



**BORU HATLARI İLE PETROL TAŞIMA A.Ş.  
PETROLEUM PIPELINE CORPORATION**

**TUZ GÖLÜ DOĞAL GAZ DEPOLAMA  
3. ETAP PROJESİ  
TUZ GOLU NATURAL GAS STORAGE  
3RD STAGE PROJECT**

**KUYULAR&DPSF3A İÇİN TRANSFORMATÖR BİLGİ FÖYÜ  
DATASHEET OF TRANSFORMER FOR CAVERNS&DPSF3A**



**Kasım / November 2024**

Revizyon / Revision			
	A2	13.11.2024	Yapım İçin / Issued For Construction
	A1	13.11.2024	Yapım İçin / Issued For Construction
	A0	13.06.2024	Yapım İçin / Issued For Construction
	00	15.05.2024	Onay İçin / Issued For Approval
No	Tarih/Date	Açıklama / Description	



**BORU HATLARI İLE PETROL TAŞIMA A.Ş.**  
**PETROLEUM PIPELINE CORPORATION**

İşin Adı/ Name of the Work	<b>TUZ GÖLÜ DOĞAL GAZ DEPOLAMA 3. ETAP PROJESİ TUZ GOLU NATURAL GAS STORAGE 3<sup>RD</sup> STAGE PROJECT</b>
Yüklenici/ Contractor	 <b>BOTAS PIPELINE SERVICES IC</b>

İdare/ Employer	İnceleyen/Reviewed By	Onay/Approved By

Mühendis/ Engineer	Tasarım/Designed By	Kontrol/Checked By	Onay/Approved By

**KUYULAR&DPSF3A İÇİN TRANSFORMATÖR BİLGİ FÖYÜ  
DATASHEET OF TRANSFORMER FOR CAVERNS&DPFS3A**

Aşama Türü- Phase Type	UYGULAMA PRJ DETAIL DESIGN	Konu/Subject	Alan Kodu/Area Code	Aşama/Level	Numara/Number	Revizyon/Revision
Tarih/ Date	13.11.2024					

**TRANSFORMER DATASHEET (For Caverns)**

	DESCRIPTION	UNITS	PURCHASER'S REQUIREMENTS	SUPPLIER'S RESPONSE
<b>A</b>	<b>TYPE</b>			
A01	Type	kV	31.5/0.4, ONAN, Hermetically	
A02	Usage Area	-	Cavern Energy Building	
A03	Indoor/Outdoor	-	<b>Outdoor</b>	
A04	Winding	-	Copper or Aluminium	
A05	Winding Connection	-	Dyn11	
A06	Tap Changer	-	Off-Load Tap Changer (Only at Primary Side)	
A07	Rated power according to IEC for tapping voltage equal or above 0.95 Un. Below 0.95 Un, rated power decreases proportionally	-	Yes	
A08	Transformers are with corrugated walls	-	Yes	
<b>B</b>	<b>ENVIROMENTAL CONDITIONS</b>			
B01	Maximum Ambient Temperature	°C	+40	
B02	Daily Maximum Temperature	°C	+40	
B03	Yearly Minimum Temperature	°C	-29	
B04	Monthly Average Temperature, Hottest Month	°C	+30	
B05	Yearly Average Temperature	°C	+20	
B06	Average Relative Humidity	%	62	
B07	Seismic Factor	Grade	5th	
<b>C</b>	<b>ELECTRICAL FEATURES</b>			
C01	Number of Windings	-	2	
C02	Number of Phase	-	3	
C03	Nominal Frequency	Hz	50	
C04	Nominal Power	kVA	400	
C05	Number of Tap Changing	-	6	
C06	Voltage Adjustment Range	kV	28.5-30-31.5-33-34.5-36	
C07	Short Circuit Impedance	%	4.5	
<b>D</b>	<b>NOMINAL INSULATION LEVELS</b>			
D01	For HV windings, lightning impulse withstand voltage	kV	170	
D02	For HV windings, short term induced or separately sourced ac withstand voltage	kV	70	
D03	For LV windings, separately sourced ac withstand voltage	kV	3	
D04	Insulation levels for primary and secondary side		According to IEC 60076-3	
D05	Bushing, tap changer, measurements acc. to IEC	kV	Supplier will provide them according to related IEC Standards.	
<b>E</b>	<b>LOSSES</b>			
E01	No load loss at rated voltage and frequency	W	495	
E02	Load Losses at full load	W	3575	

