USER MANUAL-Dyna x NHCE


About Us

Dynalektric Equipment Private Limited is envisioned to be a high technology product & solution provider for Transformers (Dry-Type VPI based & Oil-cooled), Reactors & Inductors, and Control Panel assemblies in the field of Railways, Renewable energy, Heavy and Automotive Industries. We are a DPIIT (Department for promotion of Industry and Internal Trade, Ministry of commerce & industry, government of India) certified company (certificate no.DIPP605594) under "STARTUP INDIA" in the field of "Technology Hardware" Industry and "Manufacturing. We are also a certified MSME as a manufacturing enterprise under Udyog Aadhar (UAM No. KR03B0122808). As a manufacturing company we are certified ISO 9001:2015 and ISO 14001:2015, ISO 45001:2018.

About the Software

This software is designed to facilitate the calculation of specific parameters related to transformers. Users can input default values such as voltage, current, power rating, frequency, and other relevant specifications. The software will then compute essential parameters.

Additionally, the software includes a feature for generating and displaying CAD diagrams of the transformer based on the computed parameters. These diagrams can be printed or saved for further reference. The CAD functionality helps visualize the design, providing detailed drawings of the core, windings, and overall layout, making it a comprehensive tool for transformer design and analysis.

'Build Your own Transformer'

