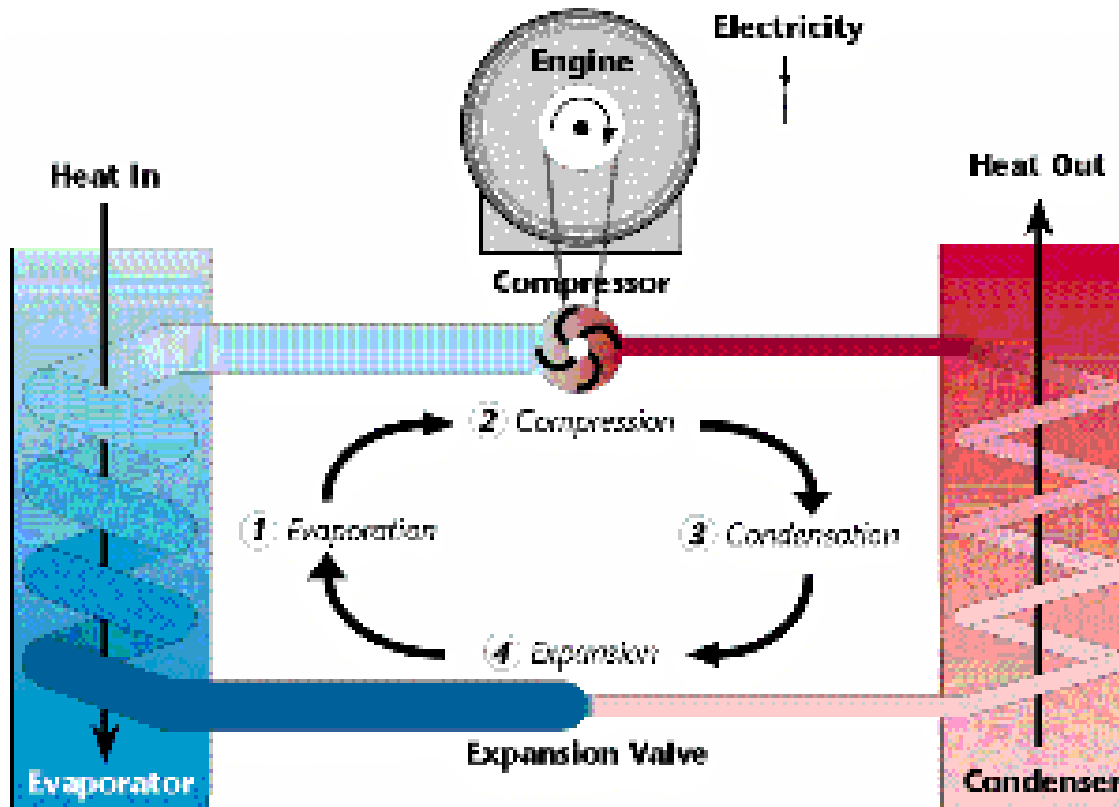


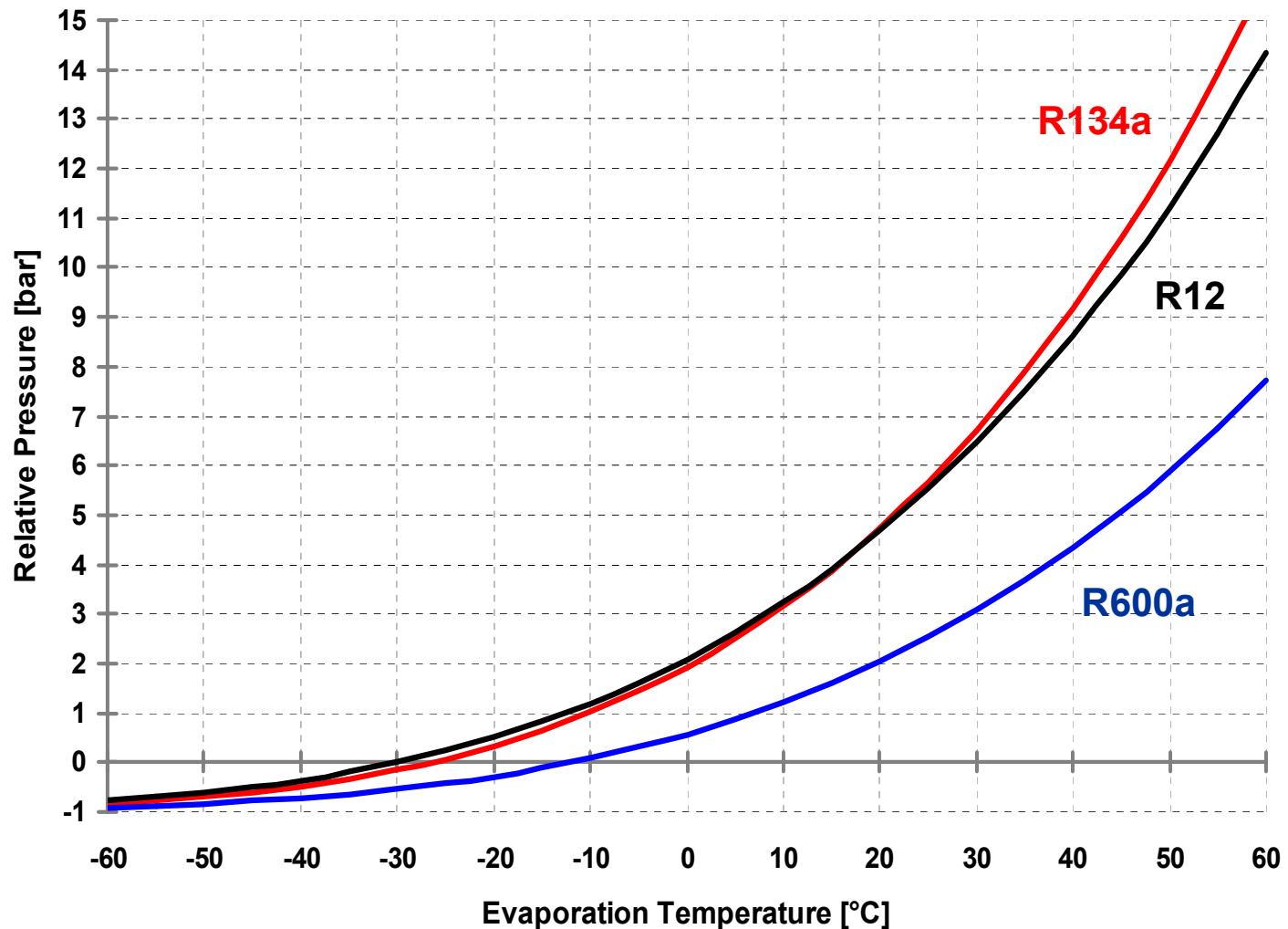


# Function of heat pump

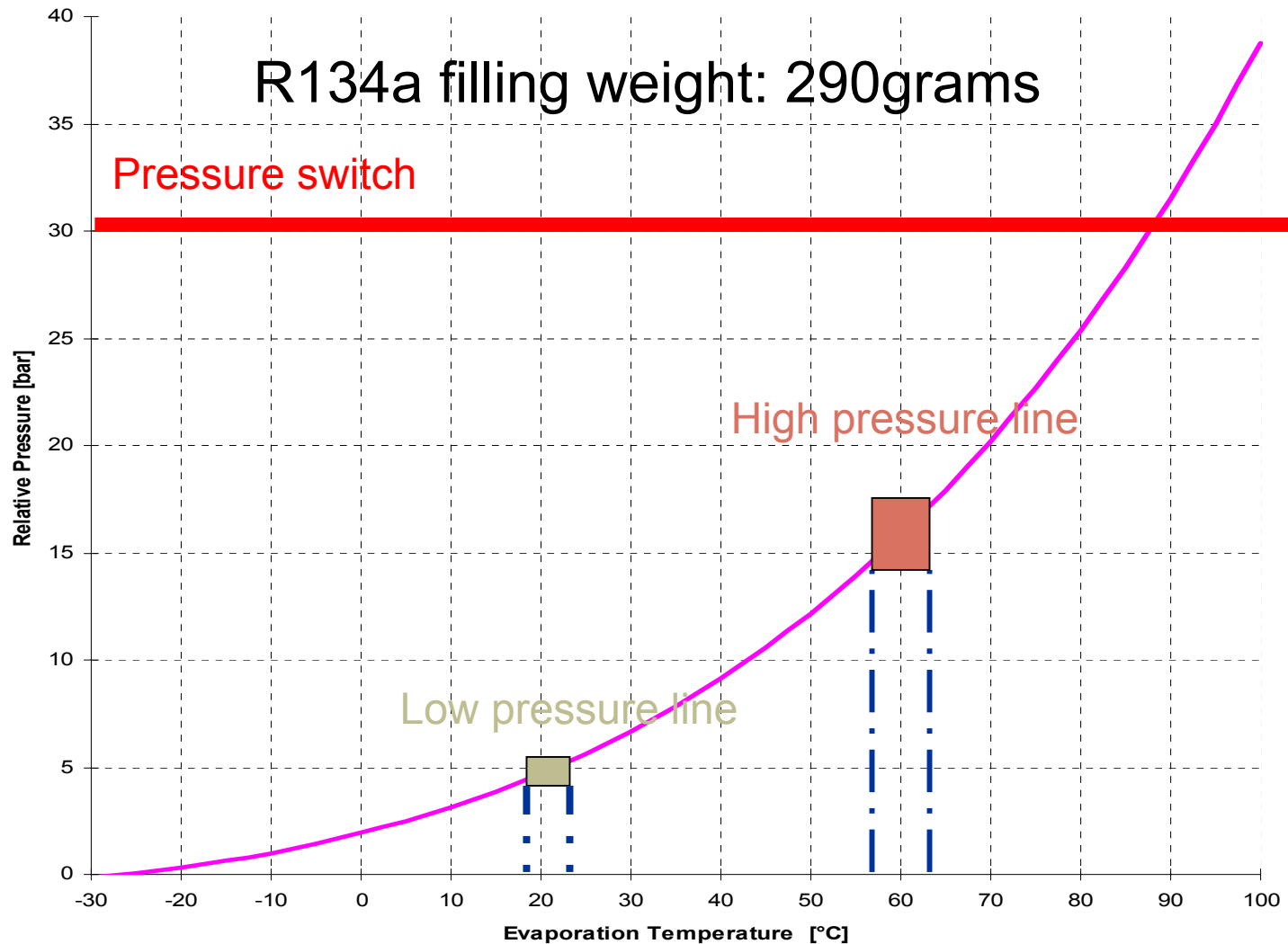
 Electrolux



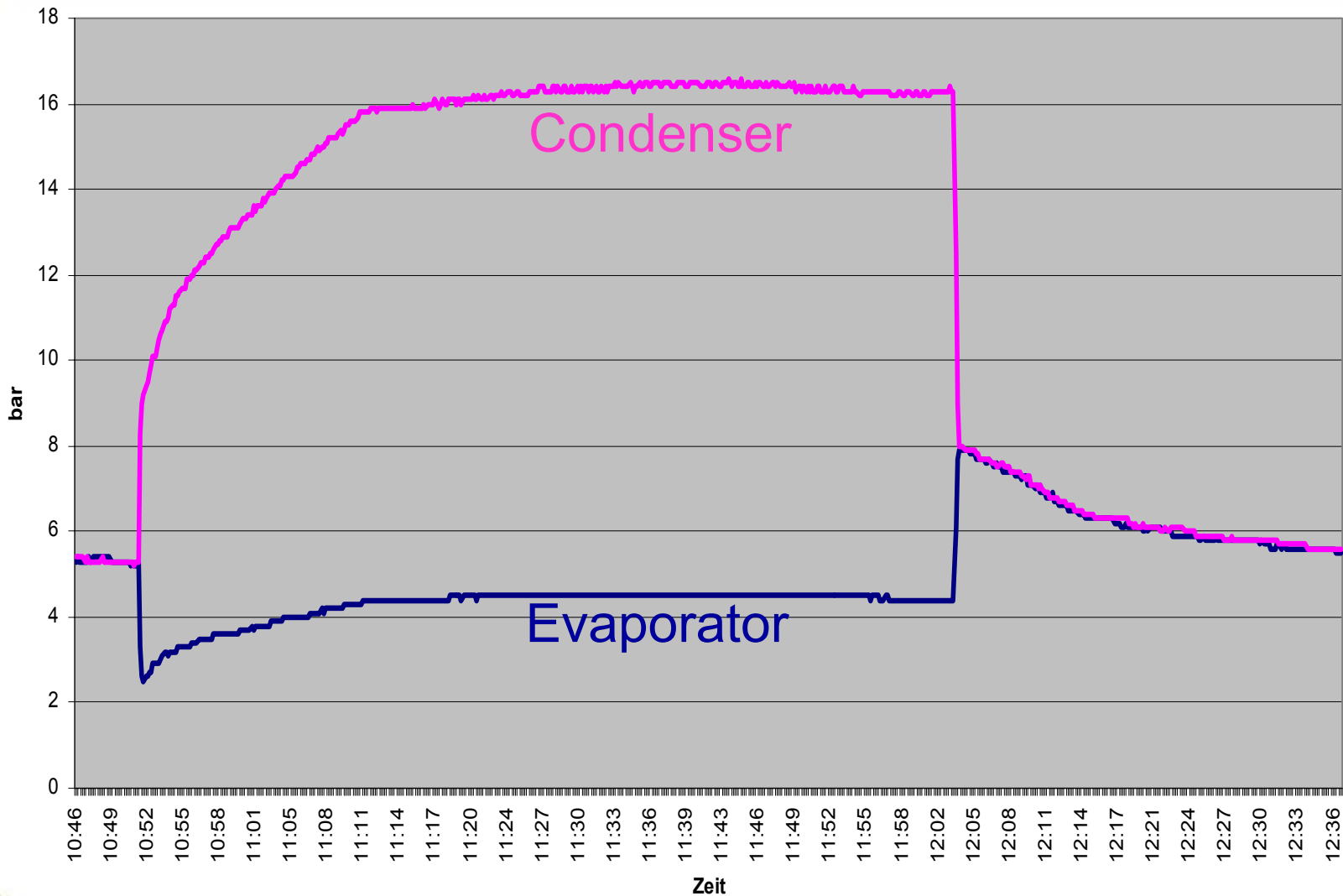
# R134a Charakteristik



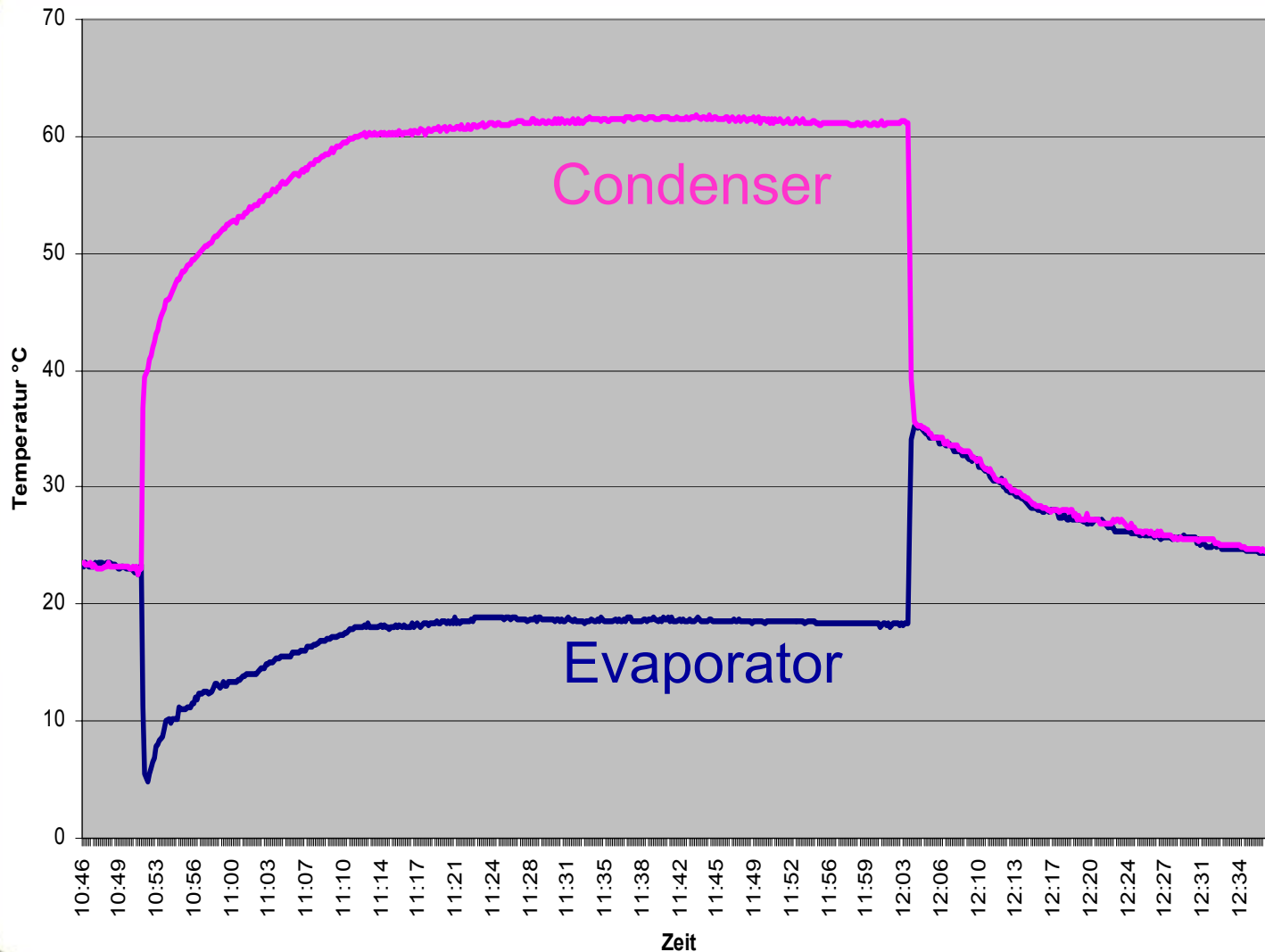
# R134a Working range heat pump



# Measured pressures in condenser and evaporator



# Measured temperatures in condenser and evaporator



- Type: Condensed dryer
- Sensor system: Clothes conductivity measurement
- Application: AEG Brand
- Factories: DGN
- Power supply: 230/240V - 50Hz
- Drying heaters relays used to drive:
  - Heat pump compressor **(with external relay?)**
  - Refrigerant: R134a
  - Process Air fan
- Door device output used to drive the compressor cooling fan  
**--- No electric door opening available ---**
- Door reversibility: available by end user
- Drum light: Available (driven by separate triac)

