



FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
ORGAN	SEPCA	DAT	September 26, 2002	SEPCA
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 1

INDEX

1.0 - PHYSICAL CHARACTERISTICS

1.1 - Reactor

1.2 - Painting

2.0 - MOUNTING OF THE REACTOR

2.1 - Lifting of the Coil (using the center of the spider)

2.2 - Lifting of the Coil (by lifting points)

2.3 – Assembly of the Reactor

3.0 - ELECTRICAL CONNECTION

4.0 - MINIMUM CLEARANCES

5.0 - MAINTENANCE

6.0 - TRANSPORTATION

FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 2

1.0 - PHYSICAL CHARACTERISTICS

1.1 - Reactor

The reactor winding consists of numerous aluminum conductors, double insulated with polyester film, connected in parallel. These conductors are mechanically immobilized and encapsulated by epoxy impregnated fiberglass filaments forming cylinders. Depending on the reactor ratings, one or more of these cylinders are connected in parallel between aluminum spiders. The individual cylinders are separated by fiberglass spacers forming cooling ducts. All the materials utilized in the manufacturing of the reactors correspond to class B thermal insulation (max temperature of 130 °C, per IEC 60289/88 standard or ANSI C57.16/96).

1.2 - Painting

After the curing process, the reactor is sandblasted to guarantee best adherence of the paint. Initially, the reactor is painted with a base coat of isocyanate shop-primer, some 10 to 20 microns thick. Minimum interval for repainting reactor is 8 hours. After curing, a coat of polyamide epoxy-primer is applied to a thickness of 60 to 80 microns. Minimum interval for repainting the reactor is 8 hours. A finishing coat of polyurethane paint, color Munsell N6.5 light gray, with minimum coat thickness of 20 to 30 microns is applied. The total curing process takes at least 05 (five) days.

The total thickness of all coats (dry) is not less than 90 µm.

2.0 - MOUNTING OF THE REACTOR

2.1 - LIFTING OF THE COIL (using the center of the spider)

The reactor is lifted by means of hooks, ropes or textile string of sufficient load capacity shall be slung around the center of the spider (see figure 1).

The reactors are mounted upon insulators column and aluminum pedestals, according to the dimensional drawing.

IMPORTANT: If a special mounting is necessary, AREVA Brazil should be contacted and a technical solution suitable for each case will be provided.

FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 3

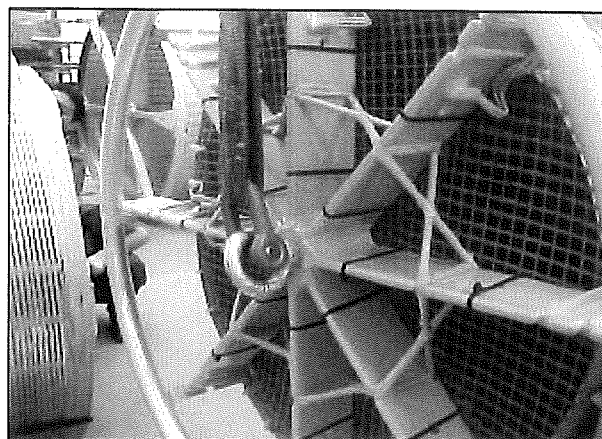
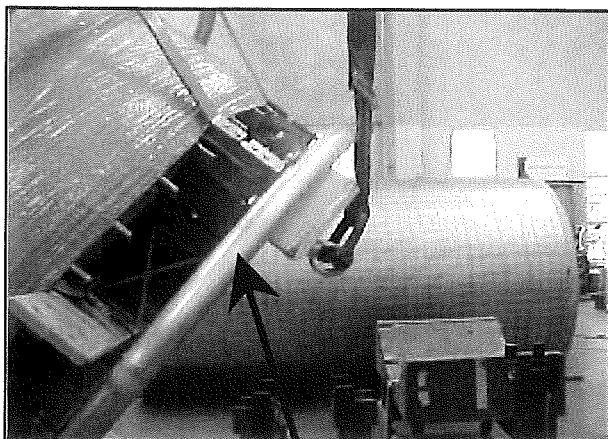
2.2 - LIFTING OF THE COIL (by lifting points)

DO NOT LIFT THROUGH THE
FIBERGLASS REINFORCEMENTS ON
THE UPPER CROSSARM.

