



**RTECH-PHOTOMETRY LABORATORY**

Testreport : Measurement of luminous intensity distribution related to the standard
NBN-EN 13032-1; NBN-EN 13032-4; CIE 121-1996; CIE S 025/E; IES LM-79-08 and procedures PT-P-01
and PT-P-02

rue de Mons, 3 B-4000 LIEGE - Tel : 04/224.71.40 - Fax : 04/224.25.90
Measurement for Schröder group.

LED

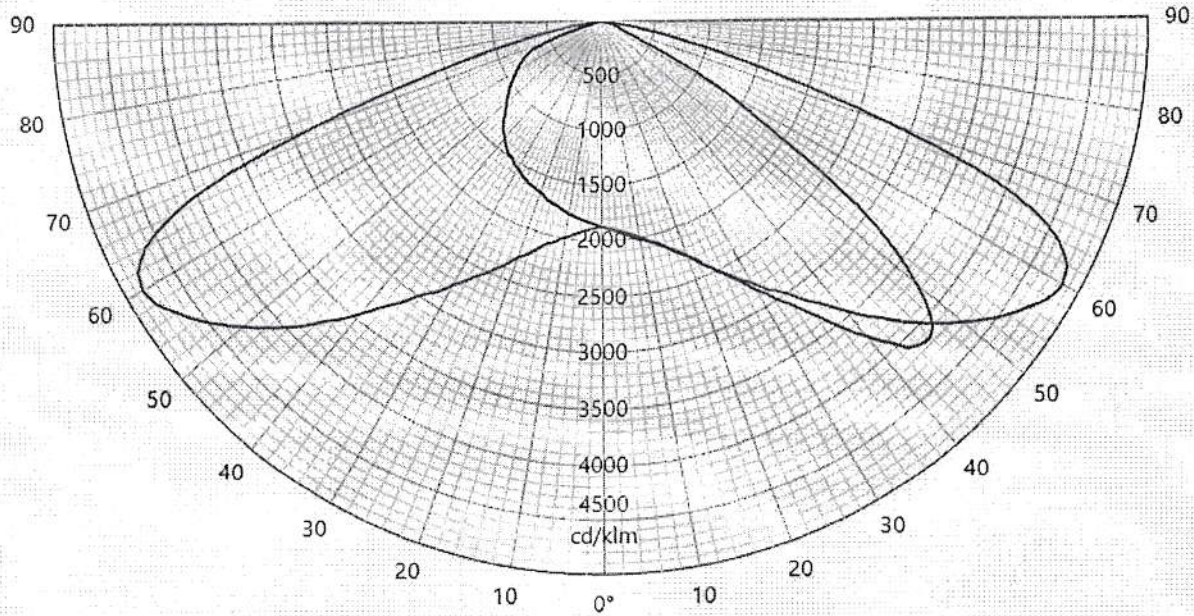
Origin Schröder TOV	Production Schröder TOV	Luminaire IZYLUM 3	Inclination 0°	Request # FD40015
Source				
Type LED	BIN RB	Trademark Samsung	Reference LH351C	# LEDs 60
Reflector No	Schreder Led assembly Wide Assembled 0,0°			5308
Protector Refractor Lens				
Protector Lens	Glass Extra Clear Flat Smooth Vossloh-Schwabe 5308 PMMA			
Laboratory observation				
IZYLUM 3 with 60 LH351C Neutral White (740) bin RB Used flux for efficiency matrix calculation = 11438 lm - CCT = 3930 K - CRI = 73,05 (see sphere test report 2019/813 to 815 on appendix).				
Purpose DOC	Sample date 10-12-2019		Sample # 39R270	
Observation				
DOC IZYLUM 3 with lenses 5308 Flux coefficient multiplicator (only for efficiency matrix): From 350 to 200 mA : 0,599 From 350 to 500 mA : 1,349 From 350 to 700 mA : 1,754 Fixture powered with driver Philips XiFP 110W 0,2-0,7A SNLDAE 230V C133 SxT for matrix @200/350/500mA Fixture powered with driver Philips XiFP 150W 0,2-0,7A SNLDAE 230V S240 SxT for matrix @700mA				
Notes				
The publication of this report in another form than the original one is not allowed without agreement of the laboratory. This report concerns type tests on one or a series of specimens. All information but the measurements results are provided by the customer.				

