



SPECIFICATION FOR SF6 GAS

A Document of the Kenya Power & Lighting Co. Ltd
October 2025



**TITLE:SF6 GAS AND CYLINDER-
SPECIFICATION**

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0.1 CIRCULATION LIST

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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)
0	2025-10-28	New issue	Daniel Achenji 	George Welimo 

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FOREWORD

This specification has been prepared by the E/plant of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for SF6 gas and Cylinder

The SF6 gas and Cylinder is intended for use by the e/plant in the SF6 type circuit breakers installed at Grid Sub-stations

This specification was prepared to establish and promote uniform requirements for SF6 gas and Cylinder to be used at Kenya Power and Lighting Company Ltd.

There are no other specifications in this series.

This specification stipulates the minimum requirements for SF6 gas and Cylinder acceptable for use in the company and it shall be the responsibility of the suppliers and manufacturers to ensure that the offered design is of the highest quality and guarantees excellent service to KPLC, good workmanship and good engineering practice in the manufacture of the SF6 gas and Cylinder for KPLC.

Users of Kenya Power specifications are responsible for their correct interpretation and application.

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1. SCOPE

- 1.1. This specification is for SF6 gas and Cylinder for use by company's E/plant in SF6 circuit breakers and gas insulated power equipments.
- 1.2. The specification covers requirements, design, inspection and tests and schedule of Guaranteed Technical Particulars of SF6 gas and Cylinder.

2. NORMATIVE REFERENCES

The following standards contain provision which, through reference in this text, constitute provisions of this specification. For dated editions the cited edition will apply; for undated editions the latest edition of the referenced document shall apply.

IEC: 60376: The quality for technical grade sulphur hexafluoride (SF6)

ASA B57.1: Compressed Gas Cylinder Valve Outlet and Inlet Connections

IEC 61557: Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c - Equipment for testing, measuring or monitoring of protective measures - Part 1: General requirements;

IEC 60815: Selection and dimensioning of high voltage insulators intended for use in polluted conditions –Part 1: Definitions, information and general principles

IEC 61000: Electromagnetic Compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test; – Part 6-2: Generic standards – Immunity for Industrial environment.

IEC 60529: Degrees of protection provided by enclosures (IP code)

ISO 9001: Quality Management systems – Requirements

ISO/IEC 17025: General Requirements for the competence of testing and calibration laboratories

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3. DEFINITIONS AND ABBREVIATIONS

For the purpose of this specification, the definitions and abbreviations given in the reference standards shall apply together with the following abbreviations.

3.1. ABBREVIATIONS

KPLC- Kenya Power and Lighting Company Limited

ISO – International Organization for Standardization.

SF6 – Sulphur Hexafluoride

Kg –Kilogram

KV - Kilovolt

IP – Ingress Protection

LV – Low Voltage

EMC – Electromagnetic Compatibility

EU – European Union

PPM-Parts per million

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4. REQUIREMENTS

4.1. SERVICE CONDITIONS

4.1.1 The SF6 gas and Cylinder shall be suitable for use outdoors in tropical areas and harsh climatic conditions including areas exposed to:

- a) Altitudes of up to 2200m above sea level;
- b) Humidity of up to 95%;
- c) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C
- d) Pollution: Degree 2

4.2. DESIGN AND CONSTRUCTION

4.2.1. The cylinders shall have a minimum designed working pressure of around 130 kgf/cm² (gauge).

4.2.2. The SF6 gas shall be free from impurities and toxic contents as per the relevant IEC standard. There should not be any contamination or introduction of impurities from defective manufacturing process, leakage in manufacturing plant or contaminations from containing cylinders.

4.2.3. The SF6 gas shall be filled in appropriate container of specified capacity in liquid state. The cylinders shall be marked as per the relevant IEC for the identification of contents. There shall not be any leakage of gas during transportation and storage.

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4.3. It shall be supplied with the following particulars as shown in table 1 below:

Table 1: Technical particulars of SF6 gas and Cylinder

Parameter	Requirement
Gas Cylinders & Valves:	SF6 gas shall be supplied with NEW cylinders and valves manufactured
Cylinder Capacity	Preferred water capacity of the cylinders supplied shall be around 40 liters and weight of SF6 gas in each cylinder shall be approximately 50kg
Filling Ratio:	The filling ratio (The ratio of weight of liquefiable gas introduced in the cylinder to the weight of the water the cylinder will hold at 15 °C) shall be around 1.20.

