



Kenya Power

TITLE:
**SPECIFICATION FOR STREET
LIGHTING ACCESSORIES**

DOC. NO.	KP/SCB/ISP/15/002
Issue No.	1
Revision No.	1
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ANNEX A: *Guaranteed Technical Particulars (to be filled and signed by the supplier and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records for previous five years, customer reference letters, details of manufacturing capacity, the manufacturer's experience and copies of complete type test reports for tender evaluation, all in English Language)*

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0.1 Circulation List

COPY NO.	COPY HOLDER
1	Research & Development Manager
2	Supply Chain Manager (Procurement)
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0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
1	2014/10/30	Section 4.19: Added Mercury Lamps	<i>J. Ngũgĩ</i>	<i>En. K. GATHIGE</i>
	2014/10/30	clause 4.4.1: removed Central Management System (CMS)	<i>J. Ngũgĩ</i>	<i>En. Gathige</i>
	2014/10/30	Clause 4.4.7: Included all available options	<i>J. Ngũgĩ</i>	<i>En. K. GATHIGE</i>
	2014/10/30	Clause 4.9.5: included minimum life Tc as 50,000hrs	<i>J. Ngũgĩ</i>	
	2014/10/30	Clause 4.3.8 : dimensions of bracket amended	<i>J. Ngũgĩ</i>	<i>En. Gathige</i>

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Signed:	Signed: <i>En. Gathige</i>
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FOREWORD

This specification has been prepared by the Standards Department of The Kenya Power and Lighting Company Limited (abbreviated as KPLC) and it lays down requirements for accessories to be used in overhead street lighting. It is intended for use by KPLC in purchasing the items.

1. SCOPE

1.1. This specification is for street lighting accessories to be used in street lighting on streetlighting columns and along the pole on power lines.

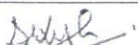
1.2. This specification covers the following items:

- (i) street lighting columns
- (ii) street lighting bracket
- (iii) lanterns as follows:-
 - (a) 100W, 150W, 250W, 400W High Pressure Sodium lanterns or LED lights complete with control gear (i.e chokes, igniters, capacitors etc. as applicable)
 - (b) 100W, 150W, 250W High Pressure Sodium Lamps or LED lights
 - (c) 125W, 250W and 400W High Pressure Mercury Lamps
 - (d) 400W High Pressure Sodium Flood or LED lights
- (iv) Pole mounted street lighting control pillar (separate specs attached)
- (v) Photo – cell
- (vi) Control Timers
- (vii) High Intensity discharge ballasts
- (viii) Igniters
- (ix) Contactors
- (x) Capacitors

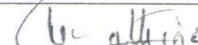
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- (xi) Consumer Units
- (xii) Earth leakage Circuit Breakers

1.3. The specification stipulates the minimum requirements for street lighting accessories, for use in the company and it shall be the responsibility of the supplier to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the items for the Kenya Power & Lighting Company.

1.4. The specification does not purport to include all the necessary provisions of a contract.

2. REFERENCES

The following standards contain provisions which, through reference in this text constitute provisions of this specification. Unless otherwise stated, the latest editions (including amendments) shall apply:

BS EN 40-3-1:2013: Lighting columns, design and verification for characteristic loads

IEC 62031:LED modules for general lighting (solid state lighting) -Safety specifications

IEC 61547-2009: Equipment for general lighting purposes - EMC immunity

IES LM-80-08 : Method for Measuring Lumen Maintenance of LED Light sources

IEC 62471:Photo biological safety of lamps and lamp systems

IEC 62262: Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)

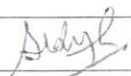
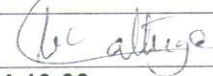
IEC60598-2-3:Particular requirements – Luminaires for road and street lighting