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Demo

Transformer Design

New Project
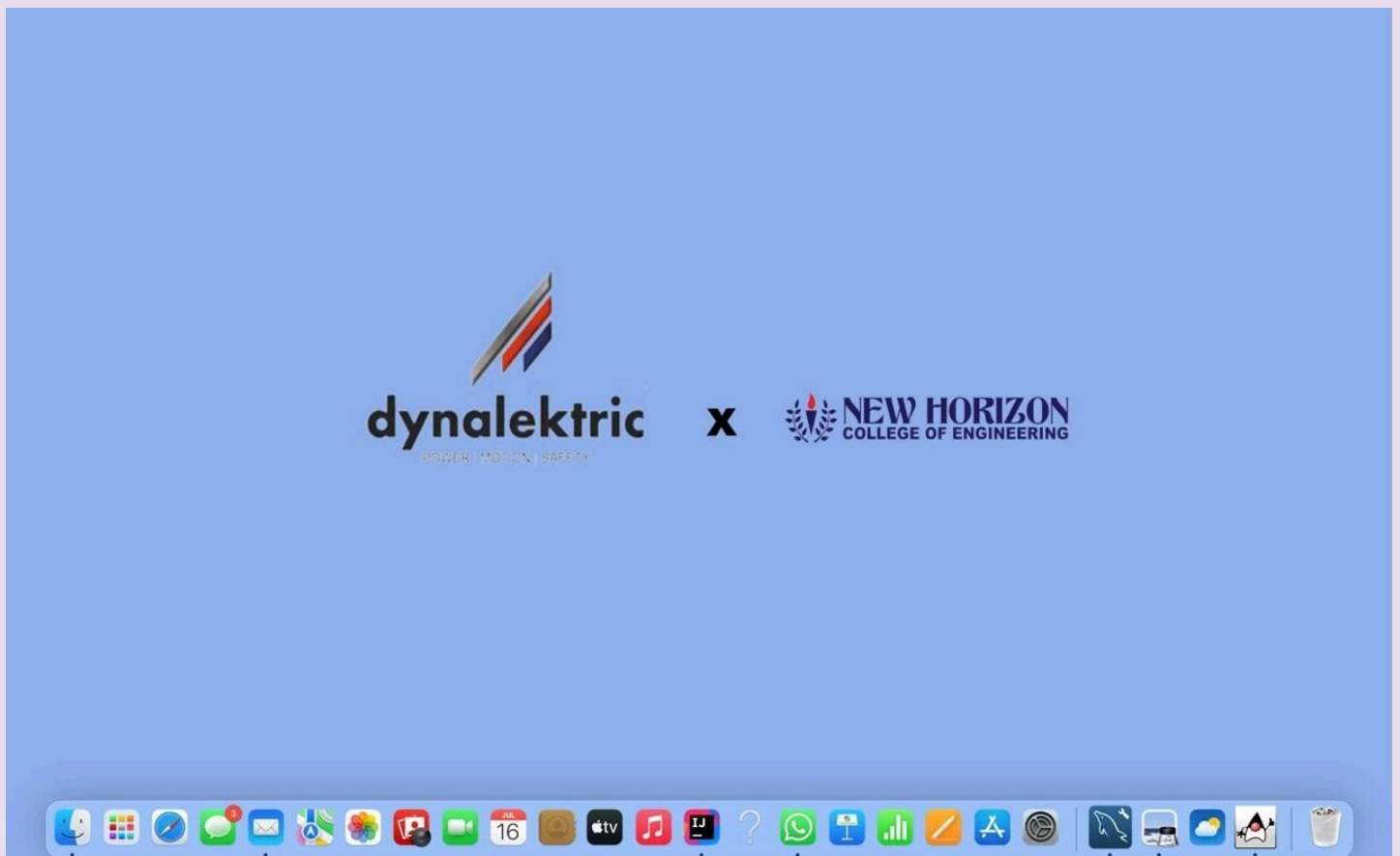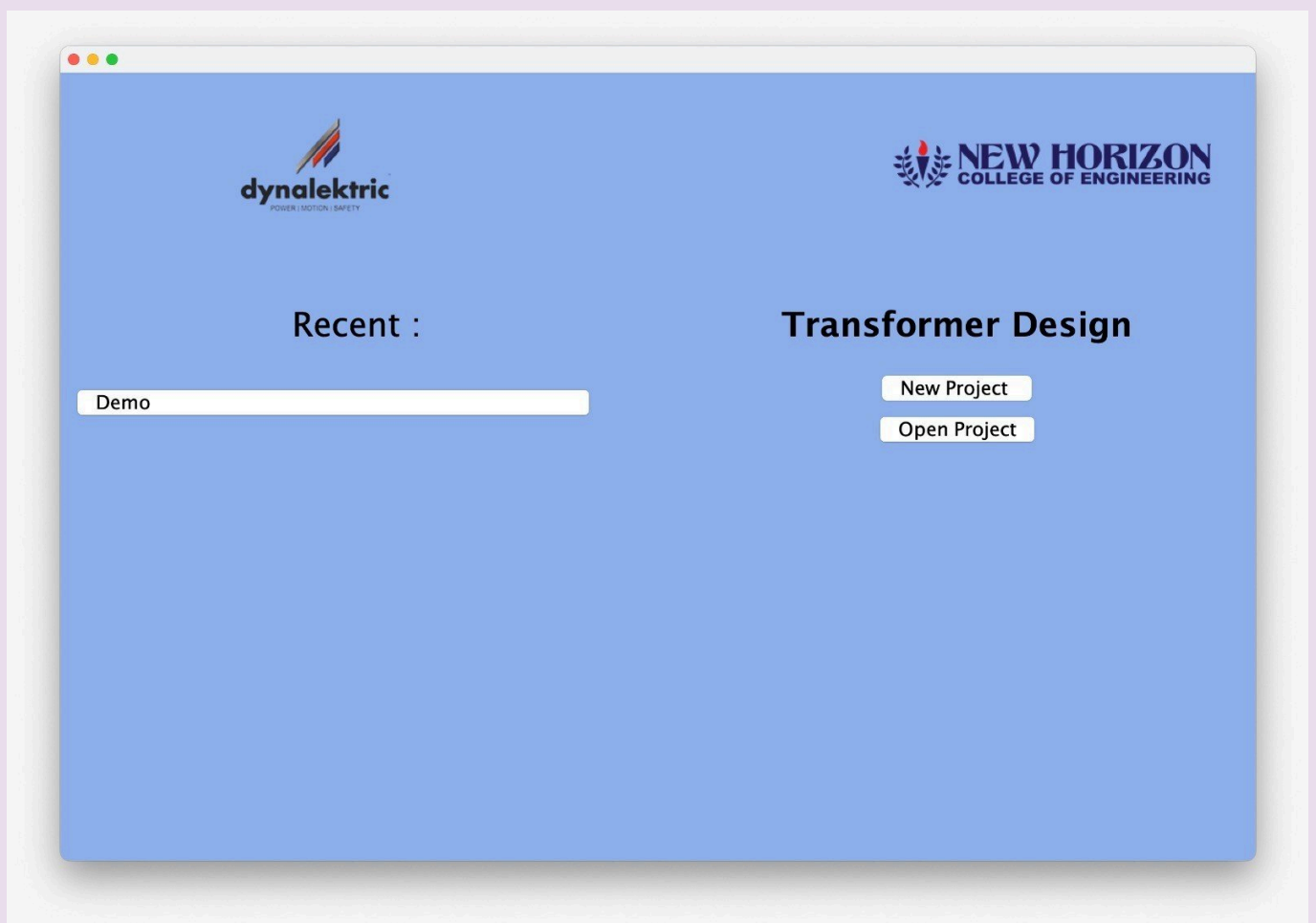
Open Project