**TRANSFORMER DATASHEET (For Caverns)**

	DESCRIPTION	UNITS	PURCHASER'S REQUIREMENTS	SUPPLIER'S RESPONSE
<b>F</b>	<b>PRIMARY SIDE BUSHINGS</b>			
F01	Number of bushings for primary Side	-	3	
F02	Rated current (minimum 120% of the rated current of the transformer)	A	Specify by supplier	
F03	Type	-	Porcelain	
F04	Connector	-	Yes, specify by supplier	
F05	Core earthing connection	-	Yes, specify by supplier	
<b>G</b>	<b>SECONDARY SIDE BUSHINGS</b>			
G01	Number of bushings for secondary Side	-	4	
G02	Rated current	A	Specify by supplier	
G03	Type	-	Porcelain	
<b>H</b>	<b>OIL TYPE</b>			
H01	Type	-	Specified by supplier	
H02	Standard	-	Complied with IEC 60296 and related TEİAŞ Insulation Transformer Oil Specification	
<b>I</b>	<b>TEMPERATURE RISE AND OVERLOAD</b>			
I01	Maximum temperature rise at rated power for all taps according to IEC 60354: Average winding temperature rise (by resistance measurement)	K	65	
I02	Maximum temperature rise at rated power for all taps according to IEC 60354: Top oil temperature rise (by thermometer measurement)	K	60	
I03	Maximum temperature rise at rated power for all taps according to IEC 60354: Winding "hot spot" temperature rise overload capabilities	K	78	
<b>J</b>	<b>SOUND LEVEL</b>			
J01	Sound Level(LwA)	dB	52	

**TRANSFORMER DATASHEET (For Caverns)**

	DESCRIPTION	UNITS	PURCHASER'S REQUIREMENTS	SUPPLIER'S RESPONSE
<b>K</b>	<b>AUXILIARY SERVICES, ACCESSORIES, PROTECTION</b>			
K01	Cable box on both sides, IP55	-	Yes	
K02	Marshalling box, INOX, min IP55	-	Yes	
K03	Electrical connections between the controls and the marshalling kiosk	-	Yes	
K04	Hermetic relay provides both alarm and trip contact signals including oil temperature indicator	-	Yes	
K05	A pocket for Pt 100 probes is also provided in the lower tube of those tank cover, but no Pt 100 is installed	-	Yes	
K06	All parts, not welded to the main tank of the transformer are equipped with equipotential links, connecting this part to the main tank. Those equipotential links have a section of at least 120 mm <sup>2</sup> .	-	Yes	
K07	4 jacking lugs (red painted)	-	Yes	
K08	4 lifting lugs to lift the complete transformer (red painted)	-	Yes	
K09	Pulling eyes, fitted adjacent to each corner of the tank near the base (red painted)	-	Yes	
K10	2 grounding pads (inox), diagonally welded to the base of the tank with 2 bolts M12	-	Yes	
K11	Rating Plates	-	Yes	
K12	Pressure Air Relief Valve	-	Yes	
<b>L</b>	<b>PAINT AND CORROSION PROTECTION</b>			
L01	Finishing colour (The transformer and its accessories are guaranteed corrosion-free for 10 years.)	-	RAL 7033, 240µm thickness C3 VH.	

