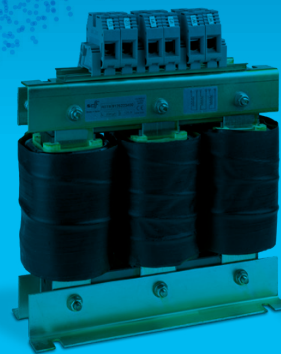


RET9 HARMONIC CIRCUIT FILTER

three-phase reactors



RET9
LINE



RET9
HCF

**PROTECTING
THE WORLD**





RET9
HCF

RATED VOLTAGE
400V

REACTIVE POWER
5kvar...80kvar

RESONANCE FREQUENCY
189Hz

STANDARDS

IEC/EN 61558-2-20
IEC/EN60076-6



RET9 Harmonic circuit filter Three-phase reactors

The increase of the use of non-linear loads such variable speed drives, soft starters, induction ovens, power converters, etc produce a high contents of harmonic currents in the networks.

These currents have bad effects on the capacitor banks used in the reactive power compensation equipment, causing current overload, overvoltages and resonance effects between the capacitors and the inductances presents in the network (distribution transformer, lines, etc).

We offer three-phase reactors specially designed for give solutions to these disturbances that can lead to a fast deterioration or destruction of the capacitor banks. The resonance effects can be avoided with the use of eactors in order to have a detuned system capacitor-reactor.

The most common value of resonant frequency is 189 Hz ($p = 7\%$), but on request we can design and manufacture reactors with another detuning factors.

In addition to avoid the resonance, the use of reactors offers supplementary advantages:

- Protection of the capacitors against harmonics
- Reduce the losses in the capacitors
- Reduce the inrush current of the capacitor banks, extend their life and reducing perturbations in the network

The main characteristics of this reactors are:

- Low inductance tolerance
- High linearity of the inductance with currents up to $1,8 \cdot I_N$
- Thermally designed for main frequency and harmonics
- Long useful life

These reactors have a thermal micro switch in order to disconnect the filter circuit in case of abnormal over temperature (this switch must be connected in the control circuit of the filter).

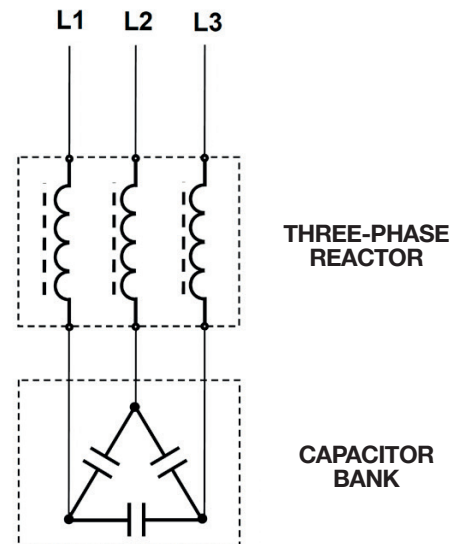
On request we can design and manufacture reactors with other characteristics.

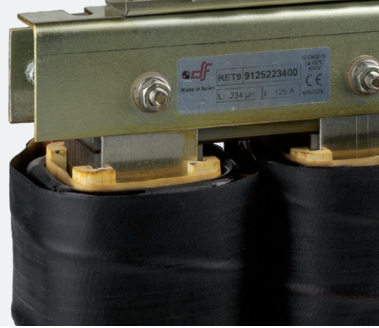
Range

POWER * (kvar)	L (mH)	CURRENT (A)		REFERENCE
		50Hz	rms	
5	7,67	7,65	8,44	9008100760
10	3,83	15,3	16,9	9015100380
12,5	3,07	19,1	21,1	9019100310
15	2,56	22,9	25,3	9023100260
20	1,92	30,6	33,7	9031100190
25	1,53	38,2	42,2	9038100150
30	1,28	45,9	50,6	9046100120
40	0,958	61,2	67,5	9061295800
50	0,767	76,5	84,4	9076276700
60	0,639	91,8	101,3	9092263900
70	0,548	107,1	118,2	9107254800
80	0,479	122,4	135,1	9122247900

