

Technical Guarantees No. 1070100-

24 kV , 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6 , Two Incoming Switch Disconnectors, Two Transformer Protection Fuse Switch combination (CTTTC)

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
1	Name of Manufacturer					
2	Country of Origin		European			
3	Reference Manufacturing Standards					
	a) Service Condition		IEC62271-1			
	b) Switch Fuse Combination		IEC62271-105			
	c) Switch endurance & Short time & Peak withstand for Switch		IEC 62271-103			
	d) Short time & Peak withstand for Earth Switch /Disconnector	Unit	IEC62271-102			
	e) Temperature Rise Test & Dielectric Test & Internal Arc Test		IEC62271-200			
	f) Safety Interlocking		IEC62271-200/ IEC60640			
	g) Enclosure Degree of Protection		IEC60529			
4	Insulation Medium ,		SF6 Gas			
5	Design		Metal- Enclosed, extendable switchgear			
6	Type		Indoor			

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SECTION OF STANDARDS & TESTING
TECHNICAL DEPARTMENT

Technical Guarantees No. 1070100-

24 kV , 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6 , Two Incoming Switch Disconnectors, Two Transformer Protection Fuse Switch combination (CTTTC)

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
7	Component		Two Incoming Switch Disconnectors, Three Transformer Protection Fuse Switch combination (CTTTC)			
8	Rated voltage	kV	24			
9	Rated Frequency	Hz	50			
10	Safe Operating Zone Temperature	°C	-10 to +55			
11	Rated insulation level					
	a) Rated short-duration power-frequency withstand voltage	KV	50			
	b) Rated lightning impulse withstand voltage	KV	125			
12	Rated Normal Current					
	a) for ring-main feeders	A	630			
	b) for transformer feeders depending on the HV HRC fuse link	A	200			
	c) for Busbar	A	630			
13	Rated short-time withstand current					
	a) for 1 sec	kA	20			

قسم المواصفات والمقاييس
SECTION OF STANDARDS & METROLOGY
TECHNICAL DEPARTMENT

Technical Guarantees No. 1070100-

24 kV , 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6 , Two Incoming Switch Disconnectors, Two Transformer Protection Fuse Switch combination (CTTTC)

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
	Rated short-time withstand current for 3 sec	kA	20			
	Rated short-circuit making current					
14	a) for ring-main feeder	kA	50			
	b) for transformer feeder	kA	25			
15	Rated Peak withstand Current	kA	50			
18	Filling pressure for operation prm	MPa	Required			
	Filling pressure for insulation pre	MPa	Required			
	Alarm pressure for insulation pae	MPa	Required			
	Minimum functional pressure for insulation and/or switching pme	MPa	Required			
	Minimum functional pressure for operation(*) pmm	MPa	Required			
17	Mechanical endurance class (Load break switch)	KA	M1			
18	Mechanical endurance class (Earthing switch)		M0			
19	Electrical endurance class (active load breaking capacity 630A)	MPa	E3			
	Panel configuration					



قسم القياسات والمعايير
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24 kV , 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6 , Two Incoming Switch Disconnectors, Two Transformer Protection Fuse Switch combination (CTTTC)

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
20	Switchgear container Design		hermetically tight welded, without any sealings			
	Degree of protection for all high-voltage sections		IP65			
	Degree of protection for switchgear enclosure		IP3XD			
	Position for isolating/grounding via the Switch Disconnector		three Position			
	Position of switch-disconnector		three Position			
21	Bolted Electrical Joints Design		secured by fasteners of corrosion-proof materials			
22	Clearance between clamp and bushing		Suitable for all type of terminations			
23	Cable Connections in Ring Main Unit Feeders		Interface C , Screw Type , Suitable for RSTI Screened, separable connection system 630 A up to 630 mm ²			



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24 kV , 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6 , Two Incoming Switch Disconnectors, Two Transformer Protection Fuse Switch combination (CTTTC)

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
24	Cable Connections in Transformer Feeders		24kv interface A, Pin Type , Suitable for Screened Separable Elbow Termination Kit 250A			
	Side extension		Required			
25	Operating Manually Indicate the Following Positions					
	a) Switch Disconnector		ON and OFF			
	b) Off-Load Isolator		ON and OFF			
	c) Earthing		ON and OFF			
26	Accessories					
	a) Voltage indicator lamps		Required			
	b) Gas Pressure Indicator		Required			
	c) M.V Porcelain Fuses		Required			
	d) Operating Lever		Required			
	e) pressure relief valve or pressure safety valve		Required			
	f) Valve to refilling gas		Required			
	g) extension basbar tools and Interconnecting the panels include (Contact basbar piece, Silicone coupling , Tension spring for earthing , Centering bolt)		Required			

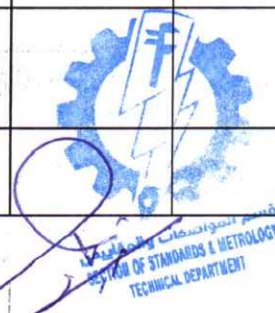


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SECTION OF STUDIES & METROLOGY
TECHNICAL DEPARTMENT

Technical Guarantees No. 1070100-

24 kV , 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6 , Two Incoming Switch Disconnectors, Two Transformer Protection Fuse Switch combination (CTTTC)

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
	Surge-proof termination include (Silicone dummy plug with insertable sleeve, Clamping cover for dummy plugs, Busbar termination cover		Required			
	3X Toroidal-core current transformer ... 1st core: ... 10 VA/0.5/M10 2nd core: ... 10 VA/10/P10 - For each panel		Required			
	3 x single-pole with earth-fault winding and damping resistor Voltage Transformer 50VA/c10.5 on busbar		Required			
	Low-voltage compartment For each panel		Required			
27	Width	mm	Shall be filled by manufacturer			
28	Height	mm	Shall be filled by manufacturer			
29	Depth	mm	Shall be filled by manufacturer			
30	Total Weight	kg	Shall be filled by manufacturer			
31	Type Test Certificates /Reports from internationally reputed testing agency		Required			
32	Acceptance & Routine tests witnessed by Beneficiary		Required			



