



Israel Electric Corporation Ltd.
Marketing Division
National Network Unit

Edition No.: 1	Specification NPS-250/1 For Single Pole HRC Fuse-Switch Disconnecter Size 4a
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SPECIFICATION NPS-250/1
FOR
SINGLE POLE HRC FUSE-SWITCH DISCONNECTOR SIZE 4a

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Israel Electric Corporation Ltd.
Marketing Division
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1. GENERAL

1.1 Scope

This specification applies to design, manufacture, preserve and furnish (with export packing if it is applicable) the following equipment: single-pole HRC fuse-switch disconnecter size 4a (hereinafter called "fuse-switch") intended for installation in polyester distribution cabinets or low voltage distribution boards.

1.2 I.E.Corp. catalog no. - **589978**.

2. THRESHOLD CONDITIONS

The threshold conditions shall be in accordance with the Bid documents of the Supply and Storage Division of the Israel Electric Corp. Ltd..

3. DOCUMENTS AND SAMPLES FOR PROPOSAL

For the technical evaluation, the Bidder shall submit to the Israel Electric Corp. together with his proposal 2 (two) copies of the following documents and sample:

- 3.1 Valid Quality Management System (QMS) certificate issued by an authorized inspection agency, as required in the threshold conditions of the Bid documents of the Supply and Storage Division.
In case of know-how agreement see Appendix "B".
- 3.2 Documents proving experience as required in the threshold conditions of the Bid documents of the Supply and Storage Division.
- 3.3 One sample of the proposed fuse-switch as required in the threshold conditions of the Bid documents of the Supply and Storage Division.

If the proposed fuse-switch was supplied to I.E.Corp. in the last three (3) years (identical fuse-switch, without any changes), than the Proposer may ask for exemption from sample submission. A written request (which shall indicate the type and the P/N of the proposed fuse-switch) shall be submitted to the Israel Electric Corp. until the technical proposal submission day. The Israel Electric Corp. will reply to the above request within one (1) week beginning at the technical proposal submission day.

- 3.4 Complete Type Test Report as required in clause 7.1 of this spec. or obligation, signed by the manufacturer and the Bidder (Appendix "C"), to perform complete or partial type test as it will be required by I.E.Corp during the technical stage of the Bid.



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- 3.5 Drawing clearly stating overall dimensions, mounting dimensions, gross weight, etc..
- 3.6 Drawing of the rating plate markings.
- 3.7 Description of equipment and catalogue with all electrical data.
- 3.8 Installation instructions.
- 3.9 Completed and filled-in summary of Data - Appendix "A" of this specification.
- 3.10 A preliminary Inspection and Test Plan (I&T Plan).
- 3.11 Know-How Agreement (if applicable, see Appendix "B").
- 3.12 Signed by the Proposer and by the Manufacturer Appendix "D" "Schedule up to prototype approval for single pole HRC fuse-switch disconnecter".

All dimensions shall be stated in the metric system.

All documents shall be in Hebrew or English. If the original documents are in other languages they have to be submitted accompanied by an authorized translation.

Proposals without all the above documents will be rejected.

4. STANDARDS

Unless otherwise stated, the fuse switch shall be designed, constructed and tested in accordance with the requirements of the latest published recommendations of the following standards and all relevant amendments.

- IEC 60947-1 - Low-voltage switchgear and controlgear. General rules.
- IEC 60947-3 - Switches, disconnectors, switch-disconnectors and fuse-combination units.
- DIN 43620 Part 3 - Low-voltage high-rupturing-capacity fuses with blade contacts 500 and 660 V a.c. and 440 d.c.; LV HRC fuse bases.
- IEC 60269-1- Low voltage fuses; General requirements.
- IEC 60269-2- Low-voltage fuses. Supplementary requirements for fuses for use by authorized persons (fuse mainly for industrial application).
- VDE 0636 Part 21 - Low voltage fuses: NH system; protection of cables and wiring up to 1250 A and 500 V a.c, 440 V dc and also 660 V a.c.
- VDE 0636 Part 22 - Low voltage fuses: H.R.C. Fuses for electrical installations. Fuse ratings up to 1250 A 1000 V A.C. Fuse application types AM, gTr, gB.



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- VDE 0636 Part 2011 - Low-voltage fuses - part 2-1. Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - National supplement 1 - protection of special electrical systems.

