

Modje Niroo co.

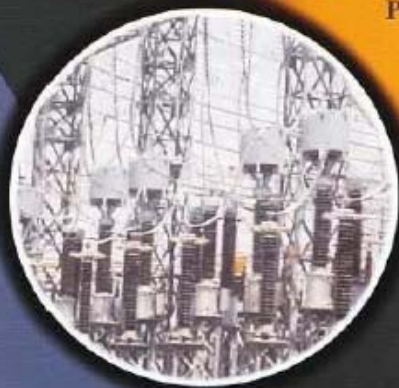
Your Partner In Line Traps



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PLC LINE TRAPS

Application

Power line carrier has been one of the main and certainly most economic means of communication in electric power systems. power line carrier in power systems means transmitting information along high voltage line from one substation to another side.



The Purpose of Line Trap

The PLC technology makes it possible to transmit various signals along power transmission lines to cover required communication as speech, fax, telecontrol, teleprotection and data. the line traps confine these signals to particular sections of power lines and prevent it from streaming into unwanted directions. prevention of signal losses due to propagation into other lines. provision of high voltage line impedances regardless of configuration of primary system switchgear. attenuation of (RF) signals from other sides of power system.

Principal Advantages Of MNC Line Traps

The open structure allows better cooling of coil and therefore increases the expected life. High short circuit withstand capacity. excellent RF characteristics with high Q factor. universal installation (pedestal mounting or suspended installation). low self capacitance of main coil and there for higher resonance frequencies. Corrosion free electrical connection. Thermal compensation is provided to absorb the mechanical stresses due to temperature variation. high pulse withstand of tuning unit. low weight simplifies the installation. transient over voltage protection by Metal oxide arrester. free maintenance.



Construction Of Line Trap

The Line Trap Comprises Of 3 main Components : Main Coil , Surge Arrester , Tuning Unit

Main Coil

The main coil which carries the power current, is constructed of one or more cylindrical windings, and designed in accordance with the power supply rating and the maximum possible short-circuit current. Each winding consists of a section bar of aluminum alloy, it has a rectangular cross-section, the shortest side of which is parallel to the line trap axis assuring in such a way a high mechanical strength. The windings are terminated at both ends on a system of aluminum bars. The individual winding or conductors are separated with special nonconductive reinforced material spacers. The main coil supports in the ends of spider are held together by tie bars of fibre glass reinforced epoxy.

Surge Arrester

Over voltage ZNO arrester is located inside the main coil and protects the tuning unit.

The surge arrester is connected to the terminals of the main coil and tuning unit in parallel.

The arrester rating voltage has to be selected considering the voltage rise due to the thermal short time current. The rated discharge current is 10 KA

Tuning unit

The tuning unit is connected in parallel with the main coil and make the attenuation and impedance characteristic of power network. Modje Niroo's tuning units are wideband type, single or double frequency tuning units are available upon request Modje Niroo's tuning unit is mounted inside the main coil. It is easily accessible and exchangeable therefore it is not necessary to remove the line trap from its installation site. The tuning units have fixed bandwidth and consist of capacitors, low inductive resistance and inductors inserted in fibre glass tube.

Accessories

Following special parts or accessories are available upon request:

- Terminal bolts.
- Line connectors for direct connection of the high voltage line conductor.
- pedestal for pedestal mounting.
- Intermediate plate for adaptation of the mounting
- Bird barrier.
- Corona ring



SURGE ARRESTER

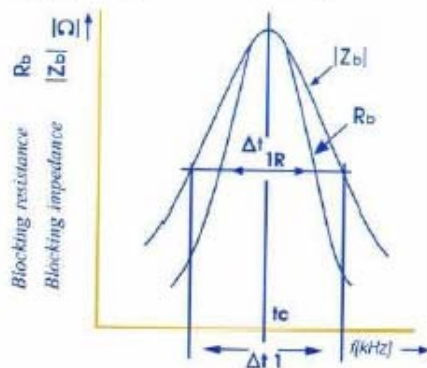
Terminals

The standard product line traps are supplied with aluminum flat terminals the dimension and characteristics of terminals are different and depend on the rated current of line traps.