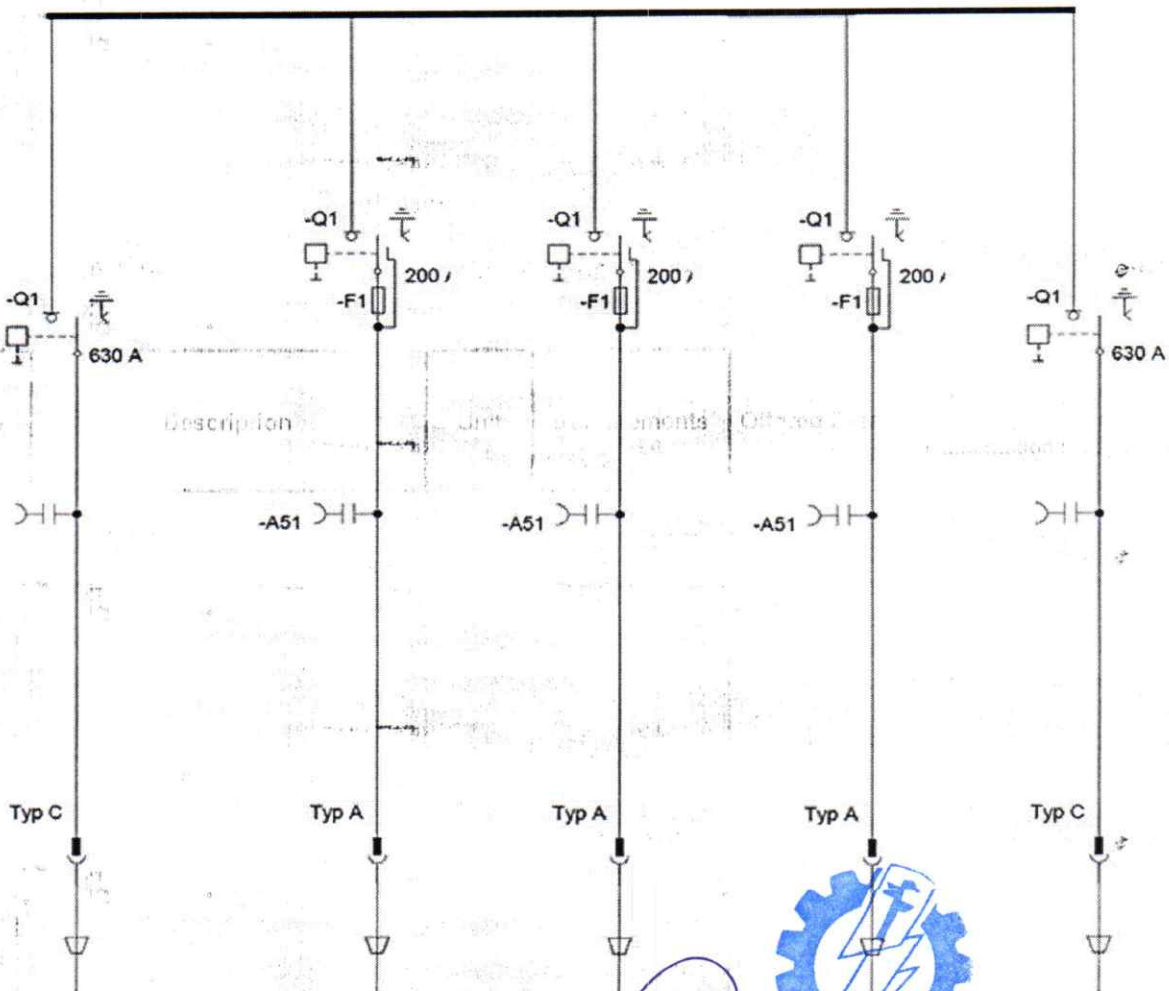
Technical Guarantees No. 1070100-

24 kV , 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6 , Two Incoming Switch Disconnectors, Two Transformer Protection Fuse Switch combination (CTTTC)

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
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Tenderer's Signature :

Date:

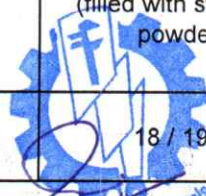


قسم المواصفات والمقاييس
SECTION OF STANDARDS & METROLOGY
TECHNICAL DEPARTMENT

Technical Guarantees No. 10502003

12/20 kV Single Core Cable with XLPE Insulation and Aluminium Circular Stranded Conductor 1x240 mm ²					
No	Description	Unit	Requirements	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
1	Name of Manufacturer				
2	Country of Origin				
3	Design Standards		IEC60502-2 & IEC60228		
4	Test Standards		IEC60230 & IEC60502-2 & IEC60811		
5	Code & Designation		NA2XS(F)2Y , Power Cable with Aluminum Conductors and XLPE Insulation		
6	Climatic Design		- 5°C to 55°C		
7- Rated Voltage					
7.1	Between Conductor and Sheath (U ₀)	kV	12		
7.2	Between any Two Conductors (U)	kV	20		
7.3	Max. Service Voltage (U _m)	kV	24		
7.4	System Nominal Voltage	kV	22		
8	Rated Frequency	HZ	50		
9	Impulse withstand Voltage 1,2/50- μs	kV	125		
10- Cable Design					
10.1 Conductor :					
10.1.1	Cross Section	mm ²	240		
10.1.2	Material		Aluminum		
10.1.3	Class and Form		Class2 - Stranded Compacted Circular (filled with swelling powder)		
10.1.4	Minimum / Maximum Diameter	mm	18 / 19.2		

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SECTION OF STANDARDS & METROLOGY
TECHNICAL DEPARTMENT

Technical Guarantees No. 10502003

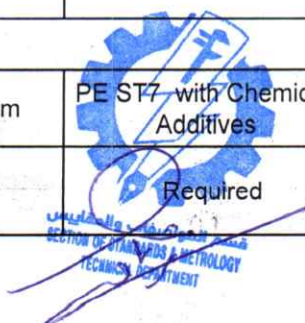
12/20 kV Single Core Cable with XLPE Insulation and Aluminium Circular Stranded Conductor 1x240 mm ²					
No	Description	Unit	Requirements	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
10.1.5	Minimum Number of Strands	No	30		
10.1.6	Weight of Conductor Per Meter	Kg/Km	shall be filled by manufacturer		
10.1.7	Maximum DC Resistance of Conductor at 20°C	Ω/km	0.125		
10.1.8	Max. Rated Temperature for Permanent Load	°C	90		
10.1.9	Max. Rated Temperature for Emergency Loads	°C	105		
10.1.10	Max. Rated Conductor Temperature at Short Circuit (1 sec. max. duration)	°C	250		
10.2 Inner Semi Conductive Layer (Conductor Screen) :					
10.2.1	Material		Triple Extruded Bonded Thermosetting Semi- Conductive Layer		
10.2.2	Thickness at Any Point	mm	0.3		
10.2.3	Max Service Temperature	°C	90		
10.3- XLPE Insulation :					
10.3.1	Material		Triple Extruded Dry Cured (XLPE)		
10.3.2	Nominal Thickness	mm	5.5		
10.3.3	Minimum Thickness at Any Point	mm	4.85		
10.3.4	Diameter Over Insulation	mm	shall be filled by manufacturer		
10.3.5	Max Service Temperature	°C	90		
10.3.6	Weight	Kg/Km	shall be filled by manufacturer		
10.4- Outer Semi Conductive Layer (Insulation Screen) :					

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SECTION OF STANDARDS & METROLOGY
TECHNICAL GUARANTEE

Technical Guarantees No. 10502003

12/20 kV Single Core Cable with XLPE Insulation and Aluminium Circular Stranded Conductor 1x240 mm ²					
No	Description	Unit	Requirements	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
10.4.1	Material		Triple Extruded Bonded Thermosetting Semi-Conductive Layer		
10.4.2	Thickness at Any Point	mm	0.3		
10.4.3	Max Service Temperature	°C	90		
10.5- Semi-Conductive Water Swelling Tape :					
10.5.1	Material		Semi Conductive Tape		
10.5.2	Thickness at Any Point	mm	0.3		
10.5.3	Max Service Temperature	°C	90		
10.6- Copper Wire Screen (including Equalizing Tape) :					
10.6.1	Material of Wire and Equalizing Tape		Copper		
10.6.2	Minimum Wires Number		shall be filled by manufacturer		
10.6.3	Wire Geometrical Cross Section	mm ²	25		
10.6.4	Equalizing Tape Width	mm	10		
10.6.5	Equalizing Tape Thickness	mm	0.1		
10.7- Separation Sheath (Binder Tape) :					
10.7.1	Material		Water Blocking Tape Non-Conductive		
10.7.2	Thickness	mm	0.2 - 0.3		
10.7.3	Max Service Temperature	°C	90		
10.8- Outer Sheath :					
10.8.1	Material	mm	PE ST7 with Chemical Additives		
10.8.2	Specify PE (LDPE, MDPE, HDPE)		Required		



