SYRIAN ARAB REPUBLIC
MINISTRY OF ELECTRICITY
PUBLIC ESTABLISHMENT FOR TRANSMISSION AND DISTRIBUTION OF ELECTRICITY (PETDE)
TECHNICAL SPECIFICATION
FOR
LOW VOLTAGE HRC FUSES AND FUSE BASES

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section 1: General information and requirements.

section 2: General conditions of Distribution Network Equipment.

section 3: General specifications and Guarantee Schedule of low voltage HRC fuses and fuse bases

SECTION 1
GENEAL INFORMATION

1.0 INTRODUCTION AND DEFINITIONS:

This description determines the requirements of the PETDE for design material, testing and supply low voltage HRC fuses and fuse bases in the distribution system of the PETDE under the service conditions of Syria.

The present general technical specification of the equipment describes the general requirements of distribution and rural, low voltage and medium voltage networks.

The figures indicated in the technical specifications are to guide the offerer, in preparing the offer.

All the needed data should be fulfilled and pages signed by the offerer, in order to be considered as guarantee schedules.

Any improvement or technological progress of the required equipment should be presented with the necessary technical and economical conformation by the offerer.

1. DEFINITIONS:

PETDE: Shall mean Public Establishment for Transmission and Distribution of Electricity.

PURCHASER: Shall mean Public Establishment for Transmission and Distribution of Electricity.

TENDERER: Shall mean supplier, manufacturer, ...

SUCCESSFUL OFFERER: Shall mean the manufacturer, supplier, whose offer has been accepted by the Purchaser.

OFFER: Shall mean all documents submitted by the Supplier, bidder, manufacturer.

I E C: International Electro-Technical Commission

1.1 INSTRUCTION TO TENDERS:

Tenderers are requested to examine carefully the tender documents in order to ascertain the matters on which they will be deemed to have satisfied themselves and the risks and obligations which they are undertake.
The guarantee schedule and all accompanying documents shall be completely filled and signed by the tenderer
The tender shall give answers to all questionnaires mentioned in the tender book.

If any tenderer is in any doubt as to the true meaning of any part of the tender documents or wishes to make inquiries regarding the documents, he should make all such inquiries as follows:

1.2 STANDARDS AND NORMS:

All equipment shall be designed, manufactured and tested in conformity with the latest applicable IEC.

Tender documents shall include a list covering all standards and norms to be applied for manufacture of each equipment, construction. Installation and testing.

The tenderer shall also specify the testing procedure to be carried out, keeping in mind that the testing procedures proposed in these specifications are stated only as a minimum.

1.3 LANGUAGE OF THE OFFER AND CORRESPONDENCES

The offer and its enclosed documents and references shall be submitted in English.

1.4 TENDERER'S BACKGROUND

Tenderers are requested to state in their offers their experience in design, manufacture and erection of the products they have proposed, namely:

- annual capacity of production;
- list of main clients (companies, establishments, etc., over the last two years)
- any other details may be useful.

1.5 PARTICIPATION IN TESTING:

The contractor will bear the following expenses for PETDE personnel:

a) Accommodation expenses of two representatives for one week to be deputed to contractor's country to participate in the testing of the equipment.

b) the travel from and to Damascus (round- trip) by plane and the travel in the contractor's country.

1.6 DIAGRAMS AND DRAWINGS

The following diagrams and drawings shall be submitted with the tender as a part of the tender documents:

- Complete sets of detailed dimension drawings and catalogues of Equipment.
-Calculation sheets for protective distance and coordination of insulation level....
-Other necessary drawings.

1.7 TESTS:

Unless specified or approved by PETDE, all equipment shall be tested according to the IEC DIN standards

The type test certificates and report shall be enclosed with the tender.

The contractor shall provide PETDE with a schedule of proposed tests to be carried out together with three copies in English of all testing standards and procedures including electric drawings and data curves, measuring months prior to the testing date so that PETDE representative may witness the tests.

The contractor shall make as many tests as, in opinion of PETDE, can be made together.

The acceptance of all the contractors tender including his design drawings and specifications shall not bind PETDE to accept any of the contract words or equipment until they shall have passed the tests prescribed an have been approved by PETDE in writing.

The expenses of all apparatus, instrument and connection required for the tests shall be born by the contracto and shall be included in the prices.

