Zakłady Badań i Atestacji "ZETOM"
im. Prof. F. Stauba w Katowicach sp. z o.o.
Institutions for Research and Certification "ZETOM" Ltd.
ul. Ks. Bpa H. Bednorza 17, 40-384 Katowice; tel. 32 256 92 57 e-mail: biuro@zetom.eu
Laboratorium Badawcze i Wzorcujące
Laboratorium badawcze akredytowane przez
Polskie Centrum Akredytacji, sygnatariusza porozumień EA MLA i ILAC MRA
dotyczących wzajemnego uznawania świadectw wzorcowania.
Nr akredytacji AB 024

AB 024

TEST REPORT

Ref. no. B/2023/24 dated 28/02/2023

Subject: Tests of the fixed lighting fixture model LED ALA2 600.

Tested for:	Furnika Sp. z o.o. [Limited Liability Partnership] Limited Partnership		
	48-200 Prudnik		
	Przemysłowa str. 11		
Tested at:	Institutes for Research and Certification "ZETOM" Katowice		
	Testing and Calibration Laboratory "ZETOM" Katowice		
Customer Order Index:	Order	dated:	10/01/2023
Laboratory Log Reference No. of Order: B/2023/10			
Test start date:	11/01/2023	**Test end date:**	28/02/2023
This Test Report contains: 24 pages			
3 copies hereof are issued to the following recipients:			
1.	Furnika Sp. z o.o. [Limited Liability Partnership] Limited Partnership		
2.	Furnika Sp. z o.o. [Limited Liability Partnership] Limited Partnership		
3.	LT		
Test supervisor:	Piotr Jureczko, MSc Eng.		
Tested and measured by:	Piotr Jureczko, MSc Eng.	Lab Section: WE	
	Kamil Długajczyk Eng.	Lab Section: WE	
Test Report prepared by:	Kamil Długajczyk Eng.		

Authorised by: **Approved by:**

Kierownik Pracowni Elektrotechnicznej
mgr inż. Piotr Jureczko

Zakłady Badań i Atestacji "ZETOM" im. Prof. F. Stauba ZETOM Katowice w Katowicach sp. z o.o.

DYREKTOR BADAŃ I WZORCOWAŃ
Tomasz Wacławczyk

Zakłady Badań i Atestacji „ZETOM”

im. Prof. F. Stauba w Katowicach sp. z o.o.

Institutions for Research and Certification “ZETOM” Ltd.

EU Notified Body no. 1436,

for the following Directives: Construction, Low Voltage & Machinery

ul. Ks. Bpa H. Bednorza 17; 40-384 Katowice, Poland

Phone: 0048(032) 2569-257, 0048(032) 2569-273, 0048(032) 2569-353

PROVISIONS

A. Obligatory:

1. The Test Report shall be property of the Customer who has ordered to have the test done.
2. The Test Report and all information contained therein shall only be used with the consent of the Test Report owner.
3. This Test Report shall only be used in full.
4. All test and measurement reports listed herein refer to the test objects only and shall not be construed as a quality approval thereof.
5. The work covered herein has been carried out according to its Work Plan and in line with the Management System requirements specified in the Testing and Calibration Laboratory Quality Manual.
6. All reference to this Test Report shall be made with the following statement (or its equivalent in meaning):

Tested by the Testing and Calibration Laboratory “ZETOM" in Katowice, a unit accredited by the Polish Centre for Accreditation seated in Warsaw within the scope of the Certificate No. AB 024 Annex.

B. Complementary (listed in this Test Report) Section

C. Anomalies (listed in this Test Report) Section

When using the contents of this Test Report, the owner hereof shall state that they use the results produced by the Testing and Calibration Laboratory at the Institutes for Research and Certification "ZETOM" in Katowice, accredited by the Polish Centre for Accreditation in Warsaw.

1. BASIS OF TESTING

1.1. Customer's document title: Order from Furnika Sp. z o.o. [Limited Liability Partnership] Limited Partnership for the test at the Testing and Calibration Laboratory "ZETOM" in Katowice

1.2. Customer's document identification: Order dated: 10/01/2023

1.3. Subject: Testing of compliance to essential requirements

2. TESTING OBJECTIVE

Control of properties and characteristics against reference standards and according to the Testing Program

