

UR Family Certification Guide

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This document outlines certification of the Universal Relay (UR) family of products to international standards. Compliance is outlined as follows:

- Products covered
- Versions covered
- Standards tested
- Detailed test tables
- Certificates

Products

The following products comprise the UR family. The tested samples passed all type tests shown in this report.

- B30 Bus Differential System
- B90 Low Impedance Bus Differential system
- C30 Controller System
- C60 Breaker Protection System
- C70 Capacitor Bank Protection and Control System
- D30 Line Distance Protection System
- D60 Line Distance Protection System
- F35 Multiple Feeder Protection System
- F60 Feeder Protection System
- G30 Generator Protection System
- G60 Generator Protection System
- HardFiber Process Bus System (only type tests apply)
- L30 Line Current Differential System
- L60 Line Phase Comparison System
- L90 Line Current Differential System
- M60 Motor Protection System
- N60 Network Stability and Synchrophasor Measurement System
- T35 Transformer Protection System
- T60 Transformer Protection System

Versions

The test results in this document refer to the firmware version that the hardware had at the time of testing. While a test can indicate UR 7.10 compliance, for example, discretion can be used to apply the results to other firmware versions. For example, because the UR firmware was not significantly changed from version 7.10 to 7.11, the user can extend compliance to version 7.11 with the knowledge that version 7.11 was not explicitly tested. For guidance, consult the UR Release Notes to determine the extent of change between firmware releases.

Standards

The table summarizes the standards certified by third parties for UR products. See the tables later in this document for specific clauses of the standards met and UR firmware versions tested. Other standards, such as ISO, are outlined in the instruction manuals for the UR products.

Table 1: Standards tested

Standard	Standard
CISPR 11	IEC 60255-26
CISPR 22	IEC 60255-27
IEC 60068-2-1	IEC 60255-127
IEC 60068-2-2	IEC 60255-151
IEC 60068-2-14	IEC 60297-3-101
IEC 60068-2-30	IEC 61000-4-2
IEC 60068-2-78	IEC 61000-4-3
IEC 60255-1	IEC 61000-4-4
IEC 60255-8	IEC 61000-4-5
IEC 60255-11	IEC 61000-4-6
IEC 60255-12	IEC 61000-4-8
IEC 60255-13	IEC 61000-4-9
IEC 60255-16	IEC 61000-4-10
IEC 60255-21-1	IEC 61000-4-11
IEC 60255-21-2	IEC 61000-4-16
IEC 60255-21-3	IEC 61000-4-17
IEC 60255-22-1	IEC 61000-4-18
IEC 60255-22-2	IEC 61000-4-29
IEC 60255-22-3	IEC 61850
IEC 60255-22-4	IEEE C37.90.1
IEC 60255-22-5	IEEE C37.90.2
IEC 60255-22-6	IEEE C37.90.3
IEC 60255-22-7	IEEE C37.118.1
IEC 60255-25	IEEE C37.118.1a

Tests

The tables provide details for type, communication, security, and other tests. When a standard has been met by the UR products, this is indicated in the **UR firmware passed** and **Issuer** columns of the tables.

Type tests

KEMA refers to the company Keuring van Elektrotechnische Materialen te Arnhem that performed the testing. KEMA was acquired in 2011 by DNV, which became DNV GL after another merger. KEMA certificates are issued by DNV GL.

A KEMA certificate outlines compliance of products with international standards and manufacturer specifications. DNV GL tests products and components and issues the reports regarding compliance. The standards include those from the International Electrotechnical Commission (IEC) and the American National Standards Institute (ANSI), for example.

KEMA offers three types of certification and reporting options, as follows:

- **Type Test Certificate** — Successful testing to all the standards and specifications as described in this document by DNV GL KEMA and at a DNV GL KEMA laboratory
- **Reports of Performance** — Testing against the standards and specifications by DNV GL. Does not mean that the products met/passed the standards and specifications.
- **Inspection Report** — Tests witnessed by DNV GL in a non-DNV GL facility

For these tests, UR firmware version 7.11 was used.

Dimensions of structure and visual inspection

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
1.1	Markings	IEC 60255-1	6.1	2009					
	Visibility	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Ratings as per IEC 60255-1	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Minimum markings								
	name or trademark	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	model or type reference	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	manufacturer location if >1	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Auxiliary supplies VT, CT, I/O	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Auxiliary power supply	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Measurands	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Inputs	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Outputs	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Fuses	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Measuring circuit terminals	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Terminals and operating devices	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Insulation requirements	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Batteries	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	
	Test voltage marking	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Warning marking	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes
	Marking durability	IEC 60255-27	9.1	2013		room 22°C	KEMA	Yes	Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
1.2	Documentation	IEC 60255-1	6.2	2009					
	Equipment identification	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Name and address information	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Safety information	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	
	Statement protective conductor	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Statement check before use	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Statement intended use equipment	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Equipment ratings	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Fuses and external protection devices	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Environmental requirements	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Equipment installation	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Equipment commissioning	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Equipment maintenance	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
	Equipment operation	IEC 60255-27	9.2	2013		room 22°C	KEMA	Yes	Yes
1.3	Packaging								
	Visual inspection at receive	IEC 60255-27	9.3	2013		room 22°C	KEMA	Yes	Yes
1.4	Dimensions								
	Manufacturer drawings	IEC 60255-1	6.2	2009		room 22°C	KEMA	Yes	Yes
	Rack mounting	IEC 60297-3-101		2004		room 22°C	KEMA	Yes	Yes

Functional requirements

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
2.1	Thermal protection relay								
	Cold curve	IEC 60255-8	5.3.1	1990		room 22°C	KEMA	Yes	
	Hot curve	IEC 60255-8	5.3.2	1990		room 22°C	KEMA	Yes	
2.2	Directional relays and power relays								
	Operating characteristics	IEC 60255-12	14.2.1	1980		room 22°C	KEMA	Yes	
	Operating and resetting times	IEC 60255-12	14.2.2	1980		room 22°C	KEMA	Yes	
2.3	Biased (percentage) differential relay								
	Operating characteristics	IEC 60255-13	15.2.1	1980		room 22°C	KEMA	Yes	
	Harmonic restraint characteristic	IEC 60255-13	15.2.3	1980					
	Through current	IEC 60255-13	17	1980					
	Influence frequency								
	Influence harmonics								
2.4	Impedance measuring relay								
	Steady state characteristic	IEC 60255-16	15.1	1982		room 22°C	KEMA	Yes	
	Dynamic characteristic	IEC 60255-16	15.2	1982					
	Influence frequency								
	Influence harmonics								
	Influence SIR								
	Influence current transformer								
2.5	Over/under voltage protection								
	Accuracy of setting value	IEC 60255-127	6.2.1	2010		room 22°C	KEMA	Yes	
	Reset ratio	IEC 60255-127	6.2.2	2010		room 22°C	KEMA	Yes	
	Start and operate time	IEC 60255-127	6.3	2010		room 22°C	KEMA	Yes	
	Reset time	IEC 60255-127	6.4	2010		room 22°C	KEMA	Yes	

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
2.6	Over/under current protection								
	Accuracy of setting value	IEC 60255-151	6.2.1	2009		room 22°C	KEMA	Yes	
	Reset ratio	IEC 60255-151	6.2.2	2009		room 22°C	KEMA	Yes	
	Start and operate time	IEC 60255-151	6.3	2009		room 22°C	KEMA	Yes	
	Reset time	IEC 60255-151	6.4	2009		room 22°C	KEMA	Yes	
2.7	Volt per Hertz protection								
	Rate of change of frequency					room 22°C	KEMA	Yes	
	Power swing/out of step								
	Auto reclosing					room 22°C	KEMA	Yes	
	Synchrophasor measurement								

Product safety

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
3.1	Clearance and creepage								
	Power supply	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes	Yes
	CT inputs	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes	Yes
	VT inputs	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes	Yes
	Binary inputs	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes	Yes
	Relay contact outputs	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes	Yes
	Communication	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes	Yes
	CPU	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes	Yes
Time synchronization	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes	Yes	
3.2	IP rating (The UR Family IP20 Cover is installed on the rear of a UR device and is purchased separately.)	IEC 60255-27	10.6.2.6	2013	IP2X	room 22°C	KEMA	Yes	Yes IP66
		IEC 60255-1		2009		room 22°C	KEMA	Yes	Yes
3.3	Impulse voltage								
	Power supply	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes	Yes
	CT inputs	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes	Yes
	VT inputs	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes	Yes
	Binary inputs	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes	Yes
	Relay contact outputs	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes	Yes
	Communication	IEC 60255-27	10.6.4.2	2013	1 kV	room 22°C	KEMA	Yes	
	Time synchronization	IEC 60255-27	10.6.4.2	2013	1 kV	room 22°C	KEMA	Yes	
3.4	Dielectric voltage								
	Power supply	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	Yes	Yes
	CT inputs	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	Yes	Yes
	VT inputs	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	Yes	Yes
	Binary inputs	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	Yes	Yes
	Relay contact outputs	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	Yes	Yes
	Communication	IEC 60255-27	10.6.4.3	2013	0.5 kV	room 22°C	KEMA	Yes	
	Time synchronization	IEC 60255-27	10.6.4.3	2013	0.5 kV	room 22°C	KEMA	Yes	

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
3.5	Insulation Resistance								
	Power supply	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes	Yes
	CT inputs	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes	Yes
	VT inputs	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes	Yes
	Binary inputs	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes	Yes
	Relay contact outputs	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes	Yes
	Communication	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes	
Time synchronization	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes		
3.6	Protective bonding resistance	IEC 60255-27	10.6.4.5.2	2013	0, 1 Ω	room 22°C	KEMA	Yes	Yes
3.7	Flammability								
	Housing	IEC 60255-27	10.6.5.2	2013	70/80 °C	room 22°C	KEMA	Yes	
	Cover	IEC 60255-27	10.6.5.2	2013	70/80 °C	room 22°C	KEMA	Yes	
	Terminals	IEC 60255-27	10.6.5.2	2013	V-2	room 22°C	KEMA	Yes	
	Push buttons	IEC 60255-27	10.6.5.2	2013	55/70 °C	room 22°C	KEMA	Yes	
	Display	IEC 60255-27	10.6.5.2	2013	55/70 °C	room 22°C	KEMA	Yes	
	PCB boards	IEC 60255-27	10.6.5.2	2013	V-2	room 22°C	KEMA	Yes	
	(Input) transformers	IEC 60255-27	10.6.5.2	2013	V-1	room 22°C	KEMA	Yes	
	Opto couplers	IEC 60255-27	10.6.5.2	2013	V-1	room 22°C	KEMA	Yes	
Output relays	IEC 60255-27	10.6.5.2	2013	V-1	room 22°C	KEMA	Yes		
Wires	IEC 60255-27	10.6.5.2	2013	V-1	room 22°C	KEMA	Yes		
3.8	Single fault condition								
	Power supply circuit	IEC 60255-27	10.6.5.5	2013	no fire risk	room 22°C	KEMA	Yes	Yes

