



O P E R A T I N G  
M A N U A L

**slee** solutions  
for  
pathology

**MSM**

CAROUSEL SLIDE STAINER

DESIGN &  
MANUFACTURING  
MADE IN GERMANY



# CONTENTS

<b>1. INTENDED USE</b>	.....	<b>4</b>
<b>2. SYMBOLS</b>	.....	<b>4</b>
<b>3. SAFETY NOTES</b>	.....	<b>4</b>
<b>4. COMPONENTS</b>	.....	<b>5</b>
<b>5. SPECIFICATIONS</b>	.....	<b>6</b>
<b>6. UNPACKING AND INSTALLATION</b>	.....	<b>7</b>
<b>7. INITIAL OPERATION</b>	.....	<b>9</b>
<b>8. OPERATION</b>	.....	<b>15</b>
<b>9. MAINTENANCE</b>	.....	<b>32</b>
<b>10. SERVICE</b>	.....	<b>32</b>
<b>11. OPTIONAL ACCESSORIES</b>	.....	<b>33</b>
<b>12. WARRANTY</b>	.....	<b>34</b>
<b>13. DISPOSAL</b>	.....	<b>34</b>

## 1. INTENDED USE

The automatic carousel stainer MSM is intended for automatic staining of microscope slides for professional use in routine and research laboratories in the fields of biology, medicine and industry.

The standard version is equipped with 24 staining positions.

## 2. SYMBOLS



Dangers, warnings and cautions are marked by this symbol



Special instructions regarding the operation of the instrument are marked by this symbol

The Slee carousel staining machine MSM is provided with the following safety features:

		Standard	Optional Accessory
Instrument Safety	<b>Slide coupling</b>	●	
Process Safety	<b>Backup battery</b>	●	
User Safety	<b>Hood</b>		●
	<b>Carbon filter</b>		●
	<b>Electrical fan</b>		●

The institution which owns the unit and the persons working with the unit, servicing or repairing it have the responsibility for a hazard-free use.

### **ELECTRICAL POWER CONNECTION**

Do not use any extension lead.



Make sure that electric power is constant:

- This should be examined during installation of the unit by a competent person
- Use a dedicated fuse for the unit
- Do not connect another unit to the same power circuit.
- Before turning on the instrument, check if the voltage of the mains supply is identical with the name plate of the unit

Slee carousel staining machines are provided with the following standard components:

	MSM 24
<b>Operation Manual</b>	●
<b>24x staining cuvettes (360 ml, plastic)</b>	●
<b>1x transport basket (plastic)</b> Capacity of 30 standard micro slides	●
<b>Mains cable</b>	●

## 5. SPECIFICATIONS

### General

Nominal supply voltage	100 – 240 V AC +/- 10%
Nominal frequency	50 / 60 Hz
Power draw	110 VA
Protective class (1)	I
Power fuses	2 * T 6,3 A
Pollution degree (1)	2
Overvoltage installation category	II
Maximum heat emission	110 J/s
Operating temperature range	+10 to +35 °C
Operating humidity	max. rel. 80 % non-condensing
Storage temperature range	+5 to +55 °C
Storage humidity	max. rel. 80 % non-condensing

(1) According to IEC 1010, EN 61010

### Dimensions

[width x depth x height]

850 mm x 850 mm x 790 mm

### Weight

without accessories

80 kg

### Staining cuvettes

**Material**  
plastic

**Dimensions** [width x depth x height]  
130 mm x 40 mm x 135 mm

**Capacity**  
360 ml

### Transport basket

**Material**  
plastic

**Capacity**  
30 standard size micro slides

### Programming

Quick start  
20 staining programs  
Freely programmable

## 6. UNPACKING AND INSTALLATION

### 6.1 UNPACKING THE INSTRUMENT

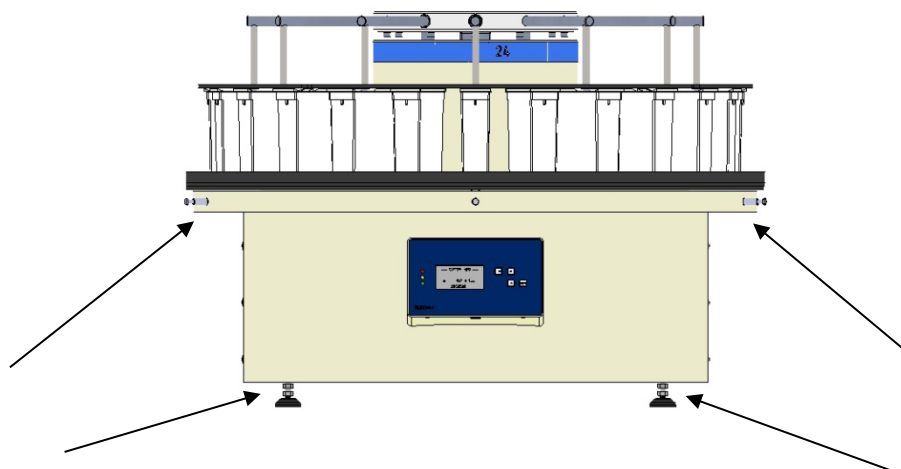
Remove the upper wooden cover.

Remove the upper supporting foams.

Lift the instrument out of the wooden transportation case.



Lift the instrument according to the photo only at the platform of the cuvettes or at the bottom of the instrument – never at the black turn table or at the arms.



For repacking use the original cases. Keep the packing material.

Place the instrument onto the selected bench.

### 6.2 INSTALLATION

The unit should be positioned onto a plane level surface.