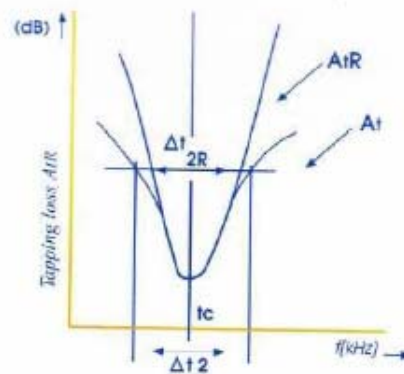
Bandwidth of Line Trap

The bandwidth of a tuned line trap is a function of the inductance of the main coil and the resistive component of blocking impedance. Having these information at hand, the frequency range of line trap can thus be determined.

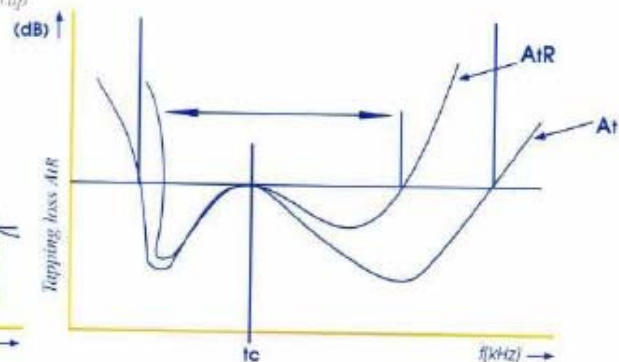
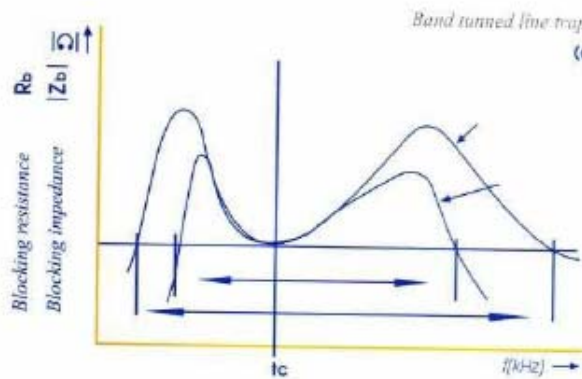
Single frequency Tuned line trap