5. TECHNICAL REQUIREMENTS

5.1 Service conditions

The fuse-switch shall withstand the "Normal" service conditions described in IEC Publication IEC 60947-1 with the following additions and changes:

- Severe atmospheric and industrial air pollution, deposits of coal dust and salt from the sea;
- Tropical environment;
- High atmospheric humidity as experienced in coastal or desert areas;
- Sand storms as experienced in desert areas;
- Annual variation in air temperature: from -10°C to +55°C;
- Annual mean temperature: + 25°C;
- Maximum relative humidity: 90%;
- Average relative humidity: 70%;
- Average ambient temperature measured over a period of 24 hours does not exceed: +35°C;
- Maximum difference of ambient temperature from day to night: +25°C.

5.2 Electrical characteristics

Rated current	1250 A
Rated voltage	min 400 V a.c.
Rated frequency	50 Hz
Rated short-time (with solid-links) withstand current	50 kA/1 sec
Utilization category	AC 22B
Rated making and breaking capacity	3750 A
Rated insulation voltage	min 660 V a.c.
Number of operating cycles with current	≥100
Number of operating cycles without current	≥1000
Total number of operating cycles	≥1100
Acceptable power loss of the installed fuse-link	≥115 W

- 5.3 The insulated components shall be highly heat resistant plastics, halogen-free, break and fire-proof.



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- 5.4 The dimensions of the fuse switch shall be according to DIN 43620 Part 3 and as per attached drawing.
- 5.5 The fuse-switch shall enable vertical or horizontal connection of 60x10 mm busbar, as per attached drawing. For each connection it is required to supply M16x50 screw (DIN EN ISO 4017 - 8.8), two conical spring washers (DIN 6796) and hexagon nut (DIN EN ISO 4032/8673-8) that shall be supplied connected to fuse-switch connection bars.
- 5.6 Two screws M12x40 (DIN EN ISO 4017 - 8.8), four conical spring washers (DIN 6796) and two nuts (DIN EN ISO 4032/8673-8) shall be supplied with each fuse-switch for installation on the board.
- 5.7 An arc quenching chamber shall achieve the breaking capacity.
- 5.8 In order to insert or remove the fuse link from the fuse-switch, the fuse-switch shall be provided with a hinged fuse holder made of self-extinguished polycarbonate.

It shall be so constructed that a force will be necessary to open it (single handed operation).

The hinge of the fuse holder shall be securely designed so that a mechanical impact, movement or shaking, in both "ON" and "OFF" positions, with or without fuse-links, will not allow accidental extraction of the fuse holder.

- 5.9 The fuse holder shall enable voltage testing below and above the fuse-link.
- 5.10 All the springs, spring washers and washers shall ensure proper mechanical and electrical operation at the specified service conditions.
It is obligatory to state the following data for each metal component of the fuse switch :
- material
 - type and thickness of coating
 - applicable standards (for the material and coating)
- 5.11 All current carrying parts of the fuse switch shall be silvered and so designed that in proper use, the electrical contact shall not deteriorate. The minimum thickness of the silver coating shall be 5 microns.

Other coating technologies may be proposed. The I.E.Corp. reserves the right, but not a duty, to accept others technologies.

- 5.12 The fuse switch shall be fully insulated against accidental access to the life parts during making and breaking operation.



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All life parts shall be covered by insulated material to eliminate any possible accidental touch. All the plastic material shall be from a self-extinguishing material.

The I.E.Corp. reserves the privilege to determine if the above requirements were fulfilled.

5.13 The fuse base shall be able to disconnect a minimum capacitive current of 150 Amps (100 KVAR, 400V capacitive bank) - 10 cycles.

6. MARKING

Each fuse-switch shall be marked in a durable and visible manner according to IEC 60947 Part 3 with the following data:

- manufacturer's name or trade mark;
- fuse-switch-disconnector symbol (see Table 1, IEC 60947);
- type designation;
- rated operational current;
- rated operational voltage;
- utilization category;
- value (or range) of the rated frequency;
- fuse type and maximum rated current and the power loss of the fuse-link.
- "IEC 60947-3"

The Proposer shall submit a drawing of the rating plate markings for I.E.Corp. approval.

7. TESTS

7.1 Type Tests

The type tests shall be carried out by the manufacturer according to standard IEC 60947 Part 3, at any independent accredited test laboratory (authorized acc. to Standard ISO/IEC 17025).