* Effective filtered compensating reactive power

OTHER CHARACTERISTICS ON REQUEST SUBJECT TO AVAILABILITY AND POSSIBILITY



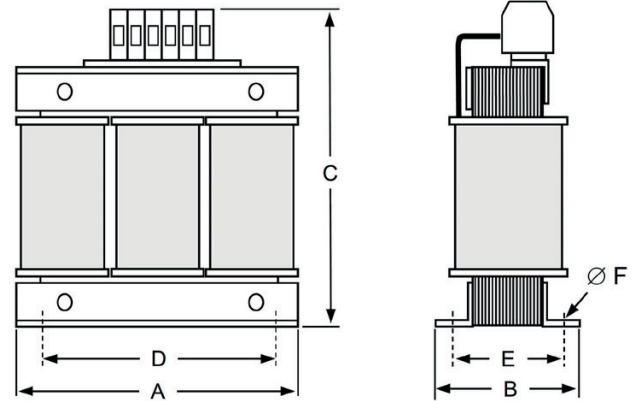


Technical data

Maximum working voltage	400V
Protection against electric shock	Class I
Thermal class	up to 15kvar → B (130°C) 20...80kvar → H (180°C)
Maximum ambient temperature	40°C
Protection index	IP00
Frequency	50Hz
Inductance tolerance	3%
Filtering factor p	7%
Resonance frequency	189Hz
Linearity $\frac{L_{95\%}}{L_N}$	up to 1,18·I _N
Maximum permanent overload	1,17·I _N
Dielectric strength	≥ 4kV
Ambient temperature of service *	-25°C ... 70°C
Storage temperature	-40°C ... 85°C
Cooling	Natural air cooling If the transformer is placed into a cabinet, it must have adequate ventilation

* For ambient temperatures higher than 40°C it is necessary to apply a derating.

Dimensions



POWER (kvar)	DIMENSIONS (mm)						WEIGHT (kg)
	A	B	C	D	E	F	
5	180	80	215	140	70	7	8,1
10	180	80	215	140	70	7	8,4
12,5	180	90	215	140	80	7	9,4
15	180	90	215	140	80	7	9,8
20	240	95	271	200	80	7	12,5
25	240	95	275	200	80	7	12,8
30	240	95	275	200	80	7	12,9

Constructive characteristics

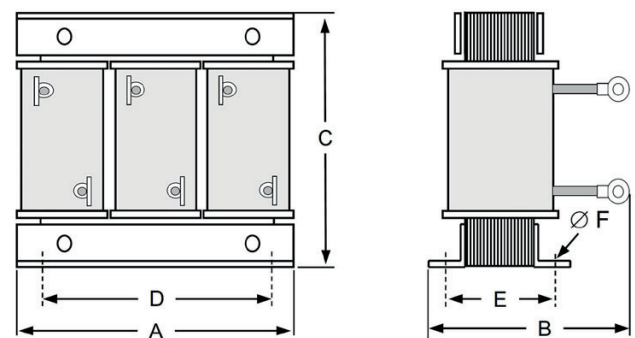
Core made with electrical steel with high permeability and low losses

Multiple air gap in order to obtain low losses and good behavior against the core saturation

Windings in copper F (155°C) or H (180°C) thermal class

Vacuum impregnation with epoxy class H (180°C) in order to obtain low noise, good isolating properties and good protection against adverse ambient

Connection with terminal blocks or copper lugs



POWER (kvar)	DIMENSIONS (mm)						WEIGHT (kg)
	A	B	C	D	E	F	
40	240	150	210	200	90	7	17,9
50	240	175	210	200	115	7	27,4
60	300	170	260	200	100	7	33,5
70	300	190	260	200	140	7	44,0
80	300	215	250	200	140	7	45,0