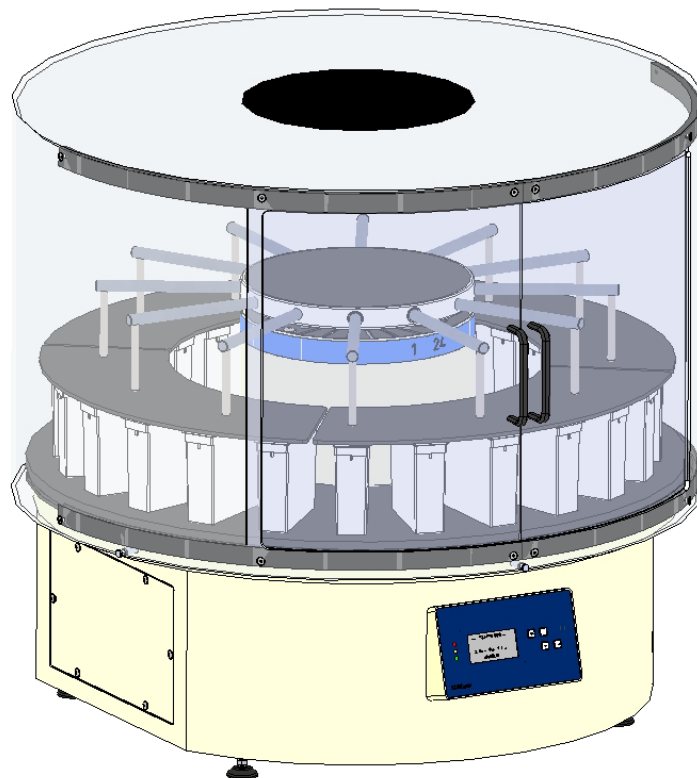
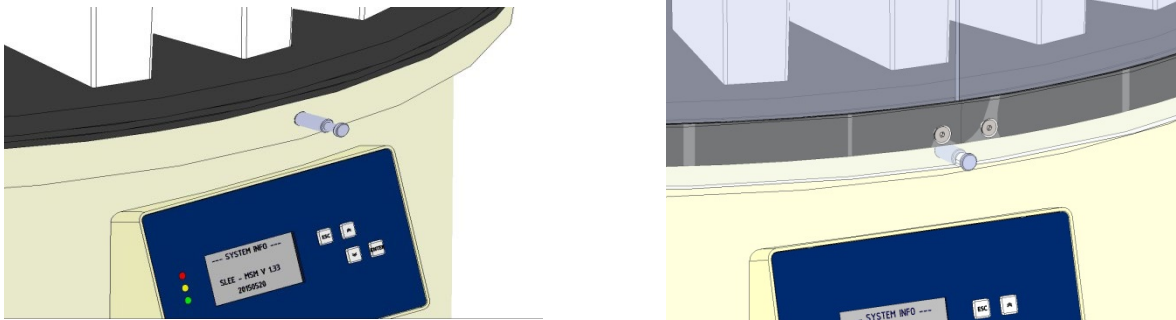
Leave enough space around the machine to place cuvettes or reagents for preparation.

Leave enough space at the back of the instrument for optional connection of exhaust air system.

### 6.3 INSTALLATION OF HOOD

In case of the option Perspex hood, it must be installed as follows:

Place the hood on the pins provided for this purpose and check whether it can be turned easily.






## 7. INITIAL OPERATION

### 7.1 STARTUP



To switch on the instrument, use the main switch at the backside of the unit.

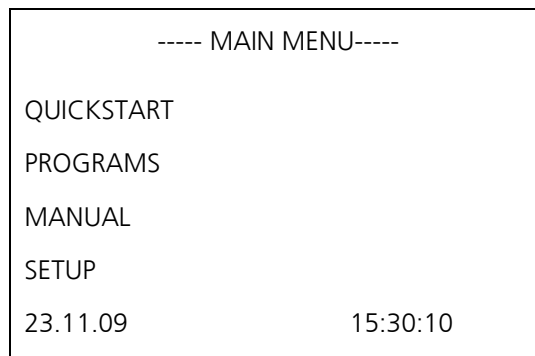
The display lights up and the instrument will ask for a reference drive.

Confirm by pressing .



The instrument will auto adjust the carousel.


The main menu is displayed.

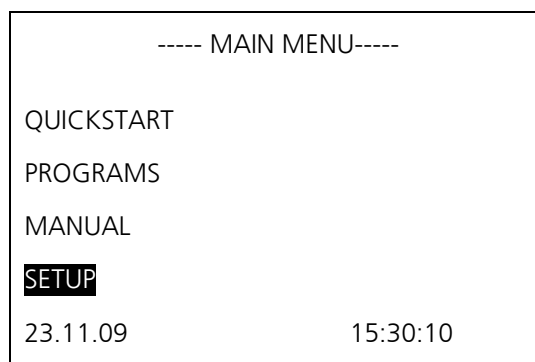
To move further down in the main menu list, press . To move up in the main menu list, press .



### 7.2 STANDARD SETTINGS

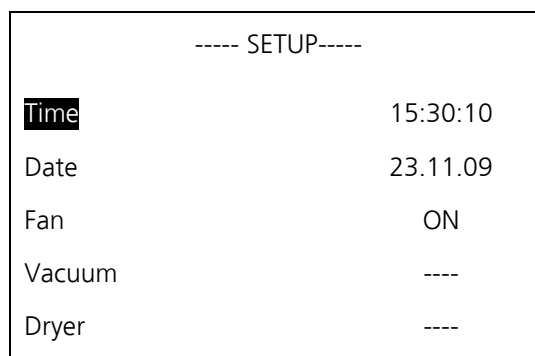
Select SETUP by pressing  or .

Press  to enter the settings menu




Select Time by pressing  or .

Press  to change the system time.




Select Date by pressing  or .

Press  to change the system date.



----- SETUP-----	
Time	15:30:10
<b>Date</b>	23.11.09
Fan	ON
Vacuum	----
Dryer	----


Select Fan by pressing  or .

Press  to change the operation of the fan.

