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HYDRAULIC ATLANTIS PLATFORMS

For the Morris Water Maze

Cat. No. 40100



INSTRUCTION MANUAL

HYDRAULIC “ATLANTIS” PLATFORMS

for WATER MAZE experiments

Cat. No. 40100

LIFTING CONTROL

LOWERING CONTROL

NO ELECTRICITY

NO HANDS IN
THE POOL !

Why Automated Platforms?

Despite being very effective, the **Morris Water Maze** task has some limitations, related to the platforms normally used having fixed height, which cannot be raised during probe tests. Probe tests run with the use of a **lift platform** give more reliable indications on the presence of true **spatial learning**.

The Ugo Basile Atlantis Platforms are made of clear Perspex and are operated by hydraulic pressure. No electricity is present inside the pool; the electrical parts of the mechanism (i.e. the electro-hydraulic actuators) are safely located outside.



Main Features

- 4-Platforms with one Controller
- Remote lifting/lowering control
- Manually or PC-Operated
- Consistency of positioning in the 4 quadrants
- No more hands in the pool!
- No Electricity in the pool

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21025 COMERIO - Varese, ITALY

INSTRUCTION MANUAL

HYDRAULIC ATLANTIS PLATFORMS

Cat. No. **40100**

Series No. _____ Mfg. date _____

SAFETY CONSIDERATION

ALTHOUGH THIS INSTRUMENT HAS BEEN DESIGNED WITH INTERNATIONAL SAFETY STANDARD, THIS MANUAL CONTAINS INFORMATION, CAUTIONS AND WARNINGS WHICH MUST BE FOLLOWED TO ENSURE SAFE OPERATION AND TO RETAIN THE INSTRUMENT IN SAFE CONDITIONS.

SERVICE AND ADJUSTMENTS SHOULD BE CARRIED OUT BY QUALIFIED PERSONNEL, AUTHORIZED BY UGO BASILE ORGANIZATION.

ANY ADJUSTMENT, MAINTENANCE AND REPAIR OF THE OPENED INSTRUMENT UNDER VOLTAGE SHOULD BE AVOIDED AS MUCH AS POSSIBLE AND, WHEN INEVITABLE, SHOULD BE CARRIED OUT BY A SKILLED PERSON WHO IS AWARE OF THE HAZARD INVOLVED.

CAPACITORS INSIDE THE INSTRUMENT MAY STILL BE CHARGED EVEN IF THE INSTRUMENT HAS BEEN DISCONNECTED FROM ITS SOURCE OF SUPPLY.

Instruction Manual dated August 2008

Revision 1





UGO BASILE S.R.L.
BIOLOGICAL RESEARCH
APPARATUS

CHECK-LIST

HYDRAULIC ATLANTIS PLATFORMS

CLIENTE / CUSTOMER _____

Ordine No. / Order No. _____ Data / Date ____ / ____ / ____

Cat. 40100 Hydraulic Atlantis Platforms – 1 platform system

UB code	CAT.No.	✓	Q.t y	DESCRIPTION	DESCRIZIONE	
	40100-306		1	INSTRUCTION MANUAL	MANUALE D'ISTRUZIONE	
	E-WP 008		1	MAINS CABLE	EUROPE	
		U.S.A.			CAVO RETE	EUROPA
		U.K.			U.S.A.	U.K.
	40100-001		1	Electronic Unit	Unita' Elettronica	
	40101-002		1	Platform	Piattaforma	
	40101-003		1	Motor	Gruppo Motore	
	40101-320		1	Connection Cable	Cavo di Collegamento	
M-CM 439-F	40101-321		2	100 ml Syringe	Siringa 100 ml	
M-TF 012-F	40101-322		1	Stretch of Tube (L=7m)	Spezzone di Tubo (L=7m)	
M-LM 345			1	Dust Cover	Copertina	
M-CM 447-F			1	Screwdriver	Cacciavite	
E-FF 003			1	Set of 2 Fuses 2.5A	Set di 2 Fusibili 2.5A	
CU 3			1	3.0 mm Hex (Allen) Wrench	Chiave a Brugola 3.0 mm	

