

TECHNICAL SPECIFICATIONS
AND SCHEDULES for 36 KV-VOLTAGE TRANSFORMERS

TECHNICAL SPECIFICATIONS

- 1. Scope:** This specification covers the minimum technical requirements for the design, manufacturing, testing, packing and procurement of medium voltage (MV) transformers used for measuring and protective relays at a frequency of 50HZ. **The specific voltage transformer VT will replace the existing VT as part of maintenance activities, with the dimension limitations (the required type is ALCE VK36 only).**
- 2. General description:** Single-pole indoor insulated voltage transformers cast in epoxy resin and designed for insulation voltages of 12 kV and 36 KV. The transformer is equipped with two secondary windings (can be three if required), the first one for measuring and the other for protection. The transformer can be mounted in any position. The secondary terminal board should be covered with a transparent and sealable cover made of suitable insulated material. In case of Voltage transformer equipped with fuse, the fuse link should be easy to be replaced (According to requirement). Unless otherwise specified, the transformers are manufactured conformably to the requirements and recommendations of IEC. The secondary circuit shall have segregated fuses or circuit breaker protection in addition to the main secondary protection device.
- 3. Applicable standards:** Unless otherwise specified, the voltage transformer should comply with the latest edition of IEC publications.
IEC 61869-1, General requirements .
IEC 61869-3, Additional requirements for inductive voltage transformers
- 4. Environmental conditions:** The performance of the voltage transformer should be guaranteed for the following table, any differences in the guaranteed performance should be clearly set out in the offer:

Minimum ambient temperature	-5°C
Maximum ambient temperature	45°C (50 °c as option).
Maximum relative humidity	95%.
Maximum altitude	1000 m

5. Technical specification:

Items	Value
Required type	ALCE VK36
Rated Primary Voltage (V)	33000/ $\sqrt{3}$
Rated Secondary Voltage (V)	
1 st Winding	110/ $\sqrt{3}$ V
2 nd Winding	110/3 V
3 rd Winding	not required
Rated Burden	
1 st winding	60 VA
2 nd winding	20 VA
Accuracy class	
1 st winding	0.5
2 nd winding	3P
3rd winding as required	not required
Max. system voltage (KV)	36 kV
Rated power-frequency withstand voltage (RMS)	70kV
Rated lightning impulse withstand voltage (peak)	170kV
Insulation level KV	36/70/170 kV
Isolation class	E
System frequency (Hz)	50Hz
IP	

6. Design criteria:

- Rated frequency 50 HZ.
- Voltage factor 1.2 continuous – 1.9 for 30 sec
- The transformer is equipped with two secondary windings, the first one for measuring and the other for protection.
- Rated impulse withstands voltage for primary windings 170KV
- Short duration withstand voltage (RMS) for primary windings (1min.) 70 KV.
- Rated power frequency short duration withstand voltage for secondary winding (1 min.) 3 KV
- The rated power-frequency withstand voltage of the insulation between sections shall be 3 kV.
- Maximum winding temperature rise should be according to IEC 61869-1,3.

- Limits of voltage error and phase displacement should be in accordance with IEC 61869-1, -3.

For protection core: The voltage error and phase displacement at rated frequency shall not exceed the values in Table below at 5 % of rated voltage and at rated voltage multiplied by the rated voltage factor (1.2, 1.5 or 1.9) with burdens of:

- any value from 0 VA to 100 % of the rated burden, at a power factor equal to 1.
- between 25 % and 100 % of rated burden at a power factor of 0.8 lagging.

At 2 % of rated voltage, the limits of voltage error and phase displacement will be twice as high as those given in Table.