[only applicable to instruments equipped with ventilation fan]



----- SETUP-----	
Time	15:30:10
Date	23.11.09
<b>Fan</b>	ON
Vacuum	----
Dryer	----


Select Vacuum by pressing  or .

Press  to change the operation of the vacuum system.

[not applicable to MSM instruments]

----- SETUP-----	
Time	15:30:10
Date	23.11.09
Fan	ON
<b>Vacuum</b>	----
Dryer	----


Select Dryer by pressing  or .

Press  to change the operation of the drying unit.

[only applicable to instruments equipped with a drying unit]


----- SETUP-----	
<b>Dryer</b>	ON
Def. End	Mon 08:00
Language	English
Contrast	14
Fan speed (open)	7

Select Default end by pressing  or .



Press  to change the default time for the program end.


----- SETUP-----	
Dryer	----
<b>Def. End</b>	Mon 08:00
Language	English
Contrast	14
Fan speed (open)	7




Select Language by pressing  or .

Press  to change the system language.



----- SETUP-----	
Dryer	----
Def. End	Mon 08:00
<b>Language</b>	English
Contrast	14
Fan speed (open)	7


Select Contrast by pressing  or .

Press  to change the contrast of the display.



The contrast can also be set in the main menu by pressing  and  or .


----- SETUP-----	
Dryer	----
Def. End	Mon 08:00
Language	English
<b>Contrast</b>	14
Fan speed (open)	7

Select Fan Speed (open) by pressing  or .

Press  to change the fan speed when the transport basket is lifted.

----- SETUP-----	
Dryer	----
Def. End	Mon 08:00
Language	English
Contrast	14
<b>Fan speed (open)</b>	7

Select Fan Speed (closed) by pressing  or .

Press  to change the fan speed when the transport basket is lowered into the reagent cuvettes during incubation.

----- SETUP-----	
Fan speed (open)	7
<b>Fan speed (closed)</b>	2
Temperatures	
Display System info	
System Configuration	

Select Temperatures by pressing  or .



The actual temperatures are displayed.

----- SETUP-----	
Fan speed (open)	7
Fan speed (closed)	2
<b>Temperatures</b>	
Display System info	
System Configuration	

Select Display System Info by pressing  or .

Press  to display system info.

----- SETUP-----	
Fan speed (open)	7
Fan speed (closed)	2
Temperatures	
<b>Display System info</b>	
System Configuration	

Select System Configuration by pressing  or .

Press  to enter system configuration menu.

[only applicable to service technicians]

----- SETUP-----	
Fan speed (open)	7
Fan speed (closed)	2
Temperatures	
Display System info	
<b>System Configuration</b>	

## 7.3 PREPARATION AND LOADING

### Preparation of reagents and staining solutions

Fill the staining cuvettes up to the filling mark on the inside.

### Loading of staining cuvettes

Load the filled staining cuvettes to their respective positions on the carousel.



Placement of filled staining cuvettes can be performed by moving the respective carousel position to the front end of the instrument (See MANUAL MODE)

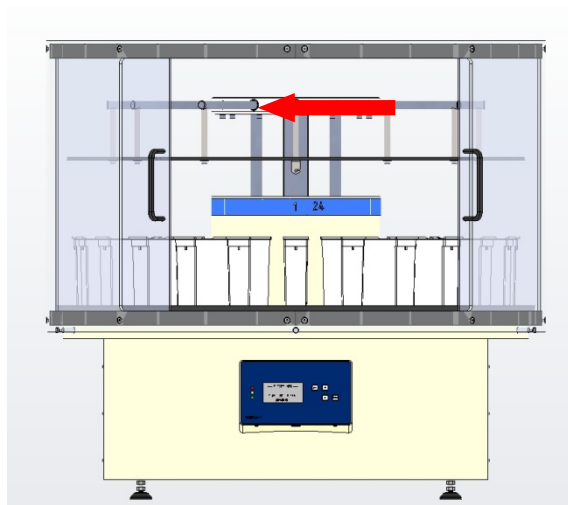
To prevent mix-up, the cuvettes are designated in numbers 1 to 24. Position each cuvette at its respective position displayed on the carousel.

## Loading of transport basket

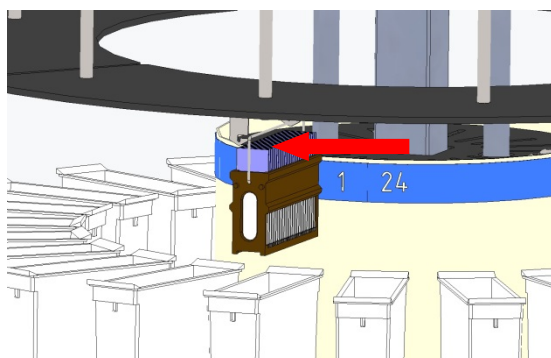
Load the transport basket with micro slides outside the instrument by positioning each micro slide with the labelling field upwards into the transport basket.

The transport basket can then be loaded to the instrument by placing it into the holder on one arm of the lifting unit.

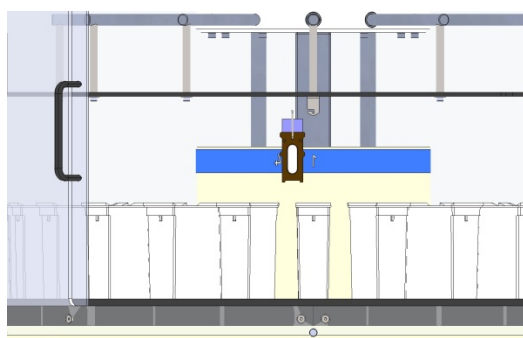
Check the correct positioning and orientation before starting a run.



Hang the slide holder into the holder of the lifting arm on the unit.





Place loaded transport basket into the holder of the lifting unit.