TransformerCalc Pro User Manual

Table of Contents:

1. Introduction-Welcome to DynaTd, a comprehensive software tool designed to calculate essential parameters for power transformers. This manual will guide you through the installation, setup, and use of DynaTd.

2. System Requirements- Operating System: Windows 10 or higher, macOS 10.13 or higher- Processor: Intel i3 or equivalent- Memory: 4 GB RAM- Storage: 500 MB of free disk space- Display: 1024 x 768 resolution or higher

3. Installation-Download: Visit the official website and download the DynaTd installer.-Run Installer: Double-click the downloaded file to run the installer.-Follow Prompts: Follow the on-screen instructions to complete the installation.

4. Launching the Software
-Locate the Software:
  - Find the DynaTd shortcut on your desktop or in the start menu.
-Open the Software:
  - Double-click the shortcut or select it from the start menu.
  - Wait for the software to load.

5. Creating a New Project
1. Start a New Project:- On the welcome screen, click New Project or go to File > New Project.
2. Project Settings: - Enter the project name and choose the save location.   - Configure initial settings, such as transformer type (e.g., power transformer, distribution transformer).
3. Save the Project: - Click Save to create and save your new project.

6. Opening an Existing Project
1. Open Project: - On the welcome screen, click Open Project or go to File > Open Project.
2. Browse and Select: - Navigate to the location of your existing project. - Select the project file and click Open.
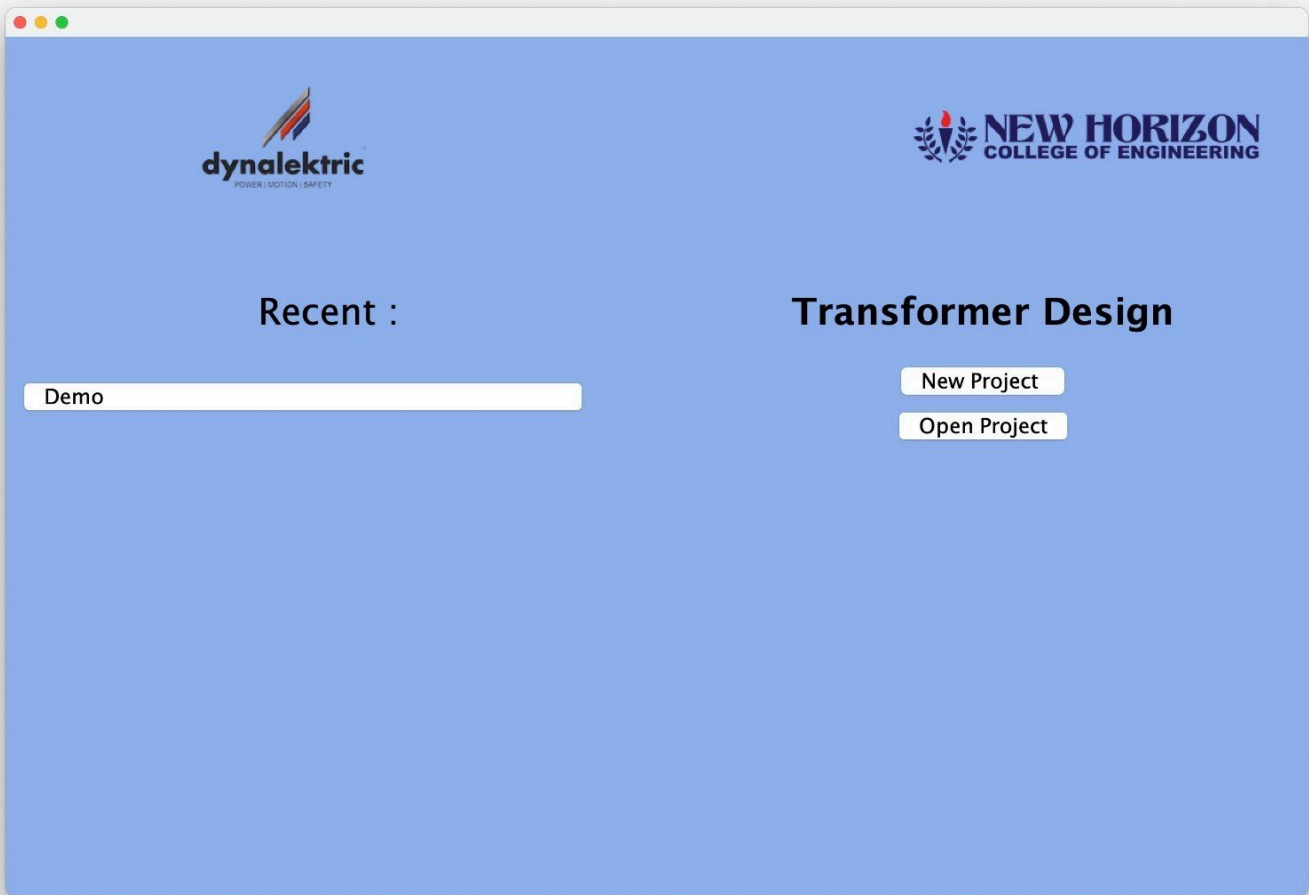
7. Inputting Transformer Parameters