**TRANSFORMER DATASHEET (For Caverns)**

	DESCRIPTION	UNITS	PURCHASER'S REQUIREMENTS	SUPPLIER'S RESPONSE
<b>M</b>	<b>MECHANICAL CHARACTERISTICS</b>			
M01	Mass			
M02	Total, ready for operation	t	Specify by Supplier	
M03	Oil	t	Specify by Supplier	
M04	Active part (magnetic circuit+windings)	t	Specify by Supplier	
M05	Others;rollers,bushing,etc	t	Specify by Supplier	
M06	Transport		Specify by Supplier	
M07	With oil or	t	Specify by Supplier	
M08	Without oil; Mass tolerances	%	± 10	
M09	Dimensions			
M10	Length	mm	Specify by Supplier	
M11	Width	mm	Specify by Supplier	
M12	Height	mm	Specify by Supplier	
M13	Metal frame, large enough to contain the transformer			
M14	Type of profiles used	-	Specify by Supplier	
M15	Transversal axle	mm	Specify by Supplier	
M16	Longitudinal axle	mm	Specify by Supplier	
M17	Safety: fixing points for harness of people, involved with erection and maintenance activities	-	No	

**TRANSFORMER DATASHEET (For DPSF3A)**

	DESCRIPTION	UNITS	PURCHASER'S REQUIREMENTS	SUPPLIER'S RESPONSE
<b>A</b>	<b>TYPE</b>			
A01	Type	kV	31.5/0.4, ONAN, Hermetically	
A02	Usage Area	-	DPFS3A (Energy Building)	
A03	Indoor/Outdoor	-	<b>Outdoor</b>	
A04	Winding	-	Copper or Aluminium	
A05	Winding Connection	-	Dyn11	
A06	Tap Changer	-	Off-Load Tap Changer (Only at Primary Side)	
A07	Rated power according to IEC for tapping voltage equal or above 0.95 Un. Below 0.95 Un, rated power decreases proportionally	-	Yes	
A08	Transformers are with corrugated walls	-	Yes	
<b>B</b>	<b>ENVIROMENTAL CONDITIONS</b>			
B01	Maximum Ambient Temperature	°C	+40	
B02	Daily Maximum Temperature	°C	+40	
B03	Yearly Minimum Temperature	°C	-29	
B04	Monthly Average Temperature, Hottest Month	°C	+30	
B05	Yearly Average Temperature	°C	+20	
B06	Average Relative Humidity	%	62	
B07	Seismic Factor	Grade	5th	
<b>C</b>	<b>ELECTRICAL FEATURES</b>			
C01	Number of Windings	-	2	
C02	Number of Phase	-	3	
C03	Nominal Frequency	Hz	50	
C04	Nominal Power	kVA	<b>630</b>	
C05	Number of Tap Changing	-	6	
C06	Voltage Adjustment Range	kV	28.5-30-31.5-33-34.5-36	
C07	Short Circuit Impedance	%	4.5	
<b>D</b>	<b>NOMINAL INSULATION LEVELS</b>			
D01	For HV windings, lightning impulse withstand voltage	kV	170	
D02	For HV windings, short term induced or separately sourced ac withstand voltage	kV	70	
D03	For LV windings, separately sourced ac withstand voltage	kV	3	
D04	Insulation levels for primary and secondary side		According to IEC 60076-3	
D05	Bushing, tap changer, measurements acc. to IEC	kV	Supplier will provide them according to related IEC Standards.	
<b>E</b>	<b>LOSSES</b>			
E01	No load loss at rated voltage and frequency	W	495	
E02	Load Losses at full load	W	3575	

