

Certificate

Applicant: TELE Haase Steuergeräte Ges.m.b.H
Vorarlberger Allee 38
1230 Wien
Österreich

Product: Automatic disconnection device

Model:	NA003
---------------	-------

Intended use:

An automatic disconnection device with three-phase mains surveillance in accordance with Engineering Recommendation G59/3 for systems with a three-phase parallel coupling to the public mains supply.

Applied standards and guidelines:

Engineering Recommendation G59/3-1
Issue 3, Amendment 1 – August 2014

Recommendations for the connection of generating plant to the distribution systems of licensed distribution network operators

The safety concept of an aforementioned representative product corresponds at the time of issue of this certificate to the valid safety specifications for the specified use in accordance with regulations.

Report No: 14PP035-09

Certificate No: 15-082-01

Date of issue: 2015-05-11



A handwritten signature in black ink, appearing to read "A. Aufmuth", is positioned above the name of the certification department.

Andreas Aufmuth
Certification Department



Protection. Frequency tests

Function	Setting		Trip test		"No trip tests"	
	Frequency	Time delay	Frequency	Time delay	Frequency / time	Confirm
U/F stage 1	47,5Hz	20,0s	47,50Hz	20,13s	47,7Hz 25s	No trip
U/F stage 2	47,0Hz	0,5s	47,00Hz	0,65s	47,2Hz 19,98s	No trip
					46,8Hz 0,48s	No trip
O/F stage 1	51,5Hz	90,0s	51,50Hz	90,20s	51,3Hz 95s	No trip
O/F stage 2	52,0Hz	0,5s	52,01Hz	0,62s	51,8Hz 89,98s	No trip
					52,2Hz 0,48s	No trip

Protection. Voltage tests LV

Function	Setting		Trip test		"No trip tests"	
	Voltage	Time delay	Voltage	Time delay	Voltage / time	Confirm
U/V stage 1	200,1V	2,5s	200,1V	2,57s	204,1V 3,5s	No trip
U/V stage 2	184,0V	0,5s	183,9V	0,58s	188,0V 2,48s	No trip
					180,0V 0,48s	No trip
O/V stage 1	262,2V	1,0s	262,2V	1,07s	258,2V 2,0s	No trip
O/V stage 2	273,7V	0,5s	273,6V	0,58s	269,7V 0,98s	No trip
					277,7V 0,48s	No trip

Protection. Voltage tests HV

Function	Setting		Trip test			
	Voltage	Time delay	Voltage	Time delay		
U/V stage 1	348,0V	2,5s	347,9V	2,54s		
U/V stage 2	320,0V	0,5s	320,0V	0,59s		
O/V stage 1	440,0V	1,0s	439,9V	1,09s		
O/V stage 2	452,0V	0,5s	452,0V	0,58s		

Loss-of-Mains (LOM) Protection Tests. RoCoF

Calibration and Accuracy Tests

Ramp in range 49,5 – 50,5Hz	Pickup ($\pm 0,005\text{Hzs}^{-1}$)				Time Delay RoCoF = $\pm 0,05\text{Hz/s}$ above setting			
Setting = $0,20\text{Hzs}^{-1}$	Lower Limit	Measured value	Upper Limit	Result	Test Condition	Measured value	Upper Limit	Result
Increasing Frequency	0,195	0,195	0,205	P	$0,25\text{Hzs}^{-1}$	458ms	<0,5s	P
Reducing Frequency	0,195	0,195	0,205	P	$0,25\text{Hzs}^{-1}$	472ms	<0,5s	P

Stability Tests

	Change	Test duration	Confirm no trip
Positive frequency drift	Higher of $0,12\text{Hz/s}$ or RoCoF $-0,01\text{Hz/s}$	5,0s	No trip
Negative frequency drift		5,0s	No trip

Loss-of-Mains (LOM) Protection Tests. Vector Shift
Calibration and Accuracy Tests

Vector shift	Pickup ($\pm 0,005\text{Hzs}^{-1}$)				Time Delay RoCoF = $\pm 0,05\text{Hz/s}$ above setting			
Setting = 12 degrees	Lower Limit	Measured value	Upper Limit	Result	Test condition	Measured value	Upper Limit	Result
Vector shift: Lagging Angle	11,5	12,0	12,5	P	14 deg	169,4ms	<0,5s	P
Vector shift: Leading Angle	11,5	-12,0	12,5	P	14 deg	174,0ms	<0,5s	P

Stability Tests

	Change	Test duration	Confirm no trip
Positive vector shift	Higher of 5 degrees or vector shift -1 degree	30s	No trip
Negative vector shift		30s	No trip

Protection. Re-connection timer

Time delay settings (s)	Measured delay (s)	Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of table 10.5.7.1			
20	20,18	At 266,2V	At 196,1V	At 47,4Hz	At 51,6Hz
Confirmation that the unit does not re-connect		No reconnection	No reconnection	No reconnection	No reconnection