IEC60662:High Pressure Sodium Vapor Lamps specifications

IEC60192:Low Pressure Sodium Lamps Performance Specifications

IEC 61439-3:low-voltage switchgear and control gear assemblies

EN 60235:Discharge Lamps safety specifications

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- ISO 9001:Quality management systems – Requirements
- ISO 1460: Metallic coatings-Hot dip galvanized coatings on ferrous materials
- IEC 60923:2001 Ballasts for discharge lamps (excluding tubular fluorescent lamps) Performance requirements
- IEC 926:1995Auxiliaries for lamps–Starting devices: General and safety requirements
- IEC 60927:2005 Starting devices (other than glow starters) - Performance requirements
- IEC 61048:2006 Capacitors for use in tubular fluorescent and other discharge lamp circuits:General and safety requirements
- IEC 61049:1991 Capacitors for use in tubular fluorescent and other discharge lamp Circuits : Performance requirements
- IEC 60947-4-1 Low voltage switchgear and control gear—Contactors and motor Starters
- IEC 60439 Low Voltage switchgear and Control gear assemblies
- IEC 61008 Residual current operated circuit breaker without integral overcurrent protection for household and similar uses
- IEC 60188 High pressure mercury vapour lamps- performance specifications

3. TERMS AND DEFINITIONS

For the purpose of this specification, the definitions given in the reference standards shall apply.

4. REQUIREMENTS

4.1. Service Conditions

The street lighting accessories shall be suitable for continuous use outdoors in tropical areas of altitude upto 2200m above sea level, humidity of up to 90%, average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C and heavy saline conditions along the coast.

4.2 Street lighting columns

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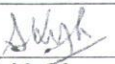
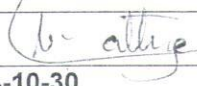
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- 4.2.1 The size of the columns shall be 8m or 10m and shall be specified in the tender
- 4.2.2 The columns shall be manufactured in accordance with the requirements of BSEN40 and latest revisions
- 4.2.3 The columns shall be manufactured from galvanized tubular/ sheet steel
- 4.2.4 The columns shall be designed to be capable of accepting lanterns with the following weights and windage of lanterns:-

Table 1.0 Lantern parameters

mounting height (m)	lantern (kg)	Windage Area (m ²)
8m post top/ side entry	10	0.19
10m post top/side entry	15	0.19

- 4.2.5 The columns shall have a root for planting to a depth 1200mm and 1500mm for 8 and 10 metre columns respectively
- 4.2.6 The columns shall have a cable entry slot of 65mm x 150mm with the top of the slot 350mm below ground level
- 4.2.7 The base section of the columns shall have a minimum wall thickness of 3.2mm and have base compartment openings of a minimum 600 x 115mm
- 4.2.8 The shaft sections shall have minimum diameters of 114mm for all the columns
- 4.2.9 The height above ground of the base sections shall be 1250mm marked A
- 4.2.10 The fixing of the bracket to the column shall be over a reduced diameter spigot to maintain the smooth parallel line between the column and bracket arm. The bracket arm shall be held in position by stainless steel screws allowing fixing in any one of four 90degrees positions.

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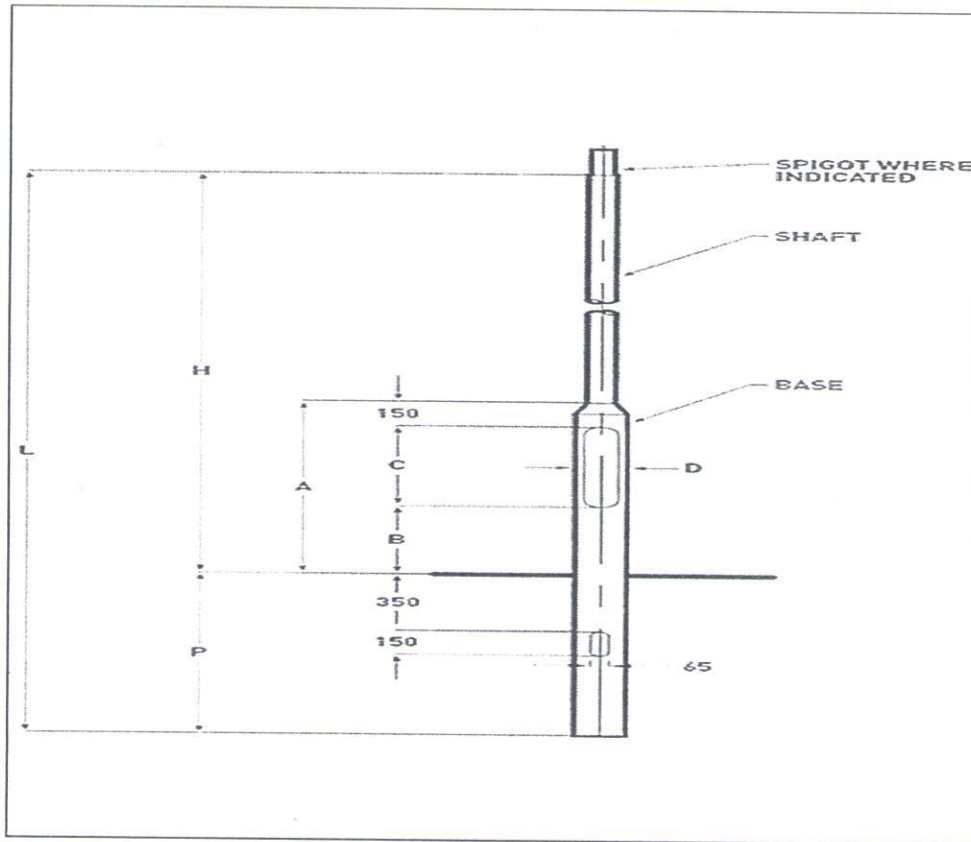