Asked by RCA	Measured by KDE	Approved by RLABO	Appendix 1	  226-TEST NBN EN ISO/IEC 17025 :2017	44785
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LUMINOUS INTENSITY DIAGRAM

Origin Schröder TOV		Production Schröder TOV		Luminaire IZYLUM 3		Inclination 0°		Request # FD40015		
Source		Type LED	BIN RB	Trademark Samsung		Reference LH351C	# LEDs 60	Reflector 5308		
Reflector		Schröder Led assembly Wide Assembled 0,0°					No	5308		
Matrices		447851 Φ 0-90° = 9693lm - 90-180° = 0lm					Absolute measurement			
Protector Refractor Lens		Protector Glass Extra Clear Flat Smooth - IZYLUM 3 Lens 60 x Vossloh-Schwabe 5308 PMMA								
Observation		<p>Matrix in total flux @350 mA</p> <p>Light losses due to thermal stabilization: 2,8 %</p> <p>Electrical measurement on LED (#1): Voltage = 166,76 V Current = 0,351 A Power = 58,58 W</p> <p>Electrical measurement on driver (#1): Voltage = 230,00 V Current = 0,283 A Power = 64,44 W PF = 0,987</p> <p>Total luminaire power = 64,44 W : Lm/Watt = 150,42 lm/W</p> <p>Driver #1 : See observations for driver details - , PCBA 00-84-624B</p>								

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
30 - 150	4838	60	S	1870	25,3°	28-01-2020	
90	4151	46	D				
270	1870	0	G				