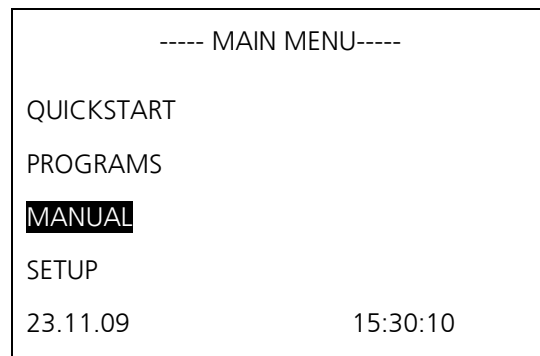
Correct positioning of transport basket in holder of the lifting unit.

## 8. OPERATION

### 8.1 MANUAL MODE

Select MANUAL OPERATION by pressing  or .

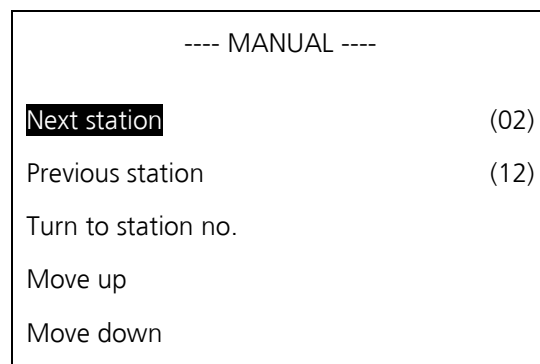
Press  to enter the manual operation menu.





Select Next station by pressing  or .

Press  to start the command.

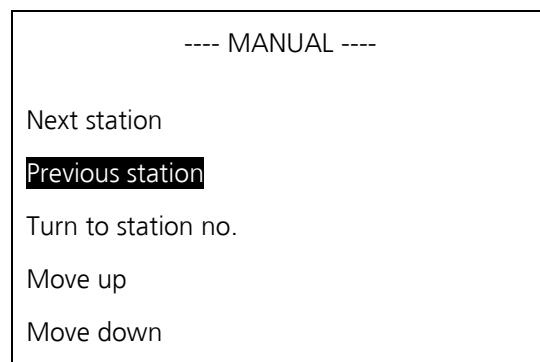
The carousel will move one position forward.









Select Previous station by pressing  or .

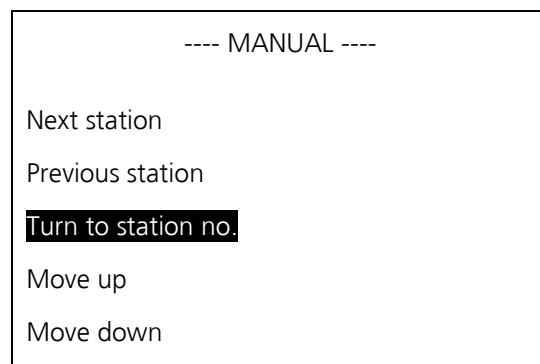
Press  to start the command.

The lifting unit will move one position back.



Select Turn to station no. by pressing  or .

Press  to select and select station no. by pressing  or . Press  to start the command. The carousel will move to the selected position.



Select Move up by pressing  or .

Press  to start the command.

The lifting unit will move up.

```
---- MANUAL ----  
  
Next station  
Previous station  
Turn to station no.  
Move up  
Move down
```

Select Move down by pressing  or .

Press  to start the command.

The lifting unit will move down.

```
---- MANUAL ----  
  
Next station  
Previous station  
Turn to station no.  
Move up  
Move down
```



The counter clockwise movement (see Right Turn) from position 24 to 1 is not possible and will be blocked by the system. To reach position 1, the turning table must be turned backwards (i.e. clockwise; left turn)

The movement of the turning table is not possible if the lifting unit is lowered.



## 8.2 QUICKSTART

In quick start mode all incubation times are equal for all positions.

### Step 1


Select Quickstart by pressing  or .

Press  to start the quick start menu.

---- MAIN MENU ----	
<b>QUICKSTART</b>	
PROGRAMS	
MANUAL	
SETUP	
23.11.09	15:30:10

### Step 2

Select No. of baskets by pressing  or .


Press  to change the number of transport baskets used in the run.

Changes are stored by pressing  again.

---- QUICKSTART ----	
<b>No. of baskets</b>	1
Exposure	00:05:00
Drip off time	00:10
Temperature	-- °C
Start	

### Step 3

Select Exposure by pressing  or .

Press  to change the incubation time in all staining positions.


Changes are stored by pressing  again.

(e.g. 5 minutes in this example)

---- QUICKSTART ----	
No. of baskets	1
<b>Exposure</b>	00:05:00
Drip off time	00:10
Temperature	-- °C
Start	

### Step 4

Select Drip off time by pressing  or .



Press  to change the dripping time above all staining positions.


Changes are stored by pressing  again.

(e.g. 10 seconds in this example)

---- QUICKSTART ----	
No. of baskets	1
Exposure	00:05:00
<b>Drip off time</b>	00:10
Temperature	-- °C
Start	

### Step 5

Select Temperature by pressing  or .

Press  to change the temperature for the drying station.


Changes are stored by pressing  again.

[only applicable to instruments equipped with this feature]

---- QUICKSTART ----	
No. of baskets	1
Exposure	00:05:00
Drip off time	00:10
<b>Temperature</b>	-- °C
Start	

### Step 6


Select Start by pressing  or .

Press  to start the run immediately.

---- QUICKSTART ----	
No. of baskets	1
Exposure	00:05:00
Drip off time	00:10
Temperature	-- °C
<b>Start</b>	

### Step 7



Select Delayed start by pressing  or .


Press  to change the end time of the run.

Changes are stored by pressing  again.

