000 W / 230 Vac / 3 = 29 A

2.2 Power quality

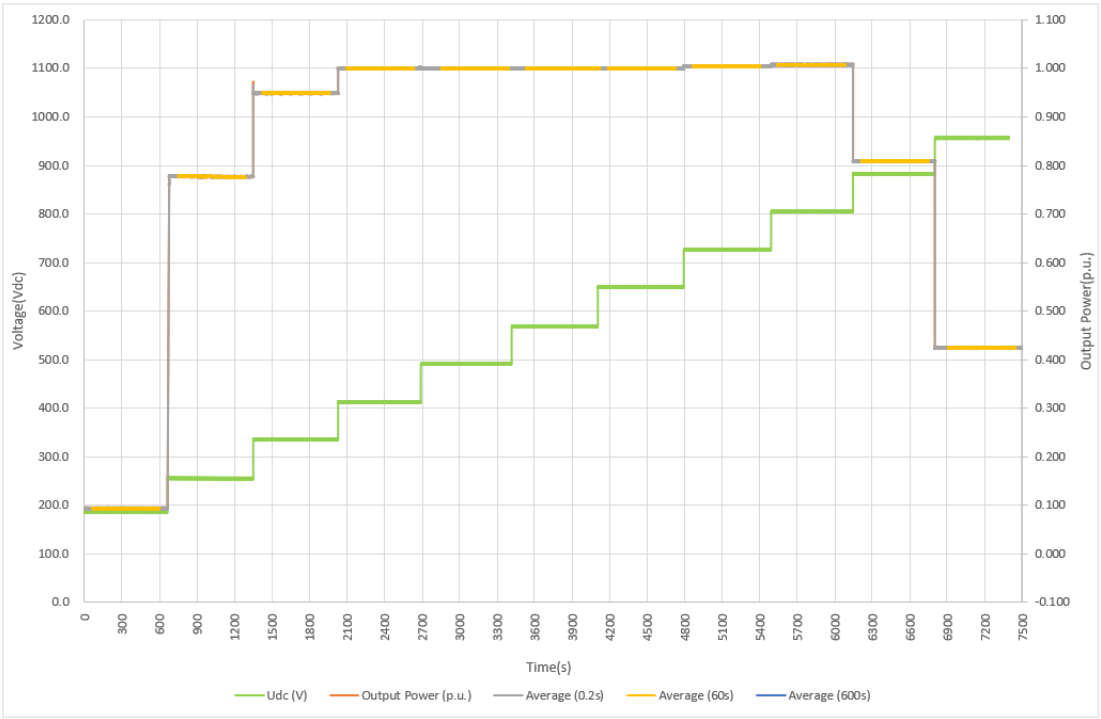
2.2.1 Wirkleistungsspitzen / Power Peaks

DC Voltage (V)	Wirkleistungsspitzen in kW / Power peaks in kW		Wirkleistungsspitzen in p.u. / Power peaks in p.u.		Anzahl 10-Minuten Datensätze in / Number of 10-minute data set
180	$p_{600} = P_{600}/P_n$	1.401	$p_{60} = P_{60}/P_n$	0.093	11
258	$p_{600} = P_{600}/P_n$	11.653	$p_{60} = P_{60}/P_n$	0.778	11
336	$p_{600} = P_{600}/P_n$	14.227	$p_{60} = P_{60}/P_n$	0.949	11
414	$p_{600} = P_{600}/P_n$	14.991	$p_{60} = P_{60}/P_n$	1.000	11
492	$p_{600} = P_{600}/P_n$	14.991	$p_{60} = P_{60}/P_n$	0.999	11
570	$p_{600} = P_{600}/P_n$	14.991	$p_{60} = P_{60}/P_n$	0.999	11
648	$p_{600} = P_{600}/P_n$	15.001	$p_{60} = P_{60}/P_n$	1.000	11
726	$p_{600} = P_{600}/P_n$	15.060	$p_{60} = P_{60}/P_n$	1.004	11
804	$p_{600} = P_{600}/P_n$	15.110	$p_{60} = P_{60}/P_n$	1.007	11
882	$p_{600} = P_{600}/P_n$	12.127	$p_{60} = P_{60}/P_n$	0.808	11
960	$p_{600} = P_{600}/P_n$	6.355	$p_{60} = P_{60}/P_n$	0.424	11

Note: The MPPT range is from 180 V to 960 V, this range is also the maximum power MPPT range.

The Reactive Power prior to start the test was set to a setpoint of Q=0, this value was maintained during the whole test.

Active Power Peaks



Note: Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document.

2.2.2 Schalthandlungen / Switching Operation

Schalthandlungen / Case of switching operation	**Einschalten bei $P_{verfügbar}$ <10 % P_n (Einschaltwindgeschw.) / Start-up at $P_{available}$ < 10% P_n (cut-in wind speed)**				
Max Anz. Schalthandlungen / Max, number of switching operations, N_{10}	20				
Max Anz. Schalthandlungen / Max, number of switching operations, N_{120}	240				
Netzimpedanzwinkel / Grid impedance angle		30º	50º	70º	85º
Flickerformfaktor / Flicker step factor, k_f (Ψ_k)	Phase A	0.010	0.010	0.010	0.010
	Phase B	0.010	0.010	0.010	0.010
	Phase C	0.010	0.010	0.010	0.010
Spannungsänderungsfaktor / Voltage change factor, k_U (Ψ_k)	Phase A	0.089	0.089	0.089	0.089
	Phase B	0.074	0.074	0.074	0.074
	Phase C	0.052	0.052	0.052	0.052

Schalthandlungen / Case of switching operation	**Einschalten bei $P_{verfügbar}$ - P_n (Nennwindgeschwindigkeit) Start-up at $P_{available}$ = P_n (rated wind speed)**				
Max Anz. Schalthandlungen / Max, number of switching operations, N_{10}	20				
Max Anz. Schalthandlungen / Max, number of switching operations, N_{120}	240				
Netzimpedanzwinkel / Grid impedance angle		30º	50º	70º	85º
Flickerformfaktor / Flicker step factor, k_f (Ψ_k)	Phase A	0.010	0.010	0.010	0.010
	Phase B	0.010	0.010	0.010	0.010
	Phase C	0.010	0.010	0.010	0.010
Spannungsänderungsfaktor / Voltage change factor, k_U (Ψ_k)	Phase A	0.089	0.089	0.089	0.089
	Phase B	0.074	0.074	0.074	0.074
	Phase C	0.052	0.052	0.052	0.052

Schalthandlungen / Case of switching operation	**Seviceabschaltung bei Nennleistung / Cut off at rated power**				
Max Anz. Schalthandlungen / Max, number of switching operations, N_{10}	20				
Max Anz. Schalthandlungen / Max, number of switching operations, N_{120}	240				
Netzimpedanzwinkel / Grid impedance angle		30º	50º	70º	85º
Flickerformfaktor / Flicker step factor, k_f (Ψ_k)	Phase A	0.010	0.010	0.010	0.010
	Phase B	0.010	0.010	0.010	0.010
	Phase C	0.010	0.010	0.010	0.010
Spannungsänderungsfaktor / Voltage change factor, k_U (Ψ_k)	Phase A	0.089	0.089	0.089	0.089
	Phase B	0.074	0.074	0.074	0.074
	Phase C	0.052	0.052	0.052	0.052

Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document

2.2.3 Unsymmetrie / Unbalances

Model HYD 20KTL-3PH						
P_n (%Sn)	V_{1+} (V)	V_{1-} (V)	I_{1+} (A)	I_{1-} (A)	U_i (%)	Number of records
110	230.8	0.03	31.7	0.07	0.208	>6000
100	230.7	0.04	28.9	0.06	0.210	>6000
90	230.6	0.04	26.1	0.06	0.215	>6000
80	230.5	0.04	23.2	0.05	0.209	>6000
70	230.3	0.04	20.3	0.04	0.209	>6000
60	230.2	0.03	17.5	0.04	0.222	>6000
50	230.1	0.03	14.6	0.03	0.235	>6000
40	230.0	0.03	11.7	0.03	0.279	>6000
30	229.9	0.03	8.8	0.03	0.332	>6000
20	229.8	0.03	5.9	0.03	0.427	>6000
10	229.6	0.03	3.0	0.02	0.824	>6000

Model: HYD 15KTL-3PH						
P_n (%Sn)	V_{1+} (V)	V_{1-} (V)	I_{1+} (A)	I_{1-} (A)	U_i (%)	Number of records
110	230.5	0.04	23.8	0.05	0.203	>6000
100	230.4	0.04	21.8	0.04	0.206	>6000
90	230.3	0.04	19.6	0.04	0.202	>6000
80	230.2	0.03	17.5	0.04	0.221	>6000
70	230.1	0.03	15.3	0.04	0.230	>6000
60	230.0	0.03	13.1	0.03	0.255	>6000
50	230.0	0.03	11.0	0.03	0.283	>6000
40	229.9	0.02	8.8	0.03	0.333	>6000
30	229.8	0.03	6.7	0.03	0.391	>6000
20	229.7	0.03	4.5	0.03	0.561	>6000
10	229.6	0.03	2.3	0.02	1.053	>6000

Model: HYD 10KTL-3PH						
P_n (%Sn)	V_{1+} (V)	V_{1-} (V)	I_{1+} (A)	I_{1-} (A)	U_i (%)	Number of records
110	230.2	0.04	15.9	0.04	0.229	>6000
100	230.1	0.04	14.6	0.03	0.235	>6000
90	230.0	0.04	13.1	0.03	0.257	>6000
80	230.0	0.03	11.7	0.03	0.281	>6000
70	229.9	0.03	10.3	0.03	0.297	>6000
60	229.9	0.02	8.8	0.03	0.336	>6000
50	229.8	0.03	7.4	0.03	0.378	>6000
40	229.8	0.02	5.9	0.03	0.426	>6000
30	229.7	0.03	4.5	0.03	0.567	>6000
20	229.6	0.02	3.0	0.02	0.819	>6000
10	230.1	0.07	1.4	0.01	0.487	>6000

Model: HYD 8KTL-3PH						
P_n (%Sn)	V_{1+} (V)	V_{1-} (V)	I_{1+} (A)	I_{1-} (A)	U_i (%)	Number of records
110	229.8	0.03	12.5	0.02	0.189	>6000
100	229.8	0.03	11.8	0.02	0.200	>6000
90	229.8	0.03	10.6	0.02	0.221	>6000
80	229.7	0.02	9.5	0.02	0.246	>6000
70	229.7	0.02	8.3	0.02	0.290	>6000
60	229.7	0.02	7.1	0.02	0.339	>6000
50	229.7	0.03	5.9	0.02	0.397	>6000
40	229.6	0.03	4.8	0.02	0.492	>6000
30	229.6	0.03	3.6	0.02	0.649	>6000
20	229.6	0.03	2.4	0.02	0.954	>6000
10	230.1	0.07	1.2	0.01	0.611	>6000

Model: HYD 6KTL-3PH						
P_n (%Sn)	V_{1+} (V)	V_{1-} (V)	I_{1+} (A)	I_{1-} (A)	U_i (%)	Number of records
110	229.7	0.02	9.7	0.02	0.243	>6000
100	229.7	0.03	8.8	0.02	0.269	>6000
90	229.7	0.02	7.9	0.02	0.299	>6000
80	229.7	0.02	7.0	0.02	0.336	>6000
70	229.7	0.02	6.2	0.02	0.380	>6000
60	229.6	0.03	5.4	0.02	0.445	>6000
50	229.6	0.02	4.5	0.02	0.530	>6000
40	229.6	0.02	3.6	0.02	0.649	>6000
30	229.6	0.03	2.7	0.02	0.841	>6000
20	229.5	0.03	1.9	0.02	1.233	>6000
10	230.0	0.07	0.9	0.01	0.790	>6000

Model: HYD 5KTL-3PH						
P_n (%Sn)	V_{1+} (V)	V_{1-} (V)	I_{1+} (A)	I_{1-} (A)	U_i (%)	Number of records
110	229.7	0.02	8.1	0.02	0.294	>6000
100	229.7	0.03	7.4	0.02	0.319	>6000
90	229.7	0.02	6.7	0.02	0.348	>6000
80	229.6	0.02	6.0	0.02	0.388	>6000
70	229.6	0.02	5.2	0.02	0.446	>6000
60	229.6	0.02	4.5	0.02	0.519	>6000
50	229.6	0.02	3.8	0.02	0.618	>6000
40	229.6	0.02	3.0	0.02	0.772	>6000
30	229.6	0.03	2.3	0.02	1.054	>6000
20	230.1	0.08	1.5	0.01	0.453	>6000
10	230.0	0.07	0.9	0.01	0.791	>6000

According to VDE-AR-N 4110: 2018-11, from the 10%Pn, the generating unit shall not exceed a maximum limit defined at 1.5%, for VDE-AR-N 4110: 2018-11

2.2.4 Flicker

Model: HYD 20KTL-3PH					
Netzimpedanzwinkel / Network impedance phase angle, Ψk	Phase	30º	50º	70º	85º
P (%Pn)		Flickerkoeffizient / Flicker coefficient, C (Ψk, P_{bin})			
1	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
10	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
20	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
30	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
40	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
50	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
60	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
70	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
80	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
90	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
100	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
110	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364

Model: HYD 15KTL-3PH					
Netzimpedanzwinkel / Network impedance phase angle, Ψk	Phase	30º	50º	70º	85º
P (%Pn)		Flickerkoeffizient / Flicker coefficient, C (Ψk, P_{bin})			
1	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
10	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
20	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
30	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
40	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
50	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
60	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
70	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
80	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
90	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
100	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
110	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364

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Model: HYD 10KTL-3PH					
Netzimpedanzwinkel / Network impedance phase angle, Ψk	Phase	30º	50º	70º	85º
P (%Pn)		Flickerkoeffizient / Flicker coefficient, C (Ψk, P_{bin})			
1	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
10	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
20	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
30	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
40	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
50	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
60	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
70	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
80	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
90	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
100	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
110	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364

Model: HYD 8KTL-3PH					
Netzimpedanzwinkel / Network impedance phase angle, Ψk	Phase	30º	50º	70º	85º
P (%Pn)		Flickerkoeffizient / Flicker coefficient, C (Ψk, P_{bin})			
1	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
10	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
20	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
30	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
40	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
50	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
60	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
70	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
80	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
90	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
100	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
110	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364

Model: HYD 6KTL-3PH					
Netzimpedanzwinkel / Network impedance phase angle, Ψk	Phase	30º	50º	70º	85º
P (%Pn)		Flickerkoeffizient / Flicker coefficient, C (Ψk, P_{bin})			
1	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
10	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
20	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
30	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
40	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
50	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
60	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
70	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
80	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
90	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
100	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
110	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364

Model: HYD 5KTL-3PH					
Netzimpedanzwinkel / Network impedance phase angle, Ψk	Phase	30º	50º	70º	85º
P (%Pn)		Flickerkoeffizient / Flicker coefficient, C (Ψk, P_{bin})			
1	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
10	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
20	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
30	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
40	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
50	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
60	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
70	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
80	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
90	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
100	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364
110	A	0.364	0.364	0.364	0.364
	B	0.364	0.364	0.364	0.364
	C	0.364	0.364	0.364	0.364

2.2.5 Oberschwingungsmessungen / Harmonics

Model HYD 5KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.036	0.089	0.114	0.140	0.080	0.057	0.057	0.044	0.027	0.028	0.034	0.078	0.140
3	0.115	0.076	0.116	0.155	0.160	0.138	0.138	0.136	0.132	0.136	0.134	0.118	0.160
4	0.247	0.093	0.119	0.146	0.089	0.043	0.043	0.027	0.026	0.026	0.029	0.038	0.247
5	1.013	0.227	0.439	0.647	0.774	0.787	0.787	0.794	0.803	0.801	0.808	0.827	1.013
6	0.085	0.050	0.076	0.079	0.049	0.026	0.026	0.026	0.029	0.029	0.029	0.033	0.085
7	0.665	0.120	0.248	0.373	0.485	0.504	0.504	0.497	0.495	0.498	0.489	0.491	0.665
8	0.143	0.047	0.072	0.093	0.059	0.032	0.032	0.029	0.031	0.052	0.039	0.052	0.143
9	0.076	0.053	0.073	0.092	0.082	0.071	0.071	0.062	0.060	0.055	0.055	0.081	0.092
10	0.188	0.046	0.070	0.091	0.062	0.035	0.035	0.028	0.027	0.029	0.033	0.041	0.188
11	0.217	0.092	0.103	0.163	0.277	0.322	0.322	0.305	0.298	0.289	0.285	0.287	0.322
12	0.095	0.028	0.044	0.057	0.037	0.018	0.018	0.019	0.020	0.023	0.030	0.027	0.095
13	0.612	0.108	0.095	0.115	0.201	0.251	0.251	0.245	0.239	0.237	0.228	0.217	0.612
14	0.167	0.017	0.028	0.038	0.024	0.020	0.020	0.016	0.019	0.022	0.026	0.035	0.167
15	0.044	0.020	0.026	0.033	0.031	0.027	0.027	0.026	0.027	0.030	0.035	0.035	0.044
16	0.091	0.016	0.024	0.032	0.022	0.020	0.020	0.017	0.018	0.021	0.024	0.040	0.091
17	0.299	0.155	0.171	0.191	0.149	0.190	0.190	0.191	0.180	0.171	0.165	0.158	0.299
18	0.035	0.015	0.025	0.034	0.027	0.012	0.012	0.012	0.013	0.014	0.016	0.019	0.035
19	0.374	0.137	0.163	0.186	0.125	0.153	0.153	0.162	0.153	0.143	0.133	0.127	0.374
20	0.069	0.016	0.020	0.024	0.012	0.020	0.020	0.011	0.011	0.013	0.014	0.022	0.069
21	0.023	0.010	0.013	0.020	0.026	0.029	0.029	0.023	0.023	0.024	0.020	0.025	0.029
22	0.023	0.017	0.023	0.028	0.013	0.015	0.015	0.011	0.012	0.013	0.015	0.021	0.028
23	0.256	0.114	0.147	0.179	0.139	0.139	0.139	0.146	0.135	0.125	0.117	0.112	0.256
24	0.024	0.010	0.015	0.020	0.019	0.010	0.010	0.010	0.010	0.011	0.011	0.014	0.024
25	0.197	0.096	0.129	0.160	0.126	0.120	0.120	0.128	0.120	0.108	0.103	0.099	0.197
26	0.024	0.012	0.019	0.025	0.017	0.018	0.018	0.013	0.012	0.011	0.012	0.015	0.025
27	0.036	0.019	0.026	0.031	0.022	0.018	0.018	0.028	0.029	0.027	0.020	0.024	0.036
28	0.037	0.009	0.017	0.025	0.018	0.015	0.015	0.012	0.011	0.012	0.013	0.018	0.037
29	0.163	0.086	0.111	0.134	0.098	0.108	0.108	0.119	0.110	0.102	0.097	0.094	0.163
30	0.019	0.011	0.011	0.014	0.015	0.010	0.010	0.009	0.010	0.010	0.011	0.013	0.019
31	0.186	0.073	0.104	0.129	0.094	0.097	0.097	0.111	0.102	0.094	0.090	0.088	0.186
32	0.019	0.006	0.009	0.016	0.018	0.013	0.013	0.011	0.010	0.010	0.010	0.013	0.019
33	0.040	0.022	0.038	0.048	0.032	0.019	0.019	0.033	0.031	0.027	0.021	0.022	0.048
34	0.040	0.008	0.009	0.014	0.018	0.012	0.012	0.010	0.010	0.009	0.010	0.014	0.040
35	0.139	0.064	0.105	0.133	0.082	0.070	0.070	0.104	0.094	0.086	0.081	0.079	0.139
36	0.013	0.011	0.013	0.014	0.013	0.010	0.010	0.010	0.010	0.010	0.010	0.013	0.014
37	0.165	0.047	0.091	0.124	0.089	0.061	0.061	0.096	0.085	0.076	0.074	0.074	0.165
38	0.029	0.010	0.010	0.011	0.015	0.013	0.013	0.011	0.011	0.011	0.012	0.014	0.029
39	0.040	0.023	0.048	0.071	0.053	0.020	0.020	0.049	0.050	0.043	0.034	0.029	0.071
40	0.014	0.008	0.010	0.012	0.016	0.014	0.014	0.011	0.011	0.011	0.011	0.014	0.016
41	0.143	0.039	0.078	0.116	0.100	0.042	0.042	0.089	0.085	0.073	0.064	0.063	0.143
42	0.023	0.009	0.014	0.017	0.015	0.014	0.014	0.013	0.013	0.013	0.013	0.016	0.023
43	0.133	0.034	0.063	0.101	0.109	0.046	0.046	0.087	0.087	0.073	0.061	0.057	0.133
44	0.024	0.010	0.015	0.018	0.016	0.016	0.016	0.015	0.015	0.015	0.016	0.018	0.024
45	0.047	0.025	0.040	0.063	0.074	0.028	0.028	0.051	0.056	0.051	0.041	0.037	0.074
46	0.148	0.048	0.076	0.105	0.115	0.114	0.114	0.111	0.110	0.110	0.110	0.110	0.148
47	0.132	0.039	0.054	0.080	0.107	0.052	0.052	0.075	0.087	0.077	0.062	0.051	0.132
48	0.164	0.050	0.082	0.112	0.122	0.120	0.120	0.119	0.119	0.117	0.116	0.118	0.164
49	0.129	0.036	0.044	0.062	0.100	0.064	0.064	0.071	0.088	0.082	0.067	0.053	0.129
50	0.025	0.011	0.016	0.020	0.020	0.018	0.018	0.018	0.017	0.017	0.017	0.019	0.025
TDC (%)	1.633	0.467	0.717	0.987	1.097	1.114	1.114	1.126	1.121	1.107	1.096	1.109	1.633

Model HYD 5KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.290	0.026	0.032	0.036	0.024	0.038	0.028	0.034	0.032	0.030	0.035	0.077	0.290
3	0.154	0.056	0.088	0.125	0.130	0.119	0.118	0.116	0.117	0.113	0.121	0.130	0.154
4	0.172	0.031	0.035	0.041	0.029	0.024	0.024	0.023	0.022	0.023	0.026	0.028	0.172
5	1.036	0.195	0.396	0.588	0.737	0.766	0.769	0.778	0.785	0.786	0.788	0.806	1.036
6	0.154	0.085	0.116	0.143	0.088	0.032	0.027	0.027	0.026	0.027	0.029	0.036	0.154
7	0.623	0.148	0.276	0.402	0.489	0.499	0.492	0.492	0.493	0.496	0.496	0.496	0.623
8	0.065	0.020	0.028	0.036	0.029	0.025	0.025	0.026	0.026	0.034	0.028	0.035	0.065
9	0.054	0.012	0.023	0.035	0.034	0.030	0.026	0.030	0.030	0.029	0.034	0.046	0.054
10	0.162	0.019	0.025	0.031	0.026	0.023	0.022	0.022	0.022	0.023	0.025	0.029	0.162
11	0.152	0.092	0.075	0.121	0.250	0.304	0.295	0.287	0.280	0.273	0.272	0.274	0.304
12	0.155	0.047	0.068	0.088	0.056	0.027	0.020	0.017	0.018	0.019	0.025	0.030	0.155
13	0.599	0.103	0.106	0.136	0.202	0.241	0.240	0.237	0.233	0.231	0.223	0.217	0.599
14	0.095	0.018	0.024	0.030	0.022	0.016	0.016	0.015	0.016	0.016	0.021	0.023	0.095
15	0.026	0.011	0.017	0.026	0.024	0.023	0.019	0.027	0.027	0.027	0.030	0.036	0.036
16	0.080	0.013	0.016	0.019	0.016	0.014	0.014	0.013	0.015	0.016	0.015	0.025	0.080
17	0.329	0.163	0.178	0.196	0.140	0.184	0.194	0.183	0.171	0.162	0.155	0.150	0.329
18	0.073	0.027	0.038	0.047	0.022	0.019	0.014	0.012	0.013	0.013	0.016	0.020	0.073
19	0.342	0.134	0.159	0.183	0.126	0.149	0.164	0.159	0.149	0.140	0.133	0.128	0.342
20	0.042	0.012	0.018	0.024	0.018	0.012	0.011	0.011	0.012	0.012	0.014	0.017	0.042
21	0.023	0.012	0.018	0.024	0.021	0.023	0.019	0.023	0.022	0.020	0.021	0.027	0.027
22	0.017	0.010	0.015	0.019	0.014	0.010	0.010	0.011	0.010	0.010	0.012	0.015	0.019
23	0.261	0.115	0.150	0.182	0.140	0.138	0.148	0.141	0.128	0.118	0.110	0.104	0.261
24	0.014	0.016	0.027	0.036	0.022	0.015	0.011	0.010	0.010	0.010	0.011	0.014	0.036
25	0.177	0.099	0.130	0.157	0.122	0.120	0.130	0.126	0.115	0.106	0.099	0.096	0.177
26	0.024	0.007	0.012	0.016	0.015	0.013	0.010	0.010	0.011	0.010	0.011	0.014	0.024
27	0.021	0.010	0.014	0.019	0.021	0.028	0.028	0.027	0.023	0.019	0.016	0.022	0.028
28	0.030	0.005	0.009	0.014	0.013	0.009	0.009	0.010	0.010	0.010	0.010	0.013	0.030
29	0.167	0.081	0.109	0.132	0.095	0.107	0.125	0.119	0.108	0.099	0.093	0.090	0.167
30	0.021	0.007	0.014	0.020	0.021	0.014	0.010	0.010	0.009	0.009	0.010	0.012	0.021
31	0.174	0.077	0.109	0.132	0.088	0.095	0.117	0.112	0.101	0.092	0.087	0.084	0.174
32	0.015	0.005	0.009	0.013	0.012	0.010	0.010	0.010	0.009	0.009	0.010	0.012	0.015
33	0.025	0.019	0.025	0.032	0.025	0.027	0.032	0.033	0.029	0.023	0.017	0.020	0.033
34	0.028	0.007	0.009	0.011	0.012	0.010	0.010	0.009	0.010	0.009	0.010	0.012	0.028
35	0.135	0.060	0.100	0.129	0.082	0.067	0.099	0.104	0.092	0.084	0.080	0.079	0.135
36	0.017	0.008	0.008	0.013	0.017	0.012	0.011	0.011	0.010	0.011	0.011	0.013	0.017
37	0.160	0.051	0.094	0.127	0.087	0.059	0.089	0.097	0.086	0.076	0.071	0.071	0.160
38	0.026	0.005	0.010	0.014	0.013	0.011	0.011	0.011	0.011	0.010	0.011	0.012	0.026
39	0.026	0.022	0.039	0.052	0.042	0.026	0.035	0.041	0.037	0.031	0.022	0.022	0.052
40	0.016	0.007	0.010	0.013	0.014	0.012	0.011	0.011	0.011	0.011	0.011	0.013	0.016
41	0.137	0.039	0.076	0.112	0.099	0.045	0.065	0.086	0.082	0.071	0.064	0.064	0.137
42	0.016	0.011	0.012	0.014	0.019	0.014	0.013	0.013	0.013	0.013	0.012	0.014	0.019
43	0.130	0.035	0.067	0.102	0.104	0.045	0.057	0.085	0.086	0.073	0.062	0.056	0.130
44	0.026	0.009	0.011	0.016	0.018	0.015	0.014	0.014	0.014	0.014	0.014	0.015	0.026
45	0.034	0.019	0.033	0.048	0.052	0.026	0.030	0.040	0.041	0.037	0.030	0.028	0.052
46	0.143	0.046	0.074	0.102	0.112	0.111	0.109	0.108	0.108	0.108	0.107	0.106	0.143
47	0.126	0.034	0.053	0.079	0.102	0.052	0.042	0.072	0.084	0.076	0.061	0.051	0.126
48	0.159	0.050	0.080	0.109	0.119	0.118	0.117	0.116	0.115	0.114	0.113	0.113	0.159
49	0.122	0.033	0.049	0.069	0.094	0.060	0.037	0.066	0.084	0.079	0.065	0.051	0.122
50	0.023	0.009	0.014	0.019	0.020	0.018	0.018	0.017	0.016	0.016	0.016	0.016	0.023
TDC (%)	1.622	0.440	0.675	0.927	1.048	1.081	1.091	1.097	1.091	1.080	1.072	1.086	1.622

Model HYD 5KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.299	0.066	0.088	0.112	0.068	0.053	0.037	0.040	0.034	0.038	0.044	0.084	0.299
3	0.162	0.034	0.053	0.071	0.095	0.105	0.104	0.104	0.105	0.103	0.101	0.111	0.162
4	0.257	0.064	0.090	0.113	0.073	0.039	0.033	0.028	0.024	0.025	0.027	0.032	0.257
5	0.975	0.216	0.427	0.629	0.764	0.781	0.782	0.785	0.791	0.787	0.788	0.803	0.975
6	0.081	0.045	0.064	0.078	0.056	0.036	0.030	0.030	0.029	0.029	0.030	0.032	0.081
7	0.588	0.142	0.282	0.417	0.512	0.519	0.511	0.509	0.511	0.512	0.514	0.517	0.588
8	0.116	0.041	0.061	0.078	0.052	0.037	0.033	0.032	0.034	0.042	0.043	0.050	0.116
9	0.094	0.046	0.064	0.084	0.073	0.066	0.063	0.065	0.063	0.057	0.056	0.066	0.094
10	0.260	0.032	0.053	0.071	0.052	0.029	0.029	0.027	0.024	0.026	0.031	0.034	0.260
11	0.183	0.064	0.075	0.141	0.274	0.322	0.313	0.302	0.295	0.286	0.278	0.278	0.322
12	0.063	0.022	0.031	0.041	0.033	0.026	0.021	0.021	0.021	0.023	0.027	0.028	0.063
13	0.576	0.094	0.088	0.123	0.213	0.258	0.257	0.251	0.246	0.243	0.237	0.234	0.576
14	0.128	0.020	0.029	0.037	0.019	0.022	0.019	0.019	0.020	0.023	0.028	0.032	0.128
15	0.024	0.024	0.034	0.043	0.032	0.025	0.023	0.030	0.034	0.036	0.041	0.038	0.043
16	0.116	0.010	0.018	0.025	0.021	0.015	0.016	0.015	0.017	0.020	0.023	0.031	0.116
17	0.295	0.150	0.162	0.178	0.138	0.190	0.200	0.187	0.177	0.168	0.159	0.153	0.295
18	0.039	0.014	0.015	0.018	0.015	0.019	0.014	0.013	0.013	0.014	0.018	0.020	0.039
19	0.337	0.134	0.154	0.176	0.124	0.156	0.171	0.166	0.158	0.148	0.144	0.142	0.337
20	0.073	0.018	0.026	0.033	0.019	0.015	0.012	0.013	0.013	0.015	0.017	0.020	0.073
21	0.030	0.011	0.020	0.027	0.026	0.023	0.021	0.025	0.026	0.025	0.027	0.036	0.036
22	0.021	0.009	0.012	0.015	0.011	0.015	0.010	0.010	0.011	0.012	0.014	0.019	0.021
23	0.258	0.119	0.151	0.183	0.141	0.138	0.152	0.143	0.132	0.121	0.112	0.108	0.258
24	0.027	0.010	0.016	0.020	0.014	0.015	0.011	0.010	0.010	0.011	0.013	0.016	0.027
25	0.185	0.095	0.125	0.154	0.122	0.123	0.133	0.130	0.122	0.112	0.107	0.104	0.185
26	0.018	0.010	0.018	0.024	0.022	0.015	0.011	0.011	0.011	0.011	0.011	0.014	0.024
27	0.020	0.009	0.015	0.020	0.022	0.028	0.029	0.027	0.025	0.025	0.022	0.029	0.029
28	0.037	0.007	0.012	0.015	0.012	0.014	0.012	0.012	0.010	0.011	0.011	0.014	0.037
29	0.172	0.086	0.113	0.136	0.099	0.112	0.127	0.119	0.108	0.098	0.093	0.090	0.172
30	0.013	0.008	0.015	0.020	0.014	0.012	0.011	0.011	0.010	0.010	0.011	0.013	0.020
31	0.178	0.075	0.105	0.128	0.090	0.096	0.116	0.112	0.104	0.096	0.092	0.091	0.178
32	0.026	0.006	0.009	0.013	0.018	0.014	0.011	0.011	0.010	0.010	0.010	0.013	0.026
33	0.026	0.015	0.025	0.033	0.030	0.027	0.033	0.034	0.028	0.023	0.018	0.023	0.034
34	0.032	0.005	0.007	0.011	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.012	0.032
35	0.146	0.063	0.105	0.133	0.082	0.071	0.105	0.106	0.094	0.084	0.079	0.080	0.146
36	0.016	0.005	0.010	0.015	0.016	0.011	0.011	0.011	0.010	0.010	0.010	0.013	0.016
37	0.163	0.049	0.092	0.125	0.088	0.061	0.089	0.097	0.087	0.078	0.075	0.075	0.163
38	0.038	0.008	0.009	0.011	0.015	0.011	0.011	0.011	0.011	0.011	0.011	0.012	0.038
39	0.031	0.016	0.033	0.049	0.045	0.026	0.036	0.043	0.039	0.032	0.023	0.025	0.049
40	0.013	0.007	0.009	0.011	0.012	0.013	0.012	0.012	0.011	0.011	0.012	0.013	0.013
41	0.142	0.038	0.078	0.116	0.101	0.043	0.067	0.089	0.085	0.073	0.065	0.065	0.142
42	0.016	0.007	0.010	0.013	0.015	0.013	0.013	0.014	0.013	0.013	0.013	0.014	0.016
43	0.123	0.030	0.065	0.102	0.106	0.043	0.059	0.087	0.087	0.075	0.063	0.058	0.123
44	0.026	0.009	0.013	0.017	0.016	0.016	0.014	0.013	0.014	0.014	0.014	0.015	0.026
45	0.030	0.015	0.029	0.044	0.050	0.026	0.030	0.041	0.042	0.037	0.029	0.030	0.050
46	0.150	0.048	0.076	0.105	0.115	0.114	0.113	0.112	0.112	0.110	0.110	0.109	0.150
47	0.127	0.033	0.050	0.076	0.101	0.052	0.042	0.075	0.086	0.077	0.061	0.052	0.127
48	0.163	0.051	0.081	0.112	0.122	0.121	0.120	0.119	0.118	0.117	0.118	0.117	0.163
49	0.124	0.030	0.040	0.062	0.096	0.062	0.036	0.068	0.086	0.082	0.066	0.051	0.124
50	0.025	0.009	0.015	0.021	0.020	0.018	0.018	0.017	0.016	0.016	0.016	0.017	0.025
TDC (%)	1.587	0.439	0.690	0.960	1.088	1.116	1.123	1.122	1.117	1.100	1.090	1.104	1.587

Model HYD 6KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.031	0.068	0.052	0.064	0.021	0.018	0.018	0.021	0.022	0.052	0.038	0.043	0.068
3	0.109	0.083	0.092	0.125	0.113	0.112	0.112	0.111	0.114	0.116	0.106	0.102	0.125
4	0.151	0.069	0.055	0.069	0.024	0.020	0.020	0.018	0.019	0.027	0.030	0.045	0.151
5	0.810	0.223	0.423	0.613	0.645	0.650	0.650	0.664	0.666	0.673	0.669	0.680	0.810
6	0.068	0.042	0.035	0.044	0.021	0.020	0.020	0.021	0.022	0.027	0.028	0.034	0.068
7	0.468	0.108	0.252	0.372	0.405	0.410	0.410	0.413	0.412	0.404	0.399	0.385	0.468
8	0.095	0.047	0.041	0.050	0.022	0.022	0.022	0.023	0.025	0.031	0.033	0.048	0.095
9	0.051	0.051	0.051	0.067	0.055	0.051	0.051	0.048	0.043	0.048	0.055	0.058	0.067
10	0.144	0.047	0.043	0.053	0.022	0.021	0.021	0.021	0.022	0.028	0.034	0.044	0.144
11	0.159	0.069	0.113	0.180	0.254	0.253	0.253	0.240	0.231	0.230	0.227	0.226	0.254
12	0.067	0.032	0.028	0.036	0.015	0.015	0.015	0.017	0.017	0.022	0.023	0.026	0.067
13	0.448	0.096	0.061	0.106	0.193	0.202	0.202	0.197	0.193	0.183	0.181	0.169	0.448
14	0.120	0.025	0.022	0.026	0.012	0.011	0.011	0.014	0.014	0.020	0.026	0.034	0.120
15	0.041	0.017	0.019	0.022	0.019	0.017	0.017	0.020	0.029	0.037	0.035	0.038	0.041
16	0.093	0.022	0.022	0.027	0.011	0.012	0.012	0.012	0.013	0.017	0.024	0.033	0.093
17	0.213	0.160	0.079	0.102	0.144	0.163	0.163	0.142	0.133	0.130	0.126	0.127	0.213
18	0.022	0.016	0.020	0.026	0.009	0.009	0.009	0.010	0.011	0.014	0.015	0.019	0.026
19	0.307	0.145	0.082	0.100	0.109	0.134	0.134	0.122	0.114	0.106	0.105	0.104	0.307
20	0.065	0.013	0.013	0.016	0.011	0.009	0.009	0.009	0.009	0.012	0.015	0.021	0.065
21	0.027	0.009	0.014	0.018	0.023	0.018	0.018	0.016	0.019	0.025	0.027	0.037	0.037
22	0.028	0.012	0.012	0.014	0.009	0.008	0.008	0.009	0.009	0.012	0.014	0.021	0.028
23	0.206	0.124	0.095	0.123	0.106	0.125	0.125	0.105	0.096	0.091	0.093	0.098	0.206
24	0.020	0.009	0.012	0.017	0.008	0.008	0.008	0.008	0.008	0.010	0.010	0.012	0.020
25	0.175	0.105	0.087	0.113	0.090	0.106	0.106	0.094	0.087	0.082	0.082	0.089	0.175
26	0.033	0.008	0.011	0.014	0.012	0.011	0.011	0.010	0.010	0.011	0.011	0.016	0.033
27	0.025	0.018	0.017	0.023	0.010	0.022	0.022	0.022	0.019	0.023	0.022	0.026	0.026
28	0.028	0.008	0.011	0.014	0.011	0.010	0.010	0.010	0.010	0.011	0.012	0.016	0.028
29	0.140	0.093	0.075	0.097	0.081	0.102	0.102	0.087	0.081	0.077	0.082	0.090	0.140
30	0.014	0.010	0.008	0.010	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.011	0.014
31	0.148	0.078	0.074	0.096	0.071	0.094	0.094	0.081	0.076	0.073	0.076	0.086	0.148
32	0.011	0.006	0.009	0.012	0.009	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.012
33	0.034	0.023	0.029	0.037	0.015	0.024	0.024	0.024	0.019	0.022	0.021	0.025	0.037
34	0.033	0.007	0.008	0.011	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.011	0.033
35	0.105	0.066	0.078	0.100	0.052	0.083	0.083	0.075	0.068	0.067	0.073	0.084	0.105
36	0.012	0.010	0.008	0.010	0.009	0.008	0.008	0.008	0.008	0.009	0.009	0.010	0.012
37	0.139	0.047	0.078	0.104	0.046	0.072	0.072	0.067	0.063	0.061	0.069	0.082	0.139
38	0.021	0.009	0.008	0.011	0.010	0.009	0.009	0.009	0.009	0.009	0.009	0.011	0.021
39	0.032	0.023	0.045	0.061	0.020	0.030	0.030	0.039	0.032	0.027	0.025	0.028	0.061
40	0.023	0.007	0.008	0.011	0.011	0.009	0.009	0.009	0.009	0.009	0.010	0.010	0.023
41	0.112	0.040	0.078	0.108	0.039	0.057	0.057	0.067	0.057	0.053	0.063	0.076	0.112
42	0.019	0.009	0.011	0.014	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.013	0.019
43	0.112	0.034	0.072	0.105	0.044	0.049	0.049	0.068	0.055	0.047	0.054	0.067	0.112
44	0.023	0.010	0.012	0.015	0.013	0.013	0.013	0.012	0.012	0.013	0.014	0.015	0.023
45	0.039	0.026	0.045	0.067	0.030	0.029	0.029	0.044	0.038	0.033	0.030	0.034	0.067
46	0.123	0.050	0.068	0.096	0.095	0.095	0.095	0.092	0.092	0.090	0.092	0.091	0.123
47	0.112	0.039	0.058	0.088	0.056	0.035	0.035	0.070	0.058	0.044	0.046	0.062	0.112
48	0.137	0.053	0.072	0.103	0.102	0.100	0.100	0.098	0.098	0.097	0.096	0.097	0.137
49	0.105	0.036	0.045	0.071	0.064	0.031	0.031	0.073	0.063	0.046	0.044	0.057	0.105
50	0.024	0.011	0.013	0.018	0.016	0.016	0.016	0.014	0.014	0.015	0.015	0.017	0.024
TDC (%)	1.260	0.460	0.607	0.869	0.896	0.921	0.921	0.922	0.909	0.906	0.902	0.913	1.260

Model HYD 6KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.173	0.022	0.020	0.022	0.027	0.021	0.024	0.024	0.027	0.029	0.028	0.038	0.173
3	0.077	0.049	0.072	0.104	0.097	0.094	0.094	0.093	0.090	0.097	0.109	0.112	0.112
4	0.160	0.026	0.020	0.024	0.023	0.020	0.019	0.019	0.018	0.022	0.024	0.026	0.160
5	0.799	0.194	0.399	0.583	0.629	0.637	0.648	0.655	0.657	0.654	0.654	0.668	0.799
6	0.107	0.069	0.056	0.068	0.022	0.021	0.022	0.021	0.021	0.025	0.032	0.043	0.107
7	0.449	0.130	0.259	0.376	0.402	0.406	0.409	0.412	0.410	0.408	0.406	0.392	0.449
8	0.040	0.020	0.020	0.022	0.022	0.021	0.021	0.021	0.021	0.025	0.027	0.028	0.040
9	0.038	0.013	0.018	0.021	0.020	0.022	0.029	0.025	0.024	0.028	0.036	0.041	0.041
10	0.136	0.022	0.020	0.024	0.019	0.019	0.019	0.018	0.018	0.021	0.021	0.027	0.136
11	0.130	0.080	0.094	0.156	0.241	0.241	0.236	0.229	0.223	0.218	0.216	0.216	0.241
12	0.108	0.052	0.042	0.052	0.015	0.014	0.014	0.014	0.014	0.018	0.022	0.036	0.108
13	0.430	0.092	0.067	0.109	0.185	0.195	0.195	0.192	0.185	0.180	0.178	0.173	0.430
14	0.048	0.021	0.016	0.021	0.012	0.012	0.013	0.013	0.013	0.016	0.018	0.019	0.048
15	0.019	0.011	0.014	0.017	0.014	0.015	0.021	0.021	0.024	0.029	0.032	0.035	0.035
16	0.071	0.016	0.015	0.019	0.011	0.011	0.011	0.011	0.011	0.013	0.015	0.019	0.071
17	0.217	0.167	0.081	0.100	0.140	0.158	0.149	0.138	0.128	0.121	0.119	0.118	0.217
18	0.042	0.029	0.028	0.035	0.010	0.009	0.010	0.009	0.009	0.013	0.017	0.025	0.042
19	0.295	0.141	0.082	0.101	0.106	0.134	0.130	0.119	0.111	0.106	0.102	0.102	0.295
20	0.038	0.015	0.016	0.021	0.009	0.010	0.010	0.010	0.011	0.011	0.012	0.013	0.038
21	0.021	0.013	0.014	0.017	0.013	0.015	0.018	0.016	0.017	0.022	0.026	0.032	0.032
22	0.020	0.011	0.012	0.016	0.008	0.008	0.009	0.008	0.008	0.010	0.010	0.013	0.020
23	0.207	0.126	0.097	0.125	0.106	0.122	0.114	0.102	0.091	0.085	0.087	0.090	0.207
24	0.013	0.012	0.017	0.023	0.009	0.008	0.008	0.008	0.008	0.010	0.010	0.016	0.023
25	0.165	0.107	0.085	0.110	0.091	0.106	0.103	0.093	0.084	0.079	0.078	0.089	0.165
26	0.028	0.008	0.011	0.015	0.009	0.008	0.009	0.009	0.009	0.010	0.010	0.013	0.028
27	0.020	0.010	0.011	0.015	0.020	0.022	0.020	0.016	0.016	0.019	0.022	0.029	0.029
28	0.028	0.007	0.009	0.012	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.010	0.028
29	0.146	0.092	0.075	0.096	0.080	0.103	0.097	0.087	0.078	0.074	0.076	0.084	0.146
30	0.013	0.006	0.010	0.014	0.009	0.008	0.008	0.008	0.008	0.009	0.009	0.011	0.014
31	0.135	0.084	0.074	0.094	0.069	0.096	0.093	0.081	0.075	0.069	0.073	0.084	0.135
32	0.011	0.006	0.008	0.011	0.009	0.008	0.008	0.008	0.008	0.009	0.009	0.010	0.011
33	0.017	0.018	0.018	0.024	0.020	0.027	0.027	0.021	0.017	0.018	0.020	0.027	0.027
34	0.028	0.009	0.007	0.010	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.009	0.028
35	0.109	0.062	0.078	0.100	0.050	0.081	0.085	0.074	0.067	0.065	0.070	0.082	0.109
36	0.013	0.007	0.010	0.013	0.009	0.009	0.009	0.008	0.009	0.009	0.009	0.009	0.013
37	0.134	0.052	0.079	0.104	0.045	0.072	0.081	0.069	0.062	0.058	0.065	0.078	0.134
38	0.021	0.005	0.009	0.013	0.010	0.009	0.009	0.009	0.009	0.009	0.009	0.010	0.021
39	0.025	0.022	0.033	0.043	0.023	0.029	0.035	0.030	0.022	0.022	0.022	0.030	0.043
40	0.020	0.007	0.009	0.012	0.010	0.010	0.009	0.009	0.009	0.009	0.009	0.010	0.020
41	0.111	0.039	0.076	0.106	0.041	0.053	0.072	0.064	0.056	0.052	0.061	0.077	0.111
42	0.014	0.009	0.010	0.014	0.011	0.011	0.011	0.010	0.011	0.010	0.011	0.012	0.014
43	0.109	0.034	0.071	0.101	0.043	0.046	0.073	0.068	0.056	0.046	0.051	0.064	0.109
44	0.028	0.009	0.012	0.016	0.014	0.015	0.013	0.012	0.012	0.012	0.012	0.013	0.028
45	0.032	0.018	0.032	0.046	0.027	0.025	0.034	0.033	0.028	0.026	0.027	0.035	0.046
46	0.119	0.048	0.067	0.094	0.093	0.092	0.091	0.090	0.090	0.090	0.090	0.089	0.119
47	0.108	0.035	0.057	0.085	0.054	0.034	0.063	0.068	0.057	0.043	0.046	0.061	0.108
48	0.132	0.052	0.071	0.101	0.098	0.098	0.096	0.096	0.095	0.095	0.094	0.094	0.132
49	0.100	0.033	0.048	0.072	0.061	0.030	0.059	0.070	0.061	0.044	0.042	0.055	0.100
50	0.028	0.011	0.013	0.018	0.017	0.016	0.015	0.015	0.014	0.014	0.013	0.014	0.028
TDC (%)	1.233	0.439	0.580	0.830	0.872	0.900	0.911	0.904	0.891	0.881	0.883	0.899	1.233

Model HYD 6KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.183	0.051	0.043	0.051	0.030	0.028	0.029	0.028	0.027	0.050	0.039	0.052	0.183
3	0.105	0.034	0.051	0.076	0.089	0.091	0.092	0.092	0.090	0.084	0.082	0.087	0.105
4	0.217	0.048	0.043	0.054	0.025	0.022	0.020	0.018	0.021	0.027	0.032	0.042	0.217
5	0.787	0.218	0.418	0.607	0.640	0.646	0.652	0.659	0.657	0.659	0.660	0.659	0.787
6	0.046	0.033	0.033	0.036	0.024	0.022	0.023	0.022	0.022	0.027	0.028	0.033	0.046
7	0.434	0.128	0.270	0.393	0.417	0.418	0.420	0.421	0.421	0.417	0.413	0.408	0.434
8	0.059	0.041	0.036	0.042	0.025	0.024	0.024	0.024	0.027	0.031	0.035	0.049	0.059
9	0.047	0.041	0.041	0.055	0.048	0.047	0.052	0.048	0.043	0.047	0.054	0.052	0.055
10	0.207	0.030	0.031	0.038	0.022	0.023	0.020	0.018	0.021	0.024	0.031	0.042	0.207
11	0.162	0.055	0.111	0.179	0.255	0.252	0.245	0.239	0.232	0.227	0.221	0.219	0.255
12	0.047	0.023	0.020	0.023	0.016	0.015	0.017	0.016	0.017	0.020	0.023	0.028	0.047
13	0.423	0.081	0.070	0.117	0.198	0.205	0.201	0.199	0.194	0.188	0.188	0.187	0.423
14	0.109	0.025	0.022	0.027	0.012	0.012	0.014	0.014	0.015	0.019	0.025	0.035	0.109
15	0.023	0.023	0.022	0.026	0.017	0.017	0.024	0.025	0.032	0.041	0.039	0.045	0.045
16	0.106	0.014	0.015	0.019	0.010	0.011	0.011	0.011	0.013	0.017	0.024	0.036	0.106
17	0.211	0.157	0.072	0.090	0.144	0.161	0.151	0.140	0.131	0.127	0.120	0.119	0.211
18	0.026	0.017	0.013	0.014	0.010	0.009	0.010	0.009	0.011	0.012	0.015	0.021	0.026
19	0.287	0.137	0.077	0.097	0.112	0.137	0.132	0.124	0.117	0.112	0.112	0.116	0.287
20	0.071	0.014	0.016	0.021	0.009	0.008	0.009	0.010	0.011	0.012	0.016	0.021	0.071
21	0.028	0.013	0.017	0.022	0.015	0.017	0.020	0.019	0.020	0.028	0.034	0.044	0.044
22	0.033	0.007	0.008	0.010	0.010	0.008	0.009	0.008	0.009	0.012	0.015	0.020	0.033
23	0.205	0.126	0.096	0.124	0.105	0.122	0.117	0.103	0.092	0.087	0.088	0.093	0.205
24	0.021	0.011	0.010	0.012	0.009	0.008	0.008	0.008	0.009	0.010	0.011	0.014	0.021
25	0.157	0.103	0.083	0.109	0.094	0.108	0.105	0.096	0.088	0.084	0.086	0.096	0.157
26	0.031	0.007	0.012	0.017	0.010	0.009	0.009	0.008	0.009	0.010	0.011	0.015	0.031
27	0.018	0.011	0.012	0.017	0.018	0.024	0.022	0.018	0.019	0.024	0.024	0.032	0.032
28	0.026	0.007	0.007	0.009	0.010	0.008	0.009	0.009	0.009	0.010	0.011	0.013	0.026
29	0.144	0.094	0.075	0.097	0.085	0.103	0.096	0.085	0.077	0.074	0.077	0.085	0.144
30	0.013	0.007	0.010	0.013	0.009	0.008	0.008	0.008	0.008	0.009	0.009	0.011	0.013
31	0.138	0.081	0.072	0.094	0.072	0.094	0.092	0.084	0.078	0.074	0.079	0.089	0.138
32	0.012	0.007	0.008	0.012	0.009	0.008	0.008	0.008	0.008	0.009	0.009	0.010	0.012
33	0.020	0.016	0.022	0.029	0.020	0.027	0.026	0.019	0.016	0.021	0.021	0.030	0.030
34	0.030	0.005	0.007	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.009	0.010	0.030
35	0.110	0.066	0.079	0.102	0.053	0.085	0.086	0.075	0.067	0.065	0.070	0.082	0.110
36	0.012	0.005	0.009	0.012	0.009	0.009	0.009	0.008	0.009	0.009	0.009	0.010	0.012
37	0.137	0.049	0.077	0.103	0.046	0.072	0.080	0.070	0.064	0.061	0.071	0.083	0.137
38	0.026	0.008	0.008	0.010	0.010	0.009	0.009	0.010	0.009	0.010	0.009	0.010	0.026
39	0.027	0.016	0.033	0.047	0.024	0.029	0.035	0.030	0.022	0.022	0.023	0.032	0.047
40	0.020	0.006	0.008	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.009	0.010	0.020
41	0.114	0.037	0.078	0.109	0.040	0.055	0.076	0.067	0.057	0.052	0.059	0.075	0.114
42	0.015	0.007	0.009	0.012	0.011	0.011	0.011	0.011	0.010	0.011	0.011	0.012	0.015
43	0.108	0.030	0.072	0.103	0.043	0.048	0.074	0.069	0.057	0.048	0.055	0.069	0.108
44	0.030	0.008	0.010	0.014	0.013	0.013	0.011	0.011	0.012	0.012	0.012	0.012	0.030
45	0.028	0.015	0.030	0.043	0.027	0.025	0.034	0.033	0.026	0.026	0.028	0.037	0.043
46	0.123	0.050	0.069	0.097	0.095	0.095	0.093	0.093	0.092	0.092	0.092	0.092	0.123
47	0.110	0.033	0.055	0.084	0.055	0.034	0.066	0.071	0.058	0.043	0.043	0.061	0.110
48	0.137	0.053	0.072	0.104	0.102	0.101	0.099	0.098	0.098	0.098	0.098	0.097	0.137
49	0.102	0.032	0.046	0.071	0.061	0.030	0.062	0.073	0.062	0.045	0.043	0.057	0.102
50	0.025	0.009	0.012	0.018	0.016	0.015	0.014	0.013	0.014	0.014	0.013	0.014	0.025
TDC (%)	1.242	0.436	0.598	0.859	0.898	0.920	0.926	0.919	0.905	0.898	0.898	0.910	1.242

Model HYD 8KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.032	0.066	0.075	0.018	0.016	0.018	0.018	0.021	0.082	0.090	0.080	0.102	0.102
3	0.079	0.076	0.109	0.085	0.082	0.085	0.085	0.086	0.108	0.113	0.106	0.095	0.113
4	0.101	0.066	0.077	0.020	0.018	0.019	0.019	0.023	0.094	0.091	0.161	0.154	0.161
5	0.643	0.207	0.421	0.475	0.479	0.488	0.488	0.492	0.634	0.645	0.416	0.484	0.645
6	0.056	0.043	0.050	0.022	0.023	0.026	0.026	0.027	0.121	0.128	0.064	0.055	0.128
7	0.267	0.103	0.237	0.300	0.309	0.307	0.307	0.301	0.150	0.174	0.466	0.454	0.466
8	0.045	0.049	0.058	0.018	0.020	0.023	0.023	0.028	0.104	0.119	0.124	0.110	0.124
9	0.038	0.049	0.066	0.046	0.042	0.042	0.042	0.043	0.201	0.208	0.061	0.081	0.208
10	0.101	0.048	0.060	0.016	0.016	0.018	0.018	0.024	0.089	0.096	0.115	0.117	0.117
11	0.213	0.075	0.098	0.196	0.193	0.183	0.183	0.171	0.294	0.316	0.270	0.226	0.316
12	0.045	0.032	0.039	0.011	0.013	0.014	0.014	0.018	0.132	0.129	0.057	0.061	0.132
13	0.279	0.094	0.063	0.147	0.158	0.151	0.151	0.136	0.293	0.324	0.337	0.269	0.337
14	0.067	0.026	0.034	0.009	0.010	0.010	0.010	0.015	0.029	0.035	0.084	0.080	0.084
15	0.030	0.015	0.021	0.015	0.015	0.017	0.017	0.029	0.048	0.062	0.023	0.029	0.062
16	0.079	0.023	0.032	0.008	0.009	0.010	0.010	0.013	0.018	0.018	0.032	0.040	0.079
17	0.136	0.145	0.147	0.122	0.131	0.113	0.113	0.096	0.181	0.193	0.259	0.196	0.259
18	0.014	0.015	0.023	0.007	0.007	0.008	0.008	0.010	0.062	0.064	0.021	0.022	0.064
19	0.225	0.128	0.142	0.093	0.109	0.098	0.098	0.079	0.066	0.089	0.178	0.126	0.225
20	0.040	0.012	0.017	0.007	0.007	0.007	0.007	0.009	0.053	0.051	0.016	0.014	0.053
21	0.022	0.007	0.012	0.018	0.013	0.015	0.015	0.019	0.014	0.022	0.021	0.028	0.028
22	0.036	0.011	0.016	0.006	0.006	0.007	0.007	0.009	0.034	0.035	0.024	0.023	0.036
23	0.134	0.107	0.130	0.091	0.102	0.088	0.088	0.068	0.100	0.107	0.144	0.112	0.144
24	0.015	0.008	0.013	0.006	0.006	0.006	0.006	0.007	0.016	0.015	0.015	0.013	0.016
25	0.143	0.089	0.115	0.076	0.088	0.078	0.078	0.062	0.149	0.141	0.145	0.122	0.149
26	0.030	0.006	0.011	0.008	0.007	0.007	0.007	0.008	0.040	0.036	0.017	0.015	0.040
27	0.013	0.016	0.023	0.007	0.016	0.019	0.019	0.016	0.034	0.033	0.022	0.023	0.034
28	0.011	0.006	0.010	0.007	0.007	0.007	0.007	0.008	0.042	0.044	0.016	0.014	0.044
29	0.105	0.082	0.103	0.064	0.081	0.071	0.071	0.059	0.031	0.038	0.117	0.103	0.117
30	0.010	0.008	0.008	0.006	0.006	0.006	0.006	0.006	0.014	0.014	0.016	0.015	0.016
31	0.103	0.069	0.099	0.055	0.075	0.066	0.066	0.055	0.150	0.162	0.103	0.095	0.162
32	0.013	0.005	0.008	0.006	0.006	0.006	0.006	0.006	0.017	0.016	0.010	0.010	0.017
33	0.023	0.021	0.035	0.012	0.019	0.020	0.020	0.015	0.014	0.016	0.026	0.021	0.035
34	0.019	0.006	0.007	0.006	0.006	0.006	0.006	0.007	0.020	0.026	0.020	0.017	0.026
35	0.075	0.060	0.101	0.040	0.067	0.061	0.061	0.051	0.052	0.037	0.089	0.085	0.101
36	0.010	0.008	0.010	0.007	0.007	0.006	0.006	0.007	0.017	0.015	0.012	0.012	0.017
37	0.094	0.044	0.090	0.034	0.059	0.054	0.054	0.046	0.094	0.105	0.090	0.090	0.105
38	0.009	0.007	0.008	0.007	0.007	0.007	0.007	0.007	0.021	0.019	0.013	0.012	0.021
39	0.026	0.022	0.047	0.015	0.025	0.031	0.031	0.019	0.079	0.069	0.030	0.023	0.079
40	0.026	0.006	0.009	0.008	0.007	0.007	0.007	0.007	0.023	0.016	0.016	0.016	0.026
41	0.067	0.035	0.077	0.031	0.048	0.054	0.054	0.040	0.114	0.106	0.078	0.081	0.114
42	0.010	0.008	0.012	0.009	0.009	0.009	0.009	0.008	0.028	0.026	0.012	0.011	0.028
43	0.085	0.031	0.064	0.035	0.044	0.053	0.053	0.034	0.078	0.080	0.074	0.078	0.085
44	0.015	0.008	0.012	0.010	0.010	0.009	0.009	0.010	0.021	0.026	0.017	0.018	0.026
45	0.024	0.023	0.039	0.024	0.025	0.035	0.035	0.023	0.040	0.058	0.031	0.027	0.058
46	0.093	0.045	0.073	0.071	0.070	0.069	0.069	0.067	0.076	0.075	0.087	0.082	0.093
47	0.070	0.034	0.051	0.044	0.033	0.053	0.053	0.031	0.075	0.094	0.071	0.076	0.094
48	0.101	0.048	0.078	0.075	0.074	0.074	0.074	0.073	0.076	0.073	0.097	0.092	0.101
49	0.080	0.032	0.041	0.049	0.028	0.054	0.054	0.031	0.078	0.079	0.070	0.075	0.080
50	0.023	0.010	0.014	0.012	0.012	0.011	0.011	0.012	0.019	0.018	0.017	0.016	0.023
TDC (%)	0.923	0.423	0.658	0.674	0.696	0.691	0.691	0.668	0.943	0.985	0.947	0.904	0.985

