

Windings	1	2	3	4	5	6	7	8	9	10
Groups	2	3	1	4	2	3				
Circuits	1	1	1	1	1	1				
Connection	1	1	1	1	1	1				
H/Voltg/A	1 55 0	1 55 0	1 2200053	1 1 0	1 55 0	1 55 0				
	.	.	.	.	.	.				
	.	.	.	.	.	.				
	.	.	.	.	.	.				
	.	.	.	.	.	.				
H/Current/A	1 4 0	2 4 0	3 50 100	3 50 100	4 4 0	5 4 0				
	1 1.45 0	1 1.45 0	.	1 10 0	1 1.45 0	1 1.45 0				
	.	.	.	.	.	.				
	.	.	.	.	.	.				
	.	.	.	.	.	.				
Time1 min.	60	60	60	60	60	60				
Load1 *	1	1	1	1	1	1				
Time2 min.	60	60	0	60	60	60				
Load2 *	1	1	0	1	1	1				
Sectors	1	1	1	1	1	1				
Ser./Para.	1	1	1	1	1	1				
Wire file	0	0	2	6	0	0				
Cu/Al	1	1	1	1	1	1				
In/Layer μ	0	0	10	10	0	0				
Type/Tran.	10	10	10	10	10	10				
Typ/L/C mm	1 2 15	1 0.2 15	6 2 8	1 4.5 2.5	6 2 8	1 0.2 15				
Typ/L/C mm	1 2 15	1 0.2 15	6 2 8	1 4.5 2.5	6 2 8	1 0.2 15				
Typ/L/I mm	1 1 1	1 1 1	2 5 10	1 1 1	1 1 1	1 1 1				
Margin mm	50	50	50	50	50	50				
RacRdc	1.05	1.05	1.05	1.05	1.05	1.05				

Frequency Hz: 50	Core select. -: Auto2	Cooling medium : Oil	CHANGED IN TEST
Criterion : Ucca	Core file : LTCM_E10_1_L	Amb. temperature °C: 40	Frequency Hz: 50
Ucc-voltage act. %: 0.85	Core name : HUT 60x60_10	Convection outside *: 1	Ambient temperature C: 40
Ucc-voltage tot. %: 5	Core assembly: (3) &C-Cores	Convection inside *: 1	Convection/outside *: 1
Temperat. rise °K: 80	With hole -: No	Emission *: 1	Convection/channels *: 1
Max. Fe losses %: 1	Steel file : STEEL1.RDS	Airflow outside m/s: 0	Emission *: 1
No-load factor %: 1	Steel name : 23P90 (50Hz)	Airflow inside m/s: 0	Ventilation/outside m/s: 0
I ⁱⁿ /I ^{nom} : 10	Induction T: 1.506	Min.oil temp.rise °K: 0	Ventilation/channel m/s: 0
I _{rms} on/I _{rms} nom : 10	W/kg *: 1		Rth-Insulation *: 1
Losses at temp.°C: 75	UAr/kg *: 1		Rth-Varnish *: 1
HU-Test volta. kV: 50	Airgap *: 5	Channel fill factor %: 80	Rth-Compound *: 1
LU-Test volta. kV:	f/Fn-Factor *: 1	Varnish in windings %: 100	Fillfactor/channels %: 80
HU-Mom.voltage kV: 22	Fill factor : 1	Varnish in gaps %: 100	Varnish in windings %: 100
LU-Testvoltage kV:	Annealed -: Yes	Rth-varnish *: 1	Varnish/gaps/stomack %: 100
Cu Price per kg : 2		Rth-compound *: 1	Stomack mm: 0.10
Al Price per kg : 1		Rth-insulation *: 1	Gap mm: 0.10
Fe Price per kg : 1		Coil insulation mm: 0	
		Stomach mm: 0.1	
		Gap mm: 0.1	
		Min.distance W-W mm: 0	
		Flange mm: 0	