Technical Guarantees No. 10502003

12/20 kV Single Core Cable with XLPE Insulation and Aluminium Circular Stranded Conductor 1x240 mm ²					
No	Description	Unit	Requirements	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
10.8.2	Nominal Thickness	mm	2.2		
10.8.3	Minimum Thickness at Any Point	mm	shall be filled by manufacturer		
10.8.4	Max Service Temperature	°C	90		
10.8.5	Color		Black		
10.8.6	Weight	Kg/Km	shall be filled by manufacturer		
10.9- Completed Cable :					
10.9.1	Overall Diameter of the Cable	mm	shall be filled by manufacturer		
10.9.2	Total Weight of the Cable	kg/km	shall be filled by manufacturer		
10.9.3	Minimum Bending Radius	mm	shall be filled by manufacturer		
10.9.4	Sustained Current Rating in Underground Under Below Conditions :				
10.9.4.1	At Flat Laying Arrangement (Buried in 0.7 m Deep in Soil at 20 °C with 1 k.m/w Thermal Resistivity and Load Factor 0.7)	A	455		
10.9.4.2	At Trefoil Laying Arrangement (Buried in 0.7 m Deep in Soil at 20 °C with 1 k.m/w Thermal Resistivity and Load Factor 0.7)	A	417		
11	Maximum Short-Circuit Current of Conductor During 1 sec.	KA	≥22.6		
12- Drum :					
12.1	Method of Cable Delivery		on Drums		
12.2	Length of Cable on Drum	m	500		
12.3	Drum Material		New Wood		



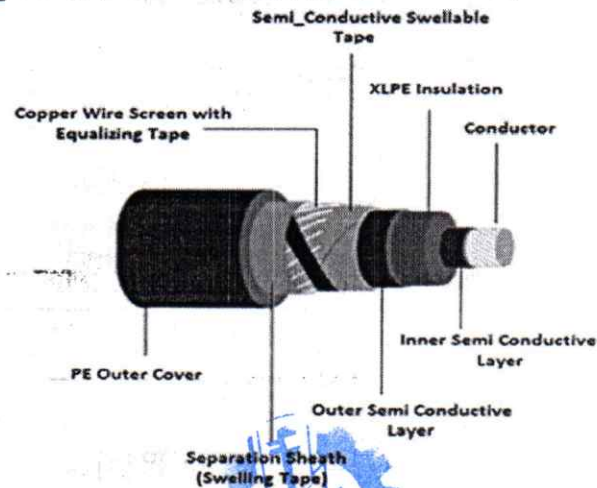
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STANDARD & METROLOGY
TECHNICAL DEPARTMENT

Technical Guarantees No. 10502003

12/20 kV Single Core Cable with XLPE Insulation and Aluminium Circular Stranded Conductor 1x240 mm2					
No	Description	Unit	Requirements	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
12.4	Cable Protection on Drum		Wooden Batten		
12.5	Max. Gross Weight of Drum with Cable	kg	shall be filled by manufacturer		
12.6	Dimension of Drum	mm	shall be filled by manufacturer		
13	Permissible Pulling Forces	N	shall be filled by manufacturer		
14- Test :					
14.1	Type Test Certificates /Reports from internationally reputed testing agency		Required		
14.2	Acceptance & Routine tests witnessed by Three Beneficiary Engineers		Required		
15	Marking		Hot Stamping, giving : 1- Type of cable 2- Conductor Cross-section area 3- Beneficiary Name (Gedco) 4- Manufacturer name 5- Nominal voltage 6- Length for Each Meter 7- Production year		

Technical Guarantees No. 10502003

12/20 kV Single Core Cable with XLPE Insulation and Aluminium Circular Stranded Conductor 1x240 mm ²					
No	Description	Unit	Requirements	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
			8- No. Of Purchase order (GEDCo)		



Tenderer's Signature : Date:



Technical Guarantees No. IDT_1600

22/0.4 KV Low Losses , 3 phase , Indoor Distribution Transformer 1600 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 Hermetically Sealed			
5	Continuous Maximum Rating (C.M.R)	KVA	1600			
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) No-load losses	Watts	1700 (Zero Tolerance)			
	b) Load losses at 75C°	Watts	14000 (Zero Tolerance)			
12	Max. Impedance Voltage of Short Circuit at 75 °C	%	6			

SECTION OF STANDARDS & METROLOGY
TECHNICAL DEPARTMENT

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Technical Guarantees No. IDT_1600

22/0.4 KV Low Losses , 3 phase , Indoor Distribution Transformer 1600 KVA Rating

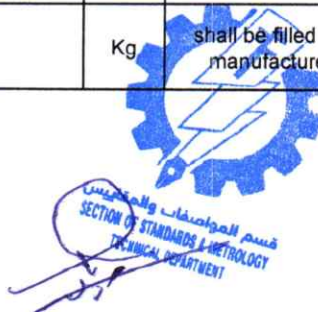
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
13	Voltage Drop at Full Load					
	a) at unity Power Factor ($\cos\phi = 1$)	%	1.095			
	b) at 0.8 Power Factor ($\cos\phi = 0.8$)	%	4.38			
14	Efficiency at full load					
	a) at unity Power Factor ($\cos\phi = 1$)	%	98.99			
	b) at 0.8 Power Factor ($\cos\phi = 0.8$)	%	98.74			
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 lightning – 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			

SECTION OF STANDARDS & METROLOGY
TECHNICAL DEPARTMENT

Technical Guarantees No. IDT_1600

22/0.4 KV Low Losses , 3 phase , Indoor Distribution Transformer 1600 KVA Rating

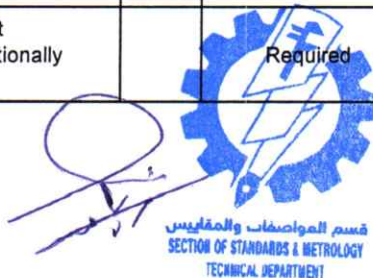
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
20	Type of insulation					
	a) H.V winding		Diamond pattern Kraft paper			
	b) L.V winding		Diamond pattern epoxy coated Kraft paper			
21	Type of Bushing					
	a) H.V Plug in Bushing		Euromold K180-AR3			
	b) L.V Bushing (with drilled hole 4x Ø14 mm Brass Flag)		DT3150			
22	Installation		Indoor			
23	Noise level at 0.3 m (Lwa)	dB	≤ 66			
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. IDT_1600

22/0.4 KV Low Losses , 3 phase , Indoor Distribution Transformer 1600 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	shall be filled by manufacturer			
	b) Length	mm	shall be filled by manufacturer			
	c) Width	mm	shall be filled by manufacturer			
	e) Space Between Wheel Centers	mm	shall be filled by manufacturer			
29	Accessories					
	a) Oil Filling Opening		Required			
	b) Manual Ball Oil Drain Valve with Sampling Devices		Required			
	c) Grounding Terminals		Required			
	d) Diagram and Name Plate		Required			
	e) Thermometer Pocket		Required			
	f) Lifting lugs		Required			
	g) Safety Valve (over Pressure Relief Device)		Required			
	h) Wheels		Required			
	i) DGPT (Combined Gas-Pressure Temperature Relay) or R.I.S. (Integrated Safety detector) Including Oil Level Indicator		Required			
30	Short Circuit withstand ability test Certificates/Reports from internationally reputed testing agency		Required			



Technical Guarantees No. IDT_1600

22/0.4 KV Low Losses , 3 phase , Indoor Distribution Transformer 1600 KVA Rating

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
31	Type, Acceptance, Overload capacity & Routine tests witnessed by Beneficiary		Required			
32	Attached Drawing		Drawing No IDT_1600			