Model HYD 8KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.135	0.020	0.022	0.020	0.019	0.020	0.023	0.027	0.241	0.251	0.132	0.144	0.251
3	0.057	0.046	0.078	0.072	0.071	0.070	0.066	0.072	0.144	0.153	0.100	0.122	0.153
4	0.129	0.024	0.027	0.020	0.019	0.020	0.019	0.021	0.056	0.067	0.103	0.093	0.129
5	0.632	0.178	0.387	0.465	0.473	0.483	0.483	0.482	0.586	0.587	0.436	0.520	0.632
6	0.087	0.069	0.081	0.021	0.021	0.028	0.025	0.026	0.110	0.130	0.106	0.077	0.130
7	0.248	0.127	0.258	0.301	0.305	0.306	0.305	0.303	0.156	0.171	0.474	0.451	0.474
8	0.039	0.018	0.021	0.019	0.019	0.021	0.023	0.022	0.101	0.117	0.078	0.066	0.117
9	0.033	0.012	0.019	0.019	0.021	0.023	0.022	0.027	0.082	0.074	0.032	0.053	0.082
10	0.111	0.021	0.024	0.015	0.017	0.017	0.017	0.019	0.160	0.153	0.063	0.056	0.160
11	0.194	0.080	0.071	0.187	0.185	0.175	0.166	0.161	0.189	0.214	0.263	0.213	0.263
12	0.072	0.052	0.063	0.010	0.011	0.012	0.012	0.014	0.188	0.177	0.097	0.088	0.188
13	0.265	0.091	0.075	0.143	0.153	0.148	0.140	0.134	0.244	0.286	0.333	0.270	0.333
14	0.018	0.019	0.022	0.010	0.010	0.010	0.011	0.013	0.100	0.087	0.054	0.043	0.100
15	0.012	0.011	0.015	0.012	0.015	0.019	0.019	0.023	0.093	0.100	0.019	0.027	0.100
16	0.069	0.015	0.018	0.008	0.009	0.009	0.009	0.010	0.094	0.105	0.021	0.017	0.105
17	0.138	0.153	0.156	0.119	0.127	0.110	0.098	0.089	0.147	0.139	0.257	0.190	0.257
18	0.025	0.027	0.038	0.007	0.007	0.008	0.008	0.009	0.102	0.111	0.039	0.038	0.111
19	0.215	0.124	0.139	0.093	0.109	0.096	0.085	0.078	0.063	0.064	0.172	0.123	0.215
20	0.017	0.012	0.018	0.007	0.007	0.007	0.008	0.008	0.081	0.074	0.022	0.017	0.081
21	0.013	0.011	0.016	0.010	0.012	0.014	0.013	0.017	0.034	0.028	0.016	0.022	0.034
22	0.030	0.009	0.013	0.006	0.006	0.007	0.007	0.007	0.028	0.021	0.019	0.015	0.030
23	0.138	0.109	0.135	0.091	0.098	0.084	0.071	0.063	0.088	0.098	0.142	0.109	0.142
24	0.011	0.010	0.019	0.006	0.006	0.006	0.006	0.007	0.026	0.024	0.014	0.012	0.026
25	0.135	0.090	0.114	0.078	0.088	0.077	0.066	0.060	0.148	0.144	0.137	0.114	0.148
26	0.026	0.006	0.010	0.007	0.006	0.007	0.007	0.007	0.030	0.023	0.012	0.011	0.030
27	0.013	0.009	0.011	0.015	0.017	0.015	0.013	0.015	0.032	0.033	0.017	0.022	0.033
28	0.013	0.006	0.008	0.006	0.006	0.006	0.006	0.007	0.040	0.039	0.014	0.012	0.040
29	0.109	0.081	0.103	0.062	0.081	0.070	0.061	0.056	0.020	0.029	0.116	0.099	0.116
30	0.008	0.005	0.009	0.006	0.006	0.006	0.006	0.006	0.013	0.013	0.013	0.010	0.013
31	0.096	0.074	0.101	0.054	0.077	0.067	0.058	0.053	0.139	0.155	0.099	0.090	0.155
32	0.015	0.005	0.009	0.006	0.006	0.006	0.006	0.007	0.011	0.010	0.014	0.013	0.015
33	0.013	0.017	0.023	0.015	0.021	0.019	0.014	0.014	0.013	0.015	0.019	0.020	0.023
34	0.017	0.007	0.008	0.006	0.006	0.006	0.006	0.006	0.015	0.022	0.015	0.013	0.022
35	0.078	0.057	0.099	0.038	0.065	0.060	0.052	0.049	0.053	0.038	0.085	0.080	0.099
36	0.009	0.006	0.008	0.007	0.007	0.007	0.007	0.006	0.016	0.015	0.013	0.011	0.016
37	0.090	0.047	0.092	0.034	0.060	0.055	0.047	0.044	0.092	0.099	0.087	0.086	0.099
38	0.009	0.004	0.009	0.007	0.006	0.007	0.007	0.007	0.023	0.023	0.011	0.010	0.023
39	0.017	0.020	0.037	0.018	0.024	0.024	0.017	0.015	0.069	0.068	0.024	0.023	0.069
40	0.022	0.006	0.009	0.007	0.007	0.007	0.007	0.007	0.027	0.022	0.015	0.013	0.027
41	0.066	0.035	0.075	0.032	0.046	0.052	0.042	0.039	0.118	0.112	0.075	0.078	0.118
42	0.011	0.008	0.009	0.008	0.008	0.008	0.008	0.008	0.018	0.020	0.012	0.011	0.020
43	0.082	0.031	0.065	0.034	0.042	0.054	0.043	0.033	0.076	0.074	0.071	0.075	0.082
44	0.013	0.007	0.011	0.009	0.009	0.009	0.008	0.009	0.021	0.025	0.017	0.015	0.025
45	0.020	0.016	0.030	0.021	0.019	0.026	0.022	0.018	0.027	0.042	0.021	0.025	0.042
46	0.089	0.043	0.071	0.069	0.068	0.067	0.067	0.066	0.075	0.074	0.085	0.080	0.089
47	0.068	0.030	0.049	0.043	0.031	0.052	0.043	0.030	0.075	0.102	0.067	0.074	0.102
48	0.098	0.046	0.076	0.074	0.072	0.071	0.071	0.071	0.071	0.069	0.094	0.088	0.098
49	0.078	0.029	0.045	0.047	0.027	0.052	0.046	0.030	0.074	0.079	0.067	0.074	0.079
50	0.022	0.009	0.013	0.011	0.010	0.010	0.010	0.010	0.022	0.015	0.016	0.015	0.022
TDC (%)	0.907	0.402	0.627	0.660	0.682	0.679	0.662	0.653	0.907	0.938	0.939	0.902	0.939

Model HYD 8KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.142	0.049	0.060	0.024	0.021	0.022	0.024	0.026	0.233	0.250	0.170	0.166	0.250
3	0.074	0.030	0.050	0.070	0.071	0.071	0.069	0.067	0.146	0.162	0.096	0.107	0.162
4	0.166	0.045	0.059	0.020	0.019	0.019	0.021	0.023	0.115	0.124	0.151	0.149	0.166
5	0.631	0.201	0.414	0.472	0.475	0.485	0.485	0.484	0.557	0.555	0.414	0.466	0.631
6	0.034	0.031	0.040	0.024	0.024	0.029	0.026	0.028	0.060	0.067	0.048	0.034	0.067
7	0.243	0.121	0.263	0.310	0.315	0.314	0.312	0.308	0.211	0.241	0.455	0.470	0.470
8	0.031	0.043	0.052	0.020	0.020	0.022	0.025	0.026	0.068	0.081	0.114	0.106	0.114
9	0.029	0.041	0.054	0.038	0.039	0.041	0.038	0.039	0.036	0.041	0.059	0.064	0.064
10	0.153	0.031	0.042	0.017	0.016	0.017	0.019	0.022	0.113	0.111	0.128	0.125	0.153
11	0.218	0.054	0.078	0.197	0.192	0.184	0.174	0.171	0.326	0.349	0.239	0.186	0.349
12	0.032	0.022	0.028	0.011	0.011	0.013	0.013	0.017	0.078	0.076	0.048	0.047	0.078
13	0.260	0.081	0.061	0.152	0.160	0.153	0.146	0.138	0.225	0.259	0.327	0.280	0.327
14	0.051	0.025	0.033	0.009	0.009	0.010	0.011	0.015	0.107	0.111	0.092	0.088	0.111
15	0.016	0.022	0.031	0.014	0.015	0.020	0.027	0.031	0.097	0.101	0.022	0.026	0.101
16	0.094	0.014	0.020	0.008	0.009	0.008	0.010	0.013	0.097	0.107	0.025	0.028	0.107
17	0.130	0.143	0.142	0.121	0.129	0.113	0.099	0.094	0.079	0.084	0.256	0.188	0.256
18	0.015	0.016	0.019	0.007	0.007	0.007	0.008	0.010	0.043	0.052	0.020	0.023	0.052
19	0.210	0.122	0.134	0.097	0.111	0.099	0.089	0.083	0.094	0.108	0.171	0.130	0.210
20	0.039	0.014	0.020	0.007	0.007	0.007	0.008	0.009	0.029	0.035	0.023	0.021	0.039
21	0.023	0.011	0.020	0.013	0.013	0.016	0.016	0.024	0.043	0.054	0.015	0.022	0.054
22	0.043	0.006	0.009	0.007	0.006	0.006	0.007	0.008	0.017	0.023	0.021	0.022	0.043
23	0.135	0.109	0.133	0.090	0.099	0.086	0.071	0.065	0.085	0.087	0.144	0.110	0.144
24	0.016	0.009	0.012	0.006	0.006	0.006	0.006	0.007	0.018	0.021	0.013	0.014	0.021
25	0.130	0.088	0.110	0.079	0.089	0.079	0.068	0.063	0.149	0.141	0.138	0.118	0.149
26	0.032	0.006	0.011	0.007	0.006	0.006	0.006	0.007	0.031	0.026	0.018	0.015	0.032
27	0.014	0.009	0.013	0.014	0.018	0.017	0.015	0.018	0.033	0.035	0.017	0.022	0.035
28	0.013	0.005	0.008	0.007	0.006	0.006	0.007	0.007	0.041	0.040	0.010	0.010	0.041
29	0.108	0.083	0.103	0.066	0.081	0.070	0.060	0.055	0.027	0.026	0.119	0.103	0.119
30	0.009	0.006	0.011	0.006	0.006	0.006	0.006	0.007	0.012	0.013	0.011	0.011	0.013
31	0.097	0.072	0.099	0.055	0.076	0.068	0.060	0.057	0.143	0.155	0.100	0.093	0.155
32	0.016	0.006	0.007	0.007	0.006	0.006	0.007	0.006	0.018	0.017	0.013	0.012	0.018
33	0.017	0.014	0.025	0.014	0.021	0.018	0.013	0.015	0.021	0.014	0.019	0.020	0.025
34	0.018	0.004	0.006	0.006	0.006	0.006	0.006	0.007	0.019	0.026	0.017	0.016	0.026
35	0.079	0.060	0.102	0.039	0.068	0.061	0.051	0.049	0.057	0.042	0.089	0.085	0.102
36	0.009	0.004	0.008	0.007	0.007	0.006	0.007	0.007	0.022	0.015	0.011	0.010	0.022
37	0.092	0.045	0.091	0.036	0.059	0.056	0.049	0.047	0.100	0.106	0.087	0.086	0.106
38	0.008	0.007	0.008	0.007	0.007	0.007	0.007	0.007	0.019	0.017	0.013	0.012	0.019
39	0.019	0.015	0.033	0.018	0.024	0.025	0.017	0.015	0.077	0.076	0.022	0.021	0.077
40	0.024	0.005	0.008	0.008	0.007	0.007	0.007	0.007	0.024	0.019	0.015	0.015	0.024
41	0.069	0.034	0.077	0.032	0.049	0.054	0.043	0.039	0.119	0.109	0.077	0.081	0.119
42	0.010	0.006	0.009	0.009	0.008	0.008	0.008	0.008	0.025	0.023	0.012	0.011	0.025
43	0.084	0.027	0.064	0.034	0.043	0.055	0.044	0.036	0.072	0.077	0.069	0.074	0.084
44	0.017	0.007	0.012	0.010	0.009	0.009	0.009	0.009	0.024	0.026	0.018	0.017	0.026
45	0.019	0.014	0.028	0.021	0.020	0.026	0.020	0.018	0.025	0.044	0.021	0.025	0.044
46	0.092	0.044	0.073	0.071	0.069	0.068	0.069	0.069	0.077	0.075	0.087	0.082	0.092
47	0.073	0.029	0.047	0.043	0.032	0.054	0.044	0.029	0.073	0.095	0.069	0.075	0.095
48	0.101	0.047	0.077	0.076	0.075	0.073	0.073	0.073	0.073	0.071	0.097	0.091	0.101
49	0.078	0.028	0.039	0.048	0.028	0.053	0.046	0.031	0.077	0.083	0.066	0.074	0.083
50	0.026	0.008	0.014	0.012	0.011	0.010	0.010	0.010	0.018	0.017	0.016	0.014	0.026
TDC (%)	0.920	0.398	0.640	0.677	0.694	0.691	0.673	0.664	0.895	0.935	0.931	0.901	0.935

Model HYD 10KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.057	0.027	0.028	0.027	0.040	0.040	0.040	0.035	0.030	0.032	0.032	0.036	0.057
3	0.061	0.157	0.130	0.111	0.100	0.070	0.070	0.046	0.048	0.048	0.055	0.058	0.157
4	0.078	0.030	0.027	0.024	0.036	0.038	0.038	0.036	0.035	0.036	0.034	0.037	0.078
5	0.615	0.610	0.103	0.386	0.593	0.582	0.582	0.550	0.551	0.540	0.523	0.530	0.615
6	0.013	0.056	0.018	0.018	0.032	0.030	0.030	0.025	0.027	0.029	0.026	0.030	0.056
7	0.535	0.660	0.160	0.229	0.152	0.198	0.198	0.238	0.233	0.239	0.234	0.223	0.660
8	0.018	0.049	0.025	0.025	0.071	0.048	0.048	0.040	0.039	0.037	0.038	0.043	0.071
9	0.031	0.058	0.057	0.059	0.137	0.101	0.101	0.095	0.090	0.097	0.108	0.115	0.137
10	0.068	0.049	0.019	0.026	0.047	0.036	0.036	0.051	0.046	0.043	0.042	0.043	0.068
11	0.048	0.686	0.551	0.091	0.257	0.227	0.227	0.196	0.216	0.238	0.215	0.227	0.686
12	0.015	0.027	0.017	0.016	0.034	0.030	0.030	0.026	0.025	0.025	0.026	0.029	0.034
13	0.569	0.416	0.554	0.125	0.197	0.145	0.145	0.128	0.105	0.093	0.112	0.116	0.569
14	0.051	0.016	0.020	0.022	0.052	0.038	0.038	0.039	0.031	0.031	0.034	0.034	0.052
15	0.038	0.106	0.031	0.018	0.078	0.045	0.045	0.033	0.035	0.050	0.068	0.073	0.106
16	0.026	0.019	0.020	0.014	0.050	0.039	0.039	0.029	0.031	0.033	0.032	0.034	0.050
17	0.337	0.301	0.666	0.264	0.277	0.210	0.210	0.178	0.156	0.116	0.079	0.088	0.666
18	0.016	0.018	0.014	0.011	0.025	0.021	0.021	0.022	0.024	0.032	0.017	0.021	0.032
19	0.351	0.259	0.536	0.257	0.219	0.109	0.109	0.099	0.080	0.078	0.086	0.114	0.536
20	0.041	0.035	0.012	0.016	0.026	0.024	0.024	0.026	0.026	0.028	0.025	0.023	0.041
21	0.029	0.088	0.078	0.038	0.066	0.040	0.040	0.028	0.038	0.034	0.036	0.034	0.088
22	0.018	0.017	0.010	0.012	0.036	0.026	0.026	0.026	0.019	0.016	0.020	0.019	0.036
23	0.318	0.318	0.450	0.265	0.225	0.238	0.238	0.217	0.178	0.136	0.117	0.106	0.450
24	0.014	0.017	0.012	0.009	0.021	0.020	0.020	0.015	0.014	0.015	0.016	0.019	0.021
25	0.247	0.107	0.368	0.240	0.278	0.125	0.125	0.043	0.071	0.091	0.083	0.065	0.368
26	0.023	0.019	0.011	0.013	0.024	0.022	0.022	0.020	0.020	0.023	0.019	0.021	0.024
27	0.025	0.027	0.041	0.045	0.052	0.051	0.051	0.046	0.055	0.054	0.056	0.057	0.057
28	0.023	0.013	0.014	0.010	0.032	0.021	0.021	0.017	0.016	0.015	0.016	0.017	0.032
29	0.234	0.193	0.256	0.286	0.101	0.142	0.142	0.167	0.136	0.102	0.080	0.076	0.286
30	0.009	0.012	0.012	0.009	0.014	0.013	0.013	0.012	0.012	0.013	0.011	0.014	0.014
31	0.239	0.224	0.174	0.268	0.223	0.136	0.136	0.058	0.109	0.163	0.183	0.191	0.268
32	0.021	0.015	0.011	0.009	0.025	0.020	0.020	0.015	0.016	0.016	0.016	0.017	0.025
33	0.014	0.040	0.014	0.046	0.015	0.026	0.026	0.019	0.025	0.040	0.053	0.065	0.065
34	0.018	0.011	0.009	0.008	0.024	0.020	0.020	0.015	0.014	0.015	0.015	0.017	0.024
35	0.220	0.116	0.134	0.242	0.192	0.105	0.105	0.076	0.066	0.047	0.028	0.033	0.242
36	0.013	0.012	0.010	0.010	0.021	0.016	0.016	0.014	0.013	0.013	0.012	0.012	0.021
37	0.192	0.069	0.086	0.185	0.099	0.075	0.075	0.024	0.088	0.148	0.183	0.197	0.197
38	0.027	0.012	0.010	0.010	0.035	0.025	0.025	0.019	0.020	0.017	0.014	0.014	0.035
39	0.018	0.035	0.029	0.046	0.066	0.053	0.053	0.073	0.061	0.038	0.020	0.028	0.073
40	0.024	0.015	0.014	0.014	0.025	0.020	0.020	0.020	0.018	0.018	0.019	0.019	0.025
41	0.228	0.101	0.088	0.141	0.150	0.190	0.190	0.094	0.116	0.145	0.134	0.095	0.228
42	0.018	0.014	0.013	0.012	0.016	0.016	0.016	0.015	0.016	0.016	0.013	0.014	0.018
43	0.136	0.098	0.071	0.105	0.229	0.087	0.087	0.114	0.075	0.058	0.111	0.143	0.229
44	0.023	0.018	0.015	0.013	0.023	0.020	0.020	0.023	0.025	0.026	0.023	0.022	0.026
45	0.030	0.042	0.030	0.036	0.019	0.027	0.027	0.027	0.043	0.063	0.072	0.060	0.072
46	0.141	0.105	0.097	0.092	0.098	0.094	0.094	0.087	0.088	0.086	0.087	0.086	0.141
47	0.184	0.107	0.086	0.116	0.210	0.031	0.031	0.112	0.115	0.189	0.240	0.237	0.240
48	0.152	0.113	0.103	0.101	0.098	0.098	0.098	0.094	0.092	0.093	0.091	0.089	0.152
49	0.139	0.105	0.098	0.110	0.196	0.118	0.118	0.126	0.149	0.126	0.078	0.062	0.196
50	0.035	0.023	0.019	0.017	0.040	0.028	0.028	0.022	0.020	0.022	0.025	0.028	0.040
TDC (%)	1.337	1.400	1.387	0.917	1.044	0.869	0.869	0.804	0.796	0.809	0.807	0.818	1.400

Model HYD 10KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.040	0.116	0.056	0.045	0.033	0.031	0.029	0.029	0.026	0.028	0.028	0.025	0.116
3	0.073	0.118	0.034	0.055	0.071	0.069	0.058	0.068	0.065	0.071	0.070	0.061	0.118
4	0.058	0.056	0.057	0.047	0.035	0.029	0.032	0.028	0.028	0.029	0.025	0.025	0.058
5	0.594	0.631	0.056	0.338	0.518	0.504	0.507	0.493	0.492	0.477	0.459	0.449	0.631
6	0.050	0.141	0.059	0.047	0.092	0.041	0.034	0.031	0.033	0.029	0.029	0.030	0.141
7	0.530	0.601	0.141	0.262	0.193	0.243	0.251	0.262	0.252	0.260	0.265	0.254	0.601
8	0.052	0.023	0.052	0.045	0.057	0.037	0.033	0.031	0.031	0.034	0.034	0.034	0.057
9	0.015	0.058	0.044	0.033	0.056	0.068	0.057	0.064	0.066	0.059	0.057	0.059	0.068
10	0.079	0.050	0.045	0.038	0.037	0.032	0.038	0.041	0.040	0.045	0.034	0.035	0.079
11	0.052	0.629	0.542	0.093	0.214	0.176	0.171	0.172	0.180	0.189	0.174	0.174	0.629
12	0.045	0.122	0.050	0.033	0.072	0.035	0.033	0.033	0.031	0.030	0.029	0.030	0.122
13	0.575	0.376	0.538	0.114	0.174	0.114	0.117	0.107	0.093	0.086	0.089	0.096	0.575
14	0.077	0.073	0.039	0.028	0.034	0.031	0.035	0.032	0.026	0.025	0.023	0.027	0.077
15	0.011	0.056	0.040	0.023	0.024	0.036	0.038	0.041	0.035	0.028	0.036	0.033	0.056
16	0.045	0.045	0.032	0.026	0.026	0.040	0.028	0.025	0.027	0.029	0.028	0.026	0.045
17	0.347	0.354	0.622	0.273	0.294	0.189	0.165	0.152	0.125	0.087	0.056	0.053	0.622
18	0.036	0.041	0.036	0.026	0.047	0.025	0.024	0.022	0.020	0.023	0.020	0.020	0.047
19	0.368	0.302	0.553	0.253	0.195	0.084	0.082	0.081	0.071	0.057	0.059	0.082	0.553
20	0.045	0.018	0.027	0.023	0.022	0.017	0.022	0.026	0.023	0.024	0.019	0.018	0.045
21	0.021	0.026	0.030	0.018	0.025	0.032	0.033	0.032	0.029	0.025	0.027	0.029	0.033
22	0.015	0.011	0.024	0.019	0.028	0.021	0.023	0.018	0.019	0.016	0.016	0.019	0.028
23	0.298	0.263	0.395	0.244	0.248	0.222	0.207	0.194	0.153	0.113	0.093	0.085	0.395
24	0.021	0.024	0.019	0.018	0.039	0.020	0.017	0.017	0.016	0.014	0.014	0.015	0.039
25	0.241	0.082	0.376	0.255	0.266	0.107	0.064	0.043	0.076	0.101	0.100	0.076	0.376
26	0.024	0.016	0.018	0.015	0.021	0.019	0.016	0.017	0.017	0.021	0.018	0.017	0.024
27	0.024	0.017	0.022	0.015	0.018	0.019	0.024	0.028	0.022	0.027	0.030	0.027	0.030
28	0.016	0.017	0.015	0.012	0.033	0.017	0.013	0.014	0.014	0.014	0.014	0.017	0.033
29	0.214	0.183	0.238	0.262	0.127	0.142	0.148	0.148	0.112	0.084	0.063	0.060	0.262
30	0.015	0.023	0.017	0.010	0.031	0.017	0.014	0.013	0.013	0.012	0.013	0.013	0.031
31	0.229	0.211	0.165	0.274	0.214	0.118	0.065	0.052	0.107	0.162	0.187	0.191	0.274
32	0.018	0.022	0.015	0.010	0.020	0.018	0.017	0.016	0.013	0.015	0.014	0.017	0.022
33	0.023	0.017	0.012	0.012	0.021	0.019	0.016	0.016	0.016	0.022	0.020	0.025	0.025
34	0.017	0.013	0.012	0.009	0.024	0.017	0.016	0.016	0.013	0.014	0.015	0.018	0.024
35	0.196	0.117	0.131	0.226	0.191	0.116	0.064	0.068	0.052	0.030	0.017	0.026	0.226
36	0.012	0.014	0.010	0.010	0.019	0.015	0.012	0.012	0.012	0.012	0.011	0.013	0.019
37	0.182	0.068	0.077	0.191	0.103	0.074	0.044	0.025	0.092	0.144	0.182	0.190	0.191
38	0.021	0.011	0.010	0.011	0.030	0.018	0.014	0.018	0.016	0.015	0.013	0.017	0.030
39	0.015	0.015	0.012	0.022	0.041	0.032	0.040	0.047	0.035	0.027	0.023	0.015	0.047
40	0.025	0.013	0.012	0.012	0.025	0.017	0.017	0.019	0.018	0.017	0.018	0.019	0.025
41	0.203	0.089	0.086	0.121	0.155	0.209	0.164	0.101	0.134	0.154	0.141	0.090	0.209
42	0.017	0.014	0.014	0.015	0.022	0.015	0.013	0.014	0.013	0.012	0.013	0.014	0.022
43	0.114	0.092	0.063	0.111	0.231	0.080	0.102	0.127	0.064	0.047	0.110	0.147	0.231
44	0.019	0.019	0.014	0.013	0.016	0.020	0.024	0.026	0.024	0.027	0.023	0.021	0.027
45	0.015	0.015	0.015	0.017	0.020	0.038	0.032	0.015	0.023	0.024	0.026	0.028	0.038
46	0.136	0.099	0.092	0.090	0.094	0.090	0.086	0.087	0.085	0.084	0.084	0.083	0.136
47	0.177	0.098	0.090	0.096	0.204	0.036	0.106	0.098	0.117	0.191	0.238	0.236	0.238
48	0.142	0.106	0.099	0.096	0.095	0.093	0.092	0.090	0.092	0.090	0.089	0.088	0.142
49	0.131	0.087	0.094	0.100	0.187	0.101	0.042	0.127	0.143	0.118	0.070	0.053	0.187
50	0.037	0.022	0.019	0.016	0.039	0.024	0.020	0.021	0.019	0.023	0.025	0.029	0.039
TDC (%)	1.313	1.353	1.335	0.886	0.983	0.788	0.754	0.740	0.727	0.738	0.741	0.729	1.353

Model HYD 10KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.024	0.092	0.040	0.032	0.040	0.018	0.018	0.017	0.019	0.015	0.018	0.024	0.092
3	0.059	0.078	0.044	0.043	0.079	0.058	0.055	0.053	0.065	0.072	0.072	0.090	0.090
4	0.034	0.068	0.035	0.031	0.050	0.032	0.030	0.028	0.025	0.028	0.027	0.028	0.068
5	0.608	0.527	0.078	0.394	0.577	0.582	0.577	0.547	0.534	0.522	0.513	0.510	0.608
6	0.040	0.096	0.055	0.044	0.080	0.042	0.038	0.032	0.033	0.034	0.035	0.035	0.096
7	0.550	0.692	0.115	0.241	0.161	0.215	0.226	0.238	0.240	0.241	0.234	0.218	0.692
8	0.043	0.061	0.040	0.030	0.054	0.043	0.035	0.036	0.033	0.031	0.036	0.040	0.061
9	0.028	0.062	0.033	0.046	0.063	0.047	0.039	0.040	0.048	0.042	0.037	0.041	0.063
10	0.043	0.018	0.037	0.024	0.047	0.034	0.037	0.044	0.043	0.041	0.037	0.042	0.047
11	0.042	0.671	0.522	0.089	0.217	0.213	0.203	0.188	0.201	0.223	0.212	0.209	0.671
12	0.035	0.103	0.044	0.031	0.060	0.041	0.037	0.032	0.032	0.033	0.036	0.036	0.103
13	0.584	0.277	0.538	0.117	0.167	0.103	0.118	0.099	0.089	0.090	0.090	0.090	0.584
14	0.049	0.080	0.034	0.018	0.037	0.033	0.040	0.036	0.028	0.025	0.032	0.033	0.080
15	0.028	0.058	0.023	0.033	0.072	0.047	0.037	0.039	0.035	0.029	0.036	0.040	0.072
16	0.035	0.042	0.021	0.021	0.041	0.036	0.031	0.027	0.028	0.030	0.030	0.032	0.042
17	0.372	0.350	0.633	0.271	0.250	0.175	0.157	0.147	0.126	0.095	0.067	0.064	0.633
18	0.027	0.050	0.030	0.027	0.035	0.026	0.024	0.025	0.025	0.027	0.023	0.026	0.050
19	0.367	0.299	0.542	0.256	0.219	0.083	0.087	0.070	0.073	0.068	0.068	0.086	0.542
20	0.033	0.039	0.023	0.014	0.034	0.026	0.023	0.026	0.025	0.024	0.022	0.023	0.039
21	0.062	0.098	0.066	0.029	0.076	0.070	0.061	0.051	0.042	0.042	0.048	0.044	0.098
22	0.022	0.015	0.022	0.015	0.026	0.025	0.021	0.024	0.016	0.015	0.019	0.021	0.026
23	0.331	0.258	0.423	0.266	0.207	0.211	0.203	0.194	0.159	0.117	0.087	0.073	0.423
24	0.013	0.016	0.014	0.016	0.032	0.021	0.017	0.018	0.016	0.017	0.019	0.020	0.032
25	0.250	0.090	0.368	0.260	0.288	0.123	0.079	0.055	0.081	0.104	0.102	0.084	0.368
26	0.017	0.019	0.018	0.011	0.027	0.026	0.016	0.017	0.017	0.018	0.019	0.022	0.027
27	0.022	0.022	0.037	0.031	0.044	0.041	0.045	0.051	0.065	0.065	0.071	0.067	0.071
28	0.020	0.018	0.013	0.011	0.027	0.021	0.014	0.018	0.014	0.016	0.016	0.017	0.027
29	0.244	0.190	0.235	0.291	0.113	0.124	0.140	0.149	0.120	0.086	0.057	0.054	0.291
30	0.017	0.025	0.011	0.011	0.021	0.016	0.013	0.015	0.014	0.014	0.018	0.016	0.025
31	0.228	0.195	0.156	0.277	0.233	0.127	0.074	0.061	0.109	0.167	0.198	0.207	0.277
32	0.017	0.017	0.011	0.010	0.024	0.019	0.017	0.018	0.014	0.013	0.016	0.019	0.024
33	0.039	0.066	0.038	0.026	0.061	0.055	0.052	0.035	0.014	0.030	0.054	0.062	0.066
34	0.014	0.012	0.011	0.009	0.022	0.016	0.018	0.016	0.014	0.015	0.016	0.018	0.022
35	0.208	0.105	0.113	0.235	0.189	0.104	0.061	0.079	0.065	0.041	0.023	0.023	0.235
36	0.014	0.011	0.009	0.010	0.025	0.016	0.014	0.013	0.013	0.013	0.016	0.016	0.025
37	0.190	0.073	0.077	0.183	0.112	0.074	0.051	0.034	0.096	0.158	0.199	0.208	0.208
38	0.024	0.012	0.011	0.010	0.031	0.025	0.019	0.021	0.019	0.015	0.015	0.018	0.031
39	0.047	0.022	0.027	0.033	0.074	0.081	0.121	0.135	0.120	0.095	0.061	0.029	0.135
40	0.025	0.017	0.014	0.015	0.030	0.022	0.020	0.021	0.019	0.019	0.020	0.021	0.030
41	0.207	0.098	0.086	0.133	0.159	0.202	0.164	0.097	0.129	0.161	0.141	0.092	0.207
42	0.020	0.014	0.015	0.013	0.018	0.019	0.020	0.021	0.018	0.019	0.018	0.017	0.021
43	0.134	0.118	0.078	0.113	0.251	0.102	0.105	0.131	0.082	0.045	0.107	0.157	0.251
44	0.021	0.019	0.013	0.012	0.024	0.022	0.024	0.028	0.026	0.026	0.025	0.024	0.028
45	0.025	0.029	0.040	0.029	0.032	0.027	0.047	0.065	0.074	0.073	0.072	0.070	0.074
46	0.137	0.101	0.095	0.091	0.099	0.094	0.092	0.089	0.091	0.088	0.087	0.086	0.137
47	0.173	0.092	0.107	0.110	0.222	0.029	0.116	0.108	0.106	0.179	0.225	0.234	0.234
48	0.146	0.109	0.102	0.098	0.100	0.099	0.095	0.093	0.093	0.094	0.094	0.092	0.146
49	0.142	0.086	0.105	0.102	0.194	0.104	0.053	0.133	0.154	0.130	0.088	0.061	0.194
50	0.035	0.022	0.017	0.017	0.031	0.022	0.021	0.023	0.021	0.022	0.025	0.030	0.035
TDC (%)	1.355	1.343	1.332	0.923	1.023	0.842	0.817	0.790	0.778	0.790	0.792	0.790	1.355

Model HYD 15KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.102	0.034	0.040	0.035	0.029	0.028	0.028	0.032	0.026	0.031	0.034	0.028	0.102
3	0.077	0.048	0.106	0.062	0.051	0.036	0.036	0.044	0.040	0.042	0.035	0.027	0.106
4	0.086	0.025	0.047	0.039	0.035	0.033	0.033	0.032	0.034	0.032	0.038	0.032	0.086
5	0.431	0.140	0.445	0.407	0.404	0.378	0.378	0.364	0.350	0.354	0.340	0.334	0.445
6	0.031	0.035	0.033	0.032	0.035	0.031	0.031	0.032	0.030	0.034	0.037	0.041	0.041
7	0.215	0.176	0.097	0.115	0.152	0.165	0.165	0.151	0.155	0.152	0.176	0.185	0.215
8	0.078	0.031	0.061	0.049	0.036	0.037	0.037	0.033	0.040	0.041	0.046	0.042	0.078
9	0.068	0.070	0.142	0.081	0.081	0.069	0.069	0.081	0.086	0.087	0.080	0.074	0.142
10	0.057	0.032	0.056	0.041	0.039	0.030	0.030	0.033	0.047	0.039	0.045	0.044	0.057
11	0.102	0.400	0.176	0.178	0.161	0.154	0.154	0.169	0.180	0.179	0.184	0.174	0.400
12	0.031	0.018	0.028	0.024	0.021	0.018	0.018	0.023	0.026	0.027	0.032	0.042	0.042
13	0.070	0.207	0.277	0.153	0.134	0.116	0.116	0.092	0.109	0.110	0.094	0.093	0.277
14	0.098	0.018	0.039	0.034	0.036	0.029	0.029	0.028	0.025	0.031	0.039	0.033	0.098
15	0.031	0.029	0.060	0.037	0.030	0.025	0.025	0.050	0.057	0.056	0.059	0.063	0.063
16	0.087	0.042	0.039	0.029	0.026	0.026	0.026	0.022	0.024	0.029	0.035	0.030	0.087
17	0.096	0.437	0.125	0.190	0.146	0.126	0.126	0.057	0.077	0.094	0.110	0.107	0.437
18	0.030	0.025	0.020	0.016	0.013	0.013	0.013	0.014	0.018	0.020	0.023	0.025	0.030
19	0.075	0.300	0.183	0.123	0.090	0.081	0.081	0.076	0.116	0.140	0.139	0.132	0.300
20	0.088	0.028	0.026	0.020	0.016	0.017	0.017	0.017	0.016	0.019	0.021	0.022	0.088
21	0.028	0.015	0.034	0.029	0.017	0.022	0.022	0.019	0.031	0.038	0.045	0.043	0.045
22	0.017	0.016	0.025	0.018	0.015	0.015	0.015	0.016	0.014	0.017	0.022	0.018	0.025
23	0.154	0.237	0.062	0.186	0.176	0.154	0.154	0.078	0.070	0.065	0.047	0.055	0.237
24	0.018	0.010	0.019	0.014	0.011	0.010	0.010	0.013	0.012	0.015	0.017	0.016	0.019
25	0.066	0.258	0.202	0.144	0.047	0.037	0.037	0.060	0.017	0.036	0.078	0.115	0.258
26	0.067	0.022	0.020	0.015	0.011	0.011	0.011	0.011	0.014	0.013	0.015	0.017	0.067
27	0.009	0.020	0.027	0.032	0.027	0.032	0.032	0.035	0.029	0.019	0.019	0.023	0.035
28	0.085	0.035	0.027	0.014	0.009	0.009	0.009	0.011	0.011	0.010	0.014	0.016	0.085
29	0.123	0.142	0.095	0.084	0.116	0.112	0.112	0.052	0.058	0.058	0.044	0.060	0.142
30	0.022	0.010	0.011	0.009	0.008	0.008	0.008	0.008	0.010	0.013	0.014	0.013	0.022
31	0.108	0.113	0.158	0.138	0.052	0.053	0.053	0.137	0.118	0.078	0.043	0.066	0.158
32	0.039	0.028	0.024	0.014	0.012	0.010	0.010	0.009	0.013	0.014	0.015	0.015	0.039
33	0.013	0.034	0.021	0.016	0.016	0.013	0.013	0.038	0.041	0.036	0.025	0.022	0.041
34	0.058	0.019	0.024	0.012	0.012	0.011	0.011	0.009	0.011	0.011	0.012	0.015	0.058
35	0.127	0.033	0.091	0.109	0.043	0.050	0.050	0.018	0.028	0.028	0.015	0.056	0.127
36	0.014	0.010	0.010	0.012	0.008	0.009	0.009	0.008	0.010	0.009	0.013	0.014	0.014
37	0.170	0.121	0.095	0.061	0.037	0.034	0.034	0.133	0.137	0.133	0.117	0.096	0.170
38	0.082	0.031	0.024	0.018	0.014	0.013	0.013	0.011	0.012	0.012	0.018	0.019	0.082
39	0.042	0.016	0.054	0.038	0.045	0.046	0.046	0.011	0.030	0.052	0.054	0.044	0.054
40	0.060	0.028	0.017	0.014	0.012	0.013	0.013	0.014	0.016	0.017	0.018	0.019	0.060
41	0.106	0.045	0.021	0.122	0.105	0.064	0.064	0.081	0.028	0.041	0.068	0.104	0.122
42	0.034	0.013	0.012	0.012	0.009	0.009	0.009	0.009	0.010	0.009	0.014	0.016	0.034
43	0.037	0.123	0.129	0.103	0.063	0.068	0.068	0.088	0.118	0.128	0.141	0.140	0.141
44	0.020	0.014	0.016	0.015	0.016	0.017	0.017	0.014	0.014	0.013	0.023	0.024	0.024
45	0.017	0.022	0.024	0.018	0.011	0.026	0.026	0.044	0.030	0.016	0.055	0.070	0.070
46	0.111	0.068	0.066	0.063	0.059	0.058	0.058	0.058	0.057	0.056	0.057	0.058	0.111
47	0.172	0.147	0.088	0.063	0.082	0.067	0.067	0.165	0.122	0.038	0.077	0.154	0.172
48	0.102	0.070	0.066	0.065	0.063	0.062	0.062	0.058	0.058	0.057	0.060	0.059	0.102
49	0.162	0.085	0.023	0.114	0.034	0.095	0.095	0.043	0.062	0.112	0.121	0.130	0.162
50	0.074	0.031	0.027	0.018	0.015	0.015	0.015	0.018	0.020	0.017	0.022	0.032	0.074
TDC (%)	0.747	0.887	0.747	0.680	0.606	0.569	0.569	0.571	0.566	0.569	0.579	0.603	0.887

Model HYD 15KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.111	0.045	0.043	0.023	0.022	0.020	0.018	0.019	0.021	0.021	0.019	0.023	0.111
3	0.039	0.054	0.046	0.052	0.041	0.047	0.048	0.044	0.047	0.043	0.047	0.037	0.054
4	0.095	0.059	0.031	0.030	0.030	0.029	0.026	0.027	0.025	0.022	0.028	0.031	0.095
5	0.400	0.156	0.378	0.348	0.349	0.341	0.331	0.312	0.300	0.301	0.290	0.283	0.400
6	0.041	0.043	0.098	0.041	0.037	0.034	0.030	0.032	0.029	0.029	0.034	0.035	0.098
7	0.226	0.149	0.102	0.145	0.168	0.175	0.176	0.171	0.169	0.162	0.183	0.186	0.226
8	0.083	0.031	0.056	0.037	0.029	0.035	0.033	0.031	0.038	0.035	0.036	0.037	0.083
9	0.018	0.031	0.034	0.052	0.044	0.050	0.046	0.045	0.040	0.044	0.045	0.046	0.052
10	0.066	0.029	0.049	0.035	0.041	0.026	0.056	0.029	0.044	0.038	0.037	0.050	0.066
11	0.078	0.390	0.178	0.132	0.130	0.136	0.143	0.136	0.140	0.144	0.151	0.137	0.390
12	0.026	0.040	0.062	0.030	0.021	0.022	0.020	0.021	0.021	0.021	0.028	0.031	0.062
13	0.052	0.219	0.247	0.125	0.110	0.105	0.081	0.072	0.094	0.090	0.077	0.086	0.247
14	0.076	0.052	0.027	0.020	0.025	0.027	0.016	0.024	0.021	0.018	0.029	0.023	0.076
15	0.016	0.022	0.024	0.022	0.027	0.029	0.020	0.022	0.019	0.023	0.027	0.027	0.029
16	0.057	0.040	0.044	0.023	0.021	0.023	0.020	0.017	0.020	0.024	0.027	0.023	0.057
17	0.119	0.406	0.178	0.191	0.138	0.111	0.062	0.037	0.046	0.065	0.083	0.077	0.406
18	0.032	0.037	0.056	0.020	0.014	0.012	0.012	0.013	0.012	0.012	0.017	0.018	0.056
19	0.073	0.283	0.180	0.100	0.071	0.065	0.047	0.055	0.092	0.119	0.131	0.126	0.283
20	0.074	0.033	0.023	0.014	0.013	0.012	0.015	0.014	0.012	0.010	0.018	0.020	0.074
21	0.014	0.020	0.022	0.020	0.018	0.020	0.015	0.017	0.019	0.012	0.015	0.016	0.022
22	0.017	0.045	0.027	0.016	0.015	0.013	0.010	0.016	0.011	0.013	0.018	0.015	0.045
23	0.137	0.222	0.077	0.192	0.166	0.140	0.090	0.066	0.061	0.056	0.043	0.040	0.222
24	0.024	0.018	0.032	0.013	0.009	0.009	0.009	0.010	0.008	0.009	0.011	0.013	0.032
25	0.088	0.250	0.203	0.132	0.046	0.044	0.078	0.072	0.032	0.020	0.077	0.112	0.250
26	0.053	0.025	0.014	0.012	0.010	0.011	0.013	0.009	0.011	0.011	0.013	0.017	0.053
27	0.016	0.024	0.023	0.014	0.015	0.014	0.015	0.017	0.013	0.014	0.023	0.018	0.024
28	0.095	0.029	0.023	0.011	0.008	0.008	0.010	0.011	0.011	0.009	0.012	0.017	0.095
29	0.103	0.134	0.086	0.101	0.110	0.099	0.063	0.043	0.054	0.047	0.035	0.053	0.134
30	0.026	0.013	0.015	0.012	0.008	0.008	0.008	0.008	0.008	0.008	0.009	0.012	0.026
31	0.115	0.111	0.157	0.125	0.044	0.054	0.117	0.142	0.123	0.088	0.043	0.061	0.157
32	0.033	0.025	0.017	0.011	0.011	0.011	0.009	0.010	0.012	0.012	0.013	0.014	0.033
33	0.009	0.033	0.023	0.015	0.010	0.011	0.014	0.013	0.017	0.019	0.024	0.023	0.033
34	0.068	0.013	0.018	0.011	0.010	0.010	0.009	0.010	0.012	0.011	0.011	0.017	0.068
35	0.138	0.036	0.084	0.117	0.043	0.042	0.020	0.014	0.029	0.030	0.024	0.056	0.138
36	0.018	0.012	0.009	0.010	0.008	0.008	0.008	0.008	0.009	0.008	0.010	0.014	0.018
37	0.170	0.114	0.102	0.061	0.029	0.038	0.099	0.135	0.130	0.139	0.118	0.097	0.170
38	0.086	0.038	0.026	0.013	0.010	0.010	0.009	0.011	0.012	0.013	0.014	0.016	0.086
39	0.026	0.009	0.023	0.018	0.026	0.026	0.018	0.013	0.013	0.023	0.040	0.029	0.040
40	0.054	0.027	0.017	0.013	0.011	0.013	0.011	0.015	0.012	0.015	0.015	0.020	0.054
41	0.119	0.055	0.023	0.133	0.109	0.076	0.105	0.081	0.020	0.049	0.094	0.116	0.133
42	0.017	0.017	0.011	0.011	0.009	0.009	0.009	0.010	0.010	0.010	0.013	0.016	0.017
43	0.036	0.120	0.129	0.100	0.072	0.072	0.031	0.091	0.118	0.132	0.141	0.136	0.141
44	0.017	0.018	0.014	0.013	0.015	0.016	0.018	0.014	0.014	0.014	0.021	0.026	0.026
45	0.012	0.022	0.022	0.019	0.021	0.011	0.017	0.015	0.019	0.010	0.047	0.049	0.049
46	0.106	0.068	0.063	0.061	0.057	0.057	0.057	0.056	0.056	0.054	0.055	0.056	0.106
47	0.163	0.140	0.084	0.071	0.070	0.064	0.128	0.163	0.123	0.044	0.095	0.169	0.169
48	0.093	0.067	0.063	0.062	0.061	0.062	0.061	0.061	0.059	0.058	0.059	0.058	0.093
49	0.156	0.089	0.024	0.103	0.028	0.095	0.077	0.036	0.056	0.116	0.154	0.135	0.156
50	0.069	0.035	0.031	0.019	0.014	0.014	0.017	0.021	0.019	0.017	0.021	0.036	0.069
TDC (%)	0.716	0.858	0.692	0.623	0.542	0.526	0.521	0.517	0.501	0.503	0.533	0.551	0.858

Model HYD 15KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.140	0.032	0.051	0.023	0.017	0.017	0.017	0.022	0.021	0.022	0.026	0.019	0.140
3	0.048	0.051	0.092	0.053	0.042	0.041	0.050	0.057	0.064	0.072	0.071	0.066	0.092
4	0.116	0.052	0.060	0.033	0.031	0.029	0.028	0.028	0.029	0.028	0.032	0.033	0.116
5	0.421	0.177	0.426	0.395	0.397	0.369	0.360	0.352	0.334	0.342	0.329	0.327	0.426
6	0.025	0.040	0.088	0.042	0.038	0.034	0.035	0.035	0.034	0.037	0.043	0.045	0.088
7	0.244	0.158	0.062	0.121	0.150	0.163	0.164	0.151	0.140	0.133	0.157	0.163	0.244
8	0.114	0.042	0.039	0.045	0.033	0.037	0.033	0.036	0.041	0.045	0.046	0.050	0.114
9	0.023	0.027	0.074	0.048	0.035	0.041	0.040	0.040	0.035	0.046	0.048	0.054	0.074
10	0.091	0.025	0.042	0.036	0.038	0.028	0.055	0.032	0.044	0.045	0.043	0.050	0.091
11	0.073	0.370	0.121	0.148	0.150	0.144	0.170	0.163	0.163	0.165	0.164	0.159	0.370
12	0.013	0.035	0.050	0.032	0.026	0.023	0.024	0.026	0.028	0.032	0.036	0.038	0.050
13	0.073	0.215	0.270	0.127	0.115	0.103	0.088	0.078	0.098	0.100	0.099	0.094	0.270
14	0.102	0.050	0.047	0.030	0.031	0.030	0.021	0.028	0.024	0.029	0.031	0.033	0.102
15	0.032	0.014	0.061	0.040	0.028	0.028	0.026	0.029	0.042	0.054	0.062	0.058	0.062
16	0.093	0.039	0.043	0.027	0.024	0.023	0.023	0.023	0.024	0.030	0.033	0.031	0.093
17	0.132	0.410	0.131	0.162	0.125	0.106	0.064	0.044	0.059	0.077	0.090	0.090	0.410
18	0.014	0.019	0.042	0.019	0.017	0.016	0.017	0.017	0.020	0.024	0.025	0.026	0.042
19	0.085	0.266	0.211	0.114	0.076	0.070	0.058	0.062	0.108	0.136	0.152	0.146	0.266
20	0.076	0.032	0.040	0.021	0.014	0.013	0.017	0.016	0.017	0.019	0.018	0.021	0.076
21	0.037	0.047	0.065	0.053	0.044	0.036	0.030	0.033	0.030	0.028	0.038	0.047	0.065
22	0.026	0.043	0.031	0.017	0.015	0.015	0.010	0.016	0.015	0.019	0.022	0.020	0.043
23	0.156	0.211	0.058	0.170	0.159	0.141	0.088	0.056	0.053	0.047	0.038	0.046	0.211
24	0.021	0.013	0.021	0.012	0.011	0.010	0.012	0.012	0.013	0.016	0.017	0.017	0.021
25	0.085	0.255	0.229	0.148	0.055	0.043	0.076	0.072	0.035	0.035	0.088	0.121	0.255
26	0.064	0.017	0.021	0.015	0.011	0.012	0.013	0.012	0.014	0.014	0.012	0.018	0.064
27	0.023	0.013	0.015	0.030	0.033	0.044	0.049	0.052	0.042	0.034	0.016	0.022	0.052
28	0.085	0.042	0.025	0.012	0.009	0.009	0.010	0.011	0.012	0.010	0.014	0.019	0.085
29	0.101	0.138	0.104	0.086	0.103	0.101	0.061	0.036	0.047	0.043	0.047	0.063	0.138
30	0.033	0.017	0.012	0.011	0.009	0.009	0.009	0.009	0.010	0.011	0.012	0.013	0.033
31	0.118	0.119	0.175	0.135	0.050	0.054	0.118	0.149	0.130	0.086	0.042	0.065	0.175
32	0.039	0.035	0.022	0.014	0.012	0.011	0.009	0.010	0.014	0.014	0.011	0.016	0.039
33	0.015	0.070	0.055	0.027	0.032	0.009	0.023	0.044	0.054	0.060	0.046	0.021	0.070
34	0.063	0.013	0.022	0.011	0.011	0.010	0.009	0.010	0.012	0.011	0.011	0.017	0.063
35	0.124	0.023	0.094	0.112	0.041	0.049	0.026	0.013	0.020	0.019	0.030	0.062	0.124
36	0.016	0.012	0.015	0.012	0.008	0.008	0.009	0.009	0.010	0.011	0.011	0.012	0.016
37	0.176	0.125	0.095	0.062	0.035	0.039	0.107	0.143	0.142	0.138	0.128	0.103	0.176
38	0.089	0.044	0.026	0.016	0.012	0.012	0.010	0.011	0.013	0.015	0.016	0.019	0.089
39	0.042	0.010	0.057	0.053	0.082	0.086	0.062	0.026	0.018	0.062	0.095	0.073	0.095
40	0.051	0.033	0.020	0.017	0.013	0.013	0.013	0.015	0.015	0.016	0.020	0.020	0.051
41	0.114	0.056	0.021	0.131	0.110	0.073	0.111	0.082	0.024	0.047	0.078	0.113	0.131
42	0.024	0.013	0.012	0.011	0.012	0.012	0.012	0.010	0.011	0.013	0.019	0.017	0.024
43	0.041	0.125	0.145	0.111	0.073	0.078	0.029	0.089	0.129	0.140	0.169	0.153	0.169
44	0.019	0.021	0.015	0.016	0.016	0.019	0.017	0.016	0.014	0.014	0.022	0.028	0.028
45	0.020	0.013	0.021	0.015	0.031	0.049	0.051	0.046	0.041	0.009	0.079	0.093	0.093
46	0.104	0.069	0.067	0.063	0.060	0.059	0.058	0.058	0.058	0.057	0.057	0.057	0.104
47	0.167	0.153	0.088	0.076	0.075	0.063	0.122	0.160	0.126	0.043	0.072	0.158	0.167
48	0.097	0.069	0.066	0.066	0.063	0.063	0.062	0.061	0.060	0.059	0.062	0.061	0.097
49	0.160	0.101	0.029	0.108	0.034	0.099	0.084	0.047	0.058	0.119	0.161	0.156	0.161
50	0.078	0.035	0.028	0.017	0.014	0.014	0.014	0.020	0.017	0.019	0.022	0.036	0.078
TDC (%)	0.767	0.858	0.742	0.650	0.582	0.555	0.558	0.558	0.543	0.553	0.591	0.612	0.858

Model HYD 20KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.094	0.016	0.011	0.011	0.011	0.012	0.012	0.015	0.014	0.016	0.016	0.017	0.094
3	0.038	0.019	0.020	0.021	0.018	0.016	0.016	0.017	0.014	0.016	0.020	0.020	0.038
4	0.086	0.023	0.021	0.021	0.018	0.016	0.016	0.018	0.020	0.019	0.020	0.020	0.086
5	0.312	0.198	0.253	0.273	0.263	0.248	0.248	0.233	0.227	0.215	0.208	0.213	0.312
6	0.021	0.020	0.029	0.025	0.023	0.022	0.022	0.024	0.021	0.022	0.025	0.023	0.029
7	0.163	0.106	0.124	0.137	0.136	0.138	0.138	0.124	0.125	0.123	0.131	0.126	0.163
8	0.068	0.023	0.027	0.022	0.022	0.022	0.022	0.025	0.021	0.024	0.032	0.027	0.068
9	0.038	0.041	0.039	0.045	0.038	0.043	0.043	0.046	0.041	0.036	0.044	0.036	0.046
10	0.065	0.025	0.034	0.019	0.022	0.030	0.030	0.020	0.027	0.030	0.035	0.031	0.065
11	0.107	0.077	0.088	0.088	0.094	0.096	0.096	0.098	0.099	0.102	0.110	0.107	0.110
12	0.018	0.013	0.016	0.017	0.014	0.014	0.014	0.016	0.017	0.019	0.028	0.024	0.028
13	0.033	0.050	0.090	0.088	0.070	0.059	0.059	0.076	0.070	0.057	0.066	0.062	0.090
14	0.069	0.023	0.018	0.017	0.013	0.012	0.012	0.017	0.017	0.014	0.024	0.021	0.069
15	0.013	0.012	0.015	0.020	0.022	0.016	0.016	0.018	0.025	0.030	0.036	0.037	0.037
16	0.037	0.021	0.018	0.016	0.017	0.013	0.013	0.016	0.013	0.013	0.028	0.021	0.037
17	0.103	0.098	0.152	0.101	0.079	0.029	0.029	0.038	0.049	0.044	0.049	0.050	0.152
18	0.015	0.009	0.010	0.009	0.009	0.008	0.008	0.009	0.011	0.011	0.017	0.016	0.017
19	0.063	0.128	0.089	0.047	0.037	0.023	0.023	0.059	0.077	0.092	0.096	0.102	0.128
20	0.048	0.012	0.011	0.008	0.008	0.010	0.010	0.010	0.014	0.014	0.015	0.016	0.048
21	0.017	0.012	0.014	0.014	0.023	0.021	0.021	0.016	0.017	0.014	0.016	0.022	0.023
22	0.027	0.010	0.011	0.010	0.007	0.008	0.008	0.010	0.014	0.011	0.016	0.017	0.027
23	0.076	0.150	0.118	0.119	0.096	0.060	0.060	0.046	0.039	0.021	0.023	0.044	0.150
24	0.012	0.008	0.007	0.007	0.007	0.007	0.007	0.008	0.008	0.008	0.012	0.012	0.012
25	0.081	0.046	0.136	0.032	0.052	0.077	0.077	0.051	0.019	0.038	0.068	0.107	0.136
26	0.057	0.016	0.011	0.009	0.008	0.008	0.008	0.009	0.010	0.012	0.013	0.015	0.057
27	0.012	0.008	0.015	0.015	0.020	0.025	0.025	0.023	0.021	0.012	0.013	0.020	0.025
28	0.026	0.024	0.011	0.007	0.008	0.008	0.008	0.009	0.011	0.011	0.012	0.015	0.026
29	0.091	0.135	0.066	0.068	0.055	0.025	0.025	0.037	0.031	0.023	0.020	0.031	0.135
30	0.017	0.006	0.007	0.006	0.006	0.006	0.006	0.007	0.007	0.007	0.011	0.010	0.017
31	0.073	0.127	0.098	0.026	0.050	0.096	0.096	0.111	0.102	0.088	0.078	0.097	0.127
32	0.034	0.012	0.009	0.008	0.006	0.006	0.006	0.008	0.007	0.009	0.013	0.013	0.034
33	0.015	0.014	0.011	0.012	0.007	0.013	0.013	0.027	0.026	0.026	0.024	0.016	0.027
34	0.069	0.017	0.012	0.008	0.008	0.007	0.007	0.009	0.009	0.011	0.012	0.014	0.069
35	0.072	0.082	0.111	0.030	0.023	0.031	0.031	0.014	0.025	0.035	0.044	0.050	0.111
36	0.023	0.008	0.008	0.006	0.006	0.006	0.006	0.006	0.007	0.008	0.011	0.009	0.023
37	0.081	0.031	0.043	0.026	0.035	0.074	0.074	0.103	0.119	0.140	0.142	0.081	0.142
38	0.062	0.021	0.014	0.008	0.008	0.007	0.007	0.008	0.009	0.009	0.014	0.014	0.062
39	0.023	0.025	0.032	0.032	0.035	0.022	0.022	0.013	0.021	0.033	0.038	0.029	0.038
40	0.031	0.018	0.012	0.009	0.009	0.009	0.009	0.011	0.012	0.015	0.018	0.017	0.031
41	0.049	0.041	0.068	0.076	0.066	0.105	0.105	0.057	0.016	0.059	0.094	0.090	0.105
42	0.024	0.008	0.009	0.007	0.007	0.007	0.007	0.008	0.008	0.009	0.013	0.012	0.024
43	0.138	0.113	0.117	0.056	0.068	0.037	0.037	0.072	0.090	0.129	0.178	0.113	0.178
44	0.045	0.011	0.011	0.011	0.010	0.011	0.011	0.011	0.013	0.013	0.017	0.019	0.045
45	0.020	0.030	0.011	0.019	0.014	0.021	0.021	0.028	0.019	0.016	0.049	0.041	0.049
46	0.084	0.051	0.048	0.044	0.044	0.042	0.042	0.043	0.043	0.042	0.046	0.045	0.084
47	0.124	0.054	0.122	0.046	0.028	0.096	0.096	0.134	0.087	0.031	0.126	0.146	0.146
48	0.079	0.050	0.049	0.047	0.046	0.044	0.044	0.044	0.044	0.044	0.046	0.045	0.079
49	0.065	0.020	0.086	0.014	0.075	0.067	0.067	0.040	0.063	0.095	0.142	0.155	0.155
50	0.035	0.020	0.018	0.011	0.010	0.010	0.010	0.014	0.017	0.018	0.022	0.027	0.035
TDC (%)	0.550	0.430	0.492	0.409	0.395	0.398	0.398	0.400	0.389	0.401	0.470	0.455	0.550