Fig1: Column details

The parameters in figure 1 are tabulated below

Table 2: Column characteristics

H	P	L	A	B	C	D	Base diam.	Shaft diam.
6	1200	7200	1250	500	600	115	168	114
8	1500	9500	1250	500	600	115	168	114

4.2.11 The columns shall have a means of preventing undesired rotational movement of the bracket, once fixed in position, to the column shaft shall be incorporated in the column design.

4.2.12 The method of joining the base section and the shaft of the columns shall be by a swage joint with an internal centralizing washer.



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- 4.2.13 The columns shall have the same pattern of door lock. Keys shall be supplied for 5% of all columns supplied. The door fixing bolt shall have a tapered end to facilitate self-centering when closing.
- 4.2.14 The columns shall have an internal full length base board, equivalent to the door size, substantially non-hygroscopic, fitted in each compartment for mounting control gear. Base board fixing studs or bolts shall not protrude beyond the front face of the base board. The base board shall be firmly bolted in position. On delivery, the column door shall come assembled on the column
- 4.2.15 The columns shall be fitted with M12 x 30mm brass earth studs threaded the whole length, with two plain washers and two nuts within the base compartment and shall be easily accessible. Column doors shall be provided with an internal lug to enable earthing of the column door with an M8 brass earth stud.
- 4.2.16 The columns shall have no sharp edges that can damage electrical cables during installation or service. An anti-chafe ring shall be fitted where cable routes change direction from horizontal to vertical within the bracket
- 4.2.17 The columns and bracket arms shall be hot dip galvanized to a minimum of 100 µm in accordance with ISO 1461 unpainted. The galvanized surface shall then be degreased and left with a smooth finish to prepare for painting.
- 4.2.18 The minimum dry film thickness of paint shall be 100µm throughout the column
- 4.2.19 The columns shall have line on the circumference of the base section to denote ground level.

4.3 Street lighting bracket for use with steel columns, wooden and concrete poles

- 4.3.1 The brackets shall be manufactured from galvanized tubular steel, or aluminum. The aluminum/zinc coating shall be tested to ISO 1460 standards.
- 4.3.2 The brackets shall be manufactured, supplied and installed in accordance with the requirements of BS EN 40-3 or revision of such. Sharp edges shall not be permitted.
- 4.3.3 The brackets shall be designed to be capable of accepting lanterns with the following weights and windage of lanterns as per table 1 below

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Table 3: Lantern mounting details

MOUNTING HEIGHT	LANTERN WEIGHT (kg)	Windage Area (m ²)
10m / side entry	Max. 15	0.19
12m / side/entry	Max.15	0.27

- 4.3.4 The method of securing the bracket arm must be positive such that the arm cannot rotate. The arm and lantern shall be at right angles to the highway to be illuminated.
- 4.3.5 The outreach of the bracket shall be 1.0m, 1.5m and 2.0m. This shall be stated in the tender
- 4.3.6 The bracket arms shall, provide an incline of lantern of 5°, or 0° in Environmental Zone E1 when fitted to spigots of 42mm OD x 127mm.
- 4.3.7 The brackets shall be of single or double projection. The details shall be as per attached drawings below

