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by VELP Scientifica

Instruction Manual

CG-1997-V10
CG-1997-V10E
Digital Heating Magnetic Stirrer

General Information

Before using the unit, please read the following instruction manual carefully.
Avant d'utiliser l'instrument, il est recommandé de lire attentivement le présent manuel d'instructions.

Caution, hot surface!
Attention, surface chaude!

Do not dispose of this equipment as urban waste, in accordance with EEC directive 2002/96/CE.
Ne pas recycler l'appareil comme déchet solide urbain, conformément à la Directive 2002/96/CE.

The product can be used with flammable liquids / Le produit peut être utilisé avec des liquides inflammables

This unit must be used for laboratory applications indoor only. The manufacturer declines all responsibility for any use of the unit that does not comply with these instructions. If the product is used in a not specified way by the manufacturer or with non specified accessories, product's safety may be compromised.

Cet instrument ne peut être utilisé pour les applications de laboratoire à l'intérieur seulement. Le fabriquant décline toute responsabilité en cas d'utilisation non conforme aux instructions concernant ces instruments. Si le produit est utilisé d'une manière non spécifiée par le fabricant ou accessoires non spécifiés, la sécurité du produit peut être compromise.

This unit has been designed and manufactured in compliance with the following standards:
L'instrument a été conçu et fabriqué conformément aux normes suivantes:

Safety requirements for electrical equipment for measurement, control and for laboratory use	**IEC/EN 61010-1**
Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire	**IEC/EN 61010-2-051**
Electrical equipment for laboratory use	**UL 61010-1**
General requirement - Canadian electrical code	**CAN/CSA-C22.2 No.61010-1**

VELP reserves the right to modify the characteristics of its products with the aim to constantly improving their quality.
Dans le but d'améliorer constamment la qualité de ses produits, VELP se réserve le droit d'apporter des modifications aux caractéristiques de ceux-ci.

Safety Regulations / Consignes de Securité

The plug disconnects the instrument. Therefore, place the instrument where it can be quickly disconnected.
Le bouchon est le moyen de déconnexion de l'appareil. Par conséquent, placer l'appareil où il peut être rapidement débranché.

Hotplate temperature: up to 370 °C / Température de la plaque chauffante: jusqu'à 370 °C.

The heated solution may release toxic, dangerous or poisonous gases. Adequate safety measures must be taken, in accordance with the safety regulations in force, including the presence of hood and personal protective equipment (masks, gloves, goggles, etc.).
La solution chauffée peut libérer gaz toxiques ou dangereux. Des mesures de sécurité adéquates doivent être prises, en conformité avec les règlements de sécurité en vigueur, compris la présence de la hotte de laboratoire et équipements de protection individuelle (masques, gants, lunettes, etc.).

Beware of the effect of the magnetic field on cardiac pacemakers and data media.
Veuillez tenir compte de l'influence du champ magnétique sur les stimulateurs cardiaques ou les supports de données.

Position the instrument on a flat surface, with a distance from the wall of 30 cm (at least).
Positionner l'appareil sur une surface plat, avec une distance de la paroi de 30 cm (au moins).

Do not use with explosive or dangerous materials for which the equipment is not designed. The stirrer must not be used in explosive atmospheres, in bain-marie or to stir combustible liquids that have a low combustion temperature. The product is intended for use with very small quantities of flammable liquids or flammable liquids that have a fire point higher than 625°C and a flash point higher than 600°C.
Ne pas utiliser avec des matières explosives et dangereuses pour lesquelles l'équipement n'est pas conçu. L'agitateur ne peut pas être utilisé dans des atmosphères explosives, dans un bain d'eau et pour remuer les combustibles liquides avec la température de combustion bas. Le produit est destiné à être utilisé avec de très petites quantités de liquides inflammables ou de liquides inflammables ayant un point d'incendie supérieur à 625 ° C et un point d'éclair supérieur à 600 ° C.

