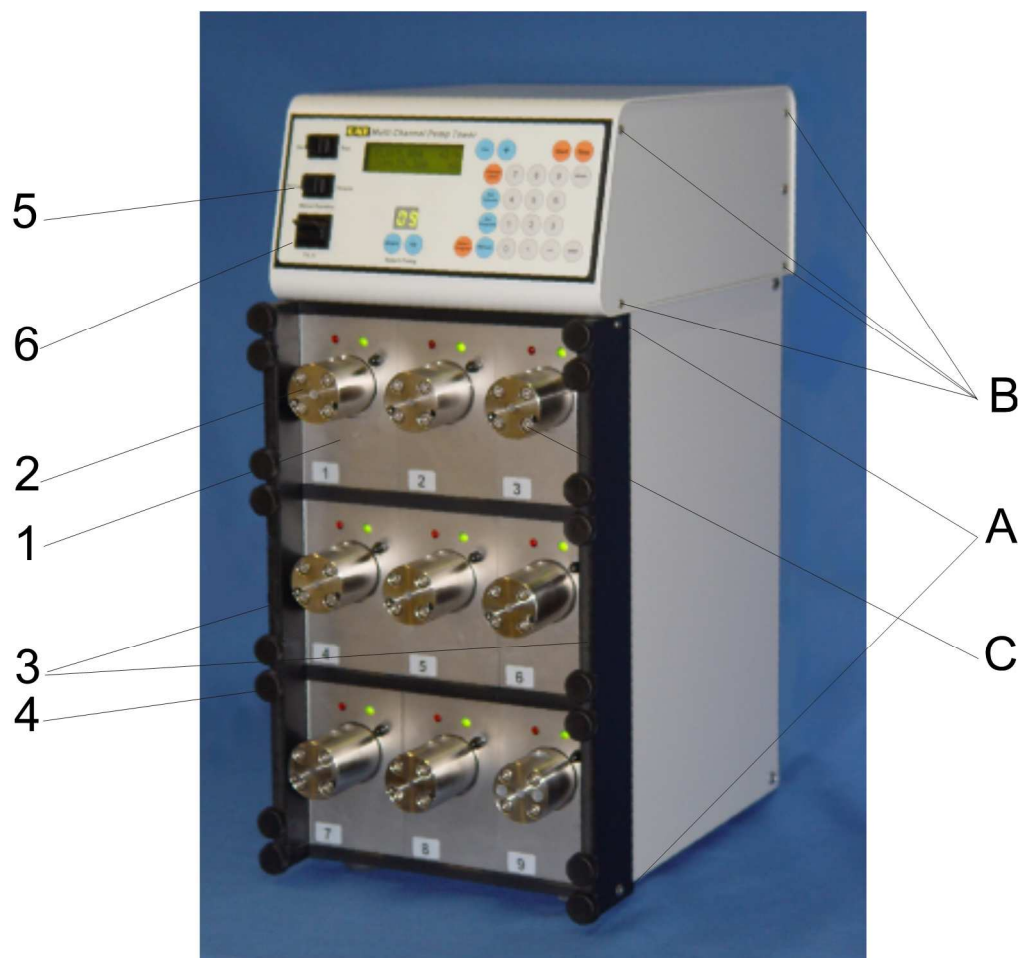




Ingenieurbüro CAT  
M. Zipperer GmbH

## ***Multichannelpump „Tower II“***

### **Service Instructions**



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# 1 User Instructions

## 1.1 Important Instructions for your safety



• Every user must read and understand this manual completely before use. Only instructed users may operate the instrument. Failure to do so can result in serious injury or death.

- Follow general instructions for hazard prevention and general safety instructions, e.g. wear protection clothing, eye protection and gloves.
- This service manual is part of the product. Thus, it must always be easily accessible.
- Enclose this operating manual when transferring the device to another place.
- If this manual is lost, please request another one. Please contact your dealer or

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## 1.2 Danger symbols in this manual

The safety instructions in this manual appear with the following danger symbols and danger levels:







### 1.2.1 Danger symbols:






	Hazard point		Electrical shock
	Risk of fire		Explosion
	Bio hazard		Chemical hazard

### 1.2.2 Danger levels

<b>⚠ DANGER</b>	Will lead to severe injuries or death
<b>⚠ WARNING</b>	May lead to severe injuries or death
<b>⚠ CAUTION</b>	May lead to light to moderate injuries
<b>NOTICE</b>	May lead to material damage