Cat. 40400 Hydraulic Atlantis Platforms – 4 platform system

UB code	CAT.No.	✓	Q.t y	DESCRIPTION	DESCRIZIONE	
	40100-306		1	INSTRUCTION MANUAL	MANUALE D'ISTRUZIONE	
	E-WP 008		1	MAINS CABLE	EUROPE	
		U.S.A.			CAVO RETE	EUROPA
		U.K.			U.S.A.	U.K.
	40100-001		1	Electronic Unit	Unita' Elettronica	
	40101-002		4	Platform	Piattaforma	
	40101-003		4	Motor	Gruppo Motore	
	40101-320		4	Connection Cable	Cavo di collegamento	
M-CM 439-F	40101-321		8	100 ml Syringe	Siringa 100 ml	
M-TF 012-F	40101-322		4	Stretch of Tube (L=7m)	Spezzone di Tubo (L=7m)	
M-LM 345			1	Dust Cover	Copertina	
M-CM 447-F			1	Screwdriver	Cacciavite	
E-FF 003			1	Set of 2 Fuses 2.5A	Set di 2 Fusibili 2.5A	
CU 3			1	3.0 mm Hex (Allen) Wrench	Chiave a Brugola 3.0 mm	

DATE / / Serial No. IMBALLATO DA / PACKED BY

Universal Input 85-264 VAC, 50-60Hz

IMPORTANT/IMPORTANTE:

Check the shipment for completeness immediately after receipt: should you find any discrepancy, please fill in the following part and transmit it to our fax no. +39 0332 745488 / Al ricevimento della merce controllate che la spedizione sia completa: in caso di discrepanza, completate il formulario di seguito riportato ed inviatelo al nostro fax no. 0332 745488

FROM: Name Company/Institution
DATE REF.

NOTES



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HYDRAULIC ATLANTIS PLATFORMS

Cat. 40100 / 40400

1 GENERAL

The **Morris Water Maze** task is the most frequently used paradigm to evaluate spatial learning and memory.

It has several advantages over other “spatial tasks” (e.g. T-maze, Radial-maze), including the fact that motivation of the animals through food and water deprivation is not necessary (rodents, in spite of being good swimmers, are naturally motivated to escape from a water environment).

Despite its efficacy, the Morris Water Maze task has some limitations, as the platforms normally used have fixed height and cannot be raised during probe tests. Probe tests run with the use of platforms that can be automatically raised give more reliable indication on the presence of true spatial learning.

The Ugo Basile Hydraulic Atlantis Platforms have been designed to overcome this limit; they are adjustable in height via an hydraulic mechanism, so that no electricity is present in the water pool.

The system is available as a “**1 to 4 platforms kit**” with a 4-channels control unit which includes TTL-inputs for integration with third-party video-tracking software

2 INSTRUMENT DESCRIPTION

The **40100 Hydraulic Atlantis Platform system**, is composed of:

- 1 Hydraulically-driven Platform 40101-002
- 1 Platform Motor 40101-003
- 1 Control Unit (with 4 independent channels) 40100-001
- 1 set of Accessories (see paragraph 2.4-Accessories)

The **40400 Hydraulic Atlantis 4-Platform system**, is composed of:

- 4 Hydraulically-driven Platforms 40101-002
- 4 Platform Motors 40101-003
- 1 Control Unit (with 4 independent channels) 40100-001
- 1 set of Accessories (see paragraph 2.4-Accessories)

2.1 Hydraulic Platforms

The platforms are made of clear Perspex (see figure 1) in order to be virtually invisible to the animal both within light or dark-colored Water Maze pools.

Circular hitches have been carved on the platform top surface so that the animal can easily grip.

The platforms can be raised by pressing the buttons on the controller front panel or via external TTL input (see also paragraphs 3.6-Connections and 9-OPERATION).

The total vertical travel of the platform is 10 cm.