1. Navigate to Parameter Input:- Go to the Parameters tab or section in the main interface.

2. Enter Parameters:- Input the necessary parameters such as primary voltage, secondary voltage, power rating, and impedance.- Use the provided fields and dropdowns to ensure accuracy.

*Click on view, from the drop down menu select the required option.

*Under winding the following parameters are available

Transformer Design Wizard [Winding]

Parameter	UNITS	HV	LV
Type of Winding		STRIP	STRIP
Rated Voltage	V	480.0	32.0
Rated Current	A	5.555555555555555	83.33333333333333
Cross Section sqmm	mm²	5.309304	68.9
Current density	A/mm²	1.0463811368788745	1.209482341557813
Turns/Limb	Nos	300.0	20.0
Turns/Layer	Nos	60.0	7.0
wdg lg-imp calc	H	162.3	141.8
Wind Length(AXL)	mm	165.0	162.0
Limb length	mm	205.0	205.0
Wind-radial depth	mm	23.0	20.0
Turn length	M	0.4465	0.632
Wire Length		133.95	12.64
Resistance (ohms)	Ω	0.9010462711173763	0.0065519386274103...
Stray Loss (%)	%	0.3151546789689298	0.0120462702388048...
Load Loss (Watts)	Watts	83.69314450004423	136.51516440923464
S.a-m(wdg)	Sqmm	0.2898678	0.3584704
W/m^2	W/M²	96.24289014974438	126.94229370982434

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*If you want the tapping, select the tapping type, the side on which you prefer the tapping on either hv or lv, choose the minimum and maximum tapping range and also the step value.

*If you do not want any tapping, select no tapping.

Transformer Design Wizard [Winding]

Sr.NO	Item Code	Material	Description of Item	Specification(Size)	Quantity	Unit	Unit Cost RS	Total Cost RS	Remark
1		Core			57	KG			
2		Core-Steel + SS			6.0	KG			
3		ALUMINIUM			14.0	KG			
4		Leads			0.56	KG			
5		Insulation-FG			1.68	KG			
6		Connection-FG			1.92	KG			
7		Insulation-CL-H			0.35000000000000003	KG			
8		RESIN-VT50			4.050899113851794	KG			
9		MISC			4.253444069544384	KG			
10		CRCA ENCL			0.0	KG			
11		Total Mass			89.32232546043205	KG			