It is responsibility of the user appropriately decontaminate the instrument in case of dangerous substances fall on or in it accordingly to the safety datasheet of substances used and to the current laboratories safety standards. It is not possible to decontaminate the product under steam.
It is also responsibility of the user to use substances for cleaning or decontaminating, which do not react with internal parts of the instrument or with the material contained in it. In case of doubts on the compatibility of a cleaning solution, contact the manufacturer or local distributor.
Est responsabilité de l'utilisateur la décontamination en cas de déversement de matières dangereuses sur ou à l'intérieur de l'équipement conformément à la fiche de données de sécurité des substances utilisées et aux normes de sécurité actuelles des laboratoires. Il n'est pas possible de décontaminer le produit sous la vapeur.
Est responsabilité de l'utilisateur à utiliser des substances qui ne produisent pas de danger pour le nettoyage ou de décontamination, qui ne réagissent pas avec les parties internes de l'appareil ou avec la matière qu'il contient. En cas de doute sur la compatibilité d'une solution de nettoyage, contactez le fabricant ou le distributeur local.

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1. Introduction

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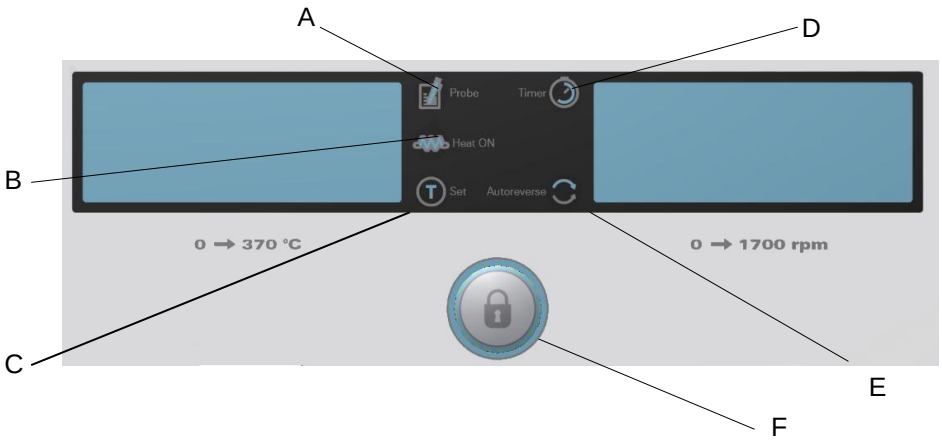
The AREX-6 Digital PRO heating magnetic stirrer is used in the laboratory for general use and for all those applications that require a precise regulation for stirring speed and heating liquids.



1	Aluminum alloy plate with ceramic coating
2	Main switch
3	Speed control knob
4	Temperature control knob
5	Display

A	Probe led
B	Heating ON led
C	Temperature set point led
D	Timer led
E	Autoreverse led
F	Timer/autoreverse/lock button

The Aluminum alloy heating plate with ceramic coating (1) ensures:
- Optimum heat distribution and a high specific power thanks to the circular configuration
- Temperature homogeneity
- High resistance to thermal stress and thermal shock
- High resistance to chemical agents and surface abrasion

Magnetic stirring is generated by an AlNiCo magnet, driven by brushless motor which offers a virtually unlimited duration.
Size and shape of the magnetic stir bar determines the stirring efficiency at any given speed.
The stirring bar which satisfies most applications is Ø8x40mm.

NOTE: The vessel must be made of a suitable material to withstand the foreseen temperature.
NOTE: Using the heating plate at high temperatures may cause discoloring. This does not alter the thermal, mechanical and chemical resistance of the plate in any way.

2. Assembly and installation

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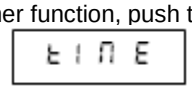
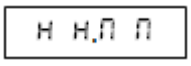
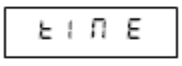
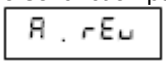
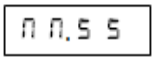
- Unpacking
  - Check the integrity of the unit after unpacking.

