INTEGRA

DOSE IT Operating instructions

171250_V11

Declaration of conformity

INTEGRA Biosciences AG – 7205 Zizers, Switzerland

declares on its own responsibility that the device

Description	Model
DOSE IT P910	**171000**
Accessory	**171720**

comply with:

EU Directives	**Scope**	**Date effective**
2014/35/EU	Low voltage directive (LVD)	20.04.2016
2014/30/EU	Electromagnetic compatibility (EMC)	20.04.2016
2012/19/EC	Waste electrical and electronic equipment (WEEE)	14.02.2014
2011/65/EC	Restriction of hazardous substances (RoHS)	03.01.2013
EU Regulations	**Scope**	**Date effective**
1907/2006	Registration, evaluation, authorisation and restriction of chemicals (REACH)	01.06.2007
2019/1782	External power supply efficiency	01.04.2020
EU Standards	**Scope**	
EN 9001:2015	Quality Management	
EN 61010-1:2020	Safety general laboratory equipment	
EN 61326-1:2013	Electromagnetic compatibility laboratory equipment	
EN 60950-1:2013	Safety information technology equipment	
EN 62368-1:2021	Safety information technology equipment	

GBR Regulations	**Scope**	**Date effective**
S.I. 2016/1101	Electrical equipment safety	08.12.2016
S.I. 2016/1091	Electromagnetic compatibility (EMC)	08.12.2016
S.I. 2013/3113	Waste electrical and electronic equipment (WEEE)	01.01.2019
S.I. 2012/3032	Restriction of hazardous substances (RoHS)	02.01.2013
GBR Standards	**Scope**	
BS 61010-1:2010	Safety general laboratory equipment	
BS 62368-1:2020	Safety information technology equipment	
BS 63000:2018	Restriction of hazardous substances (RoHS)	

USA Regulations	Scope
47 CFR Part 15 (FCC)	Electromagnetic compatibility (EMC)
10 CFR Part 430	External power supply efficiency (CEC VI)
17 CFR Parts 240 & 249b	Dodd frank “Conflict minerals”
27 CCR Parts 25102-27001	Proposition 65: The safe drinking water and toxic enforcement act
TSCA 40 CFR Part 751	Toxic substances control act
USA Standards	**Scope**
UL 61010-1:2012	Safety general laboratory equipment

CAN Standards	Scope
CSA-C22.2 No. 61010-1	Safety general laboratory equipment

CHN Regulations	Scope	Date effective
AQSIQ Order 5 /2001	China compulsory certification mark (CCC) safety and EMC requirements for electrical equipment	01.08.2003
Order 32/2016	Restriction of hazardous substances (RoHS)	01.07.2016
CHN Standards	**Scope**	
GB4943.1-2011	Information technology equipment safety	
GB9254-2008	Information technology equipment radio disturbance	
GB17625.1-2012	EMC limits for harmonic current emissions	
SJ/T 11364-2014	Restriction of hazardous substances (RoHS)	

JPN Regulations	Scope	Date effective
PSE (Denan) Law	Electrical appliance and material safety law	01.01.2014

EAC Технический регламент Таможенного союза	
ТР ТС 004/2011	О безопасности низковольтного оборудования
ТР ТС 020/2011	Электромагнитная совместимость технических средств

Zizers, April 11, 2022

Urs Hartmann
CEO

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Head of Corporate Quality

Table of contents

1 Introduction

1.1 Intended use

This is a general-purpose laboratory instrument. Any use of this instrument in a medical or IVD setting is the sole responsibility of the user.

The programmable peristaltic pump DOSE IT is designed for pumping and dispensing liquids in a volume range of 0.1 ml to 9999 ml using silicone tubings.

If the DOSE IT is used in a manner not specified by INTEGRA, the protection provided by the DOSE IT may be impaired.

1.2 Symbols used

This operating instruction manual makes specific reference to residual dangers using the symbols shown below.

1.2.1 Hazard warnings in these operating instructions

WARNING
This safety symbol advises of hazards that could result in injury or death. It also indicates hazards for machinery, materials, and the environment. It is essential that you follow the relevant precautions.

CAUTION
This symbol cautions about potential material damage or data loss in a microprocessor controller. Follow the instructions.

NOTE
This symbol identifies important notes regarding the correct operation of the device and labor-saving features.

1.2.2 Hazard warnings on the device

ROTATING COG WHEELS
Risk to squash your fingers.

1.3 Safety notes

The DOSE IT conforms to the state of technology and the recognized safety rules, and is operationally safe. Operate the DOSE IT when in perfect conditions only and observing this user manual.

Residual dangers can emanate from the device if it is used or operated incorrectly by untrained personnel. All persons entrusted with operation of the DOSE IT must have read and understood this user manual and, in particular, the safety notes, or must have been instructed by their superior such that they are able to operate the device without danger.

Please observe the danger references on the device.

Do not carry out any conversion work or alterations on the device.

Irrespective of the safety instructions set out here, applicable provisions and regulations must be observed in addition; for example, GLP, GMP, FDA, of the employer's liability insurance associations, of the health authorities and of the trading standards authorities.

Please visit our website www.integra-biosciences.com on a regular basis for up to date information regarding REACH classified chemicals contained in our products.

2 Description of the device

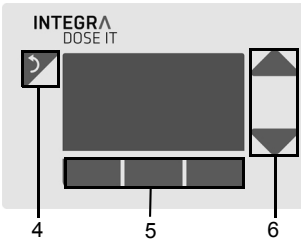
2.1 Scope of delivery

- DOSE IT P910 peristaltic pump
- Silicone tubing, autoclavable, 4 mm inner diameter (ID)
- 2x Aspiration/dispensing tubes 10 cm, stainless steel, 4 mm ID, one end dented
- Aspiration tube 35 cm, stainless steel, 4 mm ID, one end dented
- Tube collar
- Pipette-tubing connector
- AC adapter
- Operating Instructions

2.2 Overview of the DOSE IT

Front view

1 Housing
2 Operating panel with display and keypad
3 Pumphead



Operating panel

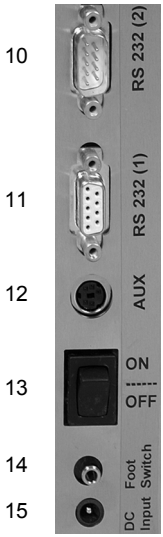
4 Back-key
5 Function keys
6 Arrow keys

Rear view

7 Screw threads for fixation of the retort rod

8 Handhold

9 Connections and mains switch (see below)



Connections and mains switch

10 RS-232 interface for connection with serial printer

11 RS-232 interface for service connection

12 AUX connection for controlling a second DOSE IT

13 Mains switch

14 Connection for foot switch, benchtop switch, MEDIAJET or external relay contact (potential free, normally open, 3.5 mm jack plug) for remote control

15 Mains connection socket

3 Installation

The DOSE IT is a ready-to-use peristaltic pump that requires only a minimal installation procedure. It shall be installed on a planar surface, in a dry and dust-free environment.

NOTE

Before proceeding with the installation compare the contents of the package with the list "2.1 Scope of delivery" on page 9. Should something be missing or should you find a faulty component, please contact your local INTEGRA Biosciences representative.

3.1 Power supply connection

Connect the AC adapter cable to the DOSE IT mains connection socket and plug it to the electricity mains.

WARNING

The supply voltage must meet the requirements of the AC adapter: 100-240 VAC, 50-60 Hz.

3.2 Retort rod and filling arm (optional)

Fix the retort rod with the two screws on the rear side, using a Phillips screwdriver (PH2), see "Screw threads for fixation of the retort rod" on page 10.

Mount the filling arm onto the rod and tighten it with the side lever in order to prevent it from moving during dispensing.

4 Operation

The DOSE IT operates in different modes: DISPENSE mode for distribution of a defined volume into containers and PUMP mode for continuous pumping of liquids. In addition, customized applications can be defined (software version 2.0 and higher).

4.1 Selection and loading of the tubing

4.1.1 Tubing selection

The pumphead of the DOSE IT is compatible with differently sized tubing allowing the user to dispense a wide range of dose volumes. The choice of tubing depends on the requirements for speed and precision of dosing. The larger the inner diameter (ID) of the tubing, the faster but less precise is the dispensing. As a reference for selecting the appropriate inner diameter of the tubing, typical volume and speed values for different tubing sizes are listed in Table 1.

Table 1: Typical volume and speed values

Tubing inner diameter (ID)	1 mm	2 mm	3 mm	4 mm	6 mm
Volume (ml) at CV* <1%	>0.5	>1	>3	>7	>15
Speed range (ml/min)	0.6–52	2.1–203	4.8–475	8.4–837	16–1634

* Coefficient of variation.

Precision in Table 1 is expressed as coefficient of variation (CV) and describes the scattering range of the single dispenses relative to the mean. To dispense with CV <1 %, search the table for the desired dosing volume (e.g. 5 ml, i.e. >3 ml) and read the appropriate tubing ID (e.g. 3 mm).

NOTE

The indicated volume values relate to the specified reproducibility and not to the actual limits of the system. The values have been determined experimentally for liquids with an viscosity of water (1 mPa s at 20 °C) and may vary slightly depending on the experimental set up.

For liquids with a different viscosity, the speed at which optimum precision (CV < 1%) can be achieved for a given tube diameter must be determined empirically, e.g. for a 50 % sugar solution start at half the maximum speed.

Compatibility with the pumphead and specified reproducibility can be guaranteed for original INTEGRA Biosciences' tubing only.

NOTE

8 mm ID tubing is only recommended for the "PUMP" program mode (for accuracy reasons, drips between the aliquots and draw backs in the tubing may be a problem).

4.1.2 Loading of the tubing in the pumphead

WARNING

Always switch off the DOSE IT when loading the tubing and when manipulating the open pumphead.

1 Open the pumphead

2 Adjust the tubing clamps

The jagged, V-shaped tubing clamps on both sides of the pumphead need to be adjusted and guarantee that the tubing does not slip when the rotor turns. The tubing clamps are set by adjusting the finger screws in such a way as to match the diameter of the tubing.

CAUTION

Do not adjust the tubing clamps according to the scale on the pumphead sides because the tubing will be unnecessarily squeezed and might be damaged. Also the pumping precision will be diminished. Use instead the adjustments described in Table 2.

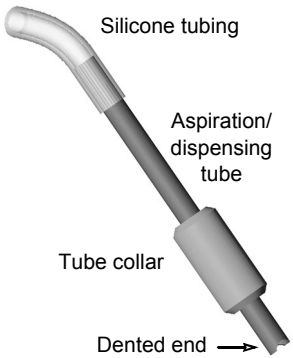
Table 2: Adjustments of the clamps for differently sized tubing

Clamp (head open)	Tubing ID	1.6-marking of clamps
	1 mm	between **3.2** and **4.8** scale values
	2 mm	matches the **4.8** value on the scale
	3 mm	matches the **6.4** value on the scale
	4–8 mm	**Completely open** the clamps as shown beside. Turn the finger screws right till the stop position.

3 Insert the tubing

Place the tubing over the rollers and center it so that it comes out of the pump head over the clamps on both sides. Close the pumphead and make sure that the tubing exits the pumphead unhindered and bending downwards. The tubing must not be bent upwards or towards the front or back.

4.1.3 Connecting the dispensing and aspiration tubes



The aspiration/dispensing tubes delivered with the DOSE IT facilitate the dosing process and are fitted on the end of the tubing. The aspiration tube is dented on one end in order to guarantee a free flowing of the liquid entering the tubing. Make sure not to insert the dented end of the aspiration tube into the silicone tubing.

The tube collar can either be screwed on the aspiration tube to weigh it down or to the dispensing tube as a spacer for use with a clamp.

4.2 Parameter settings

4.2.1 System parameters

System-Parameter	Description
Language	Set the desired language.
Time/Date	Set time and date.
Display contrast	Change the contrast of the display.
Access code	Provides user access restrictions to parameters.
Info	General information on the unit: • Version of the software • Version of the electronics • Serial number.

4.2.2 Program parameters

Some parameters described are not displayed in every program mode.

Parameter	Description	Range	Default
Name	Allows to name the program with up to 16 alphanumeric symbols. Press the arrow keys simultaneously to delete the program name.	-	-
Type	Defines the program mode: “PUMP” for continuous pumping of a liquid, “DISPENSE” for the dosing of liquids, or “CUSTOMIZE” to create a customized application.	Dispense Pump Customize	Dispense
Tubing-ID (mm)	Defines the Inner Diameter (ID) of the tubing.	1.0–8.0 mm	4.0 mm
Flow rate (ml/min)	Allows to set the pump speed. The flow rate depends on the tubing inner diameter.		
Time (h min s)	Defines the duration of the pumping. Entering 0 h 0 min 0 s puts the unit in continuous operation, which is represented by the infinite symbol (∞).	1"–9 h59'59" ∞	1h
Volume	Defines the volume of a dose in the dispensing mode.	0.01–9999 ml	10 ml
Repetitions	Defines the number of doses in the dispensing mode. Entering 0 results in an unlimited number of doses, which is represented by the infinite symbol (∞).	1–999 ∞	20

Parameter	Description	Range	Default
Pause	Defines the duration of the interval between doses in the dispensing mode. If switching to manual, the dispensing of a dose has to be activated manually.	0.1–99.9 s, manual	1.0 s
Direction	Defines the rotational direction of the rotor and hence the flow direction. ↻/CW means clockwise, ↺/CCW means counter-clockwise.	↻/CW ↺/CCW	↻/CW
Dispense direction	Defines the rotational direction for the step type "DISPENSE". For the step type "ASPIRATION" the rotor rotates oppositely.	↻/CW ↺/CCW	↻/CW
No. of heads	Defines the number of pump heads.	1, 2	1
Step 1–20	Defines single steps of a customized application.	1–20	-

Customize mode

The 'Customize' mode allows to program a customized application consisting of up to 20 single steps:

Step	Description	Parameter
Dispense	Defines the dosing of liquids analog to the program mode "Dispense". The rotational direction is defined by the parameter "Dispense direction'.	Volume Repetitions Flow rate Pause
Dispense Ramp	Defines dispensing with accelerating or decelerating speed, needed e.g. for density gradients. Just define the start and end flow to ramp the dispensing speed up or down. If the start flow is identical to the speed of the previous step, and the pause of the previous step is set to manual, the liquid can be dispensed without pause.	Volume Repetitions Pause Start flow End flow
Aspirate	Defines the aspiration of liquids analog to the program mode "Dispense" with opposite rotational direction.	Volume Repetitions Flow rate Pause
Aspirate Ramp	Defines the aspiration of liquids with accelerating or decelerating speed. Just define the start and end flow to ramp the aspirating speed up or down. If the speed of the following step is identical to the end flow, and the pause is set to manual, the DOSE IT continues without pause.	Volume Repetitions Pause Start flow End flow

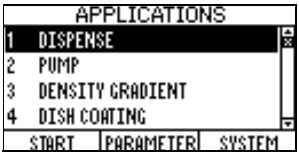
Step	Description	Parameter
Pump	Defines continuous pumping of a liquid.	Direction Flow rate Time
Wait	Defines the duration of the interval between two steps. Manual mode means that the next step has to be activated manually.	1"–9 h59'59" manual
Cycles	Defines the number of cycles of a sequence. A cycle always initiates a return back to a defined step, e.g. step 1. You can define several cycles within your customized sequence.	Number of cycles 1–999, Goto step ¥
-	No operation, used as default setup of step.	-

4.3 Adjusting the dispensing program

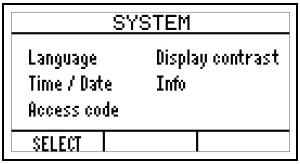
4.3.1 Choosing the language

NOTE

Because it is easiest to operate the DOSE IT by following the instructions on the screen, please select the language you are most familiar with.



1 Switch on the DOSE IT by pressing the mains switch at the back.
The APPLICATIONS window appears. The first four programs in the application list are already pre-defined with default values.



2 Press SYSTEM to access the SYSTEM window and set the language of your choice by accessing the LANGUAGE menu.
In the SYSTEM window you can also set the display contrast, the date and the time, and an access code, if required.

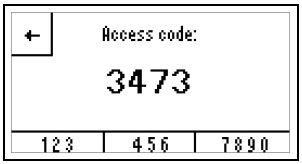
4.3.2 Access code

The DOSE IT system and parameter settings can be protected by a code, if activated (Access code required ON). Before any parameter changes can be performed, an access code must be entered. A standard user can only run defined programs.

Select the ACCESS CODE window and enter the default access code “3473” by typing the appropriate key until the correct number appears on the screen. Press the back-key.

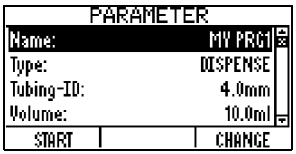
1 Select the line “Access code required” and press CHANGE. Use the arrow keys to select “Access code required: ON” and press SAVE.

2 For changing the Access code select this line and press SAVE.



3 Change the default access code to your personal code, if required. Enter the numbers by the arrow keys and select the digit with the function keys (←, →). Keep this code in a save place. Press SAVE.

4.3.3 Setting the dispensing parameters



1 Press the back-key to exit the SYSTEM window and to return to the APPLICATION window. Press PARAMETER to configure the program that is backlit.

2 Use the arrow keys to select the listed parameters and press CHANGE to set different values.

All parameters and their values are described in “4.2.2 Program parameters” on page 15.

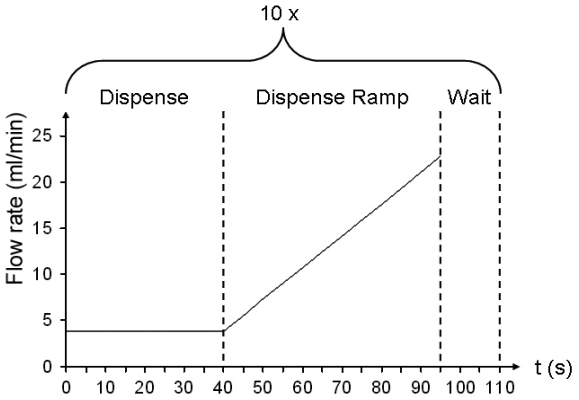
NOTE

The DOSE IT has a memory capacity for storing 20 programs, all of which can be configured according to your specific applications.

4.3.4 Defining a customized program

The following example of a customized program can be used to fill 10 density gradient tubes. The careful and continuous dispensing without pauses prevents stirring up of layers.

Parameter	Value	Description of settings
Name	Density gradient	Allows to name your customized program.
Tubing-ID	3.0 mm	Define the inner diameter of the tubing inserted.
Dispense Direction	↻/CW	Define the rotational direction of the rotor, e. g. clock-wise.
No. of heads	1	Define the number of pump heads installed.
Step 1:	Dispense	Volume: 2.5 ml Repetitions: 1 Pause: manual (here without pause) Flow rate: 3.8 ml/min (i.e. speed: 4.0 rpm).
Step 2:	Dispense Ramp	Volume: 12.5 ml Repetitions: 1 Pause: manual (here without pause) Start flow: 3.8 ml/min (i.e. speed: 4.0 rpm) End flow: 22.8 ml/min (i.e. speed: 24.0 rpm).
Step 3:	Wait	Manual, i.e. the next cycle starting with step 1 has to be activated manually by pressing NEXT STEP.
Step 4:	Cycles	Number of cycles: 10 Goto step: 1.

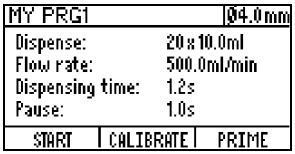


The figure depicts the customized program described above.

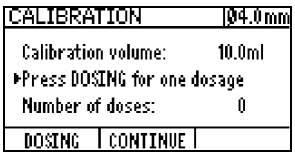
4.4 Calibrating the pump

NOTE

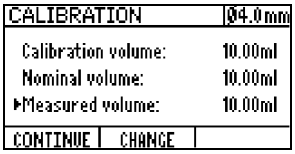
The calibration procedure tunes the pump to deliver a precise output. The output of the pump is determined by the tubing's inner diameter; therefore a calibration is necessary for tubing with different inner diameter. Also calibrate the pump after changing the fluid to be pumped. It is recommended to calibrate the pump at regular intervals to maintain its precision.



1 Select a program and press START to access the program window. Put the tubing end with the aspiration tube in the liquid that has to be dispensed and press PRIME to fill the tubing with liquid without bubbles.



2 Press the CALIBRATE button to enter the calibration dialogue window and DOSING to obtain a calibration sample. To reduce the measurement error it is possible to obtain up to ten such dosing samples (by repeatedly pressing the DOSING button).



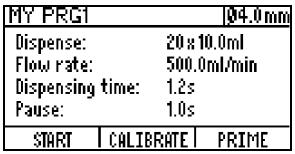
3 After one or more calibration samples have been dispensed and measured, press the CONTINUE button and enter the measured volume (CHANGE button). To end the calibration procedure press CONTINUE.

IMPORTANT NOTE

A calibration value is stored for each of the 20 programs that can be saved. Therefore a calibration for each of the 20 programs is necessary, even when the tubing inner diameter remains the same. Within each program, only the last calibration value is saved, hence calibrate whenever there is a change in the viscosity of the pumped liquid, of the flow rate or of the tubing inner diameter.

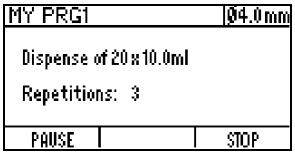
Each step within a customized program has to be calibrated separately.

4.5 Performing the dispensing process



1 In the APPLICATION window select a program and press START to access the program window. Press PRIME to fill the tubing with liquid until no more bubbles are in the tube and calibrate if necessary.

To begin dispensing, press START.



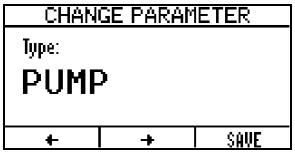
2 While dispensing, there are two possibilities to interrupt the process:

- PAUSE – the process is interrupted after completing the dispensing of the current dose.
- STOP – the process is interrupted immediately.

After interruption, the process can either be continued, aborted or parameters can be changed (the latter is not possible in the customize mode). If parameters have been changed, the user is asked to either save or discard the changes before exiting the program.

The completion of the program is announced by a beep and a message appears on the screen.

4.6 Working in PUMP mode



To continuously pump a liquid instead of dispensing it, change the TYPE-parameter from DISPENSE to PUMP. To set the other parameters follow the instructions described above and in “4.2.2 Program parameters” on page 15.

The calibration procedure in PUMP mode works as described above. Note that the calibration volume is indicated in the calibration window and that it varies depending on the tubing size and on the selected flow rate.

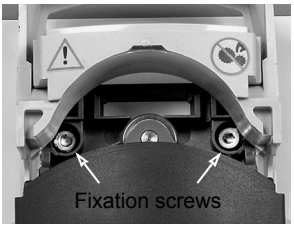
To use a pumping program, follow the instructions on the screen. Note that you can change the flow rate without interrupting the pumping by using the arrow keys (not possible within customized mode).

4.7 Using the double pumphead configuration (optional)

The DOSE IT can be used with a double pumphead and the corresponding 8 mm ID tubing set (171088) when it is necessary to quickly dispense large volumes. The double pumphead configuration also reduces flow pulsation.

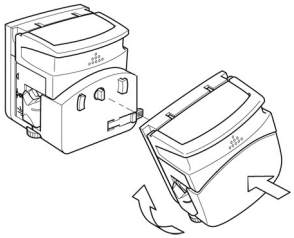
WARNING
Always switch off the DOSE IT when assembling the double pumphead configuration.

Be aware of the sharp edges of the pumpheads when assembling them and when opening and closing the first pumphead for tubing insertion.



1 Open the pumphead to gain access to the two fixation screws and unscrew the pumphead from the housing using an Allen key #3.

2 Fix the extension pumphead (171090) to the housing using the screws obtained after removing the original pumphead.



3 Assemble the two pumpheads by locking the original pumphead onto the extension pumphead. When turning the original pumphead in place, ensure that the lock mechanism engages with an audible click.

Important: The rollers of the two pumpheads must be out of phase in order to avoid excessive strain on the motor (torque limits) and to obtain a reduction in flow pulsation.

When placing the tubing set (171088) into the double pumphead assembly, gently stretch the tubing so that inside the pumphead the tubing is taut (avoid loading the tubing in a loose, slackened way).

WARNING
Visually inspect the tubing set Y-pieces for the absence of cracks in the glass. Cracked Y-pieces may burst during operation and shall not be used.

In the affected programs, change the parameter “No. of heads” before using the double pumphead configuration.

4.8 Process documentation (optional)

To document the dispensing and pumping performed with a DOSE IT, relevant data can be recorded either on paper or in an electronic text file. The following data – exemplified by a dispensing program – are recorded:

• At the start of the process

```
========================================
DOSE-IT (SN:00000000)

***Start dispense
Date/time:              02.11.2006/18:01

***Program settings
Name:                            MY PRG1
Tubing-ID:                         4.0mm
Volume:                           10.0ml
Repetitions:                          20
Pause:                             1.0s
Flow rate:                  500.0ml/min
Direction:                           CW
No. of heads:                         1
========================================
```

• After calibration

```
========================================
DOSE-IT (SN:00000000)
***Calibration done
Date/time:              02.11.2006/18:05

Tubing-ID:                         4.0mm
========================================
```

• At the end of the process

```
========================================
DOSE-IT (SN:00000000)

***End dispense
Date/time:              02.11.2006/18:02

Repetitions:                          20

***Program settings
Name:                            MY PRG1
Tubing-ID:                         4.0mm
Volume:                           12.0ml
Pause:                             1.0s
Flow rate:                  500.0ml/min
Direction:                           CW
No. of heads:                         1
========================================
```

Note: This parameter has been changed during the process.

Printing on paper occurs automatically when a label printer is connected to the RS-232 (2) port of the DOSE IT. INTEGRA Biosciences recommends the EPSON TM-U220 matrix printer and your local INTEGRA dealer can assist you to connect this printer.

To generate an electronic text file, connect a PC to the RS-232 (2) port of the DOSE IT via a crossed female-female RS-232 cable and record the process data using the HyperTerminal software installed on your PC.

RS-232 (2) interface settings:

Transmission speed:..... 9600 bps
Databits:..... 8 bits
Parity:..... No
Stopbits:..... 1
Handshake:..... Xon/Xoff

4.9 Using the foot and benchtop switch

The optional foot switch or benchtop switch can be used for hands-free operation. There are no specific setting needed, just connect one of the switches.

Depending on program mode and step, the switch can be used instead of the START, PAUSE or STOP key. However, the keys will still work, even if a switch is connected.

In DISPENSE mode, set the PAUSE parameter to manual. The first pedal/button pulse starts the set number of doses, the next pulse will pause the process, and so on until the process is completed.

In PUMP mode, the pump starts with the first pedal/button pulse (=START). With the next pulse it stops (=STOP) and so on.

4.10 Remote control by a PC

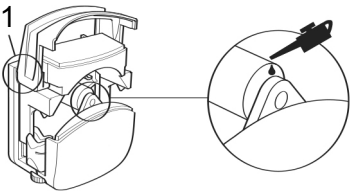
Remote operation can be performed by simulating the foot switch, e. g. with a PC and an input/output interface box as described above for the foot switch.

5 Maintenance

5.1 Cleaning and servicing

WARNING
Always switch off the DOSE IT and disconnect it from the mains when carrying out maintenance work.

If the DOSE IT gets soiled, it can be cleaned with a cloth moistened with soapy water or with a 70% solution of Ethanol.



The moving parts of the pumphead should be checked from time to time for freedom of movement.

Occasionally lightly grease the lever (1) and the rollers (see image) with Teflon lubrication oil.

The rotor shaft runs on sealed bearings which do not require lubrication.

Regular servicing of the DOSE IT by a qualified partner of INTEGRA Biosciences is recommended.

5.2 Decontamination

The aspiration/dispensing tubes, tube collars and silicone tubing contacting the liquid can be autoclaved at 121°C, 1 bar overpressure for at least 20 minutes. Silicone may become brittle after extensive autoclaving. Replace the tubings if they are damaged.

If the surface of the DOSE IT has been in contact with biohazardous material, it must be decontaminated in accordance to good laboratory practice. Do not spray directly on the instrument but use a lint-free cloth, lightly soaked with a disinfectant and wipe dry directly after decontamination. Never use acetone or other solvents! Follow the instructions provided by the disinfectant manufacturer.

The device may be decontaminated with H_2O_2 gas (maximal concentration 35 %) for 60 minutes.

5.3 Leak Test

It is recommended to perform a leak test about every 3 months or when dosing errors occur. A leak test will reveal worn or defect tubing or pumphead.

Procedure:

1) Load a silicone tubing in the pumphead.
2) Position the dispensing end of the tubing below the pumphead height into a container.
3) Put the aspiration tube in liquid and press PRIME to fill the tubing completely without any bubbles.

4) Lift the aspirating end of the tubing as high as possible above the pumphead. The system is tight, if the liquid level do not decrease and no liquid flow out of the lower dispensing end.

If the system is leaking, you have to check whether the tubing or the pumphead is worn:

Repeat the leak test with a new tubing (only use original INTEGRA tubings, see “7.1 Consumables” on page 29).

- If system is tight, the tubing was worn and the problem is solved.
- If the system is still leaking, the pumphead is worn (e.g. lever loose, mechanical play) and need to be replaced, see “7.2 Spare part” on page 30.

NOTE

Work around until a new pumphead is available: Put a rubber band (5 to 8 mm wide) around the pumphead to help holding it fully closed during operation. Repeat the leak test to confirm that the work around works.

5.4 Disposal

The DOSE IT must not be disposed of with unsorted municipal waste. Dispose of DOSE IT in accordance with the regulations in your area governing disposal of devices.

In certain regions and countries, e.g. in all EU member states, the distributor is obliged to take back this product free of charge at the end of life. Please contact your local distributor for more details.

6 Technical data

6.1 Environmental conditions

	Operation
Temperature range	5–35 °C
Humidity range	Max. rel. humidity 80 % for temperatures up to 31 °C, decreasing linearly to 50 % rel. humidity at 40 °C.
Altitude range	< 2000 m

6.2 Specifications

Dose volume	0.1 ml–9999 ml
Flow rate	0.6 ml/min–5 l/min
Tubing inner diameter	1–8 mm
Tubing wall thickness	1.5 mm
Materials	Housing: Polyurethane Base plate, rear panel: stainless steel Membrane keypad: Polyester Tubing: Silicone Pump head body rear: Polypropylene Pump head body front: IXEF Pump head tube clamps: Nylon Pump head roller: Nylatron
Dimensions (H x W x D)	203 x 210 x 191 mm
Weight	3.5 kg
Interfaces	2 x RS-232
Electricity supply	Input: 100–240 VAC, 50/60 Hz Output: 46.6–49.4 VDC, 70 W
Noise emission	At maximum speed with 2 pump heads: 65 dBA

6.3 Current consumption depending on input voltage

	Current consumption		
Input voltage	**Standby**	**Operation with 1 or 2 pump heads**	**Pause mode**
100 VAC	45 mA	260 mA	280 mA
230 VAC	15 mA	120 mA	130 mA

6.4 Chemical compatibility

A particular advantage of peristaltic pumps is that the fluid remains enclosed inside the tubing. Even chemical aggressive liquids can be transferred without the risk of damaging parts of the pump as long they are compatible with the silicone tubing. The table below rates the compatibility of silicone to a few of the chemicals commonly used in laboratories. INTEGRA Biosciences AG assumes no liability for the information contained in the table.

Chemical		**Rating**
Acetic acid	CH3COOH	B
Acetone	C3H6O	C
Acetonitrile	C2H3N	C
Dimethyl sulfoxide	DMSO	A
Ethanol	C2H5OH	B
Hydrochloric acid 33%	HCl	C
JAVEL	NaClO	A
Phenol	C6H5OH	C
Sodium carbonate	Na2CO3	A
Sodium hydroxide 50%	NaOH	B

Compatibility ratings for silicone tubing:
A = good, little to minor effects (0-5% volume swell).
B = fair, moderate effects, not recommended for continuous use (5-10% volume swell).
C = critical, not recommended (10% or greater volume swell).

To determine the compatibility silicone to a chemical not listed in the table, please consult one of the several tables available on the internet, e. g. Watson Marlow with material Pumpsil (silicone).

It is the responsibility of the users to ensure the chemical compatibility. Before using a critical chemical, immerse a short piece of the tubing in a closed container of the chemical for 48 hours. Check the tubing for sings of swelling, softening, discoloration, embrittlement or any other attack.

7 Accessories and consumables

There are a number of accessories and options that adapt the DOSE IT to particular application requirements and working environments.

7.1 Consumables

7.1.1 Silicone tubing

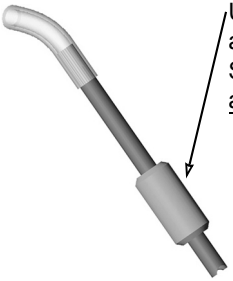
	ID[1] (mm)	Part No.
length 2.5 m, autoclavable, wall thickness 1.5 mm.	1	171 021
	2	171 022
	3	171 023
	4	171 024
	6	171 026
	8	171 028[2]
length 25 m, (bulk roll), autoclavable, wall thickness 1.5 mm.	1	171 031
	2	171 032
	3	171 033
	4	171 034
	6	171 036
	8	171 038[2]

1. ID = inner diameter
2. only for pumping applications

7.1.2 Aspiration/dispensing tubes

	ID (mm)	Part No.
Aspiration/dispensing tube, length 10 cm, stainless steel, one end dented.	1	171 051
	2	171 052
	3	171 053
	4	171 054
	6	171 056
	8	171 058
Aspiration/dispensing tube, length 35 cm, stainless steel, one end dented.	4	171 064
	6	171 066
	8	171 068

7.1.3 Tube collars

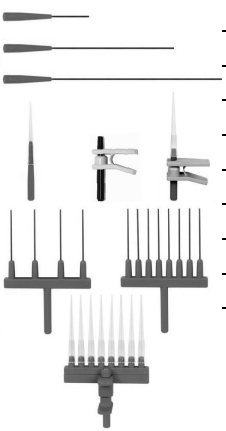
	ID (mm)	Part No.
 Used as weight for the aspiration tube or as clamp spacer for the dispensing tube. See also “4.1.3 Connecting the dispensing and aspiration tubes” on page 14.	1–3	171 071
	4–6	171 074

7.2 Spare part

	Part No.
 Pumphead 313D	103 520

7.3 Accessories

		Part No.
	Foot switch.	143 200
	Benchtop switch.	171 081
	Retort rod with filling arm.	171 091
	Extension pumphead for double pumphead assembly. See also “4.7 Using the double pumphead configuration (optional)” on page 22.	171 090
	Silicone tubing set for double pumphead (ID 8 mm), total length 3 m, autoclavable, incl. • 2 short silicone tubings (ID 8 mm) • 2 Y-pieces made of glass • 2 long silicone tubings (ID 10 mm)	171 088
	Pipette-tubing connector, consists of a silicone pipette mount for connecting serological or Pasteur pipettes or VACUBOY adapters, and a white tubing connector for 2-6 mm inner diameter silicone tubing, autoclavable, 5-pack	171 077



	VACUBOY adapters	Part No.
	1-channel stainless steel adapter 40 mm	155502
	1-channel stainless steel adapter 150 mm	155522
	1-channel stainless steel adapter 280 mm	155525
	1-channel adapter for disposable tips/GripTips (pack of 5)	159023
	1-channel adapter with ejector for disposable tips	159026
	1-channel adapter with ejector for GripTips	159027
	4-channel stainless steel adapter 40 mm	155524
	8-channel stainless steel adapter 40 mm	155503
	8-channel adapter with ejector for disposable tips	159024
	8-channel adapter with ejector for GripTips	159025

Imprint

This operating instruction manual has the part number 171250, version number V11. It applies to firmware version 2.02 or higher until a newer revision is released.

Manufacturer and customer service
Your local INTEGRA representative, further information, and operating instructions in other languages can be found at www.integra-biosciences.com or are available on request info@integra-biosciences.com.

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