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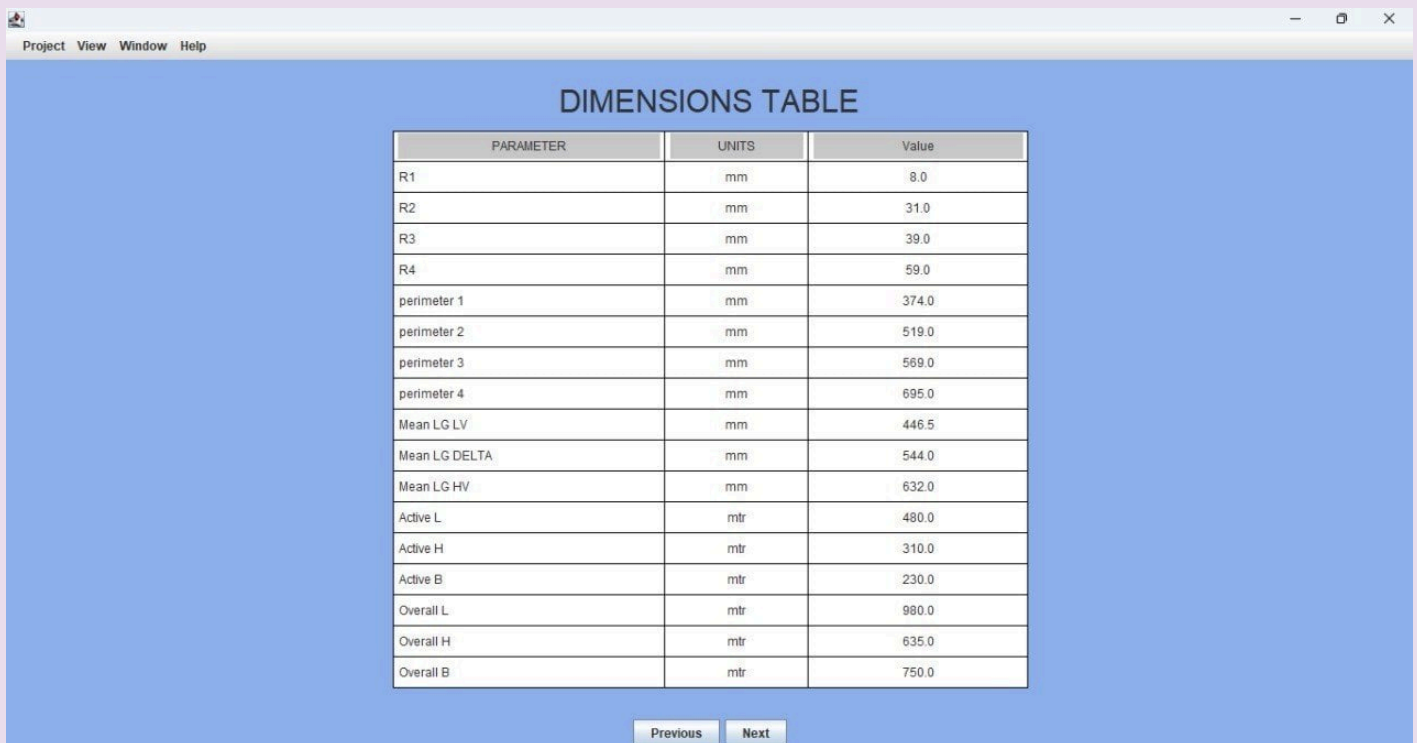
*In the core section, the following parameters are available.