Electromagnetic compatibility

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
4.1	Emission tests								
4.1.1	Radiated emission Enclosure port	IEC 60255-26 CISPR 22 CISPR 11	table 1 table 6	2013 2008 2009	class A	room 22°C room 22°C room 22°C	KEMA KEMA KEMA	Yes Yes Yes	Yes Yes
4.1.2	Conducted emission Auxiliary power supply port Communication port	IEC 60255-26 CISPR 22 CISPR 22	table 2 table 2 table 4	2013 2008 2008	 class A class A	room 22°C room 22°C room 22°C	KEMA KEMA KEMA	Yes Yes Yes	Yes Yes
4.2	Immunity tests								
4.2.1	1 MHz damped oscillatory wave Power supply (CM) Power supply (DM) Power supply (DM) CT inputs (CM) CT inputs (DM) CT inputs (DM) VT inputs (CM) VT inputs (DM) VT inputs (DM) Binary inputs (CM) Binary inputs (DM) Binary inputs (DM) Relay contact outputs (CM) Relay contact outputs (DM) Relay contact outputs (DM) Communication (CM) Communication (DM) Time synchronization (CM) Time synchronization (DM)	IEC 61000-4-18 IEC 60255-22-1 IEC 60255-22-1 IEEE C37.90.1 IEC 60255-22-1 IEC 60255-22-1 IEEE C37.90.1 IEC 60255-22-1 IEC 60255-22-1 IEEE C37.90.1 IEC 60255-22-1 IEC 60255-22-1 IEEE C37.90.1 IEC 60255-22-1 IEC 60255-22-1 IEEE C37.90.1 IEC 60255-22-1 IEC 60255-22-1 IEC 60255-22-1 IEC 60255-22-1 IEC 60255-22-1 IEC 60255-22-1 IEC 60255-22-1		2006 2007 2007 2012 2007 2007 2012 2007 2007 2012 2007 2007 2012 2007 2007 2012 2007 2007 2007 2007 2007 2007					Yes Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
4.2.2	Electrostatic discharge	IEC 60255-26							
	Contact discharge on conductive surface	IEC 60255-22-2 / IEC 61000-4-2		2008 / 2008	6 kV	room 22°C	KEMA	Yes	Yes
		IEEE C37.90.3		2001	8 kV	room 22°C	KEMA	Yes	Yes
	Contact discharge on coupling planes	IEC 60255-22-2 / IEC 61000-4-2		2008 / 2008	6 kV	room 22°C	KEMA	Yes	
		IEEE C37.90.3		2001	8 kV	room 22°C	KEMA	Yes	
4.2.3	Air discharges	IEC 60255-22-2 / IEC 61000-4-2		2008 / 2008	8 kV	room 22°C	KEMA	Yes	
		IEEE C37.90.3		2001	15 kV	room 22°C	KEMA	Yes	
4.2.3	Radiated radio frequency magnetic field	IEC 60255-26							
	Electromagnetic field strength	IEC 60255-22-3 / IEC 61000-4-3		2007 / 2006	20 V/min	room 22°C	KEMA	Yes	Yes
	Frequency range				80 to 1000 MHz				
	Modulation AM				1 kHz, 80%				
	Electromagnetic field strength	IEC 60255-22-3 / IEC 61000-4-3		2007 / 2006	10 V/min	room 22°C	KEMA	Yes	
	Frequency range				1000 to 2700 MHz				
	Modulation AM				1 kHz, 80%				
	Electromagnetic field strength	IEC 60255-22-3 / IEC 61000-4-3		2007 / 2006	10 V/min and 20 V/min	room 22°C	KEMA	Yes	Yes
	Spot frequencies				80, 160, 380, 450, 900, 1850, 2150 MHz				
	Modulation AM				1 kHz, 80%				
	Electromagnetic field strength	IEEE C37.90.2		2004	20 V/min	room 22°C	KEMA	Yes	Yes
	Frequency range				80 to 1000 MHz				
	Modulation AM				1 kHz, 80%				
	Electromagnetic field strength	IEEE C37.90.2		2004	20 V/min	room 22°C	KEMA	Yes	Yes
	Spot frequencies				80, 160, 450, 900 MHz				
Modulation AM				1 kHz, 80%					
Electromagnetic field strength	IEEE C37.90.2		2004	20 V/min	room 22°C	KEMA	Yes	Yes	
Frequency range				900 MHz					
Modulation PM				200 Hz, 50%					

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
4.2.4	Fast transient	IEC 60255-26			Zone A				
	Power supply @ 5 khz (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes	Yes
	Power supply (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes	Yes
	CT inputs (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes	Yes
	CT inputs (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes	Yes
	VT inputs (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes	Yes
	VT inputs (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes	Yes
	Binary inputs (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes	Yes
	Binary inputs (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes	Yes
	Relay contact outputs (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes	Yes
	Relay contact outputs (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes	Yes
	Communication (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	2 kV	room 22°C	KEMA	Yes	
	Communication (TM)	IEEE C37.90.1		2012	0 kV	room 22°C	KEMA	Yes	
	Time synchronization (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes	
	Time synchronization (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes	
	Functional earth port (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes	Yes
	Functional earth port (TM)	IEEE C37.90.1		2012	0 kV	room 22°C	KEMA	Yes	Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
4.2.5	Surge	IEC 60255-26			Zone A				
	Power supply (LE)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes	Yes
	Power supply (LL)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes	Yes
	CT inputs (LE)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes	Yes
	CT inputs (LL)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes	Yes
	VT inputs (LE)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes	Yes
	VT inputs (LL)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes	Yes
	Binary inputs (LE)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes	Yes
	Binary inputs (LL)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes	Yes
	Relay contact outputs (LE)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes	Yes
	Relay contact outputs (LL)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0 kV	room 22°C	KEMA	Yes	Yes
	Communication (LE)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0 kV Zone A 2,0 kV Zone B for RJ-45	room 22°C	KEMA	Yes	
	Communication (LL)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0 kV	room 22°C	KEMA	Yes	
	Time synchronization (LE)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes	
	Time synchronization (LL)	IEC 60255-22-5 / IEC 61000-4-5		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes	

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
4.2.6	Conducted distance induced by radio frequency field	IEC 60255-26							
	Power supply Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6 IEC 61000-4-6		2001 2013	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes	Yes Yes
	CT inputs Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6 IEC 61000-4-6		2001 2013	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes	Yes Yes
	VT inputs Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6 IEC 61000-4-6		2001 2013	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes	Yes Yes
	Binary inputs Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6 IEC 61000-4-6		2001 2013	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes	Yes Yes
	Relay contact outputs Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6 IEC 61000-4-6		2001 2013	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes	Yes Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
	Communication Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6 IEC 61000-4-6		2001 2013	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes	
	Time synchronization Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6 IEC 61000-4-6		2001 2013	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes	
4.2.7	Power frequency Binary inputs (CM) Binary inputs (DM)	IEC 60255-26 IEC 60255-22-7 / IEC 61000-4-16 IEC 60255-22-7 / IEC 61000-4-16 IEC 60255-22-7 / IEC 61000-4-16		2003 / 1998 2003 / 1998 2003 / 1998	class A 300 V 150 V	room 22°C room 22°C	KEMA KEMA	Yes Yes	Yes Yes
4.2.8	DC voltage dips Residual voltage Duration Residual voltage Duration Residual voltage Duration	IEC 60255-26 IEC 60255-11 / IEC 61000-4-29 IEC 60255-11 / IEC 61000-4-29 IEC 60255-11 / IEC 61000-4-29		2008 / 2000 2008 / 2000 2008 / 2000	0% 10 to 1000 ms 40% 200 ms 70% 500 ms	room 22°C room 22°C room 22°C	KEMA KEMA KEMA	Yes Yes Yes	Yes Yes Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
4.2.9	AC voltage dips	IEC 60255-26							
	Residual voltage	IEC 60255-11 / IEC 61000-4-11		2008 / 2004	0%	room 22°C	KEMA	Yes	
	Duration				0,5 to 25 cycles				
	Residual voltage	IEC 60255-11 / IEC 61000-4-11		2008 / 2004	40%	room 22°C	KEMA	Yes	
4.2.9	Duration				10/12 cycles				
	Residual voltage	IEC 60255-11 / IEC 61000-4-11		2008 / 2004	70%	room 22°C	KEMA	Yes	
4.2.9	Duration				25/30 cycles				
	DC voltage interruptions	IEC 60255-26							
4.2.10	Residual voltage	IEC 60255-11 / IEC 61000-4-29		2008 / 2000	0%	room 22°C	KEMA	Yes	Yes
	Duration				5 s				
4.2.11	AC voltage interruptions	IEC 60255-26							
	Residual voltage	IEC 60255-11 / IEC 61000-4-11		2008 / 2004	0%	room 22°C	KEMA	Yes	
	Duration				250/300 cycles				
4.2.12	DC ripple	IEC 60255-26							
	Level	IEC 60255-11 / IEC 61000-4-17		2008 / 1999	15%	room 22°C	KEMA	Yes	Yes
	Frequency				100/120 Hz				
4.2.13	Gradual shut-down/start-up	IEC 60255-26							
	Shut-down ramp	IEC 60255-11		2008	60 s	room 22°C	KEMA	Yes	Yes
	Power-off	IEC 60255-11		2008	5 min				
	Start-up ramp	IEC 60255-11		2008	60 s	room 22°C	KEMA	Yes	Yes
4.2.14	Reversal of DC power supply	IEC 60255-26							
	Duration	IEC 60255-11		2000	1 min	room 22°C	KEMA	Yes	Yes
4.2.15	Power frequency magnetic field	IEC 60255-26							
	Frequency	IEC 61000-4-8		2009	50 Hz				
	Continuous field	IEC 61000-4-8		2009	5 min				
	Level	IEC 61000-4-8		2009	30 A/min	room 22°C	KEMA	Yes	Yes
	Short time field	IEC 61000-4-8		2009	3 s				
	Level	IEC 61000-4-8		2009	300 A/min	room 22°C	KEMA	Yes	Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
4.2.16	100 kHz damped oscillatory wave								
	Power supply (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes	Yes
	Power supply (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes	Yes
	CT inputs (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes	Yes
	CT inputs (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes	Yes
	VT inputs (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes	Yes
	VT inputs (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes	Yes
	Binary inputs (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes	
	Binary inputs (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes	Yes
	Relay contact outputs (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes	Yes
	Relay contact outputs (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes	Yes
	Communication (CM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes	
	Communication (DM)	IEC 61000-4-18		2006	0,0 kV	room 22°C	KEMA	Yes	
	Time synchronization (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes	
	Time synchronization (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes	

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
4.2.17	3, 10, 30 MHz fast damped oscillatory wave immunity test								
	Power supply input	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	48 V DC power supply output	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	CT odd board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	CT even board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	VT odd board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	VT even board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Form A odd board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Form A even board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Form C odd board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Form C even board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Contact input odd board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Contact input even board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Sensitive CT odd board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Sensitive CT even board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Latching output odd board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Latching output even board	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	SSR output	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	Critical failure relay	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
	RS 485	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
	IRIG-B	IEC 61000-4-18		2011	±4 kV	24°C	GE certified lab	Yes	
4.2.18	Pulse magnetic field Level	IEC 61000-4-9		1993	1000 A/min	room 22°C	KEMA	Yes	Yes
4.2.19	Damped oscillatory magnetic field								
	Frequency	IEC 61000-4-10		1993	100 kHz				
	Level	IEC 61000-4-10		1993	100 A/min	room 22°C	KEMA	Yes	Yes
	Frequency	IEC 61000-4-10		1993	1 MHz				
4.2.20	Level	IEC 61000-4-10		1993	100 A/min	room 22°C	KEMA	Yes	Yes
	Conducted common mode disturbance								
	Frequency	IEC 61000-4-16		2011	50 Hz				
	Continuous disturbance	IEC 61000-4-16		2011					
4.2.20	Level	IEC 61000-4-16		2011	30 V	room 22°C	KEMA	Yes	
	Short duration disturbance	IEC 61000-4-16		2011					
	Level	IEC 61000-4-16		2011	300 V	room 22°C	KEMA	Yes	

