



## Manufacturer Declaration

### Settings required by CEZ DISTRIBUCE

#### For the following

**Equipment** : Huawei FusionSolar SUN2000 Inverter  
**Product/Series** : Huawei FusionHome SUN2000 Inverter

**Model/Trademark** : SUN2000-33KTL-A /Huawei : SUN2000L-2KTL /Huawei  
: SUN2000-36KTL /Huawei : SUN2000L-3KTL /Huawei  
: SUN2000-12KTL-M0/ Huawei : SUN2000L-3.68KTL /Huawei  
: SUN2000-15KTL-M0/ Huawei : SUN2000L-4KTL /Huawei  
: SUN2000-17KTL-M0/ Huawei : SUN2000L-4.6KTL /Huawei  
: SUN2000-20KTL-M0/ Huawei : SUN2000L-5KTL /Huawei  
: SUN2000-60KTL-M0 /Huawei : SUN2000-3KTL-M0 /Huawei  
: SUN2000-100KTL-H1 /Huawei : SUN2000-4KTL-M0 /Huawei  
: SUN2000-105KTL-H1 /Huawei : SUN2000-5KTL-M0 /Huawei  
: SUN2000-185KTL-H1 /Huawei : SUN2000-6KTL-M0 /Huawei  
: SUN2000-8KTL-M0 /Huawei  
: SUN2000-10KTL-M0 /Huawei

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**Statement Content:**

Country setup 50438-CZ includes default settings of EN 50438:2013 of the interface protection. The required settings defined in *Table 2* and *Table 3* of document: *PŘÍLOHA 4 PPDS: PRAVIDLA PRO PARALELNÍ PROVOZ ZDROJŮ VÝROBEN A AKUMU-LAČNÍCH ZAŘÍZENÍ SE SÍTÍ PROVOZOVATELE DISTRIBUČNÍ SOUSTAVY, květen 2017*”, hereinafter referred to as **the SD (source document)**, can be configured by manually following user manual.

**For sources up to 16 A/phase generation:**

Parameter	Maximum Trip Time [ s ]	Shutdown settings
overvoltage 1st degree <sup>(1)</sup>	3	230 V + 10 %
overvoltage 2nd degree	1	230 V + 15 %
Overvoltage 3rd degree	0.1	230 V + 20%
undervoltage	1.5	230 V - 15 %
overfrequency	0.5	52 Hz
underfrequency	0.5	47.5 Hz

1) For the 1st degree of overvoltage, 10-minute values corresponding to ČSN EN 50160 are used. The calculation of the 10-minute value must correspond to the 10-minute aggregation according to ČSN EN 61000-4-30, class S. This function must be based on the average effective voltage value in the interval 10 minutes. The deviation from EN 61000-4-30 lies in the sliding measuring window. For comparison with the tripping limit, it is sufficient to calculate a new 10-minute value at least every 3 s

*Table 2*
**For Sources above 16 A / phase generation:**

Function	Setting range	Recommended protection settings	
Overvoltage 3. Degree U >>	1.00 - 1.30 Un	1.25 Un	0.1 s
Overvoltage 2nd stage U >>	1.00 - 1.30 Un	1.2 Un	late (5s)
Overvoltage 1st stage U >	1.00 - 1.30 Un	1.15 Un (1)	≤ 60 s
Undervoltage 1st stage U <	0.10 - 1.00 Un	0.7 Un	0 - 2.7 s (1)
Undervoltage 2nd stage U <<	0.10 - 1.00 Un	0.3 Un (0.45 Un) ( 2)	≥ 0.15 s
overfrequency f >	50 - 52 Hz	51.5 Hz	Ms 100 ms
underfrequency f <	47.5 - 50 Hz	47.5 Hz (4) \ t	Ms 100 ms
Reactive Power / undervoltage (Q & U<)	0.70 - 1.00 Un	0.85 Un	t1 = 0.5 s

(1) For the 1st degree of overvoltage, 10-minute values corresponding to ČSN EN 50160 are used. The calculation of the 10-minute value must correspond to the 10-minute aggregation according to ČSN EN 61000-4-30, class S. This function must be based on the average effective voltage value in the interval 10 minutes. The deviation from EN 61000-4-30 lies in the sliding measuring window. For comparison with the tripping limit, it is sufficient to calculate a new 10-minute value at least every 3 s.