Transformer Design Wizard [Core]

Parameter	W	D
Core	50.0	108.0
Limb Plate	0	4
CORE"	50.0	112.0
gap/bobin	16	16
ID(1)	66.0	128.0
LV wdg	46.0	46.0
OD(1)	112.0	174.0
δ	16	16
ID(2)	128.0	190.0
HV wdg	40.0	40.0
OD(2)	168.0	230.0
am	12	13
Core Distance	180.0	
Yoke Length	410.0	
Leads	230.0	
Core	0.3865	

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*The following represents the dimension table

DIMENSIONS TABLE

PARAMETER	UNITS	Value
R1	mm	8.0
R2	mm	31.0
R3	mm	39.0
R4	mm	59.0
perimeter 1	mm	374.0
perimeter 2	mm	519.0
perimeter 3	mm	569.0
perimeter 4	mm	695.0
Mean LG LV	mm	446.5
Mean LG DELTA	mm	544.0
Mean LG HV	mm	632.0
Active L	mtr	480.0
Active H	mtr	310.0
Active B	mtr	230.0
Overall L	mtr	980.0
Overall H	mtr	635.0
Overall B	mtr	750.0

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7. Performing Calculations
1. Access Calculation Tools:- Go to the Calculations tab or section.
2. Select Calculation Type:- Choose the type of calculation you want to perform (e.g., efficiency, losses, voltage regulation).
3. Run Calculation:- Click Calculate to perform the selected calculation.- Review the results displayed in the results window.

*When you click on calculate, the obtained results will be displayed

LV HV data

Parameter	HV	LV
Rated Voltage	480.0	32.0
Rated Current	5.555555555555555	83.33333333333333
Cross Section sqmm	5.309304	68.9
Current density	1.0463811368788745	1.209482341557813
Turns/Limb	300.0	20.0
Turns/Layer	60.0	7.0
wdg lg-imp calc	162.3	141.8
Wind Length(AXL)	165.0	162.0
Limb length	205.0	205.0
Wind-radial depth	23.0	20.0
Turn length	0.4105	0.596
Wire Length	123.14999999999999	11.92
Resistance (ohms)	0.8283975236140717	0.006178726933443914
Stray Loss (%)	0.3151546789689298	0.012046270238804899
Load Loss (Watts)	76.94520899724111	128.73898415807568
S.a-m(wdg)	0.2664966	0.3380512
W/m^2	96.2428901497444	126.94229370982431
wdg temp rise	39.0607225374361	33.0
core	0.346	

V/T
1.5998434006697864

Parameter	HV 1	HV 2	LV 1	LV 2
Wire bare	2.6	2.6	10.0	3.5
Wire insulated	2.7	2.7	10.1	3.6

Conductor in KG	5.296110379560001	5.687727379560001	6.652432800000001	6.846967200000001

Core

Parameter	W	D
Core	50.0	90.0
Limb Plate	0	4
CORE"	50.0	94.0
gap/bobin	16	16
ID(1)	66.0	110.0
LV wdg	46.0	46.0
OD(1)	112.0	156.0
δ	16	16
ID(2)	128.0	172.0
HV wdg	40.0	40.0
OD(2)	168.0	212.0
am	12	13

C Dist 180.0
Yoke L 410.0
Leads :212.0

parameter	mm
R1	8.0
R2	31.0
R3	39.0
R4	59.0
perimeter 1	338.0
perimeter 2	483.0
perimeter 3	533.0
perimeter 4	659.0
Mean LG LV	410.5
Mean LG DELTA	508.0
Mean LG HV	596.0

Tank Dimensions

Parameter	mtr
Active L	480.0
Active H	310.0
Active B	210.0
Overall L	980.0
Overall H	635.0
Overall B	730.0

Bill of material

Core	47.08998523086323
Core-Steel + SS	5.0
ALUMINIUM	13.0
Leads	0.52
Insulation-FG	1.56
Connection-FG	1.92
Insulation-CL-H	0.325
RESIN-VT50	3.4707492615431614
MISC	3.6442867246203194
CRCA ENCL	0.0
Total Mass	76.5300212170267

Impedance

h	152.05
b	51.0
kr	0.893234026742741
Ls	170.22414669363206
δ`	11184.5
ex	3.24272184593235
Er	2.87105241444146
Ek	4.331072261756556

Surface Area:

Core s-a	959.0
Wdg s-a	2535.384
Σ s-a	3494.384
Σ Loss	316.70648586195205
θ(k)	62.0

Losses

Mass of the Conductor	12.534694579560002
Load Loss LV Watts	128.73898415807568
Load Loss HV Watts	76.94520899724111
Tank Watts	24.0
Total Obtained Watts	229.6841931553168
Total Core Mass	47.08998523086323
Net Cross Section	42.89584407630272
Spec Losses	0.924
Calc Loss watts	87.02229270663526

VA Table

Mass Limb	20.11280625	16.49250112499999
Mass Yoke	17.00595	13.94487899999999
Mass Corner	9.811124999999999	48.27073499999999
Gap VA		351.4050000000001
Σ VA		430.1131151250001
%N.L.Current		5.376413939062501
Extra-N.L.Loss		0.221717734960253

*To view the drawings go to View --> Drawings , the drawing sheet will be displayed on the screen.