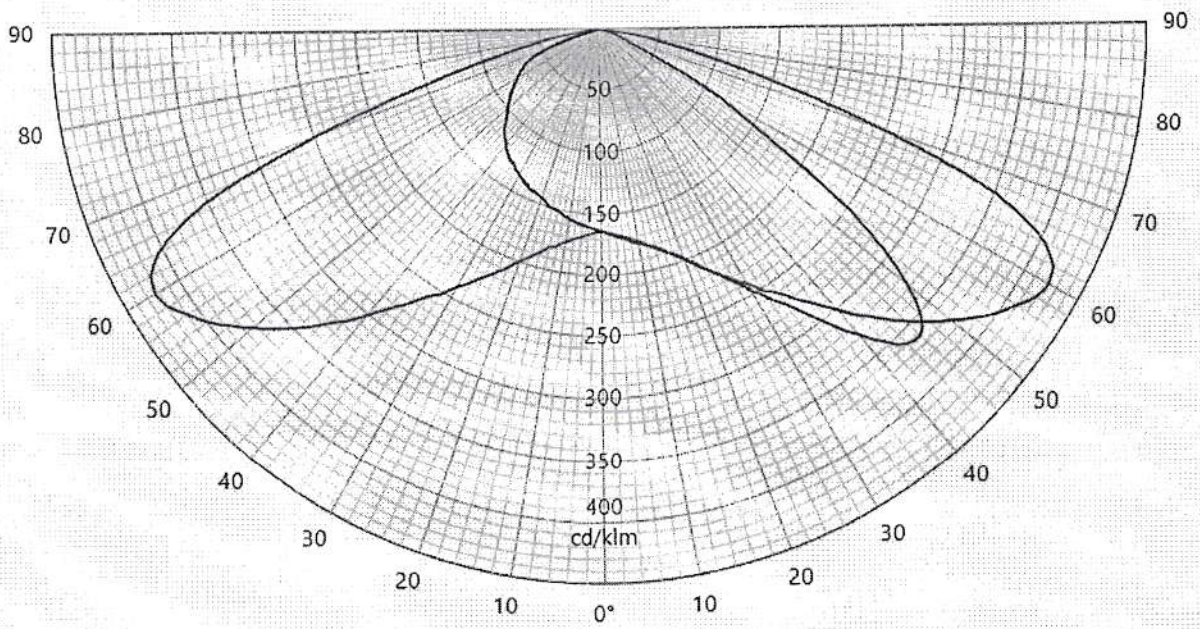


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LUMINOUS INTENSITY DIAGRAM

Origin Schröder TOV		Production Schröder TOV		Luminaire IZYLUM 3		Inclination 0°	Request # FD40015
Source	Type LED	BIN RB	Trademark Samsung	Reference LH351C	# LEDs 60	Reflector 5308	
Reflector	Schröder Led assembly Wide Assembled 0,0°					No	5308
Matrices	447852	η 0-90° = 84,7% - 90-180° = 0,0%				Relative measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - IZYLUM 3 Lens 60 x Vossloh-Schwabe 5308 PMMA						
Observation	Matrix in efficiency @350 mA Light losses due to thermal stabilization: 2,8 % Electrical measurement on LED (#1): Voltage = 166,76 V Current = 0,351 A Power = 58,58 W Electrical measurement on driver (#1): Voltage = 230,00 V Current = 0,283 A Power = 64,44 W PF = 0,987 <p style="text-align: right;">Total luminaire power = 64,44 W</p> Driver #1 : See observations for driver details - , PCBA 00-84-624B						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
30 - 150	423	60	S				
90	363	46	D				
270	163	0	G	163	25,3°	28-01-2020	

