

CERTIFICATE

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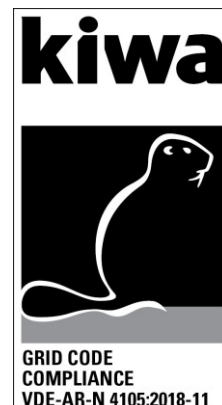
Deutsche
 Akkreditierungsstelle
 D-ZE-12089-01-00



Certificate of NS protection		Nr.: 21-282-00
Manufacturer / Applicant	ComAp a.s. U Uranie 1612/14a 170 00 Prague 7 Czech Republic	
Type of NS protection	InteliSys Gas InteliSys GSC-C InteliGen GSC-C InteliGen GSC	
Central NS protection	<input checked="" type="checkbox"/>	
Integrated NS protection	<input type="checkbox"/>	
Network connection rule	SOP-9-1_14 GCC Certification Program, 11/20 <u>Based on:</u> VDE-AR-N 4105:2018-11 Generators connected to the low-voltage distribution network – Technical minimum requirements for connection and parallel operation of power generation systems connected to the low-voltage network	
Test requirement	DIN VDE V 0124-100 (VDE V 0124-100):2020-06 “Network integration of power generation systems – Low voltage” Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network	
Test Report	21PP124-01_0 dated 2021-09-01	
The network and system protection designated above meets the requirements of VDE-AR-N 4105:2018-11.		

Kaufbeuren, 2021-09-02

Tanja Rottach
 Certification Engineer



This NS protection certificate shall not be used in extracts



Annex 1 Description of the system

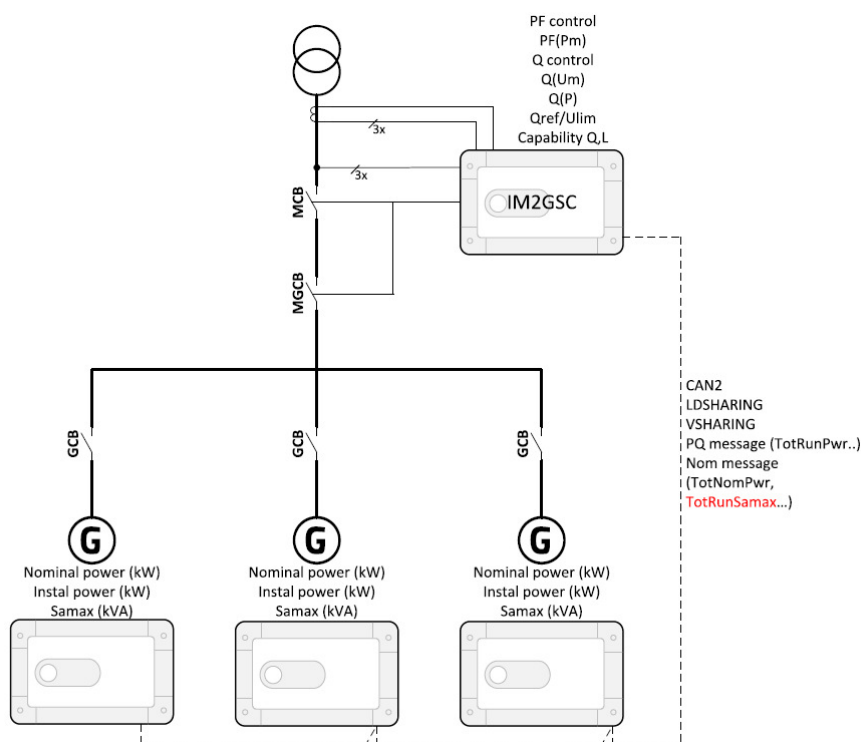
The EZE controllers IntelliSys Gas, IntelliSys GSC-C, IntelliGen GSC-C, IntelliGen GSC are controllers for genset applications manufactured by ComAp, a.s..

With the optional firmware IntelliMains GSC (IM2GSC) they are comprehensive mains supervision controller for multiple generating sets operating in parallel to the mains, which combines the following functions:

- Genset operation/control (start, stop operation)
- Genset control (voltage control, active and reactive power control, $\cos \phi$ control)
- Network voltage monitoring and generator shutdown if network values are outside adjusted limits (voltage and frequency monitoring)

Basically, the structure of the control systems can be divided into two levels. The upper level is responsible for active and reactive power management. Based on the selected mode, the required active and reactive power is made available for the lower level. At the lower level, the speed demand of the engine control unit (SRO) and the voltage demand (VRO) of the generator excitation unit are influenced.

A typical application of a control device is shown in the following figure.



For the certification, the NS protection and the PAV,E monitoring were considered.

The controller was tested with a "starter kit" simulation setup, in which the various feedback signals were implemented via switches and potentiometers in order to simulate realistic operation.



Annex 2

E.7 Extract of the test report for NS protection

No.: 21PP124-01_0

„Determination of electrical properties“

Test report NS protection

Type of NS protection	InteliSys Gas, InteliSys GSC-C, InteliGen GSC-C, InteliGen GSC		Further manufacturer information <i>Valid parameter set:</i> "SPtM under50kW.ant" or "SPtM over50kW.ant"	
Software-Version:	Type	Software-Version		Version Grid-Code Module
	InteliSys Gas	IM2GSC 1.2.0		V1.2
	InteliSys GSC-C			
	InteliGen GSC-C			
	InteliGen GSC			
Manufacturer:	ComAp a.s. U Uranie 1612/14a 170 00 Praque 7 Czech Republic			
Measurement period:	From 2021-06-16 to 2021-07-19			

	Sitrling generators, fuel cells			Inverter(s)		
	Synchronous and asynchronous generators with $P_n \leq 50\text{kW}$ coupled directly or via inverters			Directly coupled synchronous and asynchronous generators with $P_n > 50\text{kW}$		
Protective function	Set Value	Tripping Value	Tripping time NS Protection*	Set Value	Tripping Value	Tripping time NS Protection*
Rise-in-voltage protection $U_{>>}$	$1,15 * U_n$	$1,15 * U_n$	59ms	$1,25 * U_n$	$1,250 * U_n$	48ms
Rise-in-voltage protection $U_{>}$	$1,10 * U_n$	$1,10 * U_n$	10 min Mittelwert	$1,10 * U_n$	$1,10 * U_n$	10 min Mittelwert
Voltage drop protection $U_{<}$	$0,8 * U_n$	$0,794 * U_n$	29ms	$0,8 * U_n$	$0,789 * U_n$	1023ms
Voltage drop protection $U_{<<}$	Not applicable			$0,45 * U_n$	$0,441 * U_n$	336ms
Frequency decrease protection $f_{<}$	47,5Hz	47,50Hz	28ms	47,5 Hz	47,50Hz	41ms
Frequency decrease protection $f_{>}$	51,5Hz	51,50Hz	34ms	51,5 Hz	51,52Hz	31ms

* The tripping time includes the period from the limit value violation U_{lf} until the tripping signal to the interface switch.

When planning the power generation system, the response time of the interface switch shall be added to the maximum time value obtained as indicated above.

☐ For integrated NS protection

Assigned to power generation unit of type	
Type integrated interface switch	
Response time of interface switch for integrated NS protection	
Verification of the entire functional chain "integrated NS protection – interface switch" has resulted in successful disconnection	<input type="checkbox"/>