1.8 FINAL ACCEPTANCE, REJECTION AND REPLACEMENT:

The acceptanee will be in the Syrian warehouses subject to the following:

- Verifying that the delivered equipment complies with the requirements of the contractual documents and standards.
- If during inspection tests carried out or supervised by PETDE any material or equipment provided is proved defective or not manufactured according to the contractual specifications, PETDE shall have the right to reject such material or equipment.

If any material or equipment is rejected the contractor shall be obligated to replace it without any extr payment and without any extension of the time.

1.9 DANGEROUS MATERIALS:

In case of dangerous materials, it is necessary to inform about the following:

a) precautions to be taken to avoid hard events for the material itself and for the workers using it.

b) In case of accidents the medicine and the proper treatments to accelerate curing to reduce damages and bad effects.

1.10 NUMBER COPIES:

Each technical documents (catalogues; drawings, diagrams, details for tests information) should be submitte on three copies one of them in English (at least).

1.11 PACKING:

The type of packing should be suitable for export and provide complete protection for marine, truck or rai transport and for loading (for example boxes, cases. etc.) should be robust enough and have suitabl dimensions and weight and should be accepted by the insurance company.

- Tenderer will take care on his own account, that the commodity will be packed carefully, in order to avoi damage of equipment and to be accepted to the insurance company.
- The strength and quality of the packing materials should correspond with the weight of the packed materials
- Appropriate measures according to each commodity type shall be taken to prevent vibration, sliding o movement inside boxes or cases.
- Boxes which should be handled with care according to the contents, must be marked accordingly an clearly.
- Sufficient steel bands for in accordance with their weight and dimensions, sensitive instrument and simila materials must be packed carefully to prevent exposure of elements of rain, dust, etc.....with th appropriate packing on nylon bags oiled paper and foam materials.
- Packing list: each case must contain equipment of the same kind and their accessories.
- Each case must include the packing list fixed on the case and protected, in addition to the list inside th case.

1.12 MARKING:

It is important to mark each case or box clearly by the following:

- Contract number.
- PETDE, the purchaser.
- Delivery number, shipment number.
- Kind of materials.
- Quantities contained.
- Main technical specification.
- Cross weight. net weight.

The marking must be clear and written on two sides of the box with inerasable material.

It is important to mark each fuse and base clearly by the following:

- PETDE (the Purchaser)
- Manufacturing date
- Manufacturing name.

1.13 TECHNICAL OFFER DOCUMENTS:

A complete offer shall consist of the following:

- Full technical specification schedules and to give all necessary information.
- Clear technical suggestions and explanations in details for the important parts.
- Three copies of all documents, at least one of them in English.
- Routine and type test reports (officially approved).
- Reference list.
- Quality assurance certificate.
- Maximum permissible power.

1.14 OFFERES EVALUATION:

The offers will be evaluated technically according to the following:

a) Quality of materials, compliance with the required specifications and guarantees.
b) Answering questions and filling technical schedules or tables and giving extra useful technical and practical information even if not requested.
c) Tender's background.

SECTION 2
GENERAL CONDITIONS OF DTSTRIBUTION NET WORK EQUIPMENT

:2.1 DISTRIBUTION NETWORK CHARACTERISTICS:

2.1.1 Medium voltage 20 kV ± 10% 3 phases earthen through an earthling transformer 20/0.4 kV (Zn Yn11).

2.1.1.1. Vector group distributing transformer 20/0.4 kV DYN 11.
2.1.1.2. rated Frequency: 50 Hz.
2.1.1.3. Impulse withstand voltage 125 kV at 1.2/50 us.
2.1.1.4. Symmetrical system rated short – circuit level is 500 MVA.
2.1.1.5. Earth fault current is limited to 500 A to 20 kV side.

2.1.2 low voltage 230/400 ± 10% 3 phases with the insulation voltage 600/1000 volts.

2.2 CLIMATIC CONDITION:

Absolute maximum ambient temperature 50 deg °C.
Average maximum +35 deg °C.
relative humidity 80 % at temperature 35 deg °C.

2.3 ENDURANCE:

The materials offered should withstand permanent or temporary voltage variations.

2.4 MEASURING UNITS:

The fabrication should be based on the metric system

TECHNICAL SPECIFICATION OF L.V FUSES AND BASES WITH BLADE CONTACTS.

SCOPE:

They will be installed to protect installations and customers apparatus against over load and short circui current.

2-DESCRIPTION:

- Rated voltage 500 V.A.C.
- Rated frequency 50 H.Z.
- The fuses are to be of H.R.C type.
- Applied standard IEC 269, DIN.
- Fuse base and fuse link should be single.
- Breaking capacity at all related current is not less than 100 kA for 500 volts and 50 HZ.
- Rated power loss.