The type test report shall pertain to the equipment identical to the proposed equipment.
The type test report shall specify the actual values received during the type test.
The following type tests shall be performed:



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- a. Temperature-rise
- b. Temperature-rise verification
- c. Dielectric properties
- d. Dielectric verification
- e. Leakage current
- f. Rated making and breaking capacities (overload)
- g. Operational performance test
- h. Rated conditional short-circuit current
- i. Strength of actuator mechanism
- j. Overload test
- k. Special test - mechanical endurance (at least 1000 operating cycles)

The above type tests are grouped in sequences I, II, IV and V as detailed in Table 10, IEC 60947-3.

Special test of mechanical endurance can be performed during Test sequence II.

Remark:

If type test report for the proposed fuse-switch is not available or is partial, then for the technical evaluation the tests reports may pertain to a **similar** fuse-switch.

Definition for "similar": A three pole, vertical or horizontal design, fuse-switch disconnecter which on each pole is assembled the proposed one-pole fuse-switch.

7.2 **Routine Tests**

Duly certified routine tests are obligatory. Such tests shall be performed at the manufacturer's laboratory.

The following routine tests shall be performed on each fuse-switch:

- a. Mechanical operational test.
- b. Dielectric test.

The routine test report pertained to withdrawal order/lot shall be submitted two weeks before the delivery of the equipment to I.E.Corp. stores. The routine test report shall specify withdrawal order, lot no., quantity of equipment in the lot. **The format of the Routine test report shall be approved by I.E.Corp. during Prototype approval.**



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8. PACKAGING

- 8.1 The packaging of the equipment shall be suitable for transportation and for indoor storage.
- 8.2 Each equipment shall be packed together with all the accessories (as screws, conical spring washers, nuts etc.) necessary for connection and installation in the same pack.
- 8.3 The packaging shall be carton boxes arranged in wooden pallet for fork lifting.
- 8.4 The packaging shall bear a label showing the top and the bottom of the packed equipment.
- 8.5 Each packaging shall be clearly marked in print (large letters) with the following:
- Manufacturer's name or Trademark
 - Country of origin
 - Supplier name
 - Telephone, fax. No. of the Supplier
 - P/N and denomination of the equipment
 - Israel Electric Corp. catalogue number
 - Bid No./Withdrawal Order
 - Date of production (week/year, month/year)
- 8.6 One copy of the packing list and Installation Instructions written in Hebrew (if necessary the translation in Hebrew will be provided by I.E.Corp.) shall be attached to each packaging.
- 8.7 The packaging shall be approved by I.E.Corp..

9. QUALITY ASSURANCE AND QUALITY CONTROL

9.1 Quality Assurance

The quality assurance of the Manufacturer shall comply with the threshold conditions of the tender documents.

9.2 Quality control

- 9.2.1 Bidder's Quality Control system shall comply with the requirements of Specification Q-APP-02 Rev 3 03/2005 (Quality Requirements) attached in Appendix "E".



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If the Threshold Conditions of the Bid contain requirements which are differ from those of specification Q-APP-02 Rev 3 03/2005, the requirements of the Threshold Conditions of the Bid shall take precedence.

- 9.2.2 The Bidder shall submit with his proposal a preliminary Inspection and Test Plan (I&T Plan).
Any subsequent alteration to this Plan shall require the Purchaser's agreement, prior to start of any work affected by these alterations.
- 9.2.3 When subcontracting important parts of the equipment, the Contractor shall submit, on Purchaser's demand, the unpriced orders, to his Subcontractors, clearly marked with the Purchaser's name and contract No. and shall indicate the quality requirements from his sub-contractor.
- 9.2.4 Test and Inspection certificates as required in the Specification and the applicable Standards, shall be submitted immediately following their generation. The certificates shall be original, signed by the Contractor, and contain actual measured values. The generation of certificates, including those generated by subcontractors shall bear no extra cost to Purchaser.
- 9.2.5 Manufacturing shall no commence prior to respective drawings approval by the Purchaser.
- 9.2.6 Changes in Purchaser's approved design and/or change of subcontractors are normally unacceptable. However, should such changes become necessary on an exceptional basis, the Contractor shall obtain the Purchaser's written approval prior to introducing any change.
- 9.2.7 All materials used in the manufacture of the Equipment shall conform to the Specification, approved drawings and accepted Standards. Use of alternate materials and subassemblies is not accepted unless a specific and documented authorization is granted in writing by the Purchaser.

10. DELIVERY APPROVAL CONDITIONS

10.1 Prototype approval

After notification of award, and before production of all ordered fuse-switches, the Contractor shall manufacture one fuse-switch as prototype for the Israel Electric Corp. approval.

The stages of prototype approval shall withstand the timeframes of the "Schedule up to prototype approval" (see APPENDIX "D" of this specification).