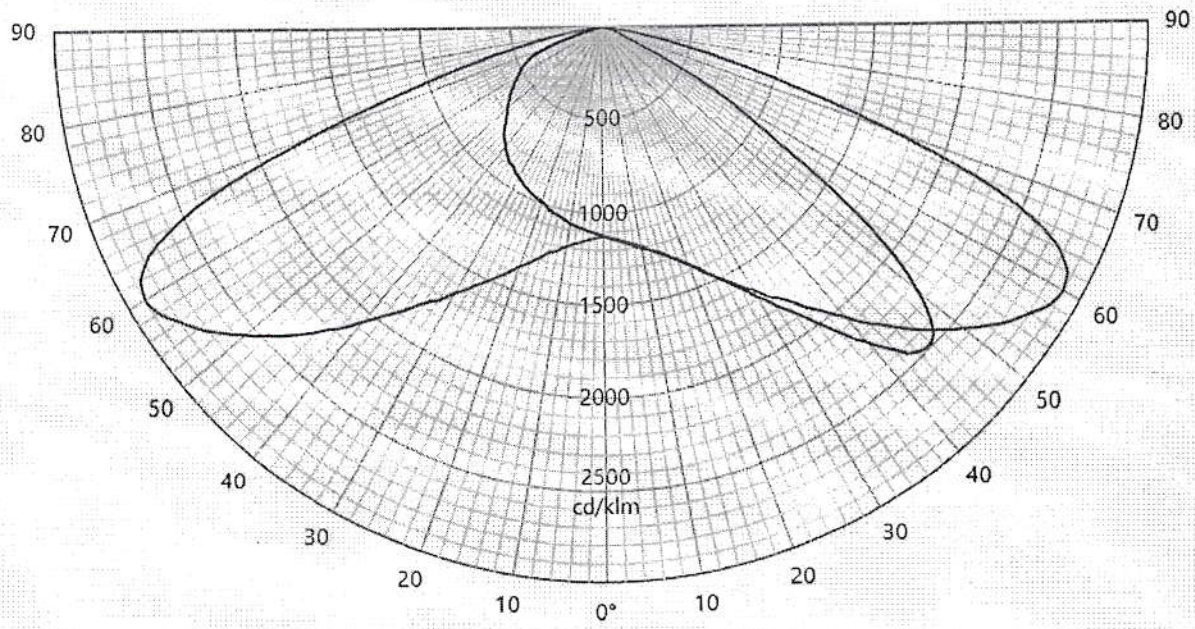


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LUMINOUS INTENSITY DIAGRAM

Origin Schröder TOV		Production Schröder TOV		Luminaire IZYLUM 3		Inclination 0°	Request # FD40015
Source	Type LED	BIN RB	Trademark Samsung	Reference LH351C	# LEDs 60	Reflector 5308	
Reflector	Schröder Led assembly Wide Assembled 0,0°					No	5308
Matrices	447853	Φ 0-90° = 5806lm - 90-180° = 0lm				Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - IZYLUM 3 Lens 60 x Vossloh-Schwabe 5308 PMMA						
Observation	<p>Matrix in total flux @200 mA</p> <p>Light losses due to thermal stabilization: 1.4 %</p> <p>Electrical measurement on LED (#1): Voltage = 163,45 V Current = 0,200 A Power = 32,73 W</p> <p>Electrical measurement on driver (#1): Voltage = 230,00 V Current = 0,168 A Power = 37,66 W PF = 0,971</p> <p>Total luminaire power = 37,66 W : Lm/Watt = 154,17 lm/W</p> <p>Driver #1 : See observations for driver details - , PCBA 00-84-624B</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
30 - 150	2898	60	S	1120	25,3°	28-01-2020	
90	2486	46	D				
270	1120	0	G				

