



Rho 512R/312R

Service Manual – UV System

Edition 23.10.2015

Table of contents

1	About this document	4
1.1	Purpose and target group	4
1.2	Revisions	4
1.3	Symbols and markers.....	4
1.3.1	Structure of warnings.....	5
2	Micro Universal Controller (MUC).....	6
2.1	Controls/displays on the Micro Universal controller	6
2.1.1	Controls.....	6
2.1.2	Displays.....	6
2.2	Navigation within the controller menu	7
2.3	Controller menu level 1 (module 1/2).....	7
2.3.1	Display status of the UV bulb and the shutter.....	8
2.3.2	Manually resetting the operating hours of the UV lamp.....	8
2.3.3	Showing the status and fault messages	8
2.3.4	Displaying the EPS operating hours, number of switch-on procedures and the shutter movements	9
2.3.5	Display the controller parameters.....	9
2.4	Controller menu level 2 (EPS 1/2).....	10
2.4.1	Displaying the status of the EPS.....	10
2.5	Controller menu level 3 (lamp 1/2)	11
2.5.1	Displaying the status of the bulbs and fans	11
2.6	Controller menu level 4 (SubD 1/2).....	12
2.6.1	Displaying the input signals of the printer	12
2.6.2	Displaying the signals of the UV bulb and shutter.....	12
2.6.3	Displaying the exhaust air temperature and bulb voltage.....	13
2.7	Controller menu level 5 (Error Log).....	13
2.7.1	Displaying the error log.....	14
3	Maintaining the UV unit	15
4	Diagnostics	16
4.1	Measuring the UV intensity.....	16
4.2	MUC error codes.....	17

1 About this document

- u Make sure that this document is accessible at all times.
- u Insert all supplements received from Durst Phototechnik AG into this document.
- u Read and comply with this document and all other documents in the service documentation.

1.1 Purpose and target group

This document is part of the service documentation and contains information on the safe handling of the UV unit of the printer.

This information applies to printers of the Rho P10 200/250/HS range of Durst Phototechnik AG and should be referred to by the following personnel:





- n Durst service engineers (service engineer Durst group)
- n General service technicians (service technician distributor)
- n Trained customer's technicians (in-house technician)

1.2 Revisions

Edition of the document	What is new?
14.02.2014	First edition
19.05.2014	HS implemented
01.10.2014	Chapter "Measuring the UV intensity" added
06.05.2015	Possible solution for error message EPSx-TE added

Tab. 1: Revision index

1.3 Symbols and markers

Symbol	Meaning
ü	Pre-requirement for an action
u	Request for a single-step action
1.	Step within a request for a multi-step action
Ê	Result of an action sequence
	Note for easier or safer work
à	Cross-reference
 DANGER!	Immediately dangerous situation, where disregard of the safety measures will lead to death or serious injury.
 WARNING!	Potentially dangerous situation, where disregard of the safety measures may lead to death or serious injury.
 CAUTION!	Potentially dangerous situation, where disregard of the safety measures may lead to minor injury.

Symbol	Meaning
NOTE!	Potentially dangerous situation, where disregard of the safety measures may lead to damage to property.

Tab. 2: Symbols and markers

1.3.1 Structure of warnings

Warnings are structured as follows (shown here as an example: the warning level "WARNING"):



WARNING! Type and source of the hazard

Consequences of the hazard.

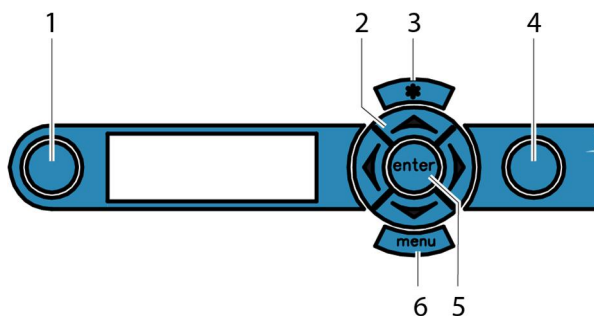
w Measures for avoiding the hazard.

u Read the warning and comply with it.