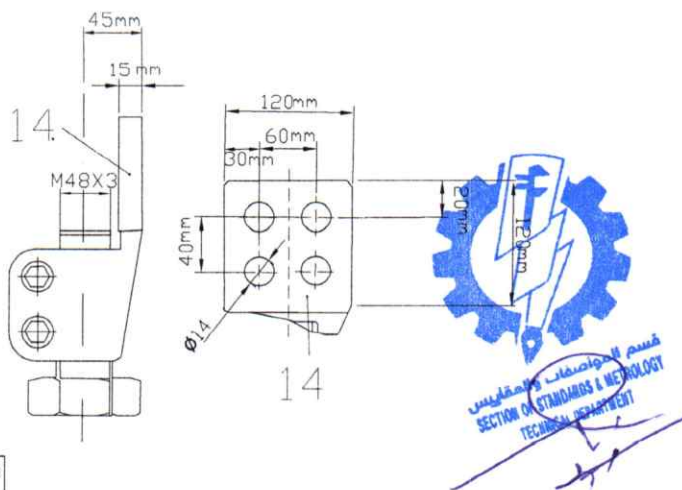
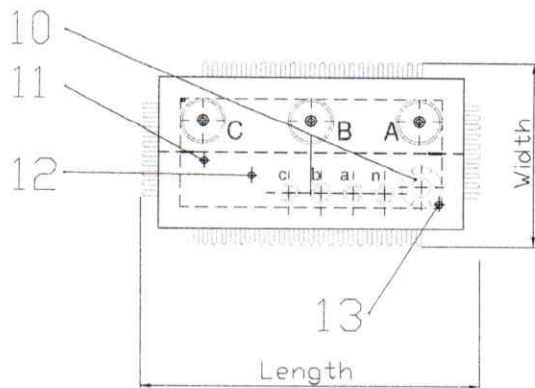
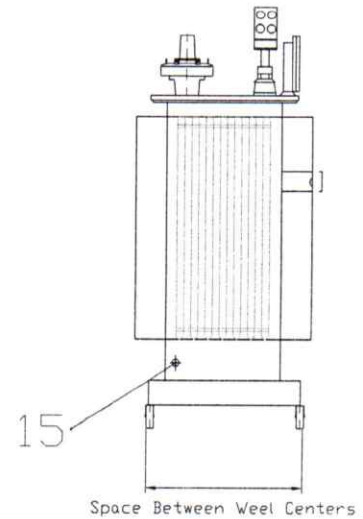
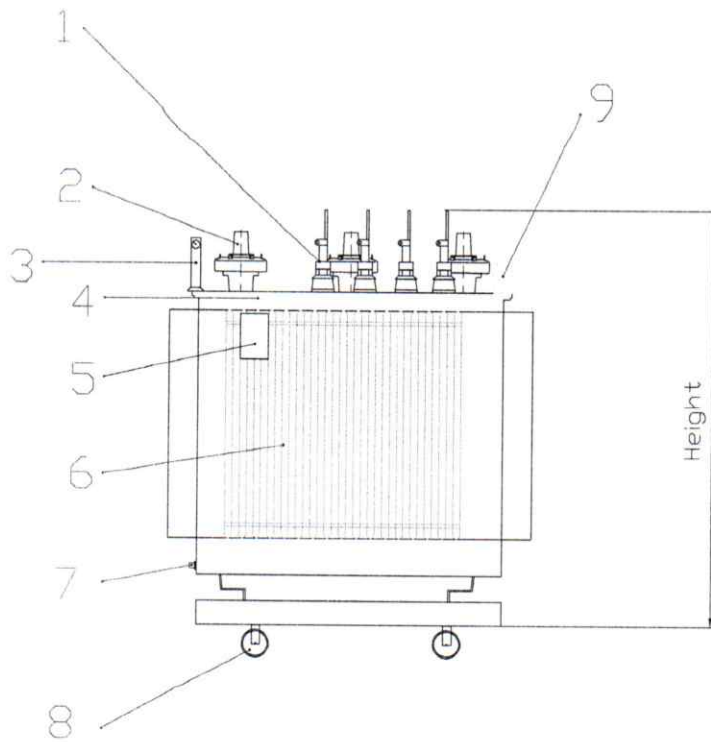
Tenderer's Signature :

Date:



IDT_1600

22/0.4 KV Low Losses , 3 phase , Indoor Distribution Transformer 1600 KVA Rating



- 1 L.V Bushing
- 2 H.V Plug in Bushing
- 3 R.I.S
- 4 Cover
- 5 Rating Plate
- 6 Tank
- 7 1" Drain Valve
- 8 Wheels
- 9 Lifting Lugs
- 10 Safety Valve
- 11 Tap Changer
- 12 Thermometer Pocket
- 13 Oil Filling Opening
- 14 Brass Flag for L.V Bushing
- 15 Grounding Terminal

Prepared by: Eng. Wael Ahmed
Ismail Elhefni

SECTION ON STANDARDS & METROLOGY
TECHNICAL DEPARTMENT

Technical Guarantees No.10701002

Material name		24 kV, 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6, Two Incoming Switch Disconnectors, one Transformer Protection Fuse Switch Combination (CTC)				
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
1	Name of Manufacturer					
2	Country of Origin		European			
3	Reference Manufacturing Standards					
	a) Service Condition		IEC62271-1			
	b) Switch Fuse Combination		IEC62271-105			
	c) Switch endurance & Short time & Peak withstand for Switch		IEC 62271-103			
	d) Short time & Peak withstand for Earth Switch /Disconnector		IEC62271-102			
	e) Temperature Rise Test & Dielectric Test & Internal Arc Test		IEC62271-200			
	f) Safety Interlocking		IEC62271-200/ IEC60640			
	g) Enclosure Degree of Protection		IEC60529			
4	Insulation Medium , Interruption medium		SF6 Gas			
	Interruption medium		Vacuum			
5	Design		Metal-Enclosed, extendable switchgear			
6	Type		Indoor			

Eng. ZYAD ALHousari

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قسم المواصفات والمقاييس
SECTION OF STANDARDS & METROLOGY
TECHNICAL DEPARTMENT

25/01/2021

Technical Guarantees No.10701002

Material name		24 kV, 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6, Two Incoming Switch Disconnectors, one Transformer Protection Fuse Switch Combination (CTC)				
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
7	Component		Two Incoming Switch Disconnectors, one Transformer Protection Fuse Switch Combination (CTC)			
8	Rated voltage	kV	24			
9	Rated Frequency	HZ	50			
10	Safe Operating Zone Temperature	°C	-10 to +55			
11	Number of operating cycles, mechanical / Classification (Three-position switch-disconnector)	No.	Required			
12	Number of operating cycles, electrical with load / Classification	No.	Required			
13	Rated insulation level					
	a) Rated short-duration power-frequency withstand voltage	KV	50			
	b) Rated lightning impulse withstand voltage	KV	125			
Rated Normal Current						
	a) for ring-main feeders	A	630			



SECTION OF STANDARDS & METROLOGY
TECHNICAL DEPARTMENT

Technical Guarantees No.10701002

Material name		24 kV, 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6, Two Incoming Switch Disconnectors, one Transformer Protection Fuse Switch Combination (CTC)				
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
14	b) for transformer feeders depending on the HV HRC fuse link	A	200			
	c) for Busbar	A	630			
Rated short-time withstand current						
15	a) for 1 sec	kA	20			
	b) for 3 sec	kA	20			
Rated short-circuit making current						
16	a) for ring-main feeder	kA	50			
	b) for transformer feeder	kA	25			
17	Rated Peak withstand Current	kA	50			
18	Filling pressure for operation prm	MPa	Required			
	Filling pressure for insulation pre	MPa	Required			
	Alarm pressure for insulation pae	MPa	Required			
	Minimum functional pressure for insulation and/or switching pme	MPa	Required			
	Minimum functional pressure for operation(*) pmm	MPa	Required			