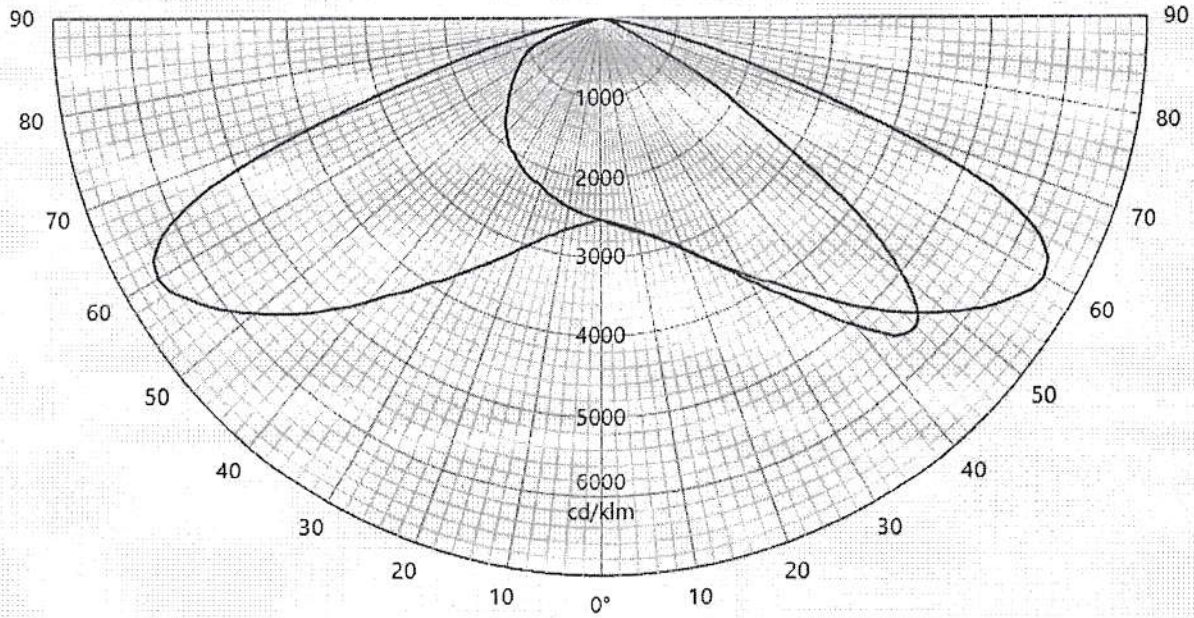


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LUMINOUS INTENSITY DIAGRAM

Origin Schröder TOV		Production Schröder TOV		Luminaire IZYLUM 3		Inclination 0°		Request # FD40015	
Source	Type LED	BIN RB	Trademark Samsung	Reference LH351C	# LEDs 60	Reflector 5308			
Reflector	Schröder Led assembly Wide Assembled 0,0°					No		5308	
Matrices	447854		Φ 0-90° = 13076lm - 90-180° = 0lm			Absolute measurement			
Protector Refractor Lens	Protector: Glass Extra Clear Flat Smooth - IZYLUM 3 Lens: 60 x Vossloh-Schwabe 5308 PMMA								
Observation	<p>Matrix in total flux @500 mA</p> <p>Light losses due to thermal stabilization: 4,2 %</p> <p>Electrical measurement on LED (#1): Voltage = 169,17 V Current = 0,500 A Power = 84,65 W</p> <p>Electrical measurement on driver (#1): Voltage = 230,00 V Current = 0,401 A Power = 91,72 W PF = 0,991</p> <p>Total luminaire power = 91,72 W : Lm/Watt = 142,56 lm/W</p> <p>Driver #1 : See observations for driver details - , PCBA 00-84-624B</p>								

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
30 - 150	6527	60	S	2522	25,3°	28-01-2020	
90	5599	46	D				
270	2522	0	G				

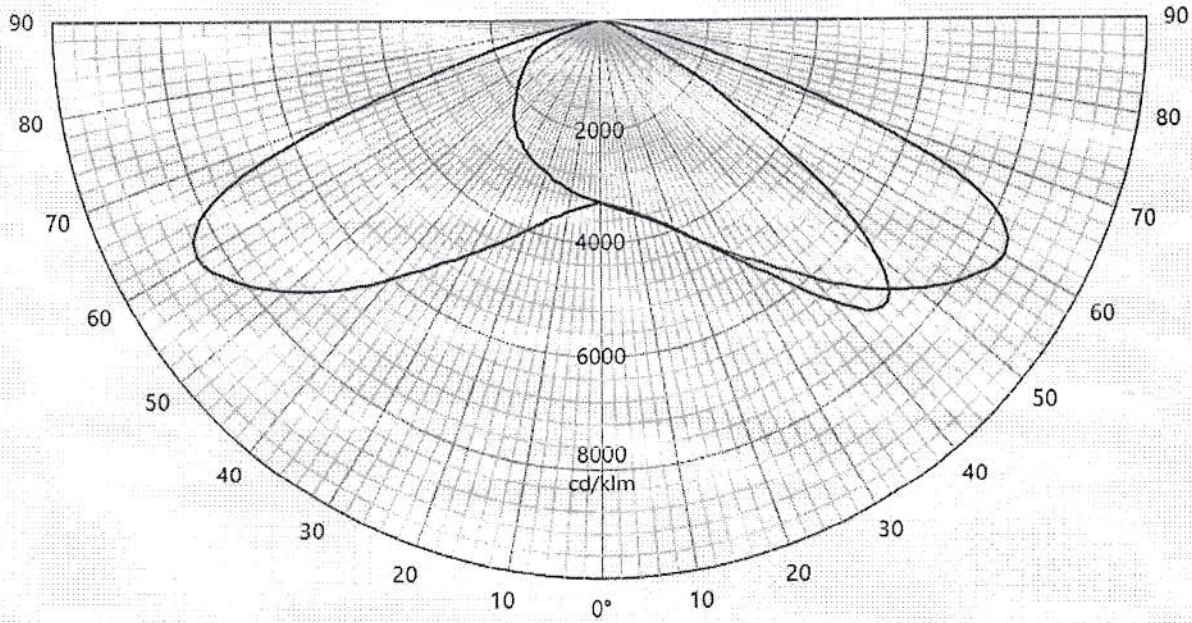


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LUMINOUS INTENSITY DIAGRAM

Origin Schröder TOV		Production Schröder TOV		Luminaire IZYLUM 3		Inclination 0°		Request # FD40015	
Source	Type LED	BIN RB	Trademark Samsung	Reference LH351C	# LEDs 60	Reflector 5308			
Reflector	Schröder Led assembly Wide Assembled 0,0°					No	5308		
Matrices	447855	Φ 0-90° = 17002lm - 90-180° = 0lm				Absolute measurement			
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - IZYLUM 3 Lens 60 x Vossloh-Schwabe 5308 PMMA								
Observation	<p>Matrix in total flux @700 mA</p> <p>Light losses due to thermal stabilization: 6,3 %</p> <p>Electrical measurement on LED (#1): Voltage = 171,78 V Current = 0,700 A Power = 120,33 W</p> <p>Electrical measurement on driver (#1): Voltage = 230,00 V Current = 0,573 A Power = 131,20 W PF = 0,993</p> <p>Total luminaire power = 131,20 W : Lm/Watt = 129,59 lm/W</p> <p>Driver #1 : See observations for driver details - , PCBA 00-84-624B</p>								

