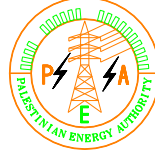


Rehabilitation of Electricity Power Distribution Network in three areas in the Gaza strip (GS)



من الشعب الياباني
From the People of Japan



50
YEARS

Empowered lives. Resilient nations.

Bill of Quantity : Package1 - Lot 2 - Supply of Overhead Transformers

Bill of Quantity : Package1 - Lot 2

Supply the listed below items (Overhead Transformers)

Item	Description	Unit	Quantity	Unit Rate (US\$)	Total Cost (US\$)
	<p>The Contract entails supply of the listed below items (22 kV Distribution Line & 0.4 kV Low Voltage Electrical Components)</p> <p>All Materials must Adhere to technical specifications and drawings as per the international standards subject to engineer's approval.</p> <p>All items will be approved through submittal of material approval from substantiated by brochures , factory specifications and sample according to approved material supply schedule.</p>				
B1	<i>Overhead Transformer & Accessories</i>				
B1.1	22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 630 KVA Rating , (According to the Transformers General Specifications and Technical Guarantees No. ODT_630)	No.	18		
B1.2	22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 800 KVA Rating , (According to the Transformers General Specifications and Technical Guarantees No. ODT_800)	No.	12		
	Total of Overhead Transformer & AccessoriesCarried to the main summary				

Bill of Quantity : Package1 - Lot 2

Supply the listed below items (Overhead Transformers)

Item	Description	Unit	Quantity	Unit Rate (US\$)	Total Cost (US\$)
<i>B1</i>	Total of Overhead Transformer & Accessories				
	Transportation of goods to Gaza area (GEDCO Warehouses)				
	Total Total EXCLUDING VAT (US\$)				

NET TOTAL SUM EXCLUDING VAT (in words) :

SIGNED AND SEALED :

AUTHORIZED :

TITLE :

SIGNATURE :

DATE :

	Transportation items:(Optional)	QTY	Total in US\$
1.1	Transportation of goods to Toulkarem area	job	
1.2	Transportation of goods from Toulkarem to Gaza.	job	

Technical Guarantees No. ODT_630**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 630 KVA Rating**

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
1	Name of Manufacturer					
2	Country of Origin					
3	Reference Manufacturing Standards		IEC 60076 or DIN42500			
4	Type		3 phase oil-immersed with Conservator			
5	Continuous Maximum Rating (C.M.R)	KVA	630			
6	Rated Frequency	Hz	50			
7	Cooling method		ONAN			
8	Normal Voltage Between Phases at No Load					
	a) H.V	Volts	22000			
	b) L.V	Volts	400			
9	Connection and Vector Group					
	a) H.V Winding		Delta			
	b) L.V Winding		Star			
	c) Vector Group		Dyn11			
10	Tapping Range on H.V Side					
	a) Rating of the Tap change		+1x2.5% -3x2.5%			
	b) Type of Tap Changer		Off Load			
11	Losses (Low Losses Type)					
	a) Max. No-load losses	Watts	900 (Zero Tolerance)			
	b) Max. Load losses at 75C°	Watts	5100 (Zero Tolerance)			
12	Max. Impedance Voltage of Short Circuit at 75 °C	%	4			

Technical Guarantees No. ODT_630**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 630 KVA Rating**

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
13	Voltage Drop at Full Load					
	a) at unity Power Factor ($\cos\phi = 1$)	%	1.11			
	b) at 0.8 Power Factor ($\cos\phi = 0.8$)	%	3.17			
14	Efficiency at full load					
	a) at unity Power Factor ($\cos\phi = 1$)	%	98.76			
	b) at 0.8 Power Factor ($\cos\phi = 0.8$)	%	98.45			
15	Max Temperature rise at C.M.R					
	a) Top Oil by Thermometer	°C	45			
	b) Average Winding by Resistance	°C	50			
	c) Hot Spot Corresponding to (b)	°C	98			
16	Insulating Voltage Level					
	a) Rated lighting – Impulse withstand Voltage 1.2/50 μ s (Peak Value)	kV	125			
	b) Rated Duration Power Frequency withstand Voltage 1 min (r.m.s Value)	kV	50			
17	Material thermal class insulation (According IEC 60085)		Class A			
18	Overloading					
	a) Minimum Duration of %133 Overloading at 30C° Ambient Temperature and Preload 75% F.L	Min.	240			
	b) Minimum Duration of %150 Overloading at 30C° Ambient Temperature and Preload 75% F.L	Min.	98			
19	Winding Conductor Material					
	a) H.V winding		high conductivity electrolytic copper			
	b) L.V winding		high conductivity electrolytic copper			