The movement of the platforms is generated by motors positioned outside the pool (see paragraph 2.3-Control Unit) and is transmitted to the platforms by water-filled tubing connected to the platforms (see paragraph 3.4-Connecting the Motors to the Platforms and Filling the System with Water).



Figure 1 “Hydraulic-Platform”

2.2 Platform Motors

The platform motors (one independent motor for each platform) are positioned outside the pool so that no electricity is present in the water pool.

The motors generate the hydraulic force that lifts/lowers the platforms by means of an electric linear motor. The motor is coupled to the platforms by a water-filled tube.

The exact positioning of the motor, and therefore of the platform, is feedback-controlled by a linear encoder.



2.3 Control Unit

The control unit drives from 1 to 4 motors independently, either manually (by pressing the buttons on the front panel) or by TTL input via the BNC connectors in the front panel.

See also paragraph 3.6-Connections.



Figure 2 “Electronic Unit”

2.4 Accessories

The **40100** “Hydraulic Atlantis Platforms for Water Maze” comes complete with all the necessary accessories; the **40100** 1-Platform System includes:

- 2 x 100 ml syringes (Cat. No. 40101-321)
- 1 x Stretch of Tygon tubing, 7m (Cat. No. 40101-322)
- 1 x Connection Cable Motor to Electronic Unit (Cat. No. 40101-320)
- 1 x Mains cable

The **40400** 4-Platform System includes:-

- 8 x 100 ml syringes (Cat. No. 40101-321)
- 4 x Stretch of Tygon tubing, 7m (Cat. No. 40101-322)
- 4 x Connection Cable Motor to Electronic Unit (Cat. No. 40101-320)
- 1 x Mains cable



3 INSTALLATION

3.1 Unpacking & Preliminary Check

Check the contents of the shipment for completeness, packing list to hand, and visually inspect the instrument as soon you take it out of the packaging. Use the **Check List** supplied.

If the instrument is damaged or, after having tested it, fails to meet rated performances, notify the carrier and our company immediately.



Protect the environment!

Dispose of packaging properly, according to existing and applicable waste management rules and regulations.

3.2 Notes on the Instruction Manual

The Instruction Manual included in the package is necessary for the correct installation and operation of the instrument.

We recommend to keep the manual in good condition, ready to be consulted by the qualified personnel who use the instrument.

Copies of the instruction manual are available free of charge upon request: please contact our service department (see paragraph 6.3-Customer Support) specifying the series number of your instrument.

3.3 Assembling the Instrument

The instrument is extremely easy to assemble and operate. Filling the Platform-Tubing circuit properly (i.e. avoiding air bubbles) is the only critical step. The following paragraph describes how to do this easily and quickly.

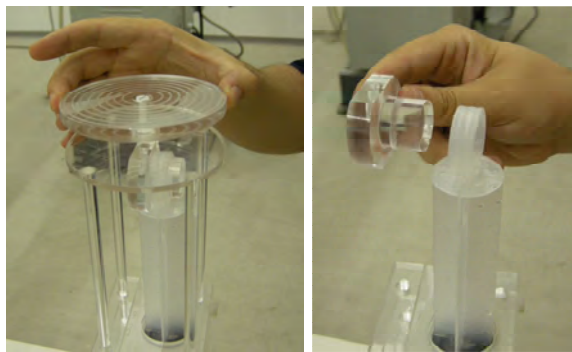
3.4 Connecting the Motors to the Platforms and Filling the System with Water

The Hydraulic Atlantis Platforms are driven by a motor which pushes a water-filled syringe. The syringe in the motor is connected via Tygon tubing (included in the standard package) to another water-filled syringe positioned inside the Perspex platform.