Model HYD 20KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.093	0.019	0.011	0.013	0.012	0.014	0.014	0.016	0.013	0.014	0.013	0.015	0.093
3	0.034	0.039	0.039	0.029	0.035	0.037	0.037	0.036	0.032	0.033	0.031	0.028	0.039
4	0.085	0.026	0.021	0.020	0.017	0.016	0.021	0.019	0.019	0.021	0.018	0.020	0.085
5	0.294	0.186	0.243	0.255	0.250	0.235	0.220	0.216	0.207	0.197	0.190	0.197	0.294
6	0.013	0.021	0.025	0.022	0.023	0.022	0.022	0.022	0.021	0.022	0.022	0.025	0.025
7	0.175	0.104	0.120	0.130	0.134	0.134	0.126	0.120	0.126	0.119	0.130	0.133	0.175
8	0.066	0.020	0.025	0.026	0.026	0.024	0.022	0.029	0.021	0.023	0.032	0.026	0.066
9	0.016	0.029	0.034	0.030	0.034	0.033	0.031	0.032	0.030	0.032	0.034	0.030	0.034
10	0.063	0.024	0.029	0.020	0.020	0.029	0.025	0.020	0.029	0.032	0.029	0.029	0.063
11	0.083	0.077	0.082	0.087	0.094	0.094	0.092	0.092	0.094	0.096	0.101	0.110	0.110
12	0.011	0.017	0.014	0.014	0.014	0.014	0.015	0.016	0.016	0.018	0.022	0.026	0.026
13	0.026	0.059	0.086	0.078	0.064	0.056	0.057	0.075	0.070	0.060	0.058	0.067	0.086
14	0.059	0.024	0.021	0.019	0.017	0.012	0.018	0.017	0.018	0.016	0.026	0.021	0.059
15	0.009	0.020	0.015	0.016	0.018	0.012	0.014	0.013	0.013	0.020	0.029	0.026	0.029
16	0.021	0.020	0.015	0.017	0.015	0.013	0.015	0.015	0.011	0.015	0.023	0.022	0.023
17	0.109	0.089	0.156	0.104	0.076	0.035	0.028	0.039	0.046	0.044	0.046	0.049	0.156
18	0.014	0.010	0.009	0.008	0.009	0.009	0.008	0.009	0.010	0.011	0.014	0.017	0.017
19	0.065	0.132	0.084	0.038	0.030	0.018	0.030	0.058	0.074	0.089	0.104	0.108	0.132
20	0.039	0.017	0.011	0.008	0.009	0.010	0.012	0.009	0.014	0.015	0.015	0.015	0.039
21	0.010	0.015	0.014	0.013	0.013	0.013	0.019	0.013	0.012	0.011	0.014	0.017	0.019
22	0.030	0.011	0.011	0.010	0.008	0.008	0.012	0.009	0.012	0.011	0.014	0.017	0.030
23	0.084	0.145	0.121	0.117	0.090	0.058	0.045	0.049	0.040	0.021	0.026	0.044	0.145
24	0.012	0.007	0.008	0.006	0.006	0.007	0.007	0.007	0.007	0.008	0.010	0.012	0.012
25	0.075	0.049	0.134	0.033	0.057	0.082	0.078	0.053	0.023	0.039	0.081	0.112	0.134
26	0.048	0.020	0.009	0.008	0.008	0.008	0.007	0.009	0.009	0.012	0.011	0.012	0.048
27	0.007	0.010	0.009	0.009	0.010	0.012	0.012	0.017	0.014	0.009	0.012	0.013	0.017
28	0.025	0.027	0.013	0.006	0.007	0.007	0.009	0.008	0.010	0.011	0.009	0.015	0.027
29	0.079	0.131	0.069	0.068	0.048	0.024	0.028	0.038	0.030	0.019	0.021	0.034	0.131
30	0.016	0.008	0.006	0.005	0.006	0.006	0.006	0.007	0.006	0.007	0.010	0.010	0.016
31	0.069	0.122	0.098	0.023	0.049	0.097	0.117	0.111	0.104	0.094	0.070	0.098	0.122
32	0.024	0.012	0.009	0.008	0.006	0.006	0.008	0.009	0.007	0.009	0.012	0.012	0.024
33	0.008	0.011	0.012	0.008	0.008	0.006	0.010	0.012	0.011	0.014	0.021	0.016	0.021
34	0.062	0.017	0.011	0.008	0.007	0.007	0.008	0.008	0.010	0.012	0.010	0.014	0.062
35	0.058	0.081	0.105	0.029	0.022	0.029	0.016	0.015	0.028	0.039	0.053	0.050	0.105
36	0.019	0.006	0.007	0.006	0.006	0.006	0.006	0.007	0.006	0.007	0.010	0.010	0.019
37	0.076	0.032	0.044	0.024	0.037	0.078	0.091	0.103	0.114	0.143	0.130	0.079	0.143
38	0.059	0.020	0.015	0.008	0.008	0.008	0.009	0.008	0.009	0.008	0.015	0.013	0.059
39	0.025	0.010	0.018	0.016	0.018	0.014	0.009	0.007	0.011	0.014	0.024	0.021	0.025
40	0.028	0.020	0.013	0.007	0.008	0.009	0.011	0.011	0.011	0.014	0.017	0.014	0.028
41	0.037	0.042	0.067	0.079	0.072	0.106	0.091	0.053	0.014	0.064	0.104	0.088	0.106
42	0.017	0.008	0.009	0.007	0.007	0.008	0.008	0.008	0.009	0.009	0.012	0.013	0.017
43	0.143	0.115	0.118	0.062	0.067	0.030	0.053	0.076	0.092	0.128	0.164	0.113	0.164
44	0.037	0.012	0.012	0.011	0.013	0.013	0.013	0.011	0.013	0.013	0.020	0.020	0.037
45	0.009	0.022	0.009	0.018	0.010	0.011	0.012	0.014	0.009	0.014	0.031	0.026	0.031
46	0.081	0.048	0.046	0.043	0.043	0.042	0.042	0.041	0.042	0.041	0.044	0.043	0.081
47	0.123	0.048	0.120	0.039	0.022	0.091	0.133	0.134	0.088	0.027	0.138	0.147	0.147
48	0.070	0.049	0.047	0.046	0.046	0.046	0.045	0.044	0.043	0.042	0.042	0.043	0.070
49	0.071	0.024	0.080	0.013	0.066	0.065	0.046	0.035	0.061	0.100	0.150	0.147	0.150
50	0.038	0.016	0.018	0.011	0.011	0.010	0.014	0.015	0.017	0.017	0.022	0.029	0.038
TDC (%)	0.525	0.420	0.481	0.390	0.379	0.387	0.388	0.386	0.372	0.390	0.456	0.448	0.525

Model HYD 20KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	Max (%)
Nr./ Order	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2	0.106	0.013	0.011	0.013	0.011	0.012	0.014	0.012	0.015	0.014	0.018	0.015	0.106
3	0.033	0.037	0.034	0.031	0.036	0.041	0.045	0.053	0.048	0.046	0.046	0.056	0.056
4	0.099	0.023	0.023	0.020	0.017	0.015	0.022	0.018	0.019	0.020	0.020	0.021	0.099
5	0.315	0.212	0.255	0.275	0.261	0.245	0.231	0.231	0.222	0.216	0.209	0.205	0.315
6	0.012	0.021	0.023	0.026	0.024	0.021	0.023	0.022	0.020	0.021	0.026	0.025	0.026
7	0.168	0.107	0.116	0.135	0.134	0.135	0.125	0.120	0.123	0.121	0.140	0.138	0.168
8	0.081	0.024	0.025	0.025	0.023	0.026	0.023	0.026	0.023	0.023	0.029	0.027	0.081
9	0.012	0.024	0.028	0.026	0.027	0.027	0.026	0.029	0.024	0.024	0.033	0.029	0.033
10	0.078	0.026	0.033	0.019	0.023	0.029	0.025	0.021	0.028	0.032	0.033	0.029	0.078
11	0.095	0.074	0.083	0.090	0.097	0.094	0.095	0.092	0.092	0.097	0.105	0.101	0.105
12	0.011	0.018	0.016	0.015	0.014	0.014	0.016	0.017	0.016	0.017	0.025	0.026	0.026
13	0.028	0.058	0.089	0.086	0.069	0.061	0.057	0.073	0.077	0.065	0.071	0.066	0.089
14	0.076	0.026	0.024	0.022	0.015	0.012	0.019	0.019	0.018	0.017	0.026	0.023	0.076
15	0.017	0.012	0.015	0.018	0.023	0.016	0.023	0.026	0.024	0.031	0.037	0.033	0.037
16	0.036	0.018	0.020	0.016	0.015	0.012	0.014	0.013	0.013	0.015	0.026	0.018	0.036
17	0.090	0.090	0.155	0.105	0.076	0.033	0.025	0.034	0.045	0.041	0.043	0.050	0.155
18	0.014	0.010	0.009	0.008	0.009	0.009	0.009	0.009	0.010	0.011	0.015	0.017	0.017
19	0.059	0.129	0.092	0.043	0.037	0.020	0.036	0.057	0.078	0.098	0.109	0.107	0.129
20	0.049	0.021	0.011	0.008	0.008	0.011	0.011	0.009	0.015	0.016	0.014	0.017	0.049
21	0.030	0.019	0.022	0.021	0.018	0.018	0.015	0.013	0.011	0.020	0.031	0.035	0.035
22	0.021	0.011	0.013	0.011	0.008	0.008	0.012	0.008	0.013	0.012	0.016	0.015	0.021
23	0.080	0.144	0.116	0.119	0.094	0.057	0.043	0.047	0.042	0.022	0.021	0.043	0.144
24	0.021	0.007	0.008	0.006	0.006	0.007	0.007	0.007	0.008	0.008	0.010	0.013	0.021
25	0.077	0.050	0.135	0.036	0.051	0.077	0.076	0.054	0.023	0.045	0.073	0.113	0.135
26	0.062	0.021	0.011	0.009	0.008	0.009	0.008	0.008	0.010	0.012	0.010	0.014	0.062
27	0.018	0.011	0.018	0.017	0.027	0.028	0.029	0.025	0.021	0.016	0.012	0.021	0.029
28	0.030	0.025	0.011	0.007	0.007	0.008	0.010	0.009	0.011	0.011	0.010	0.015	0.030
29	0.095	0.127	0.069	0.067	0.050	0.022	0.023	0.035	0.031	0.021	0.014	0.030	0.127
30	0.016	0.007	0.007	0.005	0.006	0.007	0.007	0.007	0.007	0.007	0.008	0.010	0.016
31	0.066	0.126	0.098	0.024	0.048	0.098	0.121	0.115	0.109	0.089	0.066	0.099	0.126
32	0.032	0.013	0.010	0.009	0.007	0.006	0.009	0.009	0.007	0.009	0.010	0.013	0.032
33	0.015	0.022	0.030	0.031	0.014	0.007	0.017	0.025	0.032	0.030	0.024	0.013	0.032
34	0.067	0.019	0.012	0.008	0.008	0.007	0.007	0.010	0.010	0.011	0.009	0.013	0.067
35	0.064	0.082	0.106	0.029	0.022	0.027	0.020	0.016	0.027	0.030	0.048	0.048	0.106
36	0.025	0.008	0.009	0.007	0.007	0.006	0.007	0.007	0.007	0.008	0.009	0.010	0.025
37	0.076	0.030	0.043	0.024	0.037	0.081	0.102	0.112	0.122	0.141	0.147	0.084	0.147
38	0.053	0.019	0.014	0.008	0.008	0.008	0.009	0.008	0.010	0.010	0.013	0.014	0.053
39	0.028	0.030	0.036	0.055	0.063	0.051	0.038	0.021	0.017	0.040	0.054	0.023	0.063
40	0.026	0.021	0.014	0.009	0.008	0.009	0.012	0.011	0.014	0.016	0.016	0.017	0.026
41	0.037	0.042	0.069	0.080	0.070	0.108	0.094	0.051	0.017	0.061	0.101	0.089	0.108
42	0.017	0.011	0.009	0.008	0.009	0.009	0.010	0.009	0.009	0.011	0.014	0.013	0.017
43	0.144	0.113	0.127	0.064	0.075	0.031	0.055	0.080	0.100	0.132	0.199	0.119	0.199
44	0.040	0.012	0.013	0.011	0.011	0.012	0.012	0.012	0.014	0.012	0.017	0.020	0.040
45	0.033	0.013	0.015	0.024	0.025	0.027	0.035	0.042	0.030	0.013	0.058	0.049	0.058
46	0.082	0.052	0.047	0.045	0.044	0.044	0.043	0.043	0.043	0.042	0.044	0.045	0.082
47	0.129	0.058	0.127	0.042	0.025	0.092	0.132	0.131	0.088	0.026	0.126	0.148	0.148
48	0.073	0.050	0.049	0.048	0.047	0.045	0.045	0.045	0.044	0.044	0.045	0.044	0.073
49	0.063	0.025	0.084	0.013	0.072	0.071	0.052	0.041	0.058	0.104	0.193	0.161	0.193
50	0.035	0.019	0.017	0.010	0.009	0.010	0.013	0.015	0.018	0.018	0.020	0.027	0.035
TDC (%)	0.554	0.434	0.495	0.415	0.398	0.400	0.406	0.403	0.392	0.409	0.505	0.465	0.554

2.2.6 Zwischenharmonische / Interharmonics

Model: HYD 5KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.078	0.053	0.019	0.031	0.038	0.074	0.074	0.063	0.053	0.046	0.070	0.076	0.078
125	0.029	0.018	0.022	0.029	0.049	0.042	0.042	0.075	0.034	0.034	0.040	0.048	0.075
175	0.031	0.021	0.024	0.034	0.060	0.042	0.042	0.047	0.040	0.039	0.051	0.061	0.061
225	0.033	0.019	0.027	0.043	0.044	0.046	0.046	0.049	0.056	0.045	0.051	0.056	0.056
275	0.022	0.019	0.029	0.056	0.044	0.052	0.052	0.055	0.082	0.047	0.052	0.063	0.082
325	0.023	0.025	0.039	0.035	0.039	0.044	0.044	0.047	0.045	0.045	0.049	0.056	0.056
375	0.032	0.018	0.023	0.031	0.035	0.040	0.040	0.041	0.040	0.061	0.043	0.049	0.061
425	0.022	0.014	0.022	0.029	0.033	0.033	0.033	0.037	0.035	0.049	0.041	0.050	0.050
475	0.021	0.013	0.018	0.025	0.029	0.031	0.031	0.034	0.032	0.032	0.036	0.044	0.044
525	0.024	0.012	0.017	0.023	0.025	0.026	0.026	0.028	0.028	0.028	0.030	0.034	0.034
575	0.019	0.011	0.015	0.021	0.023	0.025	0.025	0.026	0.026	0.026	0.029	0.031	0.031
625	0.020	0.010	0.014	0.019	0.021	0.022	0.022	0.023	0.023	0.023	0.040	0.029	0.040
675	0.021	0.010	0.013	0.018	0.021	0.021	0.021	0.023	0.022	0.022	0.025	0.027	0.027
725	0.019	0.009	0.012	0.017	0.018	0.020	0.020	0.021	0.020	0.020	0.024	0.030	0.030
775	0.019	0.008	0.012	0.016	0.018	0.018	0.018	0.020	0.019	0.020	0.022	0.036	0.036
825	0.023	0.009	0.011	0.015	0.017	0.017	0.017	0.018	0.018	0.018	0.019	0.024	0.024
875	0.018	0.008	0.011	0.015	0.016	0.017	0.017	0.017	0.018	0.017	0.018	0.022	0.022
925	0.018	0.008	0.011	0.015	0.016	0.016	0.016	0.017	0.017	0.017	0.019	0.021	0.021
975	0.024	0.008	0.010	0.014	0.015	0.016	0.016	0.017	0.016	0.016	0.017	0.019	0.024
1025	0.019	0.007	0.010	0.014	0.016	0.015	0.015	0.017	0.016	0.016	0.019	0.024	0.024
1075	0.018	0.007	0.010	0.013	0.015	0.015	0.015	0.016	0.016	0.015	0.018	0.023	0.023
1125	0.021	0.007	0.010	0.013	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.019	0.021
1175	0.018	0.007	0.010	0.013	0.014	0.015	0.015	0.015	0.015	0.015	0.016	0.018	0.018
1225	0.018	0.007	0.009	0.013	0.014	0.014	0.014	0.015	0.014	0.014	0.015	0.018	0.018
1275	0.019	0.007	0.009	0.013	0.014	0.014	0.014	0.014	0.015	0.015	0.015	0.016	0.019
1325	0.020	0.007	0.011	0.015	0.016	0.016	0.016	0.017	0.017	0.017	0.017	0.019	0.020
1375	0.018	0.006	0.009	0.012	0.015	0.014	0.014	0.015	0.015	0.014	0.015	0.017	0.018
1425	0.020	0.007	0.011	0.015	0.016	0.017	0.017	0.017	0.016	0.016	0.018	0.019	0.020
1475	0.018	0.006	0.009	0.013	0.014	0.014	0.014	0.014	0.015	0.014	0.015	0.017	0.018
1525	0.018	0.007	0.009	0.013	0.014	0.014	0.014	0.015	0.014	0.015	0.015	0.017	0.018
1575	0.018	0.006	0.009	0.013	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.017	0.018
1625	0.019	0.007	0.009	0.013	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.017	0.019
1675	0.019	0.007	0.010	0.014	0.015	0.016	0.016	0.016	0.016	0.015	0.016	0.018	0.019
1725	0.019	0.007	0.009	0.013	0.014	0.014	0.014	0.015	0.015	0.015	0.016	0.017	0.019
1775	0.020	0.007	0.010	0.014	0.015	0.016	0.016	0.015	0.016	0.015	0.017	0.017	0.020
1825	0.019	0.007	0.010	0.013	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.017	0.019
1875	0.020	0.007	0.010	0.014	0.015	0.015	0.015	0.016	0.016	0.016	0.016	0.017	0.020
1925	0.020	0.007	0.010	0.014	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.018	0.020
1975	0.021	0.007	0.010	0.015	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.018	0.021

Model: HYD 5KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.089	0.048	0.020	0.028	0.036	0.058	0.065	0.063	0.054	0.050	0.072	0.076	0.089
125	0.026	0.018	0.022	0.030	0.037	0.037	0.036	0.046	0.034	0.033	0.041	0.046	0.046
175	0.028	0.021	0.025	0.035	0.045	0.044	0.045	0.047	0.043	0.041	0.049	0.054	0.054
225	0.023	0.020	0.028	0.040	0.044	0.046	0.047	0.050	0.051	0.046	0.050	0.057	0.057
275	0.023	0.019	0.029	0.044	0.045	0.051	0.056	0.055	0.061	0.049	0.054	0.063	0.063
325	0.023	0.021	0.031	0.035	0.040	0.043	0.047	0.048	0.046	0.045	0.050	0.058	0.058
375	0.022	0.019	0.023	0.032	0.037	0.041	0.041	0.044	0.042	0.049	0.043	0.051	0.051
425	0.021	0.015	0.022	0.030	0.033	0.034	0.035	0.037	0.036	0.041	0.041	0.046	0.046
475	0.022	0.014	0.018	0.026	0.029	0.032	0.031	0.034	0.032	0.031	0.035	0.041	0.041
525	0.019	0.012	0.017	0.023	0.026	0.026	0.026	0.028	0.028	0.027	0.030	0.035	0.035
575	0.019	0.011	0.015	0.021	0.023	0.024	0.025	0.027	0.026	0.025	0.029	0.031	0.031
625	0.020	0.010	0.014	0.019	0.021	0.023	0.023	0.024	0.023	0.023	0.031	0.030	0.031
675	0.019	0.010	0.013	0.018	0.020	0.021	0.022	0.023	0.022	0.021	0.024	0.026	0.026
725	0.019	0.010	0.013	0.017	0.019	0.020	0.020	0.021	0.020	0.020	0.022	0.027	0.027
775	0.020	0.009	0.011	0.016	0.018	0.019	0.019	0.020	0.019	0.020	0.021	0.028	0.028
825	0.020	0.008	0.011	0.016	0.017	0.017	0.018	0.018	0.018	0.018	0.019	0.022	0.022
875	0.018	0.008	0.011	0.015	0.016	0.017	0.017	0.018	0.017	0.017	0.018	0.022	0.022
925	0.020	0.008	0.012	0.016	0.017	0.017	0.018	0.018	0.018	0.018	0.019	0.022	0.022
975	0.018	0.007	0.010	0.014	0.016	0.016	0.016	0.017	0.016	0.016	0.017	0.019	0.019
1025	0.019	0.008	0.011	0.015	0.017	0.017	0.017	0.018	0.017	0.017	0.019	0.021	0.021
1075	0.018	0.007	0.010	0.013	0.015	0.015	0.016	0.016	0.016	0.015	0.017	0.020	0.020
1125	0.020	0.007	0.010	0.013	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.018	0.020
1175	0.017	0.007	0.009	0.013	0.014	0.015	0.015	0.015	0.015	0.015	0.016	0.017	0.017
1225	0.018	0.007	0.010	0.013	0.014	0.015	0.015	0.015	0.015	0.014	0.016	0.017	0.018
1275	0.018	0.007	0.010	0.013	0.014	0.014	0.014	0.015	0.014	0.014	0.015	0.017	0.018
1325	0.021	0.008	0.011	0.016	0.018	0.017	0.018	0.018	0.017	0.018	0.018	0.020	0.021
1375	0.018	0.007	0.009	0.013	0.014	0.014	0.014	0.015	0.014	0.014	0.015	0.017	0.018
1425	0.022	0.008	0.012	0.015	0.017	0.018	0.018	0.018	0.018	0.018	0.018	0.020	0.022
1475	0.018	0.007	0.009	0.013	0.014	0.014	0.015	0.014	0.014	0.014	0.015	0.016	0.018
1525	0.018	0.007	0.009	0.013	0.014	0.014	0.014	0.015	0.014	0.014	0.015	0.016	0.018
1575	0.018	0.006	0.010	0.013	0.014	0.015	0.014	0.015	0.014	0.015	0.015	0.016	0.018
1625	0.019	0.007	0.009	0.013	0.015	0.015	0.014	0.015	0.015	0.015	0.015	0.016	0.019
1675	0.019	0.007	0.010	0.013	0.015	0.016	0.015	0.016	0.015	0.015	0.016	0.017	0.019
1725	0.018	0.007	0.009	0.013	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.017	0.018
1775	0.019	0.007	0.010	0.014	0.015	0.016	0.016	0.016	0.015	0.016	0.016	0.017	0.019
1825	0.019	0.007	0.010	0.014	0.015	0.015	0.015	0.016	0.015	0.015	0.016	0.017	0.019
1875	0.020	0.007	0.010	0.014	0.015	0.015	0.015	0.016	0.016	0.016	0.016	0.017	0.020
1925	0.022	0.007	0.011	0.015	0.017	0.017	0.017	0.017	0.017	0.016	0.017	0.018	0.022
1975	0.021	0.007	0.010	0.015	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.017	0.021

Model: HYD 5KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.086	0.053	0.020	0.029	0.037	0.061	0.064	0.062	0.055	0.050	0.064	0.078	0.086
125	0.027	0.019	0.023	0.031	0.040	0.038	0.036	0.054	0.034	0.033	0.037	0.046	0.054
175	0.029	0.021	0.025	0.035	0.048	0.044	0.045	0.047	0.041	0.040	0.047	0.056	0.056
225	0.024	0.019	0.028	0.039	0.044	0.047	0.048	0.050	0.051	0.046	0.049	0.055	0.055
275	0.021	0.019	0.029	0.046	0.046	0.052	0.054	0.055	0.061	0.049	0.053	0.059	0.061
325	0.022	0.020	0.030	0.037	0.040	0.044	0.045	0.047	0.046	0.046	0.050	0.056	0.056
375	0.025	0.019	0.024	0.032	0.037	0.042	0.042	0.045	0.042	0.046	0.043	0.048	0.048
425	0.020	0.015	0.022	0.030	0.035	0.035	0.036	0.038	0.035	0.040	0.041	0.048	0.048
475	0.021	0.014	0.019	0.026	0.030	0.034	0.034	0.036	0.033	0.032	0.036	0.042	0.042
525	0.022	0.012	0.017	0.024	0.026	0.027	0.027	0.030	0.029	0.028	0.031	0.034	0.034
575	0.019	0.011	0.016	0.022	0.024	0.025	0.026	0.027	0.026	0.026	0.028	0.032	0.032
625	0.019	0.010	0.014	0.019	0.021	0.023	0.024	0.024	0.023	0.023	0.029	0.029	0.029
675	0.021	0.010	0.013	0.018	0.021	0.022	0.022	0.023	0.022	0.022	0.024	0.026	0.026
725	0.019	0.010	0.013	0.018	0.019	0.020	0.021	0.022	0.020	0.020	0.023	0.027	0.027
775	0.019	0.009	0.012	0.016	0.018	0.020	0.020	0.021	0.020	0.020	0.021	0.028	0.028
825	0.019	0.009	0.012	0.016	0.017	0.018	0.018	0.019	0.018	0.018	0.019	0.022	0.022
875	0.018	0.008	0.011	0.015	0.016	0.017	0.018	0.018	0.017	0.017	0.019	0.021	0.021
925	0.018	0.008	0.011	0.015	0.016	0.017	0.017	0.017	0.017	0.017	0.019	0.020	0.020
975	0.021	0.008	0.010	0.014	0.016	0.016	0.017	0.017	0.017	0.016	0.018	0.019	0.021
1025	0.018	0.008	0.011	0.014	0.016	0.016	0.016	0.016	0.016	0.016	0.018	0.021	0.021
1075	0.017	0.008	0.010	0.014	0.015	0.016	0.016	0.016	0.016	0.016	0.018	0.020	0.020
1125	0.019	0.008	0.010	0.014	0.015	0.015	0.015	0.016	0.015	0.015	0.016	0.018	0.019
1175	0.017	0.007	0.010	0.013	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.017	0.017
1225	0.018	0.007	0.010	0.013	0.014	0.015	0.015	0.015	0.015	0.015	0.016	0.017	0.018
1275	0.017	0.007	0.009	0.013	0.014	0.015	0.015	0.015	0.015	0.015	0.016	0.017	0.017
1325	0.021	0.008	0.012	0.016	0.017	0.018	0.018	0.018	0.018	0.018	0.019	0.020	0.021
1375	0.017	0.007	0.010	0.013	0.015	0.015	0.015	0.016	0.015	0.015	0.015	0.017	0.017
1425	0.022	0.009	0.013	0.018	0.019	0.019	0.019	0.020	0.019	0.019	0.020	0.021	0.022
1475	0.018	0.007	0.010	0.013	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.018
1525	0.018	0.007	0.010	0.014	0.015	0.014	0.015	0.015	0.015	0.015	0.016	0.017	0.018
1575	0.019	0.007	0.010	0.013	0.015	0.015	0.016	0.016	0.015	0.016	0.016	0.017	0.019
1625	0.019	0.007	0.010	0.013	0.015	0.016	0.016	0.015	0.015	0.016	0.016	0.018	0.019
1675	0.020	0.007	0.010	0.014	0.016	0.017	0.016	0.016	0.017	0.016	0.017	0.018	0.020
1725	0.018	0.007	0.010	0.014	0.015	0.015	0.015	0.016	0.016	0.015	0.016	0.017	0.018
1775	0.020	0.007	0.010	0.014	0.016	0.016	0.016	0.017	0.016	0.016	0.017	0.018	0.020
1825	0.019	0.007	0.010	0.014	0.015	0.016	0.016	0.016	0.015	0.016	0.016	0.017	0.019
1875	0.020	0.007	0.010	0.014	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.020
1925	0.021	0.007	0.011	0.015	0.017	0.016	0.017	0.017	0.017	0.017	0.017	0.018	0.021
1975	0.021	0.007	0.011	0.015	0.016	0.016	0.017	0.017	0.017	0.017	0.017	0.017	0.021

Model: HYD 6KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.015	0.010	0.016	0.034	0.045	0.051	0.051	0.052	0.043	0.036	0.038	0.080	0.080
125	0.018	0.013	0.019	0.034	0.032	0.030	0.030	0.033	0.036	0.025	0.125	0.050	0.125
175	0.020	0.015	0.023	0.041	0.038	0.036	0.036	0.032	0.031	0.042	0.034	0.061	0.061
225	0.016	0.017	0.025	0.040	0.041	0.038	0.038	0.036	0.039	0.036	0.057	0.054	0.057
275	0.016	0.017	0.025	0.040	0.041	0.043	0.043	0.037	0.039	0.039	0.055	0.057	0.057
325	0.015	0.016	0.024	0.036	0.038	0.037	0.037	0.035	0.036	0.036	0.038	0.056	0.056
375	0.014	0.014	0.021	0.033	0.035	0.033	0.033	0.032	0.034	0.034	0.035	0.045	0.045
425	0.015	0.014	0.020	0.034	0.032	0.029	0.029	0.028	0.030	0.031	0.031	0.047	0.047
475	0.015	0.012	0.017	0.028	0.028	0.027	0.027	0.025	0.026	0.027	0.028	0.038	0.038
525	0.014	0.011	0.016	0.025	0.023	0.023	0.023	0.022	0.023	0.024	0.025	0.036	0.036
575	0.015	0.010	0.014	0.022	0.021	0.021	0.021	0.020	0.022	0.022	0.023	0.029	0.029
625	0.015	0.009	0.013	0.022	0.022	0.020	0.020	0.018	0.019	0.020	0.021	0.027	0.027
675	0.013	0.008	0.012	0.020	0.019	0.018	0.018	0.018	0.018	0.019	0.020	0.025	0.025
725	0.015	0.008	0.012	0.019	0.018	0.017	0.017	0.016	0.016	0.017	0.018	0.025	0.025
775	0.015	0.008	0.012	0.018	0.017	0.016	0.016	0.015	0.016	0.016	0.017	0.023	0.023
825	0.013	0.007	0.011	0.017	0.015	0.014	0.014	0.014	0.015	0.015	0.016	0.022	0.022
875	0.014	0.007	0.010	0.018	0.015	0.014	0.014	0.014	0.014	0.015	0.015	0.020	0.020
925	0.014	0.007	0.010	0.017	0.015	0.014	0.014	0.013	0.014	0.014	0.015	0.020	0.020
975	0.013	0.007	0.009	0.015	0.014	0.014	0.014	0.013	0.013	0.013	0.014	0.018	0.018
1025	0.014	0.007	0.010	0.016	0.014	0.013	0.013	0.012	0.013	0.013	0.014	0.020	0.020
1075	0.015	0.007	0.010	0.015	0.013	0.013	0.013	0.013	0.013	0.013	0.014	0.019	0.019
1125	0.012	0.006	0.009	0.014	0.013	0.013	0.013	0.012	0.012	0.013	0.013	0.018	0.018
1175	0.014	0.006	0.008	0.013	0.013	0.012	0.012	0.012	0.012	0.013	0.012	0.017	0.017
1225	0.015	0.006	0.008	0.014	0.014	0.012	0.012	0.011	0.012	0.012	0.013	0.017	0.017
1275	0.014	0.006	0.008	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.013	0.016	0.016
1325	0.015	0.007	0.010	0.015	0.014	0.014	0.014	0.013	0.014	0.013	0.014	0.024	0.024
1375	0.013	0.007	0.008	0.013	0.012	0.012	0.012	0.011	0.012	0.012	0.012	0.016	0.016
1425	0.015	0.008	0.010	0.015	0.014	0.013	0.013	0.013	0.014	0.014	0.014	0.017	0.017
1475	0.013	0.006	0.008	0.013	0.012	0.012	0.012	0.011	0.012	0.012	0.012	0.015	0.015
1525	0.013	0.006	0.009	0.013	0.012	0.012	0.012	0.011	0.012	0.012	0.012	0.016	0.016
1575	0.013	0.006	0.009	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.013	0.015	0.015
1625	0.014	0.006	0.010	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.013	0.016	0.016
1675	0.014	0.006	0.011	0.014	0.013	0.013	0.013	0.012	0.013	0.013	0.013	0.016	0.016
1725	0.014	0.006	0.009	0.013	0.013	0.012	0.012	0.012	0.012	0.013	0.013	0.016	0.016
1775	0.015	0.007	0.009	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.014	0.016	0.016
1825	0.015	0.006	0.009	0.014	0.013	0.013	0.013	0.012	0.013	0.013	0.014	0.016	0.016
1875	0.015	0.007	0.009	0.017	0.013	0.013	0.013	0.013	0.013	0.013	0.014	0.016	0.017
1925	0.015	0.007	0.009	0.015	0.014	0.013	0.013	0.013	0.013	0.013	0.014	0.017	0.017
1975	0.016	0.007	0.009	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.017	0.017

Model: HYD 6KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.017	0.010	0.016	0.032	0.047	0.050	0.029	0.051	0.051	0.027	0.035	0.080	0.080
125	0.016	0.013	0.019	0.032	0.032	0.029	0.025	0.025	0.027	0.024	0.042	0.048	0.048
175	0.015	0.015	0.023	0.041	0.039	0.035	0.033	0.032	0.032	0.032	0.032	0.049	0.049
225	0.016	0.018	0.025	0.041	0.041	0.040	0.037	0.036	0.037	0.037	0.040	0.052	0.052
275	0.014	0.017	0.025	0.044	0.047	0.047	0.039	0.038	0.039	0.039	0.042	0.055	0.055
325	0.015	0.016	0.025	0.039	0.040	0.038	0.036	0.036	0.037	0.037	0.039	0.058	0.058
375	0.014	0.014	0.021	0.034	0.034	0.033	0.032	0.032	0.034	0.034	0.034	0.045	0.045
425	0.014	0.014	0.020	0.033	0.032	0.029	0.028	0.028	0.028	0.030	0.031	0.048	0.048
475	0.014	0.012	0.017	0.027	0.028	0.027	0.025	0.025	0.026	0.027	0.027	0.038	0.038
525	0.014	0.011	0.016	0.025	0.022	0.022	0.022	0.022	0.023	0.023	0.024	0.035	0.035
575	0.014	0.010	0.014	0.022	0.021	0.021	0.021	0.020	0.021	0.021	0.022	0.029	0.029
625	0.013	0.009	0.013	0.021	0.020	0.019	0.018	0.018	0.019	0.020	0.020	0.027	0.027
675	0.013	0.009	0.012	0.020	0.019	0.018	0.017	0.017	0.018	0.018	0.020	0.025	0.025
725	0.013	0.008	0.012	0.019	0.018	0.017	0.016	0.015	0.016	0.017	0.017	0.025	0.025
775	0.013	0.008	0.011	0.019	0.017	0.016	0.015	0.015	0.016	0.016	0.017	0.022	0.022
825	0.013	0.008	0.010	0.017	0.015	0.014	0.014	0.014	0.015	0.015	0.016	0.022	0.022
875	0.012	0.007	0.010	0.016	0.014	0.014	0.014	0.014	0.014	0.015	0.015	0.020	0.020
925	0.014	0.007	0.010	0.017	0.015	0.015	0.014	0.014	0.015	0.015	0.015	0.020	0.020
975	0.012	0.007	0.009	0.015	0.014	0.013	0.013	0.013	0.013	0.013	0.014	0.018	0.018
1025	0.014	0.007	0.010	0.016	0.014	0.015	0.013	0.014	0.014	0.014	0.015	0.019	0.019
1075	0.013	0.006	0.009	0.015	0.013	0.013	0.012	0.012	0.013	0.013	0.013	0.018	0.018
1125	0.012	0.006	0.009	0.014	0.013	0.012	0.012	0.012	0.012	0.012	0.013	0.017	0.017
1175	0.013	0.006	0.009	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.016	0.016
1225	0.013	0.006	0.008	0.013	0.013	0.012	0.011	0.012	0.012	0.012	0.013	0.016	0.016
1275	0.013	0.006	0.009	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.016	0.016
1325	0.016	0.008	0.011	0.016	0.015	0.015	0.014	0.014	0.014	0.015	0.015	0.020	0.020
1375	0.013	0.007	0.008	0.013	0.012	0.012	0.011	0.012	0.012	0.012	0.012	0.016	0.016
1425	0.016	0.008	0.010	0.016	0.015	0.015	0.014	0.014	0.015	0.015	0.015	0.018	0.018
1475	0.013	0.006	0.009	0.013	0.012	0.012	0.011	0.011	0.012	0.012	0.012	0.015	0.015
1525	0.013	0.006	0.008	0.013	0.012	0.012	0.011	0.011	0.012	0.012	0.012	0.015	0.015
1575	0.013	0.006	0.009	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.013	0.015	0.015
1625	0.013	0.006	0.009	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.013	0.015	0.015
1675	0.014	0.006	0.010	0.014	0.013	0.013	0.012	0.013	0.013	0.013	0.013	0.016	0.016
1725	0.014	0.006	0.009	0.013	0.013	0.012	0.012	0.012	0.012	0.013	0.013	0.015	0.015
1775	0.015	0.007	0.009	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.016	0.016
1825	0.015	0.006	0.009	0.014	0.013	0.013	0.012	0.012	0.013	0.013	0.013	0.016	0.016
1875	0.015	0.006	0.009	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.016	0.016
1925	0.016	0.007	0.010	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.017	0.017
1975	0.016	0.007	0.009	0.014	0.014	0.013	0.013	0.013	0.013	0.013	0.014	0.016	0.016

Model: HYD 6KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.016	0.010	0.016	0.033	0.045	0.050	0.034	0.038	0.054	0.034	0.038	0.086	0.086
125	0.016	0.013	0.020	0.031	0.031	0.030	0.028	0.035	0.038	0.026	0.093	0.044	0.093
175	0.018	0.016	0.023	0.038	0.037	0.036	0.033	0.034	0.033	0.042	0.033	0.052	0.052
225	0.016	0.017	0.025	0.040	0.042	0.040	0.037	0.037	0.041	0.038	0.058	0.049	0.058
275	0.016	0.017	0.025	0.044	0.047	0.046	0.040	0.040	0.041	0.041	0.048	0.055	0.055
325	0.016	0.016	0.025	0.041	0.040	0.037	0.037	0.037	0.038	0.037	0.041	0.056	0.056
375	0.015	0.014	0.021	0.034	0.036	0.035	0.033	0.033	0.035	0.035	0.035	0.044	0.044
425	0.015	0.013	0.020	0.033	0.032	0.030	0.029	0.029	0.031	0.031	0.032	0.046	0.046
475	0.015	0.012	0.017	0.027	0.028	0.028	0.026	0.026	0.027	0.028	0.028	0.036	0.036
525	0.014	0.011	0.015	0.024	0.023	0.023	0.023	0.023	0.023	0.024	0.025	0.033	0.033
575	0.014	0.010	0.014	0.022	0.021	0.021	0.022	0.021	0.022	0.022	0.024	0.029	0.029
625	0.014	0.009	0.013	0.021	0.021	0.020	0.019	0.019	0.020	0.020	0.021	0.027	0.027
675	0.014	0.009	0.012	0.020	0.020	0.018	0.018	0.018	0.019	0.019	0.020	0.024	0.024
725	0.014	0.008	0.012	0.019	0.018	0.017	0.016	0.016	0.017	0.018	0.018	0.024	0.024
775	0.014	0.008	0.011	0.018	0.017	0.017	0.016	0.016	0.016	0.016	0.017	0.022	0.022
825	0.013	0.008	0.011	0.017	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.020	0.020
875	0.013	0.007	0.010	0.016	0.015	0.015	0.014	0.015	0.015	0.015	0.015	0.019	0.019
925	0.013	0.007	0.010	0.016	0.015	0.014	0.014	0.014	0.014	0.015	0.015	0.019	0.019
975	0.013	0.007	0.009	0.015	0.014	0.014	0.013	0.013	0.014	0.014	0.014	0.017	0.017
1025	0.013	0.007	0.010	0.016	0.014	0.014	0.013	0.013	0.013	0.014	0.014	0.019	0.019
1075	0.014	0.007	0.009	0.015	0.013	0.013	0.013	0.012	0.013	0.013	0.013	0.017	0.017
1125	0.013	0.006	0.009	0.014	0.013	0.013	0.012	0.012	0.013	0.013	0.013	0.016	0.016
1175	0.013	0.006	0.009	0.014	0.013	0.013	0.012	0.012	0.012	0.013	0.013	0.016	0.016
1225	0.014	0.006	0.009	0.014	0.013	0.013	0.012	0.012	0.013	0.012	0.013	0.017	0.017
1275	0.014	0.006	0.008	0.013	0.012	0.012	0.012	0.012	0.012	0.013	0.013	0.015	0.015
1325	0.016	0.007	0.010	0.016	0.015	0.015	0.014	0.015	0.015	0.015	0.015	0.020	0.020
1375	0.013	0.007	0.009	0.013	0.013	0.012	0.012	0.012	0.012	0.013	0.013	0.016	0.016
1425	0.017	0.008	0.011	0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.019	0.019
1475	0.014	0.006	0.008	0.013	0.013	0.012	0.012	0.012	0.012	0.013	0.013	0.015	0.015
1525	0.013	0.006	0.009	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.016	0.016
1575	0.014	0.006	0.009	0.013	0.012	0.012	0.012	0.012	0.013	0.013	0.013	0.015	0.015
1625	0.014	0.006	0.010	0.013	0.013	0.012	0.012	0.012	0.013	0.012	0.013	0.016	0.016
1675	0.015	0.007	0.010	0.014	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.016	0.016
1725	0.015	0.007	0.009	0.014	0.013	0.013	0.012	0.013	0.013	0.013	0.013	0.015	0.015
1775	0.016	0.007	0.010	0.014	0.014	0.014	0.013	0.013	0.013	0.014	0.014	0.016	0.016
1825	0.015	0.007	0.009	0.014	0.014	0.013	0.013	0.013	0.013	0.014	0.014	0.016	0.016
1875	0.016	0.007	0.009	0.014	0.014	0.013	0.013	0.014	0.013	0.013	0.014	0.016	0.016
1925	0.017	0.007	0.009	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.016	0.017
1975	0.016	0.007	0.010	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.015	0.016	0.016

Model: HYD 8KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.015	0.016	0.024	0.025	0.024	0.019	0.019	0.036	0.280	0.306	0.096	0.185	0.306
125	0.023	0.019	0.032	0.030	0.028	0.022	0.022	0.033	0.053	0.060	0.028	0.058	0.060
175	0.030	0.026	0.040	0.038	0.035	0.029	0.029	0.043	0.080	0.082	0.032	0.042	0.082
225	0.018	0.022	0.038	0.040	0.039	0.033	0.033	0.044	0.129	0.143	0.029	0.044	0.143
275	0.023	0.021	0.034	0.034	0.035	0.031	0.031	0.040	0.082	0.089	0.021	0.034	0.089
325	0.017	0.018	0.030	0.029	0.029	0.027	0.027	0.038	0.076	0.097	0.020	0.031	0.097
375	0.015	0.015	0.024	0.023	0.024	0.023	0.023	0.029	0.070	0.077	0.024	0.032	0.077
425	0.017	0.015	0.024	0.022	0.022	0.020	0.020	0.028	0.060	0.064	0.021	0.026	0.064
475	0.014	0.013	0.020	0.018	0.018	0.017	0.017	0.022	0.054	0.057	0.017	0.023	0.057
525	0.013	0.011	0.017	0.017	0.016	0.015	0.015	0.020	0.052	0.054	0.020	0.025	0.054
575	0.013	0.010	0.016	0.015	0.014	0.014	0.014	0.018	0.040	0.045	0.016	0.020	0.045
625	0.012	0.010	0.015	0.014	0.014	0.013	0.013	0.017	0.039	0.040	0.015	0.018	0.040
675	0.013	0.009	0.014	0.013	0.013	0.012	0.012	0.015	0.036	0.036	0.017	0.020	0.036
725	0.015	0.010	0.015	0.013	0.012	0.011	0.011	0.015	0.029	0.032	0.014	0.017	0.032
775	0.014	0.009	0.014	0.011	0.011	0.011	0.011	0.013	0.028	0.031	0.014	0.016	0.031
825	0.012	0.008	0.013	0.011	0.011	0.010	0.010	0.013	0.027	0.030	0.015	0.017	0.030
875	0.013	0.007	0.012	0.010	0.010	0.010	0.010	0.012	0.025	0.028	0.014	0.015	0.028
925	0.012	0.008	0.012	0.010	0.010	0.009	0.009	0.012	0.024	0.027	0.013	0.014	0.027
975	0.012	0.008	0.011	0.010	0.010	0.009	0.009	0.011	0.026	0.027	0.017	0.017	0.027
1025	0.013	0.008	0.012	0.010	0.010	0.009	0.009	0.011	0.022	0.024	0.012	0.014	0.024
1075	0.013	0.008	0.012	0.010	0.009	0.009	0.009	0.011	0.021	0.023	0.012	0.013	0.023
1125	0.012	0.007	0.011	0.009	0.009	0.009	0.009	0.010	0.021	0.022	0.017	0.017	0.022
1175	0.015	0.007	0.011	0.009	0.009	0.008	0.008	0.010	0.020	0.021	0.012	0.013	0.021
1225	0.011	0.007	0.011	0.009	0.009	0.008	0.008	0.010	0.019	0.020	0.012	0.013	0.020
1275	0.012	0.007	0.010	0.009	0.009	0.008	0.008	0.010	0.020	0.020	0.014	0.014	0.020
1325	0.013	0.007	0.012	0.010	0.010	0.010	0.010	0.011	0.018	0.020	0.013	0.014	0.020
1375	0.011	0.007	0.010	0.009	0.009	0.008	0.008	0.010	0.017	0.019	0.011	0.012	0.019
1425	0.012	0.007	0.011	0.010	0.010	0.010	0.010	0.011	0.019	0.019	0.013	0.014	0.019
1475	0.011	0.006	0.010	0.009	0.009	0.009	0.009	0.010	0.017	0.018	0.012	0.013	0.018
1525	0.011	0.006	0.010	0.009	0.009	0.009	0.009	0.010	0.016	0.018	0.012	0.012	0.018
1575	0.012	0.006	0.011	0.009	0.009	0.009	0.009	0.009	0.017	0.018	0.012	0.012	0.018
1625	0.012	0.006	0.010	0.009	0.009	0.009	0.009	0.010	0.016	0.017	0.011	0.013	0.017
1675	0.012	0.006	0.010	0.011	0.009	0.009	0.009	0.010	0.016	0.016	0.012	0.013	0.016
1725	0.012	0.006	0.010	0.010	0.009	0.009	0.009	0.010	0.016	0.017	0.012	0.012	0.017
1775	0.012	0.006	0.010	0.010	0.010	0.009	0.009	0.010	0.016	0.017	0.012	0.013	0.017
1825	0.012	0.006	0.010	0.010	0.011	0.009	0.009	0.010	0.015	0.017	0.012	0.013	0.017
1875	0.012	0.006	0.010	0.010	0.010	0.009	0.009	0.010	0.015	0.017	0.013	0.013	0.017
1925	0.012	0.007	0.010	0.010	0.010	0.010	0.010	0.010	0.016	0.017	0.012	0.013	0.017
1975	0.013	0.007	0.011	0.010	0.010	0.010	0.010	0.011	0.017	0.017	0.013	0.013	0.017

Model: HYD 8KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.016	0.017	0.025	0.025	0.024	0.020	0.021	0.037	0.177	0.158	0.081	0.158	0.177
125	0.019	0.019	0.031	0.029	0.026	0.023	0.023	0.033	0.053	0.054	0.026	0.045	0.054
175	0.023	0.025	0.039	0.036	0.035	0.030	0.030	0.036	0.076	0.072	0.033	0.034	0.076
225	0.016	0.022	0.039	0.039	0.038	0.033	0.034	0.042	0.083	0.088	0.024	0.033	0.088
275	0.016	0.021	0.034	0.033	0.035	0.033	0.033	0.040	0.082	0.081	0.022	0.030	0.082
325	0.015	0.018	0.032	0.033	0.032	0.028	0.029	0.038	0.074	0.078	0.020	0.028	0.078
375	0.014	0.015	0.024	0.023	0.023	0.023	0.024	0.029	0.064	0.065	0.019	0.026	0.065
425	0.015	0.015	0.024	0.023	0.022	0.020	0.021	0.026	0.058	0.057	0.019	0.023	0.058
475	0.013	0.012	0.020	0.018	0.018	0.017	0.018	0.021	0.053	0.051	0.016	0.022	0.053
525	0.013	0.011	0.018	0.017	0.017	0.015	0.016	0.019	0.048	0.046	0.017	0.019	0.048
575	0.012	0.010	0.015	0.015	0.015	0.014	0.015	0.017	0.037	0.039	0.016	0.018	0.039
625	0.012	0.010	0.015	0.014	0.014	0.013	0.013	0.016	0.035	0.034	0.015	0.016	0.035
675	0.012	0.009	0.014	0.013	0.013	0.012	0.013	0.015	0.032	0.032	0.015	0.016	0.032
725	0.014	0.010	0.015	0.012	0.012	0.011	0.011	0.014	0.029	0.030	0.014	0.015	0.030
775	0.012	0.009	0.014	0.011	0.011	0.011	0.011	0.013	0.027	0.028	0.013	0.015	0.028
825	0.012	0.008	0.013	0.011	0.011	0.010	0.010	0.012	0.026	0.026	0.014	0.014	0.026
875	0.011	0.008	0.013	0.010	0.010	0.010	0.010	0.011	0.024	0.025	0.014	0.014	0.025
925	0.012	0.008	0.012	0.011	0.011	0.010	0.010	0.012	0.023	0.024	0.014	0.014	0.024
975	0.011	0.008	0.011	0.010	0.009	0.009	0.009	0.011	0.023	0.023	0.014	0.014	0.023
1025	0.013	0.008	0.012	0.011	0.010	0.010	0.010	0.011	0.021	0.021	0.013	0.013	0.021
1075	0.012	0.007	0.011	0.009	0.009	0.009	0.009	0.010	0.020	0.021	0.011	0.012	0.021
1125	0.011	0.007	0.011	0.009	0.009	0.009	0.009	0.010	0.019	0.019	0.013	0.013	0.019
1175	0.012	0.007	0.011	0.009	0.009	0.008	0.009	0.010	0.019	0.018	0.012	0.012	0.019
1225	0.011	0.007	0.010	0.009	0.009	0.008	0.008	0.009	0.019	0.019	0.012	0.012	0.019
1275	0.011	0.007	0.010	0.009	0.009	0.008	0.008	0.009	0.019	0.018	0.012	0.012	0.019
1325	0.013	0.008	0.012	0.011	0.011	0.010	0.011	0.012	0.019	0.019	0.013	0.014	0.019
1375	0.011	0.007	0.010	0.009	0.009	0.008	0.008	0.009	0.017	0.018	0.011	0.012	0.018
1425	0.013	0.008	0.012	0.011	0.011	0.011	0.011	0.012	0.018	0.019	0.014	0.014	0.019
1475	0.011	0.006	0.010	0.009	0.009	0.008	0.008	0.010	0.017	0.017	0.012	0.012	0.017
1525	0.011	0.006	0.010	0.009	0.009	0.009	0.009	0.009	0.017	0.017	0.011	0.012	0.017
1575	0.011	0.006	0.010	0.009	0.009	0.009	0.009	0.010	0.016	0.016	0.012	0.012	0.016
1625	0.011	0.006	0.010	0.009	0.009	0.008	0.009	0.010	0.016	0.016	0.011	0.012	0.016
1675	0.012	0.007	0.010	0.010	0.009	0.009	0.009	0.010	0.016	0.016	0.012	0.012	0.016
1725	0.011	0.006	0.010	0.010	0.009	0.009	0.009	0.010	0.016	0.016	0.012	0.012	0.016
1775	0.012	0.006	0.010	0.010	0.009	0.009	0.009	0.010	0.016	0.016	0.012	0.012	0.016
1825	0.012	0.006	0.010	0.010	0.010	0.009	0.009	0.010	0.015	0.016	0.012	0.012	0.016
1875	0.012	0.006	0.010	0.010	0.009	0.009	0.009	0.010	0.015	0.016	0.013	0.013	0.016
1925	0.013	0.007	0.011	0.010	0.010	0.010	0.010	0.011	0.017	0.016	0.013	0.013	0.017
1975	0.013	0.007	0.011	0.010	0.010	0.010	0.010	0.010	0.017	0.016	0.013	0.013	0.017

Model: HYD 8KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.014	0.016	0.026	0.028	0.025	0.021	0.022	0.038	0.157	0.193	0.096	0.160	0.193
125	0.021	0.020	0.033	0.031	0.027	0.023	0.024	0.032	0.051	0.062	0.028	0.043	0.062
175	0.021	0.024	0.039	0.036	0.034	0.031	0.030	0.038	0.077	0.083	0.031	0.032	0.083
225	0.017	0.021	0.037	0.039	0.038	0.035	0.035	0.040	0.114	0.127	0.026	0.032	0.127
275	0.019	0.020	0.035	0.034	0.035	0.034	0.034	0.038	0.078	0.085	0.021	0.028	0.085
325	0.017	0.018	0.032	0.032	0.031	0.028	0.029	0.039	0.070	0.080	0.020	0.026	0.080
375	0.015	0.015	0.024	0.023	0.023	0.024	0.025	0.028	0.060	0.072	0.024	0.028	0.072
425	0.014	0.015	0.024	0.023	0.023	0.021	0.022	0.025	0.052	0.060	0.019	0.022	0.060
475	0.014	0.012	0.019	0.018	0.018	0.018	0.019	0.021	0.049	0.056	0.016	0.020	0.056
525	0.013	0.011	0.017	0.017	0.016	0.016	0.016	0.018	0.043	0.048	0.018	0.021	0.048
575	0.013	0.010	0.016	0.015	0.015	0.015	0.015	0.018	0.037	0.041	0.016	0.018	0.041
625	0.012	0.010	0.015	0.013	0.014	0.013	0.013	0.016	0.033	0.036	0.015	0.016	0.036
675	0.012	0.009	0.014	0.013	0.013	0.012	0.013	0.015	0.030	0.033	0.016	0.017	0.033
725	0.012	0.009	0.014	0.012	0.012	0.012	0.012	0.014	0.028	0.030	0.014	0.014	0.030
775	0.012	0.009	0.013	0.011	0.011	0.011	0.011	0.013	0.026	0.029	0.013	0.014	0.029
825	0.012	0.008	0.012	0.011	0.011	0.010	0.011	0.012	0.023	0.027	0.015	0.014	0.027
875	0.012	0.008	0.012	0.010	0.010	0.010	0.010	0.012	0.024	0.025	0.014	0.013	0.025
925	0.012	0.008	0.012	0.010	0.010	0.009	0.010	0.011	0.023	0.025	0.014	0.013	0.025
975	0.011	0.008	0.011	0.010	0.009	0.009	0.009	0.011	0.022	0.024	0.015	0.013	0.024
1025	0.012	0.008	0.011	0.010	0.010	0.009	0.009	0.010	0.021	0.023	0.012	0.013	0.023
1075	0.012	0.007	0.012	0.010	0.009	0.009	0.009	0.010	0.019	0.021	0.012	0.012	0.021
1125	0.011	0.007	0.011	0.009	0.009	0.009	0.009	0.010	0.020	0.021	0.014	0.014	0.021
1175	0.011	0.007	0.011	0.009	0.009	0.009	0.009	0.010	0.018	0.020	0.012	0.011	0.020
1225	0.011	0.007	0.011	0.009	0.009	0.008	0.009	0.010	0.018	0.020	0.012	0.012	0.020
1275	0.011	0.007	0.010	0.009	0.009	0.008	0.009	0.009	0.019	0.020	0.013	0.013	0.020
1325	0.013	0.008	0.012	0.011	0.011	0.011	0.011	0.011	0.019	0.020	0.013	0.014	0.020
1375	0.011	0.007	0.010	0.009	0.009	0.009	0.009	0.010	0.017	0.019	0.012	0.012	0.019
1425	0.014	0.008	0.013	0.012	0.012	0.012	0.012	0.012	0.020	0.021	0.015	0.015	0.021
1475	0.012	0.007	0.010	0.009	0.009	0.010	0.009	0.010	0.017	0.019	0.013	0.012	0.019
1525	0.012	0.007	0.011	0.009	0.009	0.009	0.009	0.010	0.017	0.018	0.012	0.012	0.018
1575	0.012	0.007	0.011	0.010	0.010	0.009	0.010	0.010	0.017	0.019	0.013	0.012	0.019
1625	0.011	0.006	0.010	0.010	0.009	0.009	0.009	0.010	0.016	0.018	0.011	0.012	0.018
1675	0.012	0.006	0.011	0.011	0.010	0.009	0.010	0.011	0.016	0.017	0.012	0.012	0.017
1725	0.011	0.006	0.010	0.010	0.009	0.009	0.009	0.010	0.015	0.016	0.012	0.012	0.016
1775	0.012	0.007	0.010	0.010	0.010	0.010	0.010	0.011	0.016	0.017	0.012	0.012	0.017
1825	0.012	0.006	0.011	0.010	0.010	0.009	0.009	0.010	0.016	0.017	0.012	0.012	0.017
1875	0.012	0.006	0.010	0.010	0.010	0.010	0.010	0.010	0.016	0.018	0.013	0.013	0.018
1925	0.013	0.007	0.011	0.010	0.010	0.010	0.010	0.010	0.016	0.018	0.013	0.013	0.018
1975	0.013	0.007	0.011	0.010	0.010	0.010	0.010	0.011	0.016	0.017	0.013	0.013	0.017