Technical Guarantees No. ODT_630**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 630 KVA Rating**

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
20	Type of insulation					
	a) H.V winding		Diamond pattern Kraft paper			
	b) L.V winding		Diamond pattern epoxy coated Kraft paper			
21	Type of Bushing					
	a) H.V Bushing		30 NF -250			
	b) L.V Bushing (with drilled hole 4x Ø14 mm Brass Flag)		DT2000			
22	Installation		Outdoor on Lattice Steel Pole arms			
23	Noise level at 0.3 m (Lwa)	dB	≤ 60			
24	Transformer Oil (as Standard IEC60296:3.0)					
	a) Kinematic Viscosity , at 40 °C	mm ² /s	8			
	b) Density, at 20 °C	kg/dm ³	≤ 0.895			
	c) Breaking Voltage before Treatment	KV	≥30			
	d) Breaking Voltage After Treatment	KV	>60			
	e) Environmental Requirements		Polychlorinated biphenyls (PCBs) Free			
	f) Type		Nytro 10XN or Equivalent			
25	Oil weight	Kg	shall be filled by manufacturer			
26	Total weight	Kg	shall be filled by manufacturer			

Technical Guarantees No. ODT_630**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 630 KVA Rating**

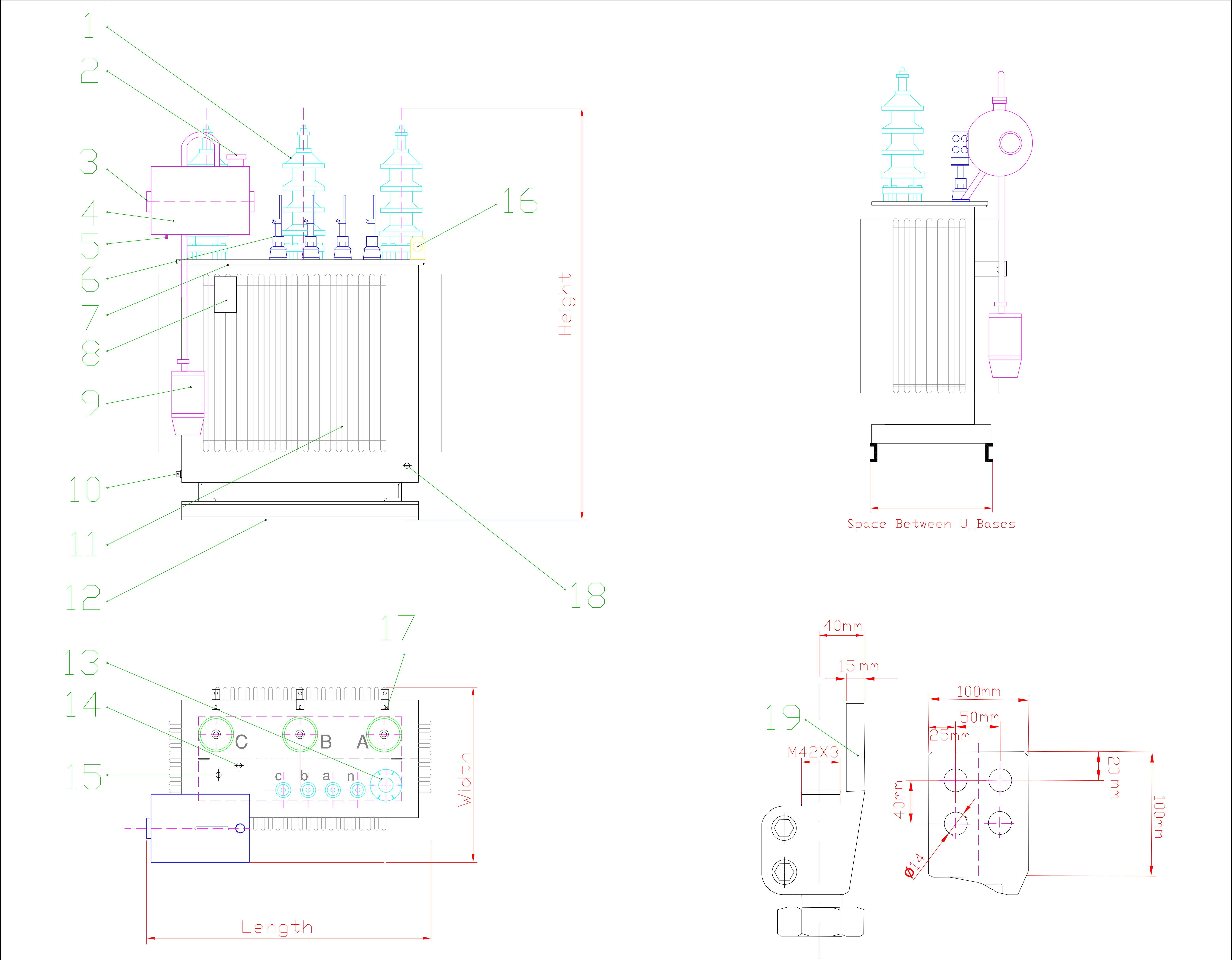
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
27	Internal Dimensions					
	a) Winding Length and shape of the windings	mm	shall be filled by manufacturer			
	b) Space Between the Windings	mm	Bigger than 20 mm			
	c) Space between Windings and Transformer Top Body	mm	Bigger than 40 mm			
	e) Space between Windings and Transformer Side Body	mm	shall be filled by manufacturer			
28	Overall Dimensions					
	a) Height	mm	≤ 1900			
	b) Length	mm	≤ 1700			
	c) Width	mm	≤ 980			
	e) Space Between U - Bases	mm	≤ 670			
29	Accessories					
	a) Expansion vessel (Conservator)		Required			
	b) Oil Filling Opening		Required			
	c) Manual Ball Oil Drain Valve with Sampling Devices		Required			
	d) Grounding Terminals		Required			
	e) Diagram and Name Plate		Required			
	f) Thermometer Pocket		Required			
	g) Oil Level Indicator		Required			
	h) Lifting lugs		Required			
	i) Safety Valve (over Pressure Relief Device)		Required			
	j) U - Base		Required			
	k) Dehydrating breather (silica-gel breather)		Required			
	L) Buchholz relay with ability to connection with SCADA System for Indication		Required			
	M) Oil temperature indicator with ability to connection with SCADA System for Indication		Required			