3. TEST OBJECT

3.1. Object designation: Fixed luminaire model LED ALA2 600

3.2. Customer: Furnika Sp. z o.o. Limited Partnership, 48-200 Prudnik, Przemysłowa str. 11

3.3. Supplier/Manufacturer: Furnika Sp. z o.o. Limited Partnership, 48-200 Prudnik, Przemysłowa str. 11

3.4. Place of production: : Furnika Sp. z o.o. Limited Partnership, 48-200 Prudnik, Przemysłowa str. 11

3.5. Method of object delivery for testing: delivered by the Customer

3.6. Objects collected at: the Customer

3.7. Collect Report: -

3.8. Date of receiving the test objects: 10/01/2023

3.9. Collector's additional labelling applied: -

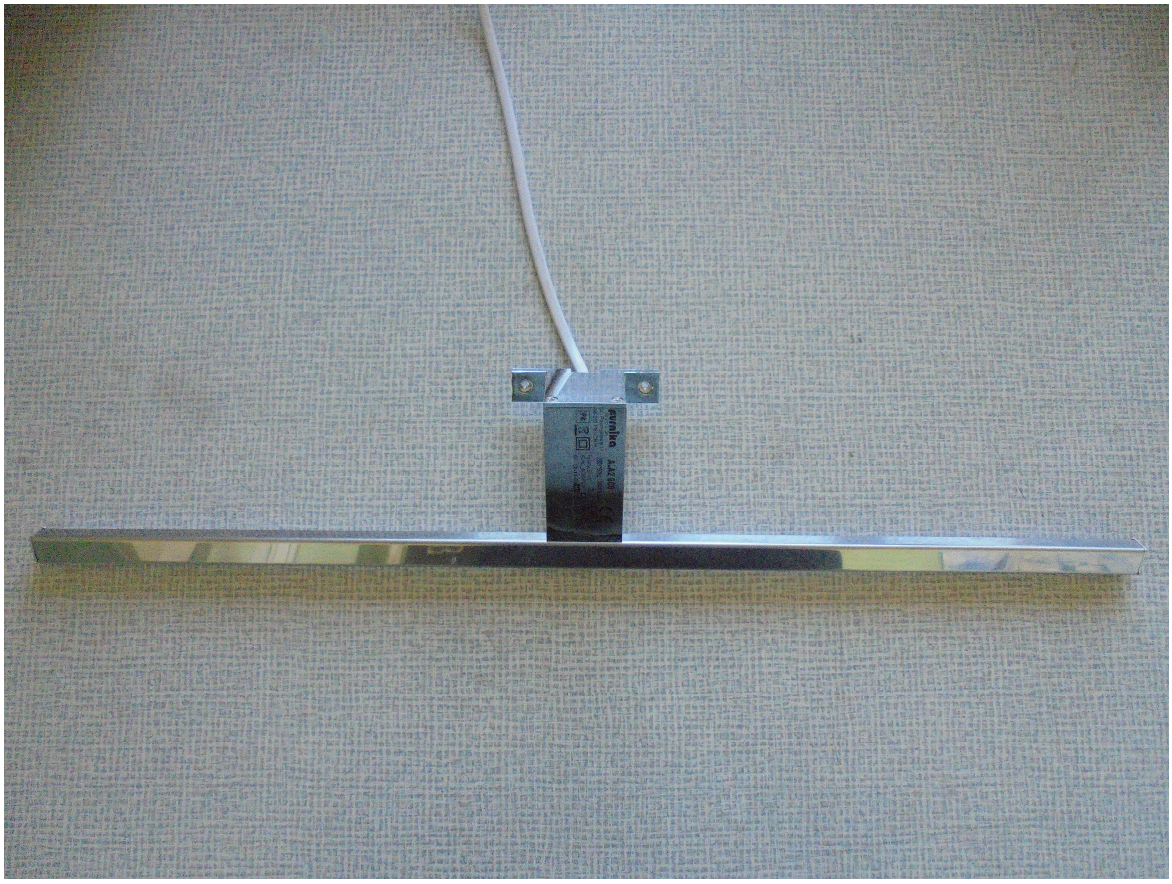
3.10. Object packaging: Cardboard box

3.11. In-laboratory labelling of objects:

Object labelling in prior of delivery to the Lab	Labelling of objects made at the Lab[1)]	Notes
Labelling	B/2023/10	———————
directly		
on the product		
(marking plate)		

[1)] Remains the Sample Index

Marking plate



Fixed luminaire model LED ALA2 600

4. TESTING PROGRAM

The Testing Program includes the testing's cope of the following reference standards:

- PN-EN 60598-1:2015-04+A1:2018-04+AC:2016-02 "Luminaires. Part 1: General requirements and tests" **(point. 4.20 and 4.24 verified outside the scope of accreditation)**
- PN-IEC 598-2-1:1994/Ap1:2000 „Luminaires. Special requirements. Fixed general purpose luminaires"

Possible evaluation results:
- test description not applicable to the test object ..... : **N** (A)
- test object meets the requirement ..... : **P** (ass)
- test object fails to meet the requirement ..... : **F** (ail)
- not within the scope of testing …… : **-** (-)

General remarks:
The numbers contained in the parentheses in the column refer to the Sections of PN-EN 60598-1.
"(See note #)" refers to notes appended herein.
"(See Annex #)" refers to Annexes appended herein.

The report refers to complete studies performed for:

Fixed luminaire model LED ALA2 600

Technical specifications:
Supply voltage: 230 V~
Rated mains frequency: 50 Hz
Max. power consumption: 5 W
Light source: LED
IP 44
Insulation class: II

This test report also applies to the luminaires of the range:

ALA 2 300 CW/NW/WW

ALA 2 400 CW/NW/WW

ALA 2 500 CW/NW/WW

ALA 2 600 CW/NW/WW

Alternative light sources used by the manufacturer in the luminaire in question:

- PD2835NWNA-PCT
- PD2835CWNA-PCT
- PD2835WWNA-PCT

5. MEASUREMENT EQUIPMENT

– Thermohygrometer	nr ident.9200014
– APPA 505 multimeter	nr ident.2500018
– APPA 305 multimeter	nr ident.2500009
– High-voltage apparatus	nr ident.2100047
– Digital thermometer	nr ident.3200064
– Digital thermometer	nr ident.3200063
– Pyrometer	nr ident.3200040
– Moisture chamber	nr ident.8920003
– Test hammer	nr ident.1005006
– Calliper	nr ident.0120027
– Force meter	nr ident.1001065
– Torque screwdriver	nr ident.1007004
– Torque screwdriver	nr ident.1007003
– Torque spanner	nr ident.1005021
– Torque spanner	nr ident.1005020
– Megohmmeter	nr ident.2700005
– Seconds meter	nr ident.4500001
– INSTEK GPT measuring device	nr ident.1005008
– Pressure testing apparatus	nr ident.1005000
– Laboratory dryer	nr ident.8910002
– Pendulum hammer	nr ident.1005005
– Draughtless chamber	nr ident.8920004
– Universal microscope	nr ident.0520011
– Ruler	nr ident.0110068
– Needle-flame test rig	
– Thermal loop test rig	
– Test site for leakage current	
– IP leakage test facility	

6. TEST DESCRIPTION AND RESULTS

6.1 Research done by the standards PN-IEC 598-2-1:1994/Ap1:2000

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
1.1 (0)	**SCOPE AND OBJECT**		
1.1 (0.2)	Other standards included ..... :	NO	-
1.4 (2)	**CLASSIFICATION**		
1.4 (2.2)	Appliance class ..... :	II	-
	rated voltage over 250 V (not for Class 0)	230 V	-
1.4 (2.3)	Ingress protection rating ..... :	IP44	-
1.4 (2.4)	Installation on a flammable substrate .... :	YES	-
1.4 (2.5)	Classification depending on the conditions of use	Luminaire for normal use	-
1.5 (3)	**MARKING**		
1.5 (3.2)	Obligatory marking		P
	- marking location		P
	- symbol / text character size		P
1.5 (3.2.1)	The mark of origin		P
1.5 (3.2.2)	Voltage rating in volts.		P
	Where marking is provided in accordance with 3.2.25 or 3.2.26, additional marking of the rated voltage is not required.		N
1.5 (3.2.3)	The rated maximum ambient temperature ta if different than 25 °C	t_a= 45 °C	P
1.5 (3.2.4)	Symbol of class II lighting fixtures		P
1.5 (3.2.5)	The symbol of class III lighting fixtures		N
1.5 (3.2.6)	Marking with IP numbers of the degree of protection against penetration of dust, solids and moisture.		P
1.5 (3.2.7)	Model number or type designation		P
1.5 (3.2.8)	Maximum power of light source or maximum power input…		P
1.5 (3.2.8.1)	Luminaires for tungsten filament lamps shall be marked with the maximum rated wattage and number of lamps		N
1.5 (3.2.8.2)	Luminaires designed for non-replaceable or non-user replaceable light sources shall be marked with the rated input power of the luminaire.		N
1.5 (3.2.8.3)	Forr all other luminaires, the rated wattage of the lamp or the designation as indicated …		N
1.5 (3.2.9)	Symbol for luminaires unsuitable for mounting directly on normally flammable surfaces		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
1.5 (3.2.10)	Information on special lamps		N
1.5 (3.2.11)	Symbol for luminaires for lamps of a "cold beam" shape		N
1.5 (3.2.12)	Marking of phase, neutral and earthing conductor		P
	Marking of the earthing terminal in class II luminaires		N
1.5 (3.2.13)	The minimum distance from illuminated objects		N
1.5 (3.2.14)	Symbol for luminaires for difficult working conditions		N
1.5 (3.2.15)	Symbol for lighting fittings intended for use with lamps with a reflecting dome		N
1.5 (3.2.16)	Luminaires with protective screens ...		N
1.5 (3.2.17)	The maximum number of lighting fixtures that can be connected to each other ...		N
1.5 (3.2.18)	Symbol or warning in the case of luminaires with impulse starters ...		N
1.5 (3.2.19)	Symbol for luminaires that are designed for use with self-shielding halogen or metal halide bulbs		N
1.5 (3.2.20)	Determining the means of setting, where they are not obvious		N
1.5 (3.2.21)	Symbol in the case of luminaires unsuitable for covering with thermal insulation materials		N
1.5 (3.2.22)	Symbol for luminaires with internal replaceable fuses		N
1.5 (3.2.23)	Warning symbol “Do not stare at the operating light source” for portable and handheld luminaries …		N
1.5 (3.2.24)	Covers fixed, over non-user replaceable light sources shall be marked ‘caution, risk of electric shock’		N
1.5 (3.2.25)	Rated constant input voltage when a luminaire is operated from a constant voltage controlgear not provided with the luminaire		N
1.5 (3.2.26)	Rated constant input current when the luminaire is operated from a constant current controlgear not provided with the luminaire. Luminaires supplied with constant current…		N
1.5 (3.3)	Supplementary information		P
	- completeness of information		P
1.5 (3.3.1)	Combination luminaires		N
1.5 (3.3.2)	Rated frequency	50 Hz	P
	Operating temperature		N
1.5 (3.3.4)	Warning		-
1.5 (3.3.5)	Connection diagram		P