Model: HYD 10KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.013	0.017	0.017	0.017	0.026	0.024	0.024	0.028	0.031	0.031	0.031	0.034	0.034
125	0.016	0.023	0.022	0.022	0.033	0.030	0.030	0.032	0.033	0.034	0.030	0.031	0.034
175	0.016	0.025	0.026	0.026	0.045	0.042	0.042	0.043	0.044	0.045	0.041	0.042	0.045
225	0.018	0.029	0.035	0.034	0.054	0.050	0.050	0.055	0.057	0.056	0.051	0.051	0.057
275	0.017	0.031	0.035	0.034	0.060	0.060	0.060	0.062	0.066	0.062	0.060	0.059	0.066
325	0.020	0.031	0.038	0.035	0.065	0.062	0.062	0.064	0.067	0.071	0.063	0.063	0.071
375	0.023	0.030	0.038	0.041	0.067	0.061	0.061	0.064	0.067	0.067	0.059	0.066	0.067
425	0.017	0.030	0.033	0.031	0.062	0.059	0.059	0.062	0.063	0.065	0.056	0.062	0.065
475	0.017	0.028	0.032	0.029	0.060	0.059	0.059	0.056	0.055	0.060	0.054	0.063	0.063
525	0.021	0.027	0.031	0.031	0.056	0.052	0.052	0.051	0.054	0.054	0.051	0.059	0.059
575	0.020	0.026	0.029	0.031	0.050	0.048	0.048	0.047	0.050	0.052	0.049	0.050	0.052
625	0.019	0.026	0.026	0.028	0.045	0.043	0.043	0.041	0.044	0.044	0.045	0.047	0.047
675	0.021	0.027	0.027	0.028	0.042	0.040	0.040	0.040	0.041	0.042	0.041	0.044	0.044
725	0.016	0.023	0.022	0.020	0.037	0.035	0.035	0.035	0.036	0.040	0.035	0.039	0.040
775	0.017	0.022	0.021	0.020	0.033	0.034	0.034	0.032	0.033	0.035	0.033	0.039	0.039
825	0.018	0.021	0.023	0.023	0.033	0.033	0.033	0.030	0.033	0.035	0.032	0.036	0.036
875	0.018	0.021	0.021	0.021	0.031	0.031	0.031	0.032	0.038	0.037	0.033	0.033	0.038
925	0.018	0.020	0.021	0.022	0.030	0.030	0.030	0.034	0.034	0.037	0.030	0.033	0.037
975	0.019	0.019	0.021	0.019	0.029	0.029	0.029	0.027	0.027	0.030	0.028	0.030	0.030
1025	0.015	0.017	0.017	0.016	0.027	0.028	0.028	0.026	0.028	0.028	0.026	0.028	0.028
1075	0.015	0.017	0.017	0.016	0.026	0.029	0.029	0.025	0.026	0.027	0.030	0.027	0.030
1125	0.018	0.017	0.019	0.019	0.027	0.028	0.028	0.024	0.023	0.024	0.024	0.025	0.028
1175	0.016	0.017	0.018	0.016	0.025	0.024	0.024	0.024	0.025	0.025	0.024	0.025	0.025
1225	0.017	0.017	0.017	0.016	0.025	0.023	0.023	0.023	0.024	0.024	0.023	0.024	0.025
1275	0.021	0.018	0.018	0.016	0.026	0.025	0.025	0.022	0.021	0.023	0.022	0.025	0.026
1325	0.017	0.019	0.016	0.016	0.025	0.024	0.024	0.022	0.023	0.024	0.023	0.025	0.025
1375	0.015	0.016	0.016	0.014	0.024	0.022	0.022	0.021	0.021	0.022	0.021	0.023	0.024
1425	0.021	0.018	0.020	0.017	0.024	0.023	0.023	0.022	0.022	0.022	0.022	0.025	0.025
1475	0.017	0.016	0.016	0.014	0.022	0.022	0.022	0.020	0.022	0.021	0.022	0.024	0.024
1525	0.017	0.015	0.015	0.018	0.021	0.021	0.021	0.019	0.021	0.021	0.021	0.024	0.024
1575	0.018	0.016	0.016	0.016	0.022	0.022	0.022	0.019	0.019	0.020	0.020	0.025	0.025
1625	0.016	0.014	0.013	0.013	0.021	0.020	0.020	0.019	0.019	0.020	0.019	0.022	0.022
1675	0.017	0.015	0.013	0.014	0.020	0.019	0.019	0.019	0.020	0.021	0.019	0.022	0.022
1725	0.019	0.015	0.015	0.015	0.022	0.020	0.020	0.020	0.020	0.021	0.020	0.022	0.022
1775	0.019	0.015	0.015	0.016	0.022	0.022	0.022	0.020	0.021	0.021	0.021	0.021	0.022
1825	0.018	0.015	0.014	0.015	0.020	0.020	0.020	0.019	0.020	0.021	0.020	0.020	0.021
1875	0.020	0.016	0.016	0.017	0.022	0.021	0.021	0.020	0.021	0.021	0.020	0.021	0.022
1925	0.021	0.018	0.015	0.016	0.023	0.023	0.023	0.023	0.022	0.025	0.023	0.023	0.025
1975	0.027	0.023	0.022	0.022	0.026	0.025	0.025	0.025	0.026	0.027	0.026	0.028	0.028

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Model: HYD 10KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.013	0.017	0.018	0.018	0.027	0.025	0.027	0.027	0.030	0.032	0.032	0.031	0.032
125	0.015	0.022	0.023	0.022	0.033	0.030	0.031	0.032	0.033	0.032	0.032	0.031	0.033
175	0.016	0.026	0.028	0.026	0.044	0.042	0.042	0.044	0.045	0.042	0.043	0.043	0.045
225	0.018	0.030	0.033	0.032	0.054	0.051	0.051	0.055	0.057	0.052	0.054	0.053	0.057
275	0.018	0.033	0.037	0.036	0.061	0.058	0.060	0.065	0.063	0.059	0.060	0.062	0.065
325	0.021	0.032	0.038	0.036	0.064	0.061	0.062	0.068	0.066	0.062	0.063	0.067	0.068
375	0.021	0.030	0.037	0.036	0.064	0.062	0.060	0.066	0.068	0.064	0.062	0.064	0.068
425	0.017	0.031	0.035	0.034	0.062	0.057	0.057	0.065	0.063	0.061	0.060	0.064	0.065
475	0.016	0.028	0.033	0.031	0.058	0.054	0.052	0.058	0.057	0.057	0.056	0.061	0.061
525	0.019	0.027	0.030	0.031	0.054	0.053	0.049	0.052	0.049	0.050	0.050	0.057	0.057
575	0.021	0.028	0.030	0.030	0.049	0.047	0.044	0.049	0.048	0.046	0.048	0.051	0.051
625	0.019	0.027	0.026	0.026	0.043	0.040	0.038	0.043	0.042	0.042	0.044	0.047	0.047
675	0.019	0.025	0.025	0.027	0.040	0.037	0.036	0.041	0.039	0.039	0.042	0.044	0.044
725	0.016	0.023	0.023	0.023	0.035	0.032	0.034	0.036	0.037	0.035	0.037	0.039	0.039
775	0.015	0.022	0.023	0.021	0.033	0.031	0.031	0.035	0.033	0.034	0.034	0.039	0.039
825	0.018	0.020	0.021	0.022	0.031	0.033	0.028	0.031	0.030	0.032	0.034	0.036	0.036
875	0.018	0.021	0.022	0.021	0.031	0.029	0.028	0.032	0.032	0.030	0.030	0.032	0.032
925	0.020	0.020	0.020	0.021	0.030	0.027	0.027	0.031	0.030	0.030	0.030	0.031	0.031
975	0.018	0.018	0.019	0.019	0.027	0.026	0.026	0.028	0.027	0.027	0.028	0.030	0.030
1025	0.015	0.018	0.019	0.018	0.027	0.026	0.025	0.027	0.026	0.026	0.026	0.028	0.028
1075	0.014	0.016	0.018	0.017	0.026	0.024	0.024	0.025	0.024	0.024	0.027	0.027	0.027
1125	0.016	0.017	0.018	0.017	0.025	0.023	0.022	0.024	0.022	0.022	0.024	0.027	0.027
1175	0.017	0.018	0.019	0.016	0.025	0.023	0.021	0.023	0.022	0.022	0.024	0.026	0.026
1225	0.018	0.018	0.017	0.016	0.024	0.022	0.021	0.023	0.022	0.021	0.023	0.025	0.025
1275	0.018	0.016	0.016	0.015	0.024	0.022	0.021	0.022	0.021	0.022	0.023	0.026	0.026
1325	0.017	0.019	0.018	0.017	0.025	0.022	0.020	0.024	0.022	0.023	0.024	0.026	0.026
1375	0.014	0.015	0.016	0.014	0.022	0.020	0.019	0.022	0.020	0.020	0.022	0.024	0.024
1425	0.020	0.017	0.018	0.016	0.023	0.022	0.020	0.022	0.021	0.021	0.023	0.026	0.026
1475	0.017	0.015	0.015	0.014	0.021	0.020	0.019	0.021	0.019	0.019	0.021	0.024	0.024
1525	0.017	0.015	0.016	0.015	0.021	0.021	0.017	0.020	0.019	0.019	0.020	0.024	0.024
1575	0.017	0.015	0.015	0.014	0.022	0.019	0.019	0.020	0.018	0.019	0.019	0.025	0.025
1625	0.015	0.014	0.014	0.014	0.020	0.018	0.017	0.019	0.019	0.019	0.020	0.023	0.023
1675	0.016	0.014	0.014	0.014	0.019	0.018	0.018	0.020	0.019	0.019	0.020	0.022	0.022
1725	0.018	0.014	0.014	0.015	0.020	0.019	0.017	0.019	0.019	0.019	0.019	0.023	0.023
1775	0.019	0.016	0.015	0.015	0.021	0.020	0.018	0.020	0.019	0.018	0.020	0.022	0.022
1825	0.019	0.015	0.014	0.015	0.020	0.019	0.017	0.019	0.019	0.019	0.019	0.021	0.021
1875	0.018	0.015	0.015	0.015	0.021	0.019	0.018	0.019	0.019	0.019	0.019	0.021	0.021
1925	0.019	0.016	0.015	0.016	0.023	0.019	0.018	0.021	0.020	0.021	0.020	0.022	0.023
1975	0.021	0.017	0.017	0.017	0.023	0.020	0.019	0.021	0.021	0.021	0.022	0.022	0.023

Model: HYD 10KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.014	0.017	0.018	0.017	0.028	0.026	0.028	0.028	0.030	0.031	0.035	0.033	0.035
125	0.016	0.021	0.023	0.021	0.034	0.032	0.032	0.031	0.032	0.033	0.033	0.031	0.034
175	0.017	0.025	0.026	0.025	0.045	0.045	0.043	0.042	0.043	0.044	0.045	0.042	0.045
225	0.020	0.029	0.034	0.033	0.056	0.056	0.055	0.054	0.057	0.057	0.057	0.052	0.057
275	0.019	0.034	0.038	0.037	0.061	0.061	0.060	0.059	0.064	0.061	0.064	0.059	0.064
325	0.021	0.033	0.040	0.039	0.063	0.066	0.066	0.062	0.063	0.064	0.066	0.062	0.066
375	0.023	0.030	0.036	0.039	0.066	0.069	0.066	0.067	0.069	0.069	0.067	0.066	0.069
425	0.018	0.030	0.033	0.033	0.065	0.064	0.061	0.061	0.064	0.062	0.065	0.062	0.065
475	0.018	0.028	0.031	0.031	0.061	0.062	0.056	0.056	0.059	0.055	0.060	0.062	0.062
525	0.022	0.027	0.030	0.032	0.056	0.058	0.051	0.055	0.054	0.054	0.055	0.058	0.058
575	0.021	0.030	0.032	0.033	0.049	0.051	0.047	0.048	0.049	0.048	0.050	0.050	0.051
625	0.019	0.029	0.028	0.029	0.045	0.044	0.043	0.043	0.044	0.045	0.048	0.047	0.048
675	0.022	0.027	0.026	0.030	0.042	0.043	0.042	0.044	0.043	0.043	0.045	0.046	0.046
725	0.016	0.023	0.023	0.022	0.037	0.036	0.037	0.038	0.038	0.037	0.040	0.040	0.040
775	0.016	0.021	0.022	0.021	0.034	0.035	0.035	0.035	0.035	0.034	0.036	0.041	0.041
825	0.020	0.022	0.022	0.024	0.033	0.035	0.032	0.034	0.034	0.035	0.035	0.038	0.038
875	0.019	0.022	0.024	0.023	0.032	0.031	0.031	0.032	0.032	0.033	0.034	0.034	0.034
925	0.019	0.020	0.022	0.022	0.030	0.029	0.030	0.031	0.030	0.032	0.032	0.033	0.033
975	0.019	0.018	0.020	0.020	0.028	0.030	0.031	0.031	0.030	0.030	0.030	0.032	0.032
1025	0.016	0.017	0.018	0.017	0.028	0.029	0.027	0.028	0.027	0.027	0.029	0.031	0.031
1075	0.015	0.017	0.017	0.017	0.027	0.028	0.025	0.027	0.024	0.025	0.028	0.029	0.029
1125	0.019	0.018	0.018	0.018	0.026	0.027	0.024	0.026	0.024	0.025	0.027	0.029	0.029
1175	0.017	0.019	0.020	0.017	0.025	0.024	0.023	0.025	0.024	0.024	0.026	0.028	0.028
1225	0.017	0.018	0.019	0.018	0.025	0.025	0.023	0.023	0.023	0.022	0.024	0.025	0.025
1275	0.019	0.017	0.017	0.016	0.025	0.025	0.023	0.025	0.023	0.023	0.024	0.026	0.026
1325	0.018	0.019	0.018	0.017	0.025	0.025	0.022	0.024	0.023	0.024	0.026	0.027	0.027
1375	0.015	0.015	0.016	0.014	0.023	0.022	0.021	0.022	0.021	0.021	0.023	0.024	0.024
1425	0.021	0.017	0.019	0.017	0.024	0.025	0.022	0.024	0.023	0.023	0.024	0.026	0.026
1475	0.018	0.016	0.017	0.015	0.021	0.021	0.021	0.021	0.021	0.020	0.022	0.024	0.024
1525	0.017	0.016	0.017	0.017	0.021	0.022	0.020	0.020	0.020	0.020	0.022	0.023	0.023
1575	0.019	0.016	0.016	0.016	0.022	0.021	0.020	0.022	0.019	0.021	0.022	0.024	0.024
1625	0.015	0.014	0.014	0.014	0.021	0.020	0.019	0.021	0.019	0.020	0.022	0.023	0.023
1675	0.017	0.015	0.014	0.014	0.020	0.021	0.020	0.021	0.020	0.020	0.022	0.023	0.023
1725	0.019	0.015	0.015	0.015	0.021	0.021	0.020	0.021	0.021	0.021	0.021	0.023	0.023
1775	0.020	0.016	0.016	0.017	0.023	0.021	0.020	0.022	0.021	0.021	0.021	0.022	0.023
1825	0.020	0.016	0.015	0.016	0.021	0.021	0.019	0.020	0.020	0.020	0.022	0.022	0.022
1875	0.020	0.016	0.016	0.017	0.021	0.022	0.020	0.021	0.022	0.022	0.022	0.023	0.023
1925	0.022	0.018	0.016	0.017	0.023	0.023	0.020	0.023	0.022	0.024	0.024	0.025	0.025
1975	0.028	0.024	0.022	0.023	0.026	0.026	0.023	0.025	0.025	0.025	0.027	0.027	0.028

Model: HYD 15KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.015	0.022	0.025	0.024	0.024	0.025	0.025	0.026	0.027	0.027	0.032	0.035	0.035
125	0.019	0.029	0.034	0.031	0.030	0.032	0.032	0.030	0.031	0.031	0.041	0.046	0.046
175	0.022	0.035	0.046	0.043	0.042	0.045	0.045	0.042	0.044	0.042	0.053	0.058	0.058
225	0.021	0.040	0.054	0.051	0.051	0.055	0.055	0.051	0.053	0.051	0.066	0.071	0.071
275	0.023	0.042	0.056	0.054	0.056	0.059	0.059	0.054	0.058	0.059	0.077	0.086	0.086
325	0.022	0.041	0.056	0.052	0.051	0.054	0.054	0.052	0.059	0.058	0.072	0.087	0.087
375	0.022	0.038	0.054	0.049	0.049	0.051	0.051	0.048	0.054	0.053	0.070	0.086	0.086
425	0.022	0.032	0.045	0.041	0.040	0.040	0.040	0.040	0.050	0.048	0.062	0.081	0.081
475	0.020	0.029	0.040	0.038	0.035	0.035	0.035	0.036	0.045	0.042	0.053	0.074	0.074
525	0.020	0.028	0.038	0.033	0.031	0.032	0.032	0.033	0.039	0.037	0.050	0.066	0.066
575	0.019	0.028	0.030	0.028	0.030	0.029	0.029	0.031	0.034	0.035	0.046	0.059	0.059
625	0.018	0.024	0.026	0.027	0.025	0.027	0.027	0.026	0.031	0.031	0.038	0.053	0.053
675	0.017	0.024	0.024	0.027	0.025	0.030	0.030	0.024	0.030	0.029	0.039	0.053	0.053
725	0.016	0.021	0.021	0.020	0.023	0.020	0.020	0.022	0.027	0.027	0.034	0.046	0.046
775	0.015	0.019	0.021	0.020	0.019	0.019	0.019	0.021	0.025	0.025	0.032	0.047	0.047
825	0.014	0.019	0.021	0.020	0.019	0.020	0.020	0.019	0.024	0.024	0.031	0.041	0.041
875	0.015	0.018	0.019	0.018	0.018	0.019	0.019	0.021	0.023	0.023	0.029	0.038	0.038
925	0.014	0.019	0.019	0.018	0.018	0.020	0.020	0.019	0.021	0.021	0.027	0.036	0.036
975	0.014	0.019	0.018	0.017	0.017	0.018	0.018	0.017	0.019	0.019	0.026	0.049	0.049
1025	0.013	0.016	0.017	0.016	0.015	0.015	0.015	0.016	0.018	0.017	0.023	0.030	0.030
1075	0.012	0.015	0.017	0.017	0.014	0.015	0.015	0.015	0.018	0.017	0.023	0.029	0.029
1125	0.012	0.016	0.017	0.016	0.014	0.013	0.013	0.015	0.016	0.016	0.021	0.027	0.027
1175	0.012	0.016	0.015	0.015	0.013	0.014	0.014	0.015	0.016	0.016	0.020	0.025	0.025
1225	0.012	0.016	0.015	0.014	0.013	0.013	0.013	0.015	0.017	0.015	0.020	0.024	0.024
1275	0.013	0.015	0.015	0.015	0.013	0.013	0.013	0.014	0.016	0.014	0.019	0.022	0.022
1325	0.012	0.014	0.015	0.014	0.013	0.013	0.013	0.014	0.016	0.015	0.018	0.020	0.020
1375	0.012	0.013	0.014	0.013	0.012	0.013	0.013	0.013	0.015	0.014	0.017	0.019	0.019
1425	0.012	0.013	0.015	0.014	0.012	0.013	0.013	0.013	0.016	0.014	0.017	0.019	0.019
1475	0.013	0.012	0.013	0.013	0.012	0.013	0.013	0.013	0.015	0.014	0.016	0.020	0.020
1525	0.012	0.012	0.013	0.013	0.012	0.012	0.012	0.012	0.015	0.014	0.017	0.019	0.019
1575	0.012	0.012	0.013	0.014	0.011	0.012	0.012	0.012	0.015	0.014	0.017	0.027	0.027
1625	0.013	0.011	0.013	0.012	0.011	0.011	0.011	0.012	0.015	0.014	0.015	0.019	0.019
1675	0.012	0.011	0.013	0.012	0.011	0.012	0.012	0.012	0.015	0.014	0.015	0.019	0.019
1725	0.012	0.012	0.014	0.013	0.011	0.012	0.012	0.012	0.015	0.014	0.016	0.021	0.021
1775	0.013	0.013	0.013	0.013	0.012	0.013	0.013	0.013	0.015	0.014	0.016	0.026	0.026
1825	0.014	0.011	0.013	0.013	0.011	0.012	0.012	0.012	0.014	0.015	0.017	0.021	0.021
1875	0.013	0.012	0.014	0.013	0.011	0.013	0.013	0.012	0.014	0.015	0.019	0.025	0.025
1925	0.016	0.013	0.014	0.014	0.012	0.013	0.013	0.013	0.015	0.017	0.022	0.028	0.028
1975	0.017	0.014	0.015	0.015	0.015	0.016	0.016	0.017	0.019	0.020	0.022	0.027	0.027

Model: HYD 15KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.016	0.022	0.024	0.023	0.024	0.027	0.027	0.026	0.026	0.030	0.035	0.038	0.038
125	0.018	0.029	0.033	0.031	0.031	0.032	0.032	0.031	0.029	0.032	0.041	0.046	0.046
175	0.019	0.036	0.044	0.042	0.043	0.046	0.044	0.044	0.041	0.045	0.053	0.059	0.059
225	0.021	0.039	0.053	0.048	0.052	0.057	0.055	0.054	0.050	0.055	0.065	0.074	0.074
275	0.021	0.040	0.056	0.054	0.054	0.060	0.056	0.057	0.055	0.059	0.072	0.078	0.078
325	0.020	0.038	0.056	0.051	0.051	0.055	0.053	0.055	0.054	0.058	0.069	0.078	0.078
375	0.021	0.036	0.052	0.047	0.047	0.052	0.049	0.049	0.048	0.055	0.069	0.077	0.077
425	0.020	0.032	0.044	0.038	0.038	0.044	0.043	0.042	0.045	0.049	0.059	0.065	0.065
475	0.020	0.029	0.041	0.036	0.034	0.037	0.040	0.038	0.040	0.044	0.051	0.058	0.058
525	0.020	0.029	0.036	0.032	0.033	0.031	0.035	0.032	0.035	0.037	0.048	0.054	0.054
575	0.018	0.029	0.031	0.029	0.027	0.029	0.030	0.030	0.031	0.036	0.045	0.048	0.048
625	0.017	0.022	0.026	0.026	0.023	0.028	0.026	0.025	0.028	0.031	0.038	0.044	0.044
675	0.017	0.022	0.023	0.023	0.024	0.027	0.025	0.024	0.029	0.030	0.036	0.045	0.045
725	0.015	0.020	0.021	0.020	0.021	0.023	0.021	0.023	0.024	0.027	0.034	0.036	0.036
775	0.014	0.020	0.021	0.019	0.018	0.021	0.020	0.021	0.024	0.026	0.031	0.035	0.035
825	0.015	0.018	0.020	0.019	0.016	0.019	0.018	0.021	0.021	0.024	0.031	0.032	0.032
875	0.014	0.018	0.019	0.019	0.017	0.018	0.019	0.019	0.020	0.022	0.029	0.031	0.031
925	0.014	0.018	0.018	0.018	0.016	0.018	0.017	0.018	0.018	0.021	0.026	0.029	0.029
975	0.014	0.018	0.018	0.016	0.016	0.017	0.016	0.017	0.017	0.019	0.024	0.033	0.033
1025	0.012	0.016	0.018	0.016	0.014	0.015	0.015	0.016	0.017	0.018	0.023	0.025	0.025
1075	0.011	0.016	0.017	0.016	0.013	0.015	0.014	0.015	0.016	0.016	0.022	0.024	0.024
1125	0.012	0.015	0.016	0.015	0.013	0.014	0.014	0.015	0.015	0.016	0.021	0.023	0.023
1175	0.011	0.015	0.016	0.015	0.012	0.014	0.014	0.015	0.015	0.015	0.020	0.022	0.022
1225	0.011	0.014	0.015	0.014	0.012	0.013	0.013	0.015	0.015	0.015	0.018	0.022	0.022
1275	0.012	0.014	0.015	0.013	0.013	0.014	0.013	0.015	0.015	0.015	0.017	0.021	0.021
1325	0.013	0.014	0.015	0.014	0.013	0.014	0.014	0.015	0.015	0.015	0.017	0.020	0.020
1375	0.011	0.013	0.014	0.013	0.011	0.012	0.013	0.013	0.014	0.014	0.015	0.018	0.018
1425	0.013	0.014	0.015	0.014	0.012	0.013	0.013	0.014	0.015	0.015	0.017	0.019	0.019
1475	0.012	0.012	0.013	0.013	0.011	0.012	0.012	0.013	0.014	0.014	0.015	0.019	0.019
1525	0.012	0.011	0.013	0.013	0.011	0.012	0.012	0.013	0.014	0.014	0.016	0.019	0.019
1575	0.012	0.011	0.013	0.012	0.011	0.012	0.012	0.013	0.014	0.015	0.015	0.021	0.021
1625	0.011	0.011	0.013	0.012	0.010	0.012	0.011	0.012	0.014	0.014	0.015	0.018	0.018
1675	0.012	0.011	0.013	0.012	0.011	0.012	0.012	0.013	0.014	0.015	0.015	0.018	0.018
1725	0.012	0.011	0.014	0.012	0.011	0.012	0.012	0.013	0.014	0.014	0.015	0.018	0.018
1775	0.013	0.012	0.014	0.013	0.011	0.013	0.012	0.013	0.014	0.015	0.015	0.020	0.020
1825	0.012	0.011	0.013	0.013	0.011	0.012	0.012	0.012	0.013	0.014	0.016	0.019	0.019
1875	0.013	0.011	0.014	0.012	0.011	0.012	0.012	0.012	0.013	0.015	0.017	0.021	0.021
1925	0.013	0.012	0.015	0.013	0.011	0.013	0.012	0.013	0.013	0.015	0.018	0.022	0.022
1975	0.013	0.012	0.015	0.013	0.012	0.013	0.013	0.014	0.014	0.016	0.019	0.022	0.022

Model: HYD 15KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.016	0.023	0.025	0.023	0.024	0.025	0.029	0.027	0.027	0.028	0.034	0.038	0.038
125	0.020	0.030	0.032	0.033	0.031	0.031	0.032	0.031	0.030	0.032	0.043	0.051	0.051
175	0.021	0.036	0.043	0.044	0.043	0.044	0.046	0.044	0.044	0.043	0.057	0.066	0.066
225	0.022	0.042	0.049	0.052	0.055	0.056	0.059	0.056	0.053	0.054	0.069	0.080	0.080
275	0.021	0.043	0.053	0.056	0.056	0.057	0.059	0.057	0.058	0.060	0.076	0.092	0.092
325	0.022	0.041	0.054	0.052	0.054	0.054	0.056	0.056	0.056	0.060	0.072	0.091	0.091
375	0.023	0.038	0.049	0.048	0.052	0.053	0.055	0.054	0.051	0.057	0.073	0.094	0.094
425	0.021	0.033	0.044	0.042	0.041	0.042	0.044	0.046	0.047	0.051	0.063	0.083	0.083
475	0.020	0.029	0.038	0.040	0.035	0.037	0.040	0.039	0.042	0.045	0.056	0.070	0.070
525	0.020	0.029	0.034	0.033	0.034	0.032	0.038	0.035	0.037	0.040	0.049	0.065	0.065
575	0.019	0.032	0.031	0.030	0.031	0.029	0.032	0.031	0.032	0.034	0.044	0.055	0.055
625	0.018	0.025	0.026	0.028	0.026	0.029	0.028	0.027	0.029	0.032	0.040	0.052	0.052
675	0.018	0.024	0.023	0.028	0.025	0.029	0.030	0.026	0.030	0.030	0.042	0.053	0.053
725	0.016	0.020	0.021	0.022	0.021	0.024	0.023	0.026	0.025	0.028	0.035	0.043	0.043
775	0.015	0.019	0.020	0.020	0.020	0.021	0.021	0.022	0.025	0.027	0.033	0.041	0.041
825	0.015	0.019	0.020	0.022	0.020	0.020	0.021	0.022	0.023	0.025	0.032	0.040	0.040
875	0.014	0.018	0.019	0.019	0.018	0.019	0.019	0.021	0.021	0.022	0.029	0.035	0.035
925	0.013	0.018	0.018	0.018	0.018	0.018	0.018	0.019	0.019	0.021	0.027	0.034	0.034
975	0.014	0.018	0.018	0.018	0.018	0.019	0.018	0.018	0.019	0.020	0.026	0.039	0.039
1025	0.013	0.016	0.017	0.016	0.015	0.016	0.016	0.017	0.017	0.018	0.024	0.028	0.028
1075	0.012	0.015	0.017	0.017	0.015	0.015	0.015	0.016	0.017	0.018	0.023	0.029	0.029
1125	0.013	0.016	0.016	0.016	0.014	0.014	0.015	0.016	0.016	0.018	0.022	0.028	0.028
1175	0.012	0.015	0.015	0.016	0.014	0.014	0.015	0.015	0.016	0.016	0.020	0.025	0.025
1225	0.012	0.015	0.014	0.015	0.014	0.014	0.014	0.015	0.015	0.016	0.019	0.025	0.025
1275	0.013	0.015	0.015	0.014	0.014	0.015	0.014	0.015	0.015	0.017	0.019	0.024	0.024
1325	0.013	0.014	0.015	0.015	0.013	0.014	0.014	0.015	0.016	0.016	0.018	0.022	0.022
1375	0.011	0.013	0.014	0.014	0.012	0.013	0.013	0.014	0.015	0.014	0.017	0.021	0.021
1425	0.014	0.014	0.015	0.015	0.014	0.014	0.014	0.015	0.016	0.016	0.018	0.022	0.022
1475	0.012	0.013	0.013	0.014	0.012	0.013	0.013	0.013	0.015	0.014	0.016	0.020	0.020
1525	0.012	0.012	0.013	0.014	0.012	0.013	0.013	0.013	0.015	0.014	0.016	0.020	0.020
1575	0.014	0.012	0.014	0.014	0.012	0.012	0.013	0.013	0.015	0.016	0.017	0.023	0.023
1625	0.012	0.012	0.013	0.013	0.011	0.012	0.012	0.013	0.014	0.015	0.016	0.020	0.020
1675	0.012	0.012	0.013	0.012	0.011	0.013	0.012	0.013	0.014	0.015	0.016	0.019	0.019
1725	0.013	0.012	0.013	0.014	0.012	0.013	0.013	0.013	0.014	0.015	0.017	0.021	0.021
1775	0.013	0.013	0.015	0.014	0.012	0.013	0.013	0.013	0.014	0.015	0.016	0.021	0.021
1825	0.012	0.012	0.013	0.013	0.012	0.013	0.013	0.013	0.014	0.015	0.017	0.020	0.020
1875	0.014	0.012	0.014	0.013	0.013	0.013	0.013	0.013	0.014	0.016	0.019	0.023	0.023
1925	0.015	0.013	0.015	0.013	0.012	0.014	0.014	0.014	0.015	0.018	0.021	0.026	0.026
1975	0.017	0.015	0.017	0.016	0.015	0.016	0.016	0.017	0.018	0.020	0.024	0.026	0.026

Model: HYD 20KTL-3PH													
Phase A													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.014	0.020	0.017	0.017	0.019	0.020	0.020	0.023	0.023	0.026	0.030	0.030	0.030
125	0.015	0.025	0.023	0.023	0.024	0.023	0.023	0.023	0.026	0.026	0.036	0.027	0.036
175	0.017	0.029	0.032	0.033	0.032	0.033	0.033	0.032	0.034	0.034	0.044	0.036	0.044
225	0.016	0.033	0.038	0.041	0.040	0.041	0.041	0.039	0.044	0.042	0.052	0.044	0.052
275	0.017	0.033	0.039	0.042	0.045	0.045	0.045	0.042	0.048	0.048	0.061	0.055	0.061
325	0.018	0.031	0.038	0.041	0.042	0.042	0.042	0.043	0.048	0.048	0.063	0.054	0.063
375	0.017	0.029	0.038	0.037	0.037	0.039	0.039	0.041	0.046	0.045	0.071	0.057	0.071
425	0.017	0.025	0.032	0.030	0.030	0.033	0.033	0.036	0.039	0.041	0.066	0.051	0.066
475	0.018	0.023	0.028	0.025	0.026	0.029	0.029	0.032	0.036	0.037	0.059	0.049	0.059
525	0.016	0.022	0.025	0.023	0.024	0.026	0.026	0.029	0.032	0.033	0.056	0.046	0.056
575	0.015	0.021	0.022	0.022	0.023	0.023	0.023	0.026	0.030	0.031	0.048	0.044	0.048
625	0.014	0.019	0.019	0.022	0.022	0.022	0.022	0.026	0.027	0.027	0.042	0.040	0.042
675	0.015	0.021	0.017	0.021	0.021	0.022	0.022	0.026	0.025	0.025	0.044	0.039	0.044
725	0.012	0.018	0.016	0.017	0.016	0.016	0.016	0.019	0.021	0.022	0.038	0.034	0.038
775	0.012	0.016	0.014	0.014	0.015	0.016	0.016	0.018	0.021	0.020	0.035	0.031	0.035
825	0.011	0.016	0.015	0.015	0.015	0.014	0.014	0.018	0.020	0.020	0.035	0.030	0.035
875	0.011	0.015	0.013	0.014	0.015	0.015	0.015	0.017	0.020	0.019	0.030	0.028	0.030
925	0.012	0.014	0.013	0.014	0.016	0.014	0.014	0.016	0.018	0.018	0.028	0.028	0.028
975	0.011	0.013	0.013	0.013	0.013	0.013	0.013	0.016	0.016	0.018	0.026	0.026	0.026
1025	0.010	0.013	0.012	0.011	0.012	0.012	0.012	0.013	0.015	0.015	0.024	0.023	0.024
1075	0.011	0.012	0.011	0.011	0.011	0.012	0.012	0.012	0.015	0.015	0.023	0.022	0.023
1125	0.011	0.012	0.011	0.011	0.010	0.011	0.011	0.013	0.015	0.015	0.022	0.022	0.022
1175	0.010	0.011	0.010	0.010	0.011	0.012	0.012	0.012	0.015	0.014	0.020	0.020	0.020
1225	0.010	0.011	0.010	0.010	0.011	0.011	0.011	0.012	0.014	0.014	0.018	0.020	0.020
1275	0.010	0.012	0.011	0.010	0.010	0.011	0.011	0.013	0.013	0.014	0.017	0.019	0.019
1325	0.010	0.011	0.010	0.010	0.010	0.010	0.010	0.012	0.013	0.013	0.016	0.017	0.017
1375	0.010	0.010	0.010	0.009	0.009	0.010	0.010	0.011	0.012	0.012	0.016	0.016	0.016
1425	0.011	0.012	0.011	0.010	0.010	0.011	0.011	0.013	0.013	0.013	0.016	0.017	0.017
1475	0.010	0.011	0.010	0.009	0.010	0.010	0.010	0.012	0.012	0.012	0.015	0.016	0.016
1525	0.010	0.010	0.009	0.009	0.010	0.010	0.010	0.011	0.012	0.012	0.016	0.016	0.016
1575	0.010	0.010	0.010	0.009	0.009	0.010	0.010	0.011	0.012	0.012	0.016	0.016	0.016
1625	0.010	0.009	0.009	0.009	0.008	0.009	0.009	0.011	0.012	0.012	0.015	0.015	0.015
1675	0.010	0.009	0.009	0.008	0.009	0.009	0.009	0.011	0.011	0.011	0.015	0.014	0.015
1725	0.010	0.009	0.010	0.008	0.009	0.009	0.009	0.011	0.012	0.012	0.016	0.016	0.016
1775	0.011	0.009	0.010	0.010	0.010	0.010	0.010	0.011	0.011	0.013	0.016	0.015	0.016
1825	0.010	0.009	0.009	0.009	0.009	0.010	0.010	0.011	0.012	0.012	0.017	0.015	0.017
1875	0.010	0.010	0.010	0.009	0.009	0.010	0.010	0.011	0.013	0.012	0.018	0.016	0.018
1925	0.011	0.009	0.010	0.009	0.009	0.010	0.010	0.013	0.014	0.014	0.019	0.018	0.019
1975	0.013	0.011	0.011	0.011	0.011	0.012	0.012	0.015	0.017	0.018	0.024	0.021	0.024

Model: HYD 20KTL-3PH													
Phase B													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.012	0.020	0.017	0.018	0.019	0.021	0.021	0.025	0.026	0.027	0.027	0.028	0.028
125	0.014	0.024	0.023	0.023	0.025	0.024	0.024	0.024	0.025	0.026	0.031	0.027	0.031
175	0.015	0.029	0.032	0.033	0.034	0.034	0.035	0.034	0.034	0.035	0.036	0.037	0.037
225	0.015	0.031	0.036	0.039	0.042	0.041	0.041	0.042	0.042	0.045	0.045	0.045	0.045
275	0.015	0.032	0.038	0.040	0.044	0.044	0.044	0.043	0.046	0.047	0.051	0.053	0.053
325	0.016	0.030	0.036	0.038	0.042	0.042	0.041	0.043	0.046	0.048	0.052	0.055	0.055
375	0.016	0.026	0.034	0.035	0.039	0.039	0.039	0.040	0.046	0.048	0.057	0.058	0.058
425	0.015	0.025	0.030	0.028	0.033	0.033	0.034	0.039	0.038	0.042	0.054	0.048	0.054
475	0.016	0.023	0.027	0.024	0.028	0.030	0.029	0.033	0.034	0.037	0.050	0.045	0.050
525	0.015	0.021	0.023	0.023	0.024	0.026	0.028	0.029	0.030	0.035	0.047	0.043	0.047
575	0.014	0.021	0.020	0.021	0.022	0.024	0.023	0.026	0.028	0.031	0.043	0.042	0.043
625	0.013	0.021	0.018	0.018	0.020	0.021	0.021	0.025	0.024	0.027	0.038	0.038	0.038
675	0.013	0.019	0.017	0.019	0.019	0.020	0.020	0.025	0.025	0.026	0.037	0.037	0.037
725	0.012	0.018	0.016	0.015	0.016	0.017	0.018	0.020	0.020	0.023	0.034	0.030	0.034
775	0.011	0.016	0.015	0.014	0.015	0.016	0.017	0.018	0.019	0.022	0.032	0.028	0.032
825	0.011	0.015	0.014	0.013	0.015	0.015	0.017	0.017	0.018	0.020	0.031	0.027	0.031
875	0.011	0.015	0.013	0.014	0.013	0.015	0.016	0.015	0.018	0.019	0.027	0.026	0.027
925	0.011	0.014	0.013	0.013	0.014	0.014	0.015	0.015	0.016	0.017	0.025	0.025	0.025
975	0.010	0.012	0.012	0.011	0.013	0.013	0.014	0.015	0.016	0.017	0.023	0.023	0.023
1025	0.010	0.013	0.012	0.011	0.012	0.012	0.013	0.012	0.014	0.016	0.022	0.020	0.022
1075	0.010	0.012	0.011	0.010	0.011	0.011	0.012	0.012	0.014	0.015	0.020	0.020	0.020
1125	0.010	0.012	0.011	0.010	0.011	0.011	0.012	0.013	0.014	0.015	0.020	0.020	0.020
1175	0.011	0.012	0.011	0.010	0.010	0.012	0.012	0.012	0.014	0.014	0.018	0.019	0.019
1225	0.010	0.012	0.010	0.009	0.010	0.011	0.012	0.011	0.013	0.014	0.017	0.019	0.019
1275	0.009	0.011	0.010	0.010	0.010	0.011	0.012	0.012	0.012	0.013	0.016	0.017	0.017
1325	0.011	0.012	0.011	0.010	0.010	0.011	0.012	0.012	0.012	0.014	0.016	0.016	0.016
1375	0.009	0.011	0.010	0.009	0.010	0.010	0.010	0.011	0.011	0.012	0.014	0.015	0.015
1425	0.011	0.011	0.011	0.009	0.010	0.010	0.011	0.012	0.012	0.013	0.014	0.016	0.016
1475	0.010	0.011	0.010	0.009	0.009	0.010	0.010	0.012	0.011	0.012	0.014	0.016	0.016
1525	0.010	0.010	0.010	0.008	0.009	0.010	0.010	0.011	0.012	0.012	0.014	0.015	0.015
1575	0.010	0.010	0.010	0.009	0.009	0.009	0.010	0.011	0.011	0.012	0.014	0.015	0.015
1625	0.010	0.010	0.009	0.008	0.009	0.009	0.010	0.011	0.010	0.012	0.014	0.014	0.014
1675	0.009	0.010	0.009	0.008	0.009	0.009	0.010	0.011	0.011	0.012	0.014	0.014	0.014
1725	0.010	0.009	0.010	0.008	0.009	0.009	0.010	0.011	0.011	0.012	0.014	0.014	0.014
1775	0.011	0.009	0.010	0.008	0.009	0.010	0.010	0.011	0.011	0.012	0.015	0.015	0.015
1825	0.010	0.009	0.010	0.008	0.009	0.009	0.010	0.010	0.011	0.012	0.015	0.015	0.015
1875	0.010	0.009	0.010	0.009	0.009	0.009	0.010	0.011	0.011	0.012	0.016	0.014	0.016
1925	0.011	0.010	0.010	0.008	0.009	0.010	0.010	0.011	0.011	0.013	0.017	0.015	0.017
1975	0.010	0.010	0.010	0.009	0.009	0.010	0.011	0.012	0.013	0.014	0.019	0.016	0.019

Model: HYD 20KTL-3PH													
Phase C													
P_n (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX
F [Hz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	(%)
75	0.014	0.019	0.018	0.018	0.020	0.021	0.021	0.022	0.024	0.030	0.032	0.029	0.032
125	0.015	0.023	0.023	0.023	0.024	0.023	0.024	0.024	0.024	0.026	0.036	0.028	0.036
175	0.017	0.029	0.032	0.033	0.034	0.032	0.034	0.033	0.033	0.035	0.043	0.038	0.043
225	0.016	0.033	0.037	0.043	0.044	0.041	0.041	0.042	0.043	0.045	0.054	0.049	0.054
275	0.016	0.033	0.038	0.043	0.046	0.044	0.044	0.044	0.044	0.047	0.060	0.058	0.060
325	0.017	0.032	0.036	0.042	0.042	0.041	0.043	0.045	0.044	0.048	0.060	0.057	0.060
375	0.017	0.028	0.035	0.040	0.043	0.042	0.040	0.045	0.048	0.048	0.069	0.062	0.069
425	0.017	0.026	0.030	0.031	0.034	0.035	0.036	0.040	0.040	0.043	0.061	0.054	0.061
475	0.016	0.023	0.028	0.026	0.029	0.031	0.031	0.036	0.035	0.037	0.053	0.051	0.053
525	0.016	0.023	0.024	0.025	0.027	0.027	0.029	0.031	0.031	0.034	0.048	0.048	0.048
575	0.014	0.021	0.022	0.022	0.025	0.023	0.024	0.027	0.030	0.031	0.045	0.044	0.045
625	0.014	0.021	0.019	0.020	0.022	0.021	0.022	0.026	0.026	0.027	0.039	0.040	0.040
675	0.014	0.020	0.017	0.021	0.021	0.022	0.021	0.026	0.029	0.027	0.042	0.040	0.042
725	0.013	0.018	0.017	0.017	0.017	0.017	0.020	0.022	0.021	0.023	0.035	0.034	0.035
775	0.011	0.016	0.015	0.016	0.016	0.017	0.018	0.020	0.020	0.022	0.033	0.031	0.033
825	0.012	0.016	0.015	0.015	0.015	0.015	0.018	0.018	0.019	0.021	0.031	0.031	0.031
875	0.011	0.015	0.014	0.014	0.014	0.015	0.016	0.017	0.019	0.019	0.028	0.028	0.028
925	0.011	0.014	0.013	0.013	0.015	0.014	0.016	0.016	0.017	0.018	0.026	0.027	0.027
975	0.012	0.013	0.013	0.013	0.013	0.014	0.015	0.015	0.017	0.019	0.025	0.027	0.027
1025	0.010	0.012	0.012	0.011	0.012	0.013	0.014	0.013	0.015	0.016	0.022	0.023	0.023
1075	0.010	0.012	0.011	0.011	0.012	0.012	0.013	0.013	0.014	0.016	0.022	0.022	0.022
1125	0.011	0.012	0.011	0.011	0.012	0.012	0.013	0.013	0.015	0.015	0.021	0.022	0.022
1175	0.010	0.013	0.011	0.010	0.011	0.012	0.012	0.013	0.014	0.015	0.018	0.020	0.020
1225	0.010	0.012	0.010	0.010	0.011	0.011	0.012	0.012	0.014	0.014	0.017	0.020	0.020
1275	0.011	0.012	0.010	0.011	0.011	0.011	0.013	0.013	0.014	0.015	0.017	0.019	0.019
1325	0.011	0.012	0.011	0.010	0.011	0.011	0.012	0.013	0.013	0.014	0.015	0.018	0.018
1375	0.009	0.011	0.010	0.009	0.010	0.010	0.011	0.012	0.012	0.013	0.014	0.017	0.017
1425	0.012	0.012	0.011	0.010	0.011	0.012	0.012	0.013	0.014	0.013	0.015	0.018	0.018
1475	0.010	0.011	0.010	0.009	0.010	0.010	0.011	0.012	0.012	0.013	0.013	0.017	0.017
1525	0.010	0.010	0.010	0.009	0.010	0.010	0.011	0.012	0.012	0.012	0.013	0.016	0.016
1575	0.011	0.010	0.010	0.010	0.010	0.010	0.011	0.012	0.012	0.013	0.014	0.017	0.017
1625	0.010	0.010	0.009	0.009	0.009	0.009	0.010	0.012	0.011	0.012	0.014	0.015	0.015
1675	0.010	0.010	0.009	0.009	0.009	0.009	0.010	0.011	0.012	0.012	0.014	0.015	0.015
1725	0.011	0.009	0.009	0.009	0.010	0.010	0.011	0.012	0.013	0.012	0.014	0.016	0.016
1775	0.010	0.010	0.010	0.009	0.010	0.010	0.011	0.012	0.012	0.012	0.014	0.016	0.016
1825	0.010	0.010	0.010	0.009	0.010	0.010	0.011	0.011	0.011	0.012	0.014	0.016	0.016
1875	0.011	0.010	0.010	0.009	0.010	0.010	0.011	0.012	0.013	0.013	0.016	0.017	0.017
1925	0.011	0.010	0.010	0.009	0.010	0.010	0.012	0.013	0.014	0.014	0.018	0.018	0.018
1975	0.012	0.011	0.011	0.011	0.012	0.012	0.014	0.015	0.016	0.018	0.022	0.022	0.022

2.2.7 Höhere Frequenzen / Higher Frequencies components

Model: HYD 5KTL-3PH													
Phase A													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.205	0.056	0.105	0.159	0.153	0.075	0.075	0.131	0.128	0.111	0.099	0.097	0.205
2.3	0.216	0.070	0.107	0.154	0.181	0.138	0.138	0.153	0.160	0.153	0.143	0.138	0.216
2.5	0.231	0.069	0.103	0.142	0.176	0.151	0.151	0.156	0.165	0.160	0.150	0.146	0.231
2.7	0.224	0.061	0.091	0.115	0.143	0.144	0.144	0.102	0.134	0.142	0.126	0.102	0.224
2.9	0.226	0.055	0.105	0.140	0.139	0.147	0.147	0.096	0.118	0.130	0.125	0.110	0.226
3.1	0.298	0.068	0.126	0.172	0.165	0.168	0.168	0.122	0.136	0.152	0.149	0.135	0.298
3.3	0.296	0.099	0.171	0.249	0.246	0.237	0.237	0.181	0.186	0.217	0.225	0.215	0.296
3.5	0.636	0.092	0.146	0.207	0.229	0.232	0.232	0.225	0.223	0.237	0.242	0.240	0.636
3.7	0.289	0.105	0.167	0.235	0.263	0.273	0.273	0.273	0.283	0.294	0.303	0.297	0.303
3.9	0.117	0.096	0.154	0.213	0.246	0.252	0.252	0.265	0.275	0.281	0.277	0.275	0.281
4.1	0.084	0.061	0.100	0.139	0.159	0.165	0.165	0.170	0.175	0.188	0.191	0.185	0.191
4.3	0.068	0.041	0.067	0.094	0.105	0.108	0.108	0.109	0.113	0.114	0.117	0.116	0.117
4.5	0.057	0.031	0.052	0.071	0.080	0.081	0.081	0.083	0.084	0.085	0.086	0.086	0.086
4.7	0.105	0.051	0.084	0.117	0.132	0.134	0.134	0.136	0.137	0.138	0.139	0.140	0.140
4.9	0.045	0.022	0.037	0.051	0.057	0.057	0.057	0.058	0.059	0.061	0.061	0.061	0.061
5.1	0.043	0.020	0.033	0.046	0.052	0.053	0.053	0.053	0.054	0.054	0.056	0.056	0.056
5.3	0.039	0.018	0.029	0.040	0.045	0.045	0.045	0.046	0.047	0.047	0.048	0.048	0.048
5.5	0.036	0.016	0.026	0.036	0.041	0.041	0.041	0.041	0.042	0.042	0.043	0.043	0.043
5.7	0.038	0.016	0.026	0.036	0.040	0.040	0.040	0.041	0.042	0.042	0.042	0.043	0.043
5.9	0.033	0.014	0.023	0.032	0.036	0.035	0.035	0.036	0.036	0.036	0.037	0.037	0.037
6.1	0.043	0.018	0.029	0.040	0.044	0.045	0.045	0.045	0.045	0.046	0.046	0.046	0.046
6.3	0.031	0.013	0.021	0.029	0.032	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
6.5	0.030	0.012	0.020	0.027	0.031	0.031	0.031	0.030	0.031	0.031	0.032	0.032	0.032
6.7	0.030	0.012	0.019	0.027	0.030	0.030	0.030	0.030	0.030	0.031	0.031	0.032	0.032
6.9	0.028	0.012	0.019	0.026	0.029	0.029	0.029	0.029	0.029	0.029	0.030	0.029	0.030
7.1	0.050	0.020	0.032	0.044	0.048	0.048	0.048	0.048	0.048	0.049	0.049	0.049	0.050
7.3	0.028	0.011	0.018	0.025	0.028	0.028	0.028	0.027	0.028	0.028	0.029	0.029	0.029
7.5	0.027	0.011	0.017	0.024	0.027	0.027	0.027	0.027	0.028	0.027	0.028	0.028	0.028
7.7	0.026	0.010	0.017	0.023	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.027	0.027
7.9	0.025	0.010	0.016	0.022	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.026	0.026
8.1	0.026	0.011	0.018	0.024	0.027	0.027	0.027	0.026	0.028	0.027	0.027	0.028	0.028
8.3	0.035	0.014	0.023	0.031	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.035
8.5	0.033	0.013	0.022	0.030	0.033	0.034	0.034	0.034	0.033	0.034	0.034	0.034	0.034
8.7	0.023	0.010	0.016	0.022	0.024	0.025	0.025	0.024	0.024	0.025	0.024	0.024	0.025
8.9	0.022	0.009	0.015	0.021	0.023	0.024	0.024	0.024	0.023	0.024	0.024	0.024	0.024

Model: HYD 5KTL-3PH													
Phase B													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.199	0.057	0.106	0.157	0.151	0.077	0.098	0.129	0.127	0.111	0.100	0.097	0.199
2.3	0.208	0.065	0.104	0.148	0.170	0.138	0.133	0.148	0.154	0.150	0.140	0.137	0.208
2.5	0.222	0.065	0.102	0.141	0.165	0.145	0.136	0.147	0.156	0.152	0.143	0.138	0.222
2.7	0.216	0.059	0.085	0.108	0.142	0.139	0.089	0.098	0.128	0.136	0.122	0.099	0.216
2.9	0.221	0.051	0.100	0.132	0.135	0.141	0.107	0.093	0.110	0.124	0.120	0.105	0.221
3.1	0.287	0.064	0.120	0.167	0.165	0.168	0.139	0.120	0.132	0.146	0.144	0.130	0.287
3.3	0.305	0.100	0.167	0.251	0.240	0.242	0.215	0.179	0.184	0.209	0.221	0.208	0.305
3.5	0.687	0.098	0.150	0.215	0.233	0.239	0.235	0.227	0.223	0.235	0.242	0.236	0.687
3.7	0.312	0.111	0.178	0.247	0.280	0.296	0.299	0.296	0.307	0.315	0.323	0.316	0.323
3.9	0.125	0.105	0.169	0.234	0.268	0.274	0.282	0.289	0.296	0.308	0.306	0.298	0.308
4.1	0.089	0.066	0.110	0.151	0.173	0.179	0.186	0.184	0.190	0.200	0.206	0.202	0.206
4.3	0.071	0.043	0.071	0.100	0.113	0.113	0.118	0.117	0.119	0.121	0.122	0.124	0.124
4.5	0.060	0.033	0.054	0.075	0.085	0.085	0.087	0.088	0.087	0.090	0.089	0.089	0.090
4.7	0.108	0.053	0.086	0.121	0.136	0.138	0.139	0.140	0.141	0.143	0.144	0.144	0.144
4.9	0.047	0.023	0.038	0.052	0.059	0.059	0.060	0.060	0.061	0.062	0.063	0.063	0.063
5.1	0.045	0.021	0.035	0.048	0.054	0.054	0.055	0.055	0.056	0.057	0.057	0.058	0.058
5.3	0.040	0.018	0.030	0.042	0.047	0.047	0.048	0.048	0.048	0.049	0.049	0.050	0.050
5.5	0.038	0.017	0.027	0.038	0.042	0.042	0.043	0.043	0.043	0.044	0.044	0.044	0.044
5.7	0.038	0.016	0.027	0.037	0.042	0.042	0.042	0.042	0.043	0.043	0.043	0.044	0.044
5.9	0.034	0.014	0.023	0.032	0.036	0.036	0.036	0.037	0.037	0.037	0.038	0.038	0.038
6.1	0.044	0.018	0.030	0.041	0.045	0.046	0.046	0.046	0.047	0.046	0.047	0.047	0.047
6.3	0.032	0.013	0.022	0.030	0.033	0.033	0.033	0.034	0.034	0.034	0.033	0.034	0.034
6.5	0.031	0.013	0.020	0.028	0.031	0.031	0.031	0.031	0.032	0.032	0.032	0.032	0.032
6.7	0.030	0.012	0.020	0.028	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.032	0.032
6.9	0.029	0.012	0.019	0.027	0.029	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
7.1	0.050	0.020	0.032	0.044	0.049	0.049	0.049	0.049	0.050	0.050	0.050	0.049	0.050
7.3	0.028	0.012	0.019	0.026	0.028	0.028	0.029	0.028	0.028	0.029	0.030	0.029	0.030
7.5	0.027	0.011	0.018	0.025	0.028	0.027	0.028	0.027	0.028	0.028	0.028	0.029	0.029
7.7	0.026	0.010	0.017	0.023	0.026	0.026	0.027	0.026	0.027	0.027	0.027	0.027	0.027
7.9	0.025	0.010	0.016	0.023	0.025	0.025	0.025	0.025	0.026	0.026	0.026	0.026	0.026
8.1	0.027	0.011	0.018	0.024	0.027	0.027	0.027	0.027	0.028	0.027	0.027	0.028	0.028
8.3	0.035	0.014	0.023	0.031	0.035	0.035	0.035	0.034	0.035	0.035	0.034	0.035	0.035
8.5	0.034	0.014	0.022	0.030	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034
8.7	0.023	0.010	0.016	0.022	0.024	0.025	0.025	0.024	0.024	0.025	0.024	0.025	0.025
8.9	0.023	0.010	0.015	0.022	0.024	0.024	0.024	0.024	0.024	0.025	0.025	0.025	0.025

Model: HYD 5KTL-3PH													
Phase C													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.197	0.052	0.106	0.160	0.153	0.074	0.098	0.131	0.129	0.112	0.099	0.098	0.197
2.3	0.210	0.063	0.101	0.144	0.168	0.136	0.133	0.148	0.155	0.147	0.137	0.134	0.210
2.5	0.226	0.065	0.100	0.141	0.168	0.149	0.139	0.151	0.160	0.156	0.148	0.142	0.226
2.7	0.223	0.059	0.085	0.109	0.145	0.144	0.094	0.105	0.138	0.144	0.127	0.105	0.223
2.9	0.237	0.054	0.103	0.138	0.146	0.147	0.115	0.103	0.122	0.135	0.130	0.115	0.237
3.1	0.304	0.068	0.127	0.173	0.176	0.177	0.148	0.131	0.146	0.161	0.156	0.143	0.304
3.3	0.300	0.101	0.173	0.253	0.249	0.250	0.228	0.191	0.199	0.226	0.237	0.223	0.300
3.5	0.632	0.097	0.152	0.219	0.234	0.242	0.244	0.242	0.239	0.247	0.252	0.244	0.632
3.7	0.289	0.109	0.174	0.244	0.271	0.281	0.292	0.295	0.300	0.317	0.313	0.310	0.317
3.9	0.119	0.096	0.157	0.218	0.245	0.251	0.258	0.269	0.274	0.281	0.277	0.275	0.281
4.1	0.086	0.060	0.100	0.140	0.159	0.165	0.171	0.170	0.174	0.185	0.189	0.185	0.189
4.3	0.069	0.041	0.068	0.093	0.106	0.107	0.110	0.111	0.111	0.115	0.116	0.117	0.117
4.5	0.058	0.031	0.052	0.072	0.080	0.080	0.083	0.082	0.084	0.085	0.086	0.087	0.087
4.7	0.105	0.051	0.084	0.116	0.131	0.132	0.133	0.134	0.133	0.136	0.138	0.138	0.138
4.9	0.047	0.022	0.037	0.051	0.058	0.057	0.058	0.059	0.059	0.060	0.062	0.061	0.062
5.1	0.044	0.021	0.034	0.046	0.052	0.053	0.053	0.054	0.053	0.055	0.056	0.057	0.057
5.3	0.040	0.018	0.029	0.041	0.046	0.046	0.046	0.047	0.047	0.048	0.049	0.049	0.049
5.5	0.038	0.016	0.027	0.037	0.041	0.041	0.042	0.042	0.043	0.043	0.044	0.044	0.044
5.7	0.038	0.016	0.027	0.037	0.041	0.042	0.042	0.043	0.042	0.043	0.043	0.043	0.043
5.9	0.034	0.014	0.023	0.032	0.036	0.036	0.036	0.037	0.037	0.037	0.037	0.038	0.038
6.1	0.044	0.018	0.029	0.041	0.045	0.045	0.045	0.046	0.046	0.046	0.046	0.046	0.046
6.3	0.032	0.013	0.021	0.030	0.033	0.033	0.033	0.033	0.033	0.033	0.034	0.034	0.034
6.5	0.030	0.012	0.020	0.028	0.031	0.031	0.031	0.031	0.031	0.032	0.032	0.032	0.032
6.7	0.030	0.012	0.020	0.028	0.031	0.030	0.031	0.031	0.031	0.031	0.032	0.032	0.032
6.9	0.029	0.012	0.019	0.027	0.029	0.029	0.029	0.029	0.029	0.030	0.030	0.030	0.030
7.1	0.051	0.020	0.032	0.044	0.049	0.048	0.049	0.049	0.049	0.049	0.049	0.050	0.051
7.3	0.028	0.011	0.019	0.026	0.028	0.028	0.028	0.028	0.029	0.028	0.029	0.029	0.029
7.5	0.027	0.011	0.018	0.025	0.027	0.027	0.028	0.027	0.028	0.028	0.028	0.029	0.029
7.7	0.026	0.010	0.017	0.023	0.026	0.026	0.026	0.026	0.026	0.026	0.027	0.027	0.027
7.9	0.025	0.010	0.016	0.023	0.025	0.025	0.025	0.025	0.025	0.026	0.026	0.026	0.026
8.1	0.027	0.011	0.018	0.024	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.028	0.028
8.3	0.035	0.014	0.023	0.031	0.034	0.034	0.035	0.034	0.034	0.034	0.034	0.035	0.035
8.5	0.034	0.013	0.022	0.030	0.033	0.033	0.034	0.034	0.034	0.034	0.034	0.034	0.034
8.7	0.023	0.010	0.016	0.022	0.024	0.024	0.025	0.024	0.024	0.025	0.025	0.025	0.025
8.9	0.022	0.009	0.015	0.021	0.023	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024