- Tank Position: upper tank only (with tank pump)
- NTC: up to 2 inputs available
- Transportation of EDR 2000AEG specification:
  - Same user interface layout (push buttons, leds, digits)
  - Same cycles
  - Same options
- Same configuration philosophy / tools
- 30% less energy consumption
- Declaration for 6kg wash load



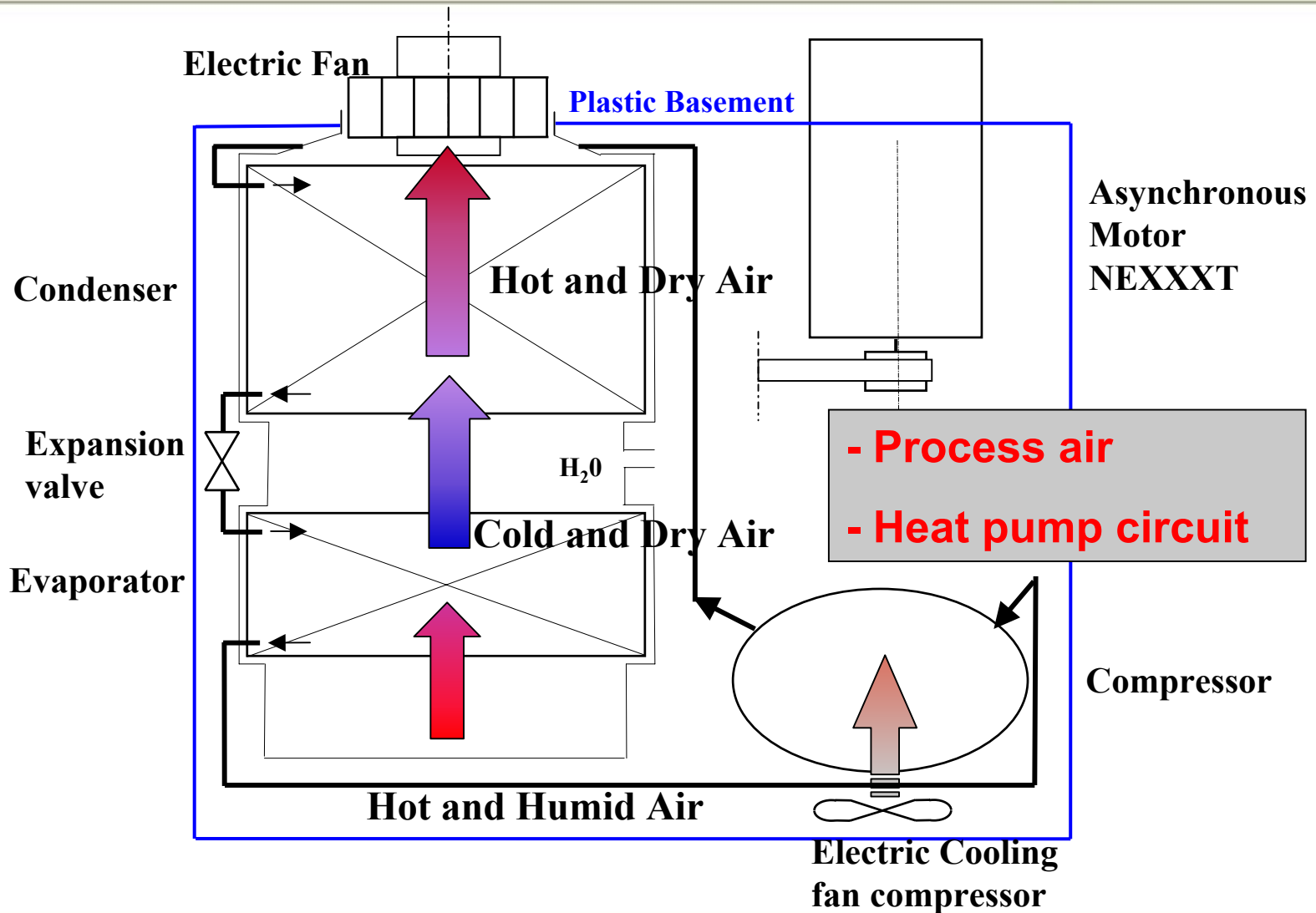
## Standardisation of electronic solutions:

Same Main board of EDR 2000 AEG

(creation of a variant with specific software)

- Use of new software concepts:
  - **User interface configuration**
  - **Cycles configuration**
  
- Short software debugging due to:
  - **Use of the same software structure of EDR 2000AEG**
  - **Only changes are on:**
    - **Compressor management**
    - **Process fan management**
    - **NTC management**

# Basement Circuits





# Cycle options



Push button options:	Time Saving	The aim is to reduce the drying programs duration. It affects a five minutes shorter cool down.
	Gentle movement	Option with red. mechanical agitation
	Very gentle movement	Option with red. mechanical agitation but additional with reduced load ( 3 kg ).
	Half Load	This option should be selected when in a high load declared cycle (5-6kg), only half load is inserted in the drum. This option affects the cycle behaviour (motor movements ) in order to optimize it for small loads.

# Cycle options



	Long Anticreasing	This option is used to prevent laundry creases if user isn't able to remove laundry from dryer at the end of the cycle. A "normal" anticrease (duration 30min) is always planned at the end of nearly every cycle. This option increases the anticrease duratio
	Final humidity adj.	It is a fine tuning of final humidity. If the user is not happy about "default" final humidity target, with this option he can adjust it (range is about -2% 4% respect default value)
Push buttons combination feature:	Water Conductivity adj.	This option could be modified by pressing the specific push button combination, depending by water conducibility level of country target. There are 3 levels of water conducibility: 250, 450 and 750 microSiemens. Default level is 450uS. This option affects

# Cycle options



Features:	Fast Program End (FPE)	This cycle feature is enclosed in all humidity controlled drying program (Cottons, Easy Cares and some Special programs). It consist in a fast detection of wet laundry inside the dryer. If it finds no laundry or dried laundry it signals the cycle end (in
	Indication of humidity level	For Cottons and Easy Cares programs, this is a LEDs indication, during a drying cycle execution, of the current status of the laundry inside the drum.

**The attached links will show you the specification drawings of the electrical components:**

**[Heat pump basement group](#)**

**[Compressor](#)**

**[Motor](#)**

**[cooling fan](#)**

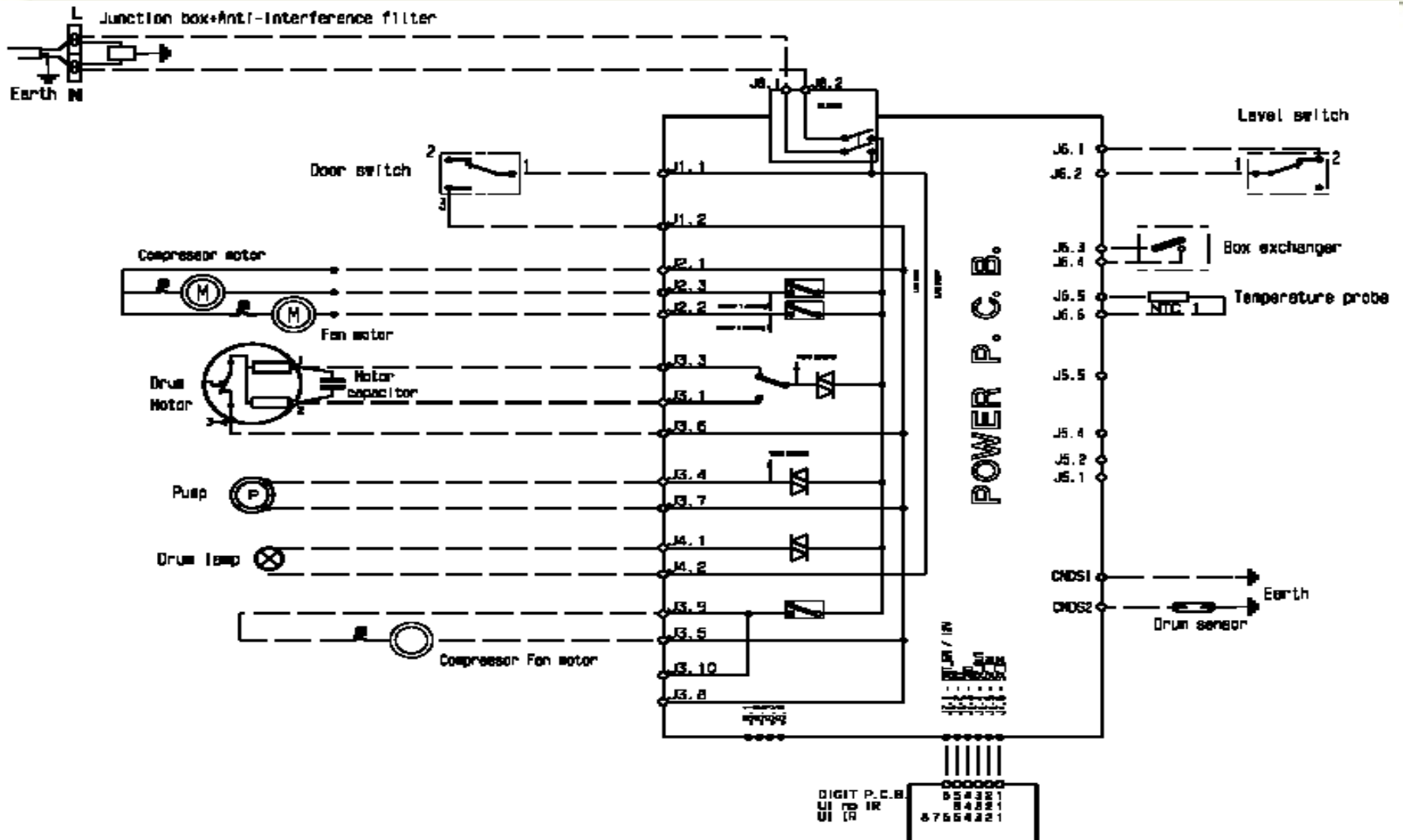
**[Fan motor](#)**

**[Motor capacitor](#)**

**[Relais for heat pump](#)**

**[Carbon brush](#)**

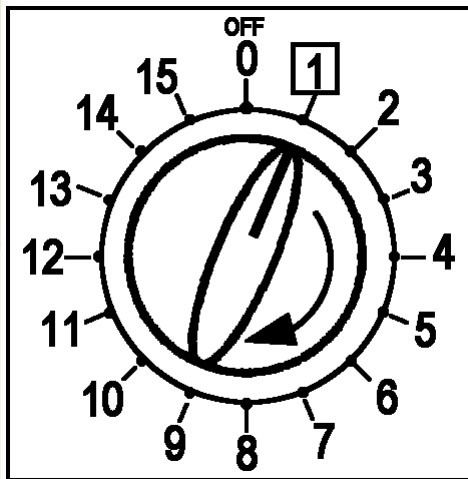
# Wiring diagram







## Selector in position 1



### checked functions:

- **User interface functionality**

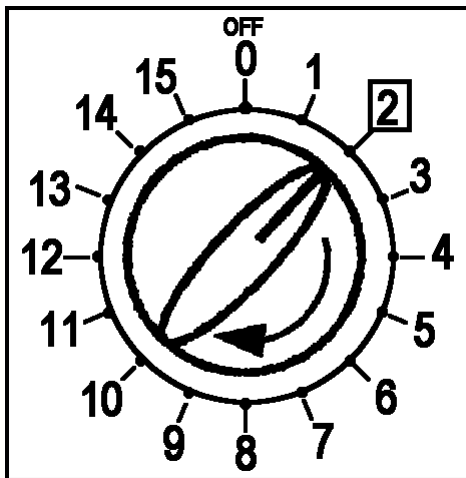
### actuated components:

- **all LEDs light in sequence**
- **if a pushbutton is depressed, the corresponding LED lights, and buzzer sounds if applicable**

### conditions:

- **none**

**Selector in  
position 2**



**checked functions:**

- **tank pump**
- **tank switch**

**Attention: the lower tank has to be filled with water, that the level switch is closed !!!**

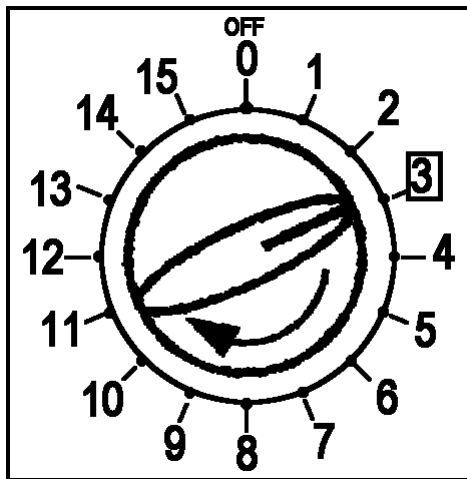
**actuated components:**

- **tank switch**
- **tank pump**
- **compressor fan**

**conditions:**

- **door closed**
- **Time out 10minutes**

**Selector in  
position 3**



**checked functions:**

- **to test motor in counter clockwise direction**

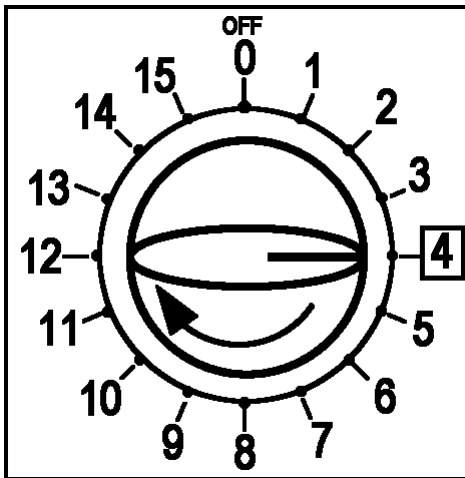
**actuated components:**

- **motor**
- **motor triac**
- **relay of direction**
- **compressor fan**

**conditions:**

- **door closed**
- **Time out 10 minutes**

**Selector in  
position 4**



**checked functions:**

- **to test motor in clockwise direction**

**(low speed for visual inspection of drum shell assembly)**

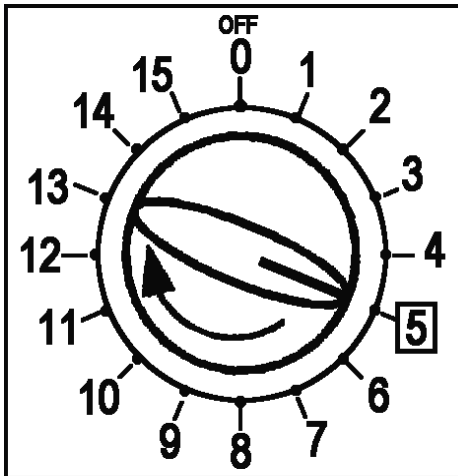
**actuated components:**

- **motor**
- **motor triac**
- **compressor fan**

**conditions:**

- **door closed**
- **time out 10 minutes**

**Selector in  
position 5**



**checked functions:**

- **to test the main process fan**

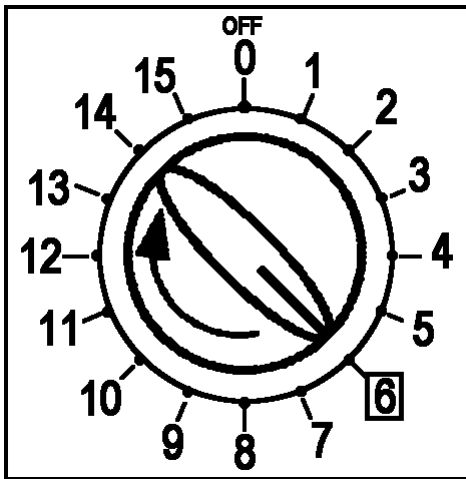
**actuated components:**

- **main fan**
- **motor triac (full speed)**
- **compressor fan**

**conditions:**

- **door closed**
- **time out 10 minutes**

**Selector in  
position 6**



**checked functions:**

- **to test the compressor**

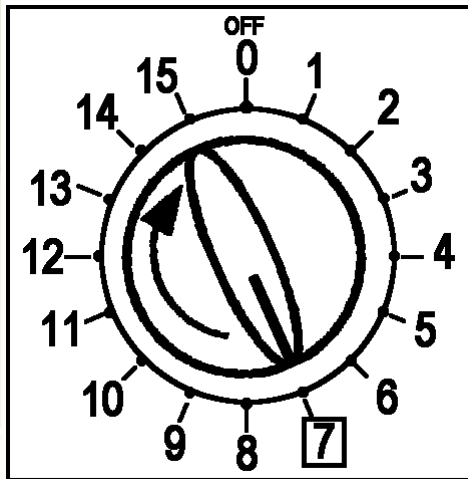
**actuated components:**

- **main fan**
- **compressor**
- **compressor fan**
- **motor triac (full speed)**

**conditions:**

- **door closed**
- **time out 10 minutes**

**Selector in position 7**



**checked functions:**

- **to verify conductimetric sensor in short circuit condition**

**actuated components:**

- **conductimetric sensor reading**

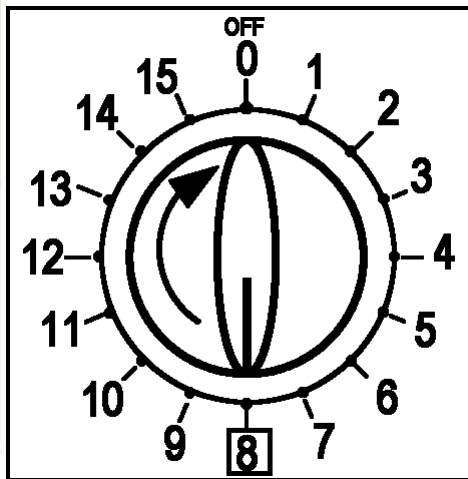
The step lasts 4 seconds (1sec. To create the short circuit condition by hand). During this time all phase leds are flashing to give information of acquisition phase. At the end of step phase leds are switched on to give ok, otherwise they are flashing forever and alarm E32 is displayed.