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If for purposes of Prototype approval the Contractor shall perform the complete or partial type tests (as will be required by I.E.Corp. during technical stage of the Bid – see remark below) at the authorized laboratory as required in subclause 7.1 of this specification, the Contractor shall be responsible to conduct successfully all the necessary tests, and to deliver to the Israel Electric Corp. all the necessary reports required in a manner which will not interfere with, or delay, any of the time schedules, pertaining to any action or undertaking, required of the winning Bidder, including, but not limited to delivery schedule.

Such responsibility shall include proper and reasonable advanced notifications to the Israel Electric Corp., prior to any action as required.

The Contractor shall cover all the costs of the tests as required to be performed according to this specification.

Representatives of the Israel Electric Corp. shall be authorized to be present during the performance of the type tests. The Contractor shall notify the Israel Electric Corporation at least 4 weeks prior to the type tests.

Remark:

If Type and special Tests have already been conducted with reference to the equipment, which is offered by the Proposer and the Israel Electric Corp. approves the reports, pertaining to such tests, the Israel Electric Corp. shall have a right (but not a duty) to waive all or part of the required tests and the Proposer will be informed about during the technical stage of the Bid.

The Israel Electric Corp. reserves the right to cancel the ordered equipment if all type tests will not be conducted successfully.

In any case, the Contractor shall not resume the manufacture of the the ordered equipment before receiving the Israel Electric Corporation's final approval of the prototype.

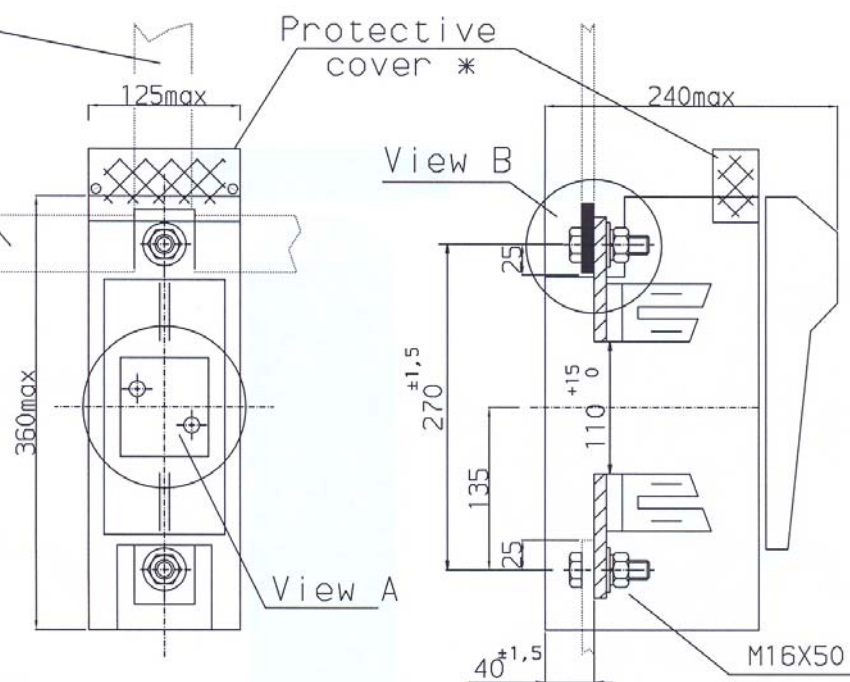
- 10.2 A Quality control label shall be attached to each equipment. The label shall indicate the following:
- Date of equipment final control before packaging
 - Code of the controller.
- 10.3 Each lot of the withdrawal order to be supplied to I.E.Corp. stores shall be accompanied by a Routine Test Report as required in clause 7.2 of this specification.
- 10.4 The Israel Electric Corp. reserves the right to verify the compliance of the delivered equipment with this specification. Any delivery which will not fulfill the requirements of this specification will be rejected.



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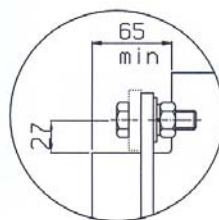
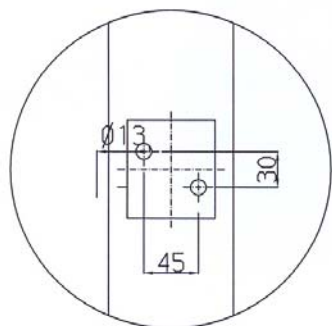
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Busbar cross-section 60X10
(Vertical or horizontal)



Front view A

View B



***Remark:**

During the operation a suitable arrangement (for ex. a protective cover) to prevent accidental access to life parts shall be provided.