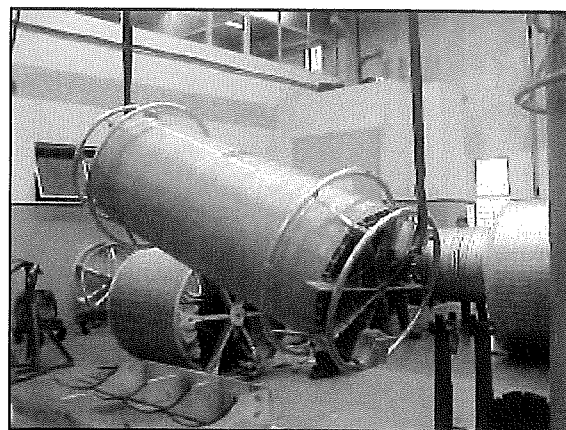
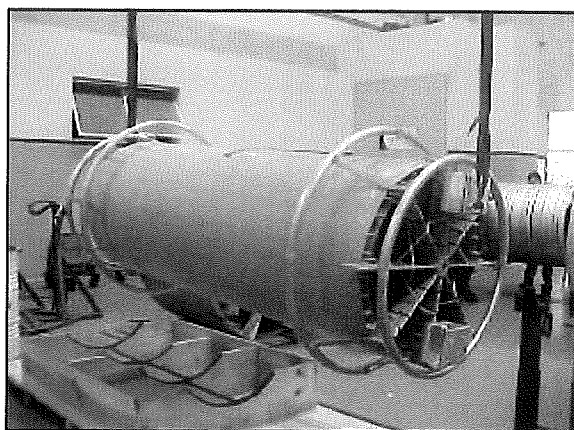
FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 4

LIFTING OF REACTOR IN HORIZONTAL PACKAGES

1 – Use the lifting lugs shown on the photos.



Be care with the corona rings during the movement



FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 5

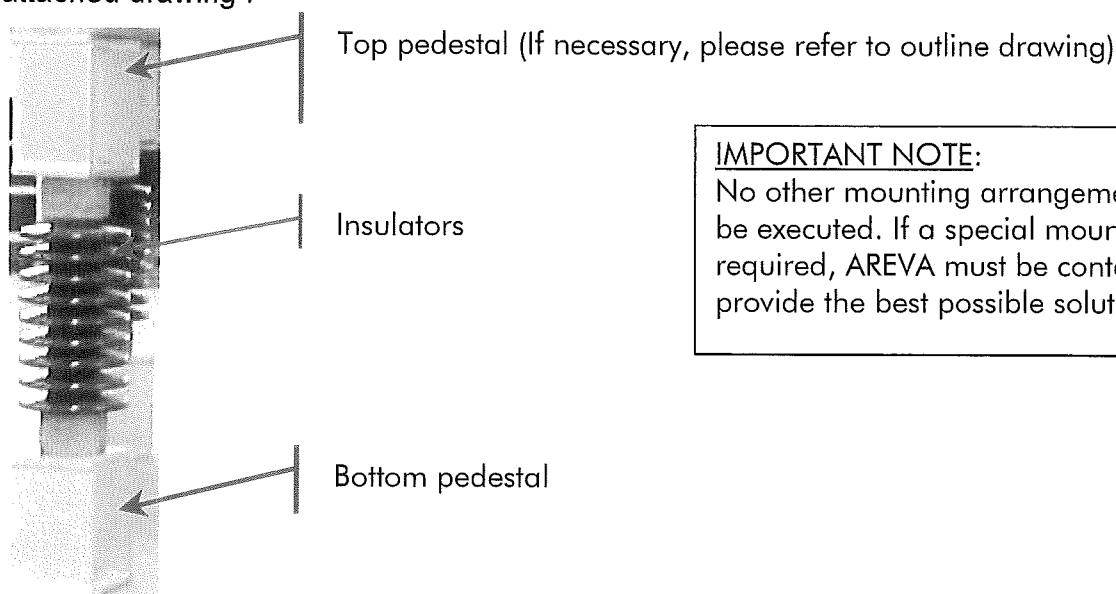
2.3 – ASSEMBLY OF THE REACTOR

Required tools/equipment

- Suitable lifting device
- Lifting cords or steel cables
- Open end wrench

1st STEP

Fix the insulators to the pedestals (on both sides of the insulator), according to attached drawing .



IMPORTANT NOTE:

No other mounting arrangement shall be executed. If a special mounting is required, AREVA must be contacted to provide the best possible solution.

2nd STEP

Mount lower coil reactor on top of pedestal structure using nuts, bolts and washers provided without fully tightening the nuts. Refer to outline drawing, for details.

3rd STEP

Fix base of lower aluminum pedestal to the foundation using anchor bolts (not supplied), without fully tightening.

4th STEP

Fully tightening the nuts.

The table below shows the torque of bolts (daN*m) .

Diameter of bolts	Electrical Connection	Other Connections
M8	1.5	1
M10	3.5	2
M12	5	3
M16	6.5	4

FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 6

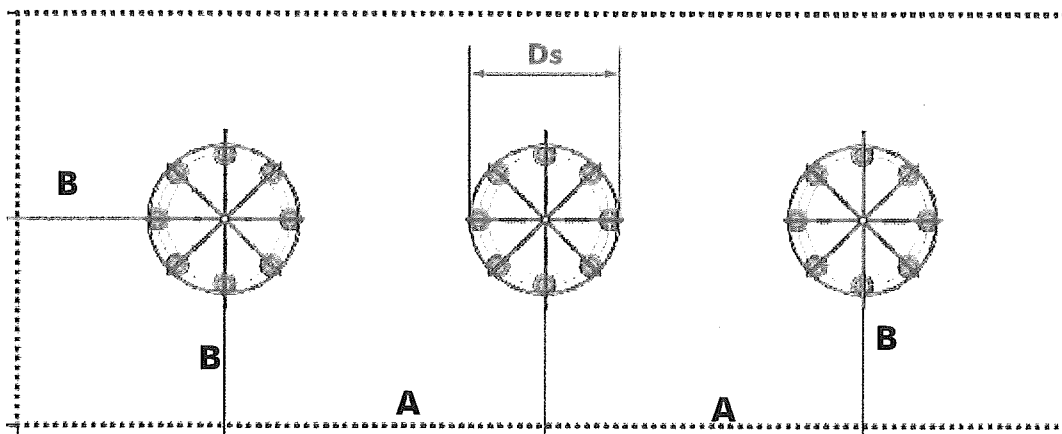
3.0 - ELECTRICAL CONNECTION

The reactor may be connected at either terminal (i.e. both terminals can be either IN or OUT terminals). For side by side mounting AREVA recommends to use same connection criteria for all adjacent reactors. The line cables are connected, through appropriate connectors (not supplied), to the flat sheet terminals welded to the spiders. If the reactor is stored in adverse weather conditions which cause oxidation of the contact surfaces, these ones must be cleaned with a fine steel brush or a fine sandpaper and afterwards protected using a non-acid lubricant vaseline. The vaseline film protects the aluminum surfaces against corrosion. The oxidation film can increase considerably the contact resistance and thus, produce an abnormal heating at the contact points.

4.0 - MINIMUM CLEARANCES

The minimum clearances between centerlines of adjacent reactors and between centerlines and metallic parts, indicated on the outline drawing, are to be observed. These clearances should also be respected regarding the connection cables of the reactors. In case a metallic fence is within the minimum clearance it should not close a loop around the reactor and should, therefore, be insulated at any point of the circumference.

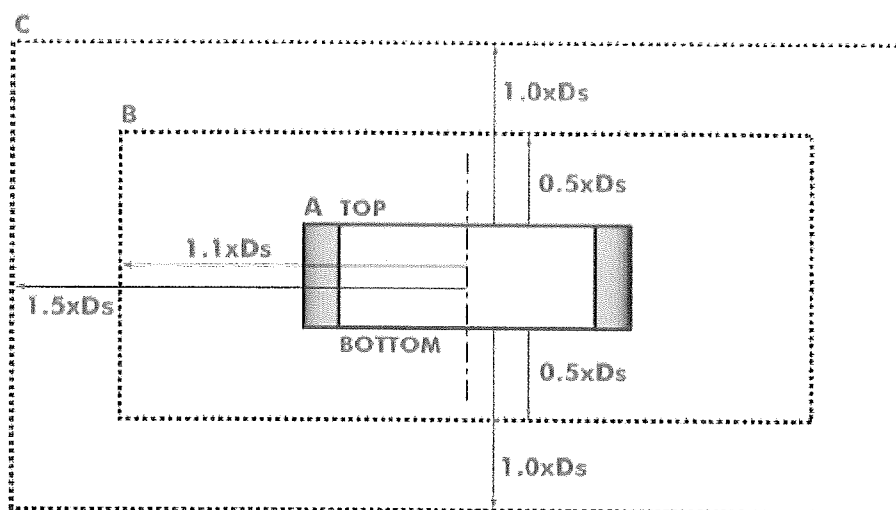
The next two pictures are only indicative values:



A – Minimum magnetic clearance between centerlines of adjacent reactors. Refer to outline drawing.

B – Minimum magnetic distance between centerlines and metallic parts not forming closed loops. Refer to outline drawings.

FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 7



A: reactor outer surface

Ds: reactor outer diameter

Keep metallic parts not forming closed loops outside B

Keep metallic parts forming closed loops outside C

5.0 - MAINTENANCE

The reactors can operate with little maintenance. However, an annual inspection of the reactors is required. It is required to inspect the reactors for signs of paint deterioration and pollution accumulation.

The reactors can be cleaned using high-pressure water. If the reactors require repainting, remove all debris from the required areas and apply 1 coat of polyurethane finish, color Munsell N6.5 light gray.

For high pollution areas, depending on the amount of pollution, this inspection is to be carried out on a more frequent basis.

6.0 - TRANSPORTATION

The reactors are dispatched in wooden crates, ready to be put into service. In case of any transportation damage, AREVA Brasil is to be immediately notified as well as the responsible Insurance Company.

FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 8



Contact us

AREVA T&D BRASIL
Avenida Nossa Senhora da Piedade, 1021 Bairro Piedade
CEP 37504-358 – Itajubá
Minas Gerais – Brasil

Phone : +55 35 3629-7000
Fax : +55 35 3629-7007
areva.itajuba.br@areva-td.com
Visite-nos: www.areva.com

FUNCTION	EMISSION	APPROVAL	EDITION	CONTROL
CHECKED	Rodrigo Marcos	José Mario	No. 11622/002 2 nd Edition	Rodrigo Marcos
TECHNICAL DOCUMENTATION TITLE: FED REACTORS INSTRUCTION MANUAL				Total of pages 9 Page 9