For measuring core: The voltage error and phase displacement at rated frequency shall not exceed the values given in Table at any voltage between 80 % and 120 % of rated voltage and with burdens:

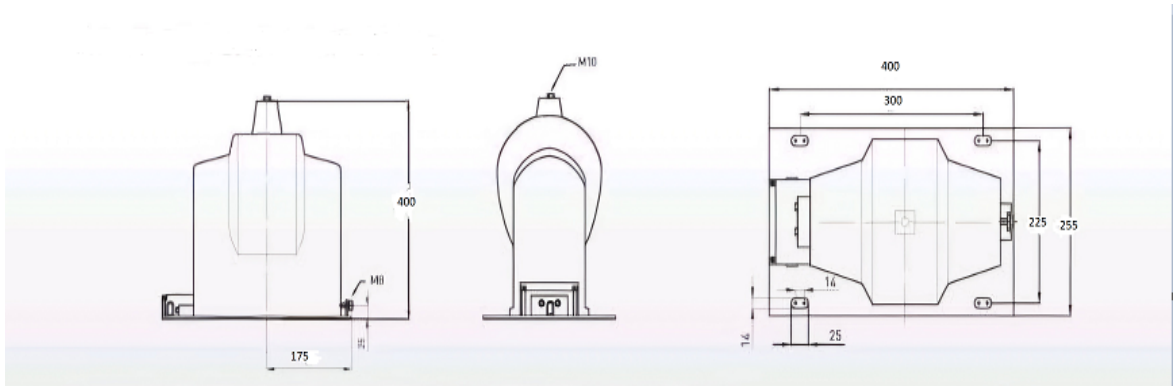
- any value from 0 VA to 100 % of the rated burden, at a power factor equal to 1.
- between 25 % and 100 % of rated burden at a power factor of 0.8 lagging.

The errors shall be determined at the terminals of the transformer and shall include the effects of any fuses or resistors as an integral part of the transformer.

	Measuring winding	Protection winding
Voltage (ratio) error ε_u	$\pm 0.5\%$	$\pm 3\%$
Phase displacement $\Delta\phi$	$\pm 20\text{min}, \pm 0.6$ centiradian	$\pm 120\text{min}, \pm 3.5$ centiradian

- Magnetization curves for each type of voltage transformer shall be submitted for approval

- Required dimension:



The dimensions in (mm)

7. Type tests:

- Type tests should be in accordance with IEC 61869-1,3.
- Type test certificates should be submitted with the offer.

8. Routine/acceptance tests: -

1. Power-frequency voltage withstand tests on primary terminals.
2. Partial discharge measurement.
3. Power-frequency voltage withstand tests between sections.
4. Power-frequency voltage withstand tests on secondary terminals.
5. Test for accuracy
6. Verification of markings.

Acceptance tests should be performed on random samples. Routine tests should be performed in compliance with IEC61869-1, -3.

9. Inspection:

- 1) Electricity Distribution Company (EDCO) preserves its right to witness acceptance tests of voltage transformer.
- 2) Unless otherwise specified or approved in writing by (EDCO) all voltage transformers should be tested in accordance with all relevant latest applicable IEC standards and test report certificates should be provided with it. The VT will be assumed as rejected if any functions of the VTs are found faulty.
- 3) EDCO has the right to reject any offer that is not clear or not enclosed with clear specifications, drawing, catalogue for the offered material.

10. Marking: -

The following data should be marked on VT itself or on a nameplate engraved or laser printed on the VT, and located in a place such that they are visible and legible when VT is installed:

- Manufacturer name
- Country of origin
- VT type
- Serial number and order number
- Year of manufacture
- No of IEC standard
- Rated voltage (V_n)
- Rated frequency.

All V.T. should carry at least the clear and indelible markings as specified in IEC 61869-1, -3.

11. Drawings and Catalogues: -

The Tenderer must submit with his offer the following terms:

- Catalogues
- Manufacturer's name and trademark.
- Specifications indicating ratings.
- Weights & dimensions.
- Type test certificate.

12. Warranty Period:

Warranty period should be 18 months from delivery or 12 months from operation date whichever later. For the first submittal.

SCHEDULE AND GUARANTEES

<u>SCHEDULE NO.</u>	<u>DESCRIPTION</u>
A	SCHEDULES OF REQUIREMENTS
B	SCHEDULES OF PRICES
C	GUARANTEED DELIVERY PERIODS
D	MANUFACTURER, PLACE OF MANUFACTURE & TESTING
E	TECHNICAL PARTICULARS AND GUARANTEES
F	DEVIATIONS FROM SPECIFICATIONS
G	LIST OF TYPE TEST CERTIFICATES
H	REFERENCE LIST

SCHEDULE (A)