2 Micro Universal Controller (MUC)


2.1 Controls/displays on the Micro Universal controller

2.1.1 Controls

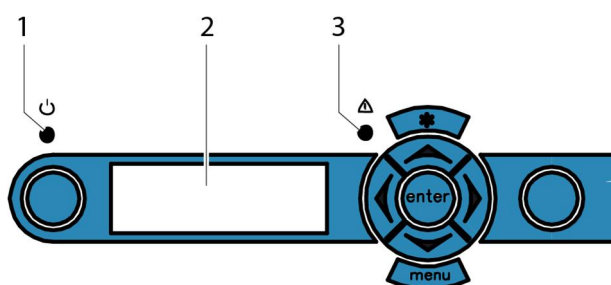


Number	Taste	Meaning
1	Lamp ignition	Switches both UV bulbs on and off
2	Arrow keys	Navigation within the controller menus
3	Reset	Resets the controller
4	Shutter actuation	Opens and closes both shutters
5	Enter	Confirms settings and selects them
6	Menu	Switches between the various controller menus

Tab. 3: Controller controls

 The "Lamp ignition" and "Shutter actuation" keys are not operational as long as the controller is receiving a signal from the printer.

2.1.2 Displays



Number	Meaning
1	Power supply LED
2	Display
3	Status LED

Tab. 4: Controller display elements

The status LED can show the following statuses:

Status-LED	Meaning
Off	Both UV bulbs are off
Flashing green	UV bulbs are switched on
Green	UV bulbs are ready
Orange	At least one shutter is open
Flashing red	Fault
Flashing red short-long	Fault, UV bulbs were switched off

Tab. 5: Status LED displays

2.2 Navigation within the controller menu

The **menu** button switches between the various controller menus:

Level	Function
1	Module 1/2
2	EPS 1/2
3	Lamp 1/2
4	SubD 1/2 (information about analogue and digital I/O signals)
5	Error Log

The **up** and **down** arrow keys allow navigation within the individual menus.

2.3 Controller menu level 1 (module 1/2)



Number	Meaning
A	UV lamp 1
B	UV lamp 2
1	Current EPS power
2	Line for status messages
3	Lamp hour counter
4	Shutter status
5	Lamp status

Tab. 6: Meaning of the controller menu level 1

2.3.1 Display status of the UV bulb and the shutter

Display	Meaning
()	Shutter closed
) (Shutter open
((Fault

Tab. 7: Status of the shutter

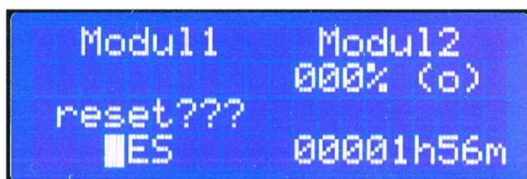
Display	Meaning
O	UV bulb off
W	Wait until the UV bulb is ready: UV bulb heating up
*	UV bulb ready
E	EPS fault: Fault in the EPS output
?	No ON signal from the EPS: EPS is on, but no OK to switch the UV bulb on
C	Cooling down: UV bulb is cooling down after use

Tab. 8: Status of the UV bulb

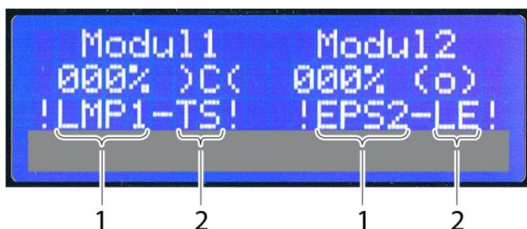
2.3.2 Manually resetting the operating hours of the UV lamp



1. Use the arrow keys to navigate the cursor to the display of the operating hours of the desired lamp.
2. Press the **enter** button.
3. Use the arrow keys **up** or **down** to change the display to YES.
4. Press the **enter** button.



2.3.3 Showing the status and fault messages



Status and fault messages consist of a fault group (1) and a fault (2).

Faults can be assigned to any one of the following three categories:

- n LMP = UV bulb fault
- n EPS = EPS fault
- n HMuC = MUC fault

2.3.4 Displaying the EPS operating hours, number of switch-on procedures and the shutter movements

- u In the controller menu level 1, press the **down** arrow key.

Number	Meaning
1	Shutter counter
2	ON counter
3	EPS hours

Number	Meaning
1	Shutter counter
2	ON counter
3	EPS hours

Tab. 9: Meaning of the controller menu (counter)

2.3.5 Display the controller parameters

- u In the controller menu level 1, press the **down** arrow key twice.

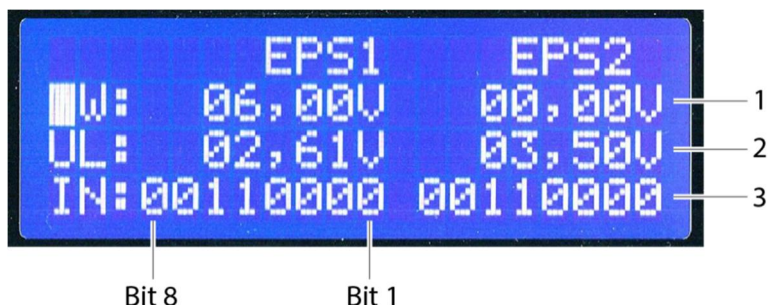
Number	Meaning
1	Controller serial number
2	Controller hour counter
3	Controller type
4	Software version
5	Controller inside temperature

Number	Meaning
1	Controller serial number
2	Controller hour counter
3	Controller type
4	Software version
5	Controller inside temperature

Tab. 10: Meaning of the controller menu (controller parameters)

2.4 Controller menu level 2 (EPS 1/2)

- Press the **menu** button until the controller menu level 2 is reached.



Number	Meaning
1	EPS set point voltage
2	Lamp voltage
3	Error status

Tab. 11: Meaning of the controller menu level 2

2.4.1 Displaying the status of the EPS

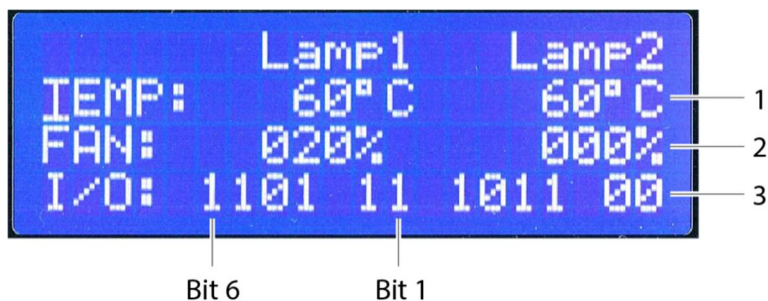
The following status signals can be displayed. Here 1 stands for active, 0 for not active.

Bit	Abbreviation	Description
8	MS	Master Slave error
7	SE	Sum error
6	READY	Lamp ready
5	ON	EPS is on
4	ÜTE	Temperature error
3	PE	Phase error
2	KE	Short/Ground error
1	LE	Lamp error

Tab. 12: Status signals for the controller menu level 2

2.5 Controller menu level 3 (lamp 1/2)

- Press the **menu** button until the controller menu level 3 is reached.



Number	Meaning
1	Lamp house exhaust temperature
2	Fan speed
3	Digital signals (input/output) to control lamp and fan

Tab. 13: Meaning of the controller menu level 3

2.5.1 Displaying the status of the bulbs and fans

The following status signals can be displayed. Here 1 stands for active, 0 for not active.

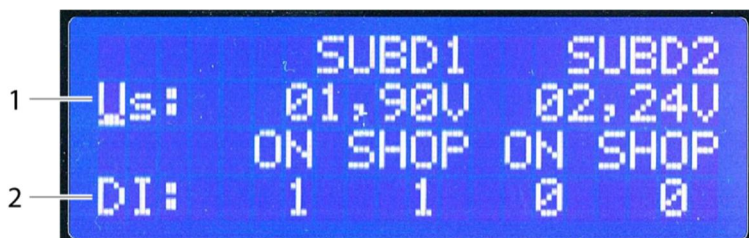
Bit	Abbreviation	Description
6	TS	Thermo switch
5	SO	Shutter open
4	SC	Shutter closed
3	FN	Fan OK
2	MV	Magnet valve/shutter
1	FS	Fan relay

Tab. 14: Status signals for the controller menu level 3

2.6 Controller menu level 4 (SubD 1/2)

2.6.1 Displaying the input signals of the printer

- u Press the **menu** button until the controller menu level 4 is reached.



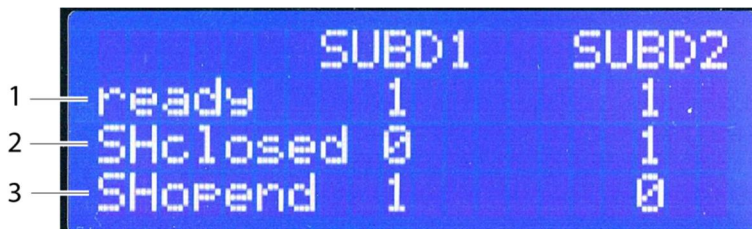
Number	Meaning
1	Input set voltage -int-: Internally controlled voltage
2	Logic bit input; 1 stands for active, 0 for not active ON: Lamp on SHOP: Shutter open

Tab. 15: Meaning of the controller menu (input signals)

The displayed values correspond to the input signals of the printer for UV bulb and shutter, and the specified input voltage for the bulb performance.