Technical Guarantees No. ODT_630**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 630 KVA Rating**

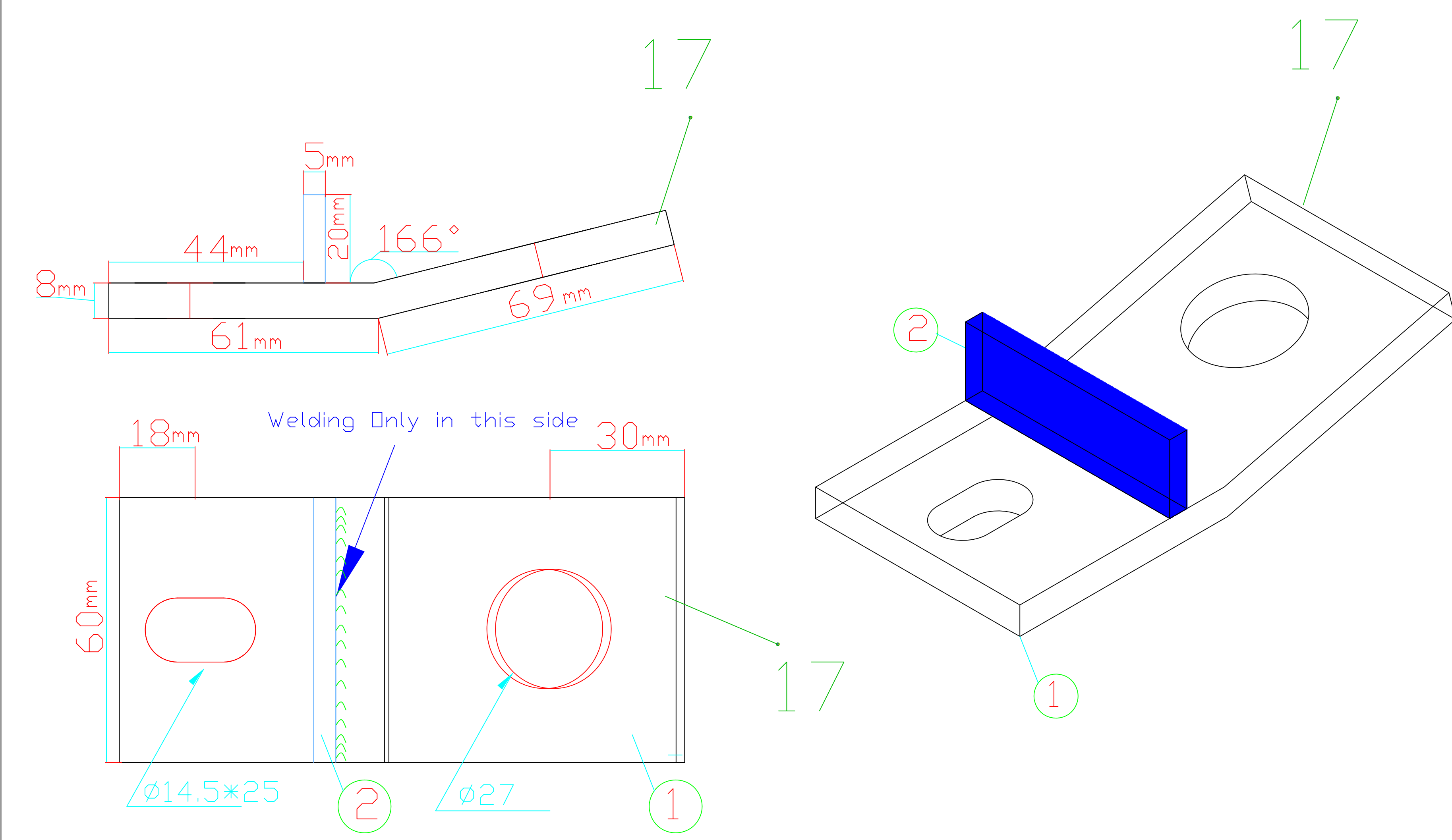
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
	N) 3 each Hot Galvanized Steel Plate for Fixing the Fuse Holder		Required			
30	Additional Maintenance Materials for all required transformers quantities					
30.1	Low voltage Gasket (Set for one phase)	Set	(100) One Hundred set			
30.2	High voltage Gasket (Set For One Phase)	Set	(15) fifteen sets			
31	The external surface color		Silver			
32	Short Circuit withstand ability test Certificates/Reports from internationally reputed testing agency According		Required			
33	Type, Acceptance, Overload capacity & Testing of L.V and H.V winding material, Routine tests witnessed by three GEDCo representatives		Required			
34	Attached Drawing		Drawing No ODT_630			

Tenderer's Signature :

Date:



- 1 H.V Bushing
- 2 Oil Filling Opening
- 3 Oil Level Indicator
- 4 Expansion Vessel
- 5 Oil Sampling Valve
- 6 L.V Bushing
- 7 Cover
- 8 Rating Plate
- 9 Silica Gel Breather
- 10 1" Drain Valve
- 11 Tank
- 12 U_Base
- 13 Safety Valve
- 14 Tap Changer
- 15 Thermometer Pocket