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
1.5 (3.3.6)	Special requirements		N
1.5 (3.3.7)	Metal hallide light source luminaires		N
1.5 (3.3.8)	Lamp use limits		N
1.5 (3.3.9)	Power factor and supply current		N
1.5 (3.3.10)	Intended for indoor use		P
1.5 (3.3.11)	Lamp types compatible with the luminaire design		N
1.5 (3.3.12)	Warning for luminaires with clip mounting		N
1.5 (3.3.13)	Specification of protective guards		N
1.5 (3.3.14)	Power supply type symbol	~	P
1.5 (3.3.15)	Manufacturer's declared current value		N
1.5 (3.3.16)	Information about heavy duty luminaires		N
1.5 (3.3.17)	Installation instructions for luminaires with type X, Y or Z mounting		N
1.5 (3.3.18)	Notice		N
1.5 (3.3.19)	For luminaires which generate wiring current at …		N
1.5 (3.3.20)	Wall-mounted and adjustable luminaires not intended for ...		N
1.5 (3.3.21)	Luminaires with non replaceable and non-user replaceable light source, the instruction sheet shall contain …		
	- replace of the light source when the light source reaches its end		P
	- replace of the light source by the manufacturer, or a qualified person		N
1.5 (3.3.22)	Controllable luminaires		N
1.5 (3.3.23)	Luminaires delivered without controlgear shall be provided with the necessary information for the selection of the appropriate component…		N
1.5 (3.3.24)	Where the terminal block in not supplied with the luminaire, the packaging shall contain the following wording		N
1.5 (3.3.101)	The package contains text		P
1.5 (3.4)	Marking check		P
	Water test		P
	Petroleum solvent test		P
	- legibility after testing		P
	- adhesion of label stickers		P
1.6 (4)	**CONSTRUCTION**		
1.6 (4.2)	Easily replaceable parts		N
1.6 (4.3)	Wire routing		P
1.6 (4.4)	Lampholders		

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
1.6 (4.4.1)	Integrated holders		N
1.6 (4.4.2)	Wiring connection in integrated holders		N
1.6 (4.4.3)	Luminaires for light line installation		N
1.6 (4.4.4)	Location and mounting of holders		N
1.6 (4.4.5)	Voltage pulse value		N
1.6 (4.4.6)	Connection with the middle contact		N
1.6 (4.4.7)	Holder and plug insulation elements used in heavy duty luminaires		N
1.6 (4.4.8)	Lamp connectors		N
1.6 (4.4.9)	Do not use handles or plinths tube originally intended ...		N
1.6 (4.4.10)	Not allowed to use light sources ...		N
1.6 (4.5)	Glow starter holders		N
	Glow starter holders for luminaires outside Appliance Class II		N
	Glow starter holders for luminaires Appliance Class II		N
1.6 (4.6)	Clamp connectors		
	Adequate clearance		P
	Loose connectors		P
1.6 (4.7)	Power supply terminals and connection		
1.6 (4.7.1)	Access to metallic parts		N
1.6 (4.7.2)	Connection of multi-wire leads		P
	Live 8 mm wire test		P
	Earthing 8 mm wire test		N
1.6 (4.7.3)	Power supply wire terminals		P
1.6 (4.7.3.1)	Soldering method and material		P
1.6 (4.7.4)	Terminals not designed for power supply wires		N
1.6 (4.7.5)	Heat-resistant wires / boots		N
1.6 (4.7.6)	Multi-pin plugs and sockets		N
1.6 (4.8)	Connectors:		
	- proper rating data		N
	- proper installation method		N
	- proper polarity		N
1.6 (4.9)	Insulation lining and boots		
1.6 (4.9.1)	Durability of mounting		N
	Mounting method ..... :		N
1.6 (4.9.2)	Insulation lining and boots		
	a) & c) Insulation resistance and electric strength		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	b) Ageing, temperature (°C)		N
1.6 (4.10)	Double and toughened insulation (Appliance Class II luminaires)		
1.6 (4.10.1)	Effectiveness of protection against contact of accessible metallic parts with wires in basic insulation		P
	Safety following luminaire installation		N
	Interference suppression capacitors		N
1.6 (4.10.2)	Installation connections:		
	- open gaps in insulation		P
	- no direct access		N
1.6 (4.10.3)	Insulation mounting firmness:		
	- mounting		P
	- impossible to remove / damaged luminaire /		P
	- boots firmly mounted		N
	- linings and boots engaged in holders		N
1.6 (4.10.4)	Bridging of the accessible conductive parts		N
1.6 (4.11)	Electrical connections and live parts		
1.6 (4.11.1)	Pressure from contacts		P
1.6 (4.11.2)	Bolts or screws:		
	- self-tapping screws for sheets		N
	- self-tapping piercing screws		N
	- earthing line continuity		N
1.6 (4.11.3)	Bolt and screw tightening security:		
	- spring washer		N
	- rivets		N
1.6 (4.11.4)	Live part material		P
1.6 (4.11.5)	Live parts must not be in direct contact with wood		P
1.6 (4.11.6)	Electromechanical connection system		N
1.6 (4.12)	Screws and (mechanical) connections and glands.		
1.6 (4.12.1)	Mechanical loads		P
	Not made of soft materials		P
	Screws made of insulating materials		N
	Bolt (screw) tightening test (Nm)	0,5 Nm	P
	Bolt (screw) tightening test (Nm)		N
1.6 (4.12.2)	Screws with diameter < 3 mm		N
1.6 (4.12.3)	Not applicable		-
1.6 (4.12.4)	Security of connections:		
	- arms and tubes; torque (Nm) ..... :		N
	- holders; torque (Nm) ..... :		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	- push-button switches; torque (Nm) …….. :		N
1.6 (4.12.5)	Threaded glands; force (N) ..... :		N
1.6 (4.13)	Mechanical endurance		
1.6 (4.13.1)	Impact strength		
	- brittle parts; energy (Nm) ..... :	0,2 Nm	P
	- other parts; energy (Nm) ..... :	0.35 Nm	P
	1) Live parts		P
	2) Lining		N
	3) Safeties		N
	4) Guards		P
1.6 (4.13.2)	Metal parts protecting live parts…		N
1.6 (4.13.3)	Rigid finger test		N
1.6 (4.13.4)	Heavy duty luminaires		N
1.6 (4.13.5)	Not applicable		-
1.6 (4.13.6)	Drum test		N
1.6 (4.14)	Suspensions and control equipment		
1.6 (4.14.1)	Mechanical loads		
	A) Loading with quadrupled weight	1,0 kg	P
	B) Torque moment		N
	C) Rigid console; force (N) ..... :		N
	D) Luminaires for busbars		N
	E) Luminaires with clip mounting ledge thickness (mm) ..... :		N
	Metal rod; diameter (mm) ..... :		N
1.6 (4.14.2)	Load on flexible wires		N
	Weight (kg) ..... :		N
	Strain in wire (N/mm^2) ..... :		N
	Adapters; weight (kg) ..... :		N
	Adapters; bending moment (Nm) ..... :		N
	Mounting instructions with all necessary information for more than one flexible cord/cable		N
1.6 (4.14.3)	Setting equipment:		
	- switching test; number of cycles ..... :		N
	- damaged wires		N
	- electric strength test	(see Section 10.2)	N
1.6 (4.14.4)	Telescopic tubes; wiring not mounted to tubes; no strain reliefs at the terminals		N
1.6 (4.14.5)	Guiding rolls		N
1.6 (4.14.6)	Load on the plug-in socket		N
1.6 (4.15)	Flammable materials		