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Appendix "A"

SUMMARY OF DATA

Bid no. _____

	Insert all data in this column
1. Bidder's name and address.	
2. Bidder's tel. no./fax no.	
3. Bidder's email	
4. Manufacturer's name and address.	
5. Manufacturer's tel. no./fax no.	
6. Manufacturer's email.	
7. Know-how supplier name and address (if it is relevant)	
8. Know-how supplier tel. and fax no. (if it is relevant)	
9. Know-how recipient name and address (if it is relevant)	
10. Know-how recipient tel. and fax no. (if it is relevant)	
11. Manufacturer P/N of proposed fuse-switch disconnecter	
12. Rated current (A)	
13. Rated operational voltage (Ue) (V)	
14. Utilization category	
15. Rated insulation voltage (Ui) (V)	
16. Impulse withstand voltage (Uimp) (V)	
17. Rated making capacity (A)	
18. Rated breaking capacity (A)	
19. Rated short circuit making capacity with fuses (Icm) (kA) peak value(kA)	
20. Rated frequency (Hz)	
21. Minimum capacitive current which can be disconnected (A/No. of cycles)	
22. Number of mechanical operating cycles (required 1000)	
23. Rated conditional short circuit current with fuses (kA)	



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Bid no. _____

	Insert all data in this column
24. Maximum permissible power loss of fitted fuse-link (W)	
25. Are all the current carrying parts silvered? (YES/NO)	
The minimum thickness of the silver coating will be (μm)	
26. No. of operating cycles with rated current (required 100) (A/No. of cycles)	
27. No. of operating cycles without current (required 1000)	
28. Does the fuse holder enable voltage testing below and above the fuse-link (YES/NO)	
29. All the springs, conical spring washers and washers will ensure the proper mechanical and electrical operation at specified service conditions. (YES/NO)	
30. Each fuse-switch will be accompanied with two screws M16x50, four conical spring washers and two nuts as required in subclause 5.5 of this specification (YES/NO)	
Recommended nominal torque for connection to busbar (N·m)	
31. Each fuse-switch will be accompanied with two screws M12x40, four conical spring washers and two nuts as required in subclause 5.6 of this specification (YES/NO)	
Recommended nominal torque for connection on the board (N·m)	
32. Does the minimum thickness of the silver coating of the current carrying parts is 5 μm as required in clause 5.11 of this specification (YES/NO)	
33. Does the insulating materials of the fuse-switch are self-extinguishing? (YES/NO)	
34. The insulating material of the protective cover (if exist in design) is	
35. Does the offered fuse-switch disconnecter comply with the following standards:	
• IEC 60947-1 (YES/NO)	
• IEC 60947-3 (YES/NO)	
• IEC 60269-1 (YES/NO)	
• IEC 60269-2 (YES/NO)	
• DIN 43620-3 (YES/NO)	
• VDE 0636-21 (YES/NO)	
• VDE 0636-22 (YES/NO)	
• VDE 0636-2011 (YES/NO)	



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Bid no. _____

	Insert all data in this column
36. Other standards, norms, recommendations used in the design, manufacturing and testing of the offered fuse switch	
37. Are the documents and sample of the proposed fuse-switch as required in clause 3 submitted with the proposal:	
37.1 QMS certificate (YES/NO)	
37.2 Document providing experience (YES/NO)	
37.3 Sample (YES/NO)	
37.4 Drawings of the fuse-switch (YES/NO)	
37.5 Drawing of the rating plate markings (YES/NO)	
37.6 Description of equipment and catalogue (YES/NO)	
37.7 List of metal parts of the fuse-switch with data regarding the material, type and thickness of coatings, applicable standards (for the material and coatings) (YES/NO)	
37.8 Installation instructions (YES/NO)	
37.9 A preliminary Inspection and Test Plan (YES/NO)	
37.10 Type test report pertain to proposed fuse-switch (YES/NO)	
• Test sequence I (fill the no. of test report)	
• Test sequence II (fill the no. of test report)	
• Test sequence IV (fill the no. of test report)	
• Test sequence V (fill the no. of test report)	
37.11 Type test report pertain to similar fuse-switch (YES/NO)	
• Test sequence I (fill the no. of test report)	
• Test sequence II (fill the no. of test report)	
• Test sequence IV (fill the no. of test report)	
• Test sequence V (fill the no. of test report)	
37.12 Signed Letter of Obligation (Appendix C") (YES/NO)	
37.13 Know-how agreement (if it is applicable) (YES/NO)	
38. Each supplied lot shall be accompanied by a Routine Test Report as required in clause 7.2 of this specification. (YES/NO)	
39. Each supplied fuse switch will be accompanied by a quality control label (YES/NO)	
40. <u>Prototype approval</u> The Contractor after notification of award and before production of all ordered fuse-switches shall present one fuse-switch for Israel Electric Corp. approval as required in clause 10.1 of this specification. (YES/NO)	



