USER INTERFACE,
PROGRAMS
CT Common Timer (electromechanical) FS+BI+FI

FS: freestanding
BI: build-in
FI: fully integrated

Electromechanical timer
+ max. 4 push buttons (1 ON/OFF + max. 3 options)
Electronic Platforms
Process Software / User Interfacing

Platform – Process SOFTWARE
with respect to Functionality and Performance

single board electronics

multi board electronics

Built-in & FS
Fully integrated
Electronic Control
EDW1001 / EDW1100 FS+BI

DGN: transition of existing EDW1001 models to DIVA structure only by MLC (old PNC)!

1st stage: same as EDW1001 (“Minitronic”) already in use on pre-DIVA ZM and DGN models (6 programs or 5 programs + 1 option)

renamed EDW1100

2nd stage (est. Sep.-2003): EDW1001 new with logic of user and service modes aligned to new electronic platform

MODIFICATION
### Electronic Control
**EDW1500 FS+BI**

| **No of programs** | maximum 6 programs (or 5 + 1 option) direct selection  
|                   | max. 12 progr. sequential selection  
|                   | Number of push buttons max. 6  
|                   | max 32 LEDs (digit segments and other indications)  |
| **I/O elements**  | input & output in one box  
|                   | functional display 2.5 digits (without point)  
|                   | automatic programs with turbidity sensor  
|                   | turbo drying  
|                   | delay and remaining time display  |
| **key features**  | AAA with turbo  
|                   | AAB with active drying  |
| **best E-Label**  |  |
| **water**         | 12 l |
Electronic Control
EDW1003 FI Low / Mid Range

Pushbuttons with rubber cover

NO display, NO buzzer

<table>
<thead>
<tr>
<th>No of programs</th>
<th>max 6, direct program selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>key features</td>
<td>as EDW1100</td>
</tr>
<tr>
<td>best E-Label</td>
<td>AAA with Turbo</td>
</tr>
<tr>
<td></td>
<td>AAB with active drying</td>
</tr>
</tbody>
</table>
# Electronic Control

## EDW1503 FI High Range

| **No of programs** | maximum 6 programs (or 5 + 1 option) direct selection  
max. 12 progr. sequential selection  
Number of push buttons max. 6  
max 32 LEDs (digit segments and other indications) |
|-------------------|----------------------------------------------------|
| **I/O elements** | input & output in one box  
**functional display 2.5 digits (without point)**  
automatic programs with turbidity sensor  
turbo drying  
delay and remaining time display  
**buzzer** |
| **key features** | AAA with turbo  
AAB with active drying |
| **best E-Label** | 12 l |
## Electronic Control

### EDW2000 FS+BI High Range

#### Key Features
- **DGN**: transition of existing Easytronic/Easytronic+ models to DIVA structure with EDW2000 only by MLC (old PNC)!
- **No of programs**: max 8 (direct program selection), max 3 options per variant
- **Key features**:
  - Advanced automatic program
  - TURBO fan option
  - Double side user interface
  - More indicators (door, sprayarm, detailed program phases, ...)
  - 3 digit display (remaining and delay time)
- **Best E-Label**:
  - AAA with Turbo
  - AAB with active drying
EDW2000: Maximum Configuration

vertical key arrangement

horizontal key arrangement

LEGEND:
SZV  delayed start (Startzeit-Vorwahl)
RLA  program duration display (Restlaufzeit-Anzeige)
PAA  program phase indicator (Programmablauf-Anzeige)
HWA  information and warning indicators (H.-Warnanzeige)
EDW2000: Maximum Configuration

- Maximum number of warning LEDs:
  - SALT
  - RINSE AID
  - WATER
  - FILTER
  - DOOR
  - SPRAYARM
**Electronic Control**  
**EDW2500 FS+BI High Range**

Estimated end of 2003

| No of programs               | by push button or rotary (tbd)  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all DW programs selectable (displayed via LCD)</td>
</tr>
</tbody>
</table>

| key features                  | advanced automatic program  
<table>
<thead>
<tr>
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</tr>
<tr>
<td></td>
<td>more indicators (door, sprayarm, detailed program phases, ...)</td>
</tr>
<tr>
<td></td>
<td>costumized display with additional ALARM</td>
</tr>
<tr>
<td></td>
<td>background colour</td>
</tr>
<tr>
<td></td>
<td>multi language display</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>best E-Label</th>
<th>AAA with Turbo</th>
</tr>
</thead>
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<td></td>
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</tr>
</tbody>
</table>
Identification of Controls by PNC

ZM 60cm only

9 1 1 9 a b x x x

9 = 60 cm

1 = FS
2 = BI
3 = FI
4 = FSBU (built under)

1 = CT 1 push button
2 = CT 2 push buttons
3 = CT 3 push buttons
4 = CT 4+ push buttons
5 = EDW1001/1003
6 = EDW1500/1503
7 = EDW2000/2003
8 = EDW2500/2503
Electronic improvement program

- Improvements in I/O functionality starting with EDW1500 and EDW2000 platform
  - Program has started and is running
    (machine works, feedback that program has started)
  - Program reset
  - Program running indication
  - Duration time display (for digital display)
  - Installation setting (water hardness,....)
  - Failure indication
    - Common failure codes for all platforms, partly aligned to washing machine
  - Meaning of program names
User Mode

Program Start

- **Previous situation**
  - Press program button – cycle phase indicators are flashing for approx. 7 seconds - then DW starts.

- **New approach**
  - Press program button – program starts after 3 sec. Drain pump will start immediately to indicate acoustically that machine is acting
Step 1: switch on dishwasher

Step 2: select the program

Step 3: program is running
User Mode

Program Reset

➢ Previous situation.
  ➢ Press button for selected program - corresponding lamp remains on for approx. 3 seconds, then program is cancelled.

➢ New approach
  ➢ To RESET a cycle (after DW has started) the user has always to push the same two push buttons (always S2 and S3) for 2 secs, regardless of the selected program.
  ➢ This is additionally indicated by
    ➢ printing on panels with horizontal push buttons
    ➢ sticker on the panel for all DW
Program Reset

Step 1:
Program is running

Step 2:
RESET
always push 2nd and 3rd button

Step 3:
program is finished, dishwasher in starting position
User Mode
program running ⇔ Alarm

On some design variants only:
only LED END red,
all other LEDs green

constantly on

constantly on
pulsing while program is running

MODIFICATION

flashing if ALARM
(constantly on)

flashing if ALARM
(here: alarm code „1“)

constantly on
Program running indication

MODIFICATION

the program phase LED is pulsing constantly on

→

Program running

<table>
<thead>
<tr>
<th>On</th>
<th>Off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 sec. 0,4 sec.

On

Off
Program failure (alarm) indication

- The selected program LED is flashing for 0.5 seconds.
- The "END" LED is flashing for 0.5 to 5 seconds.

Diagram: Alarm

- The selected program LED is flashing.
- The "END" LED is flashing.
User Mode
Program Duration Adjustment

Program phase
- Start
- Pre wash
- Main wash
- Rinse
- Hot rinse
- Drying
- End

Reaction of display by program start
Correction of max 1min per phase

Reaction of display during program
WAIT

Ideal program
Real program

Time
User Mode Logic

User Mode
- Press ON/OFF button
- Select program
- If needed select option button (e.g. time delay)

Installation Mode (for regeneration level etc.)
- Press ON/OFF button
- Press push buttons No. 2 and 3 for 2 sec.
- Select specific installation function
Program Potential

Soil / power

- heavy and more soil
- fresh and less soiled

E-Label class A

Automatic program

- Normal
- Normal 1/2 load
- Glass
- Quick
- ELR
- Superwash
- E-Label"
Automatic Program(s)

- DGN models with EDW2000 originating from an older Easytronic plus with 2 automatic programs - e.g. AUTO 65° and AUTO BIO 50° - must keep both programs (same PNC! different MLC!)

- all other models with EDW1500/1503/2000 will have only one NEW automatic program, if any
New Automatik Program

Program selection

Control System

Fuzzy logic

detection of half or full load

Turbidity sensor

measurement of turbidity in the water

Turbidity sensor

measurement of turbidity in the water
Fuzzy Logic Load Detection

Parts of the program will be influenced actively by detection of 1/2 load

- reduction of duration in cleaning
- reduction of temperature in cleaning

Heating speed (TGrad)
- 17 with rotary slide
- 18 without rotary slide

Limit for loading detection
Value is stored in EEPROM as reference taken for "standardized" conditions

Detection of 1/2 load
Detection of full load

Water temperature

Time in sec.

Phase 1
Phase 2

Heating on
Heating off

Electrolux Service

ESSE-N / A.S.

March 2003
Fuzzy Logic Turbidity Sensor

Measurement of turbidity in cleaning cycle (Dirty_1) and in intermed. rinse (Dirty_2)

- Average value of each stored in EEPROM
- According measured value of turbidity adjustment of cycle
  - If value for turbidity in pre wash phase lower Dirty_1:
    - pre wash: will be included with an additional draining
    - cleaning: increase of rinse temperature and time.
  - If value for turbidity in intermed. rinse phase below Dirty_2:
    - additional rinsing will be included
New AUTO Program

temperature reduction in main wash

- full load and dirty water: 65°
- full load or dirty water: 55°
- 1/2 load and not dirty water: 50°
# New AUTO Program Data Table

<table>
<thead>
<tr>
<th></th>
<th>water</th>
<th>energy</th>
<th>time</th>
<th>Prewash</th>
<th>Mainwash</th>
<th>1. intermed. rinse</th>
<th>2. intermed. rinse</th>
<th>Final rinse</th>
<th>Drying</th>
</tr>
</thead>
<tbody>
<tr>
<td>If full load <strong>and</strong> very dirty water</td>
<td>19,0 L</td>
<td>1,45 kWh</td>
<td>105 min.</td>
<td>yes 10 min.</td>
<td>65°C 36 min.</td>
<td>yes 7 min.</td>
<td>yes 5 min.</td>
<td>70°C 23 min.</td>
<td>yes 24 min.</td>
</tr>
<tr>
<td>If full load <strong>and</strong> dirty water</td>
<td>15,5 L</td>
<td>1,35 kWh</td>
<td>97 min.</td>
<td>yes 10 min.</td>
<td>65°C 36 min.</td>
<td>yes 7 min.</td>
<td>no</td>
<td>70°C 20 min.</td>
<td>yes 24 min.</td>
</tr>
<tr>
<td>If full load <strong>and</strong> not dirty water</td>
<td>11,5 L</td>
<td>1,20 kWh</td>
<td>92 min.</td>
<td>no (8 min.)</td>
<td>55°C 31 min.</td>
<td>yes 7 min.</td>
<td>no</td>
<td>70°C 22 min.</td>
<td>yes 24 min.</td>
</tr>
<tr>
<td>If 1/2 load <strong>and</strong> dirty water</td>
<td>14,5 L</td>
<td>1,00 kWh</td>
<td>87 min.</td>
<td>yes 10 min.</td>
<td>55°C 28 min.</td>
<td>yes 5 min.</td>
<td>no</td>
<td>70°C 20 min.</td>
<td>yes 24 min.</td>
</tr>
<tr>
<td>If 1/2 load <strong>and</strong> not dirty water</td>
<td>10,5 L</td>
<td>0,95 kWh</td>
<td>84 min.</td>
<td>no (8 min.)</td>
<td>50°C 25 min.</td>
<td>yes 5 min.</td>
<td>no</td>
<td>70°C 22 min.</td>
<td>yes 24 min.</td>
</tr>
</tbody>
</table>
New Glass Care Program

45°C in cleaning
(5 degrees higher than old DGN glass program, same temperature as old ZM glass program and therefore under any critical temperature).

😊 Better cleaning result

Keeping temperature in the washing phase to improve washing result

Soft cooling down
(by partial water exchange between the phases)

😊 no temperature shock for the glass

Low temperature of 60°C in final hot rinse
(much below the critical temperature for glass, which is 70 °C)

😊 for good drying results

Real drying phase 24 minutes (previous glass programs ZM and DGN had no drying phase)
New Glass Care Program

Program cycle
max. 73 minutes

Add detergent
30g or 1 Tab

Add rinse

Time

Water consumption 15 liter / Energy consumption 0.9 kWh

ESSE-N / A.S. March 2003
New Option “3in1”

- Option selected by push button, remains selected until button is pressed again (no automatic reset at end of program)
- Sets regeneration to lowest level, switches off Salt LED
- Switches off rinse aid dosage and Rinse Aid LED
- Program modifications:
  - all programs with short washing-phase (ELR, ..) will be about 5 to 7 minutes longer
  - all cold rinses are a „ultrashort rinse“, to improve carry over
  - hot rinse is set to 65°C or 68°C, if possible drying reduced 10 or 20 minutes
  - all energy label programs (AAX, BAB,...) will have a cleaning temperature of at least 55°C

Blue lid to make option visible
New Option “Sanitize”

- Option selected by push button
- Selectable with any program (automatic reset at end of program)
- Hot rinse temperature is set to 68°C
- This temperature is kept for at least 10 minutes
- Program duration longer, depending on „normal“ phase duration and temperature of selected program