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	- glowing wire test at 650°C		P
	- distance ≥ 30 mm		N
	- test-resistant screen acc. to Section 13.3.1		N
	- screen size		N
	- no violently burning materials present		P
	- thermal protection		N
	- thermal sensors		N
1.6 (4.15.2)	Luminaires made of thermoplastics:		
	a) Structure		N
	b) Temperature sensors		N
	c) Surface temperature		N
1.6 (4.16)	Luminaires intended for installation on normally flammable substrates		
	Driver or transformer	(acc. to Section 12)	N
1.6 (4.16.1)	Distance from driver or transformer		
	- distance of 35 mm		N
	- distance of 10 mm		P
1.6 (4.16.2)	Thermal protection:		
	- within the driver or transformer		N
	- external		N
	- fixed in a steady position		N
	- electronic driver or transformer		N
1.6 (4.16.3)	If the luminaire fails to meet the requirements ...	(See Section 12.6)	N
1.6 (4.17)	Drainage holes		N
	Minimum spacing: 5 mm		N
1.6 (4.18)	Corrosion resistance:		
1.6 (4.18.1)	- resistance to rust		P
1.6 (4.18.2)	- ageing of copper		N
1.6 (4.18.3)	- parts made of aluminium or aluminium alloys		P
1.6 (4.19)	Pulse starters		N
1.6 **(4.20)**	**Heavy duty luminaires: vibration ..... :**		**N**
1.6 (4.21)	Protective guards (halogen light sources):		
1.6 (4.21.1)	- protective guard mounting		N
1.6 (4.21.2)	Lamp chamber designed as such		N
1.6 (4.21.3)	Hole size		N
1.6 (4.21.4)	- impact strength		N
	- flame resistance		N
1.6 (4.22)	No elements mounted on the light source		P
1.6 (4.23)	Slave luminaires		N
1.6 (4.24)	**Photobiological hazards**		