*From the drop down select dry type transformer or oil-cooled transformer

Oil-cooled transformer

DRAWINGS

Select Image: Dry Type Transformer

No	Description	Qty	Quantity
1	Component 1	2	50
2	Component 2	2	50

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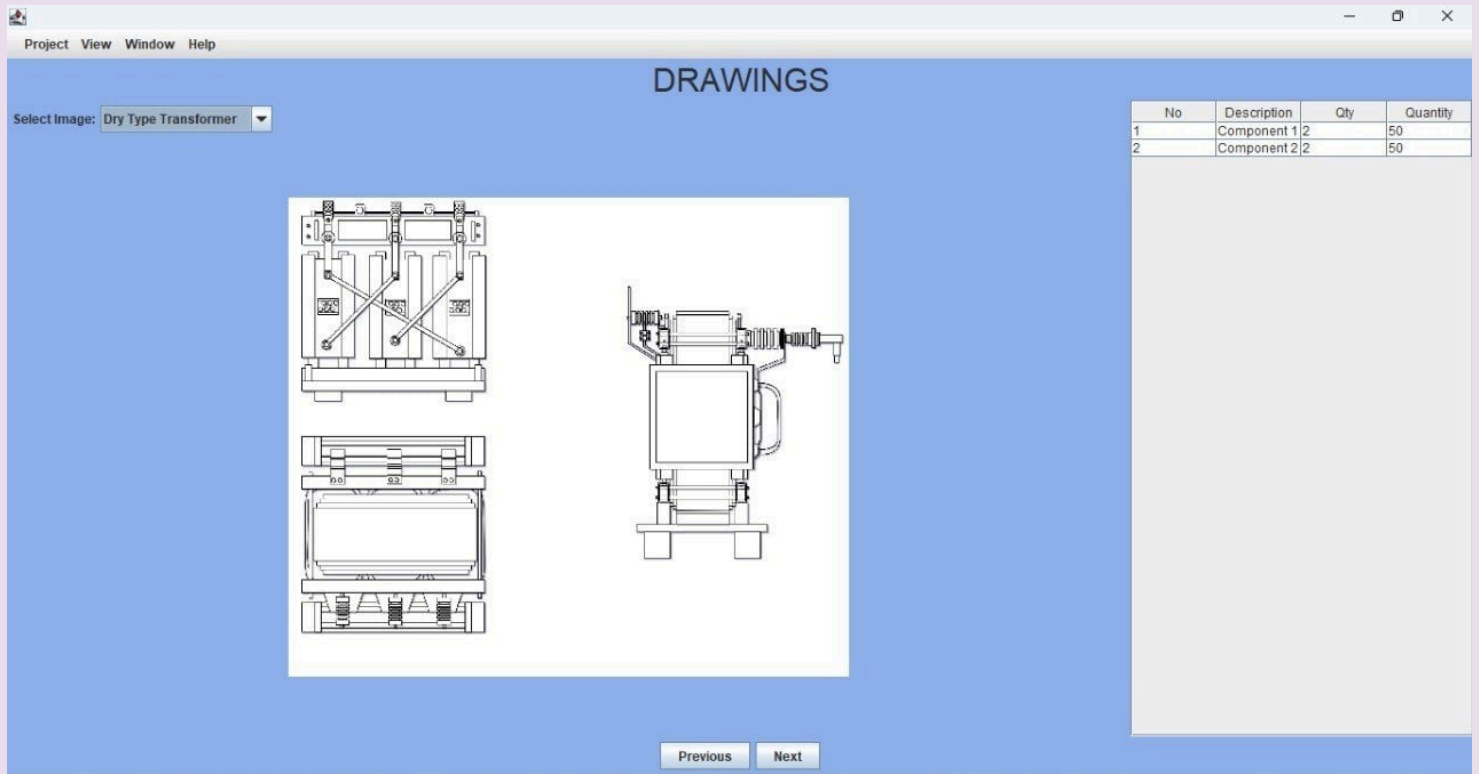
Dry type transformer

*Once you have selected all the required inputs and results click on PRINT, this will print the datasheet with your requirements.