Single frequency tuned line trap



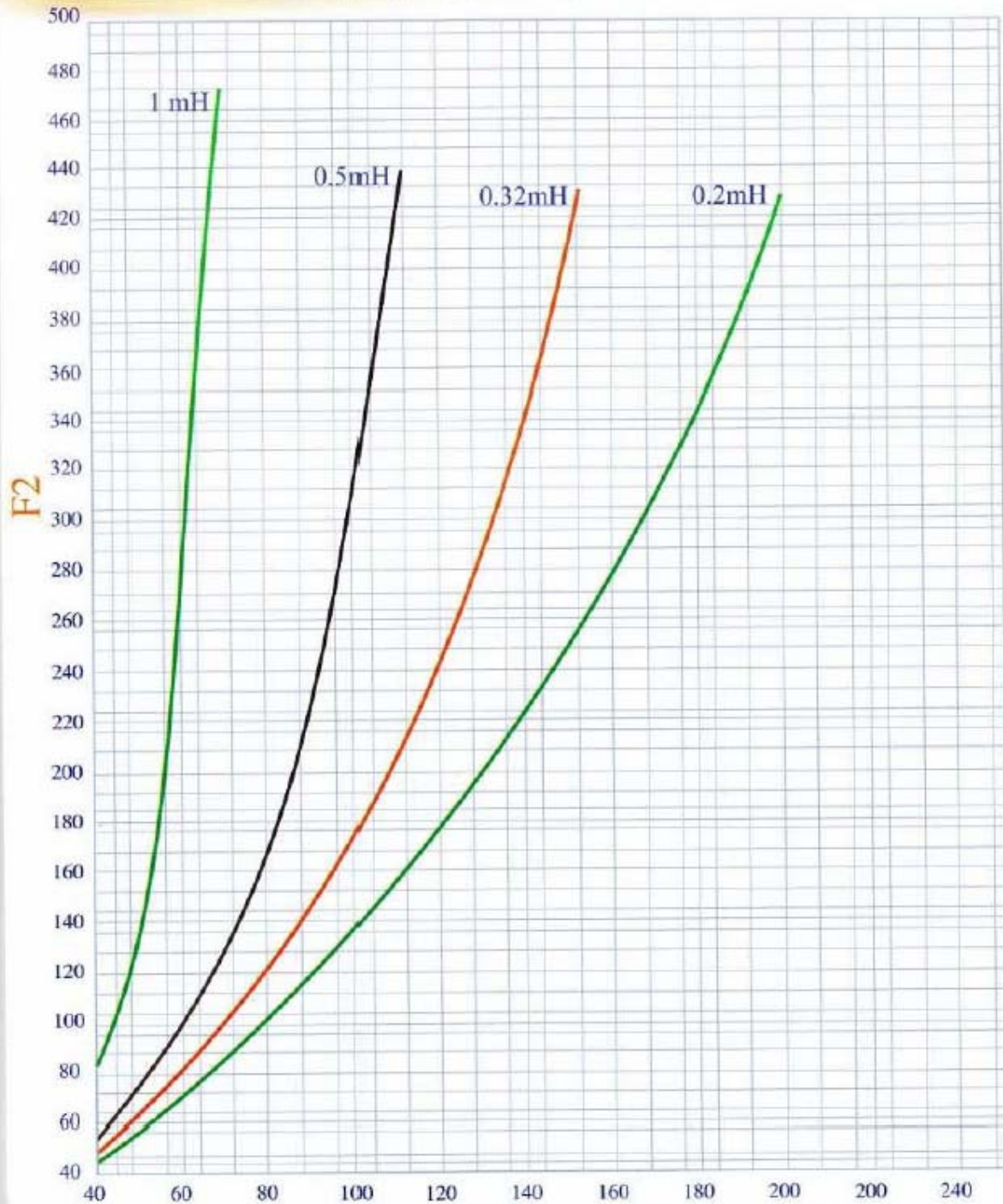
Definition of the bandwidth of a single frequency-tuned line trap.



Definition of the bandwidth of a band-tuned line trap.

Note $\Delta f_{1R} = \Delta f_{2R}$ but $\Delta f_1 \neq \Delta f_2$

Modje Niroo Line Traps
Frequency Allocation
 $Z=600 \text{ OHMS}$ $At=2.6B$



Sample Temperature Rise Test



Location of Temperature Measurement	Temperature at end of Test (at thermal stability shutdown)	Temperature rise at thermal stability	Temperature rise allowed (see table 1 of IEC 60353 for class C)	Remarks
ambient 1	°C	K	K	
ambient 2	29,7	-	-	at 1 m distance and at half the reactor height
ambient 3	24,4	-	-	
mean ambient	25,8	-	-	
object location 1	142,7	116,1	220	at top of inner windings of reactor close to upper terminal(hot spot)
object location 2	98,2	71,6	220	at top of inner windings of reactor close to upper terminal
object location 3	144,8	118,2	220	at top of inner windings of reactor(hot spot)
object location 4	135,1	108,5	220	at top of inner windings of reactor
object location 5	61,2	34,6	-	at lower end of outer windings of reactor and close to lower terminal
object location 6	59,9	133,3	-	at lower end of outer windings of reactor and close to lower terminal
average value of reactor	88,3	61,7	160	measured by increase of resistance and cooling down curve extrapolated back to time of current switch off

RESULTS OF THE TEMPERATURE RISE TEST

Atmospheric conditions

Ambient temperature (t) 26,6 °C Humidity (h) 6,0 g(H₂O)/m³
 Temperature of the test object Tested Ambient air pressure (b) 1026 hPa

Certificates



Sample Technical Specification

$L_n=0.5\text{mH}, I_n=2000\text{A}, I_{sn}=50\text{KA/s}$

Modje Niroo co.