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
1.6 (4.24.1)	**UV radiation (tungsten halogen lamps)**		**N**
1.6 (4.24.2)	**Light sources with blue light risk**	**TÜV Rheinland REPORT 50194928 001 19/03/2019**	**P**
	Luminairies having a threshold illuminance E_{thr}		
	- for fixed mounted luminaires	**RG0**	**P**
	- portable and handheld luminaires		**N**
	- portable luminaries for children		**N**
1.6 (4.25)	Mechanical hazards		P
1.6 (4.26)	Shorting protection		N
1.6 (4.26.1)	Measures to prevent deterioration of security due to a short circuit ...		N
1.6 (4.26.2)	The test sample works from 0.9 to 1.1 of the rated voltage ...		N
1.6 (4.26.3)	The test chain ...		N
1.6 (4.27)	Terminal blocks with integrated threadless earting contacts		N
1.6 (4.28)	Fixing of thermal sensing controls		
	- control of temperature		N
	- adhesive fixing of temperature sensing controls		N
1.6 (4.29)	Luminaire with non replaceable light source		P
	- lack of access to the live parts without breaking the lighting fixture or parts thereof.		P
	Parts of the luminaire, providing access to live parts ...		N
	Parts of the luminaire sealed by gluing ...		P
1.6 (4.30)	Luminaire with non-user replaceable light sources		N
1.6 (4.31)	Insulation between circuits		N
1.6 (4.31.1)	SELV circuits		N
	- reinforced or double insulation from LV voltage		N
	- basic insulation from other SELV circuits		N
	- additional insulation from FELV circuits		N
1.6 (4.31.2)	FELV circuits		N
	- separation transformer		N
	- separating device for lamps		N
	- electrochemical source		N
1.6 (4.31.3)	Other circuits		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	- for class II construction		N
1.6 (4.32)	Overvoltage protective devices		N
1.7 (11)	**SURFACE (Cr) & AIR (cl) INSULATION GAPS**		
	Appliance class ..... :	II	
	Operating voltage (V) ..... :	230 V	
	(1) Live parts of different polarity: cr (mm); cl (mm) ..... :	basic insulation (cr): 2,5 mm basic insulation (cl): 1,5 mm	P
	(2) Live and accessible parts cr (mm); cl (mm) ..... :	additional insulation (cr): 2,5 mm additional insulation (cl): 1,5 mm reinforced insulation (cr): 5,0 mm reinforced insulation (cl): 3,0 mm	P
	(3) Potentially live parts: cr (mm); cl (mm) ..... :	additional insulation (cr): 2,5 mm additional insulation (cl): 1,5 mm reinforced insulation (cr): 5,0 mm reinforced insulation (cl): 3,0 mm	P
	(4) Connection wire outer surface: cr (mm); cl (mm) ..... :		N
	(5) Not applicable		-
	(6) Live parts and substrate surface: cr (mm); cl (mm) ..... :		N
1.8 (7)	**PROVICION FOR EARTHING**		
1.8 (7.2.1-7.2.3)	Metallic parts		N
	Accessible metallic parts		N
	Metallic parts and substrate surface		N
	Resistance < 0.5 Ω		N
	Two self-tapping screws used		N
	Self-tapping piercing screws		N
	Connection priority		N
1.8 (7.2.2-7.2.3)	Earthing continuity		N
1.8 (7.2.4)	Tightening security		N
	Conformity to Section 4.7.3		N
	Properly mounted		N
	Loose terminals		N
1.8 (7.2.5-7.2.9)	Connection socket		N
1.8 (7.2.6-7.2.9)	Location of terminals		N
1.8 (7.2.7-7.2.9)	Corrosion of terminals		N
1.8 (7.2.8-7.2.9)	PE terminal material		N
	Clean metal of the terminal surface		N
1.8 (7.2.10)	PE terminal in Class II luminaire		N
1.8 (7.2.11)	PE wire green yellow insulation		N
	PE wire length		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
1.9 (14)	**SCREW TERMINALS**		
	Under separate approval; list of components	Annex 1	N
	Luminaire part		N
1.9 (15)	**SCREWLESS TERMINALS AND ELECTRIC CONNECTORS**		
	Under separate approval; list of components	Annex 1	N
	Luminaire part		N
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		
1.10 (5.2)	Power supply connection and outer wiring		
1.10 (5.2.1-5.2.4)	Connection method ..... :	Connection cable ends	P
1.10 (5.2.2-5.2.4)	Wire type ..... :	H05VVH2-F	P
	Rated cross-section (mm^2) ..... :	2 x 1mm^2	N
1.10 (5.2.3-5.2.4)	Interchangeability		N
1.10 (5.2.5)	Non-interchangeable wires		P
1.10 (5.2.6)	Wiring inlets:		
	- suitable for entry		N
	- proper ingress protection		P
1.10 (5.2.7)	Rounded off edges of wire inlets		N
1.10 (5.2.8)	Insulation bushings:		
	- properly mounted		N
	- bushing material		N
	- protective boots or coatings made of insulating material		N
1.10 (5.2.9)	Mounting of screw-in bushings		N
1.10 (5.2.10)	Wire strain relief:		
	- coating protected agains wear		P
	- obvious operating principle of the strain relief		P
	- no mechanical stress or thermal stress		P
	- no knots on the wire, etc.		P
	- insulation material or lining		P
1.10 (5.2.10.1)	a) at least one part is mounted		N
	b) adaptation for the wiring type		N
	c) does not damage the wire		N
	d) installed in the strain relief		N
	e) the wire does not touch metal lock screws		N
	f) the metal screw does not press the wire		N
	g) wiring replacement without special tools		N
	The gland has not been used as a strain relief		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	Labyrinth strain relief		N
1.10 (5.2.10.2)	Type Y and Z mounting is suitable		P
1.10 (5.2.10.3)	Test:		
	- unfeasibility of hazardous insertion of the wire		P
	- pulling test, 25 iterations (N) ..... :	60 N	P
	- twisting test (Nm) ..... :	0,25 Nm	P
	- displacement ≤ 2 mm		P
	- no movement of cores		N
	- no wire damage		P
1.10 (5.2.11)	Outer wiring entering the luminaire		P
1.10 (5.2.12)	Terminals for in-line connection of luminaires		N
1.10 (5.2.13)	The wire tips are not zinc-coated		N
	Zinc-coated wire tips, no cold flow		N
1.10 (5.2.14)	The luminaire plug has the same IP rating and Appliance Class		N
	The luminaire plug is suitable for Appliance Class III luminaires		N
1.10 (5.2.15)	Not applicable		-
1.10 (5.2.16)	Appliance plugs (IEC 60320)		N
1.10 (5.2.17)	Adhesive cables, if they are not made of standardized insulated wires with a protective coating ...		N
1.10 (5.2.18)	Luminaires intended for connection to the power supply via a socket outlet should ...		N
1.10 (5.3)	Internal wiring		
1.10 (5.3.1)	Conductor cross-section (mm^2)..... :		P
	Temperature resistance		P
	Boots in high temperature locations		N
	The green-yellow wire is only on PE connections		N
	Pass-through wires (mm^2) ..... :		N
1.10 (5.3.1.1)	- rated wire cross-section		P
	- rated insulation thickness		P
1.10 (5.3.1.2)	- minimum wire cross-section		N
	- minimum insulation thickness		N
1.10 (5.3.1.3)	Double or toughened insulation		P
1.10 (5.3.1.4)	Appropriate protective measures		N
1.10 (5.3.1.5)	Non-isolated SELV parts		N
1.10 (5.3.1.6)	Proper insulation thickness		N
1.10 (5.3.2)	Sharp edges, etc.		P
	Moving connector parts		N
	Hinged joints		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	Telescopic tubes, etc.		N
	Wire twist equal to or below 360°		N
1.10 (5.3.3)	The wire inlets of Class II luminaires shall be equipped with insulation bushings		P
	Permanently mounted bushing		P
	The bushing is housed in openings with sharp edges		P
	Wires with protective coating		N
1.10 (5.3.4)	Connections and branches in internal wiring, with the exceptions of branches to components, shall have a coating ...		P
1.10 (5.3.5)	Inner wire stress		P
1.10 (5.3.6)	Wire routing		N
1.10 (5.3.7)	Zinc-coated wire tips, no cold flow		N
1.10 (5.4)	Determining the possibility of using cables with a reduced cross-section		N
1.11 (8)	**PROTECTION AGAINST ELECTRICAL SHOCK**		
1.11 (-)	Live parts inaccessible		P
1.11 (8.2.1-8.2.5)	Protection retained in any orientation		P
	The varnish (paint coating) is no insulation		P
	Two-cap bulbs		N
	Two-cap high-pressure discharge light sources		N
	Portable luminaires		N
1.11 (8.2.3-8.2.5)	Appliance Class II luminaires:		
1.11 (8.2.2-8.2.5)	- the metallic parts of Class II luminaires are live parts if they are isolated from live parts only by primary insulation		N
	- light source starters and caps		N
	- glass guards are not additional insulation		N
	Appliance Class I luminaires with bayonet holder		N
1.11 (8.2.4-8.2.5)	Portable luminaires		
	- non-separable wire		N
	- clamp connectors completely exposed		N
1.11 (8.2.6)	Lenses and guards / proper mechanical endurance	(See Section 4.13)	P
	Lenses and guards with reliable mounting		P
1.11 (8.2.7)	Plug-terminated luminaire with capacitor		N
	Discharge device within the capacitor		N
	Separate discharge device		N
1.12 (12)	**ENDYRANCE TEST AND THERMAL TESTS**		
1.12 (12.3)	Durability test:		
1.12 (12.3.1)	- Luminaire orientation during the test .... :	as for normal use	

