



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

- 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
- 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

Dimensions of structure and visual inspection

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

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

Functional requirements

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
2.1	Thermal protection relay							
	Cold curve	IEC 60255-8	5.3.1	1990		room 22°C	KEMA	7.1x
	Hot curve	IEC 60255-8	5.3.2	1990		room 22°C	KEMA	7.1x
2.2	Directional relays and power relays							
	Operating characteristics	IEC 60255-12	14.2.1	1980		room 22°C	KEMA	7.1x
	Operating and resetting times	IEC 60255-12	14.2.2	1980		room 22°C	KEMA	7.1x
2.3	Biased (percentage) differential relay							
	Operating characteristics	IEC 60255-13	15.2.1	1980		room 22°C	KEMA	7.1x
	Harmonic restraint characteristic	IEC 60255-13	15.2.3	1980				
	Through current	IEC 60255-13	17	1980				
	Influence frequency							
	Influence harmonics							
	Influence current transformer							
	Stability through faults							
2.4	Impedance measuring relay							
	Steady state characteristic	IEC 60255-16	15.1	1982		room 22°C	KEMA	7.1x
	Dynamic characteristic	IEC 60255-16	15.2	1982				
	Influence frequency							
	Influence harmonics							
	Influence SIR							
	Influence current transformer							
	Influence arc fault							
2.5	Over/under voltage protection							
	Accuracy of setting value	IEC 60255-127	6.2.1	2010		room 22°C	KEMA	7.1x
	Reset ratio	IEC 60255-127	6.2.2	2010		room 22°C	KEMA	7.1x
	Start and operate time	IEC 60255-127	6.3	2010		room 22°C	KEMA	7.1x
	Reset time	IEC 60255-127	6.4	2010		room 22°C	KEMA	7.1x

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
2.6	Over/under current protection							
	Accuracy of setting value	IEC 60255-151	6.2.1	2009		room 22°C	KEMA	7.1x
	Reset ratio	IEC 60255-151	6.2.2	2009		room 22°C	KEMA	7.1x
	Start and operate time	IEC 60255-151	6.3	2009		room 22°C	KEMA	7.1x
	Reset time	IEC 60255-151	6.4	2009		room 22°C	KEMA	7.1x
2.7	Volt per Hertz protection							
	Rate of change of frequency					room 22°C	KEMA	7.1x
	Power swing/out of step							
	Auto reclosing					room 22°C	KEMA	7.1x
	Synchrophasor measurement							

Product safety

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
3.1	Clearance and creepage							
	Power supply	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes
	CT inputs	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes
	VT inputs	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes
	Binary inputs	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes
	Relay contact outputs	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes
	Communication	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes
	CPU	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	Yes
	Time synchronization	IEC 60255-27	10.6.3	2013		room 22°C	KEMA	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 IEC 60255-1	10.6.2.6	2013 2009	IP2X	room 22°C room 22°C	KEMA KEMA	Yes Yes
3.3	Impulse voltage							
	Power supply	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes
	CT inputs	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes
	VT inputs	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes
	Binary inputs	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	Yes
	Relay contact outputs	IEC 60255-27	10.6.4.2	2013	5 kV	room 22°C	KEMA	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
	CT inputs	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	Yes
	VT inputs	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	Yes
	Binary inputs	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	Yes
	Relay contact outputs	IEC 60255-27	10.6.4.3	2013	2 kV	room 22°C	KEMA	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
3.5	Insulation Resistance							
	Power supply	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes
	CT inputs	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes
	VT inputs	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes
	Binary inputs	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	Yes
	Relay contact outputs	IEC 60255-27	10.6.4.4	2013	500 V DC 100 Mohm	room 22°C	KEMA	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
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