(2) This voltage stage causes rapid disconnection from the mains at near short circuits. The setting of 0.3 Un is selected for the plants connected to the 110 kV networks and the voltage measured on the MV side (corresponds to about 15% Un v connection point. The 0.45 Un setting is selected for plants connected to MV networks and for lower voltage voltage measurements.

(3) This setting depends on the factory output and the frequency-dependent power adjustment.

*Table 1*

### Additional requirements:

SD defines additional requirements for generating units which can be fulfilled by inverter configuration settings explained in **user manual**.

- Active power reduction (derating) at over-frequency (SD - 9.3.1) can be set to the value shown on *Figure 1* by following user manual.

(...) the frequency threshold must be between 50.2 Hz and 50.5 Hz inclusive;

The static setting must be between 2% and 12%;

Default threshold frequency in the Czech Republic is 50.2 Hz, static  $s_2 = 5\%$

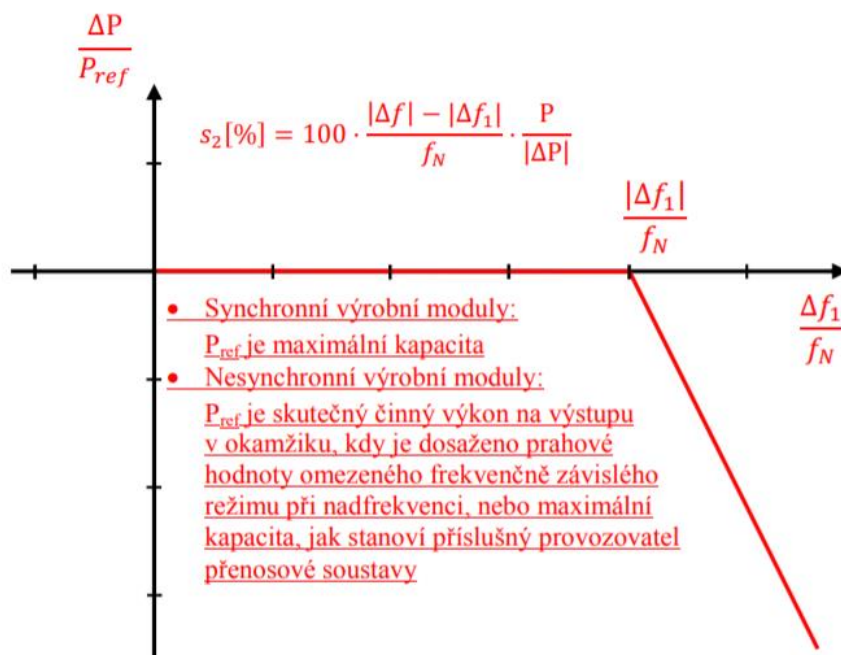
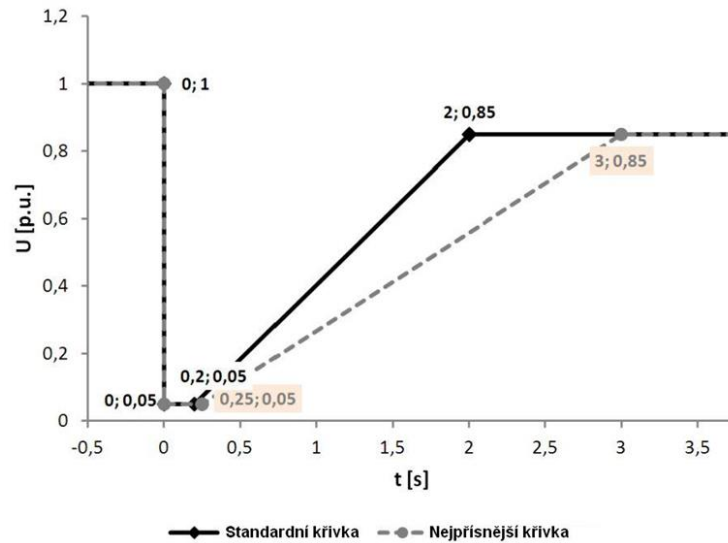