Technical Guarantees No.10701002

Material name		24 kV, 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6, Two Incoming Switch Disconnectors, one Transformer Protection Fuse Switch Combination (CTC)				
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
19	Mechanical endurance class (Load break switch)		M1			
20	Mechanical endurance class (Earthing switch)		M0			
21	Electrical endurance class (active load breaking capacity 630A)		E3			
22	Panel configuration					
	Switchgear container Design		hermetically tight welded, without any sealings			
	Degree of protection for all high-voltage sections		IP65			
	Degree of protection for switchgear enclosure		IP3XD			
	Position for isolating/grounding via the Switch Disconnector		three Position			
	Position of switch-disconnector		three Position			
23	Bolted Electrical Joints Design		secured by fasteners of corrosion-proof materials			
24	Clearance between clamp and bushing		Suitable for all type of terminations			

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Material name		24 kV, 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6, Two Incoming Switch Disconnectors, one Transformer Protection Fuse Switch Combination (CTC)				
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
25	Cable Connections in Ring Main Unit Feeders		Interface C , Screw Type , Suitable for RSTI Screened, separable connection system 630 A up to 630 mm2			
26	Cable Connections in Transformer Feeders		24kv interface A, Pin Type , Suitable for Screened Separable Elbow Termination Kit 250A			
	Side extension		Required			
27	Operating Manually Indicate the Following Positions					
	a) Switch Disconnector		ON and OFF			
	b) Off-Load Isolator		ON and OFF			
	c) Earthing		ON and OFF			
28	Accessories					
	a) Voltage indicator lamps		Required			
	b) Gas Pressure Indicator		Required			
	c) M.V Porcelain Fuses		Required			

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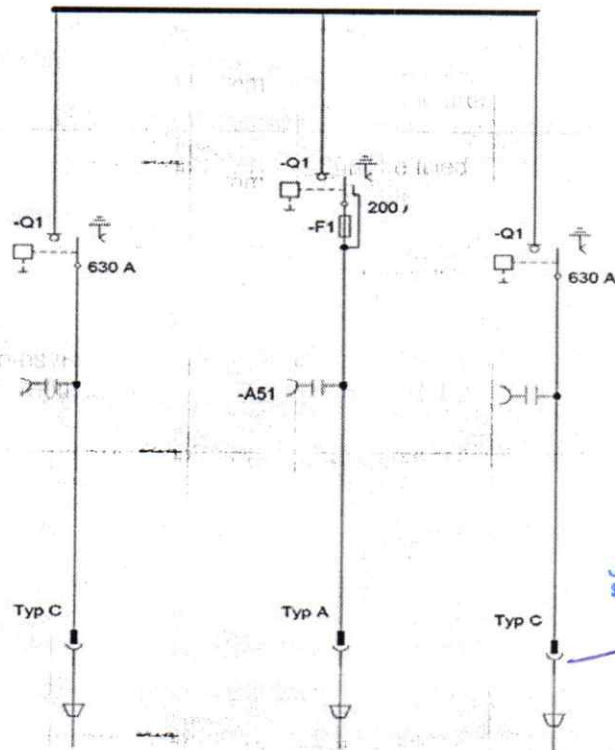
Material name		24 kV, 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6, Two Incoming Switch Disconnectors, one Transformer Protection Fuse Switch Combination (CTC)				
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
	d) Operating Lever		Required			
	e) pressure relief valve or pressure safety valve		Required			
	f) Valve to refilling gas		Required			
	g) extension busbar tools and Interconnecting the panels include (Contact busbar piece, Silicone coupling , Tension spring for earthing , Centering bolt)		Required			
	Surge-proof termination include (Silicone dummy plug with insertable sleeve, Clamping cover for dummy plugs, Busbar termination cover		Required			
	3X Toroidal-core current transformer ... 1st core: ... 10 VA/0.5/M10 2nd core: ... 10 VA/10/P10 - For each panel		Required			
	3 x single-pole with earth-fault winding and damping resistor Voltage Transformer 50VA/cl0.5 on busbar		Required			
	Low-voltage compartment For each panel		Required			
29	Width	mm	Shall be filled by manufacturer			



Technical Guarantees No.10701002

Material name		24 kV, 630 A Switchgear, and 20 kA Short Circuit Current Ring Main Unit SF6, Two Incoming Switch Disconnectors, one Transformer Protection Fuse Switch Combination (CTC)				
No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
30	Height	mm	Shall be filled by manufacturer			
31	Depth	mm	Shall be filled by manufacturer			
32	Total Weight	kg	Shall be filled by manufacturer			
33	Type Test Certificates /Reports from internationally reputed testing agency		Required			
34	Acceptance & Routine tests witnessed by Beneficiary		Required			

Tenderer's Signa



Technical Guarantees for MV Switchgear

24 kV , 630 A Switchgear, and 20 kA Short Circuit Current (Metal clad C.B CMMCCC with modern)

No	Description	Unit	Requirements	Offered Data	Notes, Remarks , Ref to Documentation	Evaluation Committee Comments
1	Name of Manufacturer		Required			
2	Country of Origin		European			
3	General					
3.1	Reference Manufacturing Standards					
	a) Common specifications for switchgear & control gear		IEC62271-200			
	b) high voltage switchgear and controlgear - common specification		IEC62271-1			
	c) high voltage switchgear and controlgear Alternating- current circuit- breaker		IEC62271-100			
	c) high voltage alternating current disconnectors and earthing switch		IEC62271-200			
	d) high voltage switchgear and controlgear: AC Metal Enclosed switchgear and controlgear for rated voltage above 1000 volt and including 52kV		IEC62271-200			
	e) High voltage switches for rated voltage above 1000 volt and less than 52KV		IEC60265-1			
	d) Short time & Peak withstand for Earth Switch / Disconnecter		IEC62271-102			
	b) Switch Fuse Combination		IEC62271-105			
	e) Temperature Rise Test & Dielectric Test & Internal Arc Test		IEC62271-200			
	f) Safety Interlocking		IEC62271-200			
	g) Enclosure Degree of Protection		IEC60529			
	Insulation		IEC 60 071			
	Current transformers		IEC 60 044-1			
	Voltage transformers		IEC 60 044-2			
	Installation, erection		IEC 61 936-1 / HD 637-S1			
3.2	Insulation Medium		SF6 Gas			
3.3	Interruption medium		vacuum			
3.4	Design		Metal-Enclosed extendable switchgear			
3.5	Maintenance		FREE			
3.6	Type		Indoor			

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3.7	Component CB(CCC)		Four (incoming/outgoing) Unit with circuit breaker (CB) and Two metering (MM)			
3.8	Network		Three phases			
3.9	Rated voltage	kV	24			
3.10	Service Voltage	kV	22			
3.11	Rated Frequency	Hz	50			
3.12	Safe Operating Zone Temperature	°C	-10 to +55			
3.13	Rated insulation level					
	a) Rated short-duration power-frequency withstand voltage	KV	50 - 1mn			
	b) Lightning Impulse withstand Voltage Phase to phase, phase to earth Across the isolating distance	KV	75 - 95 kV 110 - 145 kV			
4	Filling pressure for operation prm	MPa	Required			
	Filling pressure for insulation pre	MPa	Required			
	Alarm pressure for insulation pae	MPa	Required			
	Minimum functional pressure for insulation and/or switching pme	MPa	Required			
	Minimum functional pressure for operation(*) pmm	MPa	Required			
6	Panel configuration					
6.1	Switchgear container Design		hermetically tight welded, without any sealings			
6.2	Degree of protection for all high-voltage sections		IP65			
6.3	Degree of protection for switchgear enclosure		IP3XD			
6.4	Position for isolating/grounding via the switch disconnector		three Position			
6.5	Position of switch-disconnector		three Position			
7	Bolted Electrical Joints Design		secured by fasteners of corrosion-proof materials			
8	Clearance between clamp and bushing		Suitable for all type of terminations			
9	Dimensions	mm*mm* mm	Shall be filled by manufacturer			
10	Total Weight	kg	Shall be filled by manufacturer			
11	busbar system					