Energizing quantities

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
5.1	Burden for voltage transformers								
	Input voltage 120 V or 100 V	IEC 60255-1	6.10.1	2009	VA	room 22°C	KEMA	Yes	Yes
	Input voltage 220 V or 110 V	IEC 60255-1	6.10.1	2009	VA	room 22°C	KEMA	Yes	Yes
5.2	Burden for current transformers								
	Input current 1 A	IEC 60255-1	6.10.2	2009	VA	room 22°C	KEMA	Yes	
	Input current 5 A	IEC 60255-1	6.10.2	2009	VA	room 22°C	KEMA	Yes	Yes
5.3	Burden for AC power supply								
	Quiescent state burden at rated voltage	IEC 60255-1	6.10.3.1	2009	VA	room 22°C	KEMA	Yes	
	Maximum load burden at rated voltage	IEC 60255-1	6.10.3.2	2009	VA	room 22°C	KEMA	Yes	
	Inrush current at rated voltage	IEC 60255-1	6.10.3.3	2009	A	room 22°C	KEMA	Yes	
	Duration inrush current at rated voltage	IEC 60255-1	6.10.3.3	2009	s	room 22°C	KEMA	Yes	
5.4	Burden for DC power supply								
	Quiescent state burden at rated voltage	IEC 60255-1	6.10.4.1	2009	VA	room 22°C	KEMA	Yes	Yes
	Maximum load burden at rated voltage	IEC 60255-1	6.10.4.2	2009	VA	room 22°C	KEMA	Yes	Yes
	Inrush current at rated voltage	IEC 60255-1	6.10.4.3	2009	A	room 22°C	KEMA	Yes	Yes
	Duration inrush current at rated voltage	IEC 60255-1	6.10.4.3	2009	s	room 22°C	KEMA	Yes	Yes
5.5	Burden for binary input								
	Input voltage 24 V DC	IEC 60255-1	6.10.5	2009	mVA	room 22°C	KEMA	Yes	
	Input voltage 48 V DC	IEC 60255-1	6.10.5	2009	mVA	room 22°C	KEMA	Yes	
	Input voltage 60 V DC	IEC 60255-1	6.10.5	2009	mVA	room 22°C	KEMA	Yes	
	Input voltage 110 V DC	IEC 60255-1	6.10.5	2009	mVA	room 22°C	KEMA	Yes	
	Input voltage 220 V DC	IEC 60255-1	6.10.5	2009	mVA	room 22°C	KEMA	Yes	
5.6	Input circuit for energizing quantities								
	Correct operation CT input at 4 * Inom or 20 * Inom	IEC 60255-1	6.9.1	2009	A	room 22°C	KEMA	Yes	Yes
	Correct operation CT input at 100 * Inom	IEC 60255-1	6.9.1	2009	A	room 22°C	KEMA	Yes	Yes
	Cont./Short time withstand test VT input	IEC 60255-1	6.9.1	2009	V	room 22°C	KEMA	Yes	Yes
	Duration								
	IEC 61850-9-2 compliance	IEC 60255-1	6.9.1	2009	cont./1 min or 10 s				

Contact performance

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
6.1	Mechanical endurance unloaded contact								
	Test voltage	IEC 60255-1	6.11	2009	250 V	room 22°C	KEMA	Yes	
	Cycles	IEC 60255-1	6.11	2009	10000	room 22°C	KEMA	Yes	
6.2	Limiting making capacity								
	Test voltage	IEC 60255-1	6.11	2009	250 V	room 22°C	KEMA	Yes	
	Power	IEC 60255-1	6.11	2009	6 A form A, 8 A form C	room 22°C	KEMA	Yes	
	Time constant	IEC 60255-1	6.11	2009	40 ms	room 22°C	KEMA	Yes	
	Cycles	IEC 60255-1	6.11	2009	1000	room 22°C	KEMA	Yes	
6.3	Short time contact current								
	Test voltage	IEC 60255-1	6.11	2009	250 V	room 22°C	KEMA	Yes	
	Current	IEC 60255-1	6.11	2009	30 A	room 22°C	KEMA	Yes	
	Duration	IEC 60255-1	6.11	2009	200 ms	room 22°C	KEMA	Yes	
	Cycles	IEC 60255-1	6.11	2009	1000	room 22°C	KEMA	Yes	
6.4	Continuous contact current								
	Test voltage	IEC 60255-1	6.11	2009	250 V	room 22°C	KEMA	Yes	
	Current	IEC 60255-1	6.11	2009	6 A form A, 8 A form C	room 22°C	KEMA	Yes	
	Duration	IEC 60255-1	6.11	2009	4 hours	room 22°C	KEMA	Yes	
6.5	Limited breaking capacity								
	Test voltage	IEC 60255-1	6.11	2009	250 V	room 22°C	KEMA	Yes	
	Power	IEC 60255-1	6.11	2009	0,2 A	room 22°C	KEMA	Yes	
	Time constant	IEC 60255-1	6.11	2009	40 ms	room 22°C	KEMA	Yes	
	Cycles	IEC 60255-1	6.11	2009	1000	room 22°C	KEMA	Yes	

Climatic environmental conditions

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
7.1	Dry heat operational test Operational temperature Maximum rate of change Duration of exposure Recovery period	IEC 60255-1 IEC 60068-2-2 Bd	6.12.3.1	2009	60°C 1°C/min 16 hours 1 to 2 hours	60°C	KEMA KEMA	Yes Yes	Yes Yes
				2007					
7.2	Cold operational test Operational temperature Maximum rate of change Duration of exposure Recovery period	IEC 60255-1 IEC 60068-2-1 Ad	6.12.3.2	2009	-40°C 1°C/min 16 hours 1 to 2 hours	-40°C	KEMA KEMA	Yes Yes	Yes Yes
				2007					
7.3	Dry heat storage test Storage temperature Maximum rate of change Duration of exposure Recovery period	IEC 60255-1 IEC 60068-2-2 Bb	6.12.3.3	2009	85°C 1°C/min 16 hours 1 to 2 hours	85°C	KEMA KEMA	Yes Yes	Yes Yes
				2007					
7.4	Cold storage test Storage temperature Maximum rate of change Duration of exposure Recovery period	IEC 60255-1 IEC 60068-2-1 Ab	6.12.3.4	2009	-40°C 1°C/min 16 hours 1 to 2 hours	-40°C	KEMA KEMA	Yes Yes	Yes Yes
				2007					
7.5	Change of temperature test Lower temperature Upper temperature Ramp rate Dwell time Duration of exposure Recovery period	IEC 60255-1 IEC 60068-2-14 Nb	6.12.3.5	2009	-40°C 60°C 1°C/min 3 hours 5 cycles 1 hour	-40°C to 60°C	KEMA KEMA KEMA	Yes Yes Yes	Yes Yes Yes
				2009		-40°C 60°C			

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
7.6	Damp heat steady state Temperature Humidity Duration of exposure Recovery period	IEC 60255-1 IEC 60068-2-78 Cab	6.12.3.6	2009 2012	40°C 93% 10 days 1 to 2 hours	40°C 40°C	KEMA KEMA	Yes Yes	Yes Yes
7.7	Cyclic temperature with humidity Lower temperature Humidity at lower temperature Upper temperature Humidity at upper temperature Duration of exposure Recovery period	IEC 60255-1 IEC 60068-2-30 Db Variant 2	6.12.3.7	2009 2005	25°C 97% 40°C 93% 6 cycles 1 to 2 hours	40°C	KEMA	Yes	Yes
7.8	Cyclic temperature with humidity Lower temperature Humidity at lower temperature Upper temperature Humidity at upper temperature Duration of exposure Recovery period	IEC 60255-1 IEC 60068-2-30 Db Variant 2	6.12.3.7	2009 2005	 25°C 97% 55°C 95% 6 cycles 1 to 2 hours	40°C	GE certified lab	Yes	

Mechanical requirements

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
8.1	Vibration response Frequency range Cross over frequency Peak displacement before cross over Peak acceleration after cross over Number of sweep cycles per axis	IEC 60255-1 IEC 60255-21-1	6.13	2009 1988	class 1 10 to 150 Hz 59 Hz 0,035 mm 0,5 g _n 1	room 22°C	KEMA KEMA	Yes Yes	Yes Yes
8.2	Vibration endurance Frequency range Peak acceleration Number of sweep cycles per axis	IEC 60255-1 IEC 60255-21-1	6.13	2009 1988	class 1 10 to 150 Hz 1,0 g _n 20	room 22°C	KEMA KEMA	Yes Yes	Yes Yes
8.3	Shock response Peak acceleration Pulse duration Number of pulses in each direction	IEC 60255-1 IEC 60255-21-2	6.13	2009 1988	class 1 5 g _n 11 ms 5	room 22°C	KEMA KEMA	Yes Yes	Yes Yes
8.4	Shock withstand Peak acceleration Pulse duration Number of pulses in each direction	IEC 60255-1 IEC 60255-21-2	6.13	2009 1988	class 1 15 g _n 11 ms 3	room 22°C	KEMA KEMA	Yes Yes	Yes Yes
8.5	Bump Peak acceleration Pulse duration Number of pulses in each direction	IEC 60255-1 IEC 60255-21-2	6.13	2009 1988	class 1 10 g _n 16 ms 1000	room 22°C	KEMA KEMA	Yes Yes	Yes Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
8.6	Single axis sine sweep seismic	IEC 60255-1	6.13	2009	class 1 and class 2	room 22°C	KEMA KEMA	Yes	Yes
	IEC 60255-21-3	1993		1 to 35 Hz				Yes	Yes
	Frequency range								
	Cross over frequency								
	Peak displacement before cross over X								
	Peak displacement before cross over Y								
	Peak acceleration after cross over X								
	Peak acceleration after cross over Y								
	Number of sweep cycles per axis								

Enclosure protection

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed	Brick passed
9.1	Enclosure protection	IEC 60255-1	6.3	2009					
	Degree of protection against access to hazardous parts	IEC 60529	5	2013	IP4X front, IP2X back (with IP20 cover installed)				
	Degree of protection against solid foreign objects	IEC 60529	5	2013	IP2X				
	Degree of protection against ingress of water	IEC 60529	6	2013	IPX0				

Communication tests

For these tests, UR firmware version 7.10 was used.

IEC 61850

IEC 61850-10 is a list of tests. A Conditional test reflects a feature included in a product by GE Grid Solutions for which testing was requested by GE Grid Solutions.

