Chemglass Life Sciences

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by VELP Scientifica

Instruction Manual

CG-2033-V2
Controller Advance

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.

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.

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 not 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 Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire	**IEC/EN 61010-1**
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.

The values indicated on the rating plate of the instrument must correspond to those of the a.c. mains supply.
Les valeurs indiquées sur la plaque signalétique de l'appareil doivent correspondre à ceux de l'alimentation.

Fasten the unit to the support rod using the lateral fixing block. Position the instrument with a distance from the wall of 30 cm (at least).
Fixer l'unité à la tige de support à l'aide du bloc de fixation latéral. Positionner l'appareil avec une distance de la paroi de 30 cm (au moins).

The working speed set on the instrument must be such as to avoid wobbling and/or splashes.
Le nombre de tours de l'ensemble agitateur doit exclure les déséquilibres et les éclaboussures du produit agité.

The instrument contains a battery. Its substitution must be carried out by authorized Velp personnel only.
L'instrument contient une batterie. Son remplacement doit être effectué uniquement par du personnel autorisé de Velp.

Contains FCC ID : YOPGS2101M / Contient FCC ID: YOPGS2101M

Contents

1 Introduction

Controller advance is an innovative solution for control and data logging in process reactors, able to monitor the temperature in the reactor and continually monitor the shaft rotation speed of brushless gear-motors for liquid volumes till 150L, even with viscosity changes and the motor is reversible.
All data logging features can be managed through VELP Ermes platform or USB by a PC.

Figure 1. Controller Advance

A	Display LCD
B	Display keys
C	Speed control knob
D	Lock key
E	Main switch
F	Motor circular connector 6P *
G	Motor circular connector 4P **

*Circular connectors Model C90-3102R14S-6S
**Circular connectors Model C90-3102R14S-2S

2 Installation

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

- The box includes
  - Controller advance
  - Power supply cable
  - Instruction manual

- First installation
  - Place the unit on non-flammable surface
  - Fix the instrument to the support through the handle
  - Connect the instrument to one of the following brushless motors 4 poles, 24 V: 1/11HP (max 4.4 A) or 1/4HP (max 8,3 A) or 3/8HP (max 15 A)

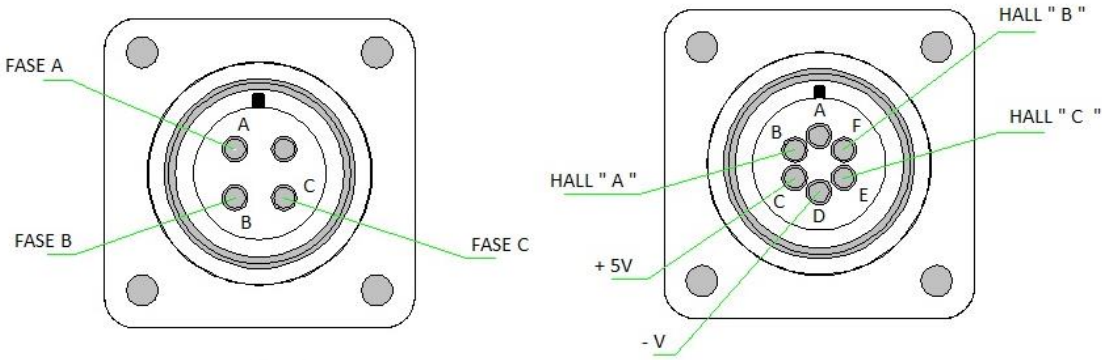


Figure 2. Connector side view

  - Make sure that the rating value of the instrument corresponds to the one of the power supply
  - Ensure that the socket with grounding is compliant with the current safety norms and easy to reach. Use only the cable provided with the instrument.
  - Insert the power cable into the socket and switch the instrument on.
  - Select the motor type in the SET UP/Motor type menu.

NOTE: the cable can be substituted only by main cables with same features (T=70°C, connector C14).