- The box includes
  - AREX-6 Digital PRO heating magnetic stirrer
  - Power supply cord
  - Instruction manual

- First installation
  - Place the unit on non -flammable surface
  - Make sure that the values on the rating plate, correspond to those of the power supply
  - Move the main switch (2) to the OFF position
  - Ensure that the socket provided with grounding is accordant to current safety norms and easy to reach. Use only the cable provided with the instrument.
  - Insert the mains power cable into the socket

NOTE: the mains cable must remain far away from the hot plate. It can be substituted only by main cables with same features (T=90°C, connector C15)

3. Operating controls

Commissioning	➢ Switch on the instrument through the main switch (2) ➢ Display shows software version, the last set point values and OFF on both displays (if "Start mode" is set on Stop, see chapter 5)
Stirring	➢ Adjust motor speed set point by turning the speed control knob (3) ➢ Click the knob to start stirring ➢ The speed increases until set point achievement ➢ A microprocessor ensures constant speed even when the viscosity changes (counter-reaction) ➢ Switch off the stirring by clicking the knob
Heating	➢ Adjust heating plate temperature set point by turning the temperature control knob (4) ➢ During all the time of set point adjusting, the temperature set point led (C) is switched on ➢ Click the knob to start heating ➢ Display shows real plate temperature for 3 seconds and temperature set point for 1 second alternatively ➢ When temperature set point is visualized, the relative led (C) turns on ➢ While the instrument is heating, the Heating ON led (B) turns on ➢ Switch off the heating by clicking the knob ➢ When heating function is off and the heating plate temperature exceeds 50 °C, the message "Hot" is shown on the temperature display until temperature falls below 50 °C **NOTE:** this warning is not active if the instrument is not powered. **NOTE:** in case of black-out, once the power is back the device restarts in the set start mode (see chapter 5 "Strt mode")
Timer	➢ To access the timer function, push the Timer/autoreverse/lock button (F) ➢ On the displays   are visualized ➢ Set the timer turning the speed control knob until the desired value and click to confirm ➢ Timer led (D) turns on ➢ Timer countdown starts when one of the main functions is on or when temperature reaches set point value (see chapter 5, "Time Strt") ➢ When countdown is active, timer led flashes ➢ Esc timer menu: a) click twice timer/autoreverse button b) wait 5 seconds without touching any knob ➢ When timer countdown ends,  shown until operator action. It's possible stirring continues if the parameter "time Sped" is ON (see chapter 5)
Autoreverse	➢ To access autoreverse function push twice the Timer/auto reverse/lock button (F) ➢ On the displays   are visualized ➢ Set the autoreverse turning the speed control knob until the desired value and click to confirm ➢ The autoreverse led (E) turns on ➢ Autoreverse starts when stirring is on
Lock	➢ Holding the Timer/auto reverse/lock button (F) for 3 seconds, the instrument will lock it's settings during operations. ➢ Unlock the control panel by holding the Timer/auto reverse/lock button (F) for 3 seconds. ➢ If other buttons are clicked while the instrument is locked, the two LEDs around the button will blink for few seconds

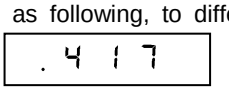
4. External thermometers

VTF	➢ Move the main switch to off position ➢ Screw the threaded support rod into its seat on the back of the instrument ➢ Fasten the VTF thermo-regulator onto the support rod ➢ Place the temperature probe in the flask ➢ Plug the VTF into the dedicated socket on the back of the instrument ➢ Switching on the instrument through the main switch, the probe led (A) turns on and display shows OFF ➢ Select operating temperature on VTF and after clicking temperature control knob, a dashed line (----) appears on the display **NOTE:** while VTF is inserted, it is not possible to set any temperature turning the knob on the instrument. The plate can heat until the maximum temperature set in the full scale (see chapter 5, "Temp Limt"). It is possible to set the timer on the VTF only.
External probe	➢ Move the main switch to off position ➢ Screw the threaded support rod into its seat on the back of the instrument ➢ Fasten the clamp onto the support rod

	➢ Place the temperature probe in the flask ➢ Plug the probe into the dedicated socket on the back of the instrument ➢ Switching on the instrument through the main switch, the probe led (A) turns on and display shows OFF ➢ Select operating temperature using the temperature control knob ➢ Click the knob to start heating ➢ The display shows the real temperature obtained by the probe. Each 3 seconds the temperature set point is shown on the display and the temperature set point led (C) turns on

5. Setting mode

Press both knobs for 3 seconds to enter into the setting mode when heating and stirring are off.
Clicking the Timer/autoreverse button (F) it is possible to pass from one of the following parameter to the next ones:

Parameter shown		Default value	Range	Description
Display 1	Display 2			
tEMP	LIMt	370	OFF - 50 - 370	Set full scale temperature: ➢ It limits the maximum value of temperature set point for the heating plate* (from 50 to 370°C step 10°C) ➢ If "OFF" is set, it is not possible to perform any action with the temperature control knob
SPEd	LIMt	1700	100 - 1700	Set full scale speed: ➢ It limits the maximum value of speed set point for the motor (from 100 to 1700rpm, step 100rpm)
Strt	MOdE	StOP	StOP - run	Set starting mode: ➢ Stop: when the instrument is switched on through the main switch, OFF is visualized on both displays ➢ Run: when the instrument is switched on, it restarts to work with the last set points set
CtrL	tYPE	FInE	FInE – FASt	Set control temperature with external probe: ➢ Fine: slow temperature set point reaching. Overshoot optimized ➢ Fast: fast temperature set point reaching. High overshoot
PrOb	ALAr	On	On - OFF	Set external probe safety: ➢ If "on" it gives AL6 alarm when a slow temperature increase is detected by the external probe. This function is active in case of: - Probe temperature < 50°C - T set point – T probe > 5°C ➢ If "on" it gives AL7 alarm when a fast temperature decrease is detected by the external probe.
PrOb	CAL	0.0	-10.0 ÷ 10.0	Alignment external probe: ➢ It allows external probe temperature alignment to a reference thermometer
tIME	Strt	SnAP	SnAP - SEtP	Set start timer countdown: ➢ Snap: timer countdown starts as soon as one main function (Temperature/Speed) is on ➢ SetP: timer countdown starts when temperature set point is reached
tIME	SPEd	On	On - OFF	Continue stirring after timer end: ➢ If "on", stirring continues after timer end
AMb.t	CAL	0.0	-10.0 ÷ 10.0	Heating plate probe calibration: ➢ It allows plate ambient temperature alignment to a reference thermometer.
COun	MOtO			Running time. Days (24H): ➢ Motor and plate working time are displayed in hours until 9999 hours (around 416 days). After, they are shown in days starting from 417 and a dot turns on as following, to differentiate days from hours 
COun	HEAt			
rSEt		nO	YES - nO	Reset: ➢ It allows to restore default setting parameters.

Click the stirring control knob to visualize the set value. Turn the knob to set the new value and click to confirm.
To esc setting mode wait 10 seconds without touching any knob or push both knobs at the same time.

* The temperature control function of the heating plate can also be used as a safety thermostat. In this case the maximum temperature of the heating plate will not exceed the full scale temperature set on the AREX-6 Digital/Digital PRO meaning that a longer heating time is required in order to reach the temperature set with VTF or external probe inserted, but reducing temperature oscillation at set point value.

6. Error messages

When the display shows an error message, the stirring and heating functions stop automatically.
To remove the error message, disconnect the instrument from the power supply.

Error code	Cause
AL1	Overtemperature (T > 430 °C)
AL2	Excessive heating time
AL3	The stirring system doesn't run correctly
AL4	Overtemperature of the external probe (T > 310 °C) – (with probe inserted)
AL5	Overtemperature of the safety probe (T > 430 °C)
AL6	Slow temperature increase read by the external probe
AL7	Fast temperature decrease read by the external probe

If an error message appears on the display, please contact authorized personnel.

7. Maintenance and cleaning

Maintenance	➢ No routine or extraordinary maintenance is necessary ; ➢ Repairs must be carried out by authorized personnel only; ➢ Instrument must be transported in its original packaging any indications present on the original packaging must be followed (e.g. palletized);
Cleaning	➢ Disconnect the unit from the power supply and use a cloth dampened with an non-inflammable non-aggressive detergent.