- 16 Lifting Lugs
- 17 Plate for Fixing the Fuse Holder
- 18 Grounding Terminal
- 19 Brass Flag for L.V Bushing



Technical Guarantees No. ODT_800**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 800 KVA Rating**

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
1	Name of Manufacturer					
2	Country of Origin					
3	Reference Manufacturing Standards		IEC 60076 or DIN42500			
4	Type		3 phase oil-immersed with Conservator			
5	Continuous Maximum Rating (C.M.R)	KVA	800			
6	Rated Frequency	Hz	50			
7	Cooling method		ONAN			
8	Normal Voltage Between Phases at No Load					
	a) H.V	Volts	22000			
	b) L.V	Volts	400			
9	Connection and Vector Group					
	a) H.V Winding		Delta			
	b) L.V Winding		Star			
	c) Vector Group		Dyn11			
10	Tapping Range on H.V Side					
	a) Rating of the Tap change		+1x2.5% -3x2.5%			
	b) Type of Tap Changer		Off Load			
11	Losses (Low Losses Type)					
	a) Max. No-load losses	Watts	950 (Zero Tolerance)			
	b) Max. Load losses at 75C°	Watts	7400 (Zero Tolerance)			
12	Max. Impedance Voltage of Short Circuit at 75 °C	%	6			

Technical Guarantees No. ODT_800**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 800 KVA Rating**