No.	Description	Conformance Block	Test		Issuer	UR firmware passed
			Mandatory	Conditional		
(IEC 61850-6, IEC 61850-7-1, IEC 61850-7-2, IEC 61850-7-4, IEC 61850-8-1)	IEC 61850-10 Edition 2.0 (2012)	1 Basic exchange	Ass1, Ass2, Ass3, AssN2, AssN3, AssN4, AssN5 Srv1, Srv2, Srv3, Srv4, Srv5, SrvN1abcd, SrvN4	Srv6, Srv7, Srv8, SrvN1e, SrvN1f, SrvN2, SrvN3	KEMA	Yes
		2 Data sets	Dset1, Dset10a, DsetN1ae		KEMA	Yes
		4 Setting group selection	Sg1, SgN1a		KEMA	Yes
		5 Unbuffered reporting	Rp1, Rp2, Rp3, Rp4, Rp7, Rp10, Rp12 RpN1, RpN2, RpN3, RpN4	Rp5, Rp8, RpN5, RpN6	KEMA	Yes
		6 Buffered reporting	Br1, Br2, Br3, Br4, Br7, Br8, Br9, Br12, Br14 BrN1, BrN2, BrN3, BrN4, BrN5	Br5, Br10, Br11, BrN6	KEMA	Yes
		9a GOOSE publish	Gop2, Gop3, Gop4, Gop7, Gop10a	Gop1, Gop5, Gop6, GopN1	KEMA	Yes
		9b GOOSE subscribe	Gos1a, Gos2, Gos3, GosN1, GosN2, GosN3, GosN4, GosN5, GosN6	Gos1b	KEMA	Yes
		12a Direct control	CtlN3, CtlN8 DOns1, DOns3	Ctl7, CtlN11	KEMA	Yes
		12b SBO control	Ctl3, CtlN1, CtlN2, CtlN3, CtlN4 SBOs2	Ctl7, CtlN11	KEMA	Yes
		12c Enhanced direct control	CtlN3, CtlN8 DOes2, DOes5	Ctl7, CtlN11	KEMA	Yes
		12d Enhanced SBO control	Ctl3, CtlN1, CtlN2, CtlN3, CtlN4, CtlN9 SBOes1, SBOes2, SBOes3	Ctl7, CtlN11	KEMA	Yes
		13 Time sync	Tm1, Tm2, TmN1	Tm3	KEMA	Yes
		14 File transfer	Ft1, Ft2ab, Ft4, FtN1ab		KEMA	Yes

Achilles Level 1 security

For these tests, UR firmware version 7.31 was used.

No.	Test case	Parameter values	Issuer	UR firmware passed
	Ethernet Unicast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Ethernet protocol = IPV4 Duration = 120	Wurldtech	Yes
	Ethernet Multicast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Ethernet protocol = IPV4 Duration = 120 Multicast IP address = Use multicast IPs from discovery	Wurldtech	Yes
	Ethernet Broadcast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Ethernet protocol = IPV4 Duration = 120	Wurldtech	Yes
	Ethernet Fuzzer (L1/L2)	Number of packets = 50000 Random seed = Automatic Source MAC address = Local MAC Destination MAC address = Use DUT MAC	Wurldtech	Yes
	Ethernet Fuzzer (L1/L2)	Number of packets = 50000 Random seed = Automatic Source MAC address = Local MAC Destination MAC address = Use multicast MACs from discovery	Wurldtech	Yes
	Ethernet Grammar (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	Yes
	ARP Request Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120	Wurldtech	Yes
	ARP Host Reply Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120	Wurldtech	Yes
	ARP Cache Saturation Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120 Random seed = Automatic	Wurldtech	Yes
	ARP Grammar (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	Yes
	IP Unicast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Protocol = 17 Duration = 120	Wurldtech	Yes

No.	Test case	Parameter values	Issuer	UR firmware passed
	IP Multicast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Protocol = 17 Duration = 120 Multicast IP address = Use multicast IPs from discovery	Wurldtech	Yes
	IP Broadcast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Protocol = 17 Duration = 120 Broadcast IP address = Local network	Wurldtech	Yes
	IP Fragmented Storm (L1/L2)	Rate limit = 812 Duration = 120	Wurldtech	Yes
	IP Fuzzer (L1/L2)	First packet = 1 Last packet = 50000 Random seed = Automatic Bad IP version = 50 Odd IP header length = 50 Fragmented packets = 50 Source IP address = Random Destination IP address = Use DUT IP	Wurldtech	Yes
	IP Grammar - Header Fields (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	Yes
	IP Grammar - Fragmentation (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	Yes
	IP Grammar - Options Fields (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	Yes
	ICMP Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120	Wurldtech	Yes
	ICMP Grammar (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	Yes
	ICMP Type/Code Cross Product (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Protocol = 17 Duration = 120 Broadcast IP address = Local network	Wurldtech	Yes
	TCP Scan Robustness (L1/L2)	Scan mode = TCP SYN scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	TCP Scan Robustness (L1/L2)	Scan mode = TCP ACK scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	TCP Scan Robustness (L1/L2)	Scan mode = TCP FIN scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	TCP Scan Robustness (L1/L2)	Scan mode = TCP connect scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes

No.	Test case	Parameter values	Issuer	UR firmware passed
	TCP Scan Robustness (L1/L2)	Scan mode = TCP null scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	TCP Scan Robustness (L1/L2)	Scan mode = TCP XMAS scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	TCP SYN Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120 Random seed = Automatic Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	TCP/IP LAND Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120 Destination TCP ports = Use open ports from discovery	Wurldtech	Yes
	TCP/IP LAND Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120 Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	TCP Fuzzer (L1/L2)	First packet = 1 Last packet = 50000 Random seed = Automatic Bad IP version = 50 IP options = 50 Fragmented packets = 50 Bad TCP checksum = 50 TCP options = 50 Source TCP port = Random Source IP address = Random Destination TCP port = First open port Destination IP address = Use DUT IP	Wurldtech	Yes
	TCP Grammar (L1)	Destination TCP port = First open port First subtest = First in set Last subtest = Last in set	Wurldtech	Yes
	UDP Scan Robustness (L1/L2)	Destination UDP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	UDP Unicast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120	Wurldtech	Yes
	UDP Multicast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120 Multicast IP address = Use multicast IPs from discovery Destination UDP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes
	UDP Broadcast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120 Broadcast IP address = Local network Destination UDP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	Yes

No.	Test case	Parameter values	Issuer	UR firmware passed
	UDP Fuzzer (L1/L2)	First packet = 1 Last packet = 50000 Random seed = Automatic Bad IP version = 50 IP options = 50 Fragmented packets = 50 Bad UDP checksum = 50 Source UDP port = Random Source IP address = Random Destination UDP port = First open port Destination IP address = Use DUT IP	Wurldtech	Yes
	UDP Grammar (L1)	Destination UDP port = First open port First subtest = First in set Last subtest = Last in set	Wurldtech	Yes

Phasor Measurement Units

For these tests, UR firmware version 7.23 was used.

Steady state

Class	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
M, P	Frequency range	IEEE C37.118.1/ IEEE C37.118.1a	5.5.5 (Table 3 and 4)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M, P	Magnitude range	IEEE C37.118.1/ IEEE C37.118.1a	5.5.5 (Table 3 and 4)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M, P	Phase angle variation	IEEE C37.118.1/ IEEE C37.118.1a	5.5.5 (Table 3 and 4)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M, P	Harmonic distortion	IEEE C37.118.1/ IEEE C37.118.1a	5.5.5 (Table 3 and 4)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M	Out-of-band interference	IEEE C37.118.1/ IEEE C37.118.1a	5.5.5 (Table 3 and 4)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes

Dynamic

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
M, P	Magnitude modulation	IEEE C37.118.1/ IEEE C37.118.1a	5.5.6 (Table 5)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M, P	Phase modulation	IEEE C37.118.1/ IEEE C37.118.1a	5.5.6 (Table 5)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M, P	Frequency ramp	IEEE C37.118.1/ IEEE C37.118.1a	5.5.7 (Table 7 and 8)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M, P	Magnitude step Phasor response time Phasor delay time Overshoot/undershoot Frequency response time Rate of change of frequency (ROCOF) response time	IEEE C37.118.1/ IEEE C37.118.1a	5.5.8 (Table 9, 10, and 11)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M, P	Phase step Phasor response time Phasor delay time Overshoot/undershoot Frequency response time ROCOF response time	IEEE C37.118.1/ IEEE C37.118.1a	5.5.8 (Table 9, 10, and 11)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes
M, P	Reporting latency	IEEE C37.118.1/ IEEE C37.118.1a	5.5.9 (Table 12)	2011/ 2014	10/25/50 frames	room 23°C ±3°C	NIST/Quanta	Yes

Functional tests

For these tests, UR firmware version 7.3x was used.

Description	Specification Description	Specification	Issuer	Reference	UR firmware passed
Transformer Percent Differential	Characteristic	Dual slope percent differential	KESCO	---	Yes
	Level accuracy	±0.5% of reading or ±1% of rated (whichever is greater) for two windings setup	KESCO	0.1 to 1.0 pu range	Yes
Transformer Instantaneous Differential	Level accuracy	±0.5% of reading or ±1% of rated (whichever is greater) for two windings setup	KESCO	2 to 10 pu range	Yes
	Operate time	<20 ms at 3 x pickup at 60 Hz	KESCO	PKP=2 pu	Yes

Description	Specification Description	Specification	Issuer	Reference	UR firmware passed
Phase Distance	Characteristic	mho (memory polarized or offset) or quad (memory polarized or non-directional), selectable individually per zone	KESCO	mho, quad	Yes
	Reach accuracy	±5% including the effect of CVT transients up to an SIR of 30	KESCO	Reach at 2Ω, 85°	Yes
	Timer accuracy	±3% of operate time or ±1/4 cycle (whichever is greater)	KESCO	Pickup delay 2 s	Yes
Ground Distance	Characteristic	Mho (memory polarized or offset) or Quad (memory polarized or non-directional), selectable individually per zone	KESCO	mho, quad	Yes
	Reach accuracy	±5% including the effect of CVT transients up to an SIR of 30	KESCO	Reach at 2Ω, 85°	Yes
	Timer accuracy	±3% of operate time or ±1/4 cycle (whichever is greater)	KESCO	Pickup delay 2 s	Yes
Line Current Differential (87L)	Characteristic	Dual slope percent differential	KESCO	---	Yes
	Level accuracy	±3% of reading of the maximum circuit current	KESCO	Pickup 0.5 to 4.0 pu	Yes
	Operating time	1.0 to 1.5 power cycles duration	KESCO	At 1.5 to 10 pu	Yes
Restricted Ground Fault	Level accuracy 0.1 to 2.0 x CT rating	±0.5% of reading or ±1% of rated (whichever is greater)	KESCO	Pickup 1 pu	Yes
Phase/Neutral/Ground Time Overcurrent (TOC)	Level accuracy 0.1 to 2.0 x CT	±0.5% of reading or ±0.4% of rated (whichever is greater)	KESCO	Pickup 1 pu	Yes
	Curve timing accuracy at 1.03 to 20 x pickup	±3.5% of operate time or ±½ cycle (whichever is greater) from pickup to operate	KESCO	Pickup delay 13.5 s	Yes
Phase/Neutral/Ground Instantaneous Overcurrent (IOC)	Level accuracy 0.1 to 2.0 x CT rating	±0.5% of reading or ±0.4% of rated (whichever is greater)	KESCO	Pickup 1 pu	Yes
	Timer accuracy	±3% of operate time or ±1/4 cycle (whichever is greater)	KESCO	Pickup delay 1 s	Yes
Phase Directional Overcurrent	Angle accuracy	±2°	KESCO	At 1 pu, ECA=0°	Yes
Neutral Directional Overcurrent	Angle accuracy	±2°	KESCO	At 1 pu, ECA=90°	Yes
Phase Undervoltage	Level accuracy	±0.5% of reading from 10 to 208 V	KESCO	Pickup 0.1pu	Yes
	Curve timing accuracy at <0.90 x pickup	±3.5% of operate time or ±1/2 cycle (whichever is greater) from pickup to operate	KESCO	Pickup delay 5 s	Yes
Auxiliary Undervoltage	Level accuracy	±0.5% of reading from 10 to 208 V	KESCO	Pickup 0.1pu	Yes
	Curve timing accuracy at <0.90 x pickup	±3.5% of operate time or ±1/2 cycle (whichever is greater) from pickup to operate	KESCO	Pickup delay 5 s	Yes
Phase Overvoltage	Level accuracy	±0.5% of reading from 10 to 208 V	KESCO	Pickup 1.1 pu	Yes
	Timer accuracy	±3% of operate time or ±1/4 cycle (whichever is greater)	KESCO	Pickup delay 5 s	Yes