Figure 2

- LVRT (9.2.2.1) is fulfilled by all listed inverters with output current >16 A accruing to TS 50549-1

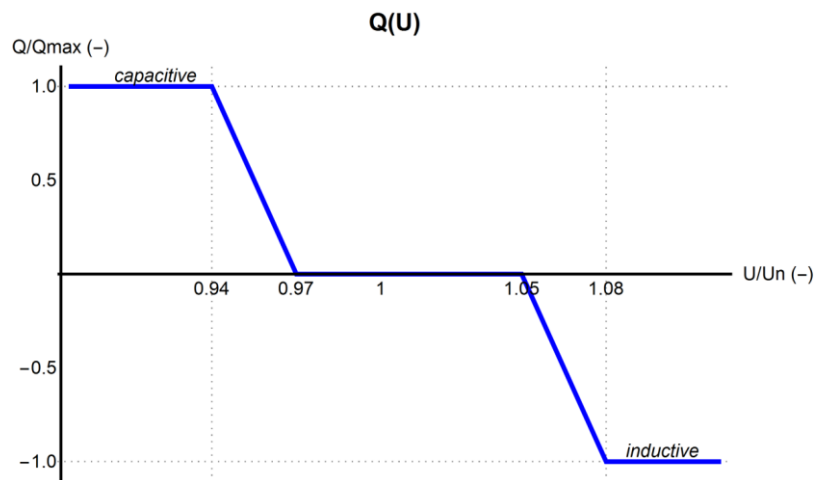


- Active power increase gradient of  $[10\% P_n / \text{minute}]$  according to SD – 9.5 can be fulfilled by manual settings by following user manual. The reconnection limits for frequency (47,5 – 50,05 Hz) and voltage (85 – 110%  $U_n$ ) range including reconnection time of 300s (SG – 9.5) can be set by following user manual.
- Q(U) characteristic (SD – 9.4) can be set to the value shown on *Figure 2* by following user manual.

*The characteristic curve of Figure 2 must be adjustable, the PDS determines the setting according to local network conditions, ev. connectivity studies.*

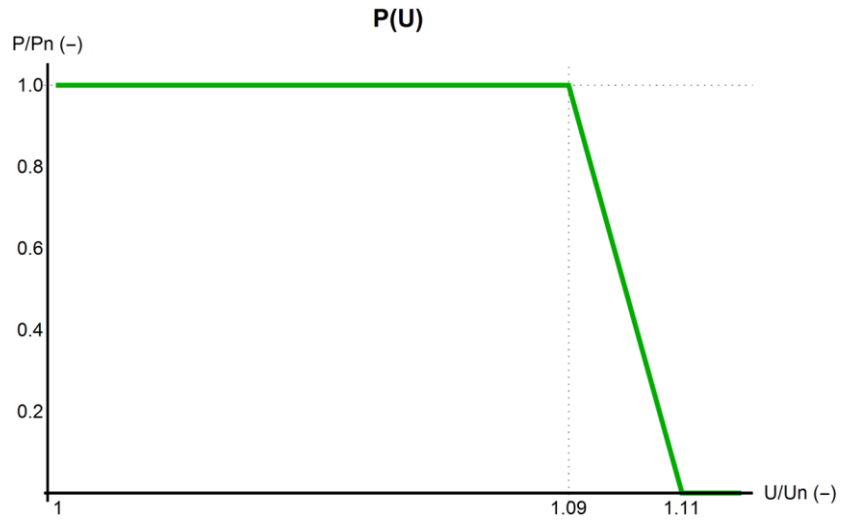
*Settings example:*

$X1 = 0.94: 1; X2 = 0.97: 0; X3 = 1.05: 0; X4 = 1.08: -1$



*Figure 3*

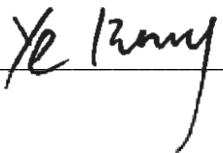
- P(U) characteristic (SD - 9.3.3) can be set to the value shown on *Figure 3* by following user manual.



*Figure 3*

On behalf of Huawei Technologies

Yours Faithfully,

Signed: 

Date: 28.08.2019

Liang, Ye  
Director of Inverter Solution Sales & Marketing, Europe