Model: HYD 6KTL-3PH													
Phase A													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.166	0.056	0.109	0.156	0.070	0.083	0.083	0.101	0.086	0.079	0.090	0.110	0.166
2.3	0.180	0.072	0.105	0.153	0.123	0.114	0.114	0.131	0.123	0.115	0.116	0.125	0.180
2.5	0.190	0.072	0.095	0.140	0.133	0.117	0.117	0.137	0.130	0.121	0.121	0.130	0.190
2.7	0.181	0.061	0.070	0.101	0.130	0.075	0.075	0.119	0.113	0.088	0.074	0.085	0.181
2.9	0.191	0.055	0.084	0.118	0.125	0.091	0.091	0.105	0.110	0.094	0.078	0.080	0.191
3.1	0.243	0.070	0.104	0.144	0.141	0.117	0.117	0.120	0.127	0.114	0.100	0.098	0.243
3.3	0.248	0.109	0.158	0.222	0.199	0.182	0.182	0.167	0.189	0.183	0.154	0.141	0.248
3.5	0.534	0.098	0.137	0.194	0.191	0.199	0.199	0.191	0.204	0.202	0.188	0.182	0.534
3.7	0.244	0.110	0.156	0.221	0.228	0.235	0.235	0.243	0.253	0.250	0.241	0.239	0.253
3.9	0.097	0.099	0.142	0.204	0.210	0.213	0.213	0.233	0.236	0.233	0.231	0.239	0.239
4.1	0.070	0.062	0.090	0.130	0.136	0.143	0.143	0.150	0.158	0.156	0.153	0.154	0.158
4.3	0.057	0.042	0.061	0.088	0.088	0.091	0.091	0.094	0.096	0.098	0.098	0.098	0.098
4.5	0.048	0.032	0.046	0.066	0.067	0.069	0.069	0.070	0.071	0.071	0.073	0.075	0.075
4.7	0.088	0.053	0.076	0.109	0.112	0.113	0.113	0.114	0.115	0.116	0.116	0.117	0.117
4.9	0.038	0.023	0.033	0.047	0.048	0.048	0.048	0.050	0.050	0.051	0.052	0.052	0.052
5.1	0.037	0.021	0.030	0.043	0.044	0.044	0.044	0.045	0.046	0.047	0.046	0.047	0.047
5.3	0.033	0.018	0.026	0.037	0.038	0.038	0.038	0.039	0.040	0.041	0.040	0.041	0.041
5.5	0.031	0.017	0.024	0.034	0.034	0.035	0.035	0.035	0.036	0.036	0.036	0.037	0.037
5.7	0.031	0.017	0.023	0.034	0.034	0.034	0.034	0.034	0.035	0.035	0.036	0.036	0.036
5.9	0.028	0.014	0.021	0.029	0.030	0.030	0.030	0.031	0.030	0.031	0.032	0.032	0.032
6.1	0.036	0.019	0.026	0.037	0.037	0.037	0.037	0.038	0.038	0.038	0.038	0.039	0.039
6.3	0.026	0.013	0.019	0.027	0.027	0.027	0.027	0.028	0.027	0.027	0.028	0.029	0.029
6.5	0.025	0.013	0.018	0.025	0.026	0.025	0.025	0.026	0.026	0.026	0.027	0.028	0.028
6.7	0.025	0.012	0.018	0.025	0.025	0.025	0.025	0.025	0.026	0.026	0.026	0.027	0.027
6.9	0.023	0.012	0.017	0.024	0.024	0.024	0.024	0.024	0.025	0.024	0.025	0.025	0.025
7.1	0.042	0.020	0.028	0.040	0.040	0.040	0.040	0.040	0.041	0.041	0.041	0.041	0.042
7.3	0.023	0.012	0.016	0.023	0.023	0.023	0.023	0.023	0.024	0.024	0.024	0.024	0.024
7.5	0.022	0.011	0.016	0.022	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.024	0.024
7.7	0.021	0.011	0.015	0.021	0.021	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022
7.9	0.020	0.010	0.014	0.020	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.022
8.1	0.022	0.011	0.016	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023
8.3	0.029	0.015	0.020	0.029	0.028	0.028	0.028	0.028	0.029	0.028	0.028	0.029	0.029
8.5	0.028	0.014	0.019	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028
8.7	0.019	0.010	0.014	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.021	0.021	0.021
8.9	0.018	0.010	0.013	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020

Model: HYD 6KTL-3PH													
Phase B													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.164	0.055	0.107	0.152	0.071	0.079	0.109	0.100	0.087	0.079	0.088	0.108	0.164
2.3	0.174	0.066	0.099	0.143	0.120	0.112	0.125	0.127	0.120	0.115	0.117	0.127	0.174
2.5	0.182	0.067	0.093	0.135	0.126	0.113	0.124	0.130	0.124	0.116	0.116	0.125	0.182
2.7	0.175	0.058	0.068	0.101	0.124	0.075	0.087	0.112	0.110	0.086	0.072	0.082	0.175
2.9	0.185	0.051	0.078	0.110	0.121	0.090	0.079	0.098	0.104	0.090	0.076	0.078	0.185
3.1	0.238	0.068	0.102	0.143	0.141	0.116	0.101	0.116	0.124	0.111	0.097	0.095	0.238
3.3	0.251	0.113	0.158	0.219	0.202	0.181	0.148	0.162	0.186	0.177	0.155	0.135	0.251
3.5	0.571	0.104	0.143	0.202	0.198	0.199	0.187	0.190	0.200	0.198	0.187	0.180	0.571
3.7	0.262	0.118	0.165	0.236	0.243	0.251	0.243	0.259	0.271	0.266	0.257	0.253	0.271
3.9	0.104	0.109	0.154	0.222	0.226	0.235	0.246	0.253	0.259	0.253	0.252	0.262	0.262
4.1	0.074	0.068	0.098	0.143	0.147	0.155	0.154	0.161	0.169	0.168	0.166	0.167	0.169
4.3	0.060	0.044	0.064	0.093	0.095	0.097	0.097	0.100	0.102	0.103	0.104	0.105	0.105
4.5	0.050	0.034	0.048	0.069	0.070	0.073	0.073	0.074	0.074	0.073	0.075	0.077	0.077
4.7	0.090	0.055	0.079	0.112	0.115	0.116	0.118	0.117	0.118	0.120	0.119	0.120	0.120
4.9	0.039	0.024	0.034	0.048	0.050	0.050	0.050	0.051	0.052	0.052	0.053	0.053	0.053
5.1	0.037	0.022	0.031	0.044	0.045	0.046	0.046	0.047	0.047	0.049	0.048	0.049	0.049
5.3	0.034	0.019	0.027	0.038	0.039	0.039	0.040	0.040	0.041	0.042	0.041	0.042	0.042
5.5	0.031	0.017	0.024	0.035	0.035	0.036	0.036	0.037	0.036	0.037	0.038	0.038	0.038
5.7	0.032	0.017	0.024	0.035	0.035	0.035	0.036	0.036	0.036	0.037	0.037	0.037	0.037
5.9	0.028	0.015	0.021	0.030	0.030	0.030	0.031	0.031	0.031	0.032	0.032	0.033	0.033
6.1	0.037	0.019	0.027	0.038	0.038	0.038	0.039	0.039	0.038	0.039	0.039	0.039	0.039
6.3	0.027	0.014	0.019	0.027	0.028	0.028	0.028	0.029	0.028	0.029	0.029	0.029	0.029
6.5	0.025	0.013	0.018	0.026	0.026	0.026	0.026	0.027	0.027	0.027	0.027	0.028	0.028
6.7	0.025	0.013	0.018	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.027	0.027
6.9	0.024	0.013	0.018	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.026	0.026
7.1	0.042	0.021	0.029	0.041	0.041	0.041	0.041	0.041	0.041	0.042	0.042	0.042	0.042
7.3	0.024	0.012	0.017	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.025	0.025
7.5	0.023	0.011	0.016	0.023	0.023	0.023	0.023	0.023	0.023	0.024	0.023	0.024	0.024
7.7	0.022	0.011	0.015	0.022	0.022	0.022	0.022	0.022	0.022	0.023	0.022	0.023	0.023
7.9	0.021	0.010	0.015	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.022	0.022	0.022
8.1	0.022	0.011	0.016	0.023	0.023	0.023	0.022	0.023	0.023	0.023	0.023	0.023	0.023
8.3	0.029	0.015	0.021	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029
8.5	0.028	0.014	0.020	0.028	0.028	0.029	0.028	0.028	0.029	0.029	0.029	0.029	0.029
8.7	0.020	0.010	0.014	0.020	0.020	0.021	0.020	0.021	0.021	0.021	0.021	0.021	0.021
8.9	0.019	0.010	0.014	0.020	0.020	0.021	0.020	0.020	0.021	0.021	0.021	0.021	0.021

Model: HYD 6KTL-3PH													
Phase C													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.166	0.051	0.109	0.155	0.069	0.081	0.111	0.102	0.088	0.080	0.089	0.110	0.166
2.3	0.175	0.065	0.098	0.142	0.120	0.111	0.125	0.127	0.119	0.112	0.113	0.124	0.175
2.5	0.187	0.068	0.094	0.137	0.130	0.116	0.128	0.133	0.127	0.119	0.119	0.127	0.187
2.7	0.181	0.059	0.070	0.103	0.129	0.078	0.093	0.119	0.115	0.089	0.075	0.087	0.181
2.9	0.195	0.053	0.082	0.117	0.126	0.096	0.089	0.108	0.113	0.099	0.083	0.086	0.195
3.1	0.248	0.073	0.106	0.150	0.150	0.124	0.112	0.128	0.135	0.121	0.106	0.103	0.248
3.3	0.249	0.114	0.161	0.224	0.211	0.190	0.158	0.178	0.198	0.193	0.162	0.146	0.249
3.5	0.527	0.102	0.145	0.204	0.206	0.203	0.197	0.205	0.212	0.212	0.196	0.190	0.527
3.7	0.244	0.114	0.161	0.230	0.237	0.242	0.243	0.260	0.267	0.266	0.250	0.250	0.267
3.9	0.099	0.100	0.143	0.205	0.209	0.214	0.225	0.234	0.235	0.233	0.231	0.242	0.242
4.1	0.072	0.062	0.091	0.130	0.135	0.142	0.140	0.148	0.156	0.155	0.153	0.155	0.156
4.3	0.058	0.042	0.061	0.088	0.089	0.092	0.092	0.095	0.096	0.097	0.098	0.101	0.101
4.5	0.049	0.032	0.046	0.065	0.067	0.069	0.069	0.071	0.072	0.071	0.073	0.075	0.075
4.7	0.088	0.053	0.075	0.108	0.110	0.111	0.112	0.113	0.114	0.114	0.116	0.115	0.116
4.9	0.038	0.023	0.033	0.047	0.048	0.048	0.048	0.049	0.050	0.051	0.051	0.052	0.052
5.1	0.037	0.021	0.030	0.043	0.044	0.044	0.045	0.046	0.046	0.047	0.047	0.048	0.048
5.3	0.033	0.019	0.026	0.038	0.038	0.039	0.039	0.039	0.039	0.041	0.041	0.041	0.041
5.5	0.031	0.017	0.024	0.034	0.035	0.035	0.035	0.036	0.036	0.037	0.037	0.038	0.038
5.7	0.032	0.017	0.024	0.034	0.034	0.035	0.035	0.036	0.036	0.036	0.037	0.037	0.037
5.9	0.029	0.015	0.021	0.030	0.030	0.030	0.030	0.031	0.031	0.031	0.033	0.033	0.033
6.1	0.037	0.019	0.026	0.037	0.038	0.038	0.038	0.038	0.038	0.038	0.039	0.039	0.039
6.3	0.026	0.013	0.019	0.027	0.027	0.027	0.028	0.028	0.028	0.028	0.029	0.030	0.030
6.5	0.026	0.013	0.018	0.026	0.026	0.026	0.026	0.027	0.027	0.026	0.027	0.029	0.029
6.7	0.025	0.013	0.018	0.026	0.026	0.025	0.025	0.026	0.026	0.026	0.026	0.027	0.027
6.9	0.024	0.013	0.017	0.025	0.024	0.024	0.024	0.025	0.025	0.025	0.025	0.026	0.026
7.1	0.042	0.021	0.029	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.042	0.042
7.3	0.024	0.012	0.017	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.025	0.025
7.5	0.023	0.011	0.016	0.023	0.023	0.023	0.023	0.023	0.023	0.024	0.024	0.024	0.024
7.7	0.021	0.011	0.015	0.021	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.023	0.023
7.9	0.021	0.010	0.015	0.021	0.021	0.021	0.021	0.022	0.021	0.022	0.022	0.022	0.022
8.1	0.023	0.011	0.016	0.023	0.022	0.023	0.022	0.023	0.023	0.023	0.023	0.024	0.024
8.3	0.029	0.015	0.020	0.029	0.028	0.029	0.028	0.029	0.029	0.029	0.029	0.029	0.029
8.5	0.028	0.014	0.019	0.028	0.028	0.028	0.027	0.028	0.029	0.028	0.028	0.029	0.029
8.7	0.020	0.010	0.014	0.020	0.020	0.020	0.020	0.020	0.021	0.020	0.021	0.021	0.021
8.9	0.019	0.010	0.014	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.021	0.021

Model: HYD 8KTL-3PH													
Phase A													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.114	0.051	0.104	0.053	0.070	0.080	0.080	0.059	0.147	0.142	0.114	0.120	0.147
2.3	0.127	0.064	0.103	0.093	0.087	0.099	0.099	0.084	0.124	0.142	0.124	0.124	0.142
2.5	0.142	0.064	0.098	0.100	0.090	0.102	0.102	0.090	0.125	0.127	0.133	0.133	0.142
2.7	0.132	0.054	0.082	0.098	0.053	0.082	0.082	0.060	0.087	0.091	0.124	0.124	0.132
2.9	0.136	0.049	0.098	0.094	0.063	0.072	0.072	0.066	0.128	0.135	0.130	0.121	0.136
3.1	0.178	0.063	0.118	0.106	0.081	0.084	0.084	0.081	0.094	0.100	0.162	0.143	0.178
3.3	0.187	0.095	0.165	0.151	0.128	0.116	0.116	0.131	0.148	0.170	0.182	0.157	0.187
3.5	0.380	0.087	0.142	0.144	0.146	0.140	0.140	0.148	0.153	0.157	0.329	0.289	0.380
3.7	0.189	0.099	0.161	0.170	0.177	0.175	0.175	0.186	0.193	0.200	0.177	0.189	0.200
3.9	0.073	0.089	0.149	0.157	0.163	0.170	0.170	0.172	0.186	0.194	0.094	0.139	0.194
4.1	0.053	0.057	0.098	0.101	0.107	0.110	0.110	0.117	0.119	0.122	0.063	0.086	0.122
4.3	0.042	0.038	0.065	0.067	0.069	0.070	0.070	0.074	0.077	0.080	0.048	0.058	0.080
4.5	0.036	0.029	0.049	0.050	0.052	0.052	0.052	0.054	0.056	0.056	0.039	0.046	0.056
4.7	0.066	0.048	0.081	0.083	0.085	0.086	0.086	0.087	0.088	0.089	0.069	0.077	0.089
4.9	0.028	0.021	0.035	0.036	0.036	0.037	0.037	0.039	0.039	0.039	0.030	0.034	0.039
5.1	0.027	0.019	0.032	0.033	0.033	0.034	0.034	0.035	0.035	0.036	0.029	0.032	0.036
5.3	0.025	0.017	0.028	0.028	0.029	0.029	0.029	0.030	0.031	0.031	0.025	0.029	0.031
5.5	0.023	0.015	0.025	0.025	0.026	0.026	0.026	0.027	0.028	0.028	0.024	0.026	0.028
5.7	0.024	0.015	0.025	0.025	0.026	0.026	0.026	0.026	0.027	0.027	0.024	0.026	0.027
5.9	0.021	0.013	0.022	0.022	0.022	0.023	0.023	0.023	0.024	0.024	0.021	0.023	0.024
6.1	0.027	0.016	0.028	0.028	0.028	0.029	0.029	0.028	0.029	0.029	0.027	0.029	0.029
6.3	0.019	0.012	0.020	0.020	0.020	0.020	0.020	0.021	0.021	0.022	0.020	0.021	0.022
6.5	0.019	0.011	0.019	0.019	0.019	0.020	0.020	0.020	0.020	0.021	0.019	0.020	0.021
6.7	0.018	0.011	0.019	0.019	0.019	0.019	0.019	0.020	0.020	0.020	0.019	0.020	0.020
6.9	0.018	0.011	0.018	0.018	0.018	0.018	0.018	0.019	0.019	0.019	0.018	0.019	0.019
7.1	0.032	0.018	0.031	0.030	0.030	0.030	0.030	0.030	0.031	0.031	0.031	0.032	0.032
7.3	0.017	0.011	0.017	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.017	0.019	0.019
7.5	0.017	0.010	0.017	0.017	0.017	0.017	0.017	0.018	0.019	0.020	0.017	0.018	0.020
7.7	0.016	0.010	0.016	0.016	0.016	0.016	0.016	0.017	0.017	0.017	0.016	0.017	0.017
7.9	0.015	0.009	0.015	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.015	0.017	0.017
8.1	0.017	0.010	0.017	0.017	0.017	0.017	0.017	0.017	0.018	0.018	0.017	0.018	0.018
8.3	0.022	0.013	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.022	0.022	0.022
8.5	0.021	0.013	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.021	0.022	0.022
8.7	0.014	0.009	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.015	0.016	0.016
8.9	0.014	0.009	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.014	0.016	0.016

Model: HYD 8KTL-3PH													
Phase B													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.112	0.050	0.104	0.055	0.068	0.080	0.066	0.058	0.148	0.142	0.110	0.114	0.148
2.3	0.123	0.060	0.099	0.091	0.085	0.096	0.091	0.084	0.121	0.142	0.119	0.122	0.142
2.5	0.138	0.060	0.096	0.096	0.085	0.097	0.093	0.086	0.118	0.121	0.127	0.128	0.138
2.7	0.129	0.051	0.076	0.094	0.052	0.078	0.082	0.058	0.084	0.083	0.118	0.122	0.129
2.9	0.132	0.046	0.092	0.091	0.062	0.067	0.077	0.064	0.120	0.127	0.122	0.117	0.132
3.1	0.174	0.059	0.113	0.105	0.081	0.081	0.092	0.080	0.092	0.096	0.156	0.139	0.174
3.3	0.190	0.098	0.161	0.152	0.128	0.114	0.139	0.129	0.143	0.164	0.183	0.158	0.190
3.5	0.406	0.092	0.144	0.148	0.148	0.141	0.150	0.148	0.154	0.153	0.353	0.308	0.406
3.7	0.202	0.104	0.169	0.182	0.187	0.189	0.203	0.195	0.202	0.211	0.192	0.205	0.211
3.9	0.078	0.099	0.162	0.170	0.178	0.185	0.190	0.188	0.207	0.218	0.102	0.152	0.218
4.1	0.056	0.062	0.104	0.110	0.117	0.117	0.129	0.126	0.127	0.132	0.068	0.092	0.132
4.3	0.044	0.040	0.069	0.071	0.073	0.075	0.077	0.077	0.082	0.084	0.051	0.061	0.084
4.5	0.037	0.031	0.052	0.053	0.054	0.055	0.056	0.056	0.059	0.060	0.041	0.047	0.060
4.7	0.068	0.049	0.084	0.086	0.087	0.088	0.089	0.089	0.090	0.091	0.071	0.078	0.091
4.9	0.029	0.022	0.037	0.037	0.038	0.038	0.039	0.040	0.041	0.041	0.031	0.035	0.041
5.1	0.028	0.020	0.033	0.034	0.034	0.035	0.036	0.036	0.036	0.037	0.029	0.032	0.037
5.3	0.025	0.017	0.029	0.029	0.030	0.030	0.030	0.031	0.032	0.032	0.026	0.029	0.032
5.5	0.023	0.016	0.026	0.026	0.027	0.027	0.027	0.028	0.028	0.029	0.024	0.026	0.029
5.7	0.024	0.015	0.026	0.026	0.027	0.027	0.027	0.028	0.028	0.028	0.025	0.026	0.028
5.9	0.021	0.014	0.023	0.023	0.023	0.023	0.023	0.024	0.024	0.025	0.022	0.023	0.025
6.1	0.028	0.017	0.028	0.029	0.028	0.029	0.029	0.029	0.029	0.030	0.028	0.029	0.030
6.3	0.020	0.012	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.022	0.020	0.021	0.022
6.5	0.019	0.012	0.019	0.020	0.020	0.020	0.020	0.020	0.021	0.021	0.019	0.020	0.021
6.7	0.019	0.012	0.019	0.019	0.019	0.020	0.020	0.020	0.020	0.020	0.019	0.020	0.020
6.9	0.018	0.011	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
7.1	0.032	0.019	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.032	0.032
7.3	0.018	0.011	0.018	0.018	0.018	0.018	0.018	0.018	0.019	0.019	0.018	0.018	0.019
7.5	0.017	0.010	0.017	0.017	0.017	0.017	0.017	0.018	0.019	0.019	0.017	0.018	0.019
7.7	0.016	0.010	0.016	0.016	0.016	0.017	0.017	0.017	0.017	0.018	0.016	0.017	0.018
7.9	0.016	0.009	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.016	0.017	0.017
8.1	0.017	0.010	0.017	0.017	0.017	0.017	0.017	0.017	0.018	0.018	0.017	0.018	0.018
8.3	0.022	0.013	0.022	0.022	0.022	0.021	0.022	0.022	0.022	0.022	0.022	0.022	0.022
8.5	0.021	0.013	0.021	0.021	0.021	0.021	0.022	0.021	0.021	0.022	0.021	0.022	0.022
8.7	0.015	0.009	0.015	0.015	0.015	0.015	0.016	0.015	0.016	0.016	0.015	0.016	0.016
8.9	0.014	0.009	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.014	0.016	0.016

Model: HYD 8KTL-3PH													
Phase C													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.114	0.046	0.104	0.053	0.070	0.081	0.067	0.059	0.148	0.142	0.111	0.116	0.148
2.3	0.126	0.058	0.096	0.091	0.084	0.095	0.089	0.082	0.117	0.136	0.120	0.120	0.136
2.5	0.140	0.060	0.096	0.098	0.088	0.099	0.094	0.087	0.119	0.124	0.129	0.130	0.140
2.7	0.134	0.052	0.077	0.098	0.056	0.083	0.087	0.062	0.085	0.089	0.124	0.125	0.134
2.9	0.139	0.049	0.096	0.094	0.068	0.074	0.085	0.070	0.127	0.130	0.132	0.124	0.139
3.1	0.184	0.066	0.119	0.112	0.086	0.090	0.100	0.086	0.100	0.103	0.167	0.149	0.184
3.3	0.189	0.101	0.166	0.157	0.135	0.123	0.150	0.140	0.149	0.170	0.182	0.160	0.189
3.5	0.374	0.093	0.147	0.152	0.154	0.148	0.161	0.158	0.164	0.161	0.325	0.295	0.374
3.7	0.188	0.102	0.168	0.175	0.182	0.184	0.200	0.198	0.204	0.210	0.179	0.195	0.210
3.9	0.075	0.090	0.151	0.156	0.163	0.170	0.175	0.175	0.189	0.195	0.094	0.137	0.195
4.1	0.054	0.057	0.097	0.101	0.107	0.107	0.117	0.116	0.116	0.120	0.064	0.084	0.120
4.3	0.044	0.038	0.065	0.067	0.069	0.070	0.072	0.074	0.076	0.080	0.049	0.058	0.080
4.5	0.037	0.029	0.050	0.051	0.052	0.052	0.054	0.054	0.055	0.056	0.040	0.046	0.056
4.7	0.067	0.047	0.081	0.083	0.084	0.084	0.085	0.086	0.086	0.087	0.070	0.075	0.087
4.9	0.029	0.021	0.036	0.036	0.037	0.037	0.038	0.039	0.039	0.040	0.031	0.034	0.040
5.1	0.028	0.019	0.032	0.033	0.033	0.034	0.035	0.035	0.035	0.036	0.029	0.032	0.036
5.3	0.025	0.017	0.028	0.029	0.029	0.029	0.030	0.031	0.032	0.032	0.026	0.028	0.032
5.5	0.024	0.015	0.026	0.026	0.026	0.027	0.027	0.028	0.028	0.028	0.024	0.026	0.028
5.7	0.024	0.015	0.025	0.026	0.026	0.027	0.027	0.027	0.028	0.028	0.024	0.026	0.028
5.9	0.021	0.013	0.022	0.023	0.023	0.023	0.023	0.024	0.024	0.025	0.021	0.023	0.025
6.1	0.028	0.017	0.028	0.028	0.028	0.029	0.029	0.029	0.029	0.030	0.028	0.029	0.030
6.3	0.020	0.012	0.020	0.020	0.021	0.021	0.021	0.021	0.022	0.022	0.020	0.021	0.022
6.5	0.019	0.011	0.019	0.020	0.020	0.020	0.020	0.020	0.021	0.021	0.019	0.020	0.021
6.7	0.019	0.011	0.019	0.019	0.019	0.019	0.020	0.020	0.020	0.020	0.019	0.020	0.020
6.9	0.018	0.011	0.018	0.018	0.018	0.018	0.019	0.019	0.019	0.020	0.019	0.019	0.020
7.1	0.032	0.018	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.032	0.031	0.032
7.3	0.018	0.011	0.018	0.018	0.018	0.018	0.018	0.018	0.019	0.018	0.018	0.018	0.019
7.5	0.017	0.010	0.017	0.017	0.017	0.017	0.017	0.018	0.020	0.020	0.017	0.018	0.020
7.7	0.016	0.010	0.016	0.016	0.016	0.017	0.017	0.017	0.017	0.017	0.016	0.017	0.017
7.9	0.016	0.009	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.016	0.016	0.017
8.1	0.017	0.010	0.017	0.017	0.017	0.017	0.017	0.018	0.017	0.018	0.017	0.018	0.018
8.3	0.022	0.013	0.022	0.021	0.021	0.021	0.021	0.022	0.022	0.022	0.022	0.022	0.022
8.5	0.021	0.013	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.021	0.022	0.022
8.7	0.015	0.009	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.015	0.016	0.016
8.9	0.014	0.009	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.014	0.015	0.016

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Model: HYD 10KTL-3PH													
Phase A													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.272	0.148	0.121	0.181	0.280	0.216	0.216	0.157	0.149	0.165	0.182	0.180	0.280
2.3	0.245	0.164	0.141	0.160	0.240	0.118	0.118	0.155	0.162	0.225	0.272	0.266	0.272
2.5	0.225	0.169	0.154	0.162	0.235	0.173	0.173	0.177	0.189	0.173	0.143	0.138	0.235
2.7	0.207	0.148	0.206	0.167	0.326	0.189	0.189	0.144	0.130	0.145	0.205	0.260	0.326
2.9	0.143	0.151	0.163	0.128	0.186	0.187	0.187	0.163	0.180	0.147	0.102	0.128	0.187
3.1	0.120	0.116	0.142	0.113	0.190	0.128	0.128	0.184	0.159	0.128	0.133	0.148	0.190
3.3	0.191	0.118	0.121	0.116	0.169	0.144	0.144	0.155	0.189	0.215	0.211	0.171	0.215
3.5	0.093	0.122	0.116	0.115	0.145	0.139	0.139	0.139	0.138	0.141	0.159	0.178	0.178
3.7	0.063	0.119	0.135	0.144	0.167	0.171	0.171	0.167	0.176	0.203	0.223	0.239	0.239
3.9	0.042	0.074	0.078	0.084	0.093	0.094	0.094	0.097	0.102	0.101	0.102	0.108	0.108
4.1	0.034	0.051	0.055	0.057	0.062	0.061	0.061	0.066	0.066	0.068	0.072	0.072	0.072
4.3	0.030	0.039	0.043	0.044	0.045	0.048	0.048	0.051	0.049	0.049	0.050	0.053	0.053
4.5	0.026	0.033	0.036	0.037	0.037	0.039	0.039	0.039	0.039	0.040	0.042	0.043	0.043
4.7	0.049	0.057	0.061	0.062	0.064	0.064	0.064	0.065	0.065	0.065	0.066	0.066	0.066
4.9	0.021	0.026	0.027	0.027	0.028	0.028	0.028	0.029	0.030	0.030	0.031	0.031	0.031
5.1	0.020	0.024	0.025	0.025	0.027	0.026	0.026	0.027	0.027	0.028	0.028	0.029	0.029
5.3	0.019	0.021	0.022	0.022	0.023	0.023	0.023	0.024	0.024	0.024	0.025	0.025	0.025
5.5	0.017	0.019	0.020	0.020	0.021	0.021	0.021	0.021	0.022	0.022	0.023	0.023	0.023
5.7	0.018	0.019	0.020	0.021	0.021	0.021	0.021	0.022	0.022	0.022	0.022	0.023	0.023
5.9	0.016	0.017	0.017	0.018	0.019	0.018	0.018	0.019	0.019	0.019	0.019	0.021	0.021
6.1	0.021	0.022	0.022	0.023	0.023	0.023	0.023	0.024	0.024	0.024	0.025	0.025	0.025
6.3	0.015	0.015	0.016	0.016	0.017	0.017	0.017	0.017	0.017	0.018	0.018	0.018	0.018
6.5	0.014	0.014	0.015	0.015	0.016	0.016	0.016	0.016	0.016	0.017	0.017	0.017	0.017
6.7	0.014	0.015	0.014	0.015	0.016	0.016	0.016	0.017	0.016	0.017	0.017	0.018	0.018
6.9	0.013	0.014	0.014	0.014	0.015	0.016	0.016	0.016	0.015	0.016	0.017	0.017	0.017
7.1	0.025	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.027	0.027	0.027	0.027
7.3	0.013	0.014	0.014	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.016
7.5	0.013	0.013	0.013	0.013	0.015	0.016	0.016	0.015	0.015	0.015	0.017	0.017	0.017
7.7	0.012	0.012	0.012	0.013	0.014	0.014	0.014	0.014	0.014	0.014	0.015	0.016	0.016
7.9	0.011	0.012	0.012	0.012	0.013	0.013	0.013	0.013	0.013	0.014	0.015	0.015	0.015
8.1	0.012	0.013	0.014	0.014	0.014	0.015	0.015	0.015	0.014	0.015	0.016	0.017	0.017
8.3	0.016	0.018	0.018	0.018	0.019	0.019	0.019	0.020	0.019	0.019	0.020	0.020	0.020
8.5	0.016	0.018	0.018	0.018	0.018	0.019	0.019	0.018	0.019	0.019	0.020	0.020	0.020
8.7	0.010	0.012	0.012	0.013	0.013	0.014	0.014	0.013	0.013	0.013	0.015	0.016	0.016
8.9	0.009	0.011	0.012	0.012	0.012	0.012	0.012	0.013	0.012	0.013	0.014	0.015	0.015

Model: HYD 10KTL-3PH													
Phase B													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.240	0.136	0.115	0.170	0.285	0.230	0.200	0.171	0.158	0.170	0.186	0.181	0.285
2.3	0.236	0.150	0.139	0.142	0.234	0.120	0.152	0.146	0.159	0.219	0.262	0.260	0.262
2.5	0.213	0.151	0.147	0.149	0.224	0.152	0.121	0.171	0.181	0.161	0.131	0.124	0.224
2.7	0.215	0.149	0.196	0.153	0.317	0.200	0.130	0.145	0.119	0.124	0.187	0.247	0.317
2.9	0.141	0.138	0.145	0.116	0.181	0.197	0.119	0.157	0.178	0.149	0.102	0.121	0.197
3.1	0.123	0.115	0.141	0.109	0.190	0.109	0.165	0.183	0.149	0.118	0.126	0.142	0.190
3.3	0.210	0.126	0.122	0.120	0.168	0.145	0.114	0.157	0.203	0.230	0.216	0.170	0.230
3.5	0.099	0.136	0.125	0.126	0.157	0.149	0.135	0.148	0.145	0.148	0.167	0.189	0.189
3.7	0.069	0.129	0.147	0.149	0.180	0.179	0.170	0.179	0.190	0.218	0.241	0.258	0.258
3.9	0.045	0.079	0.084	0.091	0.099	0.099	0.106	0.105	0.112	0.111	0.110	0.116	0.116
4.1	0.035	0.054	0.059	0.060	0.066	0.065	0.067	0.069	0.069	0.072	0.075	0.076	0.076
4.3	0.031	0.042	0.045	0.047	0.047	0.050	0.051	0.053	0.052	0.051	0.052	0.054	0.054
4.5	0.027	0.035	0.038	0.038	0.039	0.041	0.042	0.041	0.040	0.042	0.044	0.044	0.044
4.7	0.050	0.059	0.062	0.063	0.065	0.065	0.065	0.067	0.067	0.066	0.067	0.068	0.068
4.9	0.022	0.026	0.027	0.028	0.029	0.029	0.030	0.030	0.030	0.031	0.031	0.032	0.032
5.1	0.021	0.025	0.025	0.026	0.028	0.027	0.027	0.028	0.029	0.028	0.029	0.029	0.029
5.3	0.019	0.022	0.022	0.023	0.024	0.023	0.024	0.024	0.025	0.025	0.025	0.026	0.026
5.5	0.018	0.020	0.020	0.021	0.021	0.022	0.022	0.022	0.023	0.023	0.023	0.024	0.024
5.7	0.019	0.020	0.020	0.021	0.021	0.022	0.022	0.022	0.023	0.023	0.023	0.023	0.023
5.9	0.016	0.018	0.018	0.018	0.019	0.019	0.019	0.019	0.020	0.020	0.020	0.021	0.021
6.1	0.022	0.023	0.023	0.023	0.024	0.024	0.024	0.024	0.025	0.025	0.025	0.025	0.025
6.3	0.015	0.016	0.016	0.016	0.017	0.018	0.018	0.018	0.018	0.018	0.018	0.019	0.019
6.5	0.014	0.015	0.015	0.015	0.016	0.016	0.017	0.016	0.017	0.017	0.017	0.018	0.018
6.7	0.014	0.015	0.015	0.015	0.016	0.016	0.016	0.017	0.016	0.017	0.017	0.018	0.018
6.9	0.014	0.014	0.014	0.015	0.015	0.017	0.016	0.016	0.016	0.017	0.017	0.017	0.017
7.1	0.025	0.026	0.026	0.026	0.026	0.027	0.027	0.027	0.027	0.027	0.027	0.028	0.028
7.3	0.013	0.014	0.014	0.014	0.015	0.015	0.016	0.015	0.015	0.016	0.016	0.017	0.017
7.5	0.013	0.013	0.014	0.014	0.016	0.016	0.016	0.015	0.015	0.015	0.017	0.016	0.017
7.7	0.012	0.013	0.013	0.013	0.014	0.015	0.014	0.014	0.014	0.014	0.015	0.015	0.015
7.9	0.011	0.012	0.012	0.012	0.013	0.013	0.014	0.014	0.013	0.014	0.015	0.015	0.015
8.1	0.012	0.014	0.015	0.014	0.014	0.015	0.016	0.016	0.014	0.015	0.016	0.017	0.017
8.3	0.017	0.018	0.018	0.019	0.019	0.019	0.019	0.020	0.019	0.019	0.020	0.020	0.020
8.5	0.016	0.019	0.018	0.018	0.018	0.019	0.020	0.019	0.019	0.019	0.020	0.020	0.020
8.7	0.010	0.012	0.012	0.013	0.014	0.015	0.015	0.014	0.014	0.013	0.014	0.016	0.016
8.9	0.010	0.012	0.012	0.012	0.013	0.013	0.014	0.014	0.013	0.013	0.014	0.015	0.015

Model: HYD 10KTL-3PH													
Phase C													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.255	0.161	0.125	0.181	0.303	0.233	0.203	0.173	0.163	0.177	0.187	0.192	0.303
2.3	0.232	0.147	0.155	0.153	0.252	0.116	0.164	0.164	0.168	0.219	0.258	0.266	0.266
2.5	0.223	0.152	0.158	0.151	0.229	0.161	0.133	0.178	0.193	0.174	0.147	0.133	0.229
2.7	0.205	0.156	0.198	0.144	0.325	0.197	0.131	0.152	0.137	0.141	0.193	0.255	0.325
2.9	0.139	0.139	0.159	0.109	0.199	0.195	0.126	0.162	0.190	0.165	0.117	0.131	0.199
3.1	0.124	0.123	0.152	0.114	0.204	0.123	0.176	0.187	0.155	0.127	0.141	0.173	0.204
3.3	0.199	0.131	0.123	0.128	0.170	0.148	0.119	0.164	0.209	0.227	0.210	0.163	0.227
3.5	0.094	0.130	0.119	0.123	0.151	0.151	0.125	0.142	0.153	0.147	0.164	0.190	0.190
3.7	0.066	0.122	0.138	0.145	0.171	0.173	0.162	0.171	0.181	0.204	0.225	0.244	0.244
3.9	0.044	0.075	0.080	0.085	0.094	0.094	0.099	0.099	0.103	0.103	0.103	0.112	0.112
4.1	0.035	0.052	0.057	0.058	0.063	0.062	0.065	0.070	0.068	0.068	0.070	0.071	0.071
4.3	0.031	0.041	0.044	0.045	0.046	0.048	0.049	0.053	0.051	0.050	0.051	0.052	0.053
4.5	0.026	0.034	0.036	0.037	0.037	0.039	0.040	0.041	0.040	0.041	0.041	0.043	0.043
4.7	0.050	0.058	0.060	0.062	0.063	0.064	0.064	0.065	0.065	0.064	0.065	0.065	0.065
4.9	0.022	0.026	0.027	0.027	0.029	0.029	0.030	0.030	0.030	0.030	0.031	0.031	0.031
5.1	0.021	0.024	0.025	0.026	0.027	0.026	0.027	0.027	0.028	0.028	0.028	0.029	0.029
5.3	0.019	0.022	0.022	0.022	0.023	0.023	0.024	0.024	0.025	0.025	0.025	0.026	0.026
5.5	0.018	0.020	0.021	0.021	0.021	0.021	0.022	0.022	0.022	0.023	0.023	0.024	0.024
5.7	0.019	0.020	0.020	0.021	0.021	0.022	0.023	0.022	0.023	0.023	0.023	0.024	0.024
5.9	0.017	0.018	0.018	0.018	0.019	0.019	0.020	0.020	0.020	0.020	0.020	0.021	0.021
6.1	0.022	0.023	0.023	0.023	0.023	0.024	0.024	0.024	0.024	0.024	0.025	0.025	0.025
6.3	0.016	0.016	0.016	0.016	0.017	0.018	0.018	0.018	0.017	0.018	0.018	0.019	0.019
6.5	0.015	0.015	0.015	0.015	0.016	0.016	0.017	0.017	0.017	0.017	0.017	0.018	0.018
6.7	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.017	0.016	0.017	0.017	0.017	0.017
6.9	0.013	0.014	0.014	0.014	0.015	0.016	0.015	0.016	0.015	0.016	0.017	0.017	0.017
7.1	0.025	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.027	0.027	0.027
7.3	0.013	0.014	0.014	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.016
7.5	0.013	0.013	0.013	0.014	0.015	0.016	0.016	0.015	0.015	0.015	0.016	0.016	0.016
7.7	0.012	0.013	0.013	0.013	0.014	0.014	0.015	0.014	0.014	0.014	0.015	0.015	0.015
7.9	0.011	0.012	0.012	0.012	0.013	0.013	0.014	0.014	0.013	0.013	0.014	0.016	0.016
8.1	0.013	0.014	0.014	0.014	0.014	0.015	0.016	0.016	0.014	0.015	0.016	0.017	0.017
8.3	0.016	0.018	0.018	0.018	0.019	0.019	0.019	0.020	0.019	0.019	0.020	0.020	0.020
8.5	0.016	0.018	0.018	0.018	0.018	0.019	0.019	0.018	0.018	0.018	0.019	0.020	0.020
8.7	0.010	0.012	0.012	0.013	0.013	0.014	0.014	0.014	0.013	0.013	0.014	0.015	0.015
8.9	0.010	0.011	0.012	0.012	0.012	0.013	0.013	0.013	0.012	0.012	0.013	0.015	0.015

Model: HYD 15KTL-3PH													
Phase A													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.123	0.135	0.136	0.164	0.127	0.100	0.100	0.125	0.126	0.139	0.164	0.184	0.184
2.3	0.211	0.168	0.119	0.099	0.107	0.099	0.099	0.184	0.144	0.080	0.122	0.189	0.211
2.5	0.223	0.130	0.094	0.140	0.092	0.124	0.124	0.090	0.106	0.139	0.149	0.165	0.223
2.7	0.156	0.102	0.115	0.182	0.082	0.092	0.092	0.154	0.188	0.174	0.138	0.206	0.206
2.9	0.083	0.120	0.101	0.141	0.083	0.116	0.116	0.067	0.148	0.228	0.169	0.151	0.228
3.1	0.086	0.142	0.079	0.105	0.112	0.116	0.116	0.095	0.112	0.099	0.155	0.162	0.162
3.3	0.125	0.124	0.110	0.107	0.074	0.113	0.113	0.128	0.094	0.193	0.239	0.191	0.239
3.5	0.071	0.078	0.094	0.102	0.087	0.091	0.091	0.115	0.125	0.127	0.157	0.148	0.157
3.7	0.046	0.090	0.096	0.115	0.107	0.115	0.115	0.156	0.168	0.186	0.193	0.199	0.199
3.9	0.031	0.053	0.057	0.059	0.065	0.066	0.066	0.070	0.074	0.070	0.082	0.082	0.082
4.1	0.023	0.036	0.040	0.042	0.042	0.043	0.043	0.049	0.047	0.049	0.051	0.050	0.051
4.3	0.021	0.030	0.029	0.031	0.032	0.033	0.033	0.034	0.038	0.038	0.036	0.037	0.038
4.5	0.017	0.025	0.025	0.025	0.026	0.026	0.026	0.028	0.029	0.029	0.029	0.030	0.030
4.7	0.033	0.040	0.042	0.042	0.043	0.043	0.043	0.044	0.044	0.045	0.045	0.045	0.045
4.9	0.014	0.018	0.018	0.019	0.019	0.020	0.020	0.020	0.021	0.022	0.023	0.023	0.023
5.1	0.014	0.016	0.017	0.018	0.018	0.018	0.018	0.019	0.020	0.020	0.020	0.021	0.021
5.3	0.013	0.014	0.015	0.016	0.016	0.016	0.016	0.017	0.017	0.018	0.018	0.019	0.019
5.5	0.012	0.013	0.013	0.014	0.014	0.015	0.015	0.015	0.016	0.017	0.017	0.017	0.017
5.7	0.012	0.013	0.014	0.014	0.015	0.014	0.014	0.015	0.016	0.016	0.017	0.017	0.017
5.9	0.011	0.011	0.012	0.012	0.013	0.013	0.013	0.013	0.015	0.015	0.015	0.015	0.015
6.1	0.015	0.015	0.015	0.016	0.016	0.016	0.016	0.016	0.017	0.018	0.018	0.019	0.019
6.3	0.010	0.010	0.011	0.012	0.012	0.011	0.011	0.012	0.013	0.014	0.014	0.018	0.018
6.5	0.010	0.010	0.011	0.011	0.011	0.011	0.011	0.011	0.012	0.013	0.013	0.022	0.022
6.7	0.010	0.010	0.010	0.011	0.011	0.011	0.011	0.012	0.011	0.012	0.013	0.015	0.015
6.9	0.009	0.009	0.010	0.011	0.010	0.010	0.010	0.011	0.011	0.012	0.013	0.015	0.015
7.1	0.017	0.017	0.017	0.017	0.017	0.018	0.018	0.018	0.018	0.019	0.019	0.020	0.020
7.3	0.009	0.009	0.010	0.010	0.010	0.010	0.010	0.011	0.012	0.011	0.012	0.013	0.013
7.5	0.009	0.009	0.010	0.010	0.010	0.010	0.010	0.011	0.011	0.011	0.012	0.014	0.014
7.7	0.008	0.008	0.009	0.009	0.009	0.009	0.009	0.010	0.011	0.011	0.012	0.013	0.013
7.9	0.008	0.008	0.008	0.009	0.009	0.009	0.009	0.010	0.010	0.011	0.011	0.011	0.011
8.1	0.009	0.009	0.010	0.010	0.011	0.010	0.010	0.011	0.011	0.011	0.012	0.012	0.012
8.3	0.011	0.012	0.012	0.012	0.013	0.013	0.013	0.014	0.014	0.014	0.014	0.015	0.015
8.5	0.011	0.012	0.012	0.012	0.013	0.012	0.012	0.013	0.014	0.014	0.015	0.014	0.015
8.7	0.008	0.008	0.009	0.009	0.010	0.009	0.009	0.010	0.010	0.010	0.011	0.010	0.011
8.9	0.007	0.008	0.008	0.009	0.009	0.008	0.008	0.010	0.010	0.010	0.012	0.011	0.012

Model: HYD 15KTL-3PH													
Phase B													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.132	0.138	0.136	0.170	0.135	0.110	0.115	0.127	0.124	0.146	0.176	0.188	0.188
2.3	0.201	0.162	0.115	0.104	0.100	0.095	0.146	0.177	0.142	0.081	0.129	0.192	0.201
2.5	0.214	0.129	0.086	0.128	0.081	0.121	0.106	0.082	0.093	0.137	0.177	0.164	0.214
2.7	0.154	0.092	0.118	0.186	0.087	0.087	0.080	0.144	0.179	0.170	0.167	0.230	0.230
2.9	0.084	0.114	0.092	0.148	0.079	0.113	0.098	0.065	0.137	0.212	0.150	0.162	0.212
3.1	0.087	0.141	0.079	0.097	0.109	0.115	0.080	0.089	0.102	0.089	0.151	0.167	0.167
3.3	0.135	0.127	0.108	0.109	0.076	0.120	0.152	0.130	0.094	0.194	0.211	0.179	0.211
3.5	0.076	0.081	0.099	0.113	0.090	0.098	0.099	0.118	0.129	0.143	0.172	0.155	0.172
3.7	0.049	0.098	0.102	0.122	0.113	0.122	0.143	0.166	0.182	0.202	0.207	0.217	0.217
3.9	0.033	0.057	0.060	0.063	0.069	0.072	0.074	0.074	0.079	0.076	0.086	0.085	0.086
4.1	0.025	0.038	0.042	0.044	0.044	0.046	0.047	0.050	0.050	0.052	0.051	0.053	0.053
4.3	0.022	0.032	0.030	0.032	0.033	0.035	0.034	0.035	0.039	0.039	0.037	0.038	0.039
4.5	0.018	0.026	0.026	0.026	0.027	0.027	0.028	0.029	0.029	0.030	0.029	0.031	0.031
4.7	0.034	0.041	0.043	0.043	0.044	0.044	0.044	0.045	0.046	0.046	0.046	0.046	0.046
4.9	0.015	0.018	0.019	0.019	0.020	0.020	0.021	0.021	0.021	0.022	0.023	0.025	0.025
5.1	0.014	0.017	0.018	0.018	0.018	0.019	0.019	0.019	0.020	0.021	0.021	0.021	0.021
5.3	0.013	0.015	0.015	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.019	0.019	0.019
5.5	0.012	0.013	0.014	0.014	0.015	0.015	0.015	0.016	0.016	0.017	0.017	0.018	0.018
5.7	0.013	0.014	0.014	0.014	0.015	0.015	0.015	0.016	0.016	0.016	0.017	0.018	0.018
5.9	0.011	0.012	0.012	0.012	0.013	0.013	0.013	0.014	0.015	0.015	0.015	0.015	0.015
6.1	0.015	0.015	0.016	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.019	0.019
6.3	0.011	0.011	0.011	0.012	0.012	0.012	0.012	0.012	0.013	0.014	0.014	0.017	0.017
6.5	0.010	0.010	0.011	0.011	0.011	0.011	0.011	0.012	0.012	0.013	0.014	0.020	0.020
6.7	0.010	0.010	0.010	0.011	0.011	0.011	0.011	0.012	0.012	0.012	0.013	0.015	0.015
6.9	0.010	0.010	0.010	0.011	0.010	0.011	0.011	0.011	0.011	0.012	0.013	0.015	0.015
7.1	0.017	0.017	0.018	0.018	0.018	0.018	0.018	0.018	0.019	0.019	0.019	0.020	0.020
7.3	0.009	0.010	0.010	0.010	0.010	0.010	0.010	0.011	0.011	0.012	0.012	0.013	0.013
7.5	0.010	0.009	0.010	0.010	0.011	0.010	0.010	0.011	0.011	0.011	0.011	0.014	0.014
7.7	0.008	0.009	0.009	0.009	0.010	0.009	0.009	0.010	0.010	0.011	0.011	0.014	0.014
7.9	0.008	0.009	0.009	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.011	0.011	0.011
8.1	0.010	0.010	0.010	0.010	0.011	0.010	0.010	0.011	0.011	0.011	0.012	0.013	0.013
8.3	0.012	0.012	0.012	0.013	0.013	0.013	0.013	0.014	0.013	0.014	0.014	0.015	0.015
8.5	0.011	0.013	0.013	0.012	0.013	0.013	0.013	0.013	0.014	0.013	0.015	0.014	0.015
8.7	0.008	0.009	0.009	0.009	0.010	0.009	0.009	0.010	0.010	0.010	0.012	0.012	0.012
8.9	0.007	0.009	0.009	0.010	0.009	0.009	0.009	0.010	0.010	0.010	0.012	0.012	0.012

Model: HYD 15KTL-3PH													
Phase C													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.130	0.142	0.151	0.176	0.137	0.114	0.121	0.127	0.136	0.153	0.194	0.199	0.199
2.3	0.203	0.172	0.118	0.107	0.106	0.106	0.148	0.180	0.150	0.082	0.131	0.201	0.203
2.5	0.224	0.139	0.089	0.135	0.087	0.126	0.113	0.090	0.098	0.142	0.188	0.196	0.224
2.7	0.154	0.093	0.118	0.187	0.087	0.098	0.090	0.149	0.182	0.167	0.150	0.221	0.221
2.9	0.085	0.110	0.097	0.148	0.085	0.121	0.107	0.071	0.137	0.207	0.168	0.171	0.207
3.1	0.085	0.153	0.088	0.106	0.116	0.119	0.086	0.106	0.118	0.097	0.127	0.156	0.156
3.3	0.130	0.122	0.109	0.108	0.080	0.124	0.150	0.128	0.098	0.193	0.220	0.188	0.220
3.5	0.073	0.082	0.098	0.113	0.084	0.100	0.100	0.119	0.133	0.139	0.163	0.155	0.163
3.7	0.049	0.093	0.097	0.114	0.107	0.119	0.135	0.157	0.171	0.190	0.202	0.205	0.205
3.9	0.032	0.054	0.057	0.059	0.065	0.067	0.068	0.071	0.076	0.071	0.075	0.079	0.079
4.1	0.025	0.037	0.040	0.042	0.043	0.045	0.045	0.048	0.048	0.051	0.054	0.053	0.054
4.3	0.021	0.030	0.029	0.031	0.033	0.034	0.033	0.034	0.038	0.038	0.037	0.038	0.038
4.5	0.018	0.025	0.025	0.026	0.027	0.026	0.027	0.028	0.029	0.029	0.029	0.030	0.030
4.7	0.034	0.039	0.041	0.042	0.042	0.043	0.043	0.044	0.044	0.044	0.045	0.045	0.045
4.9	0.015	0.018	0.019	0.019	0.019	0.020	0.020	0.021	0.021	0.022	0.022	0.023	0.023
5.1	0.014	0.016	0.017	0.018	0.018	0.018	0.019	0.019	0.020	0.020	0.020	0.021	0.021
5.3	0.013	0.015	0.015	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.019	0.019	0.019
5.5	0.012	0.013	0.014	0.014	0.015	0.015	0.015	0.016	0.016	0.017	0.016	0.018	0.018
5.7	0.013	0.013	0.014	0.014	0.015	0.015	0.015	0.016	0.016	0.016	0.017	0.018	0.018
5.9	0.011	0.012	0.012	0.012	0.013	0.013	0.013	0.014	0.015	0.015	0.015	0.015	0.015
6.1	0.015	0.015	0.015	0.016	0.016	0.016	0.016	0.016	0.017	0.018	0.018	0.019	0.019
6.3	0.010	0.011	0.011	0.012	0.012	0.012	0.012	0.012	0.013	0.014	0.014	0.017	0.017
6.5	0.010	0.010	0.011	0.011	0.011	0.011	0.011	0.012	0.012	0.013	0.013	0.021	0.021
6.7	0.010	0.010	0.010	0.011	0.011	0.011	0.011	0.012	0.012	0.012	0.013	0.015	0.015
6.9	0.010	0.010	0.010	0.011	0.010	0.011	0.011	0.011	0.011	0.012	0.013	0.014	0.014
7.1	0.017	0.017	0.017	0.017	0.017	0.018	0.018	0.018	0.018	0.018	0.019	0.020	0.020
7.3	0.009	0.009	0.010	0.010	0.010	0.010	0.010	0.011	0.011	0.011	0.012	0.013	0.013
7.5	0.009	0.009	0.010	0.010	0.011	0.010	0.010	0.011	0.011	0.011	0.012	0.014	0.014
7.7	0.008	0.008	0.009	0.009	0.010	0.009	0.009	0.010	0.010	0.011	0.011	0.013	0.013
7.9	0.008	0.008	0.008	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.011	0.011	0.011
8.1	0.009	0.009	0.010	0.010	0.011	0.010	0.010	0.011	0.011	0.011	0.011	0.013	0.013
8.3	0.012	0.012	0.012	0.012	0.012	0.013	0.012	0.013	0.013	0.014	0.014	0.015	0.015
8.5	0.011	0.012	0.012	0.012	0.013	0.012	0.012	0.013	0.014	0.013	0.014	0.014	0.014
8.7	0.008	0.008	0.009	0.009	0.010	0.009	0.009	0.010	0.010	0.009	0.011	0.011	0.011
8.9	0.007	0.008	0.008	0.009	0.009	0.008	0.008	0.009	0.010	0.009	0.012	0.011	0.012

Model: HYD 20KTL-3PH													
Phase A													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.157	0.123	0.138	0.097	0.099	0.114	0.114	0.096	0.097	0.146	0.207	0.151	0.207
2.3	0.159	0.085	0.134	0.072	0.061	0.110	0.110	0.146	0.104	0.065	0.150	0.164	0.164
2.5	0.127	0.070	0.107	0.068	0.095	0.088	0.088	0.072	0.091	0.114	0.161	0.176	0.176
2.7	0.130	0.093	0.161	0.081	0.085	0.054	0.054	0.146	0.169	0.143	0.150	0.270	0.270
2.9	0.084	0.100	0.092	0.062	0.090	0.097	0.097	0.063	0.145	0.213	0.132	0.231	0.231
3.1	0.081	0.100	0.088	0.078	0.092	0.080	0.080	0.079	0.090	0.083	0.168	0.156	0.168
3.3	0.093	0.115	0.089	0.061	0.081	0.105	0.105	0.105	0.092	0.202	0.218	0.212	0.218
3.5	0.057	0.061	0.070	0.067	0.077	0.078	0.078	0.104	0.111	0.112	0.155	0.141	0.155
3.7	0.036	0.072	0.083	0.083	0.086	0.104	0.104	0.145	0.159	0.178	0.188	0.192	0.192
3.9	0.022	0.043	0.046	0.048	0.051	0.053	0.053	0.057	0.060	0.056	0.074	0.068	0.074
4.1	0.019	0.028	0.031	0.032	0.033	0.034	0.034	0.038	0.038	0.041	0.045	0.039	0.045
4.3	0.016	0.023	0.023	0.024	0.024	0.025	0.025	0.028	0.032	0.031	0.032	0.029	0.032
4.5	0.014	0.018	0.018	0.020	0.020	0.020	0.020	0.023	0.024	0.025	0.025	0.023	0.025
4.7	0.025	0.031	0.032	0.032	0.033	0.033	0.033	0.033	0.034	0.034	0.035	0.034	0.035
4.9	0.012	0.014	0.014	0.015	0.015	0.016	0.016	0.016	0.017	0.018	0.019	0.018	0.019
5.1	0.011	0.013	0.014	0.014	0.014	0.014	0.014	0.015	0.016	0.016	0.017	0.016	0.017
5.3	0.010	0.011	0.012	0.012	0.013	0.013	0.013	0.014	0.014	0.014	0.015	0.015	0.015
5.5	0.009	0.010	0.011	0.011	0.012	0.012	0.012	0.012	0.013	0.013	0.014	0.014	0.014
5.7	0.010	0.010	0.011	0.011	0.011	0.012	0.012	0.012	0.013	0.013	0.014	0.014	0.014
5.9	0.009	0.009	0.010	0.010	0.010	0.010	0.010	0.012	0.012	0.012	0.012	0.012	0.012
6.1	0.011	0.012	0.012	0.012	0.012	0.013	0.013	0.013	0.013	0.014	0.015	0.014	0.015
6.3	0.008	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.011	0.011	0.013	0.011	0.013
6.5	0.008	0.008	0.009	0.009	0.009	0.009	0.009	0.009	0.010	0.011	0.011	0.011	0.011
6.7	0.008	0.008	0.008	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.012	0.012	0.012
6.9	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.010	0.010	0.011	0.012	0.012	0.012
7.1	0.013	0.013	0.013	0.014	0.014	0.014	0.014	0.014	0.015	0.015	0.016	0.015	0.016
7.3	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.009	0.010	0.010	0.010	0.012	0.012
7.5	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.009	0.010	0.010	0.011	0.012	0.012
7.7	0.007	0.007	0.007	0.008	0.007	0.008	0.008	0.009	0.009	0.010	0.010	0.011	0.011
7.9	0.007	0.007	0.007	0.008	0.007	0.008	0.008	0.009	0.010	0.010	0.010	0.011	0.011
8.1	0.008	0.008	0.008	0.009	0.008	0.009	0.009	0.009	0.010	0.011	0.011	0.013	0.013
8.3	0.009	0.009	0.010	0.010	0.010	0.011	0.011	0.011	0.012	0.013	0.012	0.013	0.013
8.5	0.009	0.010	0.010	0.010	0.010	0.010	0.010	0.011	0.012	0.011	0.013	0.013	0.013
8.7	0.007	0.007	0.007	0.008	0.007	0.008	0.008	0.009	0.010	0.010	0.012	0.013	0.013
8.9	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.009	0.009	0.009	0.012	0.011	0.012