2.6.2 Displaying the signals of the UV bulb and shutter

- u In the controller menu level 4, press the **down** arrow key.



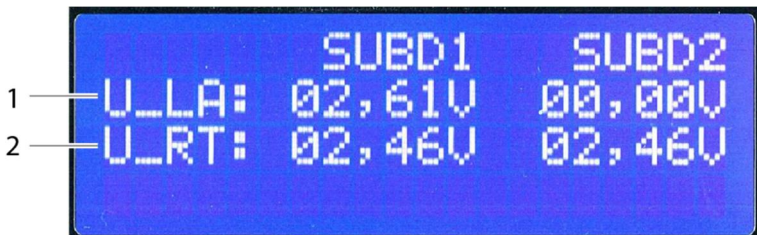
Number	Meaning
1	Lamp ready
2	Shutter closed
3	Shutter opened

Tab. 16: Meaning of the controller menu (signals UV bulb and shutter)

Here 1 stands for active, 0 for not active.
The values are forwarded to the printer software.

2.6.3 Displaying the exhaust air temperature and bulb voltage

- u In the controller menu level 4, press the **down** arrow key twice.



Number	Meaning
1	Lamp voltage Lamp voltage = U_LA*100
2	Lamp exhaust temperature (special scale)

Tab. 17: Meaning of the controller menu (UV bulb details)

The values are forwarded to the printer software.

2.7 Controller menu level 5 (Error Log)



Number	Meaning
1	Hour count at error detection
2	Error message
3	Page no. (0-19)
4	Error code (int. use)

Tab. 18: Meaning of the controller menu level 5

The last 60 fault messages are displayed in the error log. When new fault messages are received, the oldest messages are deleted if necessary.

All fault messages are stamped with the number of the operating hours at the time of the message.

2.7.1 Displaying the error log



Fault messages consist of a fault group (1) and a fault (2).

Faults can be assigned to any one of the following three categories:

- n LMP = UV bulb fault
- n EPS = EPS fault
- n HMuC = MUC fault

(Fehler! AutoText-Eintrag nicht definiert. Fehler! AutoText-Eintrag nicht definiert. 4, Fehler! AutoText-Eintrag nicht definiert. 16)

The latest software update is active and the controller is ready to use.

3 Maintaining the UV unit



If there are Maintenance questions on the UV unit: à User Manual 312R/512R.

4 Diagnostics

4.1 Measuring the UV intensity

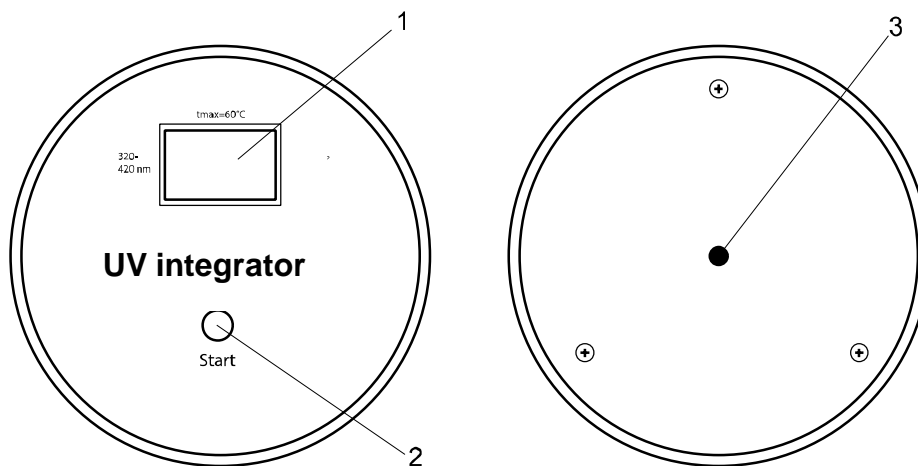


Fig. 1: Overview of the UV integrator

- 1 LCD-Display
- 2 Start button
- 3 UV probe

1. Load the roll medium with the following settings:
 - Thickness = Thickness of UV integrator + 8 mm
 - HMD 2 mm
 - Maximum UV intensity
2. Mask the media-detect sensor.
3. Start up the UV integrator by pressing the Start button (2).
4. Place the UV integrator on the transport belt with the rear of the device towards the UV bulb 2.
5. Select the **Test pattern** tab.
6. Check and if necessary adjust the following settings:

Area	Settings
Colors and Slots	Deactivate all
Print Quality Mode	Test pattern
Test pattern	Full Pattern
Heads	Deactivate all print head modules
Options	<input type="checkbox"/> High Resolution <input type="checkbox"/> Bidirectional <input type="checkbox"/> Check UV Lamps
Num. of Advances	1

Tab. 19: Measure the UV intensity settings

7. Press the **Expose** button.

8. Read the measured value for the UV bulb 2 from the LCD display (1). Repeatedly press the Start button (2) to zero the measured value display.
9. Repeat the procedure for UV bulb 1.

4.2 MUC error codes

Fault	Meaning	Possible Solution
LMPx-TS	Thermo switch	<ul style="list-style-type: none"> ⊔ Check the feedback of the thermo switch in the controller menu level 3 (Lamp 1/2) Thermo switch = 1 → OK Thermo switch = 0 → switch triggered/damaged
LMPx-S1	Shutter limit switches both=1	<ul style="list-style-type: none"> ⊔ Check the compressed air supply of the UV lamps.
LMPx-S0	Shutter limit switches both=0	<ul style="list-style-type: none"> ⊔ Check if the shutters open and close properly: <ul style="list-style-type: none"> – In the printer software: select the Other tab. – Open and close the shutters of each lamp and check the feedback in the controller menu level 3 (Lamp 1/2) ⊔ Check the position/function of the shutter limit switches.
LMPx-FN	Fan speed error	<ul style="list-style-type: none"> ⊔ Check if the fan is running when the lamp is on. ⊔ Check the power supply of the fan. ⊔ Check the function of the relais K3 and the protective switches Q3/Q4 on the connection of the UV system.
LMPx-TW	Temperature warning	<ul style="list-style-type: none"> ⊔ Check the function of the Lamp exhaust temp. sensor in the controller menu level 3 (Lamp 1/2) Temp: 0°C → Short/ground circuit Temp: --- → No sensor connected ⊔ Measure the resistance of the temperature sensor between the pins and between all pins and ground. ⊔ Change exhaust temperature sensor.
LMPx-KT	Lamp exhaust temp. sensor error (KTY-sensor)	
EPSx-TE	Temperature error	<ul style="list-style-type: none"> ⊔ Clean the ventilation slots of the EPS. ⊔ Check if the cooling fan of controller is working. ⊔ Check power supply (230 VAC) of EPS. ⊔ Check the function of emergency relais Q2 on the main connection of the printer (→ service manual Diagnostics). ⊔ Check the function of the relais K1/K2 and the protective switches Q1/Q2.

Fault	Meaning	Possible Solution
EPSx-KE	Short/Ground fault	<ul style="list-style-type: none"> ⊔ Check the connection of the UV-bulb inside the lamp housing. ⊔ Make sure that the cables of the UV-bulb are not pinched somewhere.
EPSx-PE	Phase error	Phase failure of one or more phases. Asymmetric power supply of the EPS. EPS power supply (230 VAC) too high/low.
EPSx-LE	Lamp error	<ul style="list-style-type: none"> ⊔ Check the connection of the UV bulb inside the lamp housing. ⊔ Change UV bulb.
EPSx-MS	Master/Slave error	
EPSx-SE	Sum error	
EPSx-NO	No EPS (On signal not confirmed)	<ul style="list-style-type: none"> ⊔ Check power supply (230 VAC) of EPS. ⊔ Check the function of emergency relays Q2 on the main connection of the printer (à service manual Diagnostics). ⊔ Check the function of the relays K1/K2 and the protective switches Q1/Q2.
HMuC-IC	Internal warning	<ul style="list-style-type: none"> ⊔ Restart the printer. ⊔ Change controller.
HMuC-TW	Temperature warning	<ul style="list-style-type: none"> ⊔ Check the controller inside temperature
HMuC-TE	Temperature error	<ul style="list-style-type: none"> ⊔ Clean the ventilation slots of the controller. ⊔ Check if the internal cooling fan of controller is working.

Tab. 20: Error codes UV system