MARKINGS:

- **Markings fuse-base.**
- Name of manufacturer.
- Rated voltage.
- Rated current.
- PETDE, the purchaser.
- **Marking on fuse links.**
- Name of manufacturer.
- Rated voltage.
- Rated current.
- Rated power loss.
- Kind of current and frequency: A.C.50 HZ.
- PETDE, the purchaser.

MECHANICAL DESIGN:

- It shall be possible to replace the fuse links easily and safety withdrawable force acc. to IEC, DIN.
- The fixed connection shall be such that the necessary contact force is maintained under the conditio of service and operation.
- Terminals shall be that they cannot turn or be displaced when the connecting screw are tightened such that the conductors cannot be displaced.
- The material of screws fixed of the fuse base made of hardened steel with polished and chrome-plated
- The fuse shall be such that they don't lose their insulating properties at the voltage to which they ar subjected in normal service.
- The minimum creepage distance, clearance and distance through insulating material or sealing compound shall comply with the value specified in I.E.C –D I N standards.
- The main contacts for fuse links, fuse base shall be electrolytic copper and silver plated.
- Fuse links shall have an indicator. And the design of fuses intended to be installed in such a way that their fuse – links can be replaced by unqualified persons .

- The main contacts of surfaces of fuse links, and fuse bases shall be electrolytic copper, and silver plated.
- Body filling material should be free metallic and impurities quartz.
- Main contact copper silver plated.
- For fuses and fuse Bases the offerer should submit tech specification of the used material in details with test report.
- **The material of the fuse body**: high quality material acc to IEC 672, DIN.
- **The material of the fuse base:** high quality material acc to IEC 672, DIN.

SECTION 3
GENERAL SPECIFICATION AND GURANTEE SCHEDULE
L.V FUSE LINK WITH BLADE CONTACT TO BE FILLED AND SIGNED BY OFFERER

No.	Description	Unit	PETDE Requirements	Offered Data
1	Name of manufacturer			
2	Country of origin			
3	Type of fuse		LV - H.R.C fuse link	
4	Utilization category		gG	
5	ISO quality assurance		Should be submitted	
5.1	Applied Standards		IEC60269,IEC60672 DIN 43.62	
6	Service condition			
6.1	Ambient air temperature	C°	- 5 C°, to 50 C°	
6.2	Relative humidity		80% at 35 C°	
6.3	Altitude	m	≤2000	
6.4	Insulation		Indoor	
6.5	Rated frequency	HZ	50	
6.6	Impulse with stand voltage level at (1.2/50μ sec	kV	≥ 6 kV	
6.7	Power frequency with stand voltage level	kV	≥ 3 kv	
7	Rated voltage	V	≥500 v	
8	Rated current			
	Size:00 (50) A	A	Size:00 (50) A	
	Size:00 (80) A	A	Size:00 (80) A	
	Size:1 (80) A		Size:1 (80) A	
	Size:1 (100) A	A	Size:1 (100) A	
	Size:1 (125) A	A	Size:1 (125) A	
	Size:1 (160) A	A	Size:1 (160) A	
	Size:1 (200) A	A	Size:1 (200) A	
	Size:2 (250) A	A	Size:2 (250) A	
	Size:2 (315) A	A	Size:2 (315) A	
	Size:2 (400) A	A	Size:2 (400) A	
	Size:3 (500)A	A	Size:3 (500)A	
	Size:3 (630) A	A	Size:3 (630) A	
9	Breaking capacity	KA	≥100	

No.	Description	Unit	PETDE Requirements	Offered Data
10	The material of insulator		High quality Acc. to IEC 672, DIN. The offerer should submit the group or class of the insulation material acc to the applied standard	
11	Cut – off current characteristics and their (time- current) characteristics		Should be submitted	
12	The material of fuse-element		An alloy of copper or silver	
13	Material of Arc extinguishing		Quartz sand	
14	Cut off current	KA	According to IEC	
15	Melting time	ms	According to IEC	
16	Arcing time	ms	According to IEC	
17	The material of blade contact		E-Cu silver plated	
18	force to withdraw the fuse link from the fuse base contacts **Size** 00 1 2 3		**F min** **F max** 60 250 110 350 150 400 210 400	
19	Contact surface area **Size** 00 1 2 3	mm^2	≥15x15 ≥20x30 ≥25x37 ≥32x37	
20	Thickness of the blade contacts **Size** 00 1 2 3	mm	≥6 ≥6 ≥6 ≥6	
21	Indicator system		Fuse-links shall have an indicator	
22	Creepage distance and clearance		According to IEC 60664-1	
23	Temperature rise limited	K	**≤65**	