Description	Specification Description	Specification	Issuer	Reference	UR firmware passed
Neutral Overvoltage	Level accuracy	±0.5% of reading from 10 to 208 V	KESCO	Pickup 1.1 pu	Yes
	Curve timing accuracy at >1.1 × pickup	±3.5% of operate time or ±1 cycle (whichever is greater) from pickup to operate	KESCO	Pickup delay 5 s	Yes
Auxiliary Overvoltage	Level accuracy	±0.5% of reading from 10 to 208 V	KESCO	Pickup 1.1 pu	Yes
	Timer accuracy	±3% of operate time or ±1/4 cycle (whichever is greater)	KESCO	Pickup delay 5 s	Yes
Volts per Hertz	Level accuracy	±0.02 pu	KESCO	Pickup 0.1 pu	Yes
Underfrequency	Level accuracy	±0.001 Hz	KESCO	At 59.5Hz	Yes
Overfrequency	Level accuracy	±0.001 Hz	KESCO	At 60.5Hz	Yes
Breaker Failure	Current supv. accuracy 0.1 to 2.0 × CT rating	±0.75% of reading or ±2% of rated (whichever is greater)	KESCO	At 1 pu	Yes
Power Swing Detect	Impedance accuracy	±5%	KESCO	At 10Ω reach, 50Ω blinder	Yes

Certificates

The following certificates are provided here:

- KEMA type test certificate for UR 7.11
- KEMA type test certificate for HardFiber Brick
- IEC 61850 certificates
- UL certificate
- CE / EC declaration
- Achilles Level 1 security certificate for UR 7.31
- NIST certificate for Phasor Measurement Units for UR 7.23
- KESCO IEC 60255-127/151 and functional tests for UR 7.31
- GE lab certification by the Standards Council of Canada
- GE verification certificate
- EAC certificate related to Technical Regulations (TR) for Machines and Equipment for the Russian Federation, Belarus, and Kazakhstan



Type test Certificate of complete type tests

GE Digital Energy

Markham, Ontario, Canada

has successfully passed the type test sequence on the

UR Family of protective relays

Type: UR series, which includes relay models: UR B30, UR B90, UR C30, UR C60, UR C70, UR D30, UR D60, UR F35, UR F60, UR G30, UR G60, UR L30, UR L60, UR L90, UR M60, UR N60, UR T35, UR T60.

Ratings: Operating temperature range: -40 - +60°C –
 Storage temperature range: -40 - +85°C –
 EMC emission class A – EMC immunity zone A –
 Mechanical class 1

The test object passed the required clauses of

IEC 60255-1

including IEC 60255-13, -21-1, -21-2, -21-3, -26, -27, -121, -127, -149, -151

IEEE Std C37.90

including IEEE C37.90-1, -2, -3

The test results are recorded in Certificate No.

TIC 1069-14

This Certificate is issued on 13 April 2015

KEMA Nederland B.V.

S.A.M. Verhoeven
Director Testing, Inspections & Certification The Netherlands



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Test description	Standard(s)
DIMENSIONS OF STRUCTURE AND VISUAL INSPECTION	
Markings	IEC 60255-27 (2013)
Documentation	IEC 60255-27 (2013)
Packaging	IEC 60255-27 (2013)
Dimensions	IEC 60255-1 (2009), IEC 60297-3-101 (2004)
FUNCTIONAL REQUIREMENTS	IEC 60255-1 (2009), IEC 60255-8 (1990), IEC 60255-12 (1980), IEC 60255-13 (1980), IEC 60255-16 (1982), IEC 60255-127 (2010), IEC 60255-151 (2009)
PRODUCT SAFETY	
Clearance and creepage distances	IEC 60255-27 (2013)
Enclosure protection (IP rating)	IEC 60255-1 (2009), IEC 60255-27 (2013)
Impulse voltage	IEC 60255-27 (2013)
Dielectric voltage	IEC 60255-27 (2013)
Insulation resistance	IEC 60255-27 (2013)
Protective bonding resistance	IEC 60255-27 (2013)
Flammability	IEC 60255-27 (2013)
Single fault condition	IEC 60255-27 (2013)
ELECTROMAGNETIC COMPATIBILITY	
Radiated emission	IEC 60255-26 (2013), CISPR 11 (2009), CISPR 22 (2008)
Conducted emission	IEC 60255-26 (2013), CISPR 22 (2008)
Slow damped oscillatory wave immunity (1 MHz)	IEC 60255-26 (2013), IEC 61000-4-18 (2006), IEEE C37.90.1 (2012)
Electrostatic discharge immunity	IEC 60255-26 (2013), IEC 61000-4-2 (2008), IEEE C37.90.3 (2001)
Radio frequency EM-field immunity	IEC 60255-26 (2013), IEC 61000-4-3 (2006), IEEE C37.90.2 (2004)
Fast transient / burst immunity	IEC 60255-26 (2013), IEC 61000-4-4 (2012)
Surge immunity	IEC 60255-26 (2013), IEC 61000-4-5 (2014)
Conducted disturbance by RF fields immunity	IEC 60255-26 (2013), IEC 61000-4-6 (2013)
Power frequency voltage immunity (50 Hz)	IEC 60255-26 (2013), IEC 61000-4-16 (1998)
DC supply voltage dips and interruptions	IEC 60255-26 (2013), IEC 61000-4-29 (2000)
AC supply voltage dips and interruptions	IEC 60255-26 (2013), IEC 61000-4-11 (2004)
DC supply voltage ripple	IEC 60255-26 (2013), IEC 61000-4-17 (1999)
Gradual shut-down / start-up	IEC 60255-26 (2013)
Reversal of DC power supply	IEC 60255-26 (2013)
Power frequency magnetic field (50 Hz)	IEC 60255-26 (2013), IEC 61000-4-8 (2009)
Pulse magnetic field	IEC 61000-4-9 (1993)
Damped oscillatory magnetic field	IEC 61000-4-10 (1993)
Slow damped oscillatory wave immunity (100 kHz)	IEC 61000-4-18 (2006)
ENERGIZING QUANTITIES	
Burden voltage transformers	IEC 60255-1 (2009)
Burden current transformers	IEC 60255-1 (2009)
Burden AC power supply	IEC 60255-1 (2009)
Burden DC power supply	IEC 60255-1 (2009)
Burden binary inputs	IEC 60255-1 (2009)
Overload on current- and voltage transformer inputs	IEC 60255-1 (2009)

CONTACT PERFORMANCE	
Mechanical endurance	IEC 60255-1 (2009)
Limited making capacity	IEC 60255-1 (2009)
Short-time contact current	IEC 60255-1 (2009)
Continuous contact current	IEC 60255-1 (2009)
Limited breaking capacity	IEC 60255-1 (2009)
CLIMATIC ENVIRONMENTAL CONDITIONS	
Dry heat operational	IEC 60255-1 (2009), IEC 60068-2-2 (2007)
Cold operational	IEC 60255-1 (2009), IEC 60068-2-1 (2007)
Dry heat storage	IEC 60255-1 (2009), IEC 60068-2-2 (2007)
Cold storage	IEC 60255-1 (2009), IEC 60068-2-1 (2007)
Change of temperature	IEC 60255-1 (2009), IEC 60068-2-14 (2009)
Damp heat steady state	IEC 60255-1 (2009), IEC 60068-2-78 (2012)
Cyclic temperature with humidity	IEC 60255-1 (2009), IEC 60068-2-30 (2005)
MECHANICAL ENVIRONMENTAL CONDITIONS	
Vibration response	IEC 60255-1 (2009), IEC 60255-21-1 (1988)
Vibration endurance	IEC 60255-1 (2009), IEC 60255-21-1 (1988)
Shock response	IEC 60255-1 (2009), IEC 60255-21-2 (1988)
Shock withstand	IEC 60255-1 (2009), IEC 60255-21-2 (1988)
Bump	IEC 60255-1 (2009), IEC 60255-21-2 (1988)
Seismic	IEC 60255-1 (2009), IEC 60255-21-3 (1993)



Type test Certificate of complete type test

GE Multilin

Markham, Ontario, Canada

has successfully passed the type test sequence on an

Hardfiber Brick

Type: BRICK-4-HI-CV 50

Ratings: Rated auxiliary voltage: 110-250 V DC
 Rated secondary current: 1/5 A
 Rated secondary voltage: 50-240 V
 Rated frequency: 50/60 Hz

The test object passed the required clauses of

IEC 60255-1

IEEE C37.90

The test results are recorded in Certificate No.

1420-15

This Certificate is issued on 1 March 2016.

KEMA Nederland B.V.

J.P. Fonteijne
Executive Vice President
KEMA Laboratories



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IEC 61850 Certificate Level B¹
No. 50745.6UR.803

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Issued to:
GE Grid Automation
650 Markland St.
Markham, ON L6C 0M1, Canada



For the server product:
UR N60 Network Stability and
Synchrophasor Measurement Relay
IEC 61850 Firmware Version 7.70

The server product has not been shown to be non-conforming to:
IEC 61850 First Edition Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
Communication networks and systems in substations

The conformance test has been performed according to IEC 61850-10, the UCA International Users Group Server Device Test Procedures version 3.2, the product's protocol, model and technical issue implementation conformance statements: "UR Family Version 7.70 IEC 61850 Conformance Statement for PICS", "UR Family Version 7.70 – IEC 61850 Ed 1 Conformance Statement for MICS ", "UR Family Version 7.70 IEC 61850 Conformance Statement for TICS – Edition 1 Tissues" and extra information for testing "UR Family Version 7.70 IEC 61850 Conformance Statement for PIXIT".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases):

1	Basic Exchange (24/25)	12a	Direct Control (7/11)
2	Data Sets (3/6)	12b	SBO Control (10/14)
4	Setting Group Selection (3/3)	12c	Enhanced Direct Control (9/13)
5	Unbuffered Reporting (16/18)	12d	Enhanced SBO Control (14/19)
6	Buffered Reporting (23/27)	13	Time Synchronization (4/5)
9a	GOOSE Publish (12/12)	14	File Transfer (5/7)
9b	GOOSE Subscribe (11/11)		

This certificate includes a summary of the test results as carried out at Grid Automation Laboratories in UK Grid Solutions Limited in Stafford, United Kingdom with UniCA 61850 client simulator version 4.31.02 with test suite version 3.29.00 and the UniCA 61850 Analyzer version 5.34. This document has been issued for information purposes only, and the original paper copy of the Grid Automation Laboratories report: No. 50745.6UR.303 will prevail.