4.4. DOCUMENTATION AND SUPPORT

4.4.1. Warranty

4.4.1.1. The SF6 gas and Cylinder shall be backed by a minimum of 12-months manufacturer warranty.

5. TESTS REQUIREMENTS

5.1. The manufacturer/supplier shall furnish all the test results, method of test details as specified in IEC 60376 with latest amendments if any, from any Government approved laboratory with competence along with their offer. Also they shall furnish the informations on details of the tests to be carried out at the manufacturer/ authorized dealer's factory during inspection & testing of the SF6 gases, in order to establish the purity of the SF6 gas , permissible limits of impurities in the gas , to establish cylinder weight , weight of the gases in the cylinders & etc.

5.2. Identically, the cylinders shall also be type tested as per the relevant IEC and such type tests reports shall be furnished along with the offer. The supplier shall make necessary arrangements for conducting tests , to the satisfaction of the Inspection committee at free of cost.

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6. MARKING AND PACKING

6.1. MARKING

Identification Marking: Each cylinder shall be durably and legibly marked by stamping, engraving or similar process with the following, preferably at the valve end and off the cylindrical part.

- i. The symbol of SF6
- ii. "Sulphur Hexafluoride" in words, and the name of the country of origin.
- iii. The tare weight of the cylinder without protective cap.
- iv. Additional markings, colourings etc. may be added in accordance with national or manufacturer's practice. The above marking is the basic necessity as per IEC.

Other Markings: Each cylinder shall be marked by stamping, engraving or similar process with the following details:

- a) Manufacturer's mark.
- b) Inspection agency's mark
- c) Rotation No. (Serial No.)

6.2. PACKING

6.2.1. The SF6 gas shall be packaged in 50kg cylinder.

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APPENDICIES

A: TESTS AND INSPECTION (Normative)

A.1 It shall be the responsibility of the supplier to test or to have all the relevant tests performed.

A.2 On receipt of the SF6 gas and Cylinder, Kenya Power will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The supplier shall replace without charge to Kenya Power, any SF6 gas and Cylinder which upon examination, test or use fail to meet any or all of the requirements in the specification.

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B: QUALITY MANAGEMENT SYSTEM (Normative)

- B.1 The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the SF6 gas and Cylinder physical properties, tests and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001: 2015.
- B.2 The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications including copy of valid and relevant ISO 9001:2015 certificate shall be submitted with the tender for evaluation.
- B.3 The bidder shall indicate the delivery time

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C: DOCUMENTATION AND DEMONSTRATION (Normative)

C.1 The bidder shall submit its tender complete with technical documents for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

- a) Fully filled clause by clause guaranteed technical particulars (GTP) signed by the manufacturer;
- b) Copies of the Manufacturer's catalogues, brochures, drawings giving all relevant dimensions and technical data;
- c) Manufacturers letter of authorization, ISO 9001:2015 certificate, and other technical documents required in the tender.
- d) Manufacturer's warranty and guarantee; subject to 12 months from date of delivery to KPLC stores
- e) Operational manual.
- f) Service manual.

C.2 The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of SF6 gas and Cylinder to KPLC Isiolo road stores

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D: GUARANTEED TECHNICAL PARTICULARS (Normative)

To be filled and signed by the Manufacturer and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records for previous five years, four customer reference letters, details of suppliers' capacity and experience; and copies of complete type test certificates and test reports for tender evaluation, all in English Language)

Tender No.

Bidder's name and Address.....

Clause number	Requirement	Bidder's offer
	Manufacturer's Name and address	State
	Country of Manufacture	State
1.	Scope	State
2.	Normative References	State
3.	Definitions and Abbreviations	State
3.1.	Abbreviations	State
4.1.	SERVICE CONDITIONS	
4.1.1	The SF6 gas and Cylinder shall be suitable for use outdoors in tropical areas and harsh climatic conditions including areas exposed to:	
a)	Altitudes of up to 2200m above sea level;	State
b)	Humidity of up to 95%;	State
c)	Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C	state
d)	Pollution: Degree 2	state
4.2.	DESIGN AND CONSTRUCTION	