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
13	Voltage Drop at Full Load					
	a) at unity Power Factor ($\cos\phi = 1$)	%	1.19			
	b) at 0.8 Power Factor ($\cos\phi = 0.8$)	%	4.44			
14	Efficiency at full load					
	a) at unity Power Factor ($\cos\phi = 1$)	%	98.79			
	b) at 0.8 Power Factor ($\cos\phi = 0.8$)	%	98.49			
15	Max Temperature rise at C.M.R					
	a) Top Oil by Thermometer	°C	45			
	b) Average Winding by Resistance	°C	50			
	c) Hot Spot Corresponding to (b)	°C	98			
16	Insulating Voltage Level					
	a) Rated lighting – Impulse withstand Voltage 1.2/50 μ s (Peak Value)	kV	125			
	b) Rated Duration Power Frequency withstand Voltage 1 min (r.m.s Value)	kV	50			
17	Material thermal class insulation (According IEC 60085)		Class A			
18	Overloading					
	a) Minimum Duration of %133 Overloading at 30C° Ambient Temperature and Preload 75% F.L	Min.	240			
	b) Minimum Duration of %150 Overloading at 30C° Ambient Temperature and Preload 75% F.L	Min.	98			
19	Winding Conductor Material					
	a) H.V winding		high conductivity electrolytic copper			
	b) L.V winding		high conductivity electrolytic copper			

Technical Guarantees No. ODT_800**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 800 KVA Rating**

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
20	Type of insulation					
	a) H.V winding		Diamond pattern Kraft paper			
	b) L.V winding		Diamond pattern epoxy coated Kraft paper			
21	Type of Bushing					
	a) H.V Bushing		30 NF -250			
	b) L.V Bushing (with drilled hole 4x Ø14 mm Brass Flag)		DT2000			
22	Installation		Outdoor on Lattice Steel Pole arms			
23	Noise level at 0.3 m (Lwa)	dB	≤ 62			
24	Transformer Oil (as Standard IEC60296:3.0)					
	a) Kinematic Viscosity , at 40 °C	mm ² /s	8			
	b) Density, at 20 °C	kg/dm ³	≤ 0.895			
	c) Breaking Voltage before Treatment	KV	≥30			
	d) Breaking Voltage After Treatment	KV	>60			
	e) Environmental Requirements		Polychlorinated biphenyls (PCBs) Free			
	f) Type		Nyro 10XN or Equivalent			
25	Oil weight	Kg	shall be filled by manufacturer			
26	Total weight	Kg	shall be filled by manufacturer			

Technical Guarantees No. ODT_800**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 800 KVA Rating**