No.	Description	Unit	PETDE Requirements	Offered Data
24	Power loss of the fuse link Size:00 (50) A Size:00 (80) A Size:1 (80) A Size:1 (100) A Size:1 (125) A Size:1 (160) A Size:1 (200) A Size:2 (250) A Size:2 (315) A Size:2 (400) A Size:3 (500)A Size:3 (630) A	W	According to IEC ≤12 ≤12 ≤23 ≤23 (P loss) ≤23 ≤23 ≤23 ≤34 ≤34 ≤34 ≤48 ≤48	
25	Dimensions*		According to IEC	
26	Weight	KG		
27	Pollution degree		3	
28	Test report		Should be submitted	
29	guarantee period	year	≥1year	

***The offerer should submit all dimensions, in detail for fuse link with drawings**

GENERAL SPECIFICATION AND GURANTEE SCHEDULE
L.V FUSE BASE TO BE FILLED AND SIGNED BY THE OFFERER

No.	Description	Unit	PETDE Requirements	Offered Data
1	Name of manufacturer			
2	Country of origin			
3	Type		LV HRC Fuse Bases	
4	ISO quality assurance		Should be submitted	
5	Applied standards		IEC 269,672,...DIN	
6	Service condition			
6.1	Ambient air temperature	C°	- 5 C°, to50 C°	
6.2	Relative humidity .		80% at 35 C°	
6.3	Altitude	m	2000 m	
6.4	Rated frequency	HZ	50 HZ	
6.5	Impulse with stand voltage level at (1.2/50μ sec)	kV	≥ 6 kV	
6.6	Power frequency with stand voltage level	kV	≥ 3 kv	
7	Rated voltage	V	≥500 v	
8	Rated current of fuse bases			
	Size:00	A	160	
	Size:1	A	250	
	Size:2	A	400	
	Size:3	A	630	
9	Breaking capacity	KA	≥100	
10	Material of terminal and contact		E-Cu silver plated	
11	The material of insulator		High quality acc to IEC 672 , DIN	The offerer should submit the group or class of the insulation material acc to the applied standard
12	Temperature rise limited at Rated power acceptance Size:00 160 A , 12w Size:1 250 A , 32 w Size:2 400 A ,45 w Size:3 630 A . 60 w	K	**≤65**	
13	material of screws fixed of the fuse base Size of screws Size 00 1 2 3		hardened steel with polished and chrome-plated surfaces M 8 M10 M10 M10/M12	

No.	Description	Unit	PETDE Requirements	Offered Data
14	Contact surface area Size 00 1 2 3	mm^2	 ≥12x15 ≥20x30 ≥25x37 ≥32x37	
15	Main circuit thickness size 00 1 2 3	mm	 ≥1.5 ≥2 ≥2 ≥2.5	
16	Main circuit terminal surface area size 00 1 2 3	mm2	 ≥20x20 ≥25x24 ≥25x28 ≥30x35	
17	Mechanical strength of the fuse base force to withdraw the fuse link from the fuse base contacts **Size** 00 1 2 3	N	 **F min** **F max** 60 250 110 350 150 400 210 400	
18	Creepage distance and clearance		According to IEC 60664-1	
19	Weight	kg		
20	Dimensions *		According to IEC	
21	Pollution degree		3	
22	Test report		Should be submitted	
23	guarantee period	year	≥1year	

* The offerer should submit all dimensions with drawings.

LIST OF QUANTITIES AND PRICES

em	Description		QTY	PRICE			
				FOB		CFR	
				Unit	Total	Unit	Total
1	L.V FUSE LINK WITH BLADE CONTACT	Size:00 (50) A					
		Size:00 (80) A					
		Size:1 (80) A					
		Size:1 (100) A					
		Size:1 (125) A					
		Size:1 (160) A					
		Size:1 (200) A	30 000				
		Size:2 (250) A	60 000				
		Size:2 (315) A	30 000				
		Size:2 (400) A	30 000				
		Size:3 (500)A	20 000				
		Size:3 (630) A	5000				
2	L.V FUSE BASE	Size:00 160 A					
		Size:1 250 A	10 000				
		Size:2 400 A	15 000				
		Size:3 630 A	15 000				
3	Expenses for two representatives (engineers) to participate in the testing at the manufacturer's factory for each delivery						