There are many possible procedures to fill with water the two syringes completely (i.e. avoiding water bubbles) and connect them together with water-filled tubing. Here we propose a method which showed to be quick and easy and it is detailed in the steps below:



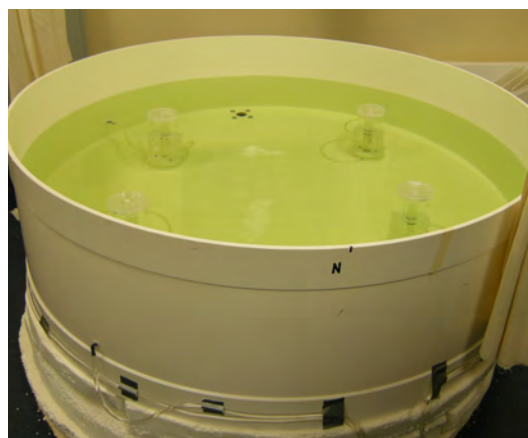
- Connect each motor to its controller (via the cable 40101-320) and set the thumbwheel to 9
- Press the “C/P” button so that the C/P led is on, and press the “up” button of each channel. This will make each motor reach the forward position
- Unscrew the nylon screw located on the top part of the platform to remove it and gently pull out the 4-columns block and the syringe plunger



- Connect the Tygon tube to the platform syringe
- Position the platform in a higher position with respect to the position of the motors. In a typical set-up, at this point the platform would be positioned within the water maze pool and the pool would be filled to a water level that completely submerges the platform (*i.e.* approximately 25 cm from the bottom of the water maze pool) and this would automatically make the platform-tubing circuit fill completely
- Insert the syringe plunger back into the syringe, paying attention to avoid air bubble
- Pull the plunger back as high as possible. This position will correspond to the maximum height of the platform (which is approximately 35 cm)
- Rapidly connect the free end of the Tygon tube to the syringe located in the motor. Make sure to avoid air bubbles.

Now the system is set-up to work! The the motor group is completely forward, the platform is completely up and the platform-tubing circuit is filled with water, without air bubbles.

The image below, courtesy of Professor Gernot Riedel (University of Aberdeen, UK), shows a 4-channel system properly installed and ready to be used.



3.5 Before Applying Power

Take a look at the Power Module, on the left of the Electronic Unit back-panel, which encompasses – from left to right - the fuse holder, the mains switch and the connection of the mains cord.

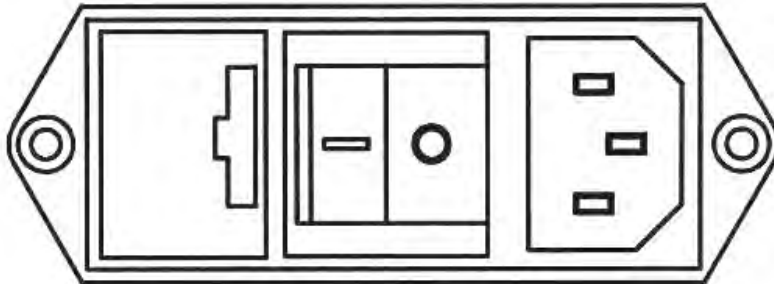


Figure 3 “Power Module”

3.5.1 Fuse Holder

The fuse holder comprises two fuses, one on the live, the other on the neutral. We recommend 2.5 Amp fast-blow fuses (type F2.5A). To replace the fuses, see paragraph 6.1-Electrical.

3.5.2 Mains Switch

This two-pole toggle switch, which complies with international safety standards, provides a visual cue, meaning:

- **OFF** when pressed to the right (“O” side)
- **ON** when pressed to the left (“I” side)

3.5.3 Mains Cord

The mains cord is a standard cable, Cat. No. **E-WP 008**. Make sure your power outtake is provided with a reliable ground connection, see also 3.6 & 4.1.

3.5.4 Input of Power Supply

A switching power supply provides current to the instrument. This is a compact, highly reliable product providing excellent electric specifications and full compliance to the EMC and Safety standards, which will ensure a long trouble-free service.

Its mains input is universal: in plain words, it accepts **any voltage from 85 to 264 Volt AC**. Forget the voltage selector and any associated doubt or problem, for instance in case you have to move your instrument from USA or Japan to Europe, or vice versa.