#*0

DIAGNOSIS

Page 0

Name : HUT 60x60_100x240
 Steel : 23P90 (50Hz 1.7T<0.90W/kg/800A/m<1.88T)
 Number of phases -: 1
 Number of legs -: 1

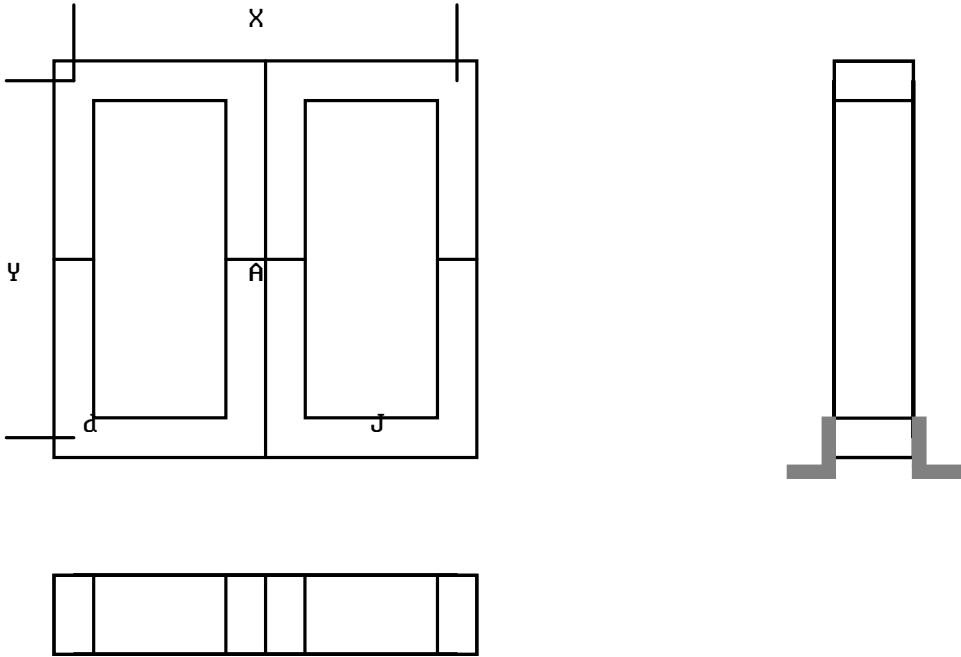
 Wight total/Cu/Fe kg:29.4 =8.5 +21
 Max.build of windings %:86.6
 max.wires in parrallel :1 =1 X 1 /0

 Induction on load T:1.516
 No-load induction T:1.520

 Max. CuAl-dT on load °K:0.9
 Max. Fe-dT on load °K:1.9
 Regulation %:0.697
 Short-circuit voltage cold %:0.84 Ucx=0.55 Ucr=0.799
 Efficiency %:95.191
 Iinrush/Inom max/rms *: 36.93 / 25.38
 No-load current factor %: 61.7

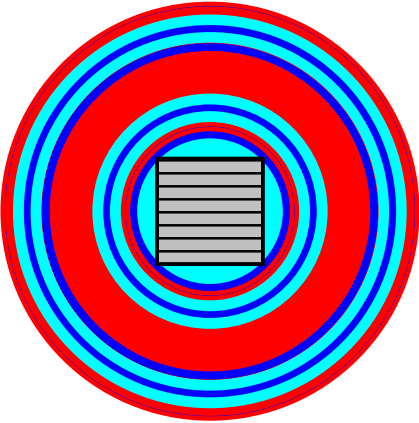
Core file name	: LTCM_EI0_1_L_1.USR	Fe-File name	: STEEL1.RDS
Core name	: HUT 60x60_100x240	Fe-Name	: 23P90 (50Hz 1.7T<0.90
Core type	: EI	Frequency	Hz: 50
Type of windings	: round	Remanence-Factor	*: 0.35
Number of legs	: 1	W/kg-Factor	*: 1
Core assembly	: (3) 8C-Cores	UAr/kg-Factor	*: 1
Leg/Diameter	cm: 8.485	Gap-Factor	*: 5
Window width	cm: 9.999	f/fn-Factor	*: 1
Window height	cm: 24	Fillfactor	*: 1
Stack	cm: 6	Annealed	-: Yes
Cross section	cm^2: 34.01		
Weight total	kg: 20.82		
With holes	-: Yes	Chassis	-:
Brackets	-: L-T&B	Vertical/Horizontal	-:

		Steps	1	2	3	4	5	6	7	8	9	10
X-Width	cm: 29	A-Leg	cm:6	0	0	0	0	0	0	0	0	0
Y-Height	cm: 27	J-Yoke	cm:3	0	0	0	0	0	0	0	0	0
d_Hole	cm: 1.1	R-Rearyoke	cm:3	0	0	0	0	0	0	0	0	0
h-Distance	cm: 2	S-Stack	cm:6	0	0	0	0	0	0	0	0	0
L-Laenght	cm: 3.5	Number lamin.	:									
Z-Width	cm: 0	Weight	kg:									



Windings	1	2	3	4	5	6	7	8	9	10
Groups-Circuits	2-I	3-I	1-I	4-I	2-I	3-I				
Connection	ser.	ser.	ser.	ser.	ser.	ser.				
Turns per leg	48.5	48.5	19200.	1.0	49.0	49.0				
Build	%									
Weight per leg	kg									
WIRE										
Type	round	round	round	Foil	round	round				
Thicknes	mm									
Width	mm									
WG-thicknes										
WG-width										
Al/Cu										
STRAND/LITZ							7			
Thickne insula.	mm									
Width insulata.	mm									
Parallel wires										
side by side										
one upon the other										
Transposition										
Cross section	mm^2									
SECTOR										
Number	1	1	1	1	1	1				
Serie/Parallel	ser.	ser.	ser.	ser.	ser.	ser.				
Turns	48.5	48.5	19200	1	49	49				
Turns/Layer	51.53	51.53	438.7	1	51.53	51.53				
Layers	0.941	0.941	43.76	1	0.950	0.950				
Insul./Layer	µm									
Transposition										
Thicknes	mm									
Height	mm									
Heights Wind/Sect										
SPACES/CHANNELS/INS.										
C/I Outside	WIW	WIW	WCICW	WIW	WCICW	WIW				
Insulation	mm									
Channel	mm									
C/I Inside	WIW	WIW	WCICW	WIW	WCICW	WIW				
Insulation	mm									
Channel	mm									
C/I Horizontal	II	II	CC	II	II	II				
Sector-Sector	mm									
Turn-Turn	mm									
Distance to yoke	mm									

Coil insulation mm: 0.00 Diatancw coil to coil : 11.75
D1i/D1e: 88.85 94.05
D2i/D2e: 94.45 99.65
D3i/D3e: 135.6 180.3
D4i/D4e: 189.3 189.6
D5i/D5e: 225.6 230.8
D6i/D6e: 231.2 236.4
D7i/D7e: /
D8i/D8e: /



Water Cooling
Cooling power W: 0
Coolertemper. gradC: 0.
Watertemper. gradC: 50.
Pipe diameter mm: 10.0
Water speed. m/s: 1.00
Water t. rise gradK: 0.0
Pressure drop mBar: 0.0
Insul.thicknfs mm: 0.00
Insul. condu. W/Kmm: 0.15
Cooler position -: 0.0