Standards

IEC/EN 61558-2-20
IEC/EN60076-6
RoHS Compliant





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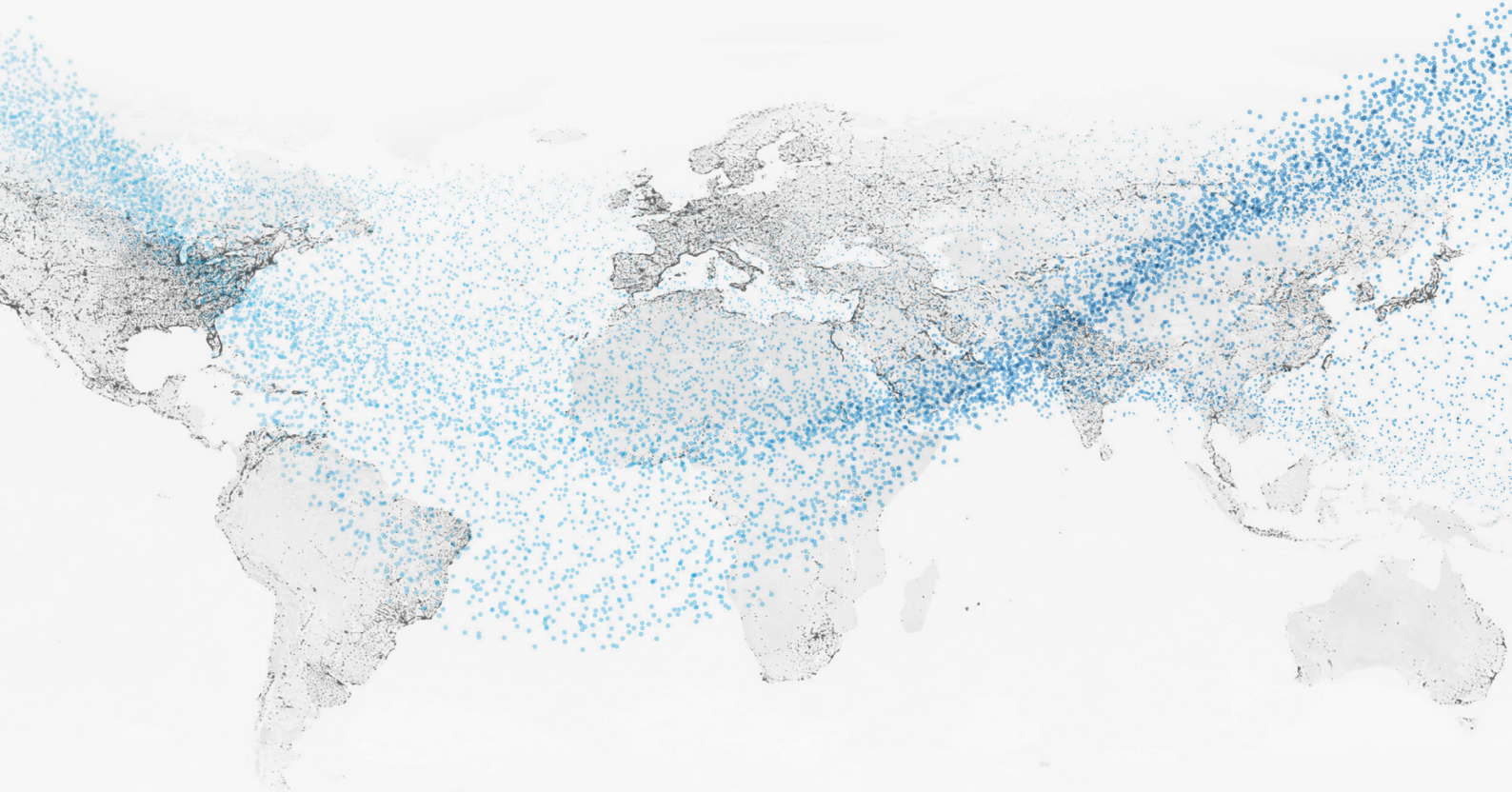
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The data reflected in this technical record are subject to the correct installation of the product in accordance with manufacturer's instructions, relevant installation standards and professional practices, maintained and used in applications for which they were made.

The products described in this document have been designed, developed and tested in accordance with specific standard. They are considered components that are integrated as part of installation, machine or equipment. The correct general operation of the referred product is responsibility of the manufacturer of the installation, machine or equipment.

DF ELECTRIC cannot guarantee the characteristics of an installation, machine or equipment that has been designed by a third party. Once a product has been selected, the user must verify that it is appropriate for its application, through the verifications and/or tests that it deems appropriate.

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