## 2 General safety warnings and instructions

	<p><b>⚠ DANGER Risk of explosion.</b></p> <ul style="list-style-type: none"> <li>• Do not operate the device in the vicinity of highly flammable or explosive substances. The instrument is not explosion-proof.</li> <li>• Do not use this device for processing any substances which could generate an explosive atmosphere.</li> <li>• Do not use this device to process any explosive or highly reactive substances.</li> </ul>
	<p><b>⚠ DANGER Electric shock as a result of penetration of liquid.</b></p> <ul style="list-style-type: none"> <li>• Do not allow any liquids to penetrate the inside of the housing</li> <li>• Switch off the device and disconnect the power plug before starting cleaning or disinfection work. The On/Off Switch on the device does not disconnect the device from the power source.</li> <li>• Only plug the device back in if it is completely dry, both inside and outside.</li> </ul>
	<p><b>⚠ WARNING ! Risk from incorrect supply voltage</b></p> <ul style="list-style-type: none"> <li>• Only connect the device to an AC power source with an protective earth (PE).</li> <li>• Only connect the device to voltage sources which correspondent to the electrical requirements on the type label.</li> </ul>
	<p><b>⚠ WARNING WARNING! Electric shock due to damage to device or mains cable</b></p> <ul style="list-style-type: none"> <li>• Only connect the device to the mains supply if the device and the mains cable are undamaged</li> <li>• Only use devices that have been properly installed or repaired.</li> <li>• In case of danger, disconnect the device from the mains supply by pulling the power plug from the mains socket or by using the isolating device intended for this purpose (e.g. emergency stop switch)</li> </ul>
	<p><b>⚠ WARNING WARNING! Lethal voltage inside the device</b></p> <ul style="list-style-type: none"> <li>• Do not open the device.</li> <li>• Ensure that the housing is always closed and undamaged so that no parts inside the housing can be contacted by accident.</li> <li>• Do not allow any liquids to penetrate the inside of the housing.</li> <li>• Repairs are only to be carried out by trained service technicians.</li> </ul>
	<p><b>⚠ WARNING Damages to health due to infectious liquids and pathogenic germs.</b></p> <ul style="list-style-type: none"> <li>• When handling infectious liquids and pathogenic germs, observe the national regulations, the biological security level of your laboratory, the material safety data sheets and the manufacturer's application notes.</li> <li>• Wear personal protective equipment</li> <li>• For comprehensive regulations about handling germs or biological material of the risk group II or higher, please refer to the "Laboratory Biosafety Manual" in its respectively current valid version from the World Health Organisation</li> </ul>

	<p><b>▲WARNING</b> <b>Damages to health due to corrosive and noxious substances</b></p> <ul style="list-style-type: none"> <li>• Always check the pump for leaks and air bubbles. Special attention should be directed to determine that all push-ons, threaded connections and suction tubes are firmly in place before beginning operation.</li> <li>• Leaking solutions may endanger persons and materials</li> <li>• Observe the nationally prescribed safety environment when working with hazardous, toxic and pathogenic samples. Pay particular attention to personal protective equipment (gloves, clothing, goggles, etc.), extraction, and the safety class of the lab.</li> <li>• Decontaminate the device and the accessories before storage and shipping.</li> </ul>
	<p><b>▲WARNING</b> <b>Damages to health due to corrosive and noxious substances</b></p> <p>Observe all markings on the reagent bottles. Dangerous and fuming chemicals must be dispensed in a fume hood. Only employ the instrument for the purpose intended by the manufacturer, and particularly within the resistance limits of the instrument. If in doubt, contact your supplier, or the manufacturer's factory representative at the phone number shown at the front page of this operating instruction.</p>
	<p><b>▲WARNING</b> <b>Risk of fire</b></p> <ul style="list-style-type: none"> <li>• Do not use this device to process any highly flammable liquids</li> </ul>
	<p><b>▲CAUTION</b> <b>Poor safety due to inadequate fixing of the unit</b></p> <ul style="list-style-type: none"> <li>• Ensure that the unit is firmly attached to a solid stand.</li> </ul>
	<p><b>▲CAUTION</b> <b>Poor safety due to incorrect accessories and spare parts.</b></p> <p>The use of accessories and spare parts other than recommended by Ingenieurbüro CAT, M. Zipperer GmbH may impair the safety, function and precision of the device. Ingenieurbüro CAT, M. Zipperer GmbH cannot be held liable or accept any liability for damage resulting from the use of incorrect or non-recommended accessories and spare parts, or from the improper use of such equipment.</p> <ul style="list-style-type: none"> <li>• Only use accessories and spare parts recommended by Ingenieurbüro CAT, M. Zipperer GmbH</li> </ul>

## 2.1 Warning signs on the device



### **▲WARNING**




This symbol indicates to read the instruction manual carefully prior to operation of the instrument. Please mark points which require special attention in your field of application so they are not overlooked. Disregarding of warnings may result in impairment of serviceability as well as impairment of the user.

### 3 General Information

The Multichannel pump Tower II is designed in accordance with Safety Class 1, and built and tested in accordance with DIN EN 61010.

According to these regulations, the unit is designed to meet the requirements for safe and correct operations. To maintain the proper safety and operational functions of the instrument, the user should follow the instructions and safety guidelines in this manual.

### 4 Intended Use

	<b>▲ DANGER</b> Do not use flammable or explosive substances near the instrument.
	<b>▲ WARNING</b> It is the responsibility of the user to consult and establish appropriate safety and health practices, and then determine the applicability of regulatory limitations prior to use. Should there be any additional questions, after reading these instructions, concerning the set-up, operation or warranty, please contact either your distributor, or the manufacturer.
	<b>▲ WARNING</b> Use the instrument only in compliance of the intended purpose and in way that neither user nor any other persons are endangered. Please comply with all safety and accident-prevention regulations applicable to laboratory work.