SCHEDULE OF REQUIREMENTS

Item No.	Description	EDCO Stock Code	Unit	Quantity Required
a.	ALCE VK36 Indoor Type - Voltage transformer(fixed); Voltage Ratio: (33000/ $\sqrt{3}$,110/ $\sqrt{3}$,110/3 V), as specified.		EA	6

SCHEDULE (B) PRICE SCHEDULE

ITEM NO.	DESCRIPTION	QTY AND UNIT	UNIT PRICE & CURRENCY		TOTAL PRICE C&F AQABA-JORDAN
			
			FOB	C & F AQABA	
A.	ALCE VK36 Indoor Type - Voltage transformer(fixed); Voltage Ratio: (33000/ $\sqrt{3}$,110/ $\sqrt{3}$,110/3 V), as specified.	6 pcs			
TOTAL PRICE C&F AQABA					

IMPORTANT NOTES:

- 1. EDCO HAS THE RIGHT TO ACCEPT PARTIAL OFFERS AND TO AWARD PART OF THE ITEMS QUANTITIES WITHOUT ANY LIMIT OR NOTICE.**
- 2. EDCO HAS THE RIGHT TO REJECT ANY OFFER RECEIVED WITHOUT CLEAR TECHNICAL DETAILS; EDCO HAS THE RIGHT TO REJECT THAT OFFER DURING EVALUATION WITHOUT ANY PRIOR NOTICE**

SCHEDULE (C)

GUARANTEED DELIVERY PERIODS IN WEEKS

This Schedule shall be completed by the Tenderer and the periods entered shall be binding on the Contractor.

DESCRIPTION	DELIVERY PERIOD FOB PORT OF LOADING-SPECIFY PORT	DELIVERY PERIOD TO AQABA PORT- JORDAN
ALCE VK36 Indoor Type -Voltage transformer(fixed); Voltage Ratio: $(33000/\sqrt{3}, 110/\sqrt{3}, 110/3 \text{ V})$, as specified,		

Note: -

Delivery time shall not exceed (8) weeks, C&F Aqaba port from the date of receipt EDCO purchasing order.

SCHEDULE (D)
MANUFACTURERS, PLACES OF MANUFACTURE
AND TESTING

The Tenderer shall state the town and country where manufacturing, testing and inspection take place.

DESCRIPTION	MANUFACTURER	PLACE OF MANUFACTURE	PLACE OF TESTING AND INSPECTION
ALCE VK36 Indoor Type - Voltage transformer(fixed); Voltage Ratio: (33000/ $\sqrt{3}$, 110/ $\sqrt{3}$, 110/3 V), as specified.			

SCHEDULE (E)
TECHNICAL PARTICULARS AND GUARANTEES FOR Voltage Transformer

These Schedules are to be completed by the Contractor at the time of tendering and particulars and guarantees entered will be binding.

Item No.	Description	VT 33KV
1	Type	ALCE VK36
2	Type and class of insulation	
3	Number of phases per unit	
4	Standard rated output per phase for each secondary winding	
5	Rated voltage: a. primary b. secondary	
6	Standard accuracy classification	
7	Maximum error at rated burden and 5% normal primary voltage:	

Item No.	Description	VT 33KV
8	a. voltage ratio	%
	b. voltage phase angle	min
9	Maximum error at rated burden and primary voltage and 95% frequency:	
	a. voltage ratio	%
10	b. voltage phase angle	min
	Weight of complete transformer	Kg
	Dimensions	mm

SCHEDULE (F)

DEVIATIONS FROM SPECIFICATION (IF ANY) TO BE COMPLETED BY THE TENDERER

ITEM NO.	BREIF DESCRIPTION	DEVIATIONS

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SCHEDULE (G)

LIST OF TYPE TEST CERTIFICATES FOR OFFERED MATERIALS

Tenderers shall provide the information required below for the type test certificates from a recognized testing station covering the equipment offered to IEC recommendations & shall be submitted with the tender.

Failure to provide copies of type test certificates/reports will result in rejection of the tender.

Type test made on identical designs of equipment to those offered.	Certificate No.	Certificate Authority

SCHEDULE (H)

SERVICE EXPERIENCE OF MATERIAL

Tenderers shall provide the information required below for the service experience of the same offered material.

Customer	Total Quantity.	Type	No. of years in service

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