Model: HYD 20KTL-3PH													
Phase B													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.155	0.125	0.139	0.103	0.102	0.114	0.109	0.097	0.098	0.147	0.200	0.150	0.200
2.3	0.152	0.078	0.132	0.067	0.058	0.106	0.144	0.145	0.104	0.062	0.155	0.162	0.162
2.5	0.125	0.069	0.101	0.058	0.086	0.085	0.072	0.066	0.084	0.116	0.167	0.165	0.167
2.7	0.137	0.088	0.157	0.082	0.084	0.049	0.089	0.136	0.164	0.142	0.201	0.269	0.269
2.9	0.081	0.095	0.087	0.052	0.089	0.094	0.061	0.058	0.137	0.207	0.131	0.239	0.239
3.1	0.083	0.104	0.093	0.078	0.093	0.078	0.066	0.076	0.084	0.075	0.178	0.174	0.178
3.3	0.100	0.118	0.091	0.061	0.081	0.113	0.134	0.106	0.091	0.199	0.197	0.226	0.226
3.5	0.060	0.063	0.077	0.069	0.082	0.083	0.091	0.109	0.122	0.127	0.154	0.148	0.154
3.7	0.039	0.078	0.089	0.087	0.094	0.113	0.138	0.156	0.174	0.196	0.199	0.213	0.213
3.9	0.024	0.048	0.049	0.051	0.056	0.057	0.057	0.060	0.064	0.060	0.075	0.070	0.075
4.1	0.019	0.029	0.033	0.034	0.034	0.036	0.040	0.040	0.039	0.044	0.043	0.042	0.044
4.3	0.017	0.024	0.023	0.025	0.026	0.026	0.027	0.029	0.033	0.032	0.032	0.030	0.033
4.5	0.015	0.018	0.019	0.021	0.021	0.021	0.022	0.024	0.024	0.025	0.025	0.023	0.025
4.7	0.026	0.031	0.032	0.033	0.034	0.034	0.034	0.034	0.035	0.035	0.036	0.035	0.036
4.9	0.012	0.014	0.015	0.015	0.015	0.016	0.016	0.017	0.017	0.018	0.019	0.019	0.019
5.1	0.012	0.013	0.014	0.014	0.014	0.015	0.015	0.015	0.016	0.017	0.018	0.017	0.018
5.3	0.010	0.012	0.012	0.012	0.013	0.013	0.014	0.014	0.014	0.014	0.016	0.016	0.016
5.5	0.010	0.011	0.011	0.011	0.012	0.012	0.012	0.012	0.013	0.014	0.014	0.014	0.014
5.7	0.010	0.011	0.011	0.012	0.012	0.012	0.012	0.012	0.013	0.013	0.014	0.014	0.014
5.9	0.009	0.009	0.010	0.010	0.010	0.010	0.011	0.012	0.012	0.012	0.012	0.012	0.012
6.1	0.012	0.012	0.012	0.013	0.013	0.013	0.013	0.013	0.013	0.015	0.015	0.014	0.015
6.3	0.009	0.009	0.009	0.010	0.010	0.010	0.010	0.010	0.011	0.012	0.012	0.011	0.012
6.5	0.008	0.008	0.009	0.009	0.009	0.009	0.009	0.009	0.010	0.011	0.012	0.010	0.012
6.7	0.008	0.008	0.008	0.009	0.009	0.009	0.009	0.010	0.010	0.011	0.012	0.012	0.012
6.9	0.008	0.008	0.008	0.009	0.008	0.009	0.009	0.010	0.010	0.011	0.012	0.012	0.012
7.1	0.014	0.013	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.015	0.017	0.015	0.017
7.3	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.009	0.010	0.011	0.011	0.012	0.012
7.5	0.008	0.008	0.008	0.009	0.008	0.009	0.009	0.009	0.010	0.011	0.011	0.012	0.012
7.7	0.007	0.007	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.010	0.011	0.012	0.012
7.9	0.007	0.007	0.007	0.008	0.007	0.008	0.008	0.009	0.009	0.010	0.011	0.012	0.012
8.1	0.008	0.008	0.008	0.009	0.008	0.008	0.009	0.009	0.010	0.011	0.012	0.013	0.013
8.3	0.010	0.010	0.010	0.010	0.010	0.011	0.011	0.011	0.011	0.013	0.013	0.014	0.014
8.5	0.009	0.010	0.010	0.010	0.010	0.010	0.010	0.011	0.012	0.011	0.015	0.014	0.015
8.7	0.007	0.008	0.008	0.008	0.007	0.008	0.008	0.009	0.010	0.010	0.013	0.013	0.013
8.9	0.007	0.007	0.007	0.007	0.007	0.007	0.008	0.009	0.009	0.009	0.012	0.011	0.012

Model: HYD 20KTL-3PH													
Phase C													
P_{bin} (%)	0	10	20	30	40	50	60	70	80	90	100	110	MAX (%)
F [kHz]	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	I_h(%)	
2.1	0.157	0.124	0.147	0.106	0.106	0.116	0.114	0.100	0.107	0.150	0.228	0.156	0.228
2.3	0.161	0.084	0.139	0.071	0.062	0.109	0.146	0.148	0.107	0.061	0.152	0.168	0.168
2.5	0.120	0.068	0.104	0.062	0.092	0.090	0.077	0.074	0.087	0.122	0.206	0.184	0.206
2.7	0.133	0.095	0.162	0.085	0.089	0.056	0.090	0.140	0.163	0.137	0.184	0.282	0.282
2.9	0.085	0.097	0.094	0.056	0.094	0.099	0.071	0.066	0.130	0.199	0.131	0.234	0.234
3.1	0.087	0.118	0.100	0.084	0.097	0.081	0.079	0.093	0.094	0.078	0.118	0.180	0.180
3.3	0.101	0.119	0.092	0.061	0.086	0.113	0.131	0.101	0.098	0.192	0.205	0.213	0.213
3.5	0.058	0.063	0.074	0.065	0.086	0.083	0.089	0.108	0.121	0.128	0.173	0.172	0.173
3.7	0.037	0.074	0.084	0.084	0.090	0.105	0.128	0.144	0.161	0.179	0.195	0.202	0.202
3.9	0.024	0.044	0.047	0.048	0.052	0.052	0.054	0.058	0.061	0.056	0.063	0.067	0.067
4.1	0.019	0.028	0.032	0.033	0.033	0.034	0.037	0.037	0.038	0.041	0.048	0.041	0.048
4.3	0.016	0.023	0.023	0.024	0.025	0.026	0.026	0.027	0.032	0.031	0.031	0.031	0.032
4.5	0.014	0.018	0.019	0.020	0.020	0.020	0.021	0.023	0.024	0.024	0.024	0.023	0.024
4.7	0.025	0.030	0.031	0.032	0.032	0.032	0.033	0.033	0.034	0.034	0.035	0.034	0.035
4.9	0.012	0.014	0.014	0.015	0.015	0.016	0.016	0.016	0.017	0.018	0.019	0.019	0.019
5.1	0.011	0.013	0.014	0.014	0.014	0.015	0.015	0.015	0.016	0.016	0.017	0.016	0.017
5.3	0.010	0.011	0.012	0.013	0.013	0.013	0.014	0.014	0.014	0.014	0.015	0.015	0.015
5.5	0.010	0.011	0.011	0.011	0.012	0.012	0.012	0.012	0.013	0.013	0.014	0.014	0.014
5.7	0.010	0.011	0.011	0.012	0.012	0.012	0.012	0.013	0.013	0.013	0.013	0.014	0.014
5.9	0.009	0.009	0.010	0.010	0.010	0.011	0.011	0.012	0.012	0.012	0.012	0.013	0.013
6.1	0.012	0.012	0.012	0.013	0.012	0.013	0.013	0.013	0.014	0.014	0.015	0.014	0.015
6.3	0.009	0.009	0.009	0.010	0.009	0.010	0.010	0.010	0.011	0.011	0.012	0.011	0.012
6.5	0.008	0.008	0.009	0.009	0.009	0.009	0.009	0.010	0.010	0.011	0.012	0.011	0.012
6.7	0.008	0.008	0.008	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.012	0.012	0.012
6.9	0.008	0.008	0.008	0.009	0.008	0.009	0.009	0.010	0.010	0.011	0.012	0.011	0.012
7.1	0.014	0.013	0.013	0.014	0.014	0.014	0.014	0.014	0.015	0.015	0.016	0.015	0.016
7.3	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.009	0.010	0.010	0.011	0.012	0.012
7.5	0.008	0.008	0.008	0.009	0.008	0.009	0.009	0.009	0.010	0.011	0.012	0.012	0.012
7.7	0.007	0.007	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.010	0.010	0.011	0.011
7.9	0.007	0.007	0.007	0.008	0.007	0.008	0.008	0.009	0.009	0.010	0.011	0.011	0.011
8.1	0.008	0.008	0.008	0.009	0.008	0.009	0.009	0.009	0.010	0.011	0.012	0.013	0.013
8.3	0.009	0.010	0.010	0.010	0.010	0.010	0.011	0.011	0.011	0.013	0.013	0.013	0.013
8.5	0.009	0.010	0.010	0.010	0.010	0.010	0.010	0.011	0.011	0.011	0.013	0.013	0.013
8.7	0.007	0.007	0.007	0.008	0.007	0.008	0.008	0.009	0.009	0.010	0.012	0.012	0.012
8.9	0.006	0.007	0.007	0.007	0.007	0.007	0.008	0.008	0.009	0.009	0.012	0.011	0.012

2.3 Grid Control Capability

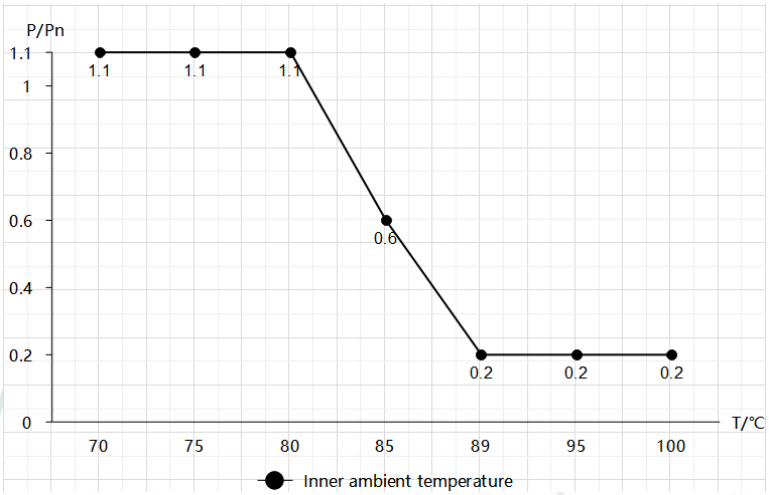
2.3.1 Wirkleistungs einspeisung in Abhängigkeit der Netfrequenz / Active power vs frequency

Überfrequenz / overfrequency	**Mittlerer Gradient der Wirkleistung sum Zeitpunkt der Frequenzüberhöhung / Mean power gradient at overfrequency**	mittl. Gradient / mean gradient 98.8 % P_M/Hz	
	Max. Einschwingzeit / Max. Settling time	0.5 s	
	Gradient der Wirkleistung nach Rückkehr aus Überfrequenz / Power gradient after recovery of over frequency	mittl. Gradient / mean gradient 8 %Pn/min max. Gradient / max. gradient 8 %Pn/min	
Unterfrequenz / underfrequency	**Mittlerer Gradient der Wirkleistung sum Zeitpunkt der Frequenzunterschreitung / Mean power gradient at underfrequency**	mittl. Gradient / mean gradient 100.4 % P_M/Hz	
	Max. Einschwingzeit / Max. Settling time	0.7 s	
	Gradient der Wirkleistung nach Rückkehr aus Unterfrequenz / Power gradient after recovery of under frequency	mittl. Gradient / mean gradient 7.9 %Pn/min max. Gradient / max. gradient 7.9 %Pn/min	
Die EZE kann mit reduzierter Leistung betrieben werden. / The unit is able to run at reduced power		☒ Ja / Yes	☐ Nein / No
Maximale Sollwertabweichung der Wirkleistung Max. deviation of power setting		Überschreitung / Exceeding 15.150 kW	Unterschreitung / Undercut 0 kW
Trennung vom Nets bei Wirkleistungssollwertvorgabe von: Disconnection from the grid at external active power setpoints at:		-- % Pn No disconnection is recorded. Operation at 0%Pn is evidenced.	
Einschwingzeit der Leistung für einen Sollwertsprung mit minimalem Gradienten / Response time of the power output after a change in setpoint with minimal gradient		P0 -> Pmin	Zeit / time : 46.1 s Gradient: 0.33 % Pn / s
		Pmin -> P0	Zeit / time : 44.2 s Gradient: 0.33 % Pn / s
Einschwingzeit der Leistung für einen Sollwertsprung mit maximalem Gradienten / Response time of the power output after a change in setpoint with maximum gradient		P0 -> Pmin	Zeit / time : 116.2 s Gradient: 0.65 % Pn / s
		Pmin -> P0	Zeit / time : 114.6 s Gradient: 0.65 % Pn / s

Note: Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document.

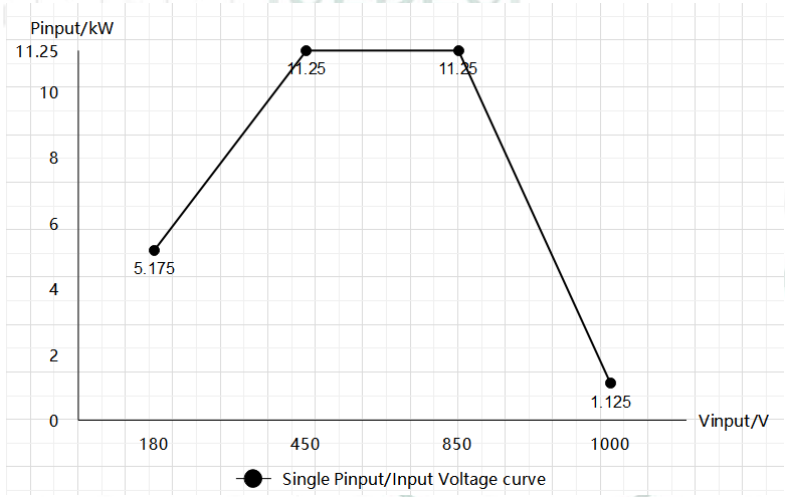
As stated in the Manufacturer Declaration “Sofar's declaration (TG8)”, Rev. 0, dated on July 12th, 2021:

Inner ambient temperature for the model HYD 15KTL-3PH



“Active power derating curve”

For the HYD 15KTL-3PH model:



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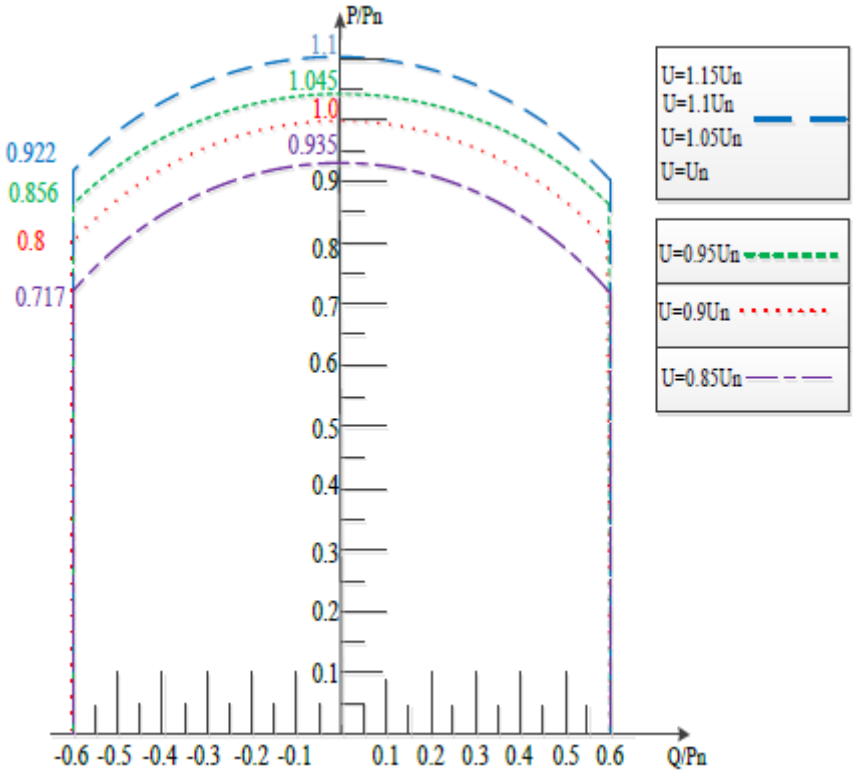
2.3.2 Procedure for reactive power provision

The certified PV inverter fulfils the following P-Q diagram at different voltage levels, as stated in the Manufacturer Declaration “Sofar's declaration (TG8)”, Rev. 0, dated on July 12th, 2021:

For VDE-AR-N 4110, the voltage-dependent PQ diagram reactive power capability of 15KTL, 5KTL, 6 KTL, 8 KTL, 10 KTL and 20 KTL hybrid inverters are shown below:



(Ambient temperature 25ºC)

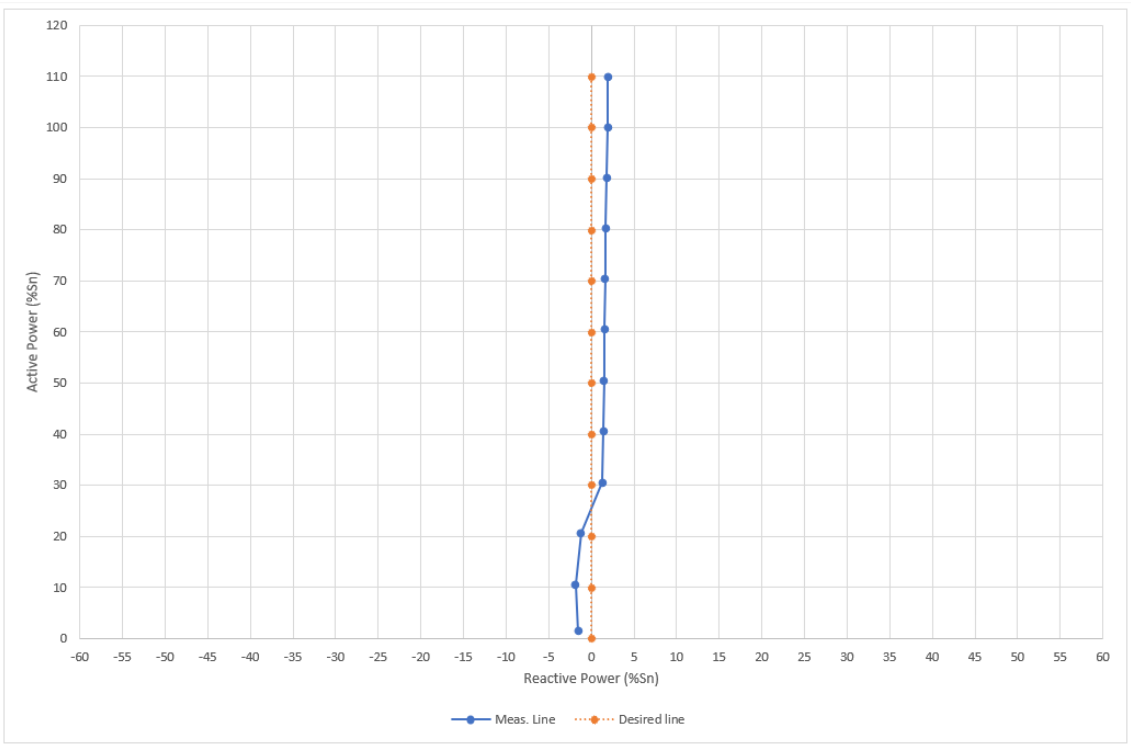
2.3.3 Blindleistungbereitstellung / Provision of reactive power

Blindleistungsregelung im Normalbetrieb und maximaler Blindleistungstellbreich / Control of reactive power in normal operation and maximum reactive power range	P/Pn	Qind	Q0	Qkap	P/Pn	Qind	Q0	Qkap
	0%	8.933	-0.227	-8.977	60%	9.127	0.231	-8.975
	10%	8.961	-0.280	-8.960	70%	9.108	0.242	-8.986
	20%	8.851	-0.179	-8.940	80%	9.090	0.255	-8.996
	30%	9.057	0.199	-8.978	90%	9.087	0.272	-8.924
	40%	9.111	0.210	-8.985	100%	7.243	0.289	-6.515
	50%	9.135	0.219	-8.993	110%	0.291	0.288	0.289
	Q in kVAr (Qind & Qkap measured at 45ºC)							
Arbitspunkte des spannungsanhängigen P-Q Diagramms / Working points of the voltage dependent P-Q diagram	AP / WP		U/Un in %		P/Pn in %		Q in kVAr	
	See measured points and results in the following pages of this annex							
Blindleistungsregelung durch Sollwertvorgabe / Control of reactive power through set point signal	☐Verschiebungsfaktor / power factor				☒Blindleistung / reactive power			
	Pbin bei / at Qmax				Q range at 50 %Pn is ± 60 %Pn			
Längste Einsschwingzeit / Longest response time	Parameter				Einsschwingzeit / settling time			
	T < 6 s				4.74 s			
	Standardzeit / standard time				--			
	T < 60 s				46.60 s			
Einstellgenauigkeit des Verschiebungsfaktors bzw. Blindleistung / Positioning accuracy of power factor or reactive power	Sollwert / setpoint				Istwert / measured value			
	4.500 kVAr				4.545 kVAr			
	0 kVAr				0.079 kVAr			
	-4.500 kVAr				-4.519 kVAr			
Anmerkung / remark	Soweit Q(U) und Q(P)- Regelung wurde, sind diese im Prüfbericht hinterlegt / See Q(U) and Q(P) in test report							

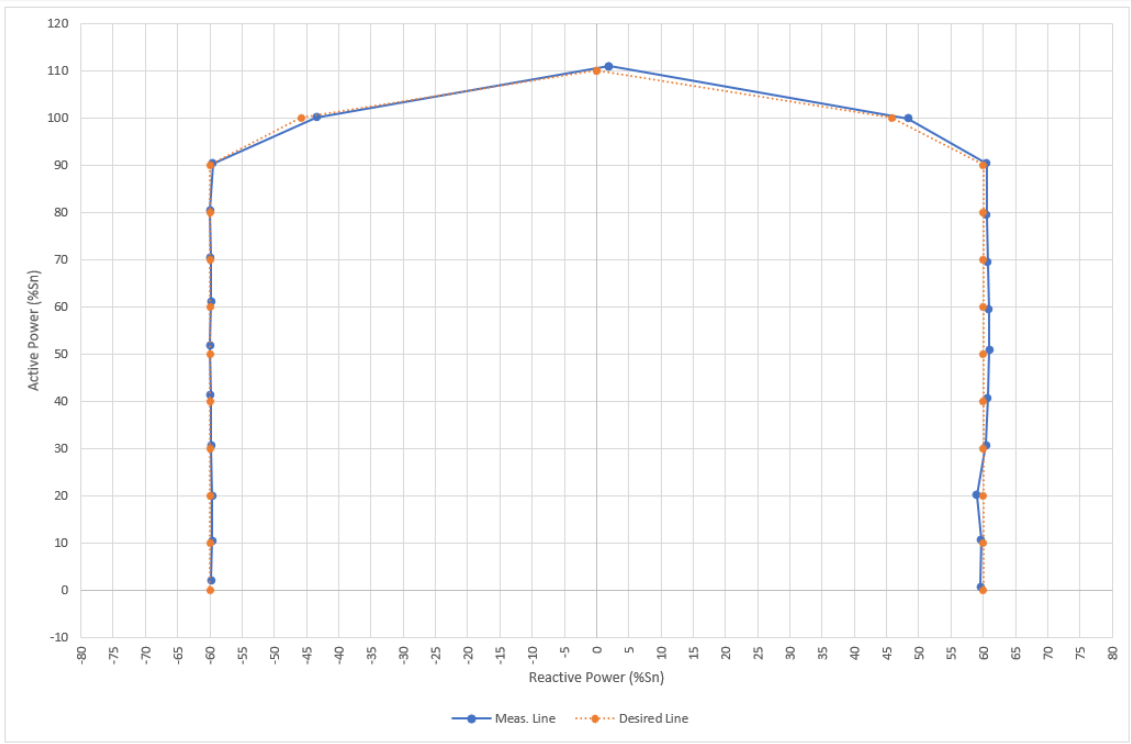
Note: Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document.

In following charts, they are offered main results after performed tests included in the FGW TG3 test report.

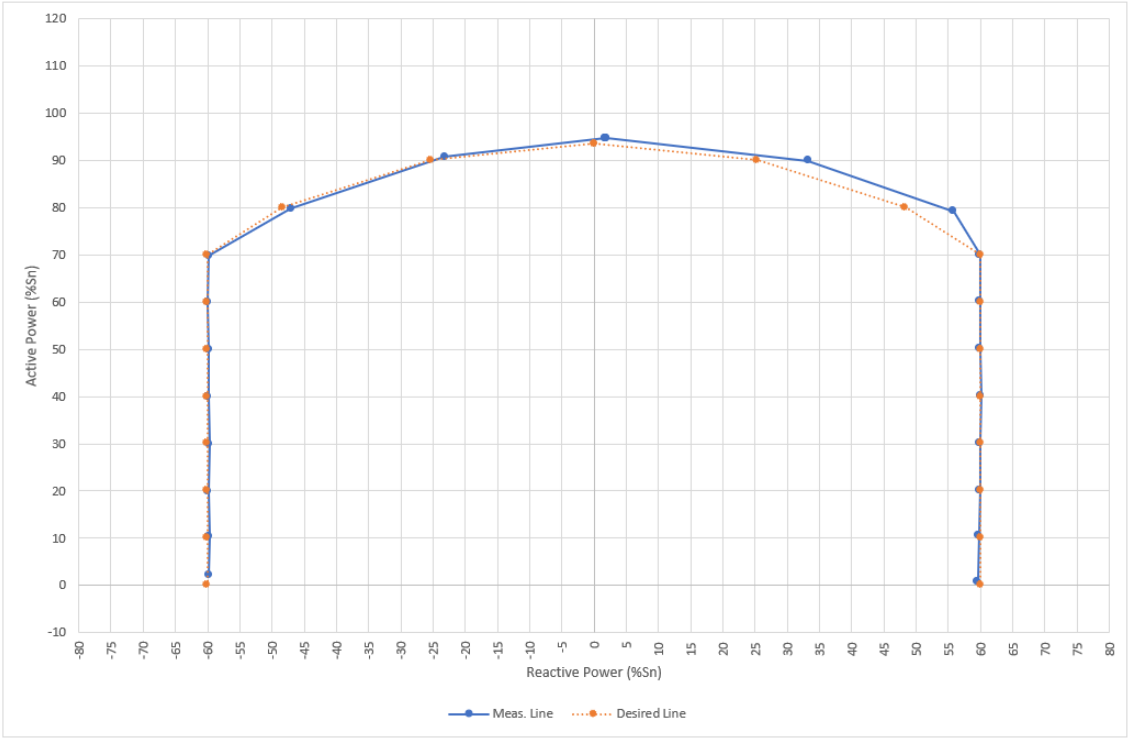
Q = 0 kVAr: Active Power over Reactive Power



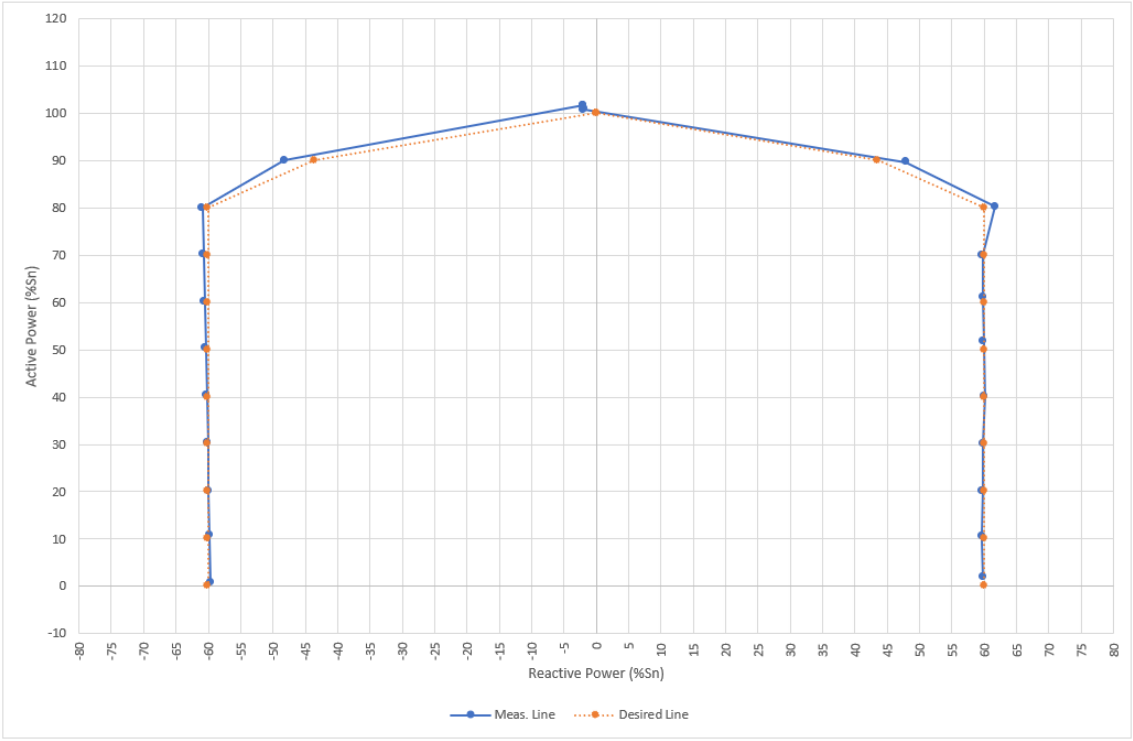
Semicircular Curve (100%Un): Active Power over Reactive Power

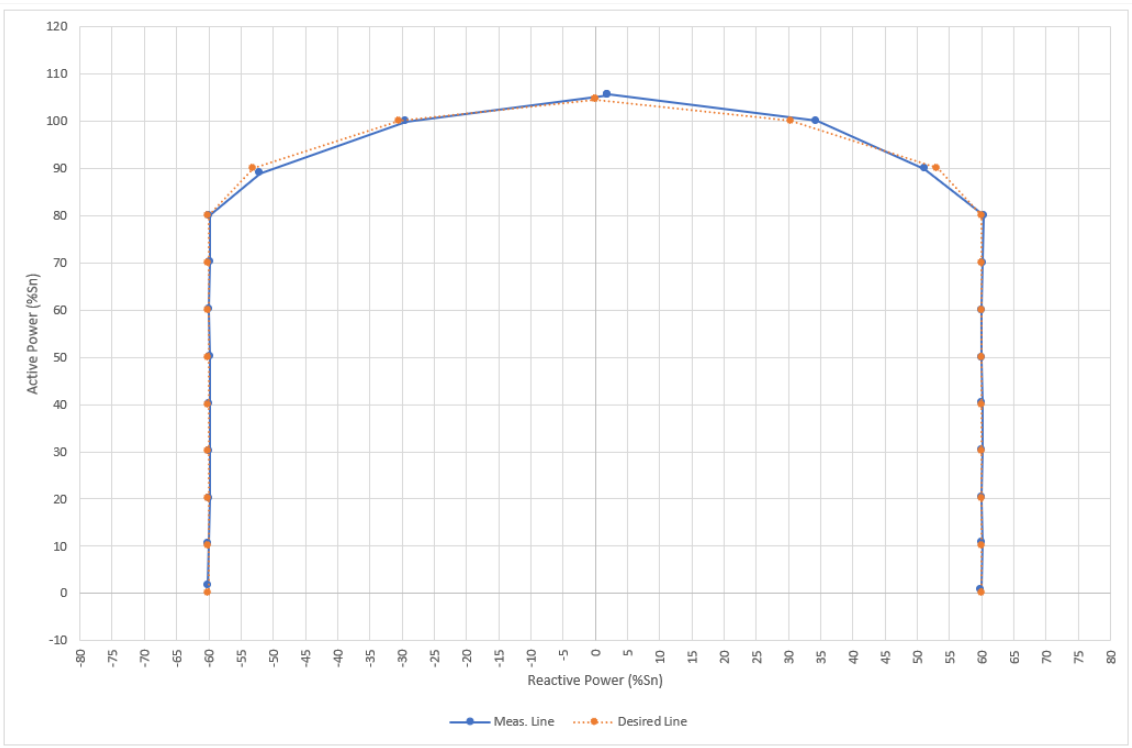


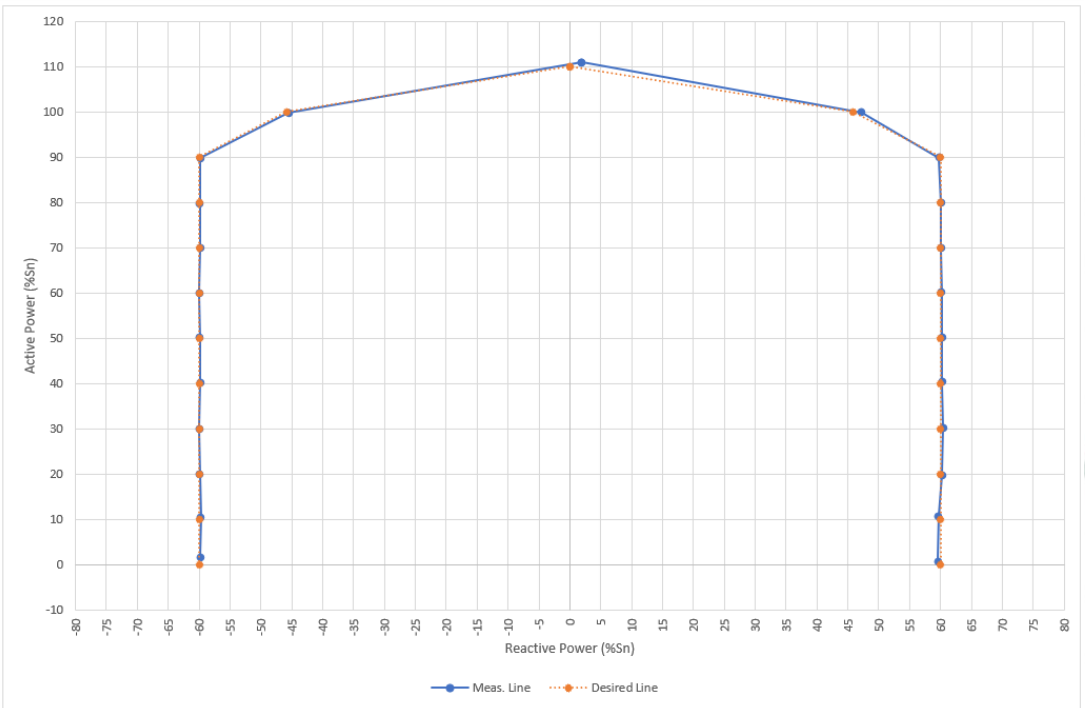
Semicircular Curve (85%Un): Active Power over Reactive Power



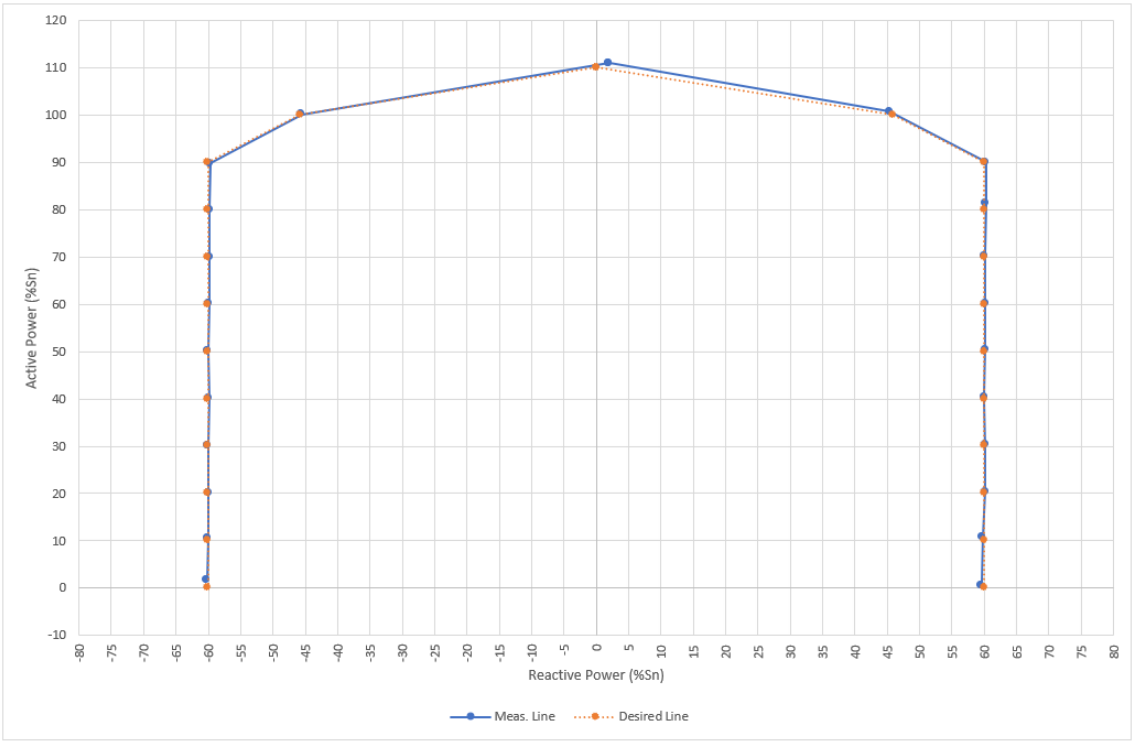
Semicircular Curve (90%Un): Active Power over Reactive Power



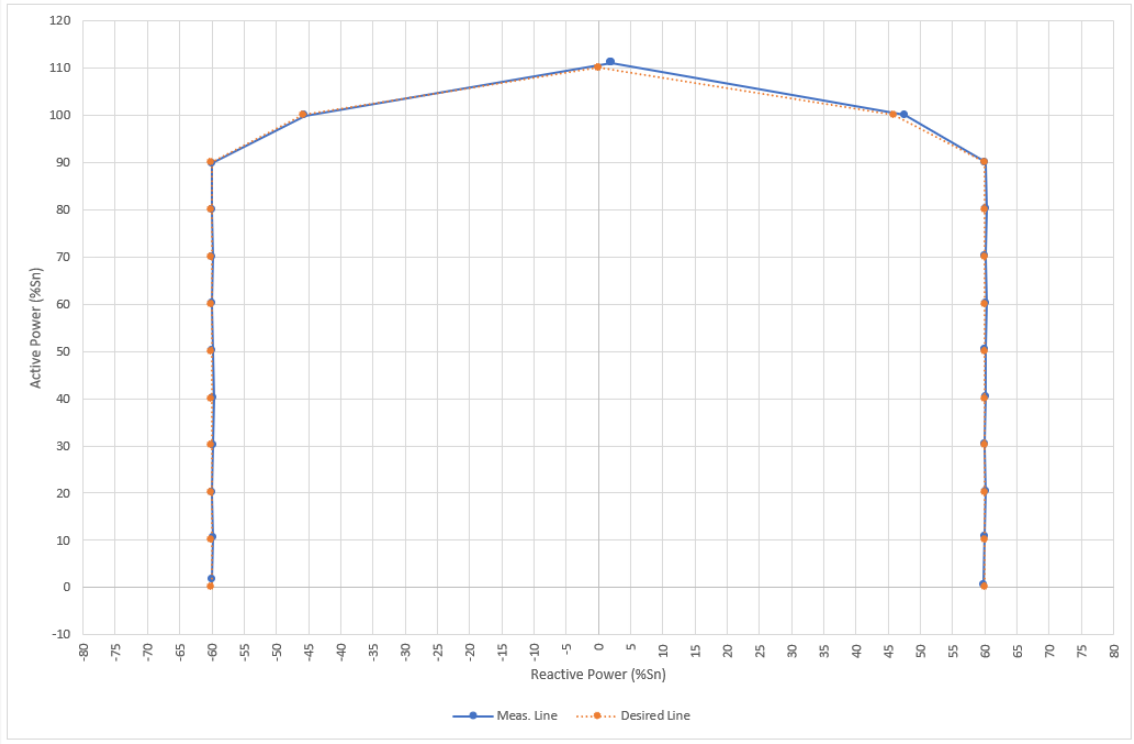
Semicircular Curve (95%Un): Active Power over Reactive Power


Semicircular Curve (105%Un): Active Power over Reactive Power


Semicircular Curve (110%Un): Active Power over Reactive Power



Semicircular Curve (115%Un): Active Power over Reactive Power



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The tables below show measured values for each power step tested to verify the voltage-dependent PQ diagram at different ambient temperature conditions:

Semicircular Curve (U = 85% Un) – Inductive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.114	8.939	8.939	-0.061	0.013	195.1	>900
10	1.583	8.967	9.105	-0.019	0.174	195.1	>900
20	3.013	8.991	9.482	-0.005	0.318	195.2	>900
30	4.522	8.987	10.061	-0.002	0.450	195.3	>900
40	6.026	9.012	10.841	+0.024	0.556	195.3	>900
50	7.524	8.993	11.725	+0.010	0.642	195.4	>900
60	9.006	8.989	12.725	-0.003	0.708	195.5	>900
70	10.492	8.986	13.814	-0.016	0.760	195.5	>900
80([1])	11.877	8.375	14.533	+0.508	0.817	195.6	>900
90([1])	13.486	4.983	14.377	+0.352	0.938	195.6	>900
100([1])	14.196	0.275	14.198	+0.173	1.000	195.6	>900
110([1])	14.197	0.275	14.199	+0.174	1.000	195.7	>900

Semicircular Curve (U = 85% Un) – Capacitive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.320	-8.965	8.971	-0.029	0.036	195.0	>900
10	1.556	-8.951	9.085	-0.039	0.171	195.1	>900
20	2.985	-8.977	9.461	-0.026	0.316	195.2	>900
30	4.495	-8.958	10.022	-0.040	0.448	195.2	>900
40	5.997	-8.984	10.802	-0.015	0.555	195.3	>900
50	7.496	-8.965	11.686	-0.029	0.641	195.4	>900
60	8.985	-8.991	12.711	-0.017	0.707	195.4	>900
70	10.467	-8.963	13.780	-0.049	0.760	195.5	>900
80([1])	11.966	-7.045	13.886	-0.139	0.862	195.6	>900
90([1])	13.599	-3.479	14.037	+0.012	0.969	195.6	>900
100([1])	14.193	0.279	14.196	+0.171	1.000	195.7	>900
110([1])	14.193	0.279	14.195	+0.170	1.000	195.7	>900

Note: Test performed in active power priority mode. Maximum apparent power that can be reached corresponds to 93.5%Pn, approximately. Deviations are calculated in relation to the theoretical P-Q curve provided by the manufacturer.
([1])The maximum reactive power was not reached max. below upper power levels due to maximum limitation of apparent power.

Semicircular Curve (U = 90% Un) – Inductive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.302	8.969	8.974	-0.026	0.034	206.5	>900
10	1.569	8.954	9.091	-0.034	0.173	206.6	>900
20	2.999	8.965	9.453	-0.034	0.317	206.7	>900
30	4.500	8.974	10.039	-0.023	0.448	206.7	>900
40	6.014	9.014	10.836	+0.020	0.555	206.8	>900
50	7.778	8.992	11.889	+0.173	0.654	206.9	>900
60	9.176	8.974	12.834	+0.107	0.715	206.9	>900
70	10.493	8.957	13.796	-0.033	0.761	207.0	>900
80	12.040	9.257	15.188	+0.188	0.793	207.6	>900
90([1])	13.442	7.187	15.243	+0.243	0.882	207.2	>900
100([1])	15.114	-0.284	15.117	+0.117	1.000	207.2	>900
110([1])	15.116	-0.284	15.118	+0.118	1.000	207.2	>900

Semicircular Curve (U = 90% Un) – Capacitive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.105	-8.937	8.937	-0.063	0.012	207.1	>900
10	1.607	-8.964	9.107	-0.017	0.176	207.1	>900
20	3.032	-8.988	9.485	-0.002	0.320	207.2	>900
30	4.540	-9.012	10.091	+0.029	0.450	207.2	>900
40	6.042	-9.037	10.871	+0.054	0.556	207.3	>900
50	7.540	-9.061	11.788	+0.073	0.640	207.3	>900
60	9.022	-9.086	12.804	+0.076	0.705	207.4	>900
70	10.513	-9.111	13.911	+0.082	0.756	207.4	>900
80	11.997	-9.136	15.080	+0.080	0.796	207.5	>900
90([1])	13.500	-7.224	15.312	+0.312	0.882	206.6	>900
100([1])	15.248	-0.287	15.251	+0.251	1.000	206.7	>900
110([1])	15.247	-0.284	15.249	+0.249	1.000	206.6	>900

Note: Test performed in active power priority mode. Maximum apparent power that can be reached corresponds to 100%Pn, approximately. Deviations are calculated in relation to the theoretical P-Q curve provided by the manufacturer.
([1])The maximum reactive power was not reached max. below upper power levels due to maximum limitation of apparent power.

Semicircular Curve (U = 95% Un) – Inductive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.109	8.982	8.982	-0.018	0.012	218.1	>900
10	1.610	9.010	9.153	+0.029	0.176	218.2	>900
20	3.041	9.004	9.504	+0.017	0.320	218.2	>900
30	4.552	9.014	10.099	+0.036	0.451	218.3	>900
40	6.059	9.009	10.857	+0.041	0.558	218.3	>900
50	7.473	9.002	11.700	-0.015	0.639	218.4	>900
60	8.995	8.998	12.723	-0.005	0.707	218.4	>900
70	10.489	9.024	13.837	+0.007	0.758	218.5	>900
80	11.995	9.049	15.026	+0.026	0.798	218.5	>900
90	13.481	7.669	15.510	-0.165	0.869	218.6	>900
100([1])	15.007	5.153	15.867	+0.192	0.946	218.6	>900
110([1])	15.834	0.294	15.836	+0.161	1.000	218.7	>900

Semicircular Curve (U = 95% Un) – Capacitive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.272	-9.018	9.022	+0.022	0.030	218.0	>900
10	1.580	-9.002	9.140	+0.016	0.173	218.1	>900
20	3.012	-8.983	9.474	-0.013	0.318	218.2	>900
30	4.524	-8.977	10.052	-0.010	0.450	218.2	>900
40	6.032	-8.985	10.822	+0.005	0.557	218.3	>900
50	7.534	-8.965	11.711	-0.004	0.643	218.3	>900
60	9.021	-8.991	12.737	+0.009	0.708	218.4	>900
70	10.514	-8.971	13.821	-0.008	0.761	218.4	>900
80	12.006	-8.980	14.993	-0.007	0.801	218.5	>900
90	13.342	-7.803	15.456	-0.219	0.863	218.5	>900
100([1])	14.979	-4.412	15.616	-0.059	0.959	218.6	>900
110([1])	15.831	0.295	15.834	+0.159	1.000	218.6	>900

Note: Test performed in active power priority mode. Maximum apparent power that can be reached corresponds to 104.5%Pn, approximately. Deviations are calculated in relation to the theoretical P-Q curve provided by the manufacturer.
([1])The maximum reactive power was not reached max. below upper power levels due to maximum limitation of apparent power.

Semicircular Curve (U = 105% Un) – Inductive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.100	8.934	8.935	-0.065	0.011	241.1	>900
10	1.613	8.960	9.105	-0.020	0.177	241.1	>900
20	2.947	9.028	9.497	+0.010	0.310	241.2	>900
30	4.545	9.054	10.131	+0.069	0.449	241.2	>900
40	6.048	9.035	10.872	+0.055	0.556	241.3	>900
50	7.549	9.029	11.769	+0.053	0.641	241.4	>900
60	9.031	9.023	12.767	+0.039	0.707	241.4	>900
70	10.523	9.019	13.859	+0.029	0.759	241.5	>900
80	12.008	9.014	15.015	+0.015	0.800	241.5	>900
90	13.492	8.965	16.198	-0.026	0.833	241.6	>900
100	14.990	7.092	16.583	+0.083	0.904	241.6	>900
110	16.642	0.294	16.644	+0.144	1.000	241.7	>900

Semicircular Curve (U = 105% Un) – Capacitive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.261	-8.980	8.984	-0.016	0.029	241.0	>900
10	1.580	-8.963	9.101	-0.023	0.174	241.1	>900
20	3.007	-8.988	9.478	-0.009	0.317	241.2	>900
30	4.515	-8.996	10.066	+0.004	0.449	241.2	>900
40	6.019	-8.975	10.807	-0.010	0.557	241.3	>900
50	7.519	-8.984	11.716	+0.000	0.642	241.3	>900
60	9.011	-8.994	12.732	+0.004	0.708	241.4	>900
70	10.495	-8.974	13.809	-0.020	0.760	241.4	>900
80	11.982	-8.984	14.976	-0.024	0.800	241.5	>900
90	13.464	-8.964	16.175	-0.050	0.832	241.6	>900
100	14.972	-6.835	16.458	-0.042	0.910	241.6	>900
110	16.642	0.296	16.644	+0.144	1.000	241.7	>900

Note: Test performed in active power priority mode. Maximum apparent power that can be reached corresponds to 110%Pn, approximately. Deviations are calculated in relation to the theoretical P-Q curve provided by the manufacturer.

Semicircular Curve (U = 110% Un) – Inductive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.093	8.932	8.933	-0.067	0.010	252.4	>900
10	1.614	8.958	9.102	-0.022	0.177	252.4	>900
20	3.038	9.026	9.524	+0.037	0.319	252.5	>900
30	4.545	9.022	10.102	+0.040	0.450	252.5	>900
40	6.050	9.002	10.846	+0.029	0.558	252.6	>900
50	7.549	9.026	11.767	+0.052	0.642	252.6	>900
60	9.034	9.022	12.767	+0.040	0.708	252.9	>900
70	10.526	9.017	13.860	+0.031	0.759	252.9	>900
80	12.188	9.045	15.178	+0.178	0.803	253.0	>900
90	13.497	9.037	16.244	+0.019	0.831	253.0	>900
100	15.115	6.804	16.576	+0.076	0.912	253.6	>900
110	16.648	0.299	16.650	+0.150	1.000	253.1	>900

Semicircular Curve (U = 110% Un) – Capacitive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.255	-9.031	9.035	+0.035	0.028	252.3	>900
10	1.580	-9.012	9.150	+0.026	0.173	252.4	>900
20	3.007	-8.992	9.482	-0.005	0.317	252.5	>900
30	4.514	-9.001	10.069	+0.007	0.448	252.5	>900
40	6.019	-8.979	10.810	-0.007	0.557	252.6	>900
50	7.520	-9.003	11.730	+0.015	0.641	252.6	>900
60	9.013	-8.982	12.725	-0.003	0.708	252.7	>900
70	10.498	-8.962	13.803	-0.026	0.761	252.7	>900
80	11.986	-8.972	14.972	-0.028	0.801	252.8	>900
90	13.471	-8.952	16.174	-0.051	0.833	252.8	>900
100	15.013	-6.837	16.497	-0.003	0.910	252.9	>900
110	16.648	0.295	16.651	+0.151	1.000	252.9	>900

Note: Test performed in active power priority mode. Maximum apparent power that can be reached corresponds to 110%Pn, approximately. Deviations are calculated in relation to the theoretical P-Q curve provided by the manufacturer.

Semicircular Curve (U = 115% Un) – Inductive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.090	8.975	8.975	-0.025	0.010	264.1	>900
10	1.614	9.000	9.143	+0.019	0.177	264.2	>900
20	3.037	9.023	9.520	+0.034	0.319	264.2	>900
30	4.545	9.003	10.085	+0.023	0.451	264.2	>900
40	6.047	9.029	10.867	+0.050	0.556	264.3	>900
50	7.549	9.009	11.753	+0.038	0.642	264.3	>900
60	9.032	9.033	12.774	+0.046	0.707	264.4	>900
70	10.525	9.013	13.857	+0.028	0.760	264.4	>900
80	12.012	9.038	15.032	+0.032	0.799	264.5	>900
90	13.495	9.019	16.232	+0.007	0.831	264.5	>900
100	14.996	7.132	16.605	+0.105	0.903	264.6	>900
110	16.655	0.309	16.658	+0.158	1.000	264.6	>900

Semicircular Curve (U = 115% Un) – Capacitive							
P Desired (%Pn)	**P measured (kW)**	**Q measured (kVAr)**	**S measured (kVA)**	**S deviation (kVA)**	**Power Factor (cos φ)**	**V_{AC+} (V)**	**Number of records**
0	0.252	-8.988	8.991	-0.009	0.028	264.0	>900
10	1.582	-8.969	9.107	-0.017	0.174	264.1	>900
20	3.004	-8.993	9.482	-0.005	0.317	264.2	>900
30	4.509	-8.972	10.042	-0.021	0.449	264.2	>900
40	6.013	-8.951	10.783	-0.033	0.558	264.3	>900
50	7.517	-8.975	11.707	-0.009	0.642	264.3	>900
60	9.011	-8.999	12.735	+0.007	0.708	264.4	>900
70	10.497	-8.978	13.813	-0.017	0.760	264.4	>900
80	11.986	-8.988	14.982	-0.018	0.800	264.4	>900
90	13.471	-8.998	16.200	-0.025	0.832	264.5	>900
100	14.978	-6.840	16.466	-0.034	0.910	264.5	>900
110	16.654	0.302	16.657	+0.157	1.000	264.6	>900

Note: Test performed in active power priority mode. Maximum apparent power that can be reached corresponds to 110%Pn, approximately. Deviations are calculated in relation to the theoretical P-Q curve provided by the manufacturer.

2.4 Protection system

2.4.1 Trennung der EZE vom Netz / Cut-off from grid

☒ Die Überprüfung der Gesamtwirkungskette führte zu einer erfolgreichen Abschaltung.
The test of the whole trip circuit led to a successful shut down

	Einstellwert Setting In pu oder/or [Hz]		Auslösewert / Release value In pu oder/or [Hz]		Abschaltzeit / Disconnection time [s]		Rückfallverhältnis Disengaging ratio
	Schwelle / value	Zeit / time	Min.	Max.	Min.	Max.	
Spannungssteigerungsschutz/ Overvoltage protection: U>	1.000	180.00 s	1.003	1.003	180.00	180.030	☒≥0.98 ☐<0.98
	1.300	0.100 s	1.302	1.304	0.095	0.108	
Spannungssteigerungsschutz/ Overvoltage protection: U>>	1.000	0.100 s	1.049	1.053	0.083	0.098	---
	1.300	0.000 s	1.300	1.303	0.012	0.041	
Spannungsrückgangsschutz/ Undervoltage protection: U<	0.100	0.000 s	0.098	0.101	0.022	0.036	☒≤1.02 ☐>1.02
	1.000	2.500 s	0.945	0.949	2.385	2.395	
Spannungsrückgangsschutz/ Undervoltage protection: U<<	0.100	0.000 s	0.096	0.100	0.042	0.074	☒≤1.02 ☐>1.02
	1.000	0.800 s	0.998	0.998	0.804	0.812	
Frequenzsteigerungsschutz/ Overfrequency protection: F>	50.00	5.000 s	50.03		4.990		---
	55.00	0.000 s	55.00		0.043s		
Frequenzsteigerungsschutz/ Overfrequency protection: F>>	50.00	0.100 s	50.02		0.095 s		---
	55.00	0.000 s	54.95		0.039 s		
Frequenzrückgangsschutz/ Underfrequency protection: F<	45.00	0.000 s	44.98		0.036 s		---
	49.50	0.100 s	49.49		0.109 s		

Eigenzeit der Abschalteinheit / Operating time of a circuit breaker:	☒ **aus Messung** by measurement	☐ **aus Prüfzertifikat** by test certificate
	According to the point 4.4.1 of the test report no. 2221/0254, the measured circuit breaker operating time is 39 ms The PGU can either be assembled with following alternatives of the circuit breaker: - Alternative: AZSR143 with: – Declared operate time given by the supplier: 10 ms as maximum. – Declared release time given by the supplier: 20 ms as maximum. See next pages.	

Note: The time accuracy is +10 ms due to relay delay. The setting time for the trigger has been established equal to the setting value. Therefore, some of the measured times are over the setting value but within the given tolerance.

Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document.

