FABRYKA TRANSFORMATORÓW
w Żychlinie
Spółka z ograniczoną odpowiedzialnością

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DRY-TYPE ARC SUPPRESSION COILS

WITH INFINITELY ADJUSTABLE

(WITH RESIN – ROVING INSULATION)

100÷2700 kVAr

1÷24 kV

Applications

Arc-suppression coils are designed to compensate a ground fault current in the power grid and are installed in power substations between the neutral point of power transformer, in case the star of star connection, or neutral point of earthing transformer in case delta connection and the ground. The terminal 1U of operating winding must be connected to the neutral point terminal 1N of the power or earthing transformer, and terminal 1N of arc suppression coil - connect with the earth.

The ends of the additional windings 500V are brought out and marked 2U - 2N. Additional winding is used to force the active current component for selective operation of protective devices. In the conditions of short-circuit between phase line and the earth the compensating current flows through the arc suppression coil.

The current – voltage characteristics of coils is very close to stright line, this is very important in operation. On the reactor are let out dual-core current transformer terminals 1S1 - 1S2 (core for protection) and 2S1 - 2S2 (measuring core). The reactor has an additional winding 100V used to measure marked as 3U - 3N, and the additional winding 1000V used to synchronize marked as 4U - 4N.

The arc suppression coil is equipped with a system which uses Automated system of coil tuning as to obtain the output current in the range of 10% to 100% of the maximum current. Infinitely adjustable allows precise setting of arc suppression coil by using the movable part of the magnetic circuit. Changing the shape of the magnetic circuit causes the smooth change impedance of arc suppression coil.

Operating conditions

Arc suppression coils in standard version are designed for operation in the conditions moderate climate.

Max installation height for the reactor:	1000 m a.s.l.
Operating place:	depending on the degree of protection IP-00 to IP-54 open space or room with sufficient ventilation, the atmosphere free from dust and chemically active or explosive
Ambient temperature range:	-25 ° C to + 40 ° C (248 ° F to 313 ° F), the average temperature may not exceed + 20 ° C (293 ° F).
Rated frequency	50 Hz

The adjustment of current and operating time are specified in Table below:

Current compensation in % of the rated current	**Operating time, hours**
100	2
87.5	4
75	8
62.5 – 10	Constant work

Warning:
It is possible to perform the Special reactors meet other requirements.

Design

Reactor cores:	Made of cold-rolled transformer sheet coated with inorganic insulation.
Reactor windings:	Made of electrolytic copper. The windings are wounded by the wire with a round section in enamel or profiled isolation. Between windings are channels required to ensure adequate air circulation and cooling. To compress the windings screw clamps were used, which do not allow to vibrate windings during work. Mounting and design of the windings provide very good dielectric strength, high resistance of lightning and a very good short circuit strength. To avoid surges, scheme of grounding components for all reactors has been developed.
Regulation:	Reactor has an system which uses an automatic coil tuning as to obtain the matched current in the range of 10 to 100% of the maximum current.
Covers:	They are made of powder painting steel coated by the one of RAL color. It is a twisted structure which provides adequate mechanical strength. Panels or filters with fans are used to remove heat (with certain degree of IP protection). The housing has a chassis on adjustable wheels on longitudinal and transverse direction of drive.

Characteristic parameters of arc suppression coils:

• frequency	– 50Hz
• current regulation	– 10% ÷ 100% In (clamps 1U, 1N)
• Additional winding for AWSCZ	– 500V ±10% dimensioned on 500A current (clamps 2U, 2N),operating time of winding – 10s
• Additional winding (measurement)	– 100V ±10% (clamps 3U, 3N)
• Additional winding (synchronization)	– 1000V ±10% (clamps 4U, 4N)
• current transformer (dual-core)	– 1S1; 1S2 core for security
	– 2S1; 2S2 measurement core

Standards and international requirements:

PN-EN 60076-6	- Power Transformers – Part 6: Reactors.
PN-EN 60076-2	- Power Transformers – Temperature rise.
PN-EN 60076-1	- Power Transformers – Part 1: General.
PN-EN 60076-11	- Power Transformers – Part 11: Dry – type transformers
PN-EN 60529	- Degrees of protection provided by enclosures (code IP)

Examples of technical data:

No.	Type	Power	Power of grid	Choke voltage	Current
		kVAr	V	V	A
1.	DGRZe 275/15,75	273	15750	9093	30-3
2.	DGRZe 365/15,75	364	15750	9093	40-4
3.	DGRZe 545/15,75	546	15750	9093	60-6
4.	DGRZe 730/15,75	727	15750	9093	80-8
5.	DGRZe 1090/15,75	1091	15750	9093	120-12
6.	DGRZe 1455/1575	1455	15750	9093	160-16
7.	DGRZe 1640/15,75	1637	15750	9093	180-18
8.	DGRZe 2180/15,75	2182	15750	9093	240-24
9.	DGRZe 2500/15,75	2501	15750	9093	275-27,5
10.	DGRZe 2700/15,75	2728	15750	9093	300-30
11.	DGRZe 365/21	364	21000	12124	30-3
12.	DGRZe 485/21	485	21000	12124	40-4
13.	DGRZe 545/21	546	21000	12124	45-4,5
14.	DGRZe 730/21	727	21000	12124	60-6
15.	DGRZe 970/21	970	21000	12124	80-8
16.	DGRZe 1090/21	1091	21000	12124	90-9
17.	DGRZe 1455/21	1455	21000	12124	120-12
18.	DGRZe 1640/21	1637	21000	12124	135-13,5
19.	DGRZe 1940/21	1940	21000	12124	160-16
20.	DGRZe 2180/21	2182	21000	12124	180-18
21.	DGRZe 2700/21	2728	21000	12124	225-22,5

<u>Attention</u>:

- *It is possible to make arc suppression coils on other powers and currents compensation.*
- *Arc suppression coil may be made to the grids mains voltage in accordance with the norm:*

U_N=3650V for 6,3kV grid,

U_N=6060 for 10,5kV grid,

U_N=9100 for 15,75kV grid,

U_N=12125 for 21kV grid,

other (within range of 1-24kV).

- *There is a possibility to manufacture choke equipped with:*

- casing with protection degree of IP-20 and IP-54

- accessories (thermal sensors PT, surge arresters, terminals, washers, vibration, voltage transformers, etc.).