



# Impedance at 175Hz

## Residential and C&I Products

**SUNGROW**

# 1 Introduction

This document describes the impedance at 175Hz .

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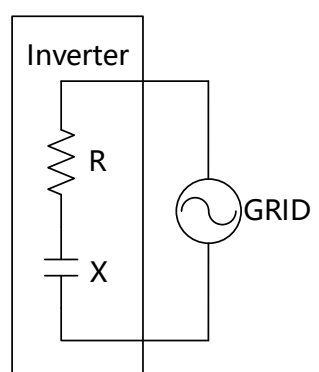
# 2 Impedance at 175Hz

For the tariff adjustment, the French grid operator ERDF uses a ripple control signal with a frequency of 175 Hz in its utility grid.

In order to assess the compatibility with the ripple control signal, ERDF requires the impedances of the generators feeding in.

To carry out the assessment, SUNGROW determined the impedances (R, X, |Z|) for its inverters at a frequency of 175 Hz. The following table lists the values for the different inverters.

| Inverter device type | Series Connection |       |       | Inverter output voltage |
|----------------------|-------------------|-------|-------|-------------------------|
|                      | X[Ω]              | R[Ω]  | Z [Ω] |                         |
| SG2K-S               | -118.1            | 0.007 | 118.1 | 1*230V                  |
| SG2K5-S              | -118.1            | 0.007 | 118.1 | 1*230V                  |
| SG3K-S               | -118.1            | 0.007 | 118.1 | 1*230V                  |
| SG3K-D               | -103.3            | 0.006 | 103.3 | 1*230V                  |



|           |        |       |       |        |
|-----------|--------|-------|-------|--------|
| SG3K6-D   | -103.3 | 0.006 | 103.3 | 1*230V |
| SG4K-D    | -103.3 | 0.006 | 103.3 | 1*230V |
| SG4K6-D   | -103.3 | 0.006 | 103.3 | 1*230V |
| SG5K-D    | -103.3 | 0.006 | 103.3 | 1*230V |
| SG6K-D    | -103.3 | 0.006 | 103.3 | 1*230V |
| SG5KTL-MT | -133.7 | 0.007 | 133.7 | 3*400V |
| SG6KTL-MT | -133.7 | 0.007 | 133.7 | 3*400V |
| SG8KTL-M  | -133.7 | 0.007 | 133.7 | 3*400V |
| SG10KTL-M | -133.7 | 0.007 | 133.7 | 3*400V |
| SG12KTL-M | -133.7 | 0.007 | 133.7 | 3*400V |
| SG15KTL-M | -113.7 | 0.007 | 113.7 | 3*400V |
| SG20KTL-M | -113.7 | 0.007 | 113.7 | 3*400V |
| SG2K-S    | -118.1 | 0.008 | 118.1 | 1*230V |
| SG2K5-S   | -118.1 | 0.008 | 118.1 | 1*230V |
| SG3K-S    | -118.1 | 0.008 | 118.1 | 1*230V |
| SG3K-D    | -103.3 | 0.007 | 103.4 | 1*230V |
| SG3K6-D   | -103.3 | 0.007 | 103.4 | 1*230V |
| SG4K-D    | -103.3 | 0.007 | 103.4 | 1*230V |
| SG4K6-D   | -103.3 | 0.007 | 103.4 | 1*230V |
| SG5K-D    | -103.3 | 0.007 | 103.4 | 1*230V |
| SG6K-D    | -103.3 | 0.007 | 103.4 | 1*230V |
| SG8K-D    | -74.5  | 0.006 | 74.6  | 1*230V |
| SG8K3-D   | -74.5  | 0.006 | 74.6  | 1*230V |
| SG5KTL-MT | -133.7 | 0.007 | 133.8 | 3*400V |
| SG6KTL-MT | -133.7 | 0.007 | 133.8 | 3*400V |
| SG8KTL-M  | -133.7 | 0.007 | 133.8 | 3*400V |
| SG10KTL-M | -133.7 | 0.007 | 133.8 | 3*400V |
| SG12KTL-M | -133.7 | 0.007 | 133.8 | 3*400V |