Electromagnetic compatibility

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware 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
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 class A	room 22°C room 22°C room 22°C	KEMA KEMA KEMA	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 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 IEC 60255-22-1		2007 2007 2012 2007 2007 2012 2007 2007 2012 2007 2007 2012 2007 2007 2012 2007 2007 2007 2007 2007	2,5 kV 1,0 kV 2,5 kV 2,5 kV 1,0 kV 2,5 kV 2,5 kV 1,0 kV 2,5 kV 2,5 kV 2,5 kV 2,5 kV 2,5 kV 1,0 kV 2,5 kV 1,0 kV 0,0 kV 2,5 kV 1,0 kV	room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C room 22°C	KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA KEMA	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware 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
		IEEE C37.90.3		2001	8 kV	room 22°C	KEMA	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
	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
	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
	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
	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
	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
	Frequency range				900 MHz			
	Modulation PM				200 Hz, 50%			

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware 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
	Power supply (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes
	CT inputs (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes
	CT inputs (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes
	VT inputs (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes
	VT inputs (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes
	Binary inputs (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes
	Binary inputs (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	Yes
	Relay contact outputs (CM)	IEC 60255-22-4 / IEC 61000-4-4		2008 / 2012	4 kV	room 22°C	KEMA	Yes
	Relay contact outputs (TM)	IEEE C37.90.1		2012	4 kV	room 22°C	KEMA	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
	Functional earth port (TM)	IEEE C37.90.1		2012	0 kV	room 22°C	KEMA	Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
4.2.5	Surge	IEC 60255-26			Zone A			
	Power supply (LE)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes
	Power supply (LL)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes
	CT inputs (LE)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes
	CT inputs (LL)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes
	VT inputs (LE)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes
	VT inputs (LL)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes
	Binary inputs (LE)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes
	Binary inputs (LL)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0 kV	room 22°C	KEMA	Yes
	Relay contact outputs (LE)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes
	Relay contact outputs (LL)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0 kV	room 22°C	KEMA	Yes
	Communication (LE)	IEC 60255-22-5 / IEC 61000-4-15		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 61000-4-15		2008 / 2014	0 kV	room 22°C	KEMA	Yes
	Time synchronization (LE)	IEC 60255-22-5 / IEC 61000-4-15		2008 / 2014	0,5, 1,0, 2,0, 4,0 kV	room 22°C	KEMA	Yes
	Time synchronization (LL)	IEC 60255-22-5 / IEC 61000-4-15		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
4.2.6	Conducted distance induced by radio frequency field	IEC 60255-26						
	Power supply	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
	CT inputs Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6		2001	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes
	VT inputs Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6		2001	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes
	Binary inputs Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6		2001	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes
	Relay contact outputs Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6		2001	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes
	Communication Level Frequency range Spot frequencies Modulation AM	IEC 60255-22-6		2001	10 V 0,15 to 80 MHz 27, 68 MHz 1 kHz, 80%	room 22°C room 22°C	KEMA KEMA	Yes Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
	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
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
4.2.9	AC voltage dips Residual voltage Duration Residual voltage Duration Residual voltage Duration	IEC 60255-26 IEC 60255-11 / IEC 61000-4-11 IEC 60255-11 / IEC 61000-4-11 IEC 60255-11 / IEC 61000-4-11		2008 / 2004 2008 / 2004 2008 / 2004	0% 0,5 to 25 cycles 40% 10/12 cycles 70% 25/30 cycles	room 22°C room 22°C room 22°C	KEMA KEMA KEMA	Yes Yes Yes