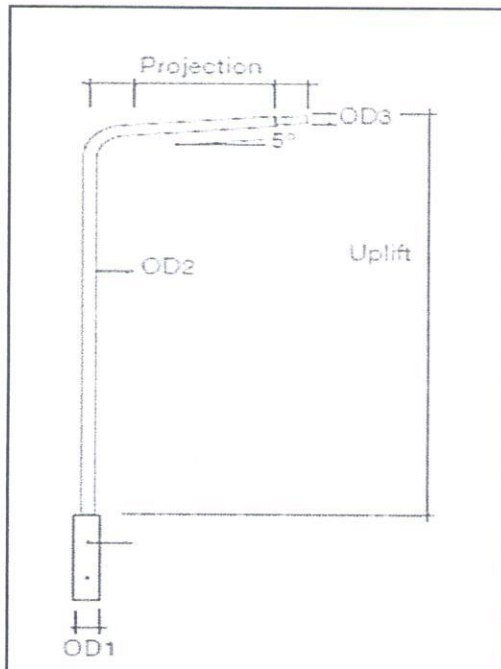


Fig 2(a): single bracket

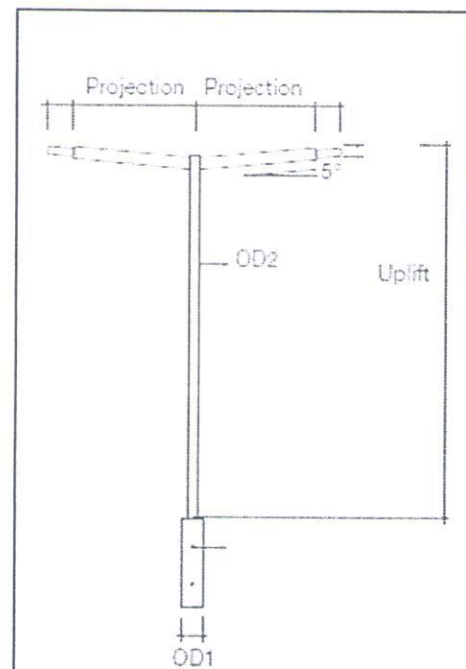


Fig2 (b): Double bracket

4.3.8 Technical details of brackets for columns

Table 4.0 Details of brackets

Projection (mm)	Spigot (mm)	ϕ	OD ₁ (mm)	OD ₂ (mm)	OD ₃ (mm)	Uplift(mm)
1000	76		89	48	42	2000
1500	76		89	48	42	2000
2000	76		89	48	42	2000

4.3.9 Wood and concrete street lighting bracket

4.3.9.1 In additions to the requirements of above clauses 4.3.1 to 4.3.6, the brackets to be used in wooden and concrete pole shall be designed as per fig3 below