11.1	a) Rated Normal Current	A	630			
11.2	Rated short-time withstand current for 3 sec	kA	20			
11.3	Rated Peak withstand Current	kA	50			
14 MV Circuit-breakers panel						
14.1	Interrupter Technology		vacuum			
14.2	Rated Normal Current for incoming/outgoing unit	A	630			
14.3	Rated Normal Current for transformer unit	A	200			
14.4	Rated short-time withstand current for 3 sec	kA	≥ 20			
14.5	Rated Short circuit making capacity of line switches and earthing switches	kA	≥ 50			
14.6	Rated Peak withstand Current	kA	≥ 50			
14.7	Number of operations at rated short circuit current on line switches, earthing switches and CB	NO.	min 10			
14.8	Rated load interrupting current Line switch	A	630 A RMS			
14.9	Number of mechanical operations Earthing switches and, switches and Circuit breaker	O - CO	10000			
14.10	Number of electrical operations at full loop current for Earthing switches and, switches and Circuit breaker	O - CO	10000			
14.11	Mechanism Operating Time		< 10 seconds			
14.12	Mechanism type		independent remote control, motorized motor charge spring			
14.13	Rated tripping voltages	AC - Volt	220			
14.14	Rated electrical endurance		> performance level 4			
14.15	Closing time		< 50 mS			
14.16	Total break time		< 100 mS			
14.17	Maximum operating force		must be filled			
14.18	Motor operating voltages	DC	24			
14.19	Rated Operating Sequence		Standart: O-0.3s-CO-0.15s-CO			
14.20	earth switch three position		Required			
14.21	Cable Connections in coming and Outgoing		Interface C , Screw Type , Suitable for RSTI Screened, separable connection system 630 A up to 630 mm ²			
Accessories for each UNIT						
	a) Voltage indicator lamps		Required			

14.21	b) Gas Pressure Indicator		Required			
	d) Operating Lever		Required			
	Capacitive voltage detecting system at the feeder (LMR)		CAPDIS S2+ or Equivalent			
	Set of Cable-type current transformer		Required			
	Short-circuit /earth-fault indicator		Required			
	protection relay		Required			
	Mechanical counter		Required			
	Metering device		Required			
Operating Manually Indicate the Following Positions and Operating remotely						
14.21	a) Circuit breaker		ON and OFF			
	a) Switch Disconnecter		ON and OFF			
	b) Off-Load Isolator		ON and OFF			
	c) Earthing		ON and OFF			
14.23	Protection					
14.23	Directional and non-directional overcurrent and earth-fault protection with multi frequency neutral admittance, voltage, frequency and power based protection and measurement functions, syncro check and circuit-breaker condition monitoring (optional power quality, fault locator and interconnection protection)		REF 615,7Sj80 siprotec5 or equivalent			
14.23.1	Reference		IEC 61850, IEC61850-9-2			
14.23.2	Three-phase non-directional overcurrent protection	50/51	Required			
14.23.3	Three-phase directional overcurrent protection	67	Required			
14.23.4	Non-directional earth-fault protection	50N/51N	Required			
14.23.5	Directional earth-fault protection	67N	Required			
14.23.6	Transient earth-fault protection	67NI	Required			
14.23.7	Negative-sequence overcurrent protection	46	Required			
14.23.8	Phase discontinuity protection	46PD	Required			
14.23.9	Three-phase undervoltage protection	27	Required			
14.23.10	Three-phase overvoltage protection	59	Required			
14.23.11	Over or under frequency protection	81	Required			
14.23.12	Three-phase thermal protection for feeders, cables and distribution transformers	49	Required			



14.23.13	Circuit breaker failure protection	50BF	Required			
14.23.14	Three-phase inrush detector	68	Required			
14.23.15	Switch onto fault	SOTF	Required			
14.23.16	Master trip / Lockout	86	Required			
14.23.17	Fault locator	21FL	Required			
14.23.18	Harmonics based earth-fault protection		Required			
14.24 Power Quality						
14.24.1	Current total demand distortion		Required			
14.24.2	Voltage total harmonic distortion		Required			
14.24.3	Voltage variation		Required			
14.24.4	Voltage unbalance		Required			
14.25 Control						
14.25.1	Circuit-breaker control		locally and remotely			
14.25.2	Disconnecter control		locally and remotely			
14.25.3	Earthing switch control		locally and remotely			
14.25.4	Disconnecter position indication		locally and remotely			
14.25.5	Earthing switch indication		locally and remotely			
14.25.6	Auto-reclosing	79	Required			
14.25.7	Synchronism and energizing check	25	Required			
14.26 Condition Monitoring						
14.26.1	Circuit-breaker condition monitoring		locally and remotely			
14.26.2	Trip circuit supervision		locally and remotely			
14.26.3	Current circuit supervision		locally and remotely			
14.26.4	Current transformer supervision for highimpedance protection scheme for phase A		locally and remotely			
14.26.5	Current transformer supervision for highimpedance protection scheme for phase B		locally and remotely			
14.26.6	Current transformer supervision for highimpedance protection scheme for phase C		locally and remotely			
14.27 Measurement						
14.27.1	Disturbance recorder		locally and remotely			
14.27.2	Load profile record		locally and remotely			
14.27.3	Fault record		locally and remotely			
14.27.4	Three-phase current measurement		locally and remotely			
14.27.5	Sequence current measurement		locally and remotely			
14.27.6	Residual current measurement		locally and remotely			
14.27.7	Three-phase voltage measurement		locally and remotely			



14.27.8	Residual voltage measurement		locally and remotely			
14.27.9	Sequence voltage measurement		locally and remotely			
14.27.10	Three-phase power and energy measurement, including power factor		locally and remotely			
14.27.11	Frequency measurement		locally and remotely			
14.27.12	2- Bi directional KW - metering		locally and remotely			
14.28 Communication						
14.28.1	(Modbus, DNP3 and IEC60870-5) VIA TCP/IP		Required			
14.28.3	Communication Interfaces					
	Isolated RS-485 Port		Required			
	Ethernet Connector		Required			
	USB Connection port		Required			
14.28.4	Necessary Connection and Configuration Between RTU and All parts and Connection between RTU and Wireless Communication Terminal		Required			
14.29 Metering device						
14.29.1	Type metering		Required			
14.29.2	CT Accuracy	$\pm 0.5\%$				
14.29.3	CVT Accuracy	$\pm 2\%$				
14.29.4	Active and reactive Energy (kWh, kVARh) single and three-phase		Required with max. $\pm 2\%$ accuracy			
14.29.5	Real and reactive power for each phase and total, including directional, on an individual phase basis		Required with max. $\pm 2\%$ accuracy			
14.29.6	Demand currents on a per phase basis		Required			
14.29.7	Instantaneous currents, including ground current		Required			
14.29.8	Instantaneous voltage on a per phase basis		Required			
14.29.9	Instantaneous frequency		Required			
14.29.10	Positive, negative, and zero sequence voltages		Required			
14.29.11	Instantaneous power factor on a per phase basis		Required with max. $\pm 0.5\%$ accuracy			
14.29.12	Metering settings to include demand interval for current, single-phase kW, three-phase kW, single-phase kVAR, and three-phase kVAR		Required			
14.30 Transformers						
Cable-type current transformers						
a) Standard			IEC 61869-1			



