NORDMANN
ENGINEERING

TECHNICAL ASSISTANCE MANUAL

for AT 3000, NOVAP 3000 and RC/DC 3000 series

Introduction:

Each humidifier is entirely tested before leaving production. When a deviation occurs or when the humidifier seems not to be working correctly, the problem is generally only sought at the humidifier itself, though the deviation is rather often caused by a problem in the installation of the humidifier. The specialist knows that he must also look at how the steam pipe has been laid, at the drainage pipe, at the water connection, at the electric connections, at the humidity controller and sometimes also at the type of water that is used.

You should proceed in the following order:

- **observe**
- **work out the problem**
- **take action**

Important: This manual should always be used along with the operating instructions of the respective unit. A diagnosis should only be carried out by a specialist who follows the recommendations of the operating instructions**.**

DEVIATIONS OF THE NORMAL CONDITIONS POSSIBLE REMEDIES (page 3)

1. START SEQUENCE OF AT 3000, NOVAP 3000, RC/DC 3000

1)	Switch unit with black power switch	
2)	Indication of humidification demand:	**If not, then**
	- 2a) AT 3000: Operation LED shining green	(b) (x)
	- 2b) NOVAP 3000, RC/DC 3000: LED shining green	(b) (x)
3)	The contactor will close	(b)
4)	Inlet valve will open	(a) (b) (c) (d) (p) (q)
5)	The water in the cylinder will be heated	(a) (y)

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2. ELECTRICAL IN GENERAL

- Power switch ON (front panel), but no power indication (a)
- No display indication (AT 3000 Series) (l) (m)
- Sparks in the cylinder (p) (v)

3. WATER AND CYLINDER

- Water will not fill the cylinder (a) (b) (c) (d) (l) (m) (p) (s)
- Water fills the cylinder too slowly or with a delay (p) (r)
- Water fills and will not stop (a) (e) (m) (y)
- Cylinder full but will not heat or not sufficient steam production (a) (b) (f) (g) (y)
- Water is dropping out of the cylinder (j)
- Cylinder will not drain (k) (l) (m)
- Cylinder overflows (a) (e) (s) (y)
- Water splashing out of the filling cup (s) (t)
- Water/condensate splashing at distribution pipe (n) (o)
- Spitting of steam blower (p)

4. VALVES

- Inlet valve not working (d) (e) (m)
- Drainage valve not working (j) (k) (m)

5. MESSAGES OF DEVIATIONS (refer also to the operating instructions of the units)

AT 3000	***NOVAP 3000 and RC/DC 3000***	
	red flash in the shining green	(g) (q)
U 1 message	LED blinking green	(h)
U 2 message	LED shining red continuously	(i) (y) (y2) (y3) (y4)
U 3 message	LED blinking red	(a) (c)(d) (m) (y)
U 4 message	LED blinking red-red-green-green	(w)

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6. PROPORTIONAL CONTROL ON AT 3000, NOVAP 3000 and RC/DC 3000

Verify if the link between terminal L1 / H (better with a high limit humidistat) has been made. If the link L1 / H has not been made, the humidifier will not work, i.e. the LED "Operation" will not shine green.

Verify first if the humidifier functions in the ON/OFF mode by removing the proportional adaptor. If the humidifier functions in the ON/OFF mode, it means that the microprocessor electronics for the steam production process functions.

Refit the proportional adaptor and test as follows:

Press button ''Set point steam'' on AT 3000 and the set point in % of the output will be displayed (AT 3000 series only). If not, then replace the proportional adaptor.

Adjust the coding switches of the proportional adapter to match the control signal, the green LED for operation should shine. If not, check if the control signal is available.
If not, then replace the proportional adaptor.

POSSIBLE CAUSES AND REMEDIES

(a) No heating or control voltage available
Check if all phases are present, check phase to neutral and phase to phase as necessary for correct voltage. Check if control voltage is applied.

(b) No control signal being received from humidity controller
Green LED will not be shining. Adjust controller until signal is received. Check circuit of external wiring. Simulate control signal (with AT 3000 only) in service level. If proportional adaptor fitted (NOVAP 3000 and RC/DC 3000 series), remove it. If unit functions with adaptor removed, then refer to (u). Minimum controller signal to operate the unit: 21%.

(c) No water supply available
Operation light (green LED) will be on. Check if water supply is turned on and available at inlet valve. Check and clean (if necessary) inlet valve strainer. Check water pressure is not too low, below 0.1 MPa (1 bar). Test function of inlet valve in the service level (AT 3000 only).

(d) Inlet valve does not open

Check if the water max. level is reached. if yes, the inlet valve does not open.

Check connections between supply PCB, relay coil and inlet valve. If voltage is available at inlet valve then the valve may be clogged or its coil is defective. Remove, bench test and clean as required. Test function of inlet valve in the service level (AT 3000 only) and replace valve if necessary. Note: there is approx. 30 seconds delay after control signal receipt before the inlet valve receives a signal to open.

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(e) Inlet valve does not close

Check system pressure and if necessary fit water pressure reducing valve so pressure is below 1 MPa (10 bar). Check inlet valve is seated correctly, clean dirt from under seat if necessary. Test function of inlet valve in the service level (AT 3000 only).

