Harmonic Filter Reactors

谐波滤波电抗器

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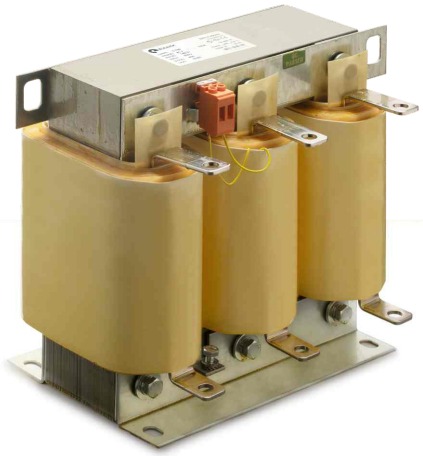

Purpose and Area of Usage

Used in filtered power factor compensation systems that reduce the effects of the harmonics. The filter prevents overvoltage and overcurrent that occur following a reson–ance between the capacitance and inductance. Through the usage of Harmonic Filter Reactors; the life span of capacitors increase impressively, the possibility of a resonance is completely avoided and harmonic current flow is prevented.

用途和使用范围

用于滤波功率因数补偿系统，减少谐波的影响。该滤波器（支路）可有效防止电容和电感之间发生谐振后出现过电压和过电流。通过谐波滤波电抗器的使用，电容器的寿命显著延长，完全消除谐振的可能性，防止谐波电流的流动。

Strength

Nearly with no–loss at all, Harmonic Filter Reactors can work at the limit of the upper current due to its strong material selection which are pure copper or aluminum.

功率损耗

谐波滤波电抗器由于材料选择纯铜或铝，损耗很小，几乎不用考虑损耗，因此可以在电流上限工作。

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谐波滤波电抗器的定义选择标准

Definitions and Selection Criteria for Harmonic Filter Reactors

Nominal Inductance

When the reactor works on it's nominal current, it should have a nominal inductance in milihenry, that value is evaluated when it is designed.

标称电感

电抗器在额定电流下工作时，有一个标称电感(单位：mH)，该值在设计时进行评估。

Nominal Voltage

When the reactor works with the capacitor in series connection, reactor should have AC rms voltage on the terminals.

额定电压

当电抗器与电容器串联工作时，电抗器的端子应具有交流均方根电压。

Capacitor Voltage

When the reactor works with the capacitor in series connection, the capacitor terminals have avoltage higher than the system voltage.

电容器电压

电抗器与电容器串联工作时，电容器端子电压高于系统电压。

$$U_c = \frac{U_n}{1-P}$$

U_n=System voltage 系统电压

U_c=Voltage at the capacitor terminal higher than the system voltage
电容器端电压，电容器的电压高于系统电压

U_n=400V　　P=7%　　U_c=430V

Capacitor's nominal voltage should be higher than this calculated voltage as much as safe.
电容器的标称电压应尽可能安全地高于该计算的端电压。

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Reactor Factor

That factor is equal to inductive reactance of the reactor devided by capacitive reac–tance of the capacitor.

电抗率

电抗率等于电抗器的感性电抗除以电容器的容性电抗。

Series Resonance Frequency

Look the below table which shows; Standard reactor factor, resonance frequency and–capacitor terminal voltage are shown in the below table Capacitor unit nominal voltages should always be selected above the given values.

串联谐振频率

见下表；标准电抗器因数、谐振频率和电容器端电压见下表电容器单元标称电压应始终选择在给定值之上。

Reactor factor 电抗率	Detuned frequency（50Hz） 调谐频率	Voltage at the capacitor terminal 电容器端电压
5,67 %	210	424 V
7 %	189	430 V
14 %	134	465 V

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Nominal Power

Is the total power of the L-C circuit at nominal voltage and frequency.

额定功率

是L-C电路在额定电压和频率下的总功率。

Nominal Current

Rms current of the circuit at nominal voltage and frequency transient effects are excluded. Maximum current value and inductance stability. The reactor should have the same reactance when it works continously on it's upper limit of the current.

额定电流

电路在额定电压和频率下的均方根电流不受瞬态影响，最大电流值和电感稳定性，当电抗器在电流上限上连续工作时，其电抗应相同。

Thermistor

The reactor has already a thermistor inside of the middle winding. The thermistor has been set to 120 for safety reasons. This for safe reason. The temperature shouldnt be increased up to 120℃.

热敏电阻器

电抗器的中间绕组内部已经有一个热敏电阻。出于安全考虑，热敏电阻已设为120。为了安全起见，温度不应该升高到120摄氏度。

Working Conditions

If the reactor has temperature class T40, it means that can work between -5/+40℃ ambient temperatures.
But it should be run < 35℃ for 24hours according IEC439-1 and DIN EN60934 standards T40 class is our recommendation for you.