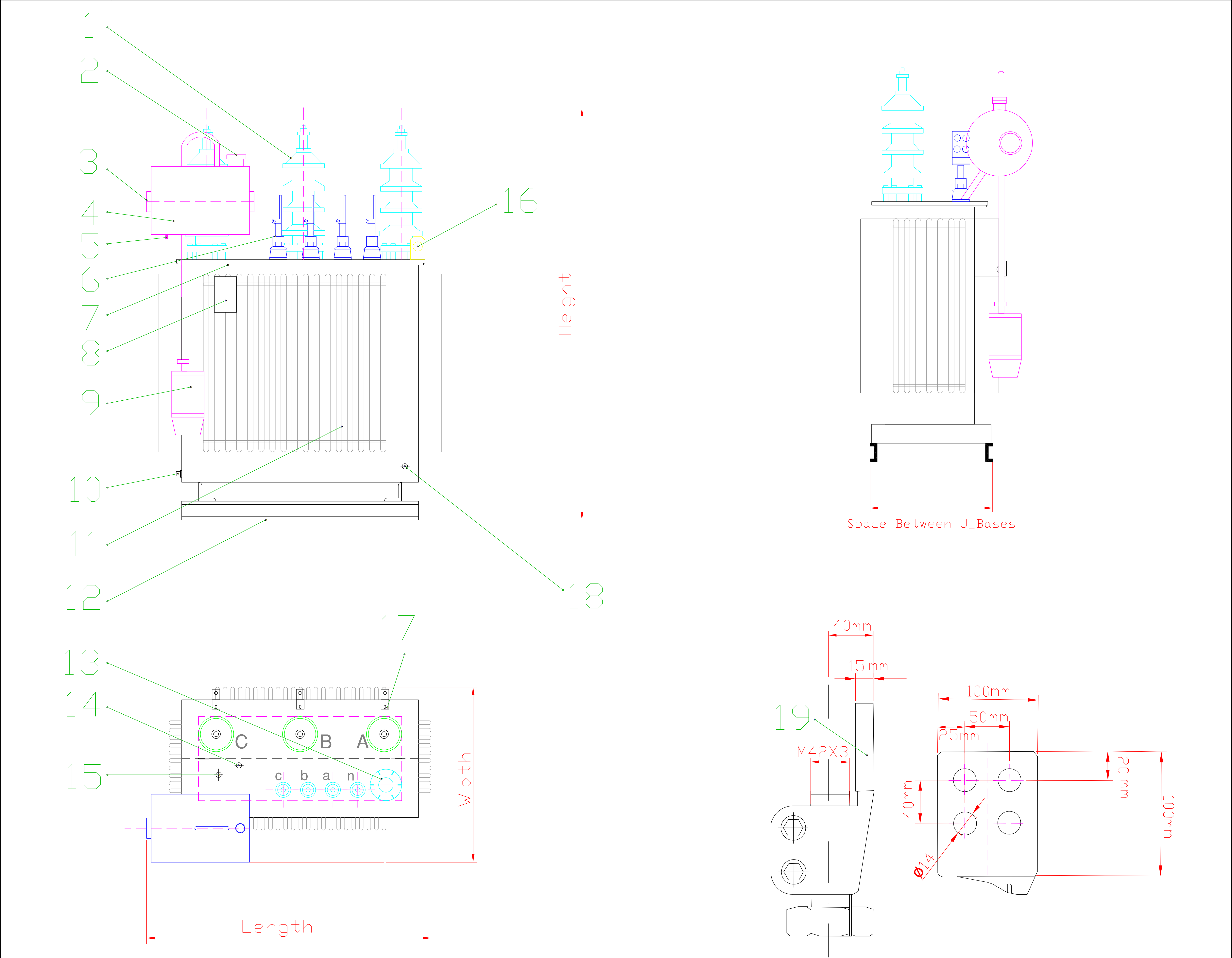
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
27	Internal Dimensions					
	a) Winding Length and shape of the windings	mm	shall be filled by manufacturer			
	b) Space Between the Windings	mm	Bigger than 20 mm			
	c) Space between Windings and Transformer Top Body	mm	Bigger than 40 mm			
	e) Space between Windings and Transformer Side Body	mm	shall be filled by manufacturer			
28	Overall Dimensions					
	a) Height	mm	≤ 1950			
	b) Length	mm	≤ 1900			
	c) Width	mm	≤ 1050			
	e) Space Between U - Bases	mm	≤ 750			
29	Accessories					
	a) Expansion vessel (Conservator)		Required			
	b) Oil Filling Opening		Required			
	c) Manual Ball Oil Drain Valve with Sampling Devices		Required			
	d) Grounding Terminals		Required			
	e) Diagram and Name Plate		Required			
	f) Thermometer Pocket		Required			
	g) Oil Level Indicator		Required			
	h) Lifting lugs		Required			
	i) Safety Valve (over Pressure Relief Device)		Required			
	j) U - Base		Required			
	k) Dehydrating breather (silica-gel breather)		Required			
	L) Buchholz relay with ability to connection with SCADA System for Indication		Required			
	M) Oil temperature indicator with ability to connection with SCADA System for Indication		Required			