Supplier: AZSR 143

AZSR143

50 AMP MINIATURE POWER RELAY

FEATURES:

- Dielectric strength 4500Vrms, 10KV surge
- 50 Amp switching capability
- Contact gap : 1.8mm
- UL class F insulation system
- UL： E365652
- TUV： B 088793 0015
- CQC： 19002227975

CONTACTS

Arrangement	SPST (1 Form A)
Ratings	Resistive load: Max. switched power: 13850VA Max. switched current: 50A Max. switched voltage: 277VAC Max. continuous current: 50 A
UL/TUV/ CQC	43A at 277 VAC, resistive, 85° C, 30k cycles 33A at 277 VAC, resistive, 105° C, 30k cycles 50A at 277 VAC, resistive, 85° C, 6k cycles 20A 277VAC on, carrying 50A, 20A 277VAC off, Res., 50k cycles, 85℃
Material	AgSnO2(Silver tin oxide)
Resistance	＜100 mΩ initially (at 6V, 1A, voltage drop method)

COIL

Power **At pickup Voltage** **Max. Continuous Dissipation** **Temperature Rise**	900 mw (typical) 2.3 W at 20℃(68℉) ambient 70℃ Max. at Rated voltage,43A,85℃
Temperature	Max. 155℃(311℉) class F

NOTES

1.All values at 20℃(68℉)
2.Relay may pull in with less than "Must Operate" value
3.Specifications subject to change without notice

GENERAL DATA

Life Expectancy **Mechanical** **Electrical**	Minimum operations 100,000 cycles Min. See UL/TUV/CQC ratings
Operate Time(typical)	20 ms Max. at nominal coil voltage
Release Time(typical)	10 ms Max. at nominal coil voltage (with no coil suppression)
Dielectric Strength (Initial.)	4500 Vrms(coil to contacts) 2500 Vrms(between open contacts)
Surge Voltage	10KV @1.2/50μs (coil to contacts)
Insulation Resistance	1,000MΩ min. at 20℃ 500VDC 50% RH
Holding voltage	Greater than 35% of nominal coil voltage
Dropout	Greater than 5% of nominal coil voltage
Ambient Temperature **Operating** **Storage**	At rated coil voltage -40℃(-40F)to 85℃(185℉) -40℃(-40F)to 105℃(221℉)
Vibration	1.5mm DA at 10-55 Hz
Shock	20g
Enclosure	P.B.T, Polyester
Terminals	Tinned copper alloy, P.C.
Max. Solder Temp.	270℃(518℉)
Max. solder time	5 seconds
Weight	25g
Packing unit in pcs	50per tray/500per carton box

ZETTLER RELAY (XIAMEN) CO., LTD. ***www.zettlercn.com***
5F,No.6 , Xinjin Road , Xinyang Industrial Zone, Haicang District, Xiamen, China. Tel:(0592)2631523
Fax: (0592)2631599

10/10/2019

AZSR143

RELAY ORDERING DATA

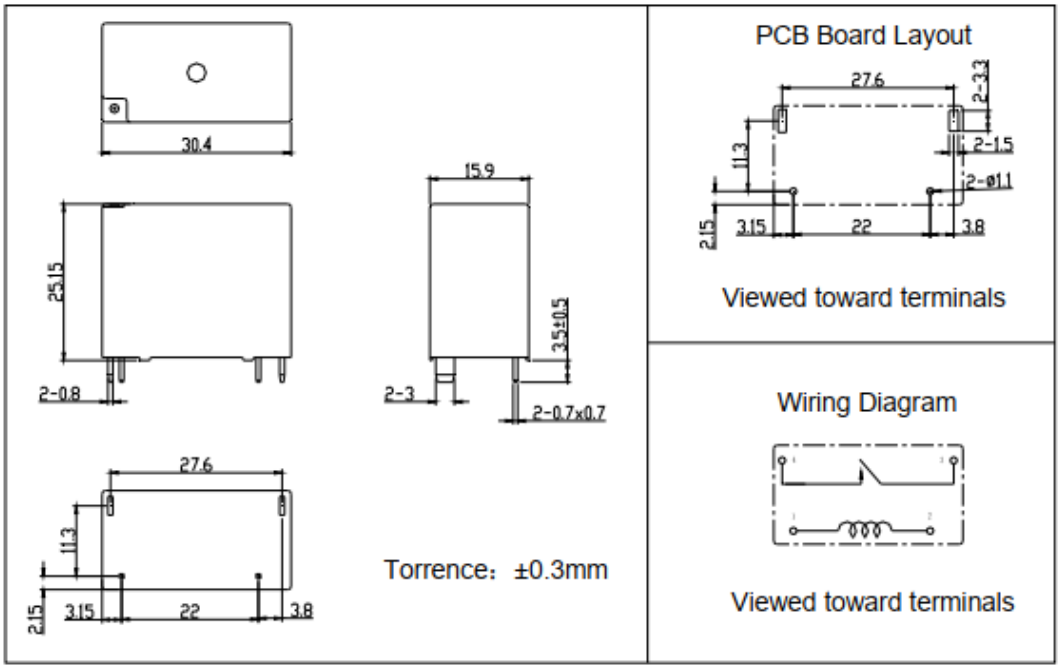
COIL SPECIFICATIONS @20℃					ORDER NUMBER
Nominal Coil VDC	Must Operate VDC	Min. holding VDC	Max. Continuous VDC	Coil Resistance Ω±10%	
5	3.75	1.75	6	15.5	AZSR143-1AE-5D
9	6.75	3.20	10.8	50.5	AZSR143-1AE-9D
12	9	4.2	14.4	90	AZSR143-1AE-12D
18	13.5	6.3	21.6	202.5	AZSR143-1AE-18D
24	18	8.4	28.8	360	AZSR143-1AE-24D
48	36	16.8	57.6	1440	AZSR143-1AE-48D

NOMENCLATURE

AZSR143 - 1A E - 12D (XXX)
I II III IV V

I. Basic Series	AZSR143
II. Contact Form	1A: 1 form A
III. Contact Material	E: AgSnO2
IV. Coil Voltage	5, 9, 12, 18, 24, 48 VDC.
V. Special code	Additional numbers or letters, which does not designate construction features or ratings

MECHANICAL DATA



Disclaimer: The specification is for referenece only. We could not evalue all the performance and all the parameters for every possible application.Thus the user should evaluate and select the suitable product for their own application. If there is any query, please contact ZETTLER. However, it is the user's responsibility to determine which product should be used only.
免责声明：此规格书仅用于参考。我们不能评估所有可能的应用条件下的性能和参数，所以用户需根据自己的应用评估和选择合适的产品。如有疑问，可以咨询赛特勒；但仍然是用户的责任来选择和使用产品。

ZETTLER RELAY (XIAMEN) CO., LTD. ***www.zettlercn.com***
5F,No.6 , Xinjin Road , Xinyang Industrial Zone, Haicang District, Xiamen, China. Tel:(0592)2631523
Fax: (0592)2631599

10/10/2019

2.4.2 Zuschaltbedingungen / Cut-in conditions

- For VDE-AR-N 4110: 2018-11

	Bereich / range In pu order/ or [Hz]	Zuschaltung erfolgte im angegebenen Bereich / cut in occurred within the given range	
Zpannung / Voltage:	0.90 – 1.10	☐ nein / no	☒ ja / yes
Frequenz / Frequency:	47.5 – 50.2	☐ nein / no	☒ ja / yes

Note: Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document.

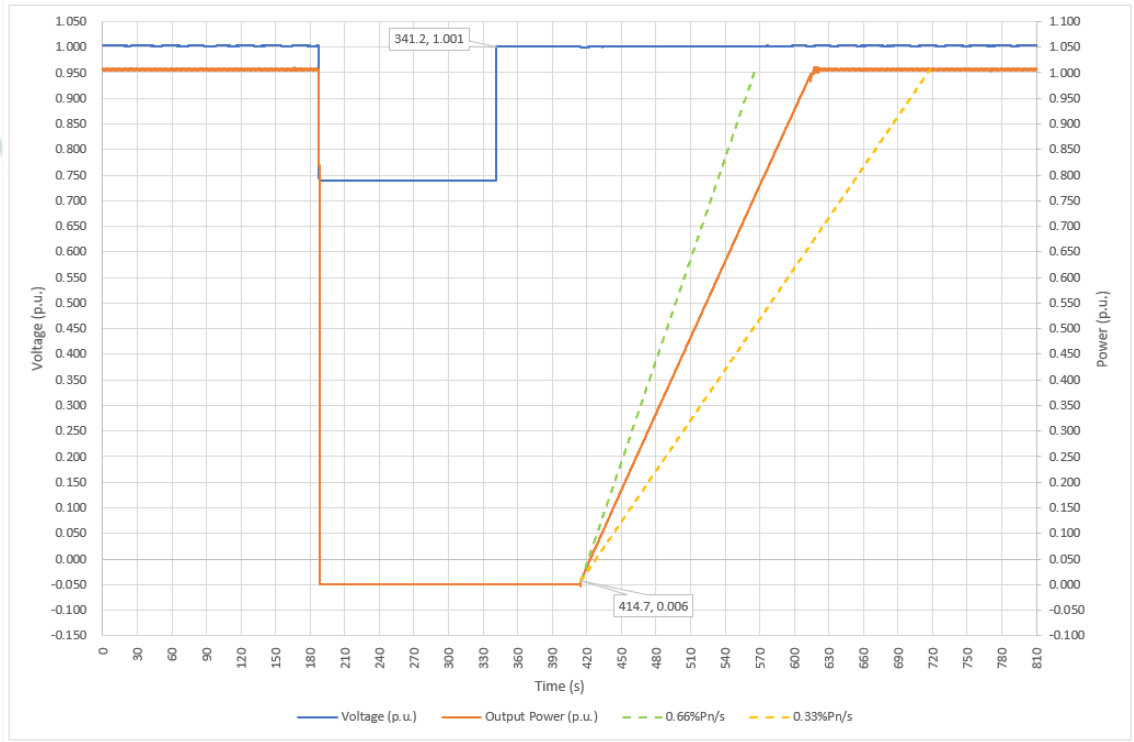
2.4.3 Zuschaltbedingungen nach Auslösung des Entkupplungsschutzes / Cut-in conditions after tripping of protection

	Bereich / range In pu order/ or [Hz]	Zuschaltung erfolgte im angegebenen Bereich cut in occurred within the given range	
Unterspannung / Undervoltage:	> 0.95	☐ nein / no	☒ ja / yes
Unterfrequenz / Underfrequency:	≥ 49.9	☐ nein / no	☒ ja / yes
Überfrequenz / Overfrequency:	≤ 50.1	☐ nein / no	☒ ja / yes

Note: Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document.

As evidenced in the FGW TG3 test report, the certified unit follows a ramp gradient inside of the range 33%Pn/s – 66%Pn/s after the reconnection occurs.

Graphical representation of the test over time



Note: Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document.

2.5 Response during grid faults

The compliance with these requirements including all calculations defined in the FGW TR3 standard is stated in the attachement to the test report:

- **2221 / 0254 (Rev 0) ATTACHMENT I : FGW-TG3: Grid Fault Tests Results**

Note: Results given are obtained after test results performed on the model HYD 15KTL-3PH. These test results for the model HYD 15KTL-3PH are essentially valid for the derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH, considering the evaluation offered in the point 1.2 of this document.

The instantaneous values of AC currents and voltages are recorded synchronously with 50kHz (20µs). Positives sequence component are based on measurement of instantaneous voltages and currents are calculated according to IEC 61400-21 (2008).

The following table shows the declared short-circuit values for certified models and can be applied to Annex E.5 of the VDE norm.

- For HYD 5KTL-3PH:
  - R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 14.5 A
  - R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 14.5 A
  - R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 14.5 A.
- For HYD 6KTL-3PH:
  - R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 17.4 A
  - R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 17.4 A
  - R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 17.4 A.
- For HYD 8KTL-3PH:
  - R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 23.19 A
  - R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 23.19 A
  - R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 23.19 A.
- For HYD 10KTL-3PH:
  - R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 28.99 A
  - R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 28.99 A
  - R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 28.99 A

- For HYD 15KTL-3PH:
  - R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 43.47 A
  - R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 43.47 A
  - R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 43.47 A

- For HYD 20KTL-3PH:
  - R.m.s. value of the source current for three-phase fault, IskPF (First 1-2 cycles of the Fault) = 43.47 A
  - R.m.s. value of the source current for two-phase fault, I(1)sk2PF (First 1-2 cycles of the Fault) = 43.47 A
  - R.m.s. value of the source current for single-phase fault, I(1)sk1PF (First 1-2 cycles of the Fault)= 43.47 A

Negative sequence short circuit impedance for all integer K factors is 1.618~9999 p.u.@stable status.

3 OVERVIEW OF RESULTS OF THE FGW TR4 VALIDATION REPORT

Report Number: 2221 / 0254 with date 2021-12-23 according FGW TR4 rev. 9.

Software Characteristics

- Validation report number: 2221/0254-TG4
- Issuance date: 28/12/2021
- Issued by: SGS Tecnos, S.A. (Electrical Testing Laboratory)
- Simulation model name: ES15kW3ph_PGU.slx
- Version of the simulation model: V2
- MD5 Checksum: CC86AB742714DC27068C31C28E341B25
- Simulation platform: Matlab Simulink
- Simulation platform version: R2021b.

The model is in accordance with the requirements of the clause 5 of FGW TR4 rev.9. The validation of the dynamic simulation model has been performed in order to be compliant with evaluations required in the point 2.3.3 of the standard FGW TR8, rev9.
Requirements of the clause 11.2.6.3 of the standard VDE-AR-N 4110: 2018 have been considered for the evaluation process.
Deviations evaluated for MXE, ME and MAE calculations are in accordance with the chapter 5.3 of FGW TR4 rev.9.

The validation plan is according with the chapter 5.1 of FGW TR4 rev.9. where following tests have been used for validation:

- Validation requirements for voltage ride through:
  This involves the validation of symmetrical and asymmetrical test cases defined in the table 4-69 of the chapter 4.6.3 of FGW TR3 rev.25 for Type 2 PGUs.
- Validation of P and Q setpoint control functions
  This involves the validation of the dynamic response of the simulation model in front of P and Q changes commanded by set point. Test requirements offered in the chapter 4.2.4 of FGW TR3 rev.25 are considered.
- Validation requirements for reactive power control processes:
  This involves the validation of accuracy requirements defined in chapters 4.2.5 (Q vs U) and 4.2.6 (Q vs P) of FGW TR3 rev.25.
- Verification of requirements for protective settings:
  This involves the verification of the parameters for protection devices and settings declared by default for the certified product.

The validation overview for VRT cases is compliant with the Annex A.1.1, included in the report and compared with the validation overview in accordance with the table A-1. See FRT validation results in the point 2.1 of this document.

The main validation process detailed in the above referred report has been performed over the dynamic simulation model for HYD 15KTL-3PH. In addition, for this model, it has been performed the full list additional plausibility tests in accordance with the chapter 5.5 of FGW TR4 rev.9.
Apart of this, in order to verify the transferability of validation results to derived models, they have also been completed following simulation cases over the dynamic simulation model of HYD 15KTL-3PH adapted to operate with generation capabilities of derived models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH, HYD 20KTL-3PH. See the information given in the point 1.4 of this document for further information.

- Verification of Voltage-Dependent PQ diagrams.

See further information of the dynamic simulation model and the software used in the point 4 of this annex.

3.1 Validation results

3.1.1 Validation overview

The following table shows the FRT validation results in terms of deviations as defined by the standard for the positive and negative sequences of currents and powers in symmetrical and asymmetrical fault conditions at nominal and partial power.

All deviations are in accordance to the regular maximum tolerances given by the standard.

Test designation compliant with TR3, Chapter 4.6 Response during grid faults. Table 4-67			Three phase voltage drops in Positive phase sequence system											
			P			Q			Ia			Iq		
			MXE	ME	MAE	MXE	ME	MAE	MXE	ME	MAE	MXE	ME	MAE
0.20≤Ures≤0.30	In accordance with IEC	Pre	0.0046	0.0007	0.0017	0.0198	-0.0166	0.0166	0.0051	0.0013	0.0020	0.0038	0.0006	0.0009
25.1		Fault	0.0056	0.0039	0.0004	0.0011	0.0015	0.0002	0.0255	-0.0132	0.0159	0.0066	0.0068	0.0034
3ph/100%/2		Post	0.0083	0.0045	0.0070	0.0195	-0.0159	0.0185	0.0079	0.0069	0.0090	0.0036	0.0007	0.0023
0.20≤Ures≤0.30	In accordance with IEC	Pre	0.0027	0.0004	0.0007	0.0035	0.0009	0.0010	0.0025	0.0001	0.0006	0.0047	0.0023	0.0023
25.2		Fault	0.0058	0.0000	0.0004	0.0007	0.0002	0.0002	0.0271	-0.0144	0.0162	0.0096	0.0102	0.0033
3ph/20%/2		Post	0.0035	0.0013	0.0021	0.0033	0.0004	0.0032	0.0032	0.0013	0.0025	0.0049	0.0036	0.0036
0.45≤Ures≤0.60	In accordance with IEC	Pre	0.0024	0.0003	0.0007	0.0196	-0.0163	0.0163	0.0026	0.0000	0.0007	0.0039	0.0005	0.0009
50.1		Fault	0.0028	0.0005	0.0012	0.0241	0.0219	0.0228	0.0280	-0.0185	0.0168	0.0476	0.0451	0.0426
3ph/100%/2		Post	0.0028	0.0052	0.0067	0.0196	-0.0143	0.0177	0.0035	0.0075	0.0086	0.0039	0.0010	0.0023
0.45≤Ures≤0.60	In accordance with IEC	Pre	0.0029	0.0002	0.0007	0.0028	0.0002	0.0007	0.0032	0.0005	0.0008	0.0060	0.0033	0.0033
50.2		Fault	0.0031	0.0008	0.0008	0.0646	0.0574	0.0631	0.0302	-0.0154	0.0170	0.1228	0.1098	0.1157
3ph/20%/2		Post	0.0029	0.0003	0.0021	0.0029	0.0021	0.0028	0.0032	0.0002	0.0028	0.0055	0.0051	0.0052
0.45≤Ures≤0.60	In accordance with IEC	Pre	0.0030	0.0001	0.0007	0.0180	-0.0156	0.0156	0.0037	0.0008	0.0010	0.0030	0.0001	0.0006
50.5		Fault	0.0134	0.0073	0.0113	0.0017	0.0026	0.0004	0.0372	-0.0214	0.0226	0.0054	0.0053	0.0008
3ph/20%/2L		Post	0.0177	0.0030	0.0053	0.0185	-0.0153	0.0153	0.0184	0.0042	0.0072	0.0031	0.0003	0.0009
0.70≤Ures≤0.80	In accordance with IEC	Pre	0.0029	0.0006	0.0008	0.0466	-0.0443	0.0443	0.0065	0.0042	0.0042	0.0310	-0.0286	0.0286
75.1		Fault	0.0113	0.0051	0.0092	0.0027	0.0004	0.0011	0.0303	-0.0188	0.0201	0.0081	0.0004	0.0008
3ph/100%/2		Post	0.0036	0.0049	0.0069	0.0474	-0.0429	0.0445	0.0074	0.0031	0.0121	0.0318	-0.0281	0.0286
0.70≤Ures≤0.80	In accordance with IEC	Pre	0.0024	0.0002	0.0007	0.0028	0.0007	0.0008	0.0027	0.0001	0.0007	0.0049	0.0025	0.0025
75.2		Fault	0.0113	0.0086	0.0094	0.0182	0.0149	0.0164	0.0315	-0.0201	0.0206	0.0305	0.0228	0.0232
3ph/20%/2		Post	0.0027	0.0020	0.0029	0.0041	0.0020	0.0023	0.0028	0.0021	0.0034	0.0048	0.0001	0.0046
0.70≤Ures≤0.80	In accordance with IEC	Pre	0.0042	0.0012	0.0013	0.0059	0.0037	0.0037	0.0030	0.0000	0.0007	0.0028	0.0006	0.0009
75.3		Fault	0.0102	0.0076	0.0084	0.0640	0.0602	0.0622	0.0304	-0.0197	0.0202	0.0896	0.0833	0.0842
3ph/20%/2		Post	0.0044	0.0024	0.0026	0.0244	0.0040	0.0095	0.0032	0.0016	0.0025	0.0276	0.0065	0.0076
0.70≤Ures≤0.80	In accordance with IEC	Pre	0.0044	0.0015	0.0015	0.0048	0.0028	0.0028	0.0037	0.0008	0.0010	0.0031	0.0005	0.0008
75.4		Fault	0.0124	0.0093	0.0099	0.0371	-0.0355	0.0347	0.0309	-0.0200	0.0201	0.0484	-0.0442	0.0450
3ph/20%/2		Post	0.0043	0.0003	0.0027	0.0300	0.0084	0.0096	0.0036	0.0008	0.0026	0.0268	0.0059	0.0072
0.70≤Ures≤0.80	In accordance with IEC	Pre	0.0028	0.0002	0.0007	0.0035	0.0008	0.0009	0.0031	0.0000	0.0006	0.0051	0.0024	0.0024
75.5		Fault	0.0042	0.0025	0.0019	0.0216	0.0168	0.0190	0.0238	-0.0128	0.0131	0.0357	0.0285	0.0282
3ph/≥10%/4		Post	0.0030	0.0009	0.0018	0.0041	0.0007	0.0028	0.0032	0.0010	0.0023	0.0047	0.0026	0.0030

Test designation compliant with TR3, Chapter 4.6 Response during grid faults. Table 4-67			Three phase voltage drops in Positive phase sequence system											
			P			Q			Ia			Iq		
			MXE	ME	MAE	MXE	ME	MAE	MXE	ME	MAE	MXE	ME	MAE
0.75≤Ures≤0.85	In accordance with IEC	Pre	0.0052	0.0004	0.0014	0.0181	-0.0157	0.0157	0.0048	0.0012	0.0018	0.0023	0.0001	0.0007
80.1		Fault	0.0134	0.0040	0.0111	0.0103	0.0095	0.0074	0.0294	-0.0152	0.0197	0.0245	-0.0217	0.0207
3ph/100%/2L		Post	0.0071	0.0072	0.0097	0.0184	-0.0151	0.0160	0.0079	0.0084	0.0122	0.0027	0.0000	0.0011
0.85≤Ures≤0.90	In accordance with IEC	Pre	0.0028	0.0005	0.0007	0.0578	-0.0557	0.0557	0.0093	0.0054	0.0054	0.0420	-0.0400	0.0400
85.1		Fault	0.0192	-0.0162	0.0166	0.0317	-0.0291	0.0290	0.0274	-0.0226	0.0229	0.0371	-0.0340	0.0340
3ph/100%/2L		Post	0.0032	0.0034	0.0049	0.0586	-0.0551	0.0553	0.0081	0.0007	0.0112	0.0428	-0.0400	0.0400
Ures≥1.15	In accordance with IEC	Pre	0.0052	0.0004	0.0014	0.0181	-0.0157	0.0157	0.0048	0.0012	0.0018	0.0023	0.0001	0.0007
115.1		Fault	0.0134	0.0040	0.0111	0.0103	0.0095	0.0074	0.0294	-0.0152	0.0197	0.0245	-0.0217	0.0207
3ph/100%/2		Post	0.0071	0.0072	0.0097	0.0184	-0.0151	0.0160	0.0079	0.0084	0.0122	0.0027	0.0000	0.0011
Ures≥1.15	In accordance with IEC	Pre	0.0034	0.0004	0.0007	0.0033	0.0011	0.0012	0.0031	0.0001	0.0006	0.0052	0.0021	0.0021
115.2		Fault	0.0422	-0.0383	0.0393	0.0046	0.0030	0.0018	0.0345	-0.0280	0.0285	0.0034	0.0012	0.0009
3ph/20%/2		Post	0.0031	0.0017	0.0024	0.0037	0.0018	0.0019	0.0028	0.0018	0.0027	0.0048	0.0022	0.0024
Ures≥1.10	In accordance with IEC	Pre	0.0022	0.0001	0.0006	0.0033	0.0009	0.0010	0.0024	0.0002	0.0006	0.0048	0.0023	0.0023
110.3		Fault	0.0368	-0.0330	0.0331	0.0089	0.0053	0.0052	0.0339	-0.0260	0.0260	0.0075	0.0042	0.0041
3ph/20%/2		Post	0.0030	0.0013	0.0025	0.0037	0.0012	0.0013	0.0031	0.0015	0.0028	0.0051	0.0025	0.0025

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Test designation compliant with TG3 Response during grid faults. Table 4-67			Two phase voltage drops in Positive phase sequence system											
			P			Q			Ia			Iq		
			MXE	ME	MAE	MXE	ME	MAE	MXE	ME	MAE	MXE	ME	MAE
Ures 20-30 % Un	In accordance with IEC	Pre	0.0032	0.0008	0.0010	0.0468	-0.0442	0.0442	0.0078	0.0035	0.0035	0.0311	-0.0285	0.0285
25.4		Fault	0.0103	0.0031	0.0079	0.0325	-0.0324	0.0306	0.0274	-0.0211	0.0206	0.0563	-0.0496	0.0516
2ph/100%/2		Post	0.0030	0.0046	0.0068	0.0467	-0.0429	0.0448	0.0069	0.0028	0.0119	0.0310	-0.0277	0.0290
Ures 20-30 % Un	In accordance with IEC	Pre	0.0028	0.0000	0.0007	0.0051	0.0029	0.0029	0.0028	0.0001	0.0007	0.0033	0.0003	0.0007
25.5		Fault	0.0095	0.0063	0.0080	0.0302	-0.0306	0.0288	0.0245	-0.0192	0.0207	0.0490	-0.0451	0.0462
2ph/20%/2		Post	0.0029	0.0007	0.0019	0.0057	0.0021	0.0040	0.0034	0.0007	0.0024	0.0036	0.0007	0.0021
Ures 45-60 % Un	In accordance with IEC	Pre	0.0033	0.0008	0.0010	0.0462	-0.0440	0.0440	0.0034	0.0013	0.0014	0.0305	-0.0283	0.0283
50.3		Fault	0.0134	0.0054	0.0095	0.0093	0.0014	0.0028	0.0265	-0.0191	0.0203	0.0134	0.0040	0.0035
2ph/100%/2		Post	0.0032	0.0058	0.0076	0.0470	-0.0428	0.0451	0.0035	0.0086	0.0097	0.0312	-0.0276	0.0294
Ures 45-60 % Un	In accordance with IEC	Pre	0.0027	0.0003	0.0007	0.0032	0.0010	0.0011	0.0028	0.0004	0.0007	0.0055	0.0022	0.0022
50.4		Fault	0.0165	0.0073	0.0088	0.0622	0.0139	0.0156	0.0281	-0.0183	0.0196	0.1171	0.0208	0.0210
2ph/20%/2		Post	0.0036	0.0001	0.0020	0.0035	0.0014	0.0031	0.0039	0.0000	0.0026	0.0052	0.0041	0.0044
Ures 45-60 % Un	In accordance with IEC	Pre	0.0029	0.0001	0.0007	0.0184	-0.0162	0.0162	0.0039	0.0014	0.0014	0.0027	0.0005	0.0008
50.6		Fault	0.0186	-0.0122	0.0162	0.0025	0.0017	0.0006	0.0312	-0.0207	0.0217	0.0034	0.0024	0.0008
2ph/100%/2		Post	0.0030	0.0317	0.0342	0.0184	-0.0150	0.0150	0.0039	0.0421	0.0444	0.0027	0.0003	0.0016
Ures 70-80 % Un	In accordance with IEC	Pre	0.0022	0.0001	0.0007	0.0199	-0.0162	0.0162	0.0037	0.0014	0.0014	0.0042	0.0004	0.0007
75.6		Fault	0.0165	0.0069	0.0138	0.0246	0.0181	0.0193	0.0231	-0.0155	0.0200	0.0279	0.0218	0.0221
2ph/100%/2		Post	0.0033	0.0076	0.0089	0.0202	-0.0161	0.0172	0.0036	0.0099	0.0109	0.0044	0.0008	0.0017
Ures 70-80 % Un	In accordance with IEC	Pre	0.0027	0.0005	0.0008	0.0025	0.0002	0.0008	0.0028	0.0006	0.0009	0.0057	0.0034	0.0034
75.7		Fault	0.0173	-0.0132	0.0145	0.0218	0.0156	0.0163	0.0239	-0.0197	0.0206	0.0250	0.0188	0.0187
2ph/20%/2		Post	0.0036	0.0006	0.0027	0.0031	0.0001	0.0013	0.0039	0.0006	0.0035	0.0058	0.0028	0.0031
Ures 70-80 % Un	In accordance with IEC	Pre	0.0025	0.0001	0.0007	0.0032	0.0010	0.0010	0.0026	0.0002	0.0007	0.0039	0.0022	0.0022
75.8		Fault	0.0125	0.0087	0.0104	0.0348	0.0249	0.0266	0.0228	-0.0184	0.0196	0.0404	0.0302	0.0306
2ph/20%/4		Post	0.0036	0.0014	0.0025	0.0028	0.0005	0.0016	0.0039	0.0015	0.0030	0.0060	0.0030	0.0038
Ures 75-85 % Un	In accordance with IEC	Pre	0.0024	0.0002	0.0007	0.0181	-0.0151	0.0151	0.0033	0.0014	0.0014	0.0032	0.0006	0.0009
80.2		Fault	0.0194	0.0098	0.0157	0.2031	0.1983	0.2011	0.0298	-0.0176	0.0210	0.2260	0.2215	0.2238
2ph/100%/2		Post	0.0034	0.0078	0.0090	0.0184	-0.0134	0.0164	0.0032	0.0101	0.0111	0.0033	0.0020	0.0023
Ures ≥ 110 % Un	In accordance with IEC	Pre	0.0024	0.0000	0.0007	0.0464	-0.0439	0.0439	0.0040	0.0021	0.0021	0.0306	-0.0281	0.0281
110.1		Fault	0.0416	-0.0330	0.0337	0.2029	-0.1984	0.1999	0.0332	-0.0266	0.0256	0.1896	-0.1839	0.1848
2ph/100%/2		Post	0.0030	0.0080	0.0092	0.0477	-0.0460	0.0460	0.0034	0.0109	0.0115	0.0319	-0.0296	0.0297
Ures ≥ 110 % Un	In accordance with IEC	Pre	0.0024	0.0002	0.0007	0.0181	-0.0159	0.0159	0.0022	0.0000	0.0006	0.0149	-0.0127	0.0127
110.2		Fault	0.0405	-0.0325	0.0327	0.1873	-0.1813	0.1830	0.0342	-0.0250	0.0249	0.1736	-0.1688	0.1698
2ph/20%/2		Post	0.0033	0.0012	0.0027	0.0200	-0.0187	0.0187	0.0033	0.0016	0.0031	0.0168	-0.0147	0.0148

Test designation compliant with TG3 Response during grid faults. Table 4-67			Two phase voltage drops in Negative phase sequence system											
			P			Q			Ia			Iq		
			MXE	ME	MAE	MXE	ME	MAE	MXE	ME	MAE	MXE	ME	MAE
Ures 20-30 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0039	0.0010	0.0012	0.0039	0.0014	0.0015
25.4		Fault	0.0344	-0.0319	0.0330	0.0396	0.0349	0.0347	0.0858	-0.0787	0.0814	0.1180	0.0935	0.0974
2ph/100%/2		Post	0.0000	0.0001	0.0002	0.0000	0.0006	0.0006	0.0046	0.0006	0.0025	0.0042	0.0007	0.0028
Ures 20-30 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0034	0.0001	0.0007	0.0031	0.0005	0.0008
25.5		Fault	0.0346	-0.0318	0.0333	0.0454	0.0360	0.0353	0.0863	-0.0781	0.0816	0.1224	0.0948	0.0961
2ph/20%/2		Post	0.0000	0.0002	0.0002	0.0000	0.0006	0.0007	0.0035	0.0011	0.0019	0.0028	0.0007	0.0022
Ures 45-60 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0038	0.0016	0.0016	0.0037	0.0010	0.0011
50.3		Fault	0.0234	-0.0218	0.0225	0.0102	0.0045	0.0040	0.0895	-0.0806	0.0832	0.0449	0.0180	0.0181
2ph/100%/2		Post	0.0000	0.0001	0.0001	0.0000	0.0005	0.0005	0.0037	0.0011	0.0023	0.0045	0.0024	0.0031
Ures 45-60 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0022	0.0000	0.0006	0.0033	0.0004	0.0008
50.4		Fault	0.0400	-0.0218	0.0224	0.0504	0.0050	0.0046	0.2009	-0.0806	0.0827	0.0950	0.0211	0.0212
2ph/20%/2		Post	0.0000	0.0000	0.0001	0.0000	0.0006	0.0006	0.0030	0.0004	0.0015	0.0035	0.0013	0.0030
Ures 45-60 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0039	0.0010	0.0012	0.0033	0.0016	0.0016
50.6		Fault	0.0044	0.0032	0.0034	0.0029	0.0026	0.0023	0.0205	-0.0131	0.0138	0.0119	-0.0112	0.0092
2ph/100%/2		Post	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0037	0.0030	0.0035	0.0029	0.0008	0.0023
Ures 70-80 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0031	0.0000	0.0007	0.0037	0.0018	0.0018
75.6		Fault	0.0092	0.0085	0.0087	0.0037	0.0029	0.0033	0.0705	-0.0649	0.0663	0.0275	-0.0225	0.0239
2ph/100%/2		Post	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0047	0.0004	0.0019	0.0045	0.0014	0.0025
Ures 70-80 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0025	0.0002	0.0008	0.0029	0.0002	0.0007
75.7		Fault	0.0095	0.0087	0.0089	0.0041	0.0033	0.0036	0.0727	-0.0664	0.0680	0.0312	-0.0254	0.0264
2ph/20%/2		Post	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0036	0.0001	0.0013	0.0033	0.0005	0.0014
Ures 70-80 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0021	0.0003	0.0007	0.0027	0.0003	0.0008
75.8		Fault	0.0121	-0.0113	0.0117	0.0026	0.0001	0.0003	0.0913	-0.0852	0.0873	0.0293	0.0059	0.0053
2ph/20%/4		Post	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0027	0.0009	0.0017	0.0030	0.0001	0.0015
Ures 75-85 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0036	0.0005	0.0009	0.0044	0.0018	0.0018
80.2		Fault	0.0022	0.0018	0.0019	0.0217	-0.0210	0.0213	0.0202	-0.0157	0.0157	0.2135	-0.2076	0.2102
2ph/100%/2		Post	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0043	0.0011	0.0016	0.0046	0.0014	0.0026
Ures ≥ 110 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0035	0.0017	0.0017	0.0028	0.0006	0.0007
110.1		Fault	0.0045	0.0039	0.0040	0.0141	-0.0136	0.0138	0.0485	-0.0421	0.0427	0.1741	-0.1687	0.1700
2ph/100%/2		Post	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0045	0.0014	0.0017	0.0041	0.0019	0.0025
Ures ≥ 110 % Un	In accordance with IEC	Pre	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0027	0.0002	0.0007	0.0030	0.0004	0.0008
110.2		Fault	0.0043	0.0038	0.0039	0.0127	-0.0122	0.0124	0.0469	-0.0412	0.0419	0.1651	-0.1597	0.1609
2ph/20%/2		Post	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0030	0.0002	0.0011	0.0035	0.0004	0.0017

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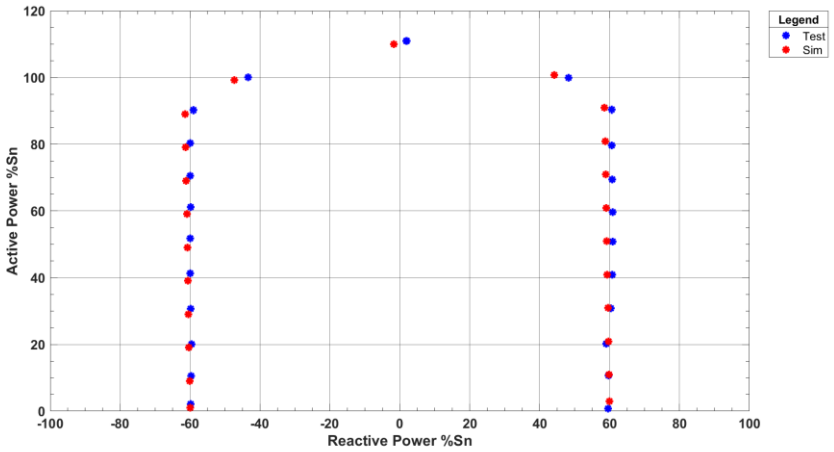
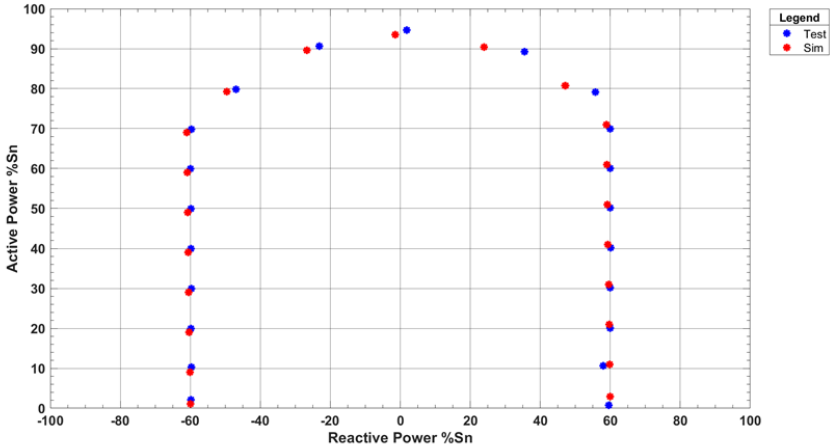
3.1.2 Simulation results of Voltage-Dependent PQ diagrams of certified models

HYD 15KTL-3PH

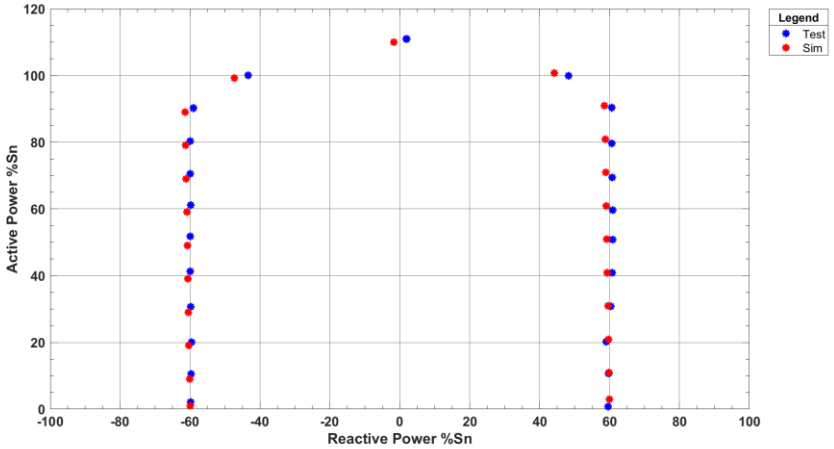
Semi-circular Curve (100%Un): Active Power over Reactive Power

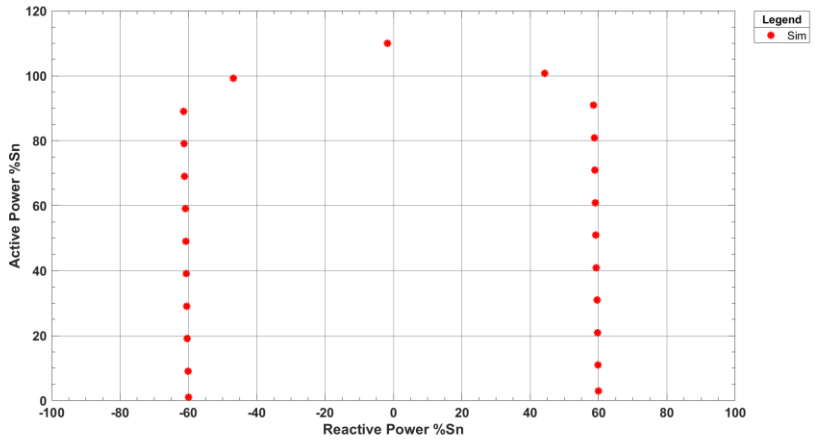
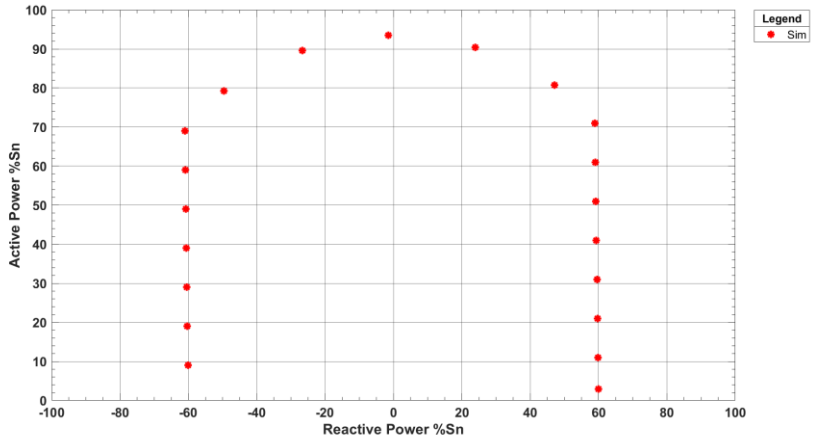
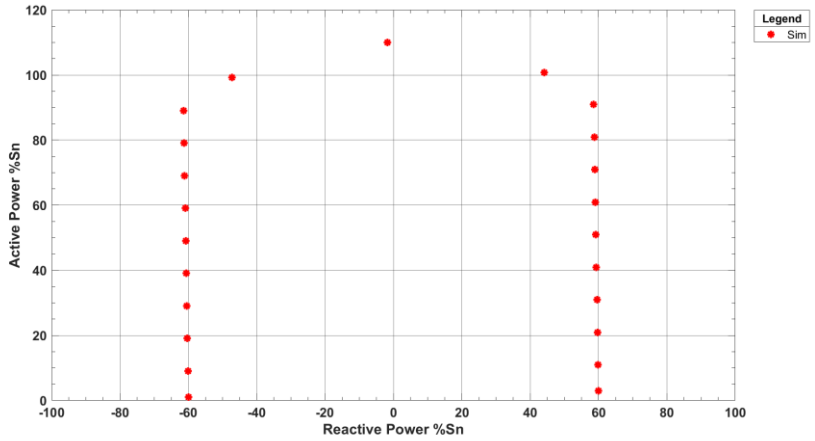


Semi-circular Curve (85%Un): Active Power over Reactive Power



Semi-circular Curve (115%Un): Active Power over Reactive Power



HYD 5KTL-3PH
Semi-circular Curve (100%Un): Active Power over Reactive Power

Semi-circular Curve (85%Un): Active Power over Reactive Power

Semi-circular Curve (115%Un): Active Power over Reactive Power


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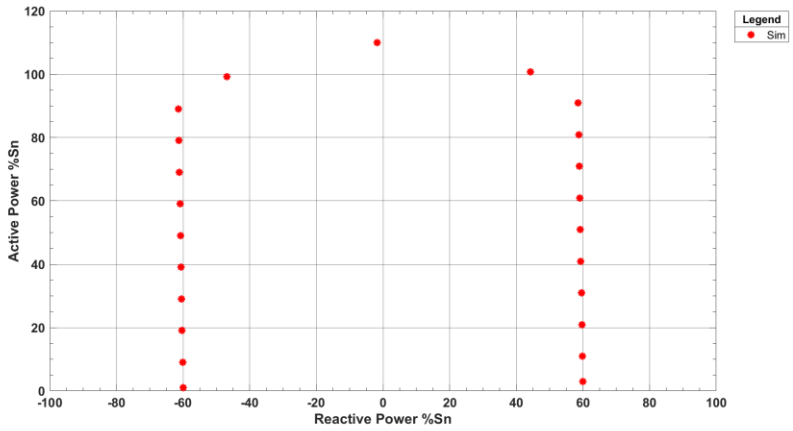
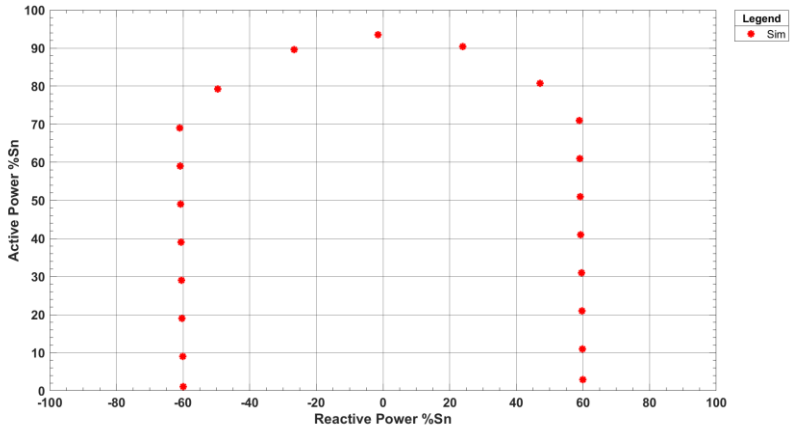
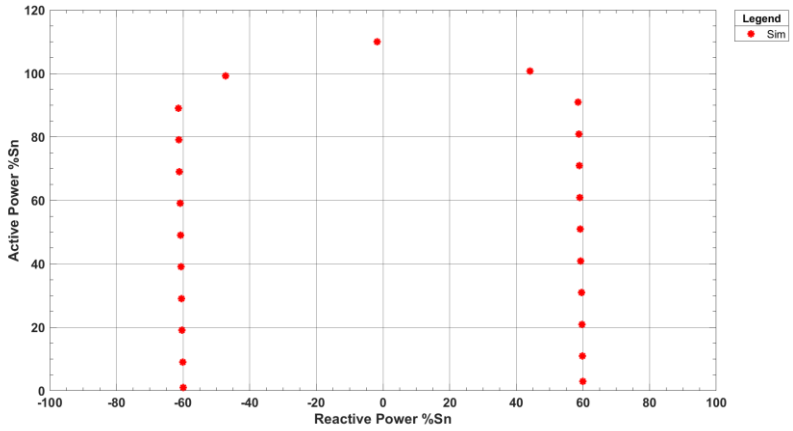
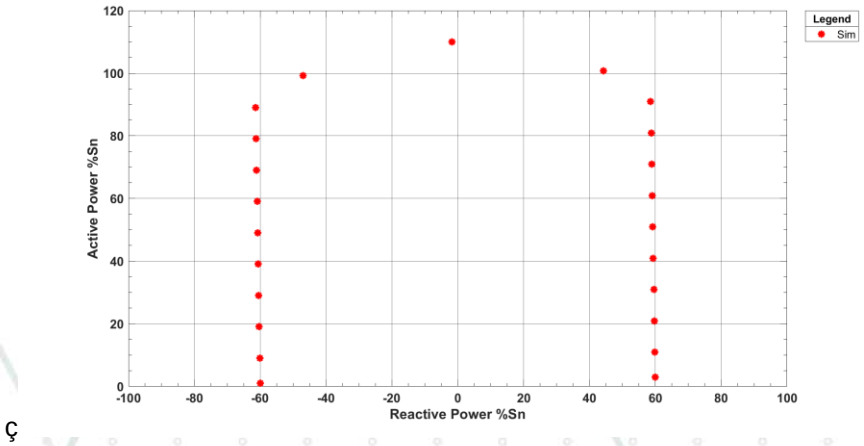
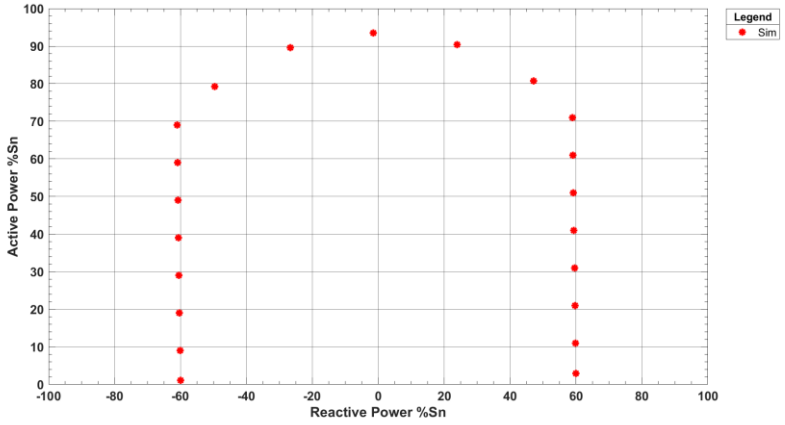
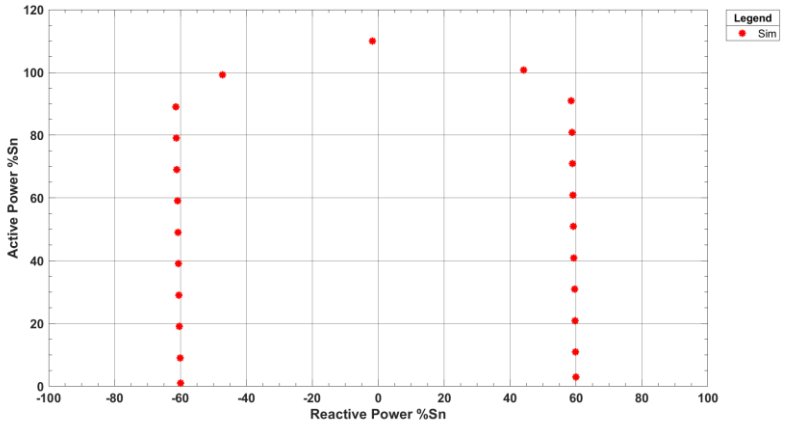
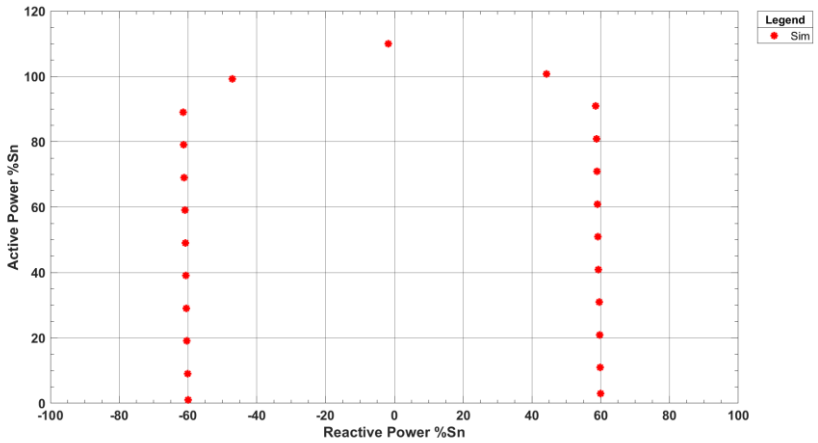
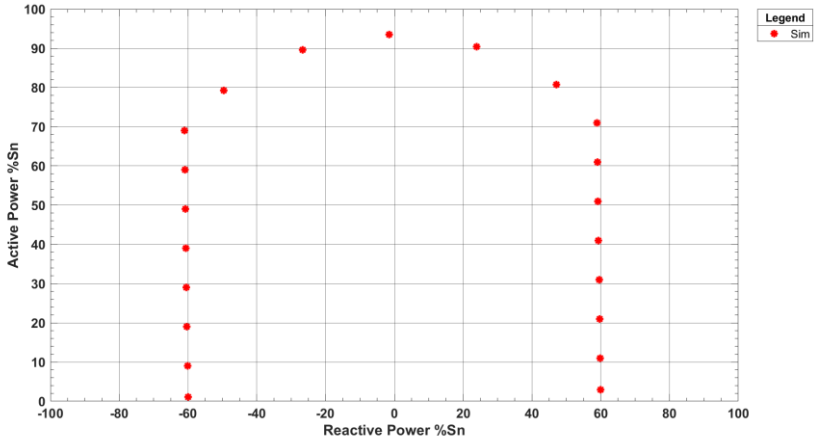
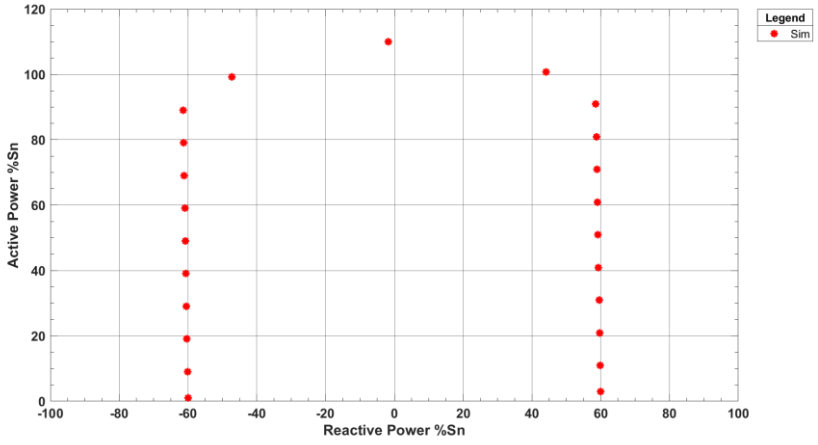
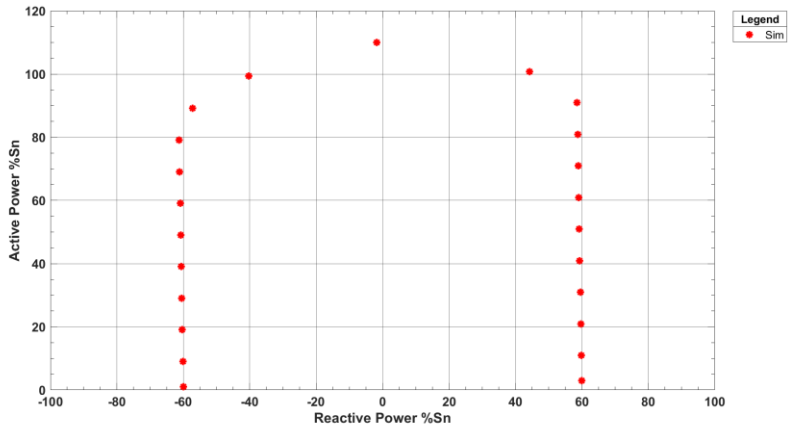
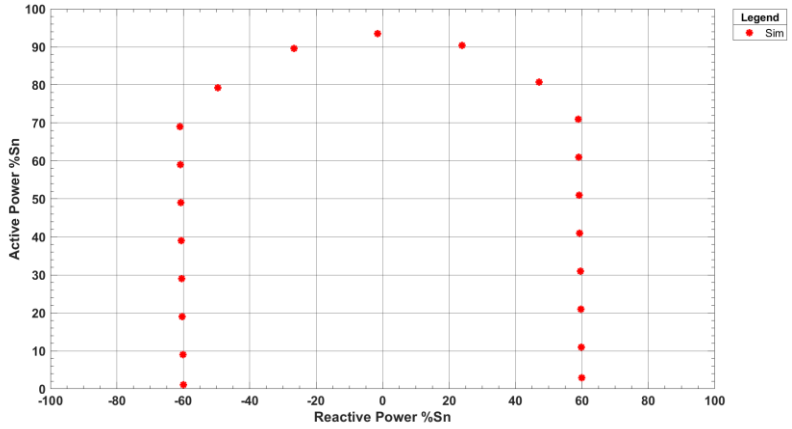
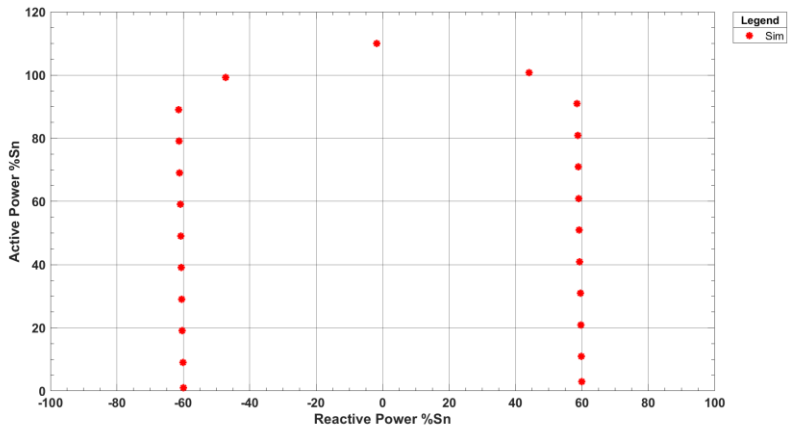
HYD 6KTL-3PH
Semi-circular Curve (100%Un): Active Power over Reactive Power

Semi-circular Curve (85%Un): Active Power over Reactive Power

Semi-circular Curve (115%Un): Active Power over Reactive Power


HYD 8KTL-3PH
Semi-circular Curve (100%Un): Active Power over Reactive Power

Semi-circular Curve (85%Un): Active Power over Reactive Power

Semi-circular Curve (115%Un): Active Power over Reactive Power


HYD 10KTL-3PH
Semi-circular Curve (100%Un): Active Power over Reactive Power

Semi-circular Curve (85%Un): Active Power over Reactive Power

Semi-circular Curve (115%Un): Active Power over Reactive Power


HYD 20KTL-3PH
Semi-circular Curve (100%Un): Active Power over Reactive Power

Semi-circular Curve (85%Un): Active Power over Reactive Power

Semi-circular Curve (115%Un): Active Power over Reactive Power


3.2 Validation conclusion

Once done the entire tests required to carry out the comparison between simulation and real tests, it is demonstrated that the behaviours of the electronic equipment and its dynamic simulation model **FULLY COMPLIES (*)** with validation requirements according to the specifications of the standard:

- FGW Technical Guidelines for Power Generating Units. Part 4 - Revision 9, dated on 01/02/2019 (FGW TG4 Rev.9): Demands on Modelling and Validating Simulation Models of the Electrical Characteristics of Power Generating Units and Systems, Storage Systems as well as their Components.

Using as reference following standard:

- VDE-AR-N 4110: 2018-11. Technical requirements for the connection and operation of customer installations to the medium voltage network (TAR medium voltage).

The Dynamic Simulation Model can be considered as validated to simulate with the required accuracy test cases over the models HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH and HYD 20KTL-3PH

(*) N-01: Simulation results offered in this validation report were obtained with the Matlab Simulink version R2021b. The validation report does not guarantee the compliance of upper version of Matlab Simulink above version R2021b.

4 TECHNICAL DATA

4.1 Technical data

Model	HYD 5KTL-3PH	HYD 6KTL-3PH	HYD 8KTL-3PH	HYD 10KTL-3PH	HYD 15KTL-3PH	HYD 20KTL-3PH
PV String Input Data						
Max. DC voltage	1000 V_{dc}					
MPPT voltage range	180 – 960 V_{dc}					
Full power MPPT voltage range	250 – 850 V_{dc}	320 – 850 V_{dc}	360 – 850 V_{dc}	220 – 850 V_{dc}	350 – 850 V_{dc}	450 - 850 V_{dc}
Nominal DC voltage	600 V_{dc}					
Max. input current	12.5 A / 12.5A	12.5 A / 12.5A	12.5 A / 12.5A	25A / 25A	25A / 25A	25A / 25A
Max. short current	15A / 15A	15A / 15A	15A / 15A	30A / 30A	30A / 30A	30A / 30A
Battery Input Data						
Battery type	Li-Ion & Lead-acid					
No. of battery input	1	1	1	2	2	2
Battery voltage range	180 – 800 V_{dc}					
Battery voltage range for full load	200 – 800 V_{dc}	240 – 800 V_{dc}	320 – 800 V_{dc}	200 – 800 V_{dc}	300 – 800 V_{dc}	400 – 800 V_{dc}
Nominal charging/discharging power	5000 W	6000 W	8000 W	10000 W	15000 W	20000 W
Max. charging/discharging current	25 A	25 A	25 A	50 A (25 A / 25 A)	50 A (25 A / 25 A)	50 A (25 A / 25 A)
AC Output Data (On-grid)						
Nominal AC power	5000 W	6000 W	8000 W	10000 W	15000 W	20000 W
Max. AC power output to utility grid	5500 VA	6600 VA	8800 VA	11000 VA	16500 VA	22000 VA
Nominal AC current output to utility grid (	7.2 A	8.7 A	11.6 A	14.5 A	21.7 A	29.0 A
Max. AC current output to utility grid	8 A	10 A	13 A	16 A	24 A	32 A
Cooling group	Natural			Forced airflow		
Nominal grid voltage	3/N/PE, 230/400Vac					
Nominal grid frequency	50Hz					
Output power factor	1 default (adjustable +/-0.8)					
Operating temperature range	- 30 ºC to 60 ºC					
Protective degree	Class I					
Ingress protection	IP 65					

Note: The rated current is calculated by rated power and voltage (for example, for the tested model: 15000 W / 230Vac / 3 = 21.7 A)

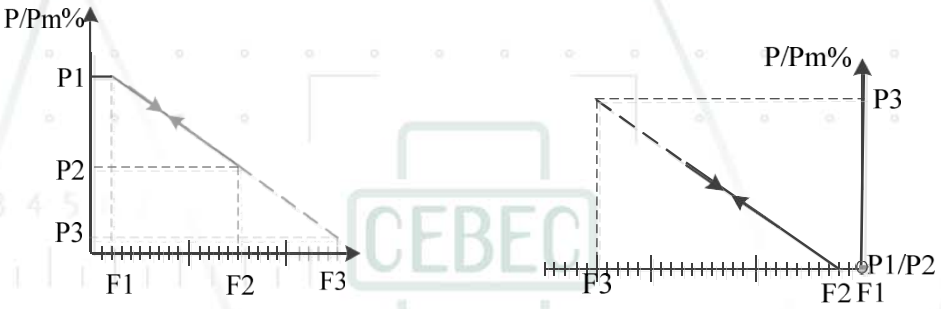
4.2 Overview of important parameters of the generation unit

The settings may be specific for each project and needed to be checked.