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14.30.1	application		for measuring phase current and for detecting earth-fault current.			
	Number and assignment of current transformer cores:		3 x 2 cores in L1/L2/L3			
	Primary data					
	Highest voltage for equipment Um	kV	0.72			
	Rated current IN	A	500			
	Rated short-duration power-frequency withstand voltage (winding test)	kV	3			
	Rated short-time thermal current Ith	kA/S	20 / 3			
	Secondary data					
	Rated current	A	5			
	Class		0.5S			
	Rating	VA	10			
	class and overcurrent factor of core 1		Cl. 5 P / 10			
	class and overcurrent factor of core 2		Cl. 0.5			
	Dimensions					
14.30.2	For cable Cross Section	mm ²	630			
	c) For measuring and instruments, not less than 10 VA, Class 0.5		Required			
	d) For protection, not less than 10 VA, Class 5P10		Required			
	Cable-type current transformers for earth-fault detection					
	Number and assignment of current transformer cores:		1			
	Voltage Transformer					
	Designed		3 x single-pole with earth-fault winding and damping resistor			
	Standard		IEC 60044-2			
	Rated voltage	kV	24.0			
	Operating voltage	kV	22.0			
	Rated short-duration power-frequency withstand voltage:	kV	50			
	Rated lightning impulse withstand voltage:	kV	125			
	Voltage of secondary winding	V	230			
	Accuracy Class		0.5s			
14.30.3	Output burden	VA	50			
	Voltage of earth-fault winding:	V				
	Rating and class of earth-fault winding:	VA	50 VA / 3P			
	Equipped with both primary H.V and secondary L.V fuses		Required			
	Battery					
	a) Battery Type		Chargeable 24 (2x12)Vdc lead acid			
	b) Battery operational capability	hour	48			
	c) Battery life expectancy	years	5			
	d) Battery Charger		Required			
	e) Battery charge Indicator (Low, high and Over charger battery		Required			
	15 Billing metering panels					
	15.1 Advanced Energy Analysis & Management Electricity 3phase Meter					



15.1.1	Name of Manufacturer				
15.1.2	Country of Origin				
15.1.3	Reference Manufacturing Standards		IEC62052-11 , IEC62053-22, IEEE 1159/EN50160		
15.1.4	Application		Metering		
15.1.5	Design and Safety		Compact design Weatherproof Plastic Case		
15.1.6	Type		Three Phase four Wires CT Type		
15.1.7	Voltage marking Three-phase 4-wire 3-element (230 V phase to neutral)		3x230/400		
15.1.8	Reference Voltage (Un) Connection through voltage transformer(s)	V	57,7-63,5-100-110-115-120-200 (IEC 60044-2)		
15.1.9	Extended operation range	V	From 0.8 to 1.15 Un		
15.1.10	Measurement Current Connection through current transformer(s) (In)	A	5 (IEC 60044-1)		
15.1.11	Meter Constant	imp/kWh	Required		
15.1.12	Power consumption in Voltage Circuit per phase including the power supply, Multi-function meter		<3W ; <15VA when communication with IEC 62053-61		
15.1.13	Current Circuit (the power absorption of the input circuit)	VA	< 0.5 (IEC 61000-4-7)		
15.1.14	Accuracy		Active, Class 0.2s , Reactive Class 0.5s IEC 62053-23		
15.1.15	Real time clock		<0.5 s/day with temperature compensation function		
15.1.16	Specified operating range	°C	-25 °C to 55 °C (class 3K6)		
15.1.17	Limit range of operation	°C	-40 °C to 70 °C (class 3K7)		
15.1.18	Humidity		<= 95% RH		
15.1.19	Voltage impulse strength		6kV with 1.2/50µs		
15.1.20	Insulation strength		4kV at 50Hz for 1 minute		
15.1.21	EMC (Electromagnetic compatibility)		IEC 61000-4		
15.1.22	Radio Interference		Class A		
15.1.23	Protection class		IP 54 (IEC 60529) indoor use		
15.1.24	Display		Large easy to read backlit LCD display (LCD shall be readable during power outage)		

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15.1.25	Password protection and lockout function		three levels of encrypted password protection plus lockout function			
15.1.26	Backup Battery		Required			
15.1.27	Auxiliary Power Supply		Required			
15.1.28	Measurement function					
15.1.29	Energy (import/export &) phase A,B,C Or Total /4 quadrant)	WH,VAR H,VAH	Active energy phases 1/2/3, reactive energy phases 1/2/3 and apparent energy phases 1/2/3 or total			
15.1.30	Power	W,VAR, VA	Instantaneous active & reactive power phases 1/2/3 or total			
15.1.31	For each phase Current and Voltage		Required			
15.1.32	Power Factor		total and 3 phase			
15.1.33	Frequency		Required			
15.1.34	Phasor Angle		3 phase			
15.1.35	Demand Response		Records meter energy every 15,30,45,60 min. Record data for 1 year			
15.1.36	Data Freeze		Stores data into EEPROM memory at any given moment			
15.1.37	Load Profile and Demand Response		Combines six data items: "voltage, current, frequency", "active power, reactive power", "power factor", "total active energy of 4 quadrant", "current demand". Duration: 1 to 60 minute. Capacity: 40 days with 1 minute duration the Record data for 1 year			
15.1.38	Maximum Demand zero reset		Manually initiated via the sealable demand reset button and Automatically reset at predefined date after self reading			
15.1.39	Anti Tamper		Reverse Power, sag/swell, clock failure, battery failure, memory failure, meter terminal cover open, meter cover open			
15.1.40	Event Record		Event Log: power on/off, time change, firmware change and log off. Alarm Record: reverse power, sag/swell, clock failure, battery failure, memory failure			
15.1.41	Total harmonic mesurment		Required (IEC 61000-4-7 Class I)			
3 x Voltage Transformer						