The tests have been carried out on one single specimen of the product as referred above and submitted to Grid Automation Laboratories by GE Grid Automation. The manufacturer's production process has not been assessed. This certificate does not imply Grid Automation Laboratories at UK Grid Solutions Limited has approved any product other than the specimen tested.

Stafford, 05-06-2018

Allen Millard 
Grid Automation Laboratories Manager

Hua Qin 
Grid Automation Laboratories
IED Communication Test Engineer

¹ Level B – Tester with ISO 9001 Quality System

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Phone: +44 (0) 1785 250 070



IEC 61850 Certificate Level B

No. 50745.6UR.803

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Applicable Test Procedures from the UCA International Users Group Server Device Test Procedures version 3.2

Conformance Block	Mandatory	Conditional
1: Basic Exchange	Ass1, Ass2, Ass3, AssN2, AssN4, AssN5 Srv1, Srv2, Srv3, Srv4, Srv5, SrvN1abcd, SrvN4	AssN3 Srv6, Srv7, Srv8, Srv9, Srv10, Srv12, SrvN1e, SrvN1f, SrvN2, SrvN3
2: Data Sets	Dset1, Dset10a, DsetN1ae	
4: Setting Group	Sg1, SgN1a, Sg3	
5: Unbuffered Reporting	Rp1, Rp2, Rp3, Rp4, Rp9, RpN1, RpN2, RpN3, RpN4, RpN8	Rp5, Rp8, Rp10, Rp11, Rp12, RpN5
6: Buffered Reporting	Br1, Br2, Br3, Br4, Br9, Br20, Br21, Br22, Br25, Br26, Br27, Br28 BrN1, BrN2, BrN3, BrN4, BrN5, BrN8	Br5, Br8, Br10, Br11, Br12
9a: GOOSE Publish	Gop2, Gop3, Gop4, Gop9, Gop10a	Gop1, Gop5, Gop6, Gop7, Gop10b, GopN1, GopN2
9b: GOOSE Subscribe	Gos1a, Gos2, Gos3, GosN1, GosN2, GosN3, GosN4, GosN5, GosN6	Gos1b, Gos4
12a: Direct Control	CtlN3, DOns1	Ctl2, Ctl7, CtlN10, CtlN11, DOns3
12b: SBO Control	CtlN1, CtlN2, CtlN3, CtlN4, SBOs2	Ctl2, Ctl3, Ctl7, CtlN10, CtlN11
12c: Enhanced Direct Control	CtlN3, DOes2, DOes5	Ctl2, Ctl7, CtlN6, CtlN8, CtlN10, CtlN11
12d: Enhanced SBO Control	CtlN1, CtlN2, CtlN3, CtlN4, CtlN9 SBOes1, SBOes2, SBOes3	Ctl2, Ctl3, Ctl7, CtlN6, CtlN10, CtlN11
13: Time sync	Tm1, Tm2	Tm3, TmN1
14: File Transfer	Ft1, Ft2ab, Ft4, FtN1ab	Ft3

All configuration file and data model tests have been successfully performed for the product variants using the same software and hardware version:

UR B30, UR B90, UR C30, UR C60, UR C70, UR D30, UR D60, UR F35, UR F60, UR G30, UR G60, UR L30, UR L60, UR L90, UR M60, UR T35, UR T60

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4085

IEC 61850 Certificate Level B¹

No. 50745.6UR.802

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Issued to:
GE Grid Automation
650 Markland St.
Markham, ON L6C 0M1, Canada



For the server product:
UR N60 Network Stability and
Synchrophasor Measurement Relay
IEC 61850 Firmware Version 7.70

The server product has not been shown to be non-conforming to:
IEC 61850 Edition 2 Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
Communication networks and systems for power utility automation

The conformance test has been performed according to IEC 61850-10 Edition 2, the UCA International Users Group Edition 2 Server Test Procedures version 1.0 with TPCL² version 1.2 with product's protocol, model and technical issue implementation conformance statements: "UR Family Version 7.70 IEC 61850 Conformance Statement for PICS", "UR Family Version 7.70 - IEC 61850 Ed 2 Conformance Statement for MICS", "UR Family Version 7.70 IEC 61850 Conformance Statement for TICS – Edition 2 Tissues" and extra information for testing "UR Family Version 7.70 IEC 61850 Conformance Statement for PIXIT".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases):

1	Basic Exchange (24/26)	12a	Direct Control (9/18)
2	Data Sets (4/7)	12b	SBO Control (16/27)
4	Setting Group Selection (4/4)	12c	Enhanced Direct Control (11/20)
5	Unbuffered Reporting (18/21)	12d	Enhanced SBO Control (17/28)
6	Buffered Reporting (25/30)	13	Time Synchronization (5/7)
9a	GOOSE Publish (12/13)	14	File Transfer (6/8)
9b	GOOSE Subscribe (14/14)		

This certificate includes a summary of the test results as carried out at Grid Automation Laboratories in UK Grid Solutions Limited in Stafford, United Kingdom with UniCA 61850 client simulator version 4.31.02 with test suite version 4.32.06 and the UniCA 61850 Analyzer version 5.34. This document has been issued for information purposes only, and the original paper copy of the Grid Automation Laboratories report: No. 50745.6UR.302 will prevail.

The tests have been carried out on one single specimen of the product as referred and submitted to Grid Automation Laboratories by GE Grid Automation. The manufacturer's production process has not been assessed. This certificate does not imply Grid Automation Laboratories at UK Grid Solutions Limited has certified or approved any other product other than the specimen tested.

Stafford, 05-06-2018

Allen Millard 
Grid Automation Laboratories Manager

Hua Qin 
Grid Automation Laboratories
IED Communication Test Engineer

¹ Level B - Test lab following ISO 9001 Quality System
² Test Procedure Change List

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Phone: +44 (0) 1785 250 070



IEC 61850 Certificate Level B

No. 50745.6UR.802

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Applicable Test Procedures from the UCA International Users Group Edition 2 Server Test Procedures version 1.0 with TPCL version 1.2.

Conformance Block	Mandatory	Conditional
1: Basic Exchange	sAss1, sAss2, sAss3, sAssN2, sAssN3, sAssN4, sAssN5, sSrv1, sSrv2, sSrv3, sSrv4, sSrv5, sSrvN1abcd, sSrvN4	sSrv6, sSrv8, sSrv9, sSrv10, sSrv12, sSrv13, sSrvN1e, sSrvN1f, sSrvN2, sSrvN3
2: Data Sets	sDs1, sDs10a, sDsN1ae	SDs15
4: Setting Group Selection	sSg1, sSg3, sSgN1	SSg11
5: Unbuffered Reporting	sRp1, sRp2, sRp3, sRp4, sRp5, sRp9, sRp14, sRp15, sRpN1, sRpN2, sRpN3, sRpN4, sRpN8	sRp8, sRp10, sRp11, sRp12, sRpN5
6: Buffered Reporting	sBr1, sBr2, sBr3, sBr4, sBr5, sBr9, sBr14, sBr15, sBr20, sBr21, sBr22, sBr25, sBr26, sBr27, sBr28, sBrN1, sBrN2, sBrN3, sBrN4, sBrN5, sBrN8	sBr8, sBr10, sBr11, sBr12
9a: GOOSE publish	sGop2a, sGop3, sGop4, sGop9, sGop10, sGop11	sGop1, sGop5, sGop6, sGop7, sGopN1, sGopN2
9b: GOOSE subscribe	sGos1, sGos2, sGos3, sGos5, sGos6a, sGos7, sGosN1, sGosN2, sGosN3, sGosN4, sGosN5, sGosN6	sGos4, sGos6b
12a: Direct control	sCtl5, sCtl10, sDOns1, sDOns2	SCtl2, sCtl7, sCtl13, sCtl15, sCtl16
12b: SBO control	sCtl5, sCtl8, sCtl9, sCtl10, sCtl11, sCtl25, sSBOns1, sSBOns2, sSBOns6	SCtl2, sCtl4, sCtl6, sCtl7, sCtl15, sCtl16, sCtl27
12c: Enhanced Direct Control	sCtl5, sCtl10, sDOes1, sDOes2	SCtl2, sCtl7, sCtl13, sCtl14, sCtl15, sCtl16, sCtl26
12d: Enhanced SBO Control	sCtl5, sCtl8, sCtl9, sCtl10, sCtl11, sCtl25, sSBOes1, sSBOes2, sSBOes6, sSBOes8	SCtl2, sCtl4, sCtl6, sCtl7, sCtl15, sCtl16, sCtl26
13: Time sync	sTm1, sTm2, sTmN1	sTm3, sTm5
14: File transfer	sFt1, sFt2ab, sFt4, sFt5, sFtN1ab	sFt3

All configuration file and data model tests have been successfully performed for the product variants using the same software and hardware version:
 UR B30, UR B90, UR C30, UR C60, UR C70, UR D30, UR D60, UR F35, UR F60, UR G30, UR G60, UR L30, UR L60, UR L90, UR M60, UR T35, UR T60

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Grid Automation Laboratories, UK Grid Solutions Limited, St. Leonards Building, Redhill Business Park, Stafford ST16 1WT, United Kingdom
 Phone: +44 (0) 1785 250 070





IEC 61850 Certificate Level A¹

Page 1/2

No. 74102335-MOC/INC 13-0451

Issued to:
GE Digital Energy
650 Markland St.
Markham, ON L6C 0M1
Canada

For the product:
UR N60 Network Stability and
Synchrophasor Measurement System
IEC 61850 Firmware version: 7.10

Issued by:



The product has not shown to be non-conforming to:
IEC 61850-6, 7-1, 7-2, 7-3, 7-4 and 8-1
Communication networks and systems in substations

The conformance test has been performed according to IEC 61850-10, the UCA International Users Group Device Test Procedures version 2.3 with TPCL² version 1.5, the product's protocol, model and technical issue implementation conformance statements: "UR IEC 61850 ACS/ Conformance Statement and Logical Nodes 7.10", "MICS for UR family Model Implementation Conformance Statement 7.10" and "TISSUES Implementation Conformance Statement for the IEC 61850 interface in the UR Family version 7.10" and the extra information for testing: "Protocol Implementation eXtra Information for Testing (PIXIT) for the IEC 61850 interface in the UR Family".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases):

1	Basic Exchange (21/24)	12a	Direct Control (6/12)
2	Data Sets (3/6)	12b	SBO Control (8/14)
4	Setting Group Selection (2/3)	12c	Enhanced Direct Control (6/13)
5	Unbuffered Reporting (15/19)	12d	Enhanced SBO Control (11/19)
6	Buffered Reporting (18/21)	13	Time Synchronization (4/5)
9a	GOOSE Publish (9/13)	14	File Transfer (4/7)
9b	GOOSE Subscribe (10/11)		

This certificate includes a summary of the test results as carried out at KEMA in the Netherlands with UniCA Client Simulator 4.26.04 with test suite 3.26.00 and UniCA 61850 Analyzer 4.25.00. This document has been issued for information purposes only, and the original paper copy of the KEMA report: No. 74102335-MOC/INC 13-0442 will prevail.