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Clause number	Requirement	Bidder's offer
4.2.1.	The cylinders shall have a minimum designed working pressure of around 130 kgf/cm ² (gauge).	State
4.2.2.	The SF6 gas shall be free from impurities and toxic contents as per the relevant IEC standard. There should not be any contamination or introduction of impurities from defective manufacturing process, leakage in manufacturing plant or contaminations from containing cylinders	state
4.2.3	The SF6 gas shall be filled in appropriate container of specified capacity in liquid state. The cylinders shall be marked as per the relevant IEC for the identification of contents. There shall not be any leakage of gas during transportation and storage.	state
4.3.	It shall be supplied with the following particulars	
	Parameter	Requirement
	Gas Cylinders & Valves:	SF6 gas shall be supplied with NEW cylinders and valves manufactured
	Cylinder Capacity	Preferred water capacity of the cylinders supplied shall be around 40 liters and weight of SF6 gas in each cylinder shall be approximately 50kg
	Filling Ratio:	The filling ratio (The ratio of weight of liquefiable gas introduced in the cylinder to the weight of the water the cylinder will hold at 15 °C) shall be around 1.20.
4.4.1.	Warranty	
4.4.1.1.	The SF6 gas and Cylinder shall be backed by a minimum of 12-months manufacturer warranty.	submit
5	TESTS REQUIREMENTS	
5.1.	The manufacturer/supplier shall furnish all the test results, method of test details as specified in IEC 60376 with latest amendments if any, from any Government approved laboratory with competence along with their offer. Also they shall furnish the informations on details of the tests to be carried out at the manufacturer/ authorized dealer's factory during inspection & testing of the SF6 gases, in order to	State

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Clause number	Requirement	Bidder's offer
	establish the purity of the SF6 gas , permissible limits of impurities in the gas , to establish cylinder weight , weight of the gases in the cylinders & etc.	
5.2.	Identically, the cylinders shall also be type tested as per the relevant IEC and such type tests reports shall be furnished along with the offer. The supplier shall make necessary arrangements for conducting tests , to the satisfaction of the Inspection committee at free of cost.	submit
6	MARKING AND PACKING	
6.1.	MARKING	
	Identification Marking: Each cylinder shall be durably and legibly marked by stamping, engraving or similar process with the following, preferably at the valve end and off the cylindrical part.	
a)	The symbol of SF6	State
b)	“Sulphur Hexaflouride” in words, and the name of the country of origin.	State
c)	Additional markings, colourings etc. may be added in accordance with national or manufacturer's practice. The above marking is the basic necessity as per IEC.	State
e)	Other Markings: Each cylinder shall be marked by stamping, engraving or similar process with the following details: a) Manufacturer's mark. b) Inspection agency's mark c) Rotation No. (Serial No.)	State
6.2.	PACKING	

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Clause number	Requirement	Bidder's offer
6.2.1.	The SF6 gas shall be packaged in 50kg cylinders	State
	APPENDICIES	
A:	TESTS AND INSPECTION (Normative)	
A.1	It shall be the responsibility of the supplier to test or to have all the relevant tests performed.	confirm
A.2	On receipt of the SF6 gas and Cylinder, Kenya Power will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The supplier shall replace without charge to Kenya Power, any SF6 gas and Cylinder which upon examination, test or use fail to meet any or all of the requirements in the specification.	submit
B:	QUALITY MANAGEMENT SYSTEM (Normative)	
B.1	The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the SF6 gas and Cylinder physical properties, tests and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001: 2015.	submit
B.2	The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications including copy of valid and relevant ISO 9001:2015 certificate shall be submitted with the tender for evaluation..	submit
B.3	The bidder shall indicate the delivery time	State
C:	DOCUMENTATION AND DEMONSTRATION (Normative)	
C.1	The bidder shall submit its tender complete with technical documents for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:	
a)	Fully filled clause by clause guaranteed technical particulars (GTP) signed by the manufacturer;	submit
b)	Copies of the Manufacturer's catalogues, brochures, drawings giving all relevant dimensions and technical data;	submit
c)	Sales records for the last five years and at least four customer reference letters;	submit

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Clause number	Requirement	Bidder's offer
d)	Details of manufacturing capacity and the manufacturer's experience;	submit
e)	Copies of required test/calibration reports of testing/calibrating laboratory accredited to ISO/IEC 17025;	submit
f)	Copy of accreditation certificate to ISO/IEC 17025 for the testing/calibrating laboratory;	submit
g)	Manufacturers letter of authorization, ISO 9001:2015 certificate, and other technical documents required in the tender.	submit
h)	Manufacturer's warranty and guarantee; subject to 12 months from date of delivery to KPLC stores	submit
i)	Operational manual.	submit
j)	Service manual.	submit
C.2.	The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of SF6 gas and Cylinder to KPLC Isiolo road stores	State

.....
Manufacturer's Name, Signature, Stamp and Date

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