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	- Ambient temperature (°C) ..... :	35 ± 2 °C	
	- Test time (h) ..... :	240 h	
	- Converted supply voltage xU_n (V) .. :	253 V	
	- Applied light source:	LED	
1.12 (12.3.2)	Conformity:		
	- no damage		P
	- the luminaire remains safe after testing		P
	- the busbar system is not damaged		N
	- legible marking		P
	- free of cracks, deformation, etc.		P
1.12 (12.4)	Thermal test (normal operating conditions)	(See Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operating conditions)	(See Annex 2)	P
	- type of damage … :	Secondary side shorted	P
1.12 (12.6)	Thermal test with the driver/transformer in the failure state		
1.12 (12.6.1)	- Damage type under abnormal conditions .. :		N
	- Electronic drivers		N
	- Measured winding temperature (°C) at 1.1 U_n ..... :		N
	- Measured substrate temperature (°C) at 1.1 U_n ..... :		N
	- Calculated substrate temperature (°C) ..... :		N
	- Luminaires for busbars		N
1.12 (12.6.2)	Temperature sensors:		
	- reswitched manually		N
	- automatic reswitching		N
	- luminaires for busbars		N
1.12 (12.7)	Thermal test (driver/transformer failure in plastic luminaires):		
	- Damage type ..... :		N
1.12 (12.7.1)	- Measured winding temperature (°C) at 1.1 U_n ..... :		N
	- Measured substrate temperature (°C) at 1.1 U_n ..... :		N
	- Calculated substrate temperature (°C) ..... :		N
1.12 (12.7.2)	Luminaires with temperature sensors:		
	- manually reswitchable		N
	- automatically reswitchable		N
1.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		
1.13 (9.1)	General provisions		P
1.13 (9.2)	Testing of resistance to ingress of dust, solids and water.		