This instrument is designed for pumping liquids up to a concentration of max. 2 Mol/l, observing the following physical limits:

- 15 to 40 °C of instrument and reagent
- When the instrument is correctly used, the dispensed liquid comes into contact with only the following chemically resistant materials:
  - Al<sub>2</sub>O<sub>3</sub>,
  - PVDF

## 4.1 Operating Exclusions

### Never use this instrument for

- liquids attacking  $\text{Al}_2\text{O}_3$ , PVDF
- suspensions (e.g., of charcoal) as solid particles may clog or damage the instrument
- strongly crystallizing solutions, concentrated acids and bases as well as non-polar solvents which effect swelling of PVDF
- carbon disulphide, as this media inflames easily
- The pumpheads must not be autoclaved!

	<b>⚠ DANGER</b> Do not use flammable or explosive substances near the instrument.
	<b>⚠ WARNING</b> Compatibility of the instrument for the application must be checked by the user or contact the manufacturer
	<b>⚠ WARNING</b> It is the responsibility of the user to consult and establish appropriate safety and health practices, and then determine the applicability of regulatory limitations prior to use. Should there be any additional questions, after reading these instructions, concerning the set-up, operation or warranty, please contact either your distributor, or the manufacturer.

## 5 Cleaning and Maintenance




Surface and operating elements may be cleaned with a mild dishwashing detergent (water and a standard dishwashing detergent) and a soft, non-fuzzing moist cloth. Do not use a wet cloth. Use only a small amount of dishwashing detergent. Do not use chlorine bleach or other chlorine-based cleaning products with metallic components under any circumstances. These will damage the surface of the instrument. If you use any other cleaning method please make sure that the intended method does not cause any damage to the instrument.

The pumpheads must be cleaned as follows to assure proper functioning and continued accuracy.

- **immediately**, if the motor becomes sticky or jammed.
- **daily, after use of these liquids**
  - Solutions prone to crystallisation
  - Alkaline solutions, aromatics, chlorinated hydrocarbons scintillation liquids
  - inorganic solutions such as buret reagents
- **periodically**, to increase the lifetime of the instrument
- **always** after long term storage



## 5.1 Cleaning the pumpheads

	<b>▲WARNING</b> Be careful to avoid any personal injury from used chemicals. While and even after dispensing liquids, the instrument, the filling and the discharge tubes contain the used reagent. Make sure, that during cleaning and maintenance you avoid splashing chemicals. Wear face screens, protective gloves and protective clothes.
	<b>▲WARNING</b> The ceramic parts are subject to binding or freezing if stored after improper cleaning.
	<b>▲WARNING</b> For a maximum of protection from health hazards caused by contaminated instruments clean and decontaminate the instrument carefully before returning.
	The HPLH-PCON-C is a measuring instrument and designed to provide high accuracy. To maintain this accuracy we recommend that this instrument be tested at regular intervals, especially after any mishandling (such as hitting or dropping) of the instrument. Testing of the instrument is provided by the manufacturer for a small fee. Under §4 of the Weights and Measuring Standards of 12.08.88 Germany, it is required that regular testing and inspections be performed when the <i>HPLH</i> is used as a medical instrument.

Cleaning procedure:

1. Select the pump No. with the "Select pump" buttons
2. Hold the discharge tube over any designated dispensing receptacle and dispense the remaining reagent (press at the same time "*Manual*" and "+").
3. Put the suction tube into cleaning solution designated for that purpose
4. Clean the instrument by pumping. Use the buttons "manual" and "+". We recommend to pump a minimum volume of 50 times the amount of the stroke volume through the pump for a good cleaning.
5. Insert the suction tube into distilled water (or other liquids for sterilisation) for rinsing.

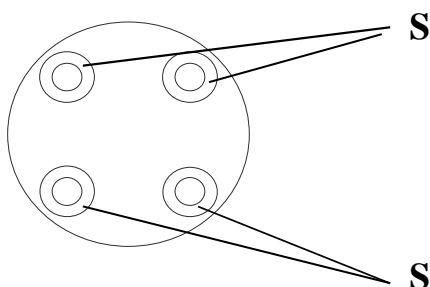
type	Stroke volume	min. cleaning volume
HPLH 20	20 µl	1 ml
HPLH 200	200 µl	10 ml
HPLH 300	350 µl	20 ml
HPLH 1000	1000 µl	50 ml

## 6 Exchange of a pump head

	<b>NOTICE</b> The narrow clearance between the ceramic parts requires skilled handling. Do not apply force as this could damage the parts.
	<b>NOTICE</b> Do not try to exchange pistons from one pump to the other. Piston and cylinder form 1 pair and must always stay together.

To exchange the pump head it is essential to bring the piston in a predefined position. To reach this position press and hold the "Manual" key during switching on the unit. Hold this position until the display shows "change position OK". Then proceed according to the following steps:

- Undo the four Allen screws (S) on the pump head with a 3 mm Allen key screwdriver
- carefully pull out the pump head by approx. 10 mm and
- tilt the pump head for approx. 45° downwards and
- allow the drive pin on the end of the piston to slide out of the orbital drive ball.



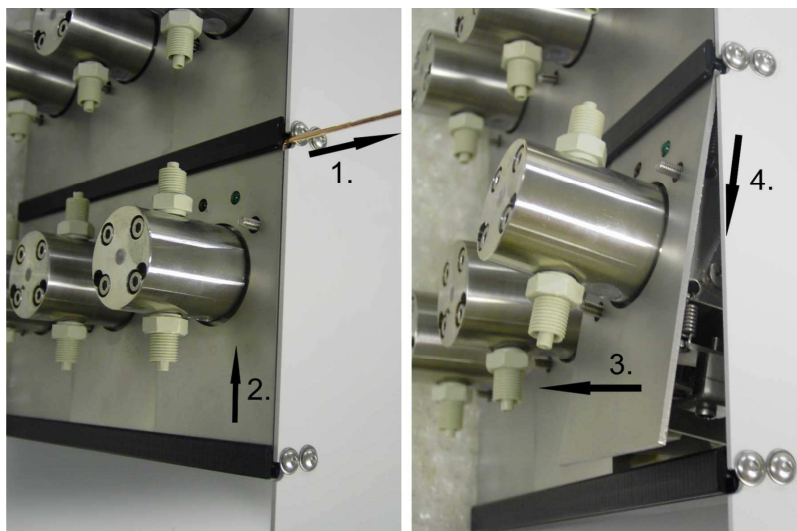
To put the pump head back into position please follow these steps in reverse sequence. It is advisable to insert the piston about half way in the cylinder to start the assembly. After the end of the exchange, press button "select program", the pump returns to normal working.

At the end of this operation we recommend to check the calibration of the pump and if needed run re-calibration (see position 6 below).

After the change of pump heads is complete please activate one of the function keys and the pump will switch back in the main menu.

## 7 Exchange of a complete pump unit

- a. Switch off the Tower II
- b. Screw off one black plastic side frame by removing the 2 screws A (see page 2)  
Use a hexagon wrench key 2,5 mm



- c. Pull out the 2 mm diameter bar upside the pump units (1.)
- d. Lift the frontplate of the pump unit for 2 mm (2.) and take out the pump unit (begin with the lower end of the frontplate, 3. and 4.)
- e. Unplug the two cables for communication and 24 V DC
- f. Build in the new pump unit in converse sequence
- g. Change the address of the pump unit (default: 255), to the address No. of the old pump module. This is necessary that the pump could be detected by the pump selection unit. Use for this a terminal program (e.g. "Labcontrol for Windows").  
Send the command (with selected baudrate, default: 4800):  
"255,WSA, *adr*" for changing the address (*adr*: required address No.) and  
"*adr*,WEE,2010" for saving the changing

## 8 Checking the volume

In line with ISO 9000 "Monitoring of Testing Apparatus" and GLP or when using a medium with different density and viscosity other than distilled water there is a possibility to calibrate the pumps. For adjustment of the unit please see chapter 9.

## 8.1 Procedure of checking

1. Fill the pump with distilled water, using the buttons “manual” and “+”, dispense the water into a separate vessel until there are any bubbles are in the dispensing tube left.
2. Dispense 5 ml into a vessel.
3. Weigh the dispensed quantity with a precision balance.
4. Calculate the volume, taking the temperature into account.
5. Repeat step 2-5 at least 10 times.
6. Calculate the accuracy A% and coefficient of variation CV% by means of the formulas of the statistical computation.

### Calculations:

Mean value  $\bar{m} = \frac{\sum m_i}{n}$   $m_i$  : results of weighing,  $n$  : number of weighing

Mean  $\bar{V} = \bar{m} \cdot Z$   $Z$  : Correction factor

Accuracy  $A \% = \frac{\bar{V} - V_0}{V_0}$   $V_0$  : Nominal volume

Coefficient of variation  $CV \% = \frac{100 s}{\bar{V}}$   $s$  : Standard deviation of the results of weighing  $m_i$

A detailed description of this test procedure you find e.g. in DIN EN ISO 8655-6.

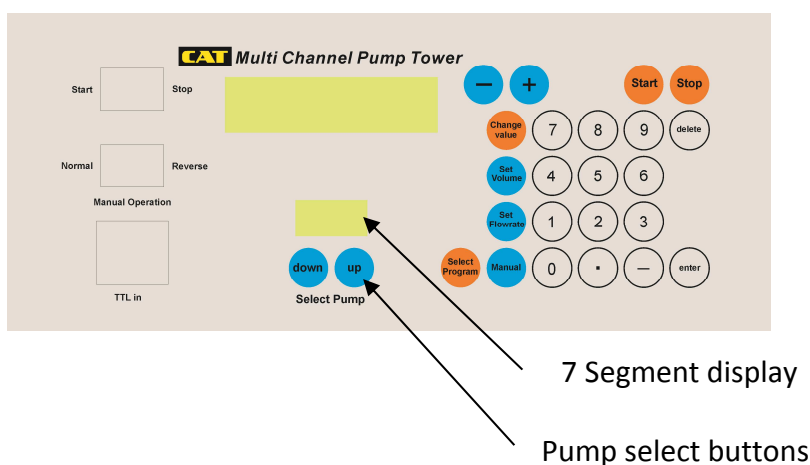
Table 1: Correction factors Z (µl/mg at 1013 hPa, abstract of EN ISO 8655-6)

Temperature °C	Correction factor Z		Temperature °C	Correction factor Z
15,0	1,00090		23,0	1,00247
15,5	1,00098		23,5	1,00259
16,0	1,00106		24,0	1,00272
16,5	1,00114		24,5	1,00284
17,0	1,00123		25,0	1,00297
17,5	1,00132		25,5	1,00310
18,0	1,00141		26,0	1,00323
18,5	1,00150		26,5	1,00336
19,0	1,00160		27,0	1,00350
19,5	1,00170		27,5	1,00364
20,0	1,00180		28,0	1,00378
20,5	1,00190		28,5	1,00393
21,0	1,00201		29,0	1,00408
21,5	1,00212		29,5	1,00422
22,0	1,00223		30,0	1,00437
22,5	1,00236			

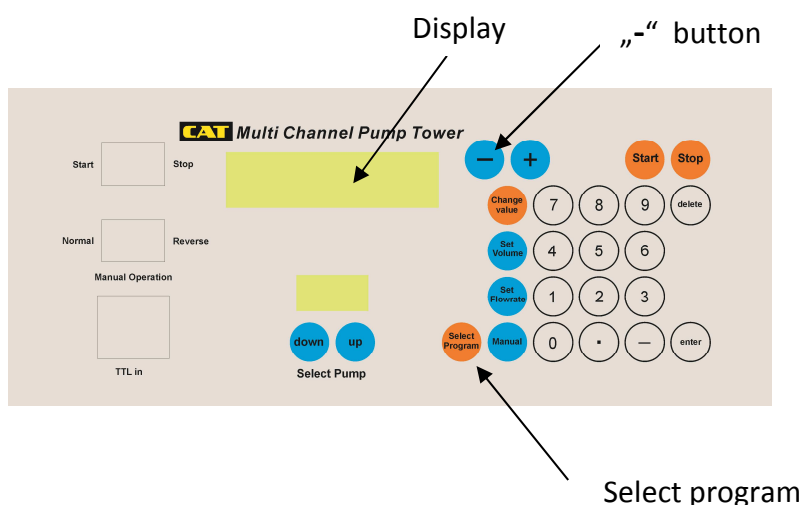
## 9 Adjustment of a pump (calibration)

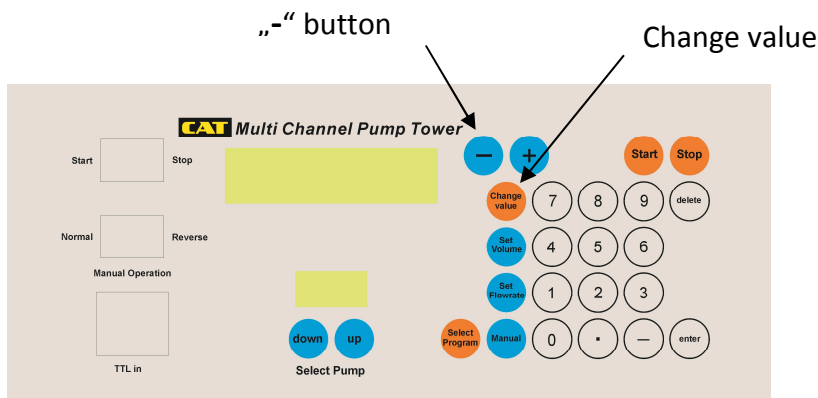
Pumps can be user calibrated. To do this you need a calibrated balance with a precise resolution of at least 0.1 mg as well as a thermometer for precise readout of temperature. For calibration use bi-distilled and degassed water. The calibration work should be done at  $\pm 0.5^\circ\text{K}$  constant temperature in the limits between  $20^\circ$  and  $25^\circ\text{C}$ . To calibrate your pump please proceed according to the following steps:

1. Install suction and dispensing tubing
2. Switch on the unit with the switch on the backside of the housing.
3. Wait for about 10 seconds for internal activating of the electronics.
4. Select the pump No. of the pump which you want to calibrate. Use the up (and down) button for it. The No. of the selected pump is shown in the 7 segment display.

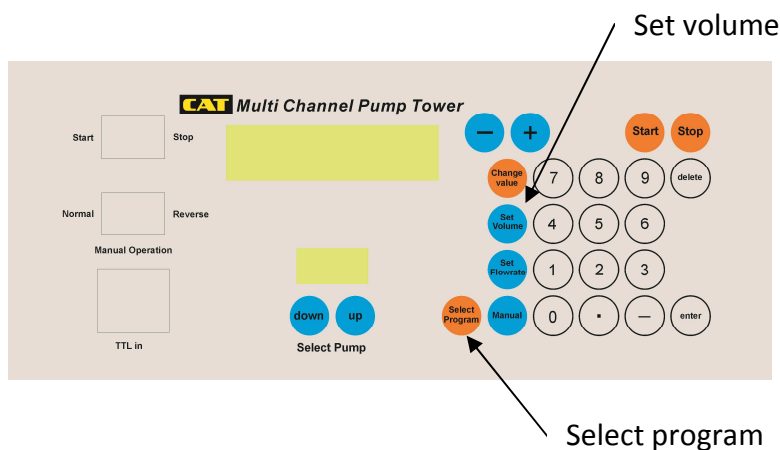


5. The upper line of the display shows: “Select prg” for”  
When the display shows something else, press the “Select program” button
6. Press the „-“ button until the display shows “Select prg” for SETUP menu”
7. Press the red button “Select program” to enter the Setup-menu



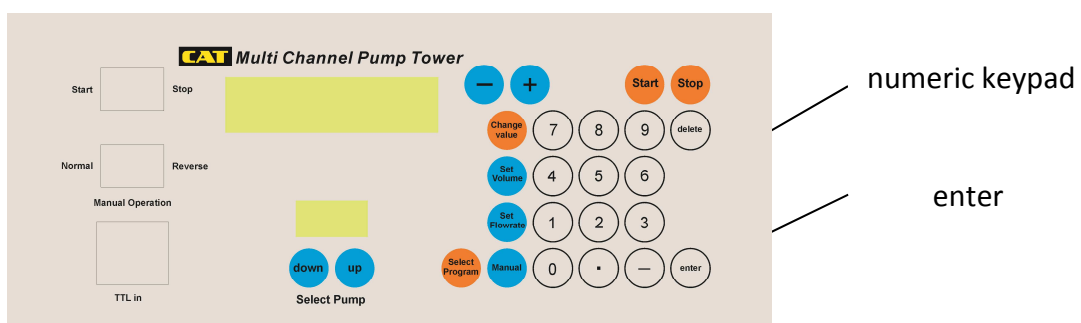


8. Press „-“ until the display shows “Execute reset :DISABLED”
9. Press “Change value” and then within 2 seconds the “+” button : The display shows now: “Execute reset :ENABLED”  
**Note:** You may only change values/items, when an arrow appears ahead. After 2 seconds the arrow disappears and no change is possible. To change the value press the “change” button again.
10. Press “Select program” and then within 1 second “Set volume” and **hold** the “Set volume” button for 3 seconds



11. The display shows “no. of strokes 25”

We recommend to calibrate with this number of strokes. To confirm press “enter”.  
 To change the number of strokes, enter the desired number of strokes with the numeric keypad and confirm with “enter”.  
**Note:** You may correct the numeric input with “delete”



12. The display shows “no. of cycles 3”

We recommend to calibrate with this number of cycles. To confirm press “enter”. To change the number of cycles, enter the number of cycles with the numeric keypad and confirm with “enter”

13. The display shows “fill tubes and then press START”

Fill the tubes free of bubbles. Press therefore the Manual-button. Press and hold the Manual button a second time. To increase the flowrate press at the same time the + button until the favored flowrate is reached.

14. When the tubes are filled, press the **red** “Start” button.

15. The display shows “tare balance and press start”

16. Make sure that the vessel on the balance is able to take the liquids you intend to dispense without the need to empty. Please tare the balance with the vessel at the beginning.

17. Start the first measuring cycle by pressing the “Start” key. After the measuring cycle, enter the balance value (in grammes) of the dispensed water by the numeric key pad into the pump and confirm with “Enter”.

18. After each measuring cycle, zero the balance, so you may read in precise figures the balance value of the following measuring cycle.


19. After the last measuring cycle, enter the water temperature (in °C) by the numerical keypad and press “Enter”. The instrument is now doing the automatic calibration self-acting and the new stroke volume is displayed.

20. Press the start key to store the new stroke volume.

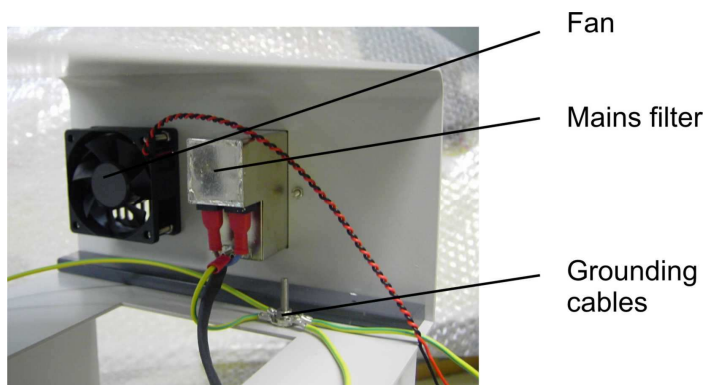
21. Now your pump is newly calibrated and the pump goes back to the main menu.



## 10 Exchange of the fan


	<b>⚠WARNING</b> When exchanging fan, mains filter, power supply or Mux-bord you have to work on the mains! Only qualified persons may do these works!
---	--

- Switch off the Tower II and remove the external power cord.
- Remove the 2 side panels by opening the screws B (see page 2)
- Unscrew the fan cables from the power supply
- Unscrew the fan and replace it.
- Assemble the unit in the reverse sequence
- Check the function of the case grounding



## 11 Exchange of the mains filter

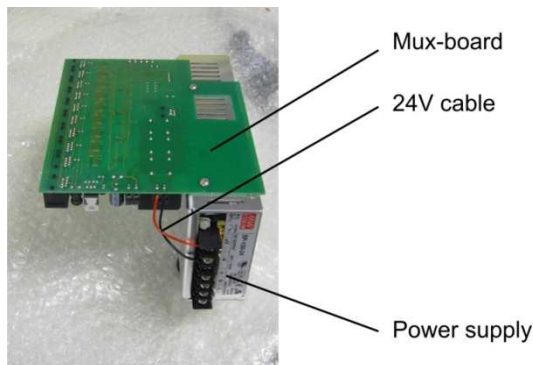
- Switch off the Tower II and remove the external power cord.
- Remove the 2 side panels by opening the screws B (see page 2)
- Detach the 3 cables from the filter
- Unscrew the filter and replace it.
- Assemble the unit in the reverse sequence
- Check the function of the case grounding

	<b>⚠WARNING</b> When exchanging fan, mains filter, power supply or Mux-bord you have to work on the mains! Only qualified persons may do these works!
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## 12

## 13 Exchange of the power supply and/or the Mux-board

- a. Switch off the Tower II and remove the external power cord.
- b. Remove the 2 side panels by opening the screws B (see page 2)
- c. Remove the 3 pumpmodules in the top level (Pump No. 1-3)
- d. Remove all cable connections to the power supply and to the Mux-board
- e. Unscrew the power supply together with the attached Mux-board
- f. Replace the power supply and assemble the unit again in the reverse sequence
- g. Check the function of the case grounding



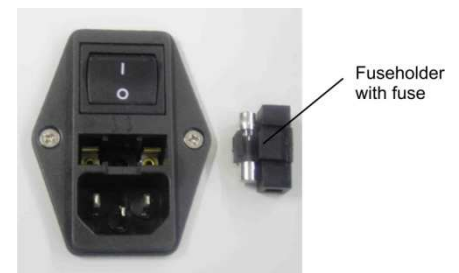
### **⚠ WARNING**

When exchanging fan, mains filter, power supply or Mux-board you have to work on the mains!  
Only qualified persons may do these works!

## 14 Exchange of the fuse

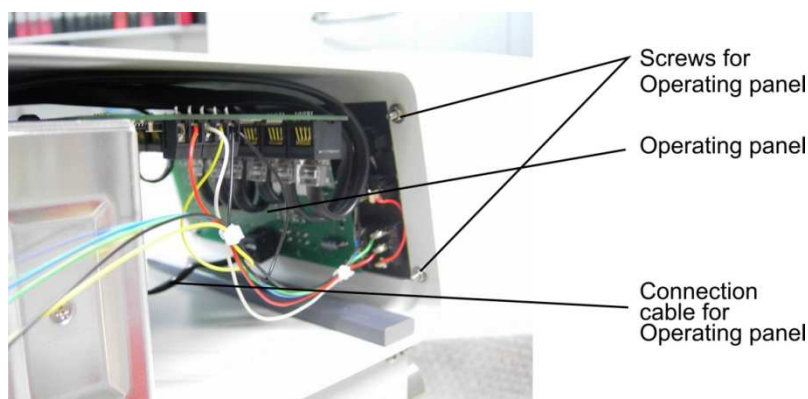
- a. Switch off the Tower II and remove the external power cord.
- b. Pull out the fuse holder and replace the fuse.

115 VAC: IEC 60127-2 2A    230 VAC: IEC 60127-2 1A




## 15 Exchange of the Operating panel

- a. Switch off the Tower II and remove the external power cord.
- b. Remove the 2 side panels by opening the screws B (see page 2)
- c. Remove all cables between Operating panel and Mux-board
- d. Unscrew the 4 fastening screws with washer and remove the panel
- e. Assemble the new panel in the reverse sequence



## 16 Dismantling and Disposal

### 16.1 Dismantling

	<b>▲WARNING</b> Pumpheads and tubing may contain reagents, which endanger persons and material. Make sure of cleaning pumphead and tubing according to Chapter 2 before removing tubing.
---	---

1. Switch the instrument off.
2. Disconnect the instrument from the mains.
3. Disconnect the tubing
4. Now the instrument may be removed from the working area.


### 16.2 Disposal



Please dispose of used instruments and defective components at your local recycling collection point. Prior to disposal, sort according to materials: metal, glass, plastic, etc. Also be sure to dispose of the packing material in an environmental-friendly manner.

## 17 Transport and Storage

### 17.1 Transport/Storage

	<b>▲WARNING</b> Pumpheads and tubing may contain reagents, which endanger persons and material. Make sure of cleaning pumphead and tubing according Chapter 2 before removing tubing.
---	--

Prior to transport:

Switch the instrument off and unplug the power supply.

Remove tubing and cables

Do not subject the instrument to mechanical shocks or vibration during transporting.

Place the instrument and its parts in its original packaging or another suitable container to protect it during transport. Close the packaging with adhesive tape.

In case you do not use the original packaging please mark the box with the following notes:


- Glass symbol (handle with care, fragile)
- Umbrella (keep dry)
- Content (list of content)

Store the instrument in a dry environment. Please observe the specified conditions of the ambient:

Ambient temperature: 5-40°C

Max. relative air humidity: 80%

## 17.2 Return for repair or calibration

	<b>▲WARNING</b> For a maximum of protection from health hazards caused by contaminated instruments clean and decontaminate the instrument carefully before returning.
---	---

We intend to give our staff a maximum of protection from health hazards caused by contaminated instruments. We therefore ask for your understanding that we cannot carry out any calibration / repair unless the

### Declaration on the Absence of Health Hazards


is submitted completed and signed.

Please copy the declaration in the appendix and attach it completed and signed to the instrument when returned to your distributor or to the manufacturer.

Please provide us with the following supplementary information:

- Detected defect
- Media which the instrument has been used with

## 18 Chemical resistance:

	<b>▲WARNING</b> The user has to determine, if the instrument is suitable for his specific application. If there are any further questions, contact your local dealer or the manufacturer.
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The materials, which come into contact with the delivered medium are either

Aluminium oxide (99,7%  $\text{Al}_2\text{O}_3$ ) or

PVDF

These materials guarantee a high resistance against almost all aggressive media.

## 19 Technical Data

	<b>⚠WARNING</b> The user has to determine, if the instrument is suitable for his specific application. If there are any further questions, contact your local dealer or the manufacturer.
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Min step volume	Strokevolume 20µl : 1µl Strokevolume 200µl : 10µl Strokevolume 300µl : 20µl Strokevolume 1000µl : 50µl
Max step volume	100 l
Min delay time in delay mode	1 second
Max delay time in delay mode	100 hours
Min flow-rate in continuous mode	Strokevolume 20µl : 1 µl/min Strokevolume 200µl: 5 µl/min Strokevolume 300µl : 10 µl/min Strokevolume 1000µl : 30 µl/min
Min flow-rate in delay mode	Strokevolume 20µl : 1µl/100h Strokevolume 200µl : 10µl/100h Strokevolume 300µl : 20µl/100h Strokevolume 1000µl : 50µl/100h
Max flow-rate	Strokevolume 20µl : 10 ml/min Strokevolume 200µl : 100 ml/min Strokevolume 300µl : 150 ml/min Strokevolume 1000µl : 400 ml/min
Precision	EV <= 1 %
Accuracy	CV <= 0.5 %
Counter pressure	up to 5 bar, depends on viscosity and max flow rate
Serial interface	RS232 (4800,8,N,1) Data transfer rate: (1200, 2400 or) 4800 Baud Databits: 8 Bit Parity: no parity Stopbits: 1 Stopbit
Electrical power requirements	115 - 230 VAC 50/60 Hz 156 W
Fuse	115 VAC: IEC 60127-2 2A T, 230 VAC: IEC 60127-2 1A T
Dimensions ( W x H x D)	218 mm x 475 mm x 300-330 (depends on type of pumphead)
Ambient temperature	5 - 40 °C
Max. air humidity	80 % relative humidity
Protection class (DIN 40050)	IP40
Protection class (DIN EN 61140)	Protection class I
Weight	10-15 Kg, depends on type and numbers of pumpunits

## Declaration on the Absence of Health Hazards

Please copy this declaration and attach it completed and signed to the instrument

Device designation:.....

Serial No.: .....

### The Undersigned hereby declares:

- ◆ That the instruments have been carefully cleaned and decontaminated before shipment.
- ◆ That the instruments pose no danger through bacteriological, chemical, radiological or viral contamination.
- ◆ To be authorised to make declarations on behalf of the Institution represented.
- ◆ That he / she is aware that shipment of contaminated instruments is a violation of law, and that he / she personally and the Institution represented may be held liable for any damages caused by contaminated instruments.
- ◆ For calibrating service only: minor repairs of a value up to € 30,--+ VAT will be carried out and invoiced without further queries (cross out if not applicable).

### Sender:

Firm / Laboratory:

.....

Name

.....

Address:

Position

.....

Date, Signature

.....

Tel. for enquiry:

.....

.....

- ◆ In case of Return for Repair, please provide us with the following supplementary information:  
Detected defect:

.....

Media which the instrument has been used with:

.....