3.6 Connections

Connect the mains cord to a power outlet, **provided with a reliable earth connection**, protected by a differential earth-leakage switch (CGFI) that breaks at the threshold of 0.03A, within a max. acceptable delay of 1s. The maximum breaking compliance required by the CGFI is 10kA at rated current of 6A.

The back panel of the Electronic Unit embodies a connection module, and the 4 connectors to the platform motors, while all the connectors and controls are on the front panel.

3.6.1 Back Panel

See paragraph 3.5-Before Applying Power for a description of the power module.



Figure 4 "Back Panel"

Connect each motor to the related socket connector, via the cable 40101-320 provided.

3.6.2 Front Panel



Figure 5 "Front Panel"

The control unit drives 1 to 4 motors independently, either manually (by pressing the buttons on the front panel) or by TTL signals input via the BNC connectors in the front panel.

Two BNC connectors are present for each platform, to control the up and down movement of the platforms, via an external TTL signal.



4 SYSTEM SPECIFICATION

- 4 independent channels
- Manual or triggered mode (via 5 V TTL)
- Continuous or Pulse mode
- Vertical range: 25-35 cm
- Speed of the platforms: 10 mm/sec
- USB connection
- Power supply: 230 V AC, 50Hz/60Hz, 480 W
- Motor voltage: 12V

4.1 Additional Safety Consideration

- a. Place the motors on a flat surface;
- b. Do not obstruct free and comfortable access to the power module;
- c. Use original accessories and spare parts only, see also paragraph 7-ORDERING INFORMATION;
- d. Immediately disconnect and replace a damaged mains cable;
- e. Do not operate the instrument in hazardous environments or outside prescribed environmental limitations (i.e. +18C°/+24C°, 60% relative humidity, non-condensing), see also paragraph;
- f. Do not spray any liquid on the connectors;
- g. Keep inflammables far from the instruments.



The instrument includes parts moving when in operation. Please do not touch the platforms while the controller is working.

Avoid to open the Motor Unit: it does not contain any part which can be of interest to the end user.

Opening the Motor Unit may result in a damage of the set-up and will void the warranty period!

**UGO BASILE DOES NOT ACCEPT ANY RESPONSIBILITY FOR PROBLEMS OR HARM CAUSED TO THINGS OR PERSONS ARISING FROM:**

- ◆ INCORRECT ELECTRICAL SUPPLY;
- ◆ INCORRECT INSTALLATION PROCEDURE;
- ◆ INCORRECT OR IMPROPER USE OR, IN ANY CASE, NOT IN ACCORDANCE WITH THE PURPOSE FOR WHICH THE INSTRUMENT HAS BEEN DESIGNED AND THE WARNINGS STATED IN THE INSTRUCTION MANUAL SUPPLIED WITH THE INSTRUMENT;
- ◆ REPLACEMENT OF ORIGINAL COMPONENTS, ACCESSORIES OR PARTS WITH OTHERS NOT APPROVED BY THE MANUFACTURER;
- ◆ SERVICING CARRIED OUT BY UNAUTHORIZED PERSONNEL.

5 OPERATION

All the connectors and controls are located on the Electronic Unit front panel, see paragraph 3.6-Connections.

The thumbwheel selector determines the “up” position, i.e. the height of the platform, while the “down” position is preset at zero, i.e. all the way down.

The platform height is reached by pressing the “up” button. This can occur with one single pressure of the button (Pulse or “P” mode), or in a continuous way (Continuous or “C” mode), by keeping the button pressed until the upper endpoint is reached.



The two modes are selected by pressing the C/P button. When the C/P led is on, one single pressure of the button makes the platform reach the final height.

Two BNC connectors are present for each platform, to control the up and down movement via TTL signal input.

Notice that the C/P button also affects the BNC inputs, when TTL input are used. Also notice that when the BNC cables are connected to the TTL input, the manual mode elevation is still possible, being the buttons always active.

The “remote” button on the right end side of the controller is used to access the remote mode, for operation via software, using the built-in USB connection.