LINE TRAP TECHNICAL DAT(0.5mH/2000A)

ITEM	DESCRIPTION	TECHNICAL PARTICULAR
1	Manufacturer	
2	Manufacturers name and country	Modje Niroo Co/IRAN
3	Manufacturer,s type designation	LT/0.5/400/2000/50/1
4	Applicable standard	UFC-60353
5	Method of mounting	Pedestal or suspension
6	Rated values and characteristics:	
7	Rated Voltage	400KV(rms)
8	Rated continuous Current	2000A(rms)
9	Rated short time current/duration	50KA/1s
10	Rated Dynamic short time current /duration	127KA/1s
11	Rated lightning Impulse withstand level	55,5KV(peak)
12	Characteristics of Protective device:	
13	Type	ZNO
14	Rated voltage	12KV(rms)
15	Nominal discharge current	10KA(Peak)
16	Power frequency withstand voltage of tuning device/duration	12KV/5sec
17	Main coil:	
18	Rated inductance	0,5mH
19	Power frequency inductance	0,51mH
20	Temperature class of insulation(as per IEC 353,1989	Class C
21	Temperature rise at nominal current(+40°C)ambient temp.	120°C
22	Radio influence voltage (R.I.V)measured at 1Mhz	<50micro volt
23	Max.power losses(at Nominalcurrent &75°C Windingtemp.)	27Kwatt
24	Max.power losses(at 1600 current &75°C winding temp.)	18Kwatt
25	Bird barrier	provided
26	TUNING UNIT	
27	Q factor at 100 KHz	>100
28	Self resonant frequency	> 500KHz
29	Expected max. Loss\Ntransmission to the line (tapping loss)	> 2.6dB
30	Expected Min.loss back into the station	7.995dB
31	Minimum Blocking Impedance	>600ohm(will be define by customer
32	Band width	Acc.to Attachedchart
33	DIMENSION	
34	Weight of line trap	550Kg
35	Overall dimensions of line trap	1,45x1,4m
36	Material of conducting Parts	Aluminum
37	Size of conductor clamp	135x125x35

Sample Technical Specification

Ln=1mH, In=2000A, Isn=40KA/s

Modje Niroo co.

LINE TRAP TECHNICAL DATA:

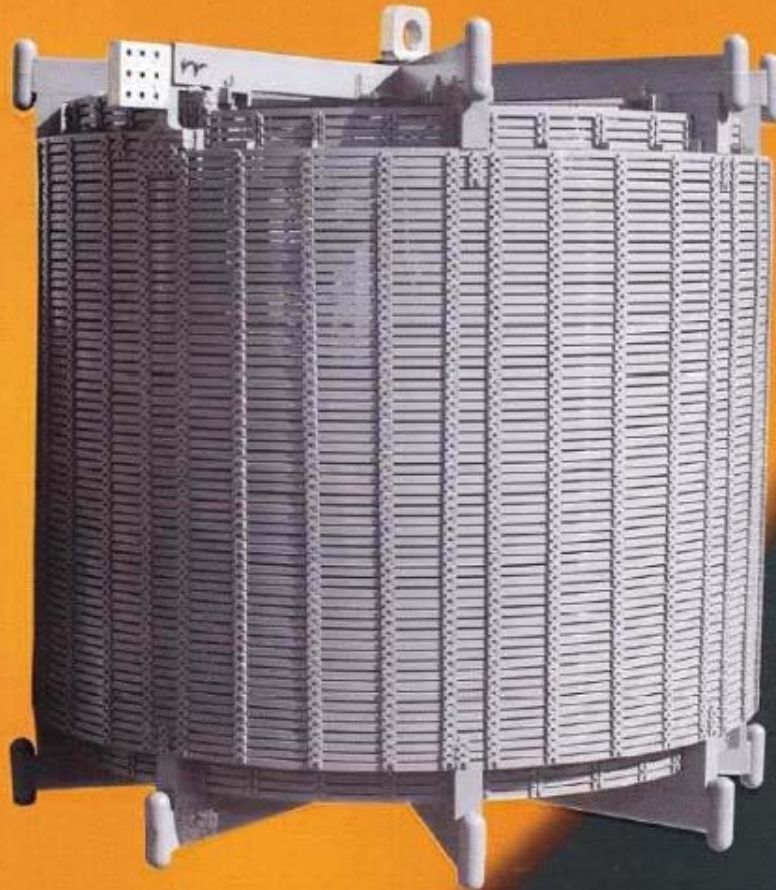
ITEM	DESCRIPTION	TECHNICAL PARTICULARS
1	Manufacturer, s name and country	Modje Niroo Co/IRAN
2	Manufacturer, s type designation	LT/1/400/2000/40/1
3	Applicable standard	IFC-60353
4	Rated values and characteristics:	
5	Rated voltage	KV(rms) 400
6	Rated continuous current	A(rms) 2000
7	Rated short time current/duration	KA(rms) 40/1
8	Rated Dynamic short time current /duration	KA(peak)sec 102/0.1
9	Rated lightning impulse withstand level	KV(peak) 99
10	Characteristics of protective device:	
11	Type	ZNO
12	Rated voltage	KV(rms) 20
13	Nominal discharge current	KA(Peak) 10
14	Power frequency withstand voltage of tuning device/Duration	
15		KA(rms)sec 20/5
16	Inductance of main coil:	
17	Rated inductance	mH 1
18	Power frequency inductance	mH 1.1
19	Temperature class of insulation(as per IEC 353,1989)	
20	Temperature rise at nominal current(+40°C)ambient temp.	
21	Radio influence voltage (R.I.V)measuredat 1Mhz(micro volts)	14
22	Max.power losses(at nominal current &75°C windintemp.)	
23	Q factor at 100 Khz	>100
24	Self resonant frequency	Khz >500
25	Expected msx. loss in transmission to the line (tapping loss)dB	
26	Expected min.back into the station	dB 7.995
27	Method of mounting	
28	Weight of line trap	Kg 850
29	Overall dimensions of line trap	mxm 1.59 x 1.59
30	Material of conductingparts	
31	Size of conductor clamp	mm 135x125x35
32	Bird barrier proved ?	Yes/No Yes
33	<i>Fanavary Bargh Omid (F.B.O.)CO.</i>	

Production Table

Continuous Rated Current In(A)	Steady state Component of Short time Isn (KA/s)	INDUTANCE OF MAIN COIL(mH)											
		0.2mH		0.32mH		0.5mH		1mH					
		Dim	Weight	Dim	Weight	Dim	Weight	Dim	Weight	Dim	Weight		
630	20	63w70h	75	75x74	90	87x82	115	99x102	180				
800	25	87x61	170	87x71	200	87x82	115	99x102	108				
1000	25	87x61	170	87x71	200	100x80	250	147x80	350				
1000	31.5	87x61	170	87x71	200	100x80	250	147x80	350				
1250	31.5	87x61	170	87x71	200	100x80	250	147x80	350				
1250	40	87x61	170	87x71	200	100x80	250	147x80	350				
2000	40	111x105	350	123x113	410	135x128	550	159x160	850				
2000	50	111x105	350	123x113	410	135x128	550	159x160	900				

Pedestal or suspension installation
Special order is acceptable

M o d j e N i r o o c o .



M N C

No 9 ; Abbaspour Buil.,Berezil Ave.,Vanak Sq., Tehran - IRAN P.O.Box:14335/974
Tel. : (+9821)2142810 - 8879381 - 8879383 Fax:(+9821)8878776 E-mail:MNC3@Tavana.net
Factory:Tel:(+98291)3423840 - 48 Fax:(+98291)3423849