The test has been carried out on one single specimen of the product as referred above and submitted to KEMA by GE Digital Energy. The manufacturer's production process has not been assessed. This attestation does not imply that KEMA has approved any product other than the specimen tested.

Arnhem, February 6, 2013

M. Adriaenssen
Director Intelligent Networks & Communication

R. Schimmel
Certification Manager

1 Level A - Independent test lab with certified ISO 9000 or ISO 17025 quality system
2 TPCL - Test procedures change list

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KEMA Nederland B.V.
Utrechtseweg 310, 6812 AR Arnhem, P.O.Box 9035, 6800 ET Arnhem, The Netherlands
T +31 26 356 20 25 F +31 26 351 36 83 sales@kema.com www.kema.com



IEC 61850 Certificate Level B¹

No. 50745.6UR.801

Page 1/2

Issued to:
 GE Grid Automation
 650 Markland St.
 Markham, ON L6C 0M1, Canada



For the product:
 UR N60 Network Stability and
 Synchrophasor Measurement Relay
 IEC 61850 Firmware Version 7.41

The server product has not been shown to be non-conforming to:
IEC 61850 Edition 2 Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
 Communication networks and systems for power utility automation

The conformance test has been performed according to IEC 61850-10 Edition 2, the UCA International Users Group Edition 2 Server Test Procedures version 1.0 with TPCL² version 1.2 with product's protocol, model and technical issue implementation conformance statements: "UR Family Version 7.41 IEC 61850 Conformance Statement for PICS", "UR Family Version 7.41 IEC 61850 Conformance Statement for MICS", "UR Family Version 7.41 IEC 61850 Conformance Statement for TICS" and extra information for testing "UR Family Version 7.41 IEC 61850 Conformance Statement for PIXIT".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of tests):

1	Basic Exchange (24/26)	12a	Direct Control (9/18)
2	Data Sets (4/7)	12b	SBO Control (16/27)
4	Setting Group Selection (4/4)	12c	Enhanced Direct Control (11/20)
5	Unbuffered Reporting (18/21)	12d	Enhanced SBO Control (17/28)
6	Buffered Reporting (25/30)	13	Time Synchronization (5/7)
9a	GOOSE Publish (12/13)	14	File Transfer (6/8)
9b	GOOSE Subscribe (14/14)		

This certificate includes a summary of the test results as carried out at Grid Automation Laboratories in UK Grid Solutions Limited in Stafford, United Kingdom with UniCA 61850 client simulator version 4.29.03 with test suite version 3.29.04 and the UniCA 61850 Analyzer version 5.28.03. This document has been issued for information purposes only, and the original paper copy of the Grid Automation Laboratories report: No. 50745.6UR.301 will prevail.

The tests have been carried out on one single specimen of the product as referred and submitted to Grid Automation Laboratories by GE Grid Automation. The manufacturer's production process has not been assessed. This certificate does not imply Grid Automation Laboratories at UK Grid Solutions Limited has certified or approved any other product other than the specimen tested.

Stafford, 06-02-2017

Allen Millard
 Grid Automation Laboratories Manager

Hua Qin
 Grid Automation Laboratories Test Engineer

¹ Level B - Test lab following ISO 9001 Quality System
² Test Procedure Change List

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Grid Automation Laboratories, UK Grid Solutions Limited, St. Leonards Building, Redhill Business Park, Stafford ST16 1WT, United Kingdom
 Phone: +44 (0) 1785 786 681 Fax: +44 (0) 1785 212232



IEC 61850 Certificate Level B

No. 50745.6UR.801

Page 2/2

Applicable Test Procedures from the UCA International Users Group Edition 2 Server Test Procedures version 1.0 with TPCL version 1.2.

Conformance Block	Mandatory	Conditional
1: Basic Exchange	sAss1, sAss2, sAss3, sAssN2, sAssN3, sAssN4, sAssN5, sSrv1, sSrv2, sSrv3, sSrv4, sSrv5, sSrvN1abcd, sSrvN4	sSrv6, sSrv8, sSrv9, sSrv10, sSrv12, sSrv13, sSrvN1e, sSrvN1f, sSrvN2, sSrvN3
2: Data Sets	sDs1, sDs10a, sDsN1ae	SDs15
4: Setting Group Selection	sSg1, sSg3, sSgN1	SSg11
5: Unbuffered Reporting	sRp1, sRp2, sRp3, sRp4, sRp5, sRp9, sRp14, sRp15, sRpN1, sRpN2, sRpN3, sRpN4, sRpN8	sRp8, sRp10, sRp11, sRp12, sRpN5
6: Buffered Reporting	sBr1, sBr2, sBr3, sBr4, sBr5, sBr9, sBr14, sBr15, sBr20, sBr21, sBr22, sBr25, sBr26, sBr27, sBr28, sBrN1, sBrN2, sBrN3, sBrN4, sBrN5, sBrN8	sBr8, sBr10, sBr11, sBr12
9a: GOOSE publish	sGop2a, sGop3, sGop4, sGop9, sGop10, sGop11	sGop1, sGop5, sGop6, sGop7, sGopN1, sGopN2
9b: GOOSE subscribe	sGos1, sGos2, sGos3, sGos5, sGos6a, sGos7, sGosN1, sGosN2, sGosN3, sGosN4, sGosN5, sGosN6	sGos4, sGos6b
12a: Direct control	sCtl5, sCtl10, sDOns1, sDOns2	SCtl2, sCtl7, sCtl13, sCtl15, sCtl16
12b: SBO control	sCtl5, sCtl8, sCtl9, sCtl10, sCtl11, sCtl25, sSBOns1, sSBOns2, sSBOns6	SCtl2, sCtl4, sCtl6, sCtl7, sCtl15, sCtl16, sCtl27
12c: Enhanced Direct Control	sCtl5, sCtl10, sDOes1, sDOes2	SCtl2, sCtl7, sCtl13, sCtl14, sCtl15, sCtl16, sCtl26
12d: Enhanced SBO Control	sCtl5, sCtl8, sCtl9, sCtl10, sCtl11, sCtl25, sSBOes1, sSBOes2, sSBOes6, sSBOes8	SCtl2, sCtl4, sCtl6, sCtl7, sCtl15, sCtl16, sCtl26
13: Time sync	sTm1, sTm2, sTmN1	sTm3, sTm5
14: File transfer	sFt1, sFt2ab, sFt4, sFt5, sFtN1ab	sFt3

All configuration file and data model tests have been successfully performed for the product variants using the same software and hardware version:

UR B30, UR B90, UR C30, UR C60, UR C70, UR D30, UR D60, UR F35, UR F60, UR G30, UR G60, UR L30, UR L60, UR L90, UR M60, UR T35, UR T60

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Grid Automation Laboratories, UK Grid Solutions Limited, St. Leonards Building, Redhill Business Park, Stafford ST16 1WT, United Kingdom
Phone: +44 (0) 1785 786 681 Fax: +44 (0) 1785 212232



CERTIFICATE OF COMPLIANCE

Certificate Number 20130704-E83849
Report Reference E83849-20050131
Issue Date 2013-JULY-04

Issued to: GE MULTILIN
 650 MARKLAND ST
 MARKHAM
 ON L6C 0M1 CANADA


This is to certify that representative samples of AUXILIARY DEVICES
 See addendum page page for models

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 508 and CSA C22.2 NO. 14-13 - STANDARD FOR INDUSTRIAL CONTROL EQUIPMENT

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Listing Mark for the US and Canada should be considered as being covered by UL's Listing and Follow-Up Service meeting the appropriate requirements for US and Canada.

The UL Listing Mark for the US and Canada generally includes: the UL in a circle symbol with "C" and "US" identifiers:  the word "LISTED"; a control number (may be alphanumeric) assigned by UL; and the product category name (product identifier) as indicated in the appropriate UL Directory.

Look for the UL Listing Mark on the product.



William R. Carney, Director, North American Certification Programs
 UL LLC

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CERTIFICATE OF COMPLIANCE

Certificate Number 20130704-E83849
Report Reference E83849-20050131
Issue Date 2013-JULY-04

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

USL, CNL Universal Relay Series, Models B30, B90, C30, C60, C70, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, N60, T35, T60; followed by -blank, -A, -C through -H, -J through -N, P, R, -S or T; followed by 00 through 99; followed by -H or -V; followed by C, F, P, K or L; followed by H or L; followed by -F; followed by XX or by 8 followed by 1, A through D, F Through H, L through N, or R; followed by -H; followed by XX or 4 followed by A, C, D, or L or 6 followed by 7, C through F, K though N, P, or R though V or 5 followed by A, E, or F; followed by -L; followed by XX or 8 followed by 1, A through D, F Through H, L through N, or R or 4 followed by A, C, D, or L or 6 followed by 7, C through F, K though N, P, or R though V or 5 followed by A or F; followed by -N; followed by XX or 4 followed by A, C, D, or L or 6 followed by 7, C through F, K though N, P, or R though V or 5 followed by A, E, or F; followed by -S; followed by XX or 4 followed by A, C, D, or L or 6 followed by 7, C through F, K though N, P, or R though V or 5 followed by A, E, or F; followed by -U; followed by XX or 4 followed by A, C, D, or L or 6 followed by 7, C through F, K though N, P, or R though V or 5 followed by A, E, or F; Followed by -W or -X; followed by 2 followed by A, B, E through H, S or T or 7 followed by A through M, P through T, W, V, or 2 through 7.

Accessory Power supply Module – Model UR-1 followed by H or L

Accessory Faceplate Module – Model UR-3 followed by C, F, P, K, or L

Accessory Solid State I/O Module – Model UR-4 followed by A, C, D, or L

Accessory Transducer I/O Module – Model UR-5 followed by A, E, or F

Accessory Relay or Input Only I/O Module – Model UR-6 followed by 7, C through F, K though N, P, or R though V

Accessory Communication Module – Model UR-7 followed by A through M, P through T, W, V, or 2 through 7; Model UR-2 followed by A, B, E through H, S or T

*Accessory CT/VT Module – Model UR-8 followed by A through E, F Through K, L through N, or P, R, S, V, or Z.

Accessory Process Card – Model UR-8 followed by 1

*Accessory CPU Module - Model UR-9 followed by A, C though H, J through N, P, R, S, T, U, V.



William R. Carney, Director, North American Certification Programs
UL LLC

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EC Declaration of Conformity

Declaration No. MAR-DOC-C-13FEB14-1

Manufacturer Name: GE Multilin Inc
Address: 650 Markland St
 Markham, ON, L6C 0M1, Canada

Authorized representative: GE Power Management, S.A.U.
Address: Avenida Pinoa 10 – 48170
 Zamudio (Vizcaya), Spain
 www.gedigitalenergy.com

CE 14

Object of the declaration

Universal Protection Relay (UR) B30, B90, C30, C60, C70, D30, D60, F35, F60,
 G30, G60, L30, L60, L90, M60, N60, T35, T60

We (the Manufacturer) declare under our sole responsibility that the product(s) described above is/are in conformity with applicable EC harmonization Legislation.