工作条件

如果电抗器的温度等级为T40，表示电抗器可以在-5/+40℃的环境温度下工作，但根据IEC439-1和DIN EN60934标准T40等级，它应该在低于35℃的环境温度下24小时运行。

Impregnation

Reactor is impregnated with epoxy varnish in vacuum conditions and left in furnace. That process gives some specialities like higher insulation and working without vibration.

浸渍

电抗器在真空条件下用环氧清漆浸渍并留在炉中内。这一过程提供了一些特殊性，如更高的绝缘性和无振动工作。

Insulation

Reactor has F class insulation which means it should stand against 155℃ for safety reasons. Rector should be run way below that temperature normally.

绝缘

电抗器具有F级绝缘，表示出于安全考虑，它应能承受155℃的温度。正常情况下，电抗器的运行温度应低于该温度。

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Features and Technical Details of Reactor

技术参数

Rated voltage 额定电压	V	230~1000V
Rated power 额定容量	kVAr	0.9~100kVAr
Inductance tolerance 电感量偏差	%	-5%~+5%
Frequency 频率	f	50 Hz
Phase 相数		Three or single phase
Standard reactor factor 标准系数	%	5.67, 7, 14
Protection degree 防护等级		IP00
Insulation(Winding-core) 绝缘（铁芯绕组）		3KV
Thermistor 热敏电阻		120℃, 1NK contact
Insulation class 绝缘等级		H 135℃/F 155℃
Cooling 冷却		Natural or forced
Varnish 浸渍		Impregnation with epoxy varnish in vacuum 真空浸渍环氧清漆
Ambient temperature 环境温度	℃	Max. temperature 40 ℃
Humidity 湿度	%	Max 95%
Altitude 海拔	m	1000m above sea level
Winding materials 绕组材料		Copper or Aluminium 铜或铝
Terminals 端子		Cu or Al bar, cable lug, Terminal block
Standard 标准		IEC EN 61558-2-20

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Model and Specification

选型表

Type 产品型号	Output power 输出功率	Capacity 容量	Rated current 额定电流	Effective current 有效电流	Loss 损耗
	(kvar)	(mH)	(A)	(A)	(W)
P=7% 189Hz 400V/50Hz/Linearity > 1,73xIrms					
ERH 7/400/2,5	2,50	15,33	3,83	4,08	42
ERH 7/400/6.,25	6,25	6,13	9,56	10,20	69
ERH 7/400/10	10	3,84	15,30	16,32	73
ERH 7/400/12,5	12,50	3,07	19,13	20,40	75
ERH 7/400/20	20	1,92	30,49	33,54	110
ERH 7/400/25	25	1,53	38,25	40,81	133
ERH 7/400/40	40	0,96	61,20	65,29	195
ERH 7/400/50	50	0,77	76,50	81,61	210
ERH 7/400/75	75	0,51	114,75	122,42	290
ERH 7/400/100	100	0,38	153,00	163,22	370
P=5,67% 210Hz 400V/50Hz/Linearity > 2,08xIrms					
ERH 5,67/400/2,5	2,50	12,25	3,83	4,59	48
ERH 5,67/400/6.,25	6,25	4,9	9,56	11,48	73
ERH 5,67/400/10	10	3,06	15,30	18,36	85
ERH 5,67/400/12,5	12,50	2,45	19,13	22,95	89
ERH 5,67/400/20	20	1,53	30,49	36,72	125
ERH 5,67/400/25	25	1,22	38,25	45,91	140
ERH 5,67/400/40	40	0,77	61,20	73,45	230
ERH 5,67/400/50	50	0,61	76,50	91,81	290
ERH 5,67/400/75	75	0,41	114,75	137,72	310
ERH 5,67/400/100	100	0,31	153,00	183,62	425
P=14% 134Hz 400V/50Hz/Linearity > 1,37xIrms					
ERH 14/400/2,5	2,50	33,16	3,83	3,85	44
ERH 14/400/6.,25	6,25	13,27	9,56	9,63	68
ERH 14/400/10	10	8,29	15,30	15,41	90
ERH 14/400/12,5	12,50	6,63	19,13	19,26	108
ERH 14/400/20	20	4,15	30,49	30,81	120
ERH 14/400/25	25	3,32	38,25	38,52	145
ERH 14/400/40	40	2,07	61,20	61,63	218
ERH 14/400/50	50	1,66	76,50	77,04	230
ERH 14/400/75	75	1,11	114,75	115,55	350
ERH 14/400/100	100	0,83	153,00	154,07	415