6 MAINTENANCE

While any service of the instrument ought to be carried out by Ugo Basile personnel or by qualified personnel authorized by UGO BASILE organization, this section of the instruction manuals describes normal maintenance procedures which can be carried out at your facility.



UNPLUG THE MAINS CORD BEFORE CARRYING OUT ANY MAINTENANCE JOB!

6.1 Electrical

To inspect and/or replace the fuses, **disconnect the mains cable first!** Insert a miniature screwdriver in the slot indentation, see paragraph 3.5.1, and snap out the slide which houses the fuses.

The fuses must be 2.5A fast-blow fuses.

Snap in the fuse slide: the mechanical “*click*” ensures that the fuse carrier is locked.

6.2 Long Inactivity

The instrument does not require any particular maintenance after long inactivity.

6.3 Customer Support

For any further information you may desire concerning the use and/or maintenance of the Hot/Cold Plate, please do not hesitate to get in touch with our local distributor or with our **service department** at:-



UGO BASILE S.r.l.
Viale G. Borghi 43
21025 COMERIO – Varese, ITALY



Phone : +39 0332 744574



Fax : +39 0332 745488



e-mail : service@ugobasile.com

Before sending any instrument to our factory for repair, we recommend you to contact our service department to obtain a return authorization number (R.A.N.) and shipping/packing instructions.



We may not be held responsible for damages during transport due to poor packing. Whenever possible, please use the original packing.

7 ORDERING INFORMATION

40100 Complete 1-Platform System consisting of:

- platform 40101-002
- motor 40101-003
- 4-channel controller 40100-001
- 2 x 100 ml syringes (Cat. No. 40101-321)
- Stretch of Tygon tube, 7m (Cat. No. 40101-322)
- Connection Cable Motor to Electronic Unit (Cat. No. 40101-320)
- Mains cable E-WP 008 and set of fuses

40400 Complete 4-Platform System consisting of:

- 4 platforms 40101-002
- 4 motors 40101-003
- 4-channel controller 40100-001
- 2 x 100 ml syringes (Cat. No. 40101-321)
- 4 x Stretch of Tygon tube, 7m (Cat. No. 40101-322)
- 4 x Connection Cable Motor to Electronic Unit (Cat. No. 40101-320)
- 1 x Mains cable E-WP 008 and set of fuses

7.1 Components

40100-001 Electronic Unit

40101 Additional platform and motor

40101-002 Platform

40101-003 Motor

40101-320 Connection Cable

40101-321 100 ml Syringe

40101-322 Tube (L=7m)

M-CM447-F Screwdriver

CU 3 3.0 mm Hex (Allen) Wrench

E-WP 008 Mains Cable

Set of 2 fuses

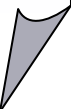


8 **BIBLIOGRAPHY**

- R.I.W. Spooner et al.: **"The Atlantis Platform: A New Design and Further Developments of Buresova's On-demand Platform for the Water Maze"** Learn. Mem.: 1: 203-211, **1994**
- G. Riedel et al.: **"Reversible Neural Inactivation Reveals Hippocampal Participation in Several Memory processes"** Nature Neurosc.: 2 (10): 898-905, **1999**
- I.Q. Wihshaw et al.: **"The Behavior of the Laboratory Rat: A Handbook with Tests"** Oxford Univ. Press, USA; 1, **2004**

Notes

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CE CONFORMITY STATEMENT

Manufacturer **UGO BASILE srl**
Address Via G. di Vittorio, 2 – 21036 Gemonio, VA, ITALY
Phone n. +39 0332 744574
Fax n. +39 0332 745488

We hereby declare that

Instrument. **HYDRAULIC ATLANTIS PLATFORMS**
Catalog number **40100**

*It is manufactured in compliance with the following European Union Directives
and relevant harmonized standards*

- *2006/95/CE relating to electrical equipment designed for use within certain voltage limits*
- *2004/108/CE relating to electromagnetic compatibility*
- *2011/65/UE on the restriction of the use of certain hazardous substances in electrical and electronic equipment*

Account Manager

Adriano Basile

Nome / Name

April 2014

Date

Firma / Signature