|              |         |       |        |        |
|--------------|---------|-------|--------|--------|
| SG15KTL-M    | -113.7  | 0.007 | 113.7  | 3*400V |
| SG20KTL-M    | -113.7  | 0.007 | 113.7  | 3*400V |
| SG30KTL-M    | -62.3   | 0.006 | 62.3   | 3*400V |
| SG30CX       | -58.299 | 0.006 | 58.299 | 3*400V |
| SG33CX       | -44.8   | 0.005 | 44.8   | 3*400V |
| SG36KTL-M    | -62.3   | 0.006 | 62.3   | 3*400V |
| SG40CX       | -44.8   | 0.005 | 44.8   | 3*400V |
| SG50KTL-M-20 | -30.3   | 0.006 | 30.3   | 3*400V |
| SG50CX       | -44.8   | 0.005 | 44.8   | 3*400V |
| SG60KTL      | -29.3   | 0.005 | 29.3   | 3*400V |
| SG80KTL      | -29.3   | 0.005 | 29.3   | 3*400V |
| SG110CX      | -25.054 | 0.006 | 25.054 | 3*400V |
| SG125HV      | -22.7   | 0.006 | 22.7   | 3*600V |
| SG250HX      | -24.58  | 0.006 | 24.58  | 3*800V |
| SG2.0RS-S    | -165.35 | 0.007 | 165.36 | 1*230V |
| SG2.5RS-S    | -165.35 | 0.007 | 165.36 | 1*230V |
| SG3.0RS-S    | -165.35 | 0.007 | 165.36 | 1*230V |
| SG3.0RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SG3.6RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SG4.0RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SG5.0RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SG6.0RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SH3.0RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SH3.6RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SH4.0RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SH5.0RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SH6.0RS      | -101.05 | 0.006 | 101.06 | 1*230V |
| SG3.0RT      | -61.87  | 0.002 | 61.87  | 3*400V |

|            |         |       |        |        |
|------------|---------|-------|--------|--------|
| SG4.0RT    | -61.87  | 0.002 | 61.87  | 3*400V |
| SG5.0RT    | -61.87  | 0.007 | 61.87  | 3*400V |
| SG6.0RT    | -61.87  | 0.007 | 61.87  | 3*400V |
| SG7.0RT    | -61.87  | 0.007 | 61.87  | 3*400V |
| SG8.0RT    | -61.87  | 0.007 | 61.87  | 3*400V |
| SG10RT     | -61.87  | 0.007 | 61.87  | 3*400V |
| SG12RT     | -61.87  | 0.007 | 61.87  | 3*400V |
| SG15RT     | -61.87  | 0.002 | 61.87  | 3*400V |
| SG17RT     | -61.87  | 0.002 | 61.87  | 3*400V |
| SG20RT     | -61.87  | 0.002 | 61.87  | 3*400V |
| SH3K6      | -101.05 | 0.006 | 101.06 | 1*230V |
| SH4K6      | -101.05 | 0.006 | 101.06 | 1*230V |
| SH5K-30    | -101.05 | 0.006 | 101.06 | 1*230V |
| SH5.0RT    | -82.72  | 0.01  | 82.72  | 3*400V |
| SH6.0RT    | -82.72  | 0.01  | 82.72  | 3*400V |
| SH8.0RT    | -82.72  | 0.01  | 82.72  | 3*400V |
| SH10RT     | -82.72  | 0.01  | 82.72  | 3*400V |
| SG25CX-P2  | -15.8   | 12.9  | 20.4   | 3*400V |
| SG30CX-P2  | -15.8   | 12.9  | 20.4   | 3*400V |
| SG33CX-P2  | -15.8   | 12.9  | 20.4   | 3*400V |
| SG36CX-P2  | -15.3   | 10.8  | 18.6   | 3*400V |
| SG40CX-P2  | -15.3   | 10.8  | 18.6   | 3*400V |
| SG50CX-P2  | -15.3   | 10.8  | 18.6   | 3*400V |
| SG110CX-P2 | -25.7   | 0.007 | 25.7   | 3*400V |
| SG125CX-P2 | -25.7   | 0.007 | 25.7   | 3*400V |