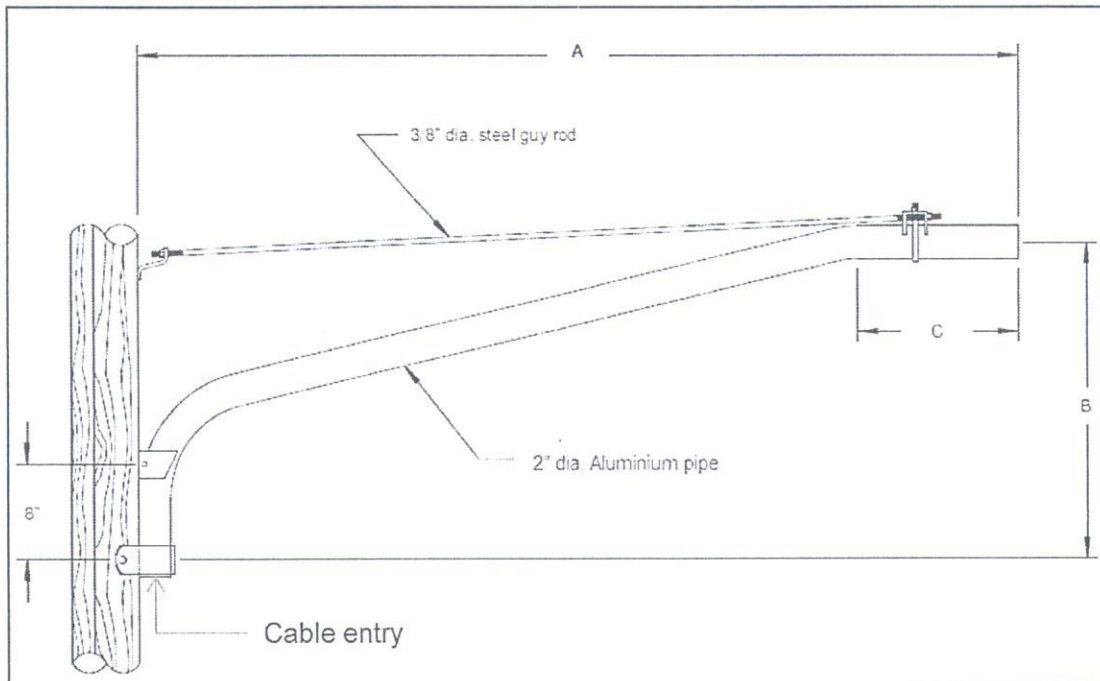


Fig 3: bracket for use in concrete and wooden poles

4.3.9.2 The bracket shall be fabricated complete with plate for fixing on either concrete or wooden pole as shown above by means of steel straps or bolts

4.3.9.3 The bidder shall submit detailed drawings for evaluation together with the bid.

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4.3.9.4 The brackets shall conform to the general shape shown in figure 3 and comply with dimensional details in table 5

Table 5.0 Dimension of the wood/concrete bracket

Projection A (mm)	B(mm)	C(mm)
1000	300	300
1500	450	300
2000	600	300

4.4 **Lanterns**

- 4.4.1 The Lanterns used for road lighting shall be integral and fitted with electronic control equipment complete with bulbs.
- 4.4.2 The lanterns should be manufactured to IEC 60598-1 and incorporate an efficient optical system to direct the light onto the highway. To ensure minimum environmental pollution of the night sky the upward light emitted shall be kept to a minimum.
- 4.4.3 The Lanterns shall allow for side entry and post mounting and shall, when post mounted, be capable of adjustable inclination between zero (0°) and five (5°) degrees without the need for special and additional adaptors
- 4.4.4 Lanterns shall be environmentally friendly and all component parts shall be easily recyclable.
- 4.4.5 The lanterns body shall be UV stabilized polycarbonate, with installation hardware and instructions. All component parts shall be corrosion resistant.
- 4.4.6 The frame and canopy of lanterns shall be made of high-quality die-cast aluminum, painted grey, silver or black. An alternative to an aluminum canopy shall be allowed if manufactured from high quality, recyclable materials
- 4.4.7 Lanterns shall be available with polycarbonate bowls, low profile bowls, and flat glass or curved tempered glass protectors.



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- 4.4.8 The impact rating for glass protectors shall be IK08 minimum in accordance with IEC 62262:2002
- 4.4.9 All lanterns shall be fitted with bowls of sound and robust construction capable of being easily dismantled for maintenance or repair purposes. All lanterns shall be fitted with bowls manufactured from vandal resistant material and stabilized to minimize loss of transparency due to weathering and exposure to ultra violet light.
- 4.4.10 All hinges, toggle catches, captive screws and nuts shall be made of non-corrosive material.
- 4.4.11 Lanterns shall be reasonably weather and dust-proof and shall be fitted with a suitable gasket between the body of the lantern and the bowl. The IP Rating of the lantern shall not be less than IP 65. They shall have tilt mounting base and easy to access ballast compartment to make installation easy.
- 4.4.12 The means of supporting the lamp shall be so designed that the position of the lamp in the lantern relative to any optical equipment remains substantially the same under all conditions of service and throughout the life of the lantern.
- 4.4.13 The optical equipment controlling distribution should include high purity aluminum reflectors and/or prismatic refractors and these shall have a smooth exterior surface or be protected by hermetically sealed cover plates to prevent an accumulation of dirt and to facilitate cleaning. Refractors wholly within a totally enclosed lantern need not be sealed.
- 4.4.14 All lanterns shall be fitted with a porcelain terminal block, earth terminal, cable clamp and lamp holder ready wired to connector block with heat resisting type cable.
- 4.4.15 All lanterns shall be fitted with integral control gear and have a heat barrier between the lamp enclosure and gear compartment. The control gear shall be fitted to a tool-less, quick release gear tray, equipped with a plug and socket connector for ease of maintenance or replacement purposes.

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