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

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware 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
	Power supply (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes
	CT inputs (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes
	CT inputs (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	Yes
	VT inputs (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes
	VT inputs (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	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
	Relay contact outputs (CM)	IEC 61000-4-18		2006	2,5 kV	room 22°C	KEMA	Yes
	Relay contact outputs (DM)	IEC 61000-4-18		2006	1,0 kV	room 22°C	KEMA	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
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	UltraTech	Yes
	48 V DC power supply output	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	CT odd board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	CT even board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	VT odd board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	VT even board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Form A odd board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Form A even board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Form C odd board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Form C even board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Contact input odd board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Contact input even board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Sensitive CT odd board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Sensitive CT even board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Latching output odd board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Latching output even board	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	SSR output	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	Critical failure relay	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	RS 485	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
	IRIG-B	IEC 61000-4-18		2011	±4 kV	24°C	UltraTech	Yes
4.2.18	Pulse magnetic field							
	Level	IEC 61000-4-9		1993	1000 A/min	room 22°C	KEMA	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
	Frequency	IEC 61000-4-10		1993	1 MHz			
	Level	IEC 61000-4-10		1993	100 A/min	room 22°C	KEMA	Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
4.2.20	Conducted common mode disturbance							
	Frequency	IEC 61000-4-16		2011	50 Hz			
	Continuous disturbance	IEC 61000-4-16		2011				
	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
5.1	Burden for voltage transformers Input voltage 120 V or 100 V Input voltage 220 V or 110 V	IEC 60255-1 IEC 60255-1	6.10.1 6.10.1	2009 2009	VA VA	room 22°C room 22°C	KEMA KEMA	Yes Yes
5.2	Burden for current transformers Input current 1 A Input current 5 A	IEC 60255-1 IEC 60255-1	6.10.2 6.10.2	2009 2009	VA VA	room 22°C room 22°C	KEMA KEMA	Yes Yes
5.3	Burden for AC power supply Quiescent state burden at rated voltage Maximum load burden at rated voltage Inrush current at rated voltage Duration inrush current at rated voltage	IEC 60255-1 IEC 60255-1 IEC 60255-1 IEC 60255-1	6.10.3.1 6.10.3.2 6.10.3.3 6.10.3.3	2009 2009 2009 2009	VA VA A s	room 22°C room 22°C room 22°C room 22°C	KEMA KEMA KEMA KEMA	Yes Yes Yes Yes
5.4	Burden for DC power supply Quiescent state burden at rated voltage Maximum load burden at rated voltage Inrush current at rated voltage Duration inrush current at rated voltage	IEC 60255-1 IEC 60255-1 IEC 60255-1 IEC 60255-1	6.10.4.1 6.10.4.2 6.10.4.3 6.10.4.3	2009 2009 2009 2009	VA VA A s	room 22°C room 22°C room 22°C room 22°C	KEMA KEMA KEMA KEMA	Yes Yes Yes Yes
5.5	Burden for binary input Input voltage 24 V DC Input voltage 48 V DC Input voltage 60 V DC Input voltage 110 V DC Input voltage 220 V DC	IEC 60255-1 IEC 60255-1 IEC 60255-1 IEC 60255-1 IEC 60255-1	6.10.5 6.10.5 6.10.5 6.10.5 6.10.5	2009 2009 2009 2009 2009	mVA mVA mVA mVA mVA	room 22°C room 22°C room 22°C room 22°C room 22°C	KEMA KEMA KEMA KEMA KEMA	Yes Yes Yes Yes Yes
5.6	Input circuit for energizing quantities Correct operation CT input at 4 * Inom or 20 * Inom Correct operation CT input at 100 * Inom Cont./Short time withstand test VT input Duration IEC 61850-9-2 compliance	IEC 60255-1 IEC 60255-1 IEC 60255-1 IEC 60255-1	6.9.1 6.9.1 6.9.1 6.9.1	2009 2009 2009 2009	A A V cont./1 min or 10 s	room 22°C room 22°C room 22°C	KEMA KEMA KEMA	Yes Yes Yes

Contact performance

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

Climatic environmental conditions

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware 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 2007	60°C (70°C for HF) 1°C/min 16 hours 1 to 2 hours	60°C (70°C for HF)	KEMA KEMA	Yes Yes
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 2007	-40°C 1°C/min 16 hours 1 to 2 hours	-40°C	KEMA KEMA	Yes Yes
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 2007	85°C 1°C/min 16 hours 1 to 2 hours	85°C	KEMA KEMA	Yes Yes
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 2007	-40°C 1°C/min 16 hours 1 to 2 hours	-40°C	KEMA KEMA	Yes Yes
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	6.12.3.5	2009 2009	-40°C 60°C 1°C/min 3 hours 5 cycles 1 hour	-40°C to 60°C -40°C 60°C	KEMA KEMA KEMA	Yes Yes Yes