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	- Classification rating ……..... :	IP44	
	- Luminaire orientation during the test .... :	as in normal use	
	- Tightened mounting screws (Nm) ..... :		
	- test comply with Section ..... :	9.2.0 and 9.2.5	
	- Electric strength	(See Section 10.2.2)	P
	a) No excessive amounts of talc in the dust-proof luminaire		N
	b) No talc in the dust-proof luminaire		N
	c) No traces of water on live parts		P
	d) No water in the waterproof luminaire		N
	e) No access to live parts		N
	f) No traces of water on any part which requires flooding protection		P
	g) No mechanical damage		N
1.13 (9.3)	48 h humidity test		P
1.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		
1.14 (10.2.1)	Insulation resistance test:		
	Appliance class ..... :	II	
	Insulation resistance (MΩ):		
	- Live parts of different polarity …..... :		N
	- Live parts of different polarity (breakers) ..... :		N
	- Live parts / luminaire body ..... :	> 4 MΩ	P
	- Accessible metallic parts / insulation lining		N
	- Between live parts and metallic parts	> 4 MΩ	P
	- Conduits acc. to Section 5 ..... :		N
	- Insulating strain reliefs acc. to Section 5..... :		N
	- Insulating grips or clips acc. to Section 5 ….. :		N
1.14 (10.2.2)	Insulation Electric strength test		
	Appliance class ..... :	II	
	Voltage test (V):		
	- Live parts of different polarity …….. :		N
	- Live parts of different polarity (breakers) ..... :		N
	- Between live parts and metallic parts ..... :	2920 V	P
	- Live parts / luminaire body …..... :	2920 V	P
	- Primary insulation of Class II luminaires ..... :		N
	- Additional insulation of Class II luminaires ... :		N
	- Reinforced insulation of Class II luminaires . :		N
	- Conduits acc. to Section 5 ..... :		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	- Insulating strain reliefs acc. to Section 5 ..... :		N
	- Insulating grips or clips acc. to Section 5 ..... :		N
1.14 (10.3.1)	Shock current (mA) ..... :	0,002 mA	P
1.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
1.15 (13.2.1)	Steel ball pressure test:		
	- checked parts; temperature (75°C) .... :	Power supply housing: 0.8 mm	P
	- checked parts; temperature (75°C) .. :	Transculent cover: 1.8 mm	P
	- checked parts; temperature (75°C) .... :		N
1.15 (13.3.1)	Needle flame, 10 seconds test		
	- checked parts ..... :		N
	- checked parts ..... :		N
1.15 (13.3.2)	Glowing wire test (650°C)		
	- checked parts ..... :	Power supply housing	P
	- checked parts ..... :	Transculent cover	P
	- checked parts ..... :		N
1.15 (13.4.1)	Resistance creepace current; checked part ..... :		N

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation

	ANNEX 1: Components				
Item / part no.	Manufacturer / trademark	Type / model	Ratings	Standard	Conformity mark [1)]
Internal cables	-	-	0,4 mm^2	-	-
LED	BRILLIANT FURNIKA (WUXI) CO.,LTD JINCHANG ROAD, CHANGAN TOWN, HUISHAN DISTRICT WUXI CITY JIANGSU PROVINCE P.R. CHINA	PD2835NWR2-PCT PD2835CWR2-PCT PD2835WWR2-PCT	-	-	-
Power supply	FURNIKA	-	230 V 50Hz Iout = 20mA	-	20
External wires	-	H05VVH2-F	2 x 1,0 mm^2 300/500 V	-	1

[1)] the reference indicates the mark (test station) providing the supervised level of compliance

No.	mark of conformity	No.	mark of conformity	No.	mark of conformity	No.	mark of conformity
1	VDE	2	ENEC	3	SEV	4	ÖVE
5	DEMKO	6	SEMKO	7	NEMKO	8	SETI
9	BSI	10	UL	11	CSA	12	UTE
13	IMQ	14	BNL	15	CEBEC	16	KEMA
17	AEE	18	B	19	HAR	20	CE

PN-IEC 598-2-1:1994/Ap1:2000			
Section	Requirement - Check	Result	Evaluation
	ANNEX 2: Temperature measurements; thermal tests - Section 12		
	Luminaire type:	Fixed luminaire model LED ALA2 600	-
	Lamp ……..……..... :	LED	.-
	Driver ..... :	-	-
	Luminaire mounting orientation ..... :	as for normal use	-
	Supply power (W) ..... :		-
	Supply current (A) ..... :		-
	Calculated power factor ..... :		-
	Table: measured temperatures in reference to t_a = 25 °C:		P
	- Abnormal operating conditions ..... :		-
	- Test 1: rated voltage ..... :	230 V	-
	- Test 2: 1.05 times the rated voltage or 1.05 times the rated power ..... :	243,8 V	-
	- Test 3: 1.06 times the rated voltage:	253 V	-

Tested part	Section 12.4 - Normal operating conditions			Section 12.5 - Abnormal operating conditions	
Temperature (°C)	Test 1	Test 2	Permissible val.	Test 3	Permissible val.
Outer surface of the luminaire	40	55	-	57	-
Mounting surface	35	53	90	35	130
Wire insulation	35	47	90	40	90
Power supply surface	53	56	-	60	-
LED module surface	41	55	-	35	-

Complementary photos: