General Specification

EWM2000 EVO / EWM3000 NEW
History: One family of washing machines with standardized components and electronic technology

- **EWM1000**
  - 1 electronic board solution, traditional, without display and without electronic pressure sensor

- **EWM1000 PLUS**
  - 2 electronic boards solution, traditional, with display and without electronic pressure sensor

- **EWM2000 EVO**
  - 2 electronic boards solution, Jet-system, with LCD-display and with electronic pressure sensor

- **EWM3000 NEW**
  - 3 electronic boards solution, Jet-system, with big and small LCD-displays and with electronic pressure sensor, weight Sensor, turbidity sensor and asynchron AC motor with motor control electronic
Appliances:

• Front loaded machines
• Top loaded machines
• Wash and drier machines
EWM2000 EVO / EWM3000 NEW

- Standardisation of electronic solutions:
- Same hardware components and solutions of EWM1000, 1000+ and 2000 EVO platforms.

- Use of new software concepts:
  - Full configuration of user interface devices (knobs, push buttons, leds)
  - Full configuration of the cycle: on external EEPROM are stored all steps composing the cycle; they include also motor rhythms, FUCS parameters, option behavior, ....
  - Standard Configuration DATABASE used for production and service purposes

- Use of the same software structure of EWM2000 EVO with introduction of new parts as:
  - BIG LCD User interface management
  - External motor management
New features:

• big and small LCD – Display
• memories for configured programs by the customer
• alternative with LED user interfaces
• water flow sensor
• turbidity sensor
• weight sensor
• introduction of @LINK application
• external EEPROM on LCD electronic for language memory
• real time clock
• multi sound buzzer
• infrared – interface
• 3 phases asynchronous AC motor (2 poles) with electronic control
• drum light: 5W/5V Halogen type on the door gasket
Technical data:

• 220...240V AC 50Hz
• 850 1600 rpm (EWM3000 NEW max. 1800 l/min)
• Heating power: 1950W
• Door lock: PTC- or IDOLO-door lock
• Jet-system
• Digital pressure switch with 2 or 3 contacts
• Analog electronic pressure sensor
• Universal AC motor and asynchronous AC motor for EWM3000 NEW
• 3- oder 4-chamber drawer
• Sensing of temperature: NTC-sensor
• Program selector with 16 positions (all known program selectors alternative)
EWM2000 EVO / EWM3000 NEW

Electrolux Jewels

Delta 3

AEG NEXXXT
Alternative the present big EWM3000 LCD user interface will be combined to EWM2000 EVO and EWM3000 NEW
1 mainboard box for

- EWM1000 PLUS
- EWM2000 EVO
- EWM3000 NEW
EWM2000 EVO / EWM3000 NEW

Main board
EWM2000 EVO / EWM3000 NEW

Sensor application
(same as EWM2000 Evo Platform)

1. Flow meter: water volume measurement (and safety usage under investigation)
2. Weight sensor: washing load weight measurement to be shown to the user. The information can be used to change program behavior. Sensor signal can be used also for better unbalance management (under investigation).
3. Turbidity sensor: possibility to change rinse behaviour of the program according to water turbidity measurement (add rinse or increase of water level)
Flow sensor:

**Caractéristics**

Sensor supply voltage 5V
Working field 0.2-10 bar
Water temperature +2 ÷ 80 degrees
Flowreading characteristic: Reed switch, magnet

This flow-meter consists of a magnetic turbine inserted in the water circuit and a sensor that counts the number of rounds done by the turbine (by reading the magnetic field).

The flow-meter could be integrated in the valve or standing alone in a specific adapter.

The sensor could be a reed contact or a Hall effect. The flow-meters are shown in Electrolux drawings, of which this specification forms an integral part.
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Schematics flow sensor

- Reed contact
  - 5V
  - 10K
  - 10nF
  - To impulse counter

- Hall effect sensor
  - 5V
  - 10K
  - 10nF
  - To impulse counter

Reed contact
Hall effect sensor
Flow sensor is used only in energy label programmes (for test institutes)

Advantages:

- exact water amount for energy label cycles
- right water amount is filled immediately
- time saving

Investigations for safety usage are in progress
Turbidity sensor:

Possibility to change rinse behaviour of the programme according to water turbidity measurement.

Sensor is placed in the hose to the tub after circulation pump.
Turbidity sensor wiring:

Sensor is active only during rinsing performance. The difference (sensor signal) of the clean water at the beginning of the first rinse and of the dirty water at the end of the first rinse is measured.

If the delta voltage is bigger than a defined value, then an additional rinse will be added.

• Sensor is active in cotton cycles only
• Not active in energy label programmes
• When rinse + is configured then sensor is deactivated
Weight sensor

The weight sensor is placed in the left dumper of the machine. It is a coil which is creating induction voltage while the tub is moving. 2mm movement means a weight of 7kg. The voltage signals of the sensor will be calculated to the weight values by the weight sensor electronic board, which is connected to the main board.

For the moment it is only planned to use this sensing to show the weight and the detergent dosing. For futur, maybe it can be used for a better unbalancing system.
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Introduction of INVERTER motor control and asynchronous motor

Motor control by MAGNETEK
Max. power 1KW

2 poles
Asynchronous motor by CESET (55mm stack)
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Asynchronous 3 phases motor with tacho generator

- no protector in motor windings (self protected cause when one phase is broken, motor will not work anymore)
- motor temperature lower compared to other AC motors
- motor speed will be controlled by frequency
- transmission ratio = 1 : 9.6
- motor has no brushes → longer lifetime
- max. spin speed: 1800rpm (1750rpm) in G20 (5kg drum)
  1600rpm in G22 (6kg drum)
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@LINK application
For EWM2000 EVO and EWM3000 NEW
with LCD-user interface

External BCU
EWM2000 EVO / EWM3000 NEW

- **A**: Electrolux Customers Portal
- **B**: Electrolux Intranet
- **C**: User connection in Internet
- **D**: Service connection in Internet
- **E**: SIMULATOR ON PC
- **F**: HRGW
- **G**: Powerline over Mains
- **H**: GSM MOBILE PHONE
- **I**: DATA and or SMS

The diagram illustrates the connection between various components, including the Electrolux Customers Portal, Electrolux Intranet, and User and Service connections in Internet, with various devices and data transmission paths.
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POWERLINE OVER MAINS

@LINK WM

Electronic Controller

Antinoise Filter

Internal Wiring

Electronic
Controller

Network Adapter
Manager (NAM)

DAAS

Dedicated
Functionality

Network Adapter
Manager (NAM)

EHS
Protocol Library

PD LAUNDRY

CTI - EC

ESSE-N / H.K.

August 2003
@LINK application:
A modem transmits data by the power cord to a special web interface.
The customer can use an internet connection with the machine.
The customer can monitor the status of the machine, can pause the machine, if there is a present alarm, or increase the delay start time.

Only the service engineer can replace the power cord of the machine with the @LINK application.
He must substitute the power cord of the machine and connect the DAAS connector to the main board.
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Control panel with small LCD display board

1 – display board assembly with LCD
2 – button support
3 – Buttons
4 – control panel and drawer handle
5 – selector knob
1 Programm - Drehwahlschalter
2 LCD – Display
3 Temperatur - Taste
4 Schleuderabwahl - Taste
5 Options - Taste
6 Auswahl - Taste
7 Bestätigungs - Taste
8 START / PAUSE - Taste
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Indication of the current programme
Status of correct selection/suggestions
Real day time
Cycle temperature
Selected option + menu
Spin speed + rinse hold + night cycle
Time when cycle is finished
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LCD display icons:

- Rinse hold
- Night cycle
- Extra rinse
- Energy saving
- Easy iron
- Setup
- Stains
- Prewash
- Delayed start
- Short/very short
Setup options:

- Memory 1
- Memory 2
- Memory 3
- Sound
- Rinses +
- Language
- Time regulation
- Contrast of LCD display
- Brightness of LCD display

With button 3 select the menu symbol, confirm with button 4. Press button 3, the following information appears sequentially.

To modify the selected choice press button 4.
For LCD display appliances only the 16 position selector is forseen
**Diagnostics system**

**Activation:**

1. Cancel the set programme and switch the appliance off.

2. Press START/PAUSE and the nearest button simultaneously and switch the programme selector to **first** position clockwise.

3. Hold the START/PAUSE and option buttons pressed till DIAGNOSTIC MODE appears or till the LEDs start flashing (about 5 seconds).

To exit the service cycle switch the appliance off, on and then off again.
Executed tests:

In this 1st selector position starts the User Interface test cycle; all led are lighted on sequentially, and pressing any key the correspondent led is lighted on.

Moving in clockwise direction, for any position there is a different tests:

- **Position 1**: User interface test cycle
- **Position 2**: Water load from wash compartment.
- **Position 3**: Water load from prewash compartment.
- **Position 4**: Water load from softner compartment.
- **Position 5**: Water load from 3rd valve.
- **Position 6**: Wash heater activation.
- **Position 7**: Spin phase at 250 rpm with water in the tub (leakage test).
- **Position 8**: Drain and spin phase at max. spin speed.
- **Position 9**: Drum positioning (for top-loaders).
- **Position 10**: Last alarm display and possible reset.
Demo Mode = cycle without water, heating, drain…

Activation:
1. Cancel the set programme and switch the appliance off.
2. Press START/PAUSE and the nearest button simultaneously and switch the programme selector to second position clockwise.
3. Hold the START/PAUSE and option buttons pressed till DEMO MODE appears or till the LEDs start flashing (about 5 seconds).

To exit from DEMO MODE switch off the appliance.

!!! Not for top load machine !!!
Activation:

1. Cancel the set programme and switch the appliance off.
2. Press START/PAUSE and the nearest button simultaneously and switch the programme selector to **third** position clockwise.
3. Hold the START/PAUSE and option buttons pressed till OPERATING HOURS appears or till the LEDs start flashing (about 5 seconds).
Display of the operating time on LED user interface

<table>
<thead>
<tr>
<th>1 →</th>
<th>2 →</th>
<th>3 →</th>
</tr>
</thead>
</table>
| Blank display for **two seconds** | The first pair of digits is displayed for **two seconds**:  
- thousands (6)  
- hundreds (5)      | The second pair of two digits is displayed for **two seconds**:  
- tens (5)  
- units (0)           |
Display of the operating time on LCD user interface

The operating time is displayed in the second line WORKING HOURS and the operating hours of the appliance are displayed where usually the end of cycle time appears.
EWM2000 EVO / EWM3000 NEW

Alarms

• Alarm management is the same like in EWM1000, EWM1000 PLUS and EWM2000.
• The display of alarms to the customer is still in discussion by quality and R&D departments.
  Show only alarms which cause safety problems!!!.
• For EWM3000 New, maybe some new alarms will be created.
Alarm management is active only during cycle execution (except for overload alarm, configuration alarms, voltage/frequency monitor alarms and some other particular alarms).

In normal user mode only the alarm family code is shown to the customer.

The complete alarm code can be read in the diagnostic mode only.

Alarms are displayed on the display and on end cycle phase led flashing many times correspondent to the alarm family code and on START/PAUSE Led the alarm number of the family (for example an E53 alarm is shown flashing 5 times 0.4s ON, 0.4s OFF with a pause of 2.5 seconds on END CYCLE led and 3 times on START/PAUSE led).

During the cycle the standard key combination is used to display the complete machine last alarm. Last alarm is memorized on the main board EEPROM in order to give to Service engineers the possibility to know the cause of the machine failure.
Display of the alarms to the user

The control of the alarms can be configured and therefore, according to the model, they can be totally or partially displayed to the user.

Following alarms are displayed to the user:

- Door not closed
  Please check
- No incoming water
  Check tap hose
- No drain
  Check hose/filter

The other alarms are not displayed to the user (the appliance stops). The service engineer can find the last alarm in position 10 of diagnostic mode.
## Components of the appliance

1. Electronic board
2. Suppressor
3. ON/OFF switch *(incorporated in the selector)*
4. AE1 Anti-boiling pressure switch
5. Door interlock
6. Heating element
7. AE2 Anti-boiling pressure switch
8. Anti-overflow pressure switch
9. Recirculation pump
10. Pre-wash solenoid valve
11. Wash solenoid valve
12. Drain pump
13. Selector
14. Control/display board
15. Analogic pressure switch
16. Thermal cut-out (motor)
17. Stator (motor)
18. Rotor (motor)
19. Tachometric generator (motor)
20. NTC temperature sensor

## Components of the PCB

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEL_TY</td>
<td>Bleach solenoid Triac</td>
</tr>
<tr>
<td>DOOR_TY</td>
<td>Door interlock Triac</td>
</tr>
<tr>
<td>DRAIN_TY</td>
<td>Drain pump Triac</td>
</tr>
<tr>
<td>REC_TY</td>
<td>Recirculation pump Triac</td>
</tr>
<tr>
<td>K1</td>
<td>Heating element relay</td>
</tr>
<tr>
<td>K2</td>
<td>Motor relay: clockwise rotation</td>
</tr>
<tr>
<td>K3</td>
<td>Motor relay: anti-clockwise rotation</td>
</tr>
<tr>
<td>K4</td>
<td>Motor relay: half-field power supply (models with higher spin at 1200 rpm)</td>
</tr>
<tr>
<td>MOTOR_TY</td>
<td>Motor Triac</td>
</tr>
<tr>
<td>PWELV_TY</td>
<td>Pre-wash solenoid Triac</td>
</tr>
<tr>
<td>WELV_TY</td>
<td>Wash solenoid Triac</td>
</tr>
</tbody>
</table>
EWM2000 EVO / EWM3000 NEW

EWM3000 WD

Acqua control variant

ESSE-N / H.K.
EWM2000 EVO / EWM3000 NEW

Programming and configuration:

The procedure is the same like in EWM1000 and EWM1000 PLUS. That means the service engineer will order configured main boards and user interfaces.
### Washing cycles

<table>
<thead>
<tr>
<th>Programme</th>
<th>Temperature (°C)</th>
<th>Number of rinses</th>
<th>Final spin (rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cotton</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>90</td>
<td>85</td>
<td>3</td>
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<tr>
<td>90E</td>
<td>67</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>60</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>60E</td>
<td>50 (*) (**</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>50/40E</td>
<td>44 (*)</td>
<td>2</td>
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</tr>
<tr>
<td>40</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>30</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>cold</td>
<td>20</td>
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</tr>
<tr>
<td><strong>Synthetic fabrics</strong></td>
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<tr>
<td>60</td>
<td>60</td>
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<tr>
<td>60/50E</td>
<td>42 (*)</td>
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<tr>
<td>50</td>
<td>50</td>
<td>3</td>
<td>Max. 900</td>
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<tr>
<td>cold</td>
<td>20</td>
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<tr>
<td><strong>Delicates</strong></td>
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</tr>
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<td>40</td>
<td>40</td>
<td>3</td>
<td>450/700</td>
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<td>30</td>
<td>30</td>
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</tr>
<tr>
<td>cold</td>
<td>20</td>
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</table>
**EWM2000 EVO / EWM3000 NEW**

**Washing cycles**

<table>
<thead>
<tr>
<th>Programme</th>
<th>Temperature (°C)</th>
<th>Number of rinses</th>
<th>Final spin (rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delicates</td>
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</tr>
<tr>
<td></td>
<td>cold</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Wool</td>
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<td>cold</td>
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<tr>
<td>Hand-wash</td>
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<td>30</td>
<td>35</td>
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<tr>
<td></td>
<td>cold</td>
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</tr>
<tr>
<td>Soak</td>
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</tr>
<tr>
<td>Rinses</td>
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<td>Max. 1600</td>
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<tr>
<td>Delicate rinses</td>
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<tr>
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<tr>
<td>Drain</td>
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</tr>
<tr>
<td>Spin</td>
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<td>Max. 1600</td>
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<tr>
<td>Delicate spin</td>
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<td>Max. 700</td>
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<tr>
<td>Mini</td>
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<td>30</td>
<td>Max. 1000</td>
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</tbody>
</table>
EWM2000 EVO / EWM3000 NEW

Finish