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
30 - 150	8486	60	S	3279	25,3°	28-01-2020	
90	7280	46	D				
270	3279	0	G				



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INFORMATION

Measurement fulfil Standards:

NBN-EN 13032-1
NBN-EN 13032-4
NBN-EN 17025:2017
CIE 121-1996
LM79-08
CIE S 025

Measurement quantities measured:

Light distribution in relative or absolute photometry
Led alone cold lumen package
Led CCT and CRI
Power consumption of the fitting
Lm/watt

Electrical measurement, if not specified:

Primary values are AC with 50Hz frequency
Secondary values on SSL are DC

CCT, CRI and chromaticity coordinates: are measured in Ulbricht sphere.
If specified Main test report refer to sphere extra test report.

Light distribution are measured on gonio. If not otherwise specified, measurement is done at 50 Hz

Number of hours operated prior to measurement: if not otherwise specified, 0 hours (no aging).

Stabilization time: If not otherwise specified, a minimal stabilization time of 0.5 hour is applied; and measurement will start when it exists no more variation above 0.5% in 15 minutes

Total operating time of the product including stabilization:
45 minutes have to be added by measurement.
Minimal operating time is 75 minutes

Luminous intensity distribution: available on electronic file with
.mat format (internal Schröder format)
.ldt format (European standard)
.IES format (American standard)

Statement of uncertainties (K=2, 95% of confidence level):
Uncertainties calculated based on a typical Schröder fitting and PCBA

Intensity measurement: +/- 3%
Angle: +/- 0.5°
Flux: +/- 2.5%
Electrical DC
Power: +/- 0.25%
Voltage: +/- 0.15%
Current: +/- 0.15%
Electrical AC
Power: +/- 0.15%
Voltage: +/- 0.3%
Current: +/- 0.3%
Temperature: +/- 0.65%

ISP2000		JETI
CCT:	+/- 5%	+/-7.5%
CRI:	+/- 2%	+/-2.75%
x/y:	+/- 2%	+/-4.6%

lm/Watt: +/-3.5%

Measuring instruments in use:

Gonio 1

Type C with Moving mirror

Manufacturer: LMT Lichtmesstechnik GmbH Berlin, Helmholtzstrasse 9 10587 Berlin, Germany

Type: GO-DS 2000

Calibration: traceable to PTB (Physikalisch-Technische Bundesanstalt D-Braunschweig) and METAS (Federal Institute of Metrology, CH-Bern)

Photometric test distance: By default 10 meter, on request 30 meter.

Gonio 2

Type C

Manufacturer: Technoteam Bildverarbeitung, Werner-von-Siemens-Strasse 5 98693 Ilmenau, Germany

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Photometric test distance: Near Field

Sphere n°1

4p geometry

Manufacturer: LMT Lichtmesstechnik GmbH, Helmholtzstrasse 9 10587 Berlin, Germany

Type: UL2000 + U1000 V-Lambda photometer

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Sphere n°2

4p geometry

Manufacturer: Instrument Systems GmbH, Neumarkter Str. 83, 81673 Muenchen, Germany

Type: ISP2000 + Spectroradiometer CAS120 and CAS140

Calibration: traceable to NIST

Colorimetric portable spectroradiometer

Manufacturer: JETI Technische Instrumente GmbH, Tatzendpromenade 2 07745 Jena

Type: SPECBOS 1201

Calibration: traceable to NIST

Multimeters

Manufacturer: Agilent

Type: 34401A

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Wattmeters

Manufacturer: Yokogawa

Type: WT210 and WT310

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Thermometers

Amarell Precision

Type: Liquid in glass N63833

Calibration: traceable to LBT (Laboratoire Belge de Thermométrie)

— End of test report —