8. Technical data

	Models	CG-1997-V10	CG-1997-V10E
General features	Power supply	230 V / 50-60 Hz (+/-10%)	115V / 60 Hz (+/-10%)
	Dimensions (WxHxD)	160x105x280 mm (6.5x4.1x11 in)	160x105x280 mm (6.5x4.1x11 in)
	Weight	2.6 Kg (5.7 lb)	2.6 Kg (5.7 lb)
	Potenza assorbita	630W, 2,7A	630W, 5,5A
	Construction material (body)	Aluminium body – Technopolymer enclosure	Aluminium body – Technopolymer enclosure
	Working in continuous	Admitted	Admitted
	Settable restart modality	Stop or work	Stop or work
	Maximum load on the plate	25kg	25kg
	Noisiness	<< 80 dBa	<< 80 dBa
	Environmental temperature admitted	+5…+40 °C	+5…+40 °C
	Storage temperature admitted	-10…+60 °C	-10…+60 °C
	Max humidity	80%	80%
	Level of electrical protection CEI EN60529	IP 42	IP 42
	Overvoltage category	II	II
	Pollution degree CEI EN61010-1	2	2
	Max altitude	2000 m	2000 m
Heating plate	Potenza piastra riscaldante	600 W	600 W
	Heating plate dimensions	Ø 135mm	Ø 135mm
	Programmable temperature range	0 - 370 °C	0 - 370 °C
	Type of temperature control	Digital	Digital
	Temperature selection	1 °C	1 °C
	Reading temperature resolution	1 °C	1 °C
	Hot plate indication	Over 50°C	Over 50°C
	Overtemperature alarm	Over 430°C	Over 430°C
	Construction material (plate)	Aluminium	Aluminium
	Full scale temperature range	From 50°C to 370°C	From 50°C to 370°C
	Safety circuit	Separated with dedicated probe	Separated with dedicated probe
External Probe	Type	Pt100 Class A – Ø 3mm	Pt100 Class A – Ø 3mm
	Temperature control type	2 modalities: Fine, Fast	2 modalities: Fine, Fast

	Programmable temperature range	0 – 300°C	0 – 300°C
	Temperature selection	1°C	1°C
	Reading temperature resolution	1°C	1°C
	Accuracy	+/- 1°C*	+/- 1°C*
	Calibration	Da -10.0 a +10.0°C	Da -10.0 a +10.0°C
	Position alarm	Not inserted in the sample	Not inserted in the sample
	Overtemperature alarm	310°C	310°C
	Electrical data	5 Vdc – 1W (max)	5 Vdc – 1W (max)
Stir	Stirring capacity	20 l H_2O	20 l H_2O
	Programmable speed range	30 – 1700 rpm	30 – 1700 rpm
	Motor type	BLDC	BLDC
	Speed selection	5 rpm step	5 rpm step
	Autoreverse	From 5s to 99m:59s	From 5s to 99m:59s
	Autoreverse selection	1 s	1 s
	Full scale speed range	From 100 to 1700 rpm	From 100 to 1700 rpm
	Stirring alarm	Motor fault	Motor fault
	Motor rating output	10 W	10 W
Timer	Timer	From 1min to 99h:59min	From 1min to 99h:59min
	Timer selection	1 min	1 min
	2 modalities	Immediate start or at temperature set point	Immediate start or at temperature set point
Counters	Motor counter	Hours of work	Hours of work
	Heating plate counter	Hours of work	Hours of work
VTF	Temperature accuracy	+/-0,5°C*	+/-0,5°C*
	Electrical data	12Vdc-1.2W	12Vdc-1.2W

* in following conditions: 800ml water in 1 liter glass beaker (diameter 105mm), stirring bar 8x40mm, 600rpm, 50°C.

9. Accessories

Please get in contact with Chemglass Life Sciences for more details about accessories.
www.cglifesciences.com Phone: 1-800-843-1794

10. Warranty

The unit is guaranteed against production defects for 25 months from our invoice date.

In accordance with this guarantee Chemglass Life Sciences undertakes to repair any units resulting as faulty due to the quality of the materials used or poor workmanship.
Units rendered faulty due to inexpert handling/use or carelessness will not be replaced or repaired under warranty.

Exclusions:
The guarantee will be considered null and void for faults resulting from:
- inexperience and carelessness of the operator
- repairs, maintenance or replacement of parts carried out by personnel or Companies not authorized by the manufacturer
- use of the instrument that does not comply to the instructions/recommendations given in the present operating manual
- use of non-original spare parts.

11. Declaration of conformity CE

We, the manufacturer VELP Scientifica, under our responsibility declare that the product is manufactured in conformity with the following standards:

EN 61010-1 (2001)
EN 61326-1 (2006)
2011/65/EU (RoHS)
2002/96/CE (RAEE)

and satisfies the essential requirements of the following directives:

- Machinery directive 2006/42/EC
- Low voltage directive 2006/95/EC
- Electromagnetic compatibility directive 2004/108/EC
- plus modifications

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