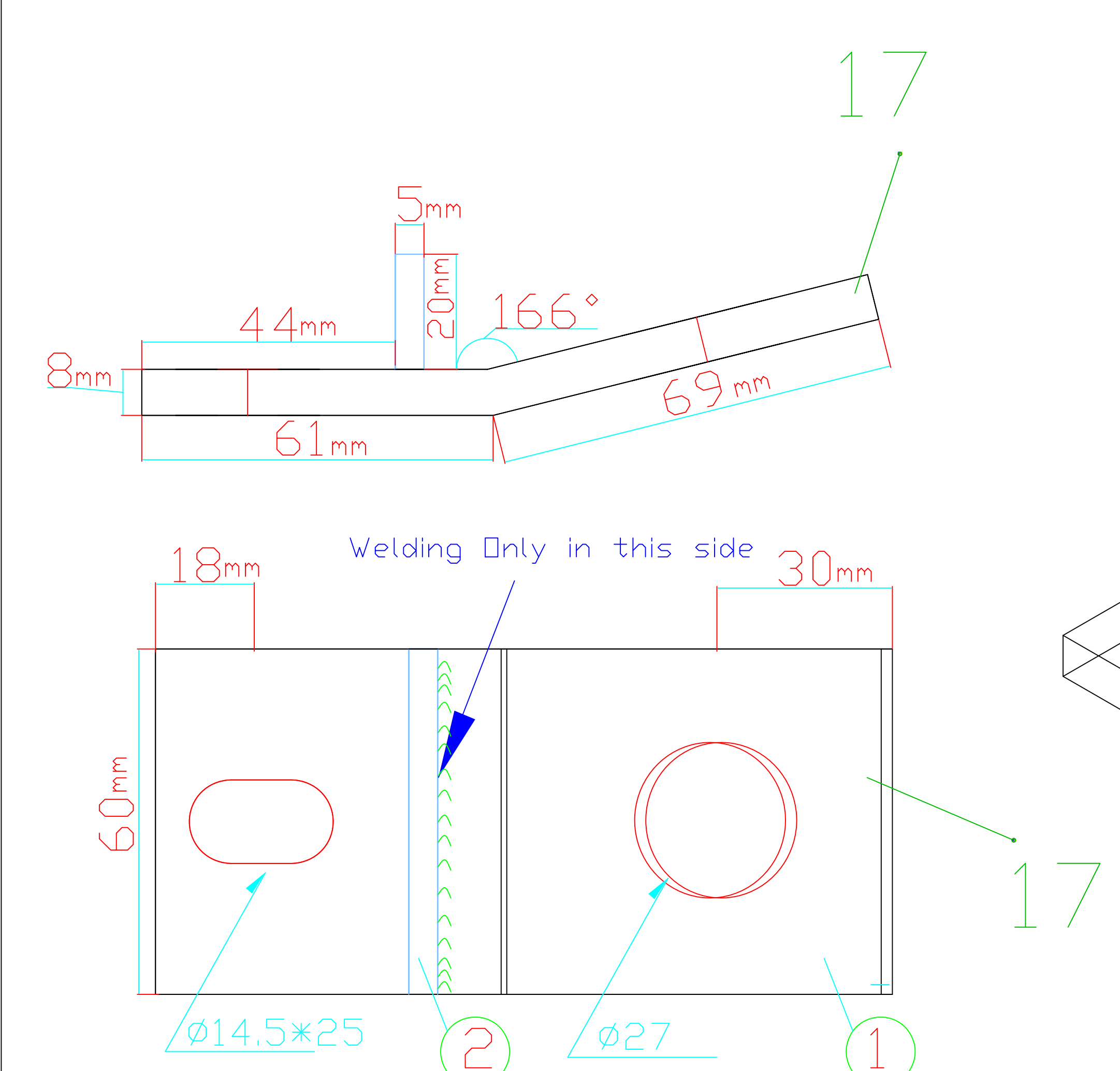
Technical Guarantees No. ODT_800**22/0.4 KV Low Losses , 3 phase , Outdoor Distribution Transformer 800 KVA Rating**

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
	N) 3 each Hot Galvanized Steel Plate for Fixing the Fuse Holder		Required			
30	Additional Maintenance Materials for all required transformers quantities					
30.1	Low voltage Gasket (Set for one phase)	Set	(100) One Hundred set			
30.2	High voltage Gasket (Set For One Phase)	Set	(15) fifteen sets			
31	The external surface color		Silver			
32	Short Circuit withstand ability test Certificates/Reports from internationally reputed testing agency According		Required			
33	Type, Acceptance, Overload capacity & Testing of L.V and H.V winding material, Routine tests witnessed by three GEDCo representatives		Required			
34	Attached Drawing		Drawing No ODT_800			

Tenderer's Signature :

Date:



	1	H.V Bushing
	2	Oil Filling Opening
	3	Oil Level Indicator
	4	Expansion Vessel
	5	Oil Sampling Valve
	6	L.V Bushing
	7	Cover
	8	Rating Plate
	9	Silica Gel Breather
	10	1" Drain Valve
	11	Tank
	12	U_Base
	13	Safety Valve
	14	Tap Changer
	15	Thermometer Pocket
	16	Lifting Lugs
	17	Plate for Fixing the Fuse Holder
	18	Grounding Terminal
	19	Brass Flag for L.V Bushing

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