Windings	1	2	3	4	5	6	7	8	9	10
Test voltage kU:	4.0	4.0	50.0	50.0	50.0	4.0				
Outside ofwindow										
Space type	-I-	-I-	gig	-I-	gig	-I-				
Insulation mm:	2.0	0.2	2.0	4.5	2.0	0.2				
Eac.rms isol. kU/mm:	5.0	20.0	1.5	11.4	1.5	20.0				
Eabd.ac isol. kU/mm*	23.0	41.8	23.0	18.6	23.0	41.8				
Gap mm:	0	0	8.0	0	8.0	0				
Eac.rms gap kU/mm:	0.0	0.0	3.4	0.0	3.2	0.0				
Ebd.ac in gap kU/mm*	0.0	0.0	11.5	0.0	11.0	0.0				
Epd.ac in gap kU/mm*	0.0	0.0	6.7	0.0	6.7	0.0				
Ecb.ac in gap kU/mm*	0.0	0.0	6.4	0.0	6.4	0.0				
INSIDE of window										
Space type	-I-	-I-	gig	-I-	gig	-I-				
Insulation mm:	2.0	0.2	2.0	4.5	2.0	0.2				
Eac.rms isol. kU/mm:	0.0	0.0	0.0	0.0	0.0	0.0				
Ebd.rms isol. kU/mm*	0	0	0	0	0	0				
Gap mm:	0	0	8.0	0	8.0	0				
Eac.rms gap kU/mm:	0.0	0.0	0.0	0.0	0.0	0.0				
Ebd.ac in gap kU/mm*	0	0	0	0	0	0				
Epd.ac in gap kU/mm*	0	0	0	0	0	0				
Ecb.ac in gap kU/mm*	0	0	0	0	0	0				
MARGIN -----										
Coil to yoke mm:	50.0	50.0	50.0	50.0	50.0	50.0				
Tube over coil mm:	0.0	0.0	48.4	48.4	0.0	0.0				
Yoke Insulation mm:	2x2mm	2x2mm	2x2mm	2x2mm	2x2mm	2x2mm				
Eg in gap kU/mm:	0.08	0.08	1.00	1.00	0.08	0.08				
Creeping mm*	0.0	0.0	96.7	96.7	0.0	0.0				
BIL-----										
Pulse voltage kU:	0.0	0.0	100.0	100.0	0.0	0.0				
Sections -:	1	1	1	1	1	1				
Uolage/Section kU:	0.0	0.0	100.0	100.0	0.0	0.0				
L. or D./Section :	0.9	0.9	43.8	1.0	1.0	1.0				
Voltage/L.or D. kU:	0.0	0.0	2.3	100.0	0.0	0.0				
E /screen kU/mm:	0.0	0.0	1.1	1.1	1.1	1.1				
Q screen uC:	0.0	0.0	0.7	0.0	0.0	0.0				
Qp to ground uC:	0.0	0.0	0.5	0.0	0.0	0.0				
Qs /turns uC:	0.000	0.000	0.053	0.000	0.000	0.000				
((Qp-Qscr)/Qs)^1/2 :	0.0	0.0	72.5	0.0	0.0	0.0				
axVoltsge t-t U:	0	0	378	0	0	0				

RECOMMENDED SPACING in mm for dry transformrs and fhe test boltsge in kU/1 min/50Hz

Test voltage	a01	d01	t01	l01	e01	a12	d12	l12	l02	e02
3	10	2x0.5	5	15	22	10	2x0.5	5	15	22
10	14	2.6	10	130	50	15	2.5	10	20	50
16	27	5	25	55	90	22	4	25	45	90
14	10	6	40	90	120	40	5	40	90	120

Power/Test RECOMMENDED SPACING in mm for oil transformrs and fhe test boltsge in kU/1 min/50Hz

kVA/kU	a01	d01	t01	l01	e01	a12	d12	l12	l02	e02
25-630/ 5	4-5	2x0.5	-	15	-	-	-	-	-	-
1000-2500/ 5	15	4	6	15	--	-	-	-	-	-
<5000/18 25 35	8-18	4	6	20-50	25-60	8-18	4	10-25	20-50	25-60
45	20	50.0	10	50	80	20	5	25	50	80
55	25	5	13	55	90	25	5	35	55	90
85	50.0	6	19	75-80	115	30	6	40	75-80	115