Operating Instructions

1. Operating Instructions for Air Heating Batteries

a, Technical Prerequisites for Putting into Operation
Prior to connecting the heating batteries it must be checkes if the voltage indicated on the name plate agrees with the existing supply voltage.The heating batteries are connected together into one or more groups for switching purposes, and for three-phase supplies each switching group has three terminals, and for DC or AC supplies each switching group has two terminals and a terminal for earthing purposes for each switching group in addition. The parts of the housing or flange plates are made of metal and must also be earthed.
It is a general requirement that the electrical connection may be made by certified personnel only. The applicable regulations as per DIN 57100, part 420/VDE 0100, must also be complied with. The temperature safety limiter, temperature monitor, flow monitor and so forth must be controlled accordingly.

b, Putting into Operation
In the case of the embodiment with **cold air inlet** in line with types ERR/91 and ERRG/91 the heating element cables and the connecting bars are provided inside the duct. The air flowing through the heater cools the cable connections continuously thus reducing the heat in the IP 54 connection box. Therefore standard cables may be used.
In the case of very high final air temperatures or very unfavourable conditions (e.g. reduced air quantity or recirculated air operation depending on the method used) there may be temperatures existing in the connection box which are no longer suited to use standard, rubber-insulated cables (this decision can be taken by the customer only). In this case use high temperature resisting cables, e.g. silicone, teflone or fiberglass insulated cables.
Depending on the distance between the control box and the air heating battery it is recommended to mount separate connecting blocks in a short distance to the air heating battery with the aim to save running metres of heat resisting cables. The correct manufacture of the current supply connections and both earthings (electrical connection and housing) must be checked prior to the test run.
On the occasion of a test run all parameters, e.g. air quantity, final air temperature and so forth (Technical Data Sheet refers), must be completely complied with. In unfavourable cases partial considerations of or deviations from the values prescribed by the manufacturer (Technical Data Sheet refers) may cause damage to or destruction of the air heating battery.

c, Normal Shut-Down Procedure
The shut-down procedure for fan and air heating battery shall be as such that the fan is still in operation for another five minutes to avoid overheating. For this reason the fan motor after-running is ensured with the help of a time-limit relay. Also, existing thermostats must be set on site in accordance with the requirements requested for. For example, a temperature safety limiter is adjusted between 50°C and 60°C with a final air temperature of 40°C; this applies also to other final air temperatures.

d, Safety Shut-Down in the Case of Power Failure
Depending on the operation conditions and in the case of voltage failure the surface of the heating rods can be heated up by 50°C to 70°C. It can hardly be expected that the air heating battery will be damaged. At worst, it may be necessary to replace a filter or a plastic cover.

e, Regulations for the Use of Control and Adjustment Devices
On principle, there are 4 parameters to be observed for the control of a heat battery made by VOLTA:
- quantity of air;
- air intake or air exhaust temperature;
- operating voltage or current resulting thereof;
- use of operating groups (performence distribution).

If the air exhaust temperature is required to be changed or if the air intake temperature changes a control can be achieved by switching on or switching off one or more operating groups without changing the quantity of the air.
If the quantity of air changes (to less than approx. 70-80 per cent of the quantity of air defined for each heat battery embodiment) this may be balanced only by a voltage control (less current required). For technical reasons the switching off of one or more operating groups will not lead to success. If these instructions recommended by the manufacturer are not complied with this may result in a partly or completely destruction of an air heating battery.

f, Operating Conditions
Air heating batteries are single piece productions which are produced for special customer operating conditions and in accordance with the dimensions provided and requested for by our customer. On delivery of the air heating batteries a complete documentation (Operating Instructions, Declaration of Conformity, Technical Data Sheet, Table of Dimensions, Wiring or Circuit Diagram, Operating Instructions for Thermostats used) is provided, the dates and operating instructions of which apply exclusively to this individual air heating battery provided. The data included in the Technical Data Sheet are to be considered as nominal operating values applying to the air heating battery specified by the customer and manufactured in accordance with the requirements requested for by the customer. They must be complied with to ensure an application of the air heating battery as directed.
It is also possible to manufacture air heating batteries in accordance with different operating conditions which are considered on the occasion of its development and design and included in the Technical Data Sheet. Any deviations from these recommended data provided must be compensated by suitable control and adjustment actions to be carried out on-site. In unfavourable cases partial considerations of or deviations from the values prescribed by the manufacturer (Technical Data Sheet refers) may cause damage to or destruction of the air heating battery.

Unless otherwise specified in the Documentation of the Air Heating Battery normal environmental and operating conditions, normal methods and modes of operation in accordance with Standard DIN VDE 0100 are a prerequisite for the use and operation of the Air Heating Battery.

g, Repair Activities
VOLTA GmbH are able to supply replacement heating rods within a few days if the manufacturer's identification number of the heating battery is advised by the customer. Then a qualified electrician will be able to perform the required repair himself. Repair or maintenance activities may be performed only if all electrical devices have been switched off, and the current supply system must be protected against re-switching in. Furthermore it must be paid attention to the fact that the heating rods are cooled off sufficiently prior to beginning with any repair and maintenance activities.
All repair activities may be performed by a corresponding expert only who installs and connects replacement heating rods the same way he has removed the damaged heating rods prior to repair activities involved. If larger heating batteries are subject to repair activities and to the extent that no experts are available, it is advisable to have the repair work performed by the manufacturer. A heating battery sent in for repair purposes will be returned in a few days as good as new and tested in accordance with the regulations and/or specifications.

h, Long-Term Control and Maintenance
As a matter of principle it is not required to maintain air heating batteries. It will be sufficient to examine the connecting cables periodically to ensure that the screws at the terminals are still tight and that both earthing systems (connection and housing) are still operating properly and that the insulation of the cables has not been cracked. Cleaning activities are required to be part of the maintenance activities only if the medium to be heated is extremenly dirty or dusty (e.g. wood dust produced in a joiner's shop). It is recommended to clean the heating rods with the help of compressed air.
Air filters that may have been installed in front of or behind the air heating battery must be cleaned at regular intervals.