**conditions:**

- **door closed**



**Selector in  
position 8**



**checked functions:**

- **to verify conductimetric sensor in open circuit condition**

**actuated components:**

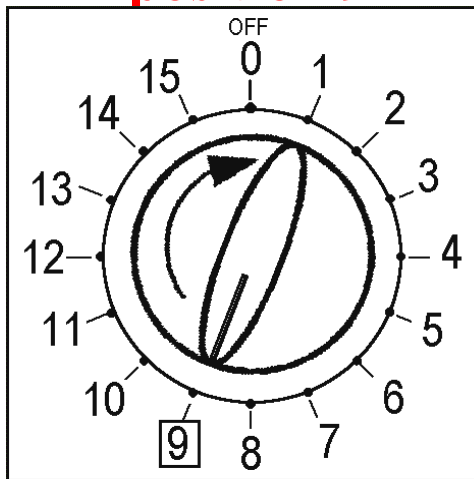
- **conductimetric sensor reading**

The step lasts 4 seconds (software configured). During this time all phase leds are flashing to give information of acquisition phase. At the end of step phase leds are switched on to give ok, otherwise they are flashing forever.

**conditions:**

- **door closed**

**Selector in  
position 9**



**checked functions:**

- **tank switch**  
(same test as in diagnostic mode 2,  
used for factory purposes)

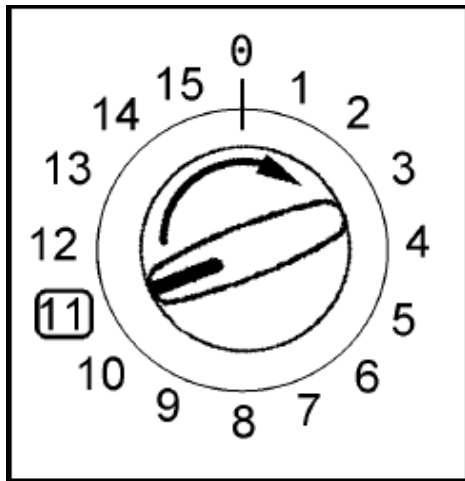
**actuated components:**

- **tank switch**

**conditions:**

- **door closed**
- **Time out 30s**

**Selector in  
position 11**



**checked functions:**

- **reading and deleting of the last alarm code**

**actuated components:**

- **alarm indication**

## Alarm management is the same like for AEG EDR 2000 (Nexus 4)

with some alarm deviations:

- Heating element
- Compressor
- Electronic door release
- Cooling fan
- .....

**Quick alarm reading with standard key combination is possible!!!! (Start-/Pause- key and left option key)**

## General:

If a failure occurs during normal working condition of the dryer, then an alarm will be shown to the customer and the buzzer will be activated.

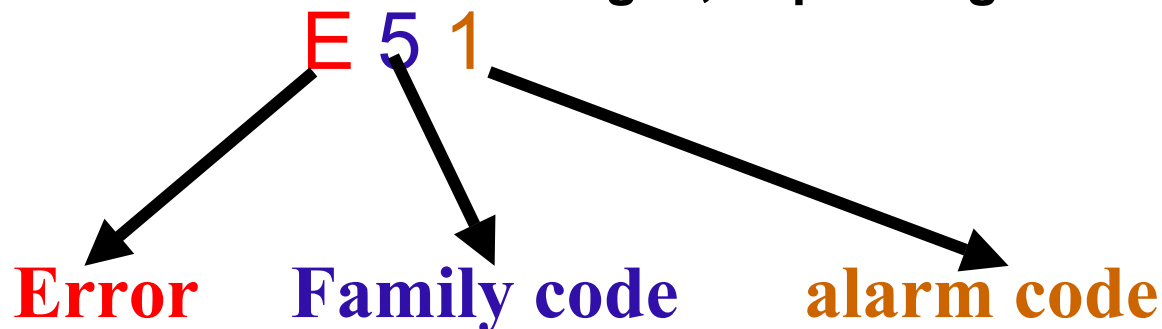
Alarms management is always active.

Some alarms require a cooling cycle activation in order to bring the machine in a safe condition, trying to switch off the compressor and starting motor movement to ventilate the internal of the machine. When the alarm cooling program has started, it continues until the user switches off the dryer.

## Alarm indication:

The alarm code has two or three digits, depending on the dryer version

e.g.



**All EDR 2000 dryers will show the alarm code on the time to end display.**

**The alarm will be shown as E **X Y** e.g. E**51****

**E = Error**

**X = alarm family**

**Y = alarm number**


**Alarm:** E21

**Alarm description:** Tank drain pump triac failure


**Fault condition:** Incongruence between drain pump triac sensing and triac status

**Possible fault:** Wiring or main board defective

**Action / status:** Cycle stopped  Reset

<b>Alarm:</b>	E22
<b>Alarm description:</b>	Tank drain pump triac sensing failure
<b>Fault condition:</b>	Input voltage value on microprocessor always to 0V or to 5V
<b>Possible fault:</b>	Main board defective
<b>Action / status:</b>	Cycle stopped  Reset



<b>Alarm:</b>	E31
<b>Alarm description:</b>	Conductimetric sensing oscillation frequency too high
<b>Fault condition:</b>	The conductimetric electronic circuit has an oscillation frequency out of range ( $f > \text{TBD Hz}$ )
<b>Possible fault:</b>	Main board defective
<b>Action / status:</b>	Cycle stopped  Reset

**Alarm:** E32

**Alarm description:** Conductimetric sensing oscillation frequency too low

**Fault condition:** The conductimetric electronic circuit has an oscillation frequency out of range ( $f < \text{TBD Hz}$ )

**Possible fault:** Main board or wiring defective

**Action / status:** Cycle stopped  Reset

**Alarm:** E51

**Alarm description:** Motor triac failure

**Fault condition:** Incongruence between motor triac sensing and triac status

**Possible fault:** Wiring or main board defective  
Motor defective  
Motor overheating

**Action / status:** Cycle stopped  Reset

**Alarm:** E52

**Alarm description:** Motor thermal cut off

**Fault condition:** Incongruence between motor triac sensing and triac status

**Possible fault:** Wiring or main board defective  
Motor defective  
Motor overheating

**Action / status:** Alarm stored in memory  
Disable movement  
After n trials generates E51


**Alarm:** E53


**Alarm description:** Motor triac sensing failure


**Fault condition:** Incongruence between motor triac sensing and triac status

**Possible fault:** Main board defective

**Action / status:** Cycle stopped  Reset

<b>Alarm:</b>	E54
<b>Alarm description:</b>	Motor jammed
<b>Fault condition:</b>	Motor cannot move
<b>Possible fault:</b>	Laundry load too heavy Low Power Supply Motor defective
<b>Action / status:</b>	Cycle paused  Start

<b>Alarm:</b>	E61
<b>Alarm description:</b>	Heating timeout
<b>Fault condition:</b>	NTC value hasn't changed after some minutes since every heating cycle step start
<b>Possible fault:</b>	Drying compressor defective Wiring or main board defective NTC out of position
<b>Action / status:</b>	Cycle paused  Start

<b>Alarm:</b>	E62
<b>Alarm description:</b>	Compressor relay failure
<b>Fault condition:</b>	Incongruence between compressor sensing and relay driving after n trials
<b>Possible fault:</b>	Wiring or main board defective Relay defective
<b>Action / status:</b>	Forced alarm cooling cycle  Reset



**Alarm:** E63

**Alarm description:** Compressor automatic thermostat

**Fault condition:** Incongruence between compressor sensing and relay driving

**Possible fault:** Thermostat defective  
Compressor defective  
Wiring or main board defective

**Action / status:** Alarm stored in memory  
Disable compressor  
After n trials generates E63


**Alarm:** E64

**Alarm description:** Compressor sensing failure

**Fault condition:** Incongruence between compressor sensing and relay status

**Possible fault:** Main board defective

**Action / status:** Cycle stopped  Reset

<b>Alarm:</b>	E65
<b>Alarm description:</b>	Main Fan relay failure
<b>Fault condition:</b>	Incongruence between main fan sensing and relay driving after n trials
<b>Possible fault:</b>	Wiring or main board defective Relay defective
<b>Action / status:</b>	Forced alarm cooling cycle  Reset

<b>Alarm:</b>	E66
<b>Alarm description:</b>	Main fan automatic thermostat
<b>Fault condition:</b>	Incongruence between main fan sensing and relay driving
<b>Possible fault:</b>	Fan motor defective Wiring or main board defective
<b>Action / status:</b>	Alarm stored in memory Disable compressor After n trials generates E66


**Alarm:** E67

**Alarm description:** Main fan sensing failure

**Fault condition:** Incongruence between main fan sensing and relay status

**Possible fault:** Main board defective

**Action / status:** Cycle stopped  Reset

<b>Alarm:</b>	E71
<b>Alarm description:</b>	Drying NTC1 failure
<b>Fault condition:</b>	Voltage value out of limit (open circuit or short circuit)
<b>Possible fault:</b>	NTC defective Wiring or main board defective
<b>Action / status:</b>	Forced alarm cooling cycle  Reset

<b>Alarm:</b>	E72
<b>Alarm description:</b>	Drying NTC2 failure
<b>Fault condition:</b>	Voltage value out of limit (open circuit or short circuit)
<b>Possible fault:</b>	NTC defective Wiring or main board defective
<b>Action / status:</b>	No action

**Alarm:** E82

**Alarm description:** Wrong selector reset position detection

**Fault condition:** Reset position code read on selector out of power fail management

**Possible fault:** Main board defective

**Action / status:** Cycle stopped  Reset




**Alarm:** E93

**Alarm description:** Machine configuration error

**Fault condition:** Incongruent values on configuration data at power-on (checksum error)

**Possible fault:** Wrong configuration data on EEPROM  
Main board defective

**Action / status:** Cycle stopped  Reset

<b>Alarm:</b>	E94
<b>Alarm description:</b>	Cycle Configuration error failure
<b>Fault condition:</b>	Incongruence values on configuration data at power-on (checksum error)
<b>Possible fault:</b>	Wrong configuration data on EEPROM Main board defective
<b>Action / status:</b>	Cycle stopped  Reset


**Alarm:** E95

**Alarm description:** Communication error between microprocessor and external EEPROM

**Fault condition:** Error detected during external EEPROM data read/write

**Possible fault:** main board defective

**Action / status:** Cycle stopped  Reset

<b>Alarm:</b>	E97
<b>Alarm description:</b>	SCF – CTF mismatch error
<b>Fault condition:</b>	CTF file doesn't contain all programs specified into SCF file
<b>Possible fault:</b>	Wrong configuration
<b>Action / status:</b>	Cycle Stopped  Reset

<b>Alarm:</b>	EB1
<b>Alarm description:</b>	Power supply frequency out of limits
<b>Fault condition:</b>	Power supply period lower/higher than configured values
<b>Possible fault:</b>	Wrong or disturbed Power Supply line Main board defective
<b>Action / status:</b>	Cycle stopped by power fail management

<b>Alarm:</b>	EB2
<b>Alarm description:</b>	Power supply voltage too high
<b>Fault condition:</b>	MAIN_V sensing input voltage value on microprocessor to 5V
<b>Possible fault:</b>	Wrong or disturbed Power Supply line Main board defective
<b>Action / status:</b>	Cycle stopped

<b>Alarm:</b>	EB3
<b>Alarm description:</b>	Power supply voltage too low
<b>Fault condition:</b>	MAIN_V sensing input voltage value lower than configured value
<b>Possible fault:</b>	Wrong or disturbed Power Supply line. Main board defective
<b>Action / status:</b>	Cycle stopped by power fail management

# Markets & Volumes



<b>Country</b>	<b>Quantity</b>
<b>D</b>	<b>10000</b>
<b>DK</b>	<b>3000</b>
<b>NL</b>	<b>4000</b>
<b>Scandinavia</b>	<b>3000</b>
<b>France</b>	<b>2000</b>
<b>Switzerland</b>	<b>5000</b>
<b>UK</b>	<b>3000</b>
	<b>30000</b>