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

Mechanical requirements

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware 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 (0,075 mm for HF) 0,5 g _n (1,0 g _n for HF) 1	room 22°C	KEMA KEMA	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 (2,0 g _n for HF) 20	room 22°C	KEMA KEMA	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 (10 g _n for HF) 11 ms 5	room 22°C	KEMA KEMA	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 (30 g _n for HF) 11 ms 3	room 22°C	KEMA KEMA	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 (20 g _n for HF) 16 ms 1000	room 22°C	KEMA KEMA	Yes Yes

No.	Description	Standard	Clause	Std. year	Requirement	Ambient temp.	Issuer	UR firmware passed
8.6	Single axis sine sweep seismic	IEC 60255-1 IEC 60255-21-3	6.13	2009 1993	class 1 and class 2 1 to 35 Hz 8 Hz 3,5 mm (7,5 mm for HF) 1,5 mm (3,5 mm for HF) 1,0 g _n (2,0 g _n for HF) 0,5 g _n (1,0 g _n for HF) 1	room 22°C	KEMA KEMA	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
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 (IP6X for HF)			
	Degree of protection against ingress of water	IEC 60529	6	2013	IPX0			

Communication tests

IEC 61850

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

No.	Description	Conformance Block	Test		Issuer	UR firmware passed
			Mandatory	Conditional		
	IEC 61850-10 Edition 2.0 (2012) (IEC 61850-6, IEC 61850-7-1, IEC 61850-7-2, IEC 61850-7-4, IEC 61850-8-1)	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	7.1x
		2 Data sets	Dset1, Dset10a, DsetN1ae		KEMA	7.1x
		4 Setting group selection	Sg1, SgN1a		KEMA	7.1x
		5 Unbuffered reporting	Rp1, Rp2, Rp3, Rp4, Rp7, Rp10, Rp12 RpN1, RpN2, RpN3, RpN4	Rp5, Rp8, RpN5, RpN6	KEMA	7.1x
		6 Buffered reporting	Br1, Br2, Br3, Br4, Br7, Br8, Br9, Br12, Br14 BrN1, BrN2, BrN3, BrN4, BrN5	Br5, Br10, Br11, BrN6	KEMA	7.1x
		9a GOOSE publish	Gop2, Gop3, Gop4, Gop7, Gop10a	Gop1, Gop5, Gop6, GopN1	KEMA	7.1x
		9b GOOSE subscribe	Gos1a, Gos2, Gos3, GosN1, GosN2, GosN3, GosN4, GosN5, GosN6	Gos1b	KEMA	7.1x
		12a Direct control	CtlN3, CtlN8 DOns1, DOns3	Ctl7, CtlN11	KEMA	7.1x
		12b SBO control	Ctl3, CtlN1, CtlN2, CtlN3, CtlN4 SBOns2	Ctl7, CtlN11	KEMA	7.1x
		12c Enhanced direct control	CtlN3, CtlN8 DOes2, DOes5	Ctl7, CtlN11	KEMA	7.1x
		12d Enhanced SBO control	Ctl3, CtlN1, CtlN2, CtlN3, CtlN4, CtlN9 SBOes1, SBOes2, SBOes3	Ctl7, CtlN11	KEMA	7.1x
		13 Time sync	Tm1, Tm2, TmN1	Tm3	KEMA	7.1x
		14 File transfer	Ft1, Ft2ab, Ft4, FtN1ab		KEMA	7.1x

Achilles Level 1 security

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	7.31x
	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	7.31x
	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	7.31x
	Ethernet Fuzzer (L1/L2)	Number of packets = 50000 Random seed = Automatic Source MAC address = Local MAC Destination MAC address = Use DUT MAC	Wurldtech	7.31x
	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	7.31x
	Ethernet Grammar (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	7.31x
	ARP Request Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120	Wurldtech	7.31x
	ARP Host Reply Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120	Wurldtech	7.31x
	ARP Cache Saturation Storm (L1/L2)	Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120 Random seed = Automatic	Wurldtech	7.31x
	ARP Grammar (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	7.31x
	IP Unicast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Protocol = 17 Duration = 120	Wurldtech	7.31x
	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	7.31x