(f) Incorrect or disconnected terminal connections

Check all electrode and sensor connections are fitted tightly and are in correct pattern i.e. white wire to white dot, red wire to red dot, etc.

(g) Steam cylinder in start up phase

If water is soft (little conductivity), it can take several hours to reach the required nominal conductivity. An addition of salt (NaCl) to speed up the heating and drawn Amps can be undertaken. As salt is corrosive to the electrodes we however recommend to take Sodium Carbonate (Na_2 CO_3).

(h) Steam cylinder needs maintenance or is spent

U1 message on AT 3000 series, flashing green LED on NOVAP 3000 and RC/DC 3000 series. The steam production may be reduced and unit can continue to work at reduced capacity. Check cylinder for accumulation of minerals or electrodes isolated by scale, rinse or replace the cylinder if necessary.
Is the cylinder still quite new the problem could be a too low electrical conductivity of less than 125 µS/cm (microSiemens per centimetre)

(i) Over current

Over current, at 40 % over the nominal value has been detected and the unit has been switched off automatically. To restart, press T6 button (reset) on AT 3000. On NOVAP 3000 and RC/DC 3000, switch black power off and on again. Check if the cylinder is spent or full of minerals which entails increased conductivity. If necessary replace cylinder. Also, cylinder drain line may be clogged. Clean drain line. Also, the drain valve may be faulty. Check drain valve (service level AT 3000) and repair/replace if necessary. ➔ Cold water effect: see (y)

(j) Drain valve not closing

Check if the drain valve is seated correctly. Remove and clean as necessary. Check if valve is receiving a voltage signal when pushing the manual drainage button. If not, check the corresponding relay on the PCB. If the manual drainage works and the automatic drainage does not function, the PCB may be faulty. Check (service level for AT 3000) and replace if necessary.

(k) Drainage valve not opening

Check if the drain valve is operating. Check if valve is not clogged.
Replace coil or valve as necessary.

(l) Blown fuses F1 (6.3 A) in AT 3000 and RC/DC 3000 or F2 (1.6 A) in AT 3000 only.

A replacement fuse is located in the terminals of each fuse holder.

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(m) Check processor PCB
For this PCB, a diagnosis can only be done at the factory by the manufacturer. On site, first exchange the print by a spare PCB you have in your stock.

(n) Steam distribution pipe installed incorrectly
Check installation instructions and install correctly.

(o) Condensate hose not draining
Check for clogging or sharp bent. Verify the positive fall to drain. Check if the duct is not below atmospheric pressure.

(p) Foam in cylinder
Foam is generally caused by chemicals that entered the cylinder through treated water or because of using water intake-, steam or condensate hoses which contain lubricants. Check the quality of the water and that of the hoses. Drain and flush steam cylinder and flush intake hose. Use Nordmann steam- and condensate hose as they are free of lubricants. Use normal tap water.

(q) Message of max. water level (S = 1 in service level of AT 3000 or red flash in the green continuous of the LED with NOVAP 3000 and RC/DC 3000)

Unplug max. level sensor from the cylinder, wait 2 minutes, max. level indication should extinguish and cylinder should start filling when filling is required.
If the message is still there, disconnect the wire on terminal 2 of the current transformer and wait 2 minutes. The lamp should then extinguish and the cylinder should start filling. If not, then replace current transformer.

(r) Check for correct inlet valve body or any clogging of valve inlet.

(s) Check for too high duct pressure (max. 1000 Pa) , for too long steam hoses (should be less than 4 m long), too small diameter of steam hose, sharp bents or clogged exhaust holes of the distribution pipe in the duct.

(t) There may be air in the supply water pipe

(u) Check if the proportional adaptor is fitted correctly, check external wiring connections and if a control signal is sent by the humidity controller.

(v) - water level too low in the steam cylinder, refer also to (s).
- too conductive water because of the use of softened water (ion exchanging method) with conductivity above 1250 microsiemens/cm.
- too conductive water because cylinder does not drain, refer to (k),(l),(m),or because cylinder is spent and full of minerals.

(w) This signal appears if a replacement electronic controls unit has been fitted to the humidifier without being coded. The humidifier is prevented from operating. The signal disappears as soon as the electronic controls unit has been coded.

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(x) **Verify if a link or a bridge L1 / H has been made**. If it has not been made, the humidifier will not work, i.e. LED "Operation" on AT 3000 or the LED on NOVAP 3000 and RC/DC 3000 will not shine green.

(y) **The heating voltage to the steam cylinder is cut off**. Temporarily cut off of the heating voltage can lead to U2 message ➔ Cold water effect. Due to cut-off of the heating voltage the cylinder will be filled with cold water up to the top and the water will be drained over the water filling cup. When the heating voltage will work again, the current in the cylinder can be too high due to the high water level and U2 can appear.

(y1) **The contactor coil or an electric cable to the coil is defective**.

(y2) **The wires 3 and 4 from the current transformer are loose or disconnected** or the connector the PCB is not connected tightly enough (due to a shock during transport, etc)

(y3) **There is a “bridge” of minerals short-circuiting two electrodes**

(y4) **The inlet valve does not close correctly and keeps filling the cylinder**

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