---- QUICKSTART ----	
Start	
<b>Delayed start</b>	
Used / Failsafe 01	01
Used / Failsafe 02	02
Used / Failsafe 03	03

### Step 8

Select Used / Failsafe for each position by pressing  or .


Press  to select those positions that shall be active and for each position the stop position if the system fails to finish the run.


Changes are stored by pressing  again.

---- QUICKSTART ----	
Start	
Delayed start	
<b>Used / Failsafe 01</b>	01
Used / Failsafe 02	02
Used / Failsafe 03	03

### Step 9

Select Jump to start by pressing  or .

Press  to change to the start command.

Press  again to start the run.

---- QUICKSTART ----	
Used / Failsafe 21	21
Used / Failsafe 22	22
Used / Failsafe 23	23
Used / Failsafe 24	24
<b>Jump to start</b>	

For discontinuation of the run, please refer to section 8.6.




During incubation times, the instrument will automatically mix by moving the slide holder up and down every 5 seconds.

At the end of the run, the basket will stay in incubation station 24 until the user moves it out.

## 8.3 SETTING AND STORAGE OF CUSTOMIZED PROGRAMS



### Step 1


Select Programs by pressing  or .

Press  to change to the Programs menu.

---- Main Menu ----	
Quickstart	
<b>Programs</b>	
Manual	
Setup	
23.11.09	15:30:10


### Step 2





Select Edit program by pressing  or .

Press  to change to editing mode for all programs.

---- Programs ----		
Prog.	01	Routine
<b>Edit program</b>		
Start (01:04:50)		
Delayed start		

### Step 3


Select Name by pressing  or .

Press  to change to editing mode for program name. Each letter or number can be changed by pressing  or . Press  to move to next letter.

---- Edit program 01 ----	
<b>Name</b>	Routine____
No. of baskets	1
Station 01	00:05:00
Station 02	00:00:15
Station 03	00:01:00

### Step 4


Select No of baskets by pressing  or .

Press  to change the number of baskets used.  
(only applicable for continuous loading option)

---- Edit program 01 ----	
Name	Routine____
<b>No. of baskets</b>	1
Station 01	00:05:00
Station 02	00:00:15
Station 03	00:01:00

### Step 5


Select Station 01 by pressing  or .

Press  to enter the editing mode for position 01.

---- Edit program 01 ----	
Name	Routine____
No. of baskets	1
<b>Station 01</b>	00:05:00
Station 02	00:00:15
Station 03	00:01:00

### Step 6

Select position by pressing  or .

Press  to enter the step position of the station.

In cases the station position is identical with the step position, the no. are identical.


If the program step is different from the station position the second no. is different.

(see step 11)

---- P 01 STATION 01 ----	
<b>Position</b>	01
Exposure	01:00:00
Drip off time	00:05
Temperature	___ °C
Failsafe pos.	01
Save	

### Step 7


Select Exposure by pressing  or .

Press  to change the incubation time for position 01.

---- P01 STATION 01 ----	
Position	01
<b>Exposure</b>	01:00:00
Drip off time	00:05
Temperature	___ °C
Failsafe pos.	01

### Step 8

Select Drip off time by pressing  or .

Press  to change the drip off time between movement from position 01 to the next position.

---- P01 STATION 01 ----	
Position	01
Exposure	01:00:00
<b>Drip off time</b>	00:05
Temperature	___ °C
Failsafe pos.	01

### Step 9

Select Failsafe pos. by pressing  or .

Press  to select those positions that shall be active and for each position the stop position if the system fails to finish the run.

---- P01 STATION 01 ----	
Position	01
Exposure	01:00:00
Drip off time	00:05
Temperature	___ °C
<b>Failsafe pos.</b>	01
Save	

### Step 10

Select Save by pressing  or .

Press  to save the entries for the selected position.

---- P01 STATION 01 ----	
Position	01
Exposure	01:00:00
Drip off time	00:05
Temperature	___ °C
Failsafe pos.	01
<b>Save</b>	

### Step 11

Select Station 02 by pressing  or .

Press  to enter the editing mode for position 02.

(Repeat Step 5 to Step 10 for all 12 resp. 24 stations)

In cases the station position is identical with the step position, the no. are identical.

If the program step is different from the station position the second no. is different.

---- Edit program 01 ----		
Name		Routine____
No. of baskets		1
Station 01	01	00:05:00
<b>Station 02</b>	02	00:00:15
Station 03	03	00:01:00

**Step 11a**

Example for different step and station positions.

In this case the basket moves from cuvette 2 into cuvette 3 and then in cuvette 1.

---- Edit program 01 ----		
Name		Routine____
No. of baskets		1
Station 01	02	00:05:00
<b>Station 02</b>	03	00:00:15
Station 03	01	00:01:00

**Step 12**

Select Save (01) by pressing  or .

Press  to save the entries in program 01.

---- Programs ----	
Station 22	00:05:00
Station 23	00:00:15
Station 24	00:01:00
<b>Save (01)</b>	
Save at ...	

**Step 13**



Select Save at by pressing  or .


Press  to select a program number under which you would like to store the afore changed entries.

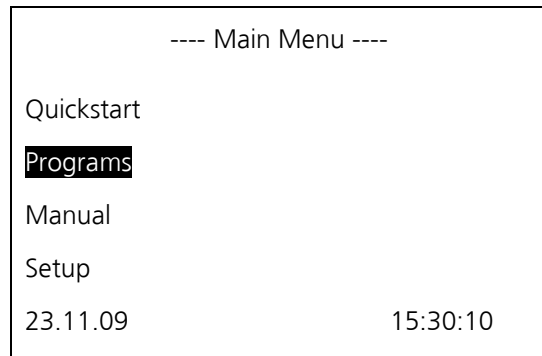
---- Programs ----	
Station 22	00:05:00
Station 23	00:00:15
Station 24	00:01:00
Save (01)	
<b>Save at ...</b>	

## 8.4 RUNNING A PROGRAMME



### Step 1

Select Programs by pressing  or .

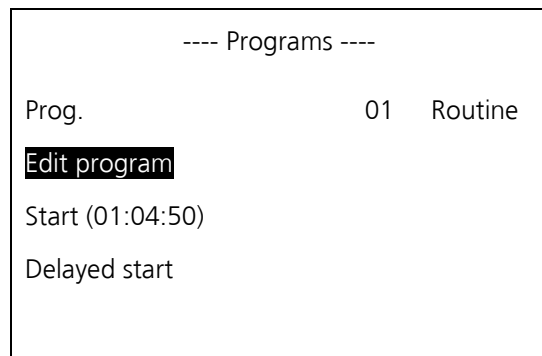
Press  to change to the Programs menu.



### Step 2

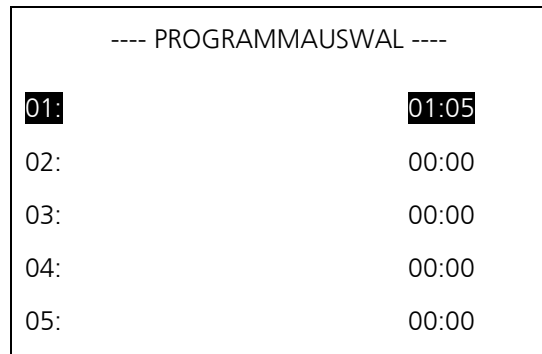
Select Prog. by pressing  or .

Press  to select the program.




### Step 3

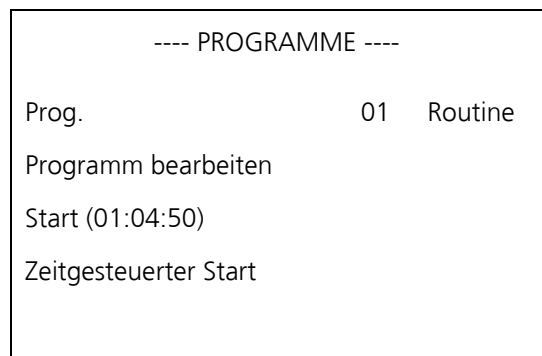
Select a program, which you want to start, by pressing  or . Press , to choose the selected program.



### Step 4

Select Start by pressing  or .


Press  to start the selected program.

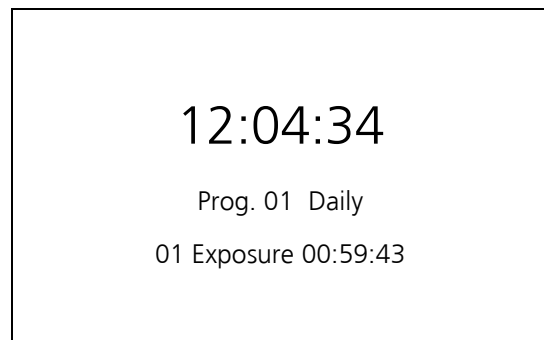
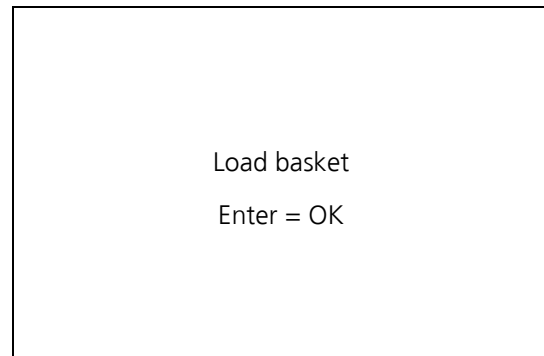




**Step 5**

Load the basket to the lifting unit.

Press  to start the run.



For discontinuation of the run, please refer to section 8.6.





During incubation times, the instrument will automatically mix by moving the slide holder up and down every 5 seconds.


At the end of the run, the basket will stay in incubation station 24 until the user moves it out.

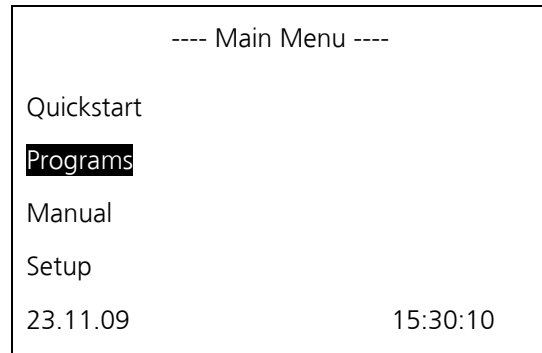
## 8.5 TIME DELAY

The instrument is equipped with a delay function that allows delaying the start of the run by a defined time.


### Step 1


Select Programs by pressing  or .

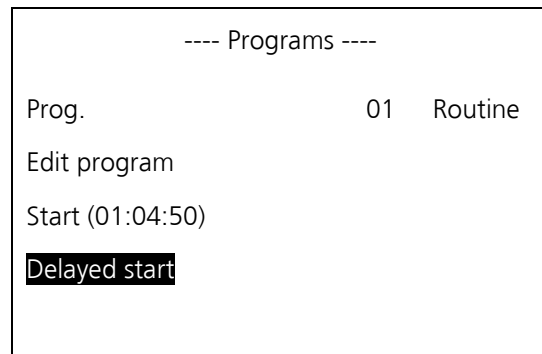
Press  to change to the Programs menu.





### Step 2


Select Delayed start by pressing  or .

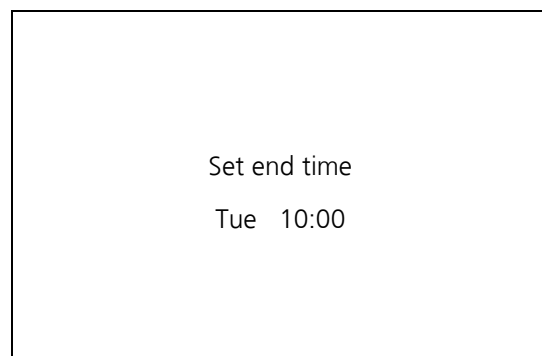
Press  to activate the delayed start function.



### Step 3

Change required end time of the run by pressing  or .

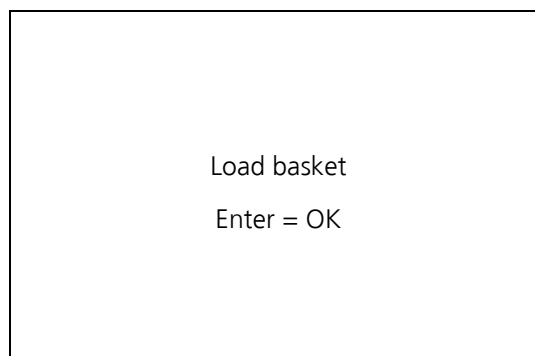
Press  to store the set time and progress with the start of the run.



#### Step 4

Load the basket to the lifting unit.

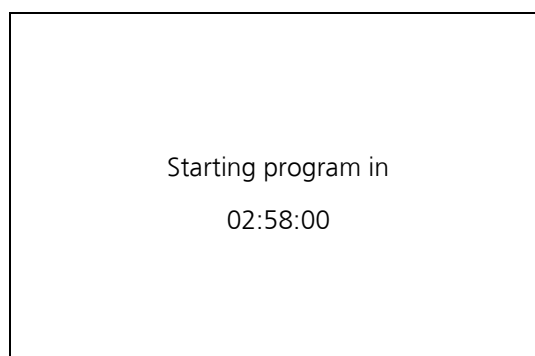
Press  to start the run.



#### Step 5

The display will show the starting time of the run.

(e.g. 2 hours and 58 minutes in this example)



For discontinuation of the run, please refer to section 8.6.

After start of a run, the settings for time delay will be reset to 00:00:00.

During incubation times, the instrument will automatically mix by moving the slide holder up and down every 5 seconds.

At the end of the run, the basket will stay in incubation station 24 until the user moves it out.


## 8.6 DISCONTINUATION OF A RUN

Press  to discontinue or interrupt a run.





### Step 1


Select Continue by pressing  or .

Press  to continue the run without discontinuation.

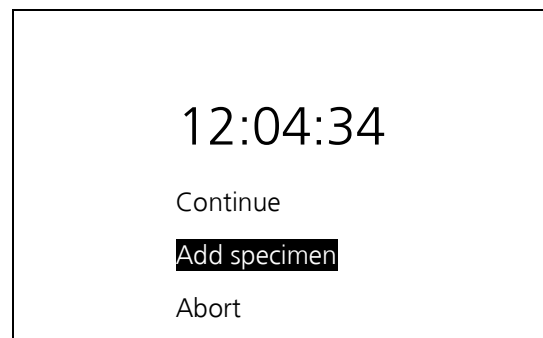


### Step 2



Select Add specimen by pressing  or .

Press  to lift the lifting unit temporarily to add a specimen and thereafter continue the run.

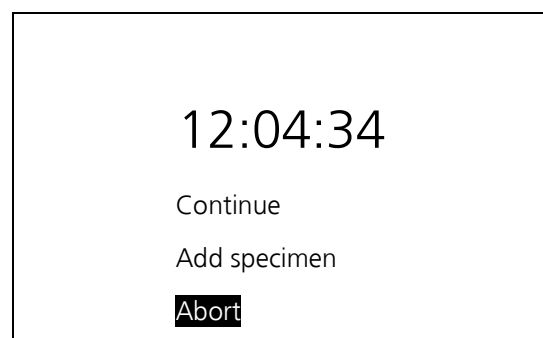
The display will guide you through the process.



### Step 3

Select Abort by pressing  or .

Press  to discontinue the run.



## 8.7 SHUT DOWN

To switch off the instrument, use the main switch at the backside of the unit.

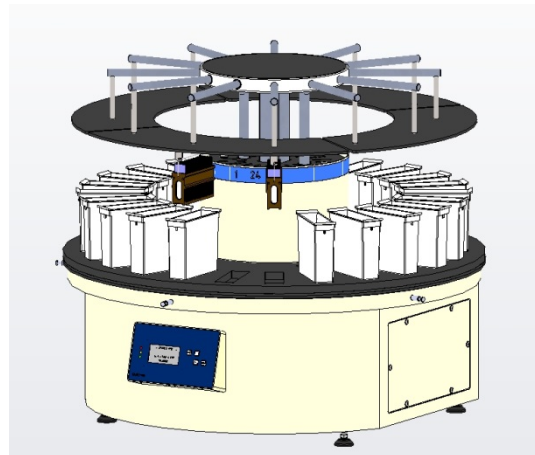
## 8.8 DOUBLE BASKET LOADING [only applicable to instruments equipped with this feature]

In this case the instrument is equipped with two holders for micro slide transport baskets on the lifting unit.

In the programming procedure, only one basket is indicated, but two baskets are loaded. In this case the preparation of the run starts with loading of all baskets to the lifting unit. The program will start to incubate the first basket in position 1 and so forth. The other basket will follow the procedure until it has passed the last position.

Please note that the number of incubation stations is reduced by two stations.

As each basket will be incubated in a different beaker, all incubation times must be equal when performing a double basket run.



Double basket loading in MSM 24. The number of incubation stations should be reduced by the last two incubation positions.

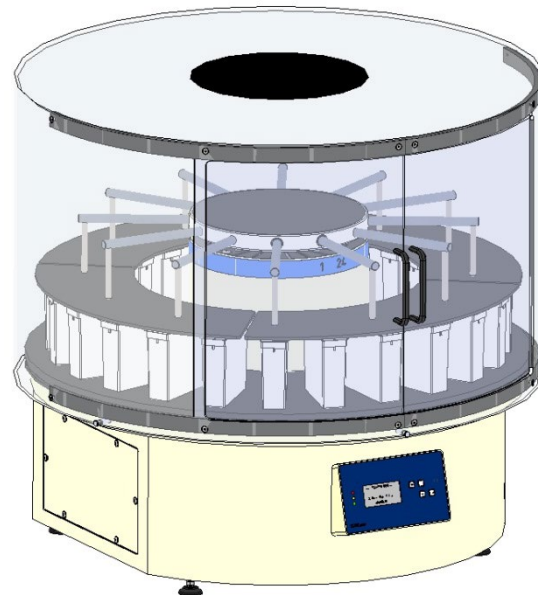
## 8.9 HOOD [only applicable to instruments equipped with this feature]

This option contains the plastic hood, a shield, some rollers and washers. It is a good safety feature and gives protection to customer and samples.

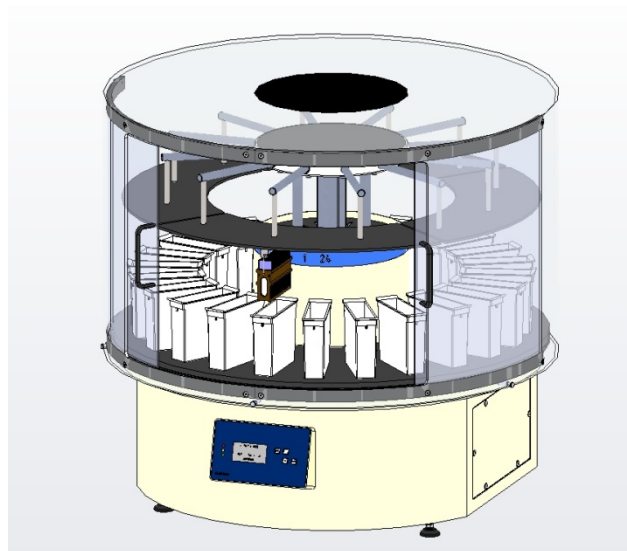
Please mount the shield with washers at the back of the instrument. Screw in the rollers and place the hood onto them.

During a run the opening can be placed to the back (shield) and the processor is closed, to refill baskets or cuvettes the opening can manually be turned towards the front.

The hood is mandatory for optional fume extraction system (see section 8.10).



Carousel staining processor MSM with closed hood.



Carousel staining processor MSM open for loading and unloading of instrument.

### **8.10 FAN / CARBON FILTER** [only applicable to instruments equipped with this feature]

For more safety (especially to remove vapours) the instrument can be directly connected to a central fume extraction system or be equipped with an optional fan (plus carbon filter). The fan can be activated in the menu adjustments and runs continuously at programmable speeds.

If the instrument is equipped with a carbon filter, the vapours are absorbed there. Otherwise the vapours can be blown into an already existing in-house system.

### **8.11 DRYING STATION** [only applicable to instruments equipped with this feature]

The instrument can be equipped with an additional drying station in position 1. If installed, a temperature for this position of up to 65 °C can be selected in the programming mode or short mode. The drying station can easily be installed and removed from the instrument.

## 9. MAINTENANCE

Besides regular cleaning, the instrument is basically maintenance-free.

For cleaning the unit only use alcoholic media, not acetone or xylene. For the hood it is best to use a commercially available cleaner for plastics. The hood should not come in contact with alcoholic or other solvents.



Never spray or use cleaning medium directly onto the touch panels.

Please take note of the safety aspects of the instrument.

Wear protective clothing and disposable gloves according to Good Laboratory Practices.

## 10. SERVICE

Internal components should only be serviced by technicians authorized by SLEE medical GmbH.

If technical service or spare parts are necessary, please contact your local SLEE medical GmbH distributor. Please have the following information available:

- Complete contact details
- Type of instrument and serial number
- Place of instrument and name of user
- Purpose of service call
- Delivery date of the unit

If it is necessary to return the instrument, it must be cleaned and disinfected before delivery. It must be returned in its original packing.

If the instrument or parts thereof are sent back in a dirty or non-disinfected condition, SLEE medical GmbH reserves the right to return the parts to the debit of the customer.



## 11. Optional accessories

### MSM

**Perspex hood**

#11000220

**Staining cuvettes** (360 ml, plastic)

#12000260

**Slide basket (30 slides, plastic)**

#12000261

**Twin option**

#12000260

**Drying Station**

#12000256

**Exhaust fan**

#11000210

**Exhaust fan including carbon filter**

#11000211

**Exchange carbon filter**

#11000254



## **12. WARRANTY**

SLEE medical GmbH guarantees that the product delivered has been subjected to a comprehensive quality control procedure, and that the product is faultless and complies with all technical specifications and/or agreed characteristics warranted.

SLEE medical GmbH guarantees that the instrument is manufactured under an ISO 9001:2015 and ISO 13485:2016 quality management system.

Unauthorized modification or repair by third party persons will void the warranty.

Only original SLEE medical GmbH spare parts must be used.

Guarantee claims can be put forward only if the instrument is used according to this manual and for the purpose described.

Mistakes and errors which occur because of improper use cannot be accepted.

## **13. DISPOSAL**

The instrument or parts of the instrument must be disposed of according to existing local applicable regulations.

**Notes**



SLEE medical GmbH · Am Neuberg 14  
55268 Nieder-Olm · Germany  
[www.slee.de](http://www.slee.de)

T: +49 (0) 6136 76997-0  
E: [mail@slee.de](mailto:mail@slee.de)



[www.slee.de](http://www.slee.de)



YouTube



LinkedIn



Instagram