No.	Test case	Parameter values	Issuer	UR firmware passed
	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	7.31x
	IP Fragmented Storm (L1/L2)	Rate limit = 812 Duration = 120	Wurldtech	7.31x
	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	7.31x
	IP Grammar - Header Fields (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	7.31x
	IP Grammar - Fragmentation (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	7.31x
	IP Grammar - Options Fields (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	7.31x
	ICMP Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120	Wurldtech	7.31x
	ICMP Grammar (L1)	First subtest = First in set Last subtest = Last in set	Wurldtech	7.31x
	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	7.31x
	TCP Scan Robustness (L1/L2)	Scan mode = TCP SYN scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	7.31x
	TCP Scan Robustness (L1/L2)	Scan mode = TCP ACK scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	7.31x
	TCP Scan Robustness (L1/L2)	Scan mode = TCP FIN scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	7.31x
	TCP Scan Robustness (L1/L2)	Scan mode = TCP connect scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	7.31x
	TCP Scan Robustness (L1/L2)	Scan mode = TCP null scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	7.31x
	TCP Scan Robustness (L1/L2)	Scan mode = TCP XMAS scan Destination TCP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	7.31x

No.	Test case	Parameter values	Issuer	UR firmware passed
	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	7.31x
	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	7.31x
	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	7.31x
	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	7.31x
	TCP Grammar (L1)	Destination TCP port = First open port First subtest = First in set Last subtest = Last in set	Wurldtech	7.31x
	UDP Scan Robustness (L1/L2)	Destination UDP ports = Use open ports from discovery, use neighboring closed ports	Wurldtech	7.31x
	UDP Unicast Storm (L1/L2)	Packet length = 60 Rate limit: (Dos search mode: Interval = 10, Start = 10, End = 10) Duration = 120	Wurldtech	7.31x
	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	7.31x
	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	7.31x

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	7.31x
	UDP Grammar (L1)	Destination UDP port = First open port First subtest = First in set Last subtest = Last in set	Wurldtech	7.31x

Phasor Measurement Units

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	7.23
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	7.23
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	7.23
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	7.23
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	7.23

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	7.23
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	7.23
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	7.23
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	7.23
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	7.23
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	7.23

Certificates

The following certificates are provided here:

- KEMA Type Test Certificate for UR 7.11
- KEMA IEC 61850 certificate for UR 7.10
- UL
- CE
- IEC 61000-4-18
- Achilles Level 1 security certificate for UR 7.31
- NIST certificate for Phasor Measurement Units for UR 7.23



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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Please note that this document has been issued for information purposes only, and that the original bound and sealed paper copy of the Certificate including the results of the tests of the apparatus will prevail. This document does not imply that KEMA has certified or approved any apparatus other than the specimen tested.



Experience
you can trust.

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	
Clearage 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)



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 ACSI 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".

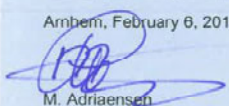
The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases):

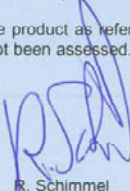
1 Basic Exchange (21/24)	12a Direct Control (6/12)
2 Data Sets (3/6)	12b SBO Control (8/14)
4 Setting Group Selection (2/3)	12c Enhanced Direct Control (6/13)
5 Unbuffered Reporting (15/19)	12d Enhanced SBO Control (11/19)
6 Buffered Reporting (18/21)	13 Time Synchronization (4/5)
9a GOOSE Publish (9/13)	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.
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T +31 26 356 20 25 F +31 26 351 36 83 sales@kema.com www.kema.com



Applicable Test Procedures from the UCA International Users Group Device Test Procedures version 2.3 with TPCL version 1.5