**TRANSFORMER DATASHEET (For DPSF3A)**

	DESCRIPTION	UNITS	PURCHASER'S REQUIREMENTS	SUPPLIER'S RESPONSE
<b>F</b>	<b>PRIMARY SIDE BUSHINGS</b>			
F01	Number of bushings for primary Side	-	3	
F02	Rated current (minimum 120% of the rated current of the transformer)	A	Specify by supplier	
F03	Type	-	Porcelain	
F04	Connector	-	Yes, specify by supplier	
F05	Core earthing connection	-	Yes, specify by supplier	
<b>G</b>	<b>SECONDARY SIDE BUSHINGS</b>			
G01	Number of bushings for secondary Side	-	4	
G02	Rated current	A	Specify by supplier	
G03	Type	-	Porcelain	
<b>H</b>	<b>OIL TYPE</b>			
H01	Type	-	Specified by supplier	
H02	Standard	-	Complied with IEC 60296 and related TEİAŞ Insulation Transformer Oil Specification	
<b>I</b>	<b>TEMPERATURE RISE AND OVERLOAD</b>			
I01	Maximum temperature rise at rated power for all taps according to IEC 60354: Average winding temperature rise (by resistance measurement)	K	65	
I02	Maximum temperature rise at rated power for all taps according to IEC 60354: Top oil temperature rise (by thermometer measurement)	K	60	
I03	Maximum temperature rise at rated power for all taps according to IEC 60354: Winding "hot spot" temperature rise overload capabilities	K	78	
<b>J</b>	<b>SOUND LEVEL</b>			
J01	Sound Level(LwA)	dB	54	



**TRANSFORMER DATASHEET (For DPSF3A)**

	<b>DESCRIPTION</b>	<b>UNITS</b>	<b>PURCHASER'S REQUIREMENTS</b>	<b>SUPPLIER'S RESPONSE</b>
<b>K</b>	<b>AUXILIARY SERVICES, ACCESSORIES, PROTECTION</b>			
K01	Cable box on both sides, IP55	-	Yes	
K02	Marshalling box, INOX, min IP55	-	Yes	
K03	Electrical connections between the controls and the marshalling kiosk	-	Yes	
K04	Hermetic relay provides both alarm and trip contact signals including oil temperature indicator	-	Yes	
K05	A pocket for Pt 100 probes is also provided in the lower tube of those tank cover, but no Pt 100 is installed	-	Yes	
K06	All parts, not welded to the main tank of the transformer are equipped with equipotential links, connecting this part to the main tank. Those equipotential links have a section of at least 120 mm <sup>2</sup> .	-	Yes	
K07	4 jacking lugs (red painted)	-	Yes	
K08	4 lifting lugs to lift the complete transformer (red painted)	-	Yes	
K09	Pulling eyes, fitted adjacent to each corner of the tank near the base (red painted)	-	Yes	
K10	2 grounding pads (inox), diagonally welded to the base of the tank with 2 bolts M12	-	Yes	
K11	Rating Plates	-	Yes	
K12	Pressure Air Relief Valve	-	Yes	
<b>L</b>	<b>PAINT AND CORROSION PROTECTION</b>			
L01	Finishing colour (The transformer and its accessories are guaranteed corrosion-free for 10 years.)	-	RAL 7033, 240µm thickness C3 VH.	

**TRANSFORMER DATASHEET (For DPSF3A)**

	DESCRIPTION	UNITS	PURCHASER'S REQUIREMENTS	SUPPLIER'S RESPONSE
<b>M</b>	<b>MECHANICAL CHARACTERISTICS</b>			
M01	Mass			
M02	Total, ready for operation	t	Specify by Supplier	
M03	Oil	t	Specify by Supplier	
M04	Active part (magnetic circuit+windings)	t	Specify by Supplier	
M05	Others;rollers,bushing,etc	t	Specify by Supplier	
M06	Transport		Specify by Supplier	
M07	With oil or	t	Specify by Supplier	
M08	Without oil; Mass tolerances	%	± 10	
M09	Dimensions			
M10	Length	mm	Specify by Supplier	
M11	Width	mm	Specify by Supplier	
M12	Height	mm	Specify by Supplier	
M13	Metal frame, large enough to contain the transformer			
M14	Type of profiles used	-	Specify by Supplier	
M15	Transversal axle	mm	Specify by Supplier	
M16	Longitudinal axle	mm	Specify by Supplier	
M17	Safety: fixing points for harness of people, involved with erection and maintenance activities	-	No	