1. HV LV Data

	HV	LV
Rated Voltage	480.0	32.0
Rated Current	5.555555555555555	83.33333333333333
Cross Section sqmm	5.309304	68.9
Current density	1.0463811368788745	1.209482341557813
Turns/Limb	300.0	20.0
Turns/Layer	60.0	7.0
wdg lg-imp calc	162.3	141.8
Wind Length(AXL)	165.0	162.0
Limb length	205.0	205.0
Wind-radial depth	23.0	20.0
Turn length	0.4465	0.632
Wire Length	133.95	12.64
Resistance (ohms)	0.9010462711173763	0.006551938627410325
Stray Loss (%)	0.3151546789689298	0.012046270238804899
Load Loss (Watts)	83.69314450004423	136.51516440923464
S.a-m(wdg)	0.2898678	0.3584704
W/m^2	96.24289014974438	126.94229370982434
wdg temp rise	39.06072253743609	33.0
core	0.3865	

Cancel   Print

2. Wire Details

	HV 1	HV 2	LV 1	LV 2
Wire bare	2.6	2.6	10.0	3.5
Wire insulated	2.7	2.7	10.1	3.6

3. Core Weight

Conductor in KG	7.054257600000001	7.2605424	5.76056829348	6.1865292934800005

4. Core Details

	W	D
Core	50.0	108.0
Limb Plate	0	4
CORE*	50.0	112.0
gap/bobin	16	16
ID(1)	66.0	128.0
LV wdg	46.0	46.0
OD(1)	112.0	174.0
δ	16	16
ID(2)	128.0	190.0
HV wdg	40.0	40.0
OD(2)	168.0	230.0
am	12	13
C Dist	180.0	
Yoke L	410.0	
Leads	230.0	
R1	8.0	
R2	31.0	
R3	39.0	
R4	59.0	
perimeter 1	374.0	
perimeter 2	519.0	
perimeter 3	569.0	
perimeter 4	695.0	
Mean LG LV	446.5	
Mean LG DELTA	544.0	
Mean LG HV	632.0	

5. Tank Dimensions

Active L	480.0
Active H	310.0
Active B	230.0
Overall L	980.0
Overall H	635.0
Overall B	750.0

6. Impedance

h	152.05
b	51.0
kr	0.893234026742741
Ls	170.22414669363206
δ'	11988.5
ex	2.8965212906224367
Er	3.052603861365986
Ek	4.208114295198693

7. Losses

Mass of the Conductor	13.447071693480002
Load Loss LV Watts	136.51516440923464
Load Loss HV Watts	83.69314450004423
Tank Watts	24.0
Total Obtained Watts	244.20830890927886
Total Core Mass	56.507982277035865
Net Cross Section	51.47501289156327
Spec Losses	0.9239999999999999
Calc Loss watts	78.3200634359717

8. Surface Area

Core s-a	1068.8
Wdg s-a	2688.5280000000002
Σ s-a	3757.3280000000004
Σ Loss	322.52837234525055
θ(k)	59.0

9. VA Table

Mass Limb	24.135367499999997	19.79100135
Mass Yoke	20.40714	16.733854799999996
Mass Corner	11.773349999999999	57.924882
Gap VA		421.6860000000001
Σ VA		516.1357381500001
%N.L.Current		6.451696726875
Extra-N.L.Loss		0.34727316655309204

10. Bill of Material

Core	56.507982277035865
Core-Steel + SS	6.0
ALUMINIUM	14.0
Leads	0.56
Insulation-FG	1.68
Connection-FG	1.92
Insulation-CL-H	0.35000000000000003
RESIN-VT50	4.050899113851794
MISC	4.253444069544384
CRCA ENCL	0.0
Total Mass	89.32232546043205