Parameter description	Unit	Default Value	Min.	Max.	Step- wide	Note
Behaviour in the event of disturbances in the network						
LVRT Protection Level		2	1	5		
LVRT Voltage 1	Un%	0	0	130	1	
LVRT Time 1	ms	500	0	65535	1	
LVRT Voltage 2	Un%	20	0	130	1	
LVRT Time 2	ms	1500	0	65535	1	
LVRT Voltage 3	Un%	40	0	130	1	
LVRT Time 3	ms	3000	0	65535	1	
LVRT Voltage 4	Un%	85	0	130	1	
LVRT Time 4	ms	61000	0	65535	1	
LVRT Exit	Un%	91	0	130	1	
LVRT Exit Time	ms	20	0	65535	1	
HVRT Protection Level		2	1	5		
HVRT Voltage 1						
HVRT Time 1	ms	100	0	65535	1	
HVRT Voltage 2	Un%	120	0	130	1	
HVRT Time 2	ms	5000	0	65535	1	
HVRT Voltage 3	Un%	115	0	130	1	
HVRT Time 3	ms	61000	0	65535	1	
Zero Power mode	Un%	70	0	130	1	
HVRT Exit	Un%	109	0	130	1	
HVRT Exit Time	ms	20	0	65535	1	
LVRT K Factor		2.0	0	6	0.1	
HVRT K Factor		2.0	0	6	0.1	
Gradient for active power increase after fault recovery	%Pn/s	200	0	500	1	

Parameter description	Unit	Default Value	Min.	Max.	Step- wide	Note
Active power by setpoint						
Power Limitingswitch	On/Off	Off				
Pac Limit	%Pn	100	0	100	1	
Active speed control	On/Off	Off				
Active Power Decline Speed	%Pn/min	30	0	3000	1	
Active Power Rising Speed	%Pn/min	30	0	3000	1	
Description of interfaces		RS485				
Behaviour at P=0		No active power output				
Active power reduction at overfrequency						
Over frequency derating	On/Off	On				
Gradient	%Pm/△f	40	0	100	1	
F1	Hz	50.2	50.0	55.0	0.1	
P1	%Pm	100	0	100	1	
F2	Hz	51.5	50.0	55.0	0.1	
P2	%Pm	48	0	100	1	
F3	Hz	52.5	50.0	55.0	0.1	
P3	%Pm	8	0	100	1	
Active power drop rate in overfrequency drop	s	<1				
Active power restoration rate after overfrequency drop	%Pn/min	9	0	3000	1	
Overfrequency drop curve		Curve1				
Underfrequency increment	On/Off	On				
Gradient	%Pm/△f	40	0	100	1	
F1	Hz	50.0	45.0	50.0	0.1	
P1	%Pm	0	0	100	1	
F2	Hz	49.8	45.0	50.0	0.1	
P2	%Pm	0	0	100	1	
F3	Hz	47.5	45.0	50.0	0.1	
P3	%Pm	92	0	100	1	
Active power rise rate in underfrequency drop	s	<1				
Active power restoration rate after underfrequency drop	%Pn/min	9	0	3000	1	
Underfrequency drop curve		Curve2				

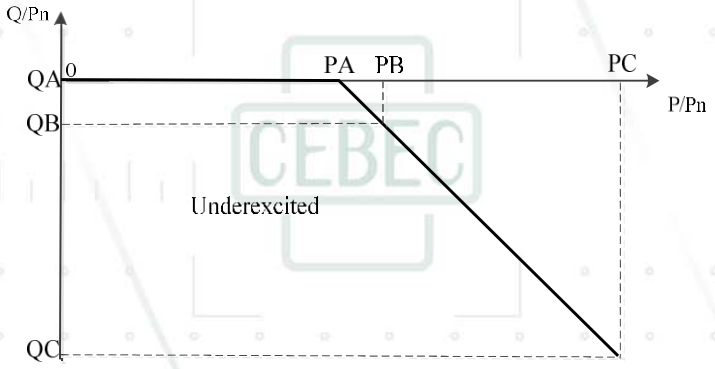
Others						
Islanding judge criteria (When select 'Frequency Change protectio)	On/Off	On (Size and direction of frequency change)				
Frequency change	Hz/s	2.5				
Protection time	s	0.5				
Active speed control (When select 'Active power adjustment')	On/Off	On				
Active Power Decline Speed	Pn%/min	30	0	3000	1	
Active Power Rising Speed	Pn%/min	30	0	3000	1	
Limited power switch	On/Off	On				
Pac limit	Pn%	0	0	100	1	



Curve 1 Curve 2

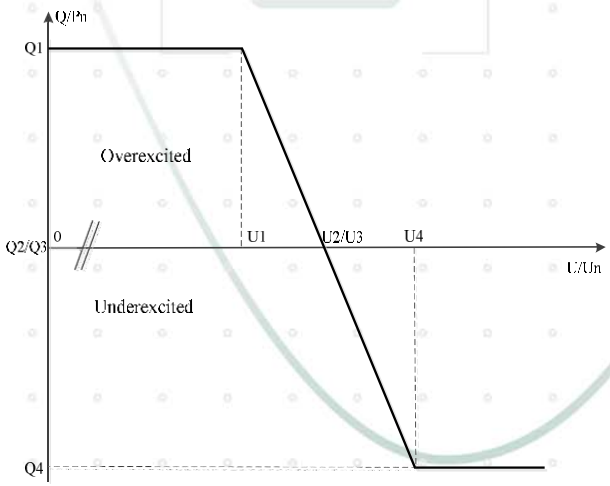
Parameter description	**Unit**	**Default Value**	**Min.**	**Max.**	**Step- wide**	**Note**
Reactive power supply						
Reactive power regulation mode (when select 'Reactive adjusting switch')	Off/Pf/Qt/ Q(P)/Q(U)	Off				
Reactive power supply. Mode PF: The reactive power can be regulated by the parameter PF (Power Factor).						
PF (when select Pf).		1.00	0.8(leading or lagging)	1	0.01	
Reactive power supply. Mode Qt: The reactive power can be regulated by the parameter 'Reactive power limit' (in %).						
Reactive power limit (when select Qt).	%Pn	0.00	0.00	60	0.01	

Reactive power supply. Mode Q(P): The reactive ratio or power factor changes with the output power of the inverter.						
Q(P) Curve (when select Q(P))		Curve3				
Active power ratio PA	%Pn	50	0	100	1	
Active power ratio PB	%Pn	60	0	100	1	
Active power ratio PC	%Pn	100	0	100	1	
Corresponding reactive ratio or power factor of active power ratio PA point	%Pn	0	0	1	1	
Corresponding reactive ratio or power factor of active power ratio PB point	%Pn	-5	0	-60	1	
Corresponding reactive ratio or power factor of active power ratio PC point	%Pn	-60	0	60	1	



Curve 3

Parameter description	Unit	Default Value	Min.	Max.	Step- wide	Note
Reactive power supply. Mode Q(U): The reactive power changes with the grid voltage.						
Q(U) curve		Curve4				
Hysteretic proportion	%Un	0	0	5	1	
Voltage proportion U1	%Un	96	90	110	1	
Voltage proportion U2	%Un	100	90	110	1	
Voltage proportion U3	%Un	100	90	110	1	
Voltage proportion U4	%Un	104	90	110	1	
Corresponding reactive ratio of voltage proportion U1	%Pn	60	0	60	1	
Corresponding reactive ratio of voltage proportion U2	%Pn	0	0	60	1	
Corresponding reactive ratio of voltage proportion U3	%Pn	0	-60	0	1	
Corresponding reactive ratio of voltage proportion U4	%Pn	-60	-60	0	1	
Reactive response	On/Off	On				
Reactive response time	s	10	0	60	1	



Curve 4

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Limits for re-energising (reconnection after fault event)						
Undervoltage Protection Recovery Value	V	218.5	23.0	230.0	0.1	
Overvoltage Protection Recovery Value	V	253.0	230.0	299.0	0.1	
Underfrequency Protection Recovery Value	Hz	49.9	45.0	50.0	0.01	
Overfrequency Protection Recovery Value	Hz	50.1	50.0	55.0	0.01	
Fault Recovery Time	ms	5000	0	200000	20	
Fault Recovery Active Soft Start	On/Off	On				
Fault Recovery Active Soft Start Time	s	300	0	6000	1	
Limits for connection (without previous trip)						
Grid Connection Condition		Grid normal range				
Grid Connection Voltage Minimum	V	207.0	23.0	230.0	0.1	
Max. Grid-connected Voltage	V	253.0	230.0	299.0	0.1	
Grid Connection Frequency Minimum	Hz	47.5	45.0	50.0	0.01	
Max. Grid-connected Frequency	Hz	50.2	50.0	55.0	0.01	
Grid Connection Detection Time	s	60	0	600	1	
Grid-connected Active Power Rising Rate	Pn%/min	30	20	40	1	

Parameterdescription	**Unit**	**Default Value**	**Min.**	**Max.**	**Step- wide**	**Note**
Protective functions						
AC Over-voltage Level 1 Protection Value	V	287.5	230.0	299.0	0.1	
AC Over-voltage Level 1 Protection time	ms	100	100	180000	1	
AC Over-voltage Level 2 Protection Value	V	287.5	230.0	299.0	0.1	
AC Over-voltage Level 2 Protection time	ms	100	0	100	1	
AC Under-voltage Level 1 ProtectionValue	V	184	23.0	230.0	0.1	
AC Under-voltage Level 1 ProtectionTime	ms	1000	0	2500	1	

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AC Under-voltage Level 2 Protection Value	V	103.5	23.0	230.0	0.1	
AC Under-voltage Level 2 Protection Time	ms	300	0	800	1	
Grid Overfrequency Level 1 Protection Value	Hz	51.5	50.0	55.0	0.01	
Grid Overfrequency Level 1 Protection Time	ms	200	0	5000	1	
Grid OverfrequencyLevel 2 Protection Value	Hz	52.5	50.0	55.0	0.01	
Grid OverfrequencyLevel 2 Protection Time	ms	100	0	100	1	
AC Under-frequency Level 1 Protection Value	Hz	47.5	45.0	49.5	0.01	
AC Under-frequency Level 1 Protection Time	ms	100	0	100	1	
AC Under-frequency Level 2 Protection Value	Hz	47.5	45.0	49.5	0.01	
AC Under-frequency Level 2 Protection Time	ms	100	0	100	1	
Evaluation of conductor-conductor or conductor-earth voltage		conductor-earth voltage				
Logical AND or OR link		OR				
Self-protection overvoltage (transient)	V	430				Protection time 250us

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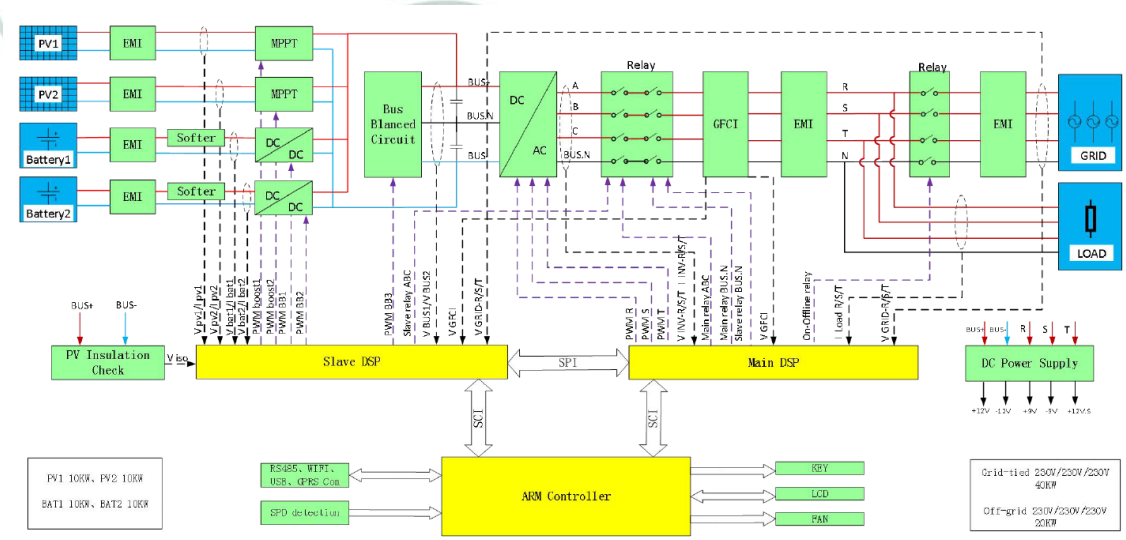
4.3 Electric scheme

Equipment under testing


4.4 Interfaces

Following interfaces for setting parameters (include the active power or reactive power) configurations are provided on the PGU level:

- Local method: After the inverter is powered on, enter the authority password through the LCD display outside the inverter to set related running parameters (including active power and reactive power) and protection parameters. For more running information and parameter settings, please refer to the inverter system manual.

- Remote method: connect the Ethernet port on the inverter's built-in SCU board (smart gateway) to the Ethernet switch, and then connect the switch to the PC. The user accesses the WEB through the PC to realize remote parameter setting and control. For more operation information, see "UMCG Smart Gateway Manual".

Set inverter parameters from which way above is not much of difference on the setting point accuracy, setting/response time and always get a millisecond level or second level.

The communication between SofarSolar's photovoltaic grid-connected inverter HYD 15KTL-3PH and the background monitoring system adopts Modbus RTU/Modbus TCP (Ethernet interface optional) communication protocol. This protocol can read the inverter's operating data and fault status in real time. This protocol is a general protocol, and the physical interface is RS-485.

The inverter HYD 15KTL-3PH does not directly communicate with the direct market, and all active power priorities are identified by the plant controller and give the inverter active power control signals.

c

4.5 Manufacturer's certificates for certified PGUs according to FGW TG3

Manufacturer Certificate according to FGW TG3
Model HYD 5KTL-3PH

Herstellerbescheinigung zu spezifischen Daten eines Photovoltaik-Wechselrichters vom Type HYD5KTL-3PH

Manufacturer's certificate on specific data of a Photovoltaic Converter of the type VDE-AR-N 4110:2018-11

Datum /Date:13/7/2021 Seite/Page1/1

1.	**AllgemeinesundAusgangsgrößen**			**General and Outputvalues**
1	Hersteller	ShenzhenSOFAR SOLARCo.Ltd		Manufacturer
2	Typenbezeichnung	HYD5KTL-3PH		typename
3	Einspeisung(einphasig/dreiphasig)	three-phase		no. of phases(single-phase/three-phase)
4	Nennscheinleistung	5.5	kVA	rated apparentpower
5	Nennwirkleistung	5	kW	rated activepower
6	AC-Nennspannung	230	V	ratedAC-voltage
7	AC-Nennfrequenz	50	Hz	ratedfrequency
8	Beitragzum Stoßkurzschlussstrom	0.008	kA	contribution to short circuitcurrent
2	**DCEingangsgrößen**			**DCInput**
1	Min.MPP-Spannung	180	V	min. MPPvoltage
2	Max.MPP-Spannung	960	V	max. MPPvoltage
3	Max.PV-Eingangsspannung	1000	V	max. DC inputvoltage
4	Max.PV-Eingangsstrom	15	A	max. DC inputcurrent
5	Max.Modulleistung	4.5	kW_p	max. peakpower
3	**Wechselrichter-Leistungsteil**			**Converter-Powersection**
1	Hersteller	ShenzhenSOFAR SOLAR Co.Ltd		manufacturer
2	Typenbezeichnung	HYD5KTL-3PH		typename
3	Nennscheinleistung	5.5	kVA	rated apparentpower
4	Art(HF/NF-Trafo,trafolos)	Without		generic type (HV/LV of Trans.,without)
5	Taktfrequenz	20	kHz	pulse rate ofinverter
6	Art derLeistungsregelung(MPP-Tracking)	Perturbation& Observation		generic type of power control(MPP-Tracking)
7	Software-Version	V060001		softwareversion
4	**SonstigeelektrischeKomponenten**			**Other electricinstallations**
1	Artder Netzkopplung	breaker		generic type ofinterconnection
2	-Hersteller	ZETTLERCN		-manufacturer
3	-Typenbezeichnung	AZSR143		-type
4	Netzschutzintegriert(Ja/Nein)	yes		integrated grid protection(yes/no)
5	Netzschutzhersteller	ZETTLERCN		grid protectionmanufacturer
6	-Typenbezeichnung	AZSR165		-type
7	-Einstellbereiche	Showninappendix		- adjustmentranges
8	Spannungssteigerungsschutz	267.5	V	overvoltageprotection
9	Spannungsrückgangschutz	184	V	undervoltage protection
10	Frequenzsteigerungsschutz	51.5	Hz	overfrequencyprotection
11	Frequenzrückgangschutz	47.5	Hz	underfrequencyprotection
12	TypenbezeichnungderAbschalteinheit	Airswitch		circuit breakertype
13	Oberschwingungsfilter(ja/nein)	No		harmonic filter (yes /no)
5	**Typenprüfung**			**Typetest**
1	Prüfbehörde	SocieteGeneraledeSurveillanceS.A.		testingauthority
2	Aktenzeichen	VDE-AR-N4110:2018-11		reference
3	SeriennummerdesWechselrichters	SP1ES115LC4025		serial number ofconverter

AnschriftdesHerstellers

ss ofmanufacturer

Addre

Stempel, Unterschrift
stamp, signature

Der Hersteller des PV-Wechselrichters bestätigt, dass der PV-Wechselrichter, dessen elektrischen Eigenschaften in den Prüfberichten abgebildet sind, hinsichtlich seiner technischen Daten mit den o.g. Positionen identisch ist.
The manufacturer of the PV-Converter confirms that the PV-Converter whose power quality is measured and depicted in the test reports, is identical with the above entries with regard to its technical data

Manufacturer Certificate according to FGW TG3

Model HYD 6KTL-3PH

Herstellerbescheinigung zu spezifischen Daten eines Photovoltaik-Wechselrichters vom Type HYD 6KTL-3PH

Manufacturer's certificate on specific data of a Photovoltaic Converter of the type VDE-AR-N 4110:2018-11

Datum /Date:13/7/2021 Seite/Page1/1

1.	**AllgemeinesundAusgangsgrößen**			**General and Outputvalues**
1	Hersteller	ShenzhenSOFAR SOLARCo.Ltd		Manufacturer
2	Typenbezeichnung	HYD6KTL-3PH		typename
3	Einspeisung(einphasig/dreiphasig)	three-phase		no. of phases(single-phase/three-phase)
4	Nennscheinleistung	6.6	kVA	rated apparentpower
5	Nennwirkleistung	6	kW	rated activepower
6	AC-Nennspannung	230	V	ratedAC-voltage
7	AC-Nennfrequenz	50	Hz	ratedfrequency
8	Beitragzum Stoßkurzschlussstrom	0.010	kA	contribution to short circuitcurrent
2	**DCEingangsgrößen**			**DCInput**
1	Min.MPP-Spannung	180	V	min. MPPvoltage
2	Max.MPP-Spannung	960	V	max. MPPvoltage
3	Max.PV-Eingangsspannung	1000	V	max. DC inputvoltage
4	Max.PV-Eingangsstrom	15	A	max. DC inputcurrent
5	Max.Modulleistung	4.5	kW_p	max. peakpower
3	**Wechselrichter-Leistungsteil**			**Converter-Powersection**
1	Hersteller	ShenzhenSOFAR SOLAR Co.Ltd		manufacturer
2	Typenbezeichnung	HYD6KTL-3PH		typename
3	Nennscheinleistung	6.6	kVA	rated apparentpower
4	Art(HF/NF-Trafo,trafolos)	Without		generic type (HV/LV of Trans.,without)
5	Taktfrequenz	20	kHz	pulse rate ofinverter
6	Art derLeistungsregelung(MPP-Tracking)	Perturbation& Observation		generic type of power control(MPP-Tracking)
7	Software-Version	V060001		softwareversion
4	**SonstigeelektrischeKomponenten**			**Other electricinstallations**
1	Artder Netzkopplung	breaker		generic type ofinterconnection
2	-Hersteller	ZETTLERCN		-manufacturer
3	-Typenbezeichnung	AZSR143		-type
4	Netzschutzintegriert(Ja/Nein)	yes		integrated grid protection(yes/no)
5	Netzschutzhersteller	ZETTLERCN		grid protectionmanufacturer
6	-Typenbezeichnung	AZSR165		-type
7	-Einstellbereiche	Showninappendix		- adjustmentranges
8	Spannungssteigerungsschutz	287.5	V	overvoltageprotection
9	Spannungsrückgangschutz	184	V	undervoltage protection
10	Frequenzsteigerungsschutz	51.5	Hz	overfrequencyprotection
11	Frequenzrückgangschutz	47.5	Hz	underfrequencyprotection
12	TypenbezeichnungderAbschalteinheit	Airswitch		circuit breakertype
13	Oberschwingungsfilter(ja/nein)	No		harmonic filter (yes /no)
5	**Typenprüfung**			**Typetest**
1	Prüfbehörde	SocieteGeneraledeSurveillanceS.A.		testingauthority
2	Aktenzeichen	VDE-AR-N4110:2018-11		reference
3	SeriennummerdesWechselrichters	SP1ES115LC4025		serial number ofconverter

AnschriftdesHerstellers

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Manufacturer Certificate according to FGW TG3

Model HYD 8KTL-3PH

Herstellerbescheinigung zu spezifischen Daten eines Photovoltaik-Wechselrichters vom Type HYD 8KTL-3PH

Manufacturer's certificate on specific data of a Photovoltaic Converter of the type VDE-AR-N 4110:2018-11

Datum /Date:13/7/2021 Seite/Page1/1

1.	**AllgemeinesundAusgangsgrößen**			**General and Outputvalues**
1	Hersteller	ShenzhenSOFAR SOLARCo.Ltd		Manufacturer
2	Typenbezeichnung	HYD8KTL-3PH		typename
3	Einspeisung(einphasig/dreiphasig)	three-phase		no. of phases(single-phase/three-phase)
4	Nennscheinleistung	8.8	kVA	rated apparentpower
5	Nennwirkleistung	8	kW	rated activepower
6	AC-Nennspannung	230	V	ratedAC-voltage
7	AC-Nennfrequenz	50	Hz	ratedfrequency
8	Beitragzum Stoßkurzschlussstrom	0.013	kA	contribution to short circuitcurrent
2	**DCEingangsgrößen**			**DCInput**
1	Min.MPP-Spannung	180	V	min. MPPvoltage
2	Max.MPP-Spannung	960	V	max. MPPvoltage
3	Max.PV-Eingangsspannung	1000	V	max. DC inputvoltage
4	Max.PV-Eingangsstrom	15	A	max. DC inputcurrent
5	Max.Modulleistung	4.5	kW_p	max. peakpower
3	**Wechselrichter-Leistungsteil**			**Converter-Powersection**
1	Hersteller	ShenzhenSOFAR SOLAR Co.Ltd		Manufacturer
2	Typenbezeichnung	HYD8KTL-3PH		typename
3	Nennscheinleistung	8.8	kVA	rated apparentpower
4	Art(HF/NF-Trafo,trafolos)	Without		generic type (HV/LV of Trans.,without)
5	Taktfrequenz	20	kHz	pulse rate ofinverter
6	Art derLeistungsregelung(MPP-Tracking)	Perturbation& Observation		generic type of power control(MPP-Tracking)
7	Software-Version	V060001		softwareversion
4	**SonstigeelektrischeKomponenten**			**Other electricinstallations**
1	Artder Netzkopplung	breaker		generic type ofinterconnection
2	-Hersteller	ZETTLERCN		-manufacturer
3	-Typenbezeichnung	AZSR143		-type
4	Netzschutzintegriert(Ja/Nein)	yes		integrated grid protection(yes/no)
5	Netzschutzhersteller	ZETTLERCN		grid protectionmanufacturer
6	-Typenbezeichnung	AZSR165		-type
7	-Einstellbereiche	Showninappendix		- adjustmentranges
8	Spannungssteigerungsschutz	287.5	V	overvoltageprotection
9	Spannungsrückgangschutz	184	V	undervoltage protection
10	Frequenzsteigerungsschutz	51.5	Hz	overfrequencyprotection
11	Frequenzrückgangschutz	47.5	Hz	underfrequencyprotection
12	TypenbezeichnungderAbschalteinheit	Airswitch		circuit breakertype
13	Oberschwingungsfilter(ja/nein)	No		harmonic filter (yes /no)
5	**Typenprüfung**			**Typetest**
1	Prüfbehörde	SocieteGeneraledeSurveillanceS.A.		testingauthority
2	Aktenzeichen	VDE-AR-N4110:2018-11		reference
3	SeriennummerdesWechselrichters	SP1ES115LC4025		serial number ofconverter

AnschriftdesHerstellers

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Manufacturer Certificate according to FGW TG3

Model HYD 10KTL-3PH

Herstellerbescheinigung zu spezifischen Daten eines Photovoltaik-Wechselrichters vom Type HYD 10KTL-3PH

Manufacturer's certificate on specific data of a Photovoltaic Converter of the type VDE-AR-N 4110:2018-11

Datum /Date:13/7/2021 Seite/Page1/1

1.	**AllgemeinesundAusgangsgrößen**			**General and Outputvalues**
1	Hersteller	ShenzhenSOFAR SOLARCo.Ltd		Manufacturer
2	Typenbezeichnung	HYD10KTL-3PH		typename
3	Einspeisung(einphasig/dreiphasig)	three-phase		no. of phases(single-phase/three-phase)
4	Nennscheinleistung	11	kVA	rated apparentpower
5	Nennwirkleistung	10	kW	rated activepower
6	AC-Nennspannung	230	V	ratedAC-voltage
7	AC-Nennfrequenz	50	Hz	ratedfrequency
8	Beitragzum Stoßkurzschlussstrom	0.016	kA	contribution to short circuitcurrent
2	**DCEingangsgrößen**			**DCInput**
1	Min.MPP-Spannung	180	V	min. MPPvoltage
2	Max.MPP-Spannung	960	V	max. MPPvoltage
3	Max.PV-Eingangsspannung	1000	V	max. DC inputvoltage
4	Max.PV-Eingangsstrom	30*2	A	max. DC inputcurrent
5	Max.Modulleistung	11.25	kW	max. peakpower
3	**Wechselrichter-Leistungsteil**			**Converter-Powersection**
1	Hersteller	ShenzhenSOFAR SOLAR Co.Ltd		manufacturer
2	Typenbezeichnung	HYD10KTL-3PH		typename
3	Nennscheinleistung	11	kVA	rated apparentpower
4	Art(HF/NF-Trafo,trafolos)	Without		generic type (HV/LV of Trans.,without)
5	Taktfrequenz	20	kHz	pulse rate ofinverter
6	Art derLeistungsregelung(MPP-Tracking)	Perturbation& Observation		generic type of power control(MPP-Tracking)
7	Software-Version	V060001		softwareversion
4	**SonstigeelektrischeKomponenten**			**Other electricinstallations**
1	Artder Netzkopplung	breaker		generic type ofinterconnection
2	-Hersteller	ZETTLERCN		-manufacturer
3	-Typenbezeichnung	AZSR143		-type
4	Netzschutzintegriert(Ja/Nein)	yes		Integrated grid protection(yes/no)
5	Netzschutzhersteller	ZETTLERCN		grid protectionmanufacturer
6	-Typenbezeichnung	AZSR165		-type
7	-Einstellbereiche	Showninappendix		- adjustmentranges
8	Spannungssteigerungsschutz	287.5	V	overvoltageprotection
9	Spannungsrückgangschutz	184	V	undervoltage protection
10	Frequenzsteigerungsschutz	51.5	Hz	overfrequencyprotection
11	Frequenzrückgangschutz	47.5	Hz	underfrequencyprotection
12	TypenbezeichnungderAbschalteinheit	Airswitch		circuit breakertype
13	Oberschwingungsfilter(ja/nein)	No		harmonic filter (yes /no)
5	**Typenprüfung**			**Typetest**
1	Prüfbehörde	SocieteGeneraledeSurveillanceS.A.		testingauthority
2	Aktenzeichen	VDE-AR-N4110:2018-11		reference
3	SeriennummerdesWechselrichters	SP1ES115LC4025		serial number ofconverter

AnschriftdesHerstellers

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Der Hersteller des PV-Wechselrichters bestätigt, dass der PV-Wechselrichter, dessen elektrischen Eigenschaften in den Prüfberichten abgebildet sind, hinsichtlich seiner technischen Daten mit den o.g. Positionen identisch ist.
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Manufacturer Certificate according to FGW TG3

Model HYD 15KTL-3PH

Herstellerbescheinigung zu spezifischen Daten eines Photovoltaik-Wechselrichters vom Type HYD 15KTL-3PH

Manufacturer's certificate on specific data of a Photovoltaic Converter of the type VDE-AR-N 4110:2018-11

Datum /Date:13/7/2021 Seite/Page1/1

1.	**AllgemeinesundAusgangsgrößen**			**General and Outputvalues**
1	Hersteller	ShenzhenSOFAR SOLARCo.Ltd		Manufacturer
2	Typenbezeichnung	HYD15KTL-3PH		typename
3	Einspeisung(einphasig/dreiphasig)	three-phase		no. of phases(single-phase/three-phase)
4	Nennscheinleistung	16.5	kVA	rated apparentpower
5	Nennwirkleistung	15	kW	rated activepower
6	AC-Nennspannung	230	V	ratedAC-voltage
7	AC-Nennfrequenz	50	Hz	ratedfrequency
8	Beitragzum Stoßkurzschlussstrom	0.024	kA	contribution to short circuitcurrent
2	**DCEingangsgrößen**			**DCInput**
1	Min.MPP-Spannung	180	V	min. MPPvoltage
2	Max.MPP-Spannung	960	V	max. MPPvoltage
3	Max.PV-Eingangsspannung	1000	V	max. DC inputvoltage
4	Max.PV-Eingangsstrom	30*2	A	max. DC inputcurrent
5	Max.Modulleistung	11.25	kW_p	max. peakpower
3	**Wechselrichter-Leistungsteil**			**Converter-Powersection**
1	Hersteller	ShenzhenSOFAR SOLAR Co.Ltd		manufacturer
2	Typenbezeichnung	HYD15KTL-3PH		typename
3	Nennscheinleistung	16.5	kVA	rated apparentpower
4	Art(HF/NF-Trafo,trafolos)	Without		generic type (HV/LV of Trans.,without)
5	Taktfrequenz	20	kHz	pulse rate ofinverter
6	Art derLeistungsregelung(MPP-Tracking)	Perturbation& Observation		generic type of power control(MPP-Tracking)
7	Software-Version	V060001		softwareversion
4	**SonstigeelektrischeKomponenten**			**Other electricinstallations**
1	Artder Netzkopplung	breaker		generic type ofinterconnection
2	-Hersteller	ZETTLERCN		-manufacturer
3	-Typenbezeichnung	AZSR143		-type
4	Netzschutzintegriert(Ja/Nein)	yes		integrated grid protection(yes/no)
5	Netzschutzhersteller	ZETTLERCN		grid protectionmanufacturer
6	-Typenbezeichnung	AZSR165		-type
7	-Einstellbereiche	Showninappendix		- adjustmentranges
8	Spannungssteigerungsschutz	287.5	V	overvoltageprotection
9	Spannungsrückgangschutz	184	V	undervoltage protection
10	Frequenzsteigerungsschutz	51.5	Hz	overfrequencyprotection
11	Frequenzrückgangschutz	47.5	Hz	underfrequencyprotection
12	TypenbezeichnungderAbschalteinheit	Airswitch		circuit breakertype
13	Oberschwingungsfilter(ja/nein)	No		harmonic filter (yes /no)
5	**Typenprüfung**			**Typetest**
1	Prüfbehörde	SocieteGeneraledeSurveillanceS.A.		testingauthority
2	Aktenzeichen	VDE-AR-N4110:2018-11		reference
3	SeriennummerdesWechselrichters	SP1ES115LC4025		serial number ofconverter

AnschriftdesHerstellers

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Der Hersteller des PV-Wechselrichters bestätigt, dass der PV-Wechselrichter, dessen elektrischen Eigenschaften in den Prüfberichten abgebildet sind, hinsichtlich seiner technischen Daten mit den o.g. Positionen identisch ist.
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Manufacturer Certificate according to FGW TG3

Model HYD 20KTL-3PH

Herstellerbescheinigung zu spezifischen Daten eines Photovoltaik-Wechselrichters vom Type HYD 20KTL-3PH

Manufacturer's certificate on specific data of a Photovoltaic Converter of the type VDE-AR-N 4110:2018-11

Datum /Date:13/7/2021 Seite/Page1/1

1.	**AllgemeinesundAusgangsgrößen**			**General and Outputvalues**
1	Hersteller	ShenzhenSOFAR SOLARCo.Ltd		Manufacturer
2	Typenbezeichnung	HYD20KTL-3PH		typename
3	Einspeisung(einphasig/dreiphasig)	three-phase		no. of phases(single-phase/three-phase)
4	Nennscheinleistung	22	kVA	rated apparentpower
5	Nennwirkleistung	20	kW	rated activepower
6	AC-Nennspannung	230	V	ratedAC-voltage
7	AC-Nennfrequenz	50	Hz	ratedfrequency
8	Beitragzum Stoßkurzschlussstrom	0.032	kA	contribution to short circuitcurrent
2	**DCEingangsgrößen**			**DCInput**
1	Min.MPP-Spannung	180	V	min. MPPvoltage
2	Max.MPP-Spannung	960	V	max. MPPvoltage
3	Max.PV-Eingangsspannung	1000	V	max. DC inputvoltage
4	Max.PV-Eingangsstrom	30*2	A	max. DC inputcurrent
5	Max.Modulleistung	11.25	kW_p	max. peakpower
3	**Wechselrichter-Leistungsteil**			**Converter-Powersection**
1	Hersteller	ShenzhenSOFAR SOLAR Co.Ltd		Manufacturer
2	Typenbezeichnung	HYD20KTL-3PH		typename
3	Nennscheinleistung	22	kVA	rated apparentpower
4	Art(HF/NF-Trafo,trafolos)	Without		generic type (HV/LV of Trans.,without)
5	Taktfrequenz	20	kHz	pulse rate ofinverter
6	Art derLeistungsregelung(MPP-Tracking)	Perturbation& Observation		generic type of power control(MPP-Tracking)
7	Software-Version	V060001		softwareversion
4	**SonstigeelektrischeKomponenten**			**Other electricinstallations**
1	Artder Netzkopplung	breaker		generic type ofinterconnection
2	-Hersteller	ZETTLERCN		-manufacturer
3	-Typenbezeichnung	AZSR143		-type
4	Netzschutzintegriert(Ja/Nein)	yes		integrated grid protection(yes/no)
5	Netzschutzhersteller	ZETTLERCN		grid protectionmanufacturer
6	-Typenbezeichnung	AZSR165		-type
7	-Einstellbereiche	Showninappendix		- adjustmentranges
8	Spannungssteigerungsschutz	287.5	V	overvoltageprotection
9	Spannungsrückgangschutz	184	V	undervoltage protection
10	Frequenzsteigerungsschutz	51.5	Hz	overfrequencyprotection
11	Frequenzrückgangschutz	47.5	Hz	underfrequencyprotection
12	TypenbezeichnungderAbschalteinheit	Airswitch		circuit breakertype
13	Oberschwingungsfilter(ja/nein)	No		harmonic filter (yes /no)
5	**Typenprüfung**			**Typetest**
1	Prüfbehörde	SocieteGeneraledeSurveillanceS.A.		testingauthority
2	Aktenzeichen	VDE-AR-N4110:2018-11		reference
3	SeriennummerdesWechselrichters	SP1ES115LC4025		serial number ofconverter

AnschriftdesHerstellers

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4.6 BEHAVIOUR IN THE EVENT OF A FAILURE OF EITHER THE PGP CONTROLLER OR THE ASSOCIATED MEASUREMENT OR THE CONNECTION BETWEEN PGP CONTROLLER AND PGU

Communication interruption response function: when the inverter detects the communication interruption with the monitoring system, it needs to operate according to the preset active and reactive power.

If the inverter detects no valid data interaction with the monitoring system for a period of time, the communication is considered interrupted. Working according to preset active and reactive power configuration parameters. If the inverter detects that the communication is restored, the inverter will return to the active and reactive power parameters before the communication interruption.

When communication interruption is enabled, the interruption time shall be recorded. If the interruption time reaches the preset communication interruption time, the operation shall be conducted according to the preset active and reactive power parameters.

Under the condition of communication recovery enabling, the current state is in the state of communication interruption. When a normal communication message is received and the time reaches the set value of communication recovery time, the communication is considered restored. At this time, the inverter operates according to the active and reactive power parameters at the last communication time.

5 DYNAMIC SIMUALTION MODEL INFORMATION

5.1 Software Characteristics

- Software type: Simulator for Grid Connected Power Conversion System
- Simulation platform: Matlab Simulink
- Used version of the simulation platform: R2021b
- Simulation Software File identification: ES15kW3ph_PGU.slx
- Dynamic Simulation Model version: V2
- MD5 Checksum: CC86AB742714DC27068C31C28E341B25

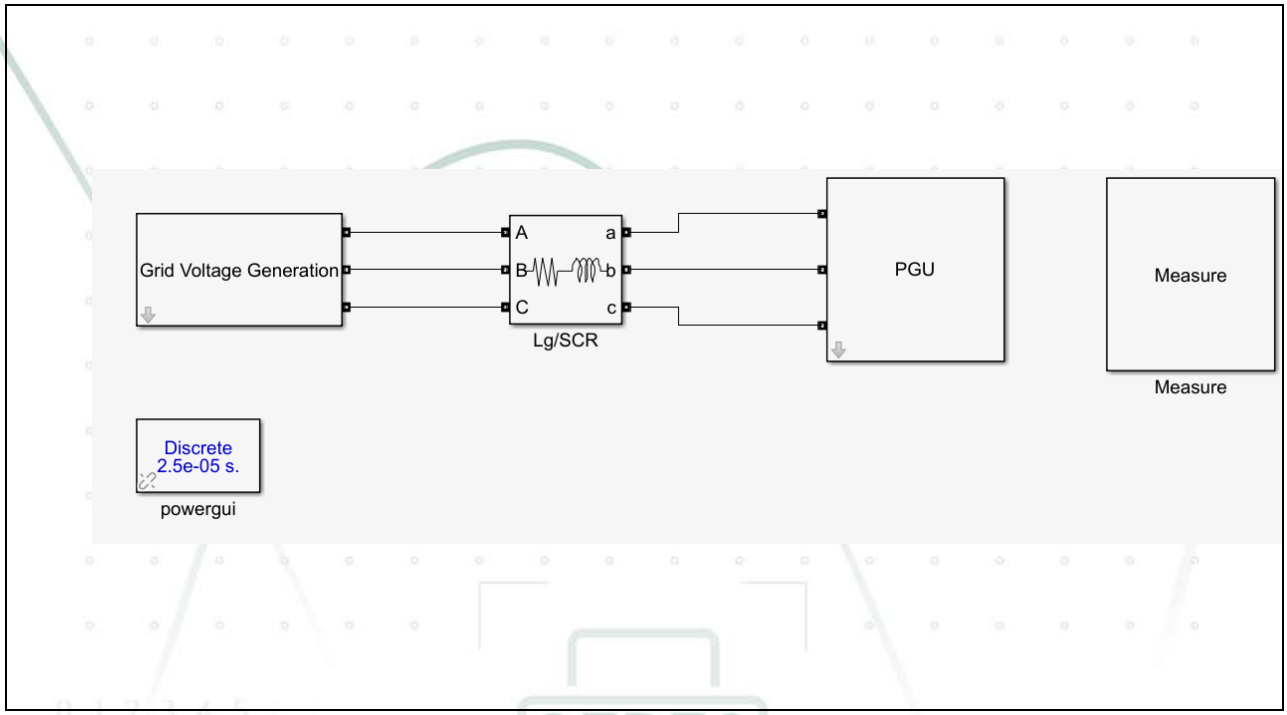
5.2 Software Information and Comments

As evidenced in the manufacturer's documentation and the validation report, the dynamic model could be completely able to represent the dynamic behaviours at the PV inverter terminal, and also be suitable for power grid studies. The dynamic model covered by the validation report is valid for fundamental frequency positive and negative sequence response. The dynamic model is developed with the following specifications in mind:

- The model is to be used primarily for power system stability studies and thus should represent all positive and negative sequence dynamics affected and relevant during:
  - Balanced and unbalanced short-circuits on the transmission grid (including voltage recovery)
  - Grid frequency disturbances
  - Reference value changes
- The model is for fundamental frequency positive and negative sequence response.
- The model is valid for typical power system frequency deviations.
- The model is able to handle numerically the simulation of phase jumps.
- The model is valid for steady state voltage deviations within the range from 0.9 p.u. to 1.1 p.u.
- The model could work with integration time step range from 0.001s to 0.01s.
- The model could be initialized to a steady state from load flow solutions at full or partial nominal power.
- External conditions like solar radiation are taken into account through the available PV array conversion power.
- Over/under frequency and over/under voltage protections are modelled in the control model in order to allow a realistic representation of PV inverter disconnection following grid disturbances. This may be separate modules that connect to the main PV inverter model.
- The model includes the reactive power capability of the PV inverter.

5.3 Description of the model

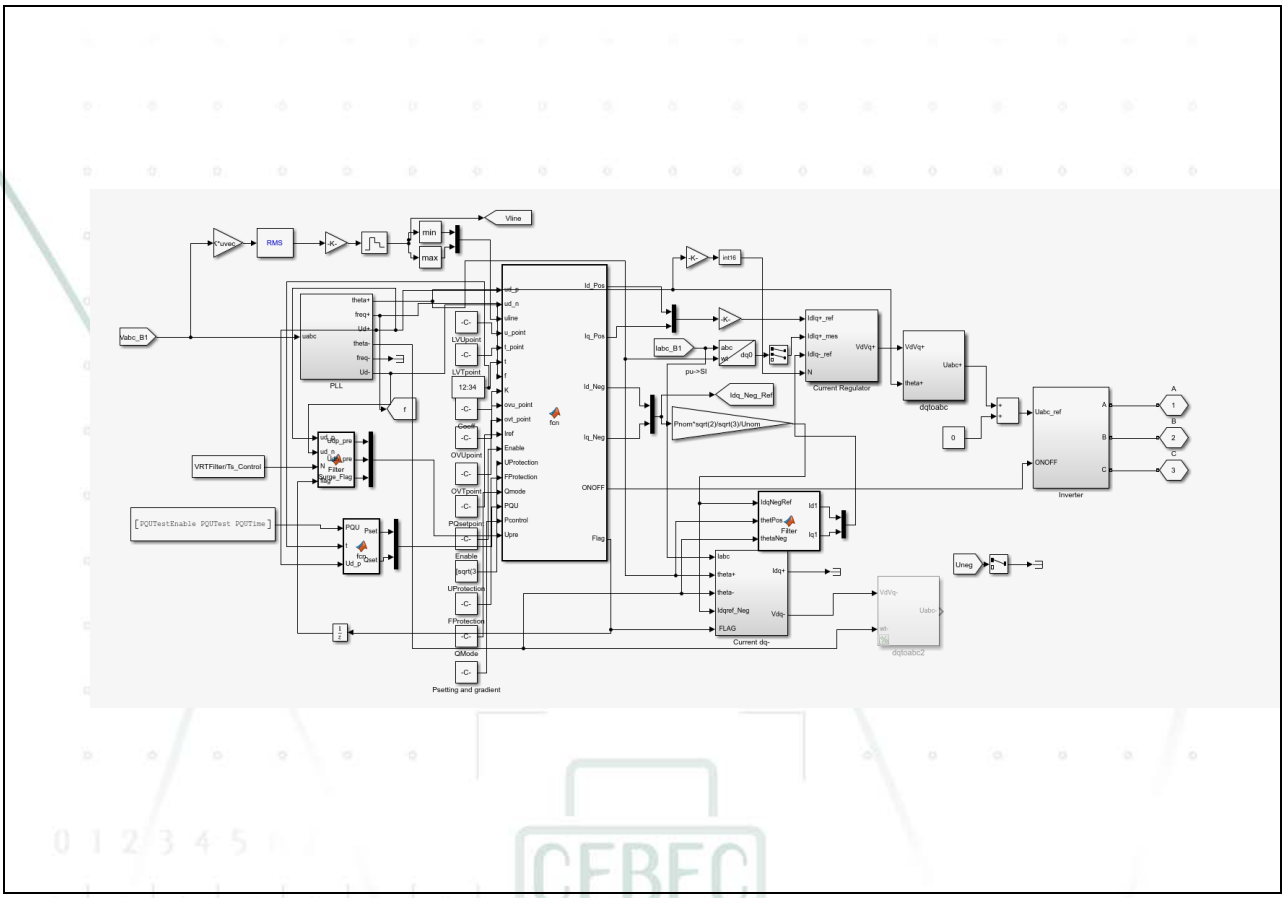
The model has the following design:



The grid information of HYD 15KTL-3PH Inverter Simulink project is as follows:

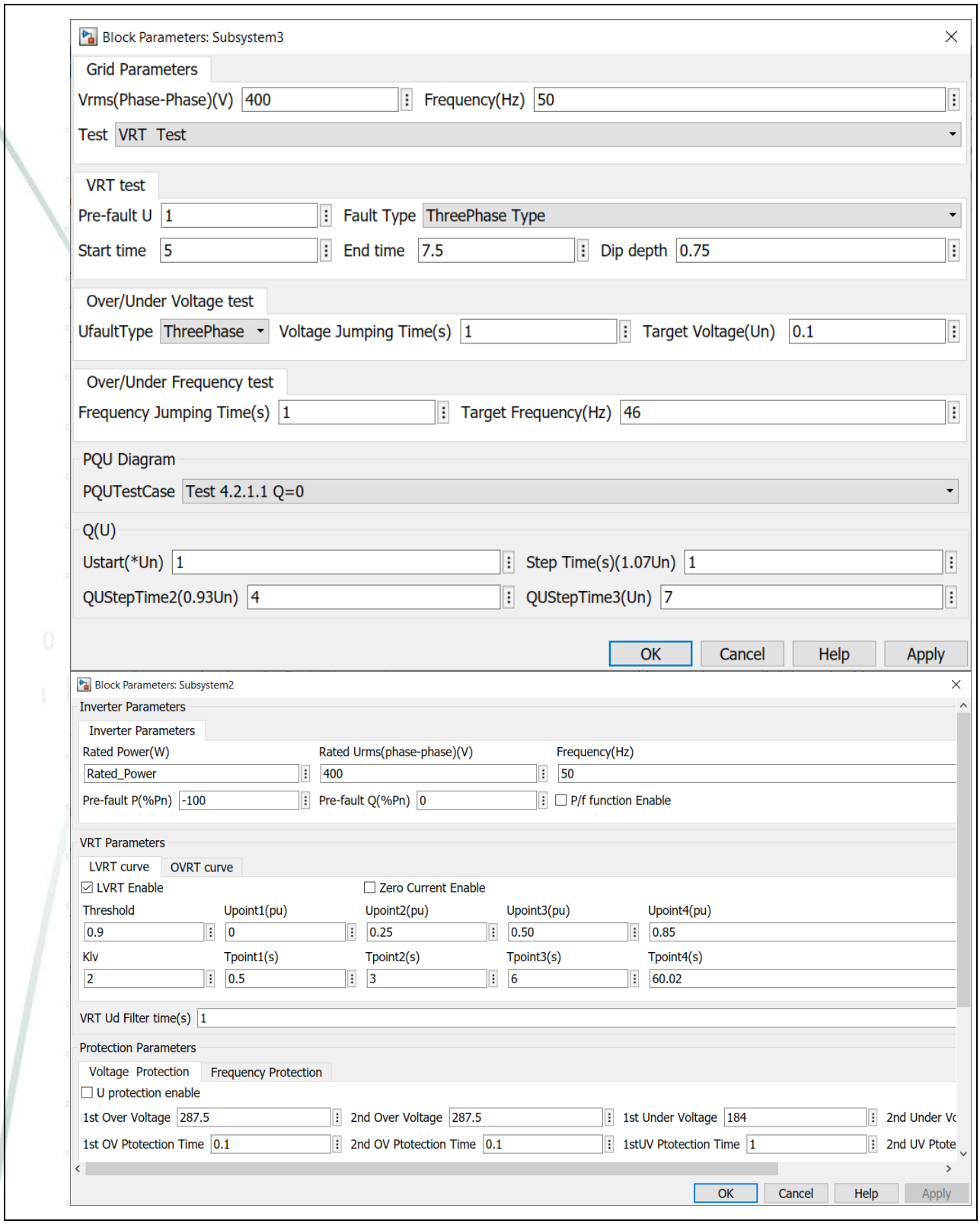
	SCR implemented in the simulated grid	Data recording rate	Sampling resolution of simulation results
Validation requirements for Voltage Ride Through (LVRT and HVRT, except 75.3 and 75.4)	5	100 Hz (Step size is 10 ms)	25 kHz (Step size is 0.25 ms)
Validation of changes commanded by set point (Active Power)	5	50 Hz (Step size is 20 ms)	25 kHz (Step size is 0.25 ms)
Validation of changes commanded by set point (Reactive Power)	5	50 Hz (Step size is 20 ms)	25 kHz (Step size is 0.25 ms)
Verification of requirements for Protective Settings (Under/Over voltage cases)	5	50 Hz (Step size is 20 ms)	25 kHz (Step size is 0.25 ms)
Plausibility check. Tests for Type 2 PGUS.	50	100 Hz (Step size is 10 ms)	25 kHz (Step size is 0.25 ms)
U-P-Q capability curves	5	10 Hz (Step size is 100 ms)	25 kHz (Step size is 0.25 ms)
Plausibility Tests for typical PGS configurations. One-off voltage drops	8	100 Hz (Step size is 10 ms)	25 kHz (Step size is 0.25 ms)
Plausibility Tests for typical PGS configurations. Unsuccessful AR	8	100 Hz (Step size is 10 ms)	25 kHz (Step size is 0.25 ms)

For further information, see the “Sofar Model description” (version 2, issued on 12th, October 2021).
Below is showed the converter model:
The model can be adjusted to simulate models HYD 15KTL-3PH; HYD 5KTL-3PH; HYD 6KTL-3PH; HYD 8KTL-3PH; HYD 10KTL-3PH; HYD 20KTL-3PH as it is detailed following instructions given in the points 4 of the user manual of the simulation model.



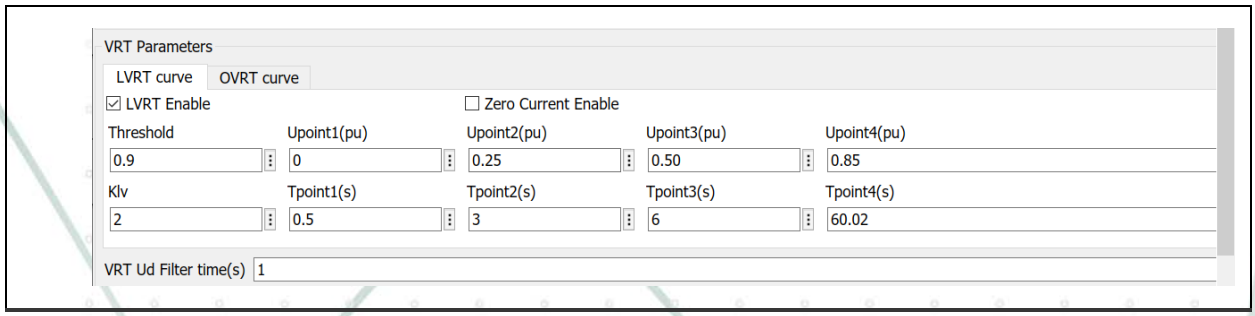
The following pictures shows parameters adjusted by default for the simulations LVRT/HVRT tests offered in this report (*).

(*) The test parameters in subsystem3 have been modified during the different simulations, VRT test is shown due to the parameter can not be either unselected or hidden.

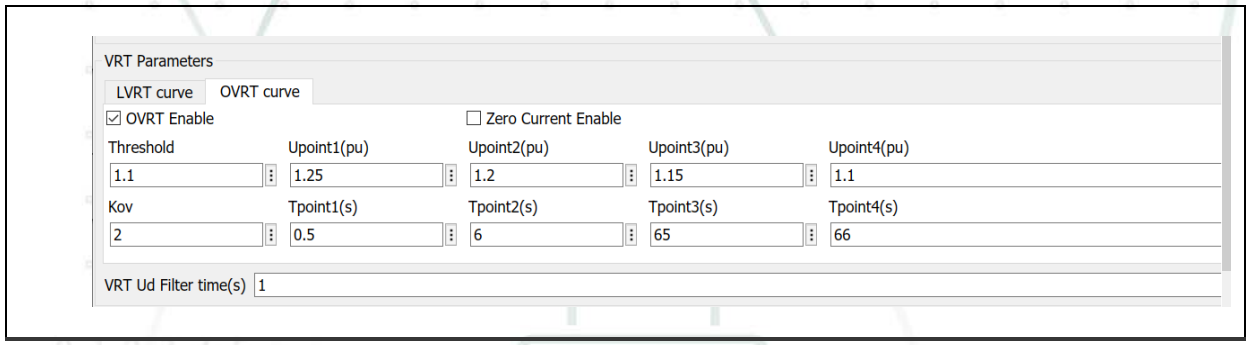


The PGU subsystem has been configurated differently depeding of the simulation executed. Configuration of both LVRT and OVRT parameters are shown below.

The configuration for LVRT is the following:



Configuration on matlab script
The configuration for OVRT is the following:



The zero current enable only has been set for Test 50.5, 80.1, 50.6, 80.2

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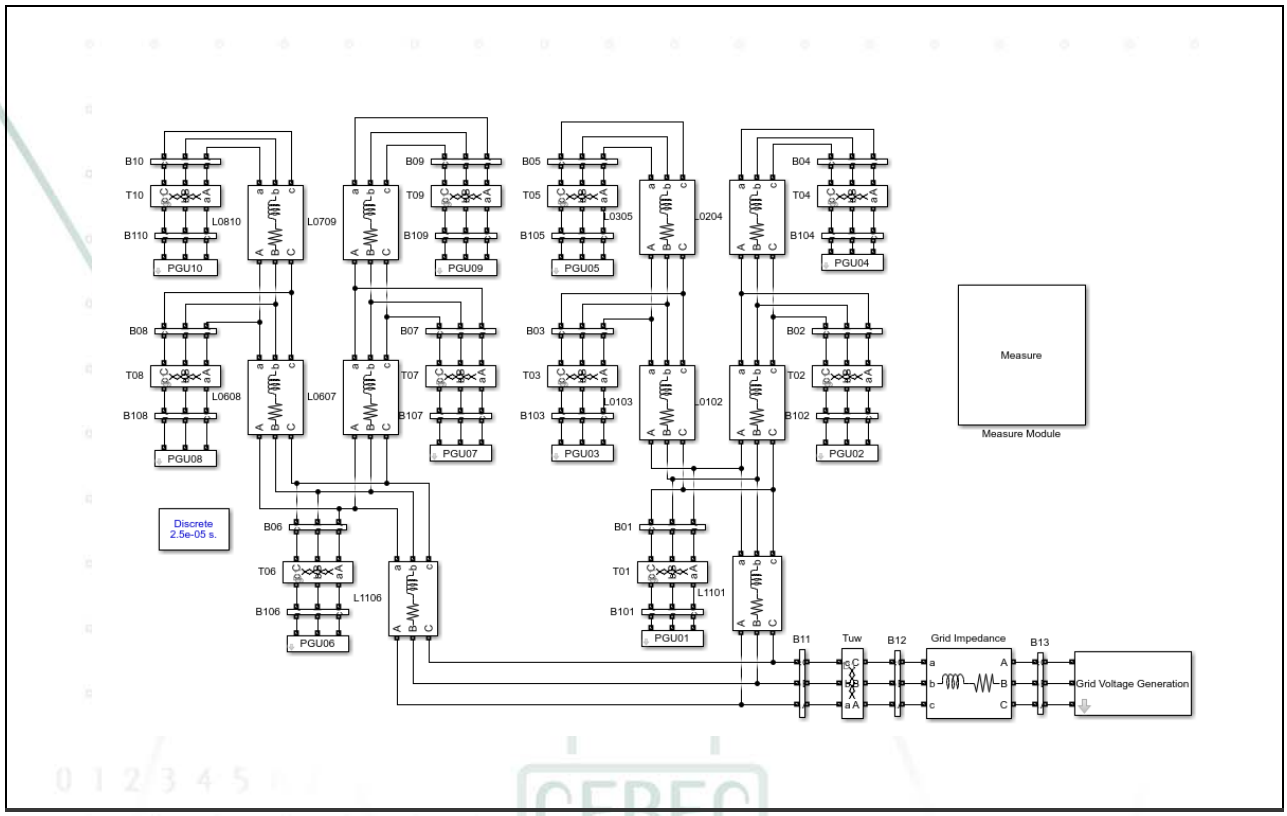
The model for determinate the suitability in PGS simulations has the following design:



The PGU1 has been selected as the nearest PGU, and PGU9 has been selected as the farthest PGU.

Resistance and reactance values have been modelled by adding R-L block with the corresponding values. For this report only the values associated with PGU9 and PGU1 are relevant, and those values has been set as following:

- PGU1: Resistance = 2,4 Ω; Reactance = 0,002 L.
- PGU9: Resistance = 2,8 Ω; Reactance = 0,004 L.

--- END OF THE ANNEX TO CERTIFICATE ---

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