Document No.	Title	Edition/Issue
2006/95/EC	Low Voltage Directive	December 12, 2006
2004/108/EC	EMC Directive	December 15, 2004

Harmonised standards or references to the specifications in relation to which conformity is declared:

Document No.	Title	Edition/Issue
EN 50263	Electromagnetic compatibility (EMC). Product standard for measuring relays and protection equipment	1999
IEC 60255-26	Measuring relays and protection equipment - Part 26: Electromagnetic compatibility requirements	2008
EN 60255-5	Electrical Relays - Part 5: Insulation coordination for measuring relays and protection equipment - Requirements and tests	2001
EN 60255-27	Measuring relays and protection equipment - Part 27: Product safety requirements	2005
IEC/TS 61000-6-5	Electromagnetic compatibility (EMC) - Part 6-5: Generic standards - Immunity for power station and substation environments	2001

Additional Information

This declaration applies to the final product as well as the modules listed in the Appendix

Signed for and on behalf of the Manufacturer:

Name: Vijay Muthukrishnan
Function: DE Engineering Manager
Signature:



Name: Kevin Fuller
Function: DE Regulatory Leader – TRS & ITC
Signature:



Issued Date: 13-FEB-20144



EC Declaration of Conformity Appendix

Declaration No.

MAR-DOC-C-05FEB14-1



Modules covered:

CPU	(UR3): 9A,9C,9D (UR6): 9E,9G,9H,9J,9K,9L,9M,9N,9M,9N,9S (UR7): 9T,9U,9V
DSP	(UR3): 8A,8B, 8C,8D,8E (UR6 & UR7): 8F,8G,8H,8J,8L,8M,8N,8R,8K,8S (Hi Z DSP): 8Z (L60DSP): 8P
Digital I/O	4A,4B,4C,4D,4L,67,6A,6B,6C,6D,6E,6F,6G,6H,6K,6L,6M,6N,6P,6R,6S,6T,6U,6V
Front Panel	3C,3D,3R,3A,3P,3G,3S,3B,3K,3M,3Q,3U,3L,3N,3T,3V
Communications:	2A,2B,2E,2F,2G,2H,72,73,74,75,76,77,7A,7B,7C,7D,7E,7F,7G,7H,7I,7J,7K,7L,7M,7N, 7P,7Q,7R,7S,7T,7V,7W
Transducer	5A,5C,5D,5E,5F
Power supply	RH, RL
Process card	81
Embedded switch	2S,2T



Achilles Level 1 security





Quanta Technology Certificate

Certificate No.	QT-15110001
Certificate Type	Test results certification
Issued To	GE Multilin 650 Markland Street Markham, Ontario, L6C 0M1 CANADA
For product	N60 Network Stability and Synchrophasor Measurement System – UR Series
Unit Tested	Specific hardware and software configurations for unit tested are documented in Quanta Technology Certification Report No. 14A005-042015
Standards and Requirements	IEEE Std C37.118.™-2011, and IEEE Std C37.118.1a™-2014
For Data Classes and Reporting Rates	M Class: 10, 25 and 50 frames/s P Class: 10, 25 and 50 frames/s
Reference Test Conditions	Room temperature: +23° C ± 3 °C Nominal Voltage: 70 V (RMS) Nominal Current: 1 A (RMS) Nominal Frequency: 50 Hz

This Certificate is issued based on the examination of the test results of the tested unit against the synchrophasor measurement performance requirements in the above listed standards and the calibrated uncertainties of test equipment. Test results and test equipment uncertainties are provided to Quanta Technology by SynchroMetrology Lab of National Institute of Standard and Technology (NIST). Quanta Technology Certification Report No. 14A005-042015, dated April 20, 2015, documents the detailed examination results by Quanta Technology.

Conformity of manufacturer's production with tested unit is manufacturer's own responsibility.

Quanta Technology
Raleigh, North Carolina, USA
April 20, 2015

Douglas Proudfoot
VP, Advisory Services



**한국전기안전공사
안전인증센터**

KESCO Safety Test Center
Tel : 82-31-240-4500 Fax : 82-31-240-4500

TEST REPORT

Report No. : STC-C15-103-02

Page of : (1) / (15)



1. Customer

- Name : GE Digital Energy
- Address : 650 Markland Street, Markham, Ontario, L6C 0M1 Canada
- Date of Receipt : 2015.06.05.

2. Use of Test Report : Reference

3. Product : Digital Protection Relay

- Model : L90
- Serial No. : AAZC15000017

4. Test Period : 2015.06.09. ~ 2015.06.11.

5. Test Method/Item : IEC 60255-127/151 and Customer's specification(Functional Tests)

6. Test Environment

- Temperature : (24 ± 1) °C
- Relative Humidity : (50 ± 3) %

7. Test Result : Pass

Conformation	Tested by	Approved by Technical Manager
	Name J. H. Jung 	Name H. C. Jang 

- This document certifies that the above mentioned products have been tested for the sample provided by the customer and it does not guarantee the quality of other products
- The original document produced by KESCO Safety Test Center is valid and the copy of this document is invalid

2015. 06. 16.



The head of Korea Electrical Safety Corporation Safety Test Center

- 440-819 경기도 수원시 장안구 정조로 933번길 21(영화동)
21, Jeongjo-Ro, 933beon-Gil, Jangan-Gu, Suwon-City, Gyonggi-Do, 440-819, Korea

GE lab certification



Standards Council of Canada
Conseil canadien des normes

Accreditation > Laboratory Accreditation > Directory of Accredited Laboratories

GE Multilin Inc (Digital Energy) GE Multilin Test Laboratory

650 Markland Street
Markham, ON L6C0M1
Canada

Contact:
Vincent Raponi
+1 905 927 5089

Program Specialty Area(s): No program specialty area;
Field(s) of Testing: Electrical/Electronic;
Issued On: 2015-12-10
Scope Document(s): [English PDF](#)



Standards Council of Canada
Conseil canadien des normes

Help > Acronyms & Glossary

International Laboratory Accreditation Cooperation

ILAC

The International Laboratory Accreditation Cooperation (ILAC) is an international forum, founded in 1996, to promote cooperation between global accreditation models. The SCC is a member of ILAC.



GE verification certificate

VERIFICATION CERTIFICATE



This verification certificate is issued to the customer on 2/19/2016 and is valid only for equipment identified in this certificate.

Customer:

Address	GE Multilin Inc 650 Markland Ont, L6C0M1, Canada
Contact Person:	Jose Antonio Mendez
	Ph: 905-927-5104
	Email: Jose.Antonio.Mendez@ge.com

Equipment Type:	Protective Relay
Product Name:	UR (Universal Relay) series which includes relay models: B30,B90,C30,C60,C70,D30,D60,F35,F60,G30,G60,L30,L60,L90,M60,N60,T35,T60
Model Number or name :	F60, T60, L60, L90 (Tested models)

- The tested samples passed all type tests shown in this report

Applicable Standard and Severity:

Standard	Description	Severity level applied	Performance criteria
IEC61000-4-18 (2011-03)	Fast Damped OSC wave immunity test (3Mhz,10Mhz and 30Mhz)	+/- 4KV @ (3Mhz, 10Mhz and 30Mhz)	B (PASS)
IEC60068-2-30 (2005)	Environmental Testing-part 2-30: tests-Db: Damp heat cyclic (12h+12h cycle)	55°C Upper Temp, 25°C lower Temp, 95% r.h 6 cycles of 24 hrs, Db variant 2	Db (PASS)

Note (s):



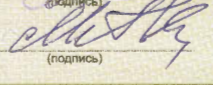
- (i) The Following tests performed conform to the GE Multilin Test Lab work Instruction test procedures (HUPC-TT and DOPC-TT) without any deviations to the fore mentioned standards as per SCC (Standards Council of Canada) file #15980
- (ii) Refer to test reports for full details: IEC60068-2-30_UR-F60_24-11-15.r01, IEC60068-2-30_UR-L60_24-11-15.r02, IEC60068-2-30_UR-L90_30-11-15.r01, IEC60068-2-30_UR-T60_24-11-15.r01, IEC61000-4-18_UR-L60_13-11-2015.r02, IEC61000-4-18_UR-L90_08-09-2015.r01[1], IEC61000-4-18_UR-T60_11-11-2015.r02, IEC61000-4-18_UR-F60_28-7-2015 r01.

Issued by:

Vincent Raponi
Quality Lab Manager

GE Multilin Test Laboratory | 650 Markland St, Markham Ont, L6C0M1, Canada
Tel 1-905-927-7070
web : www.gegridsolutions.com

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ТАМОЖЕННЫЙ СОЮЗ			
СЕРТИФИКАТ СООТВЕТСТВИЯ			
№ ТС <u>RU C-PR.MO04.B.01022</u>			
Серия RU № 0223512			
ОРГАН ПО СЕРТИФИКАЦИИ Орган по сертификации электрооборудования и медицинских изделий ООО "ТестСертифико", Адрес: 107023, г. Москва, ул. Б. Семеновская, д. 40, Фактический адрес: 107023, Россия, город Москва, ул. Семеновская Б., дом 40, строение 2А, офис 103, Телефон: (495) 7816395, Факс: (495) 7816396, E-mail: info@testsert.ru, Аттестат пер. № РОСС RU.0001.11MO04, выдан 24.02.2014 Федеральной службой по аккредитации			
ЗАЯВИТЕЛЬ "GE Multilin", Адрес: 650 Markland Street, Markham, Ontario, L6C 0M1, КАНАДА, Телефон: +19059277070, Факс: +19059275098, E-mail: multilin.tech@ge.com			
ИЗГОТОВИТЕЛЬ "GE Multilin", Адрес: 650 Markland Street, Markham, Ontario, L6C 0M1, КАНАДА Адрес филиала: "GE Industrial of PR LLC", State Road 402, km 1.5, Las Marias Industrial Zone, Anasco, Puerto Rico 00610-1575, Пуэрто-рико			
ПРОДУКЦИЯ Устройства измерения, контроля и управления, серии UR, URplus, модели: B30, B90, C30, C60, C70, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, N60, T35, T60, P30, D90plus, C90plus, B95plus торговой марки GE. Серийный выпуск, Директивы: 2006/95/ЕС, 2004/108/ЕС			
КОД ТН ВЭД ТС 8537 10 910 9			
СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ ТР ТС 004/2011 "О безопасности низковольтного оборудования"; ТР ТС 020/2011 "Электромагнитная совместимость технических средств"			
СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ Протоколы испытаний № 1376ТС-ЭР/14, № 1376ТС-ЭР/14 от 20.10.2014 г., № 1506ТС-ЭР/14, № 1506ТС-БР/14 от 12.11.2014 г., РОСС RU.0001.21MЭ40, Испытательная лаборатория ЗАО НИЦ "САМТЭС", от 01.08.2014; Акт о результатах анализа состояния производства производства ОС ООО "ТестСертифико" (№ РОСС RU.0001.11MO04 до 02.09.2016 г.) № АС-01-21/10 от 21.10.2014 г.			
ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Изготовителем установлен срок службы не менее 25 лет в условиях эксплуатации при температуре от -40 до +60°С, хранения при температуре от -40°С до +85°С и влажности до 95% без конденсации.			
СРОК ДЕЙСТВИЯ С 20.03.2015 ПО 19.03.2020 ВКЛЮЧИТЕЛЬНО			
	Руководитель (уполномоченное лицо) органа по сертификации	 (подпись)	С.Ю. Черная (инициалы, фамилия)
	Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы))	 (подпись)	М.А. Касаткин (инициалы, фамилия)
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