Conformance Block	Mandatory	Conditional
1: Basic Exchange	Ass1, Ass2, Ass3, AssN2, AssN3, AssN4, AssN5 Srv1, Srv2, Srv3, Srv4, Srv5, SrvN1abcd, SrvN4	Srv6, Srv7, Srv8, SrvN1e, SrvN1f, SrvN2, SrvN3
2: Data Sets	Dset1, Dset10a, DsetN1ae	
4: Setting Group Selection	Sg1, SgN1a	
5: Unbuffered Reporting	Rp1, Rp2, Rp3, Rp4, Rp7, Rp10, Rp12 RpN1, RpN2, RpN3, RpN4	Rp5, Rp8, RpN5, RpN6
6: Buffered Reporting	Br1, Br2, Br3, Br4, Br7, Br8, Br9, Br12, Br14 BrN1, BrN2, BrN3, BrN4, BrN5	Br5, Br10, Br11, BrN6
9a: GOOSE publish	Gop2, Gop3, Gop4, Gop7, Gop10a	Gop1, Gop5, Gop6, GopN1
9b: GOOSE subscribe	Gos1a, Gos2, Gos3, GosN1, GosN2, GosN3, GosN4, GosN5, GosN6	Gos1b
12a: Direct control	CtlN3, CtlN8 DOs1, DOs3	Ctl7, CtlN11
12b: SBO control	Ctl3, CtlN1, CtlN2, CtlN3, CtlN4, SBOs2	Ctl7, CtlN11
12c: Enhanced Direct Control	CtlN3, CtlN8 DOes2, DOes5	Ctl7, CtlN11
12d: Enhanced SBO control	Ctl3, CtlN1, CtlN2, CtlN3, CtlN4, CtlN9 SBOes1, SBOes2, SBOes3	Ctl7, CtlN11
13: Time sync	Tm1, Tm2, TmN1	Tm3
14: File transfer	Ft1, Ft2ab, Ft4, FtN1ab	

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

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 AUXILIARY DEVICES
representative samples of 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

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at www.ul.com/contactus



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:



Issued Date: 13-FEB-20144

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




EC Declaration of Conformity Appendix

Declaration No.

MAR-DOC-C-05FEB14-1

CE 14

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



VERIFICATION CERTIFICATE



NOT TRANSFERABLE

This Verification Certificate is hereby issued to the named GRANTEE and is VALID ONLY for the equipment identified hereon for use under the rules and regulations listed below:

GRANTEE: GE Digital Energy Multilin
Address: 650 Markland Str.
 Markham ON
 Canada L6C 0M1
Contact Person: Mr. Vincent M. Raponi
 Phone #: 905-927-5089
 Email Address: vincent.raponi@ge.com

Equipment Type: Measuring relays and protection equipment
Product Name: UR Universal Relay
Model Name or Number: F60-T03-HKH-F8F-H6L-M8Z-P4L-U4A-W77

APPLICABLE STANDARD: **Fast Damped Oscillatory wave test of IEC 61000-4-18, Electromagnetic Compatibility Requirements, Part 18: Testing and measurement techniques - Damped oscillatory wave immunity test**

SEVERITY & CRITERIA MET:

DESCRIPTION	SEVERITY LEVEL APPLIED	PERFORMANCE CRITERIA
Fast damped oscillatory wave immunity test (3 MHz, 10 MHz and 30 MHz)	▪ ± 4 kV Common mode	B

Note(s):

- Test methods employed conform to the following General Test Procedures:
 - UltraTech's Standard Operating Procedures.
 - International Standard IEC 61000-4-18: 2006+A1:2010(Edition 1.1 2011-03)
- See attached report, UltraTech's File No.: 15MTL233_IEC61000-4-18 dated January 28, 2015 for details and conditions of Verification Compliance.

Approved by: Victor H. Kee, P.Eng.
V.P.

UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4
 Tel.: (905) 829-1570 Fax.: (905) 829-8050
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91038



1309



46390-2049

NVLAP LAB
CODE 200093-0SL2-IN-E-
1119RKorea
CA2049

TL363_B

TPTDP
DA1300

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. TM -2011, and IEEE Std C37.118.1a TM -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