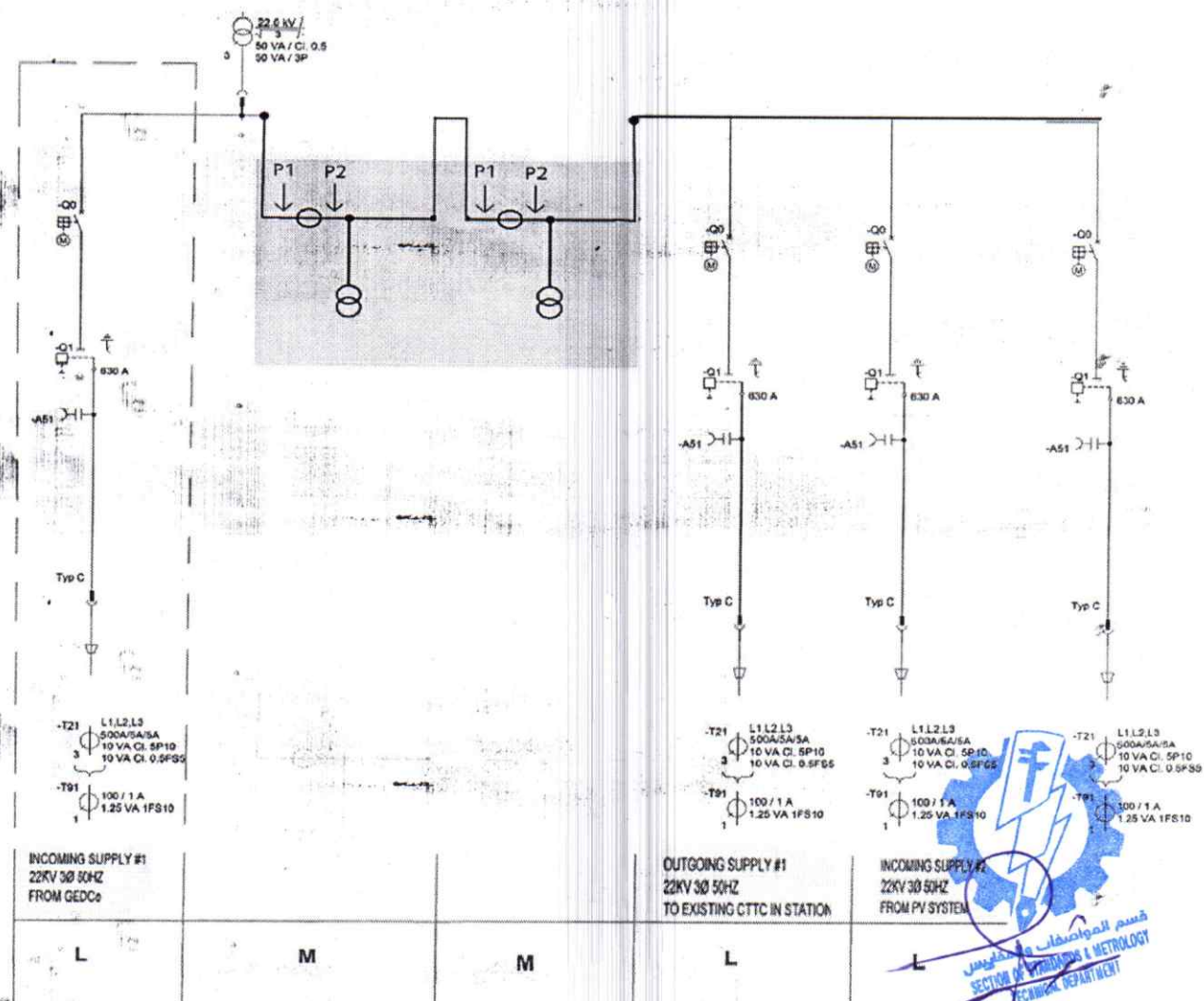
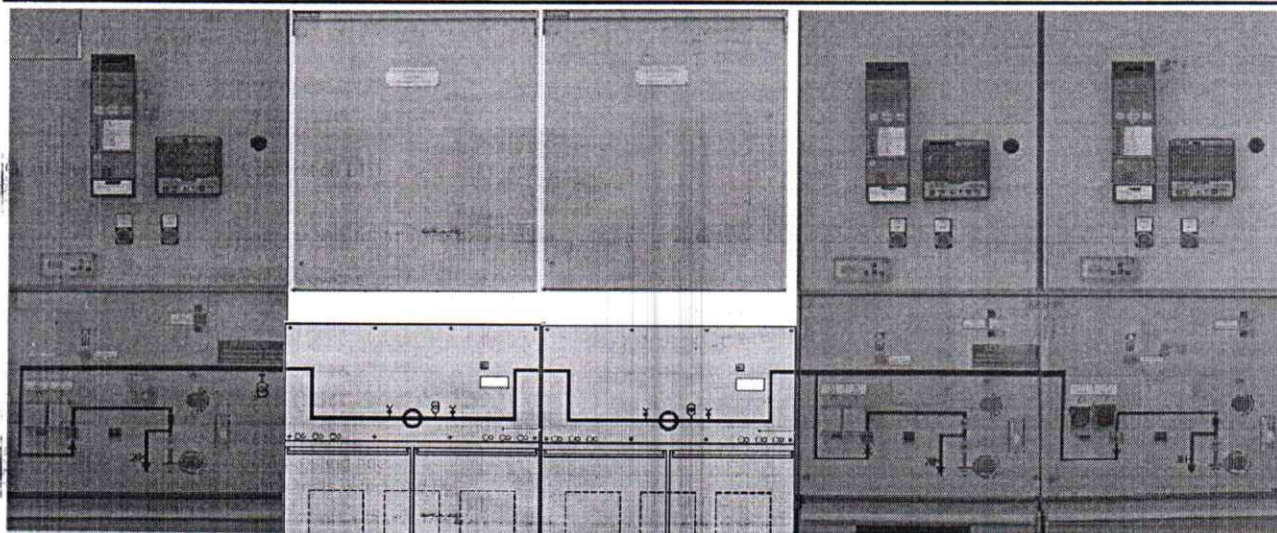
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15.2	Designed		3 x single-pole with earth-fault winding and damping resistor			
	Standard		IEC 61869-1, IEC 61869-3			
	Rated voltage	kV	24.0			
	Operating voltage	kV	22.0			
	Rated short-duration power-frequency withstand voltage:	kV	50			
	Rated lightning impulse withstand voltage:	kV	125			
	Voltage of secondary winding	V	230			
	Accuracy Class		0.2s			
	Output burden	VA	50			
	Voltage of earth-fault winding:	V				
	Rating and class of earth-fault winding:	VA	50			
	Equipped with both primary H.V and secondary L.V fuses		Required			
3 x current transformers 500/5A						
Name of Manufacturer						
Country of Origin						
a) Standard IEC 61869-1, IEC 61869-1.BS7626						
application for metering						
Design indoor current transformer, 1-pole						
type Cast-resin insulated						
Primary data						
15.3	Highest voltage for equipment Um	kV	24 kV			
	Rated current IN	A	500			
	Rated short-duration power-frequency withstand voltage Ud	kV	50 kV			
	Rated lightning impulse withstand voltage:	kV	125			
	Rated short-time thermal current Ith	kA/S	20 / 3			
Secondary data						
	Rated current	A	5			
	Class		0.2S			
	Rating	VA	50			
15.4	Ferro-Damp Unit		Required			
15.5 Communication from metering device						
15.5.1	(Modbus, DNP3 and IEC60870-5) VIA TCP/IP		Required			
15.5.2	Communication Interfaces					
	Isolated RS-485 Port		Required			
	Ethernet Connector		Required			
	USB Connection port		Required			
15.5.3	Necessary Connection and Configuration Between RTU and All parts and Connection between RTU and Wireless Communication Terminal		Required			



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16	uninterruptible power supply	2kw	Required		.+24V Power supply if needed for C.B
17	surge arrestor		Required		
19 Tests for all componet include					
19.1	Type Test Certificates /Reports from internationally reputed testing agency		Required		
19.2	Acceptance & Routine tests witnessed by Beneficiary		Required		
All the control system must be Connected with GEDCo. scada system					



Wireless Communication Terminal

1	Name of Manufacturer		SECOMEA or Equivalent			
2	Country of Origin					
3	Reference Standards		Shall be Suitable for JAWWAL or Palestine Cellular Communications Company in the Palestinian			
4	Bands		Integrated broadband modem supporting the frequencies: WCDMA 850/1900/2100 MHz EDGE/GPRS 850/900/1800/1900 MHz			
5	Mobile phone system		2G			
6	Required system		2G and 3G			
7	Sims Card		JAWWAL Sim Card			
9	TCP/IP stack access via AT commands		Required			
10	Internet Services		TCP, UDP, HTTP, FTP, SMTP, POP3			
11	Supply voltage	V	12 - 48 V/DC			
12	Housing		Robust			
13	SMS					
	Short Message Service Transfer		Point-to-point MO (mobile originated) and MT (Mobile Terminated), SECOMEA Solution			
	SMS cell broadcast		Required			
14	Interfaces					
	Antenna Connector		SMA 50 Ω , Include Ex Antenna 2dB (2m Cable)			
	USB		Required			
	9 pin sub-D connector for RS-232 serial interface		Required			
15	Environmental conditions					
	Operating temperature		v-15 °C - +55 °C			
	Storage and transportation		v-25 °C - +70 °C			
	Switch off		V+75 °C			
	Humidity		5 % - 95 %			
16	Power Supply 12/24V DC		Required			