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Bid no. _____

	Insert all data in this column
41. <u>Conformity with proposal documents</u> Bidder hereby certifies that he agrees to all the provisions of the Inquiry Documents (YES/NO)	
42. Bidder hereby certifies that he agrees to all conditions of the cover letter of the Israel Electric Corporation Limited, which accompanied the Proposal documents. (YES/NO)	

Signature of Bidder: _____ Date: _____

Signature of Manufacturer: _____ Date: _____

Signature of Know-How Supplier (if applicable): _____ Date: _____

Signature of know-How recipient (if applicable): _____ Date: _____



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APPENDIX "B"

Know-How Requirements

1. Where a "Know-how" agreement is required under the tender/inquiry documents, or under the specification, such "Know-how" agreement must include the following commitments, or substantially similar commitments, on part of the provider of the know-how:
 - 1.1 To transfer to the know-how recipient, all the technical documents and drawings, necessary for the manufacturing, fabrication, testing, proper packing, operating and maintaining of the proposed equipment.
 - 1.2. To adequately instruct and provide technical support to the know recipient in the field of manufacture/fabrication, design, quality control, testing and repair of the proposed equipment.
 - 1.3 To conduct an inspection of the manufacturing line of the know-how recipient and to approve its adequacy to manufacture the proposed equipment up to the standards of the know-how provider.
 - 1.4 To participate in type tests of the proposed equipment (of the know-how recipients manufacture) and to instruct/support the know-how recipient in undertaking corrective act/procedure, if required or approved by the I.E.Corp.
 - 1.5 To provide technical support/instructions to the know-how recipient during the first two years following the start of manufacturing by the know-how recipient.
2. The IEC waives any and all claims it may have against the know-how provider, for any conduct, act or omission, on part of the know-how provider, or any of its employees, agents, or representatives, directly or indirectly related to the transfer of know-how, the know-how agreement, or any action, or omission there under.

This waiver of claims shall insure to the benefit of the know-how provider and to the benefit of any of its employees, agents or representatives.

Nothing said herein shall release the know-how recipient from any duties or commitments, undertaken by it, as part of its proposal to the IEC, or in connection with any failures or omissions to carry out such duties, or commitments.



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APPENDIX "C"

Bid no. _____

LETTER OF OBLIGATION

We undersigned obligate, that in case of award the Type Tests, that will be required by I.E.Corp. during technical stage and detailed in this specification, will be performed within the timeframe as required in "Schedule up to prototype approval for single pole HRC fuse-switch disconnecter size 4a" (Appendix "D").

Signature of Bidder: _____

Date: _____

Signature of Manufacturer: _____

Date: _____

Signature of Know-How Supplier (if applicable): _____

Date: _____

Signature of know-How recipient (if applicable): _____

Date: _____



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Schedule up to Prototype approval for Single Pole HRC Fuse-Switch Disconnecter Size 4a

Bid Number _____

No.	STAGE	Week								
		1	2	3	4	5	6	7	8	9
1.	Submitting detailed manufacturing drawings including Q.A. and Q.C. procedure of required equipment.									
2.	Israel Electric Corp. approval for the above documents.									
3.	Completion or modification of the above documents (if necessary).									
4.	Written confirmation of the know-how Supplier that the Type Tested Prototype and the mass production will be manufactured at the same production facilities with same molds and fixations, production process and materials.									
5.	Israel Electric Corp. approval of the documents after clarifications.									
6.	a. Preliminary prototype approval by Israel Electric Corp.. Submitting of changes and corrections to be performed (if necessary) and set of drawings "AS MADE".									
	b. Performance of the required type tests (as per subclause 7.1 of this specification.) and submitting of the Type Test Reports for I.E.Corp. approval.									
7.	Final Prototype approval.									

Signature of Bidder: _____

Date: _____

Signature of Manufacturer: _____

Date: _____

Signature of Know-How Supplier (if applicable): _____

Date: _____

Signature of know-How recipient (if applicable): _____

Date: _____