3 Display symbols

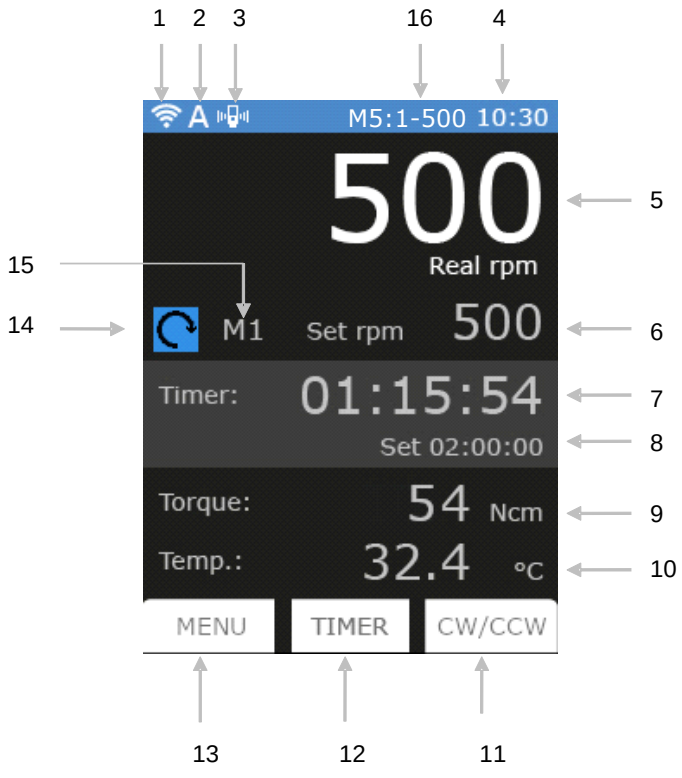


Figure 3. Display

1	Wi-Fi symbol
2	Start Mode symbol
3	Vibration Sensor symbol
4	Hour
5	Current Speed
6	Set Speed
7	Timer or Time counter
8	Set Timer
9	Current Torque
10	Current temperature (only when Pt100 probe is connected)
11	Reverse button
12	Timer button
13	Menu button
14	Current rotation direction
15	Current Method indication
16	Motor type

4 Working

Commissioning	➢ Switch on the instrument using the main switch (E) ➢ Display (A) shows Welcome page and the main screen (Figure 3).
Stirring	➢ Adjust speed set point by turning the speed control knob (C). As soon as the knob is moved, set rpm (6) becomes blue. ➢ Click the speed control knob (C) to start stirring. ➢ Speed increases until set point is achieved. ➢ A microprocessor ensures constant speed even when the viscosity changes (counter-reaction). ➢ Switch off the stirring by clicking the knob (C).
Timer	➢ Click Timer button (12) to select the timer. ➢ Set timer (8) - time becomes blue. Adjust timer by turning the speed control knob (C). ➢ Click the knob (C) to confirm. ➢ If the instrument is already working, timer countdown starts immediately, otherwise timer (7) is fixed as set timer (8) until stirring begins. ➢ If timer is not set, set timer (8) shows hh:mm:ss and timer (7) works as a counter.
CW / CCW	 **Figure 4. Set Rotation Direction** ➢ Set the rotating direction by clicking CW/CCW button (11) and rotating the speed control knob (C). ➢ Click the knob (C) to confirm clockwise (CW) or counterclockwise (CCW) direction. Once confirmed, “CW/CCW” symbol becomes black.
Torque	➢ The intensity of the torque is indicated on the main screen (9).
Lock	➢ Holding the Lock key (D) for 3 seconds, the instrument will lock it’s settings during operations. ➢ Unlock the control panel by holding the Lock key (D) for 3 seconds. ➢ If other buttons are clicked while the instrument is locked, the two LEDs aside lock button blink for many seconds.

5 External Connections

USB	➢ for PC controlling, data logging using modbus protocol ➢ for software upgrading, using a dedicated program to requested by to service@velp.it and to be installed in the PC.
RS232	➢ for interface with other instrument using RS232 protocol
Pt100	➢ This model has Pt100 connection in the back for fluid temperature measurement (measuring range from -200°C to + 550°C).

5.1 Modbus protocol
Controller register assignment

Register address	Register name	Write	Byte Number	Function/expanation
1	Instrument	NO	2	Instrument model
2	Serial number	NO	6	Instrument serial number
5	Product code	NO	12	Instrument product code
11	Main board sw	NO	8	Main board sw version
15	Display board sw	NO	8	Display board sw version
24	State	NO	2	Instrument state
25	Alarm	NO	2	The instrument notifies an alarm
26	Gear	NO	2	Gear set (only for OHS200)
27	Speed	NO	2	rpm measured
28	Torque	NO	2	Ncm measured
29	Timer	NO	4	Residual timer or counter
31	Timer set point	NO	4	Timer set value
33	Speed set point	NO	2	Speed set value
48	Pt100 connection	NO	2	Pt100 connected to the instrument
49	Temperature	NO	2	Temperature indication
50	Speed limit	NO	2	Speed maximum value
51	Torque limit	NO	2	Torque maximum value
52	Ramp	NO	2	Setting of acceleration
53	Method	NO	2	Reading of method number
54	Method n steps	NO	2	Total number of steps
55	Method step	NO	2	Current step visualized
56	Method n loops	NO	2	Total number of loops
57	Method loop	NO	2	Current loop visualized
102	Gear	SI	2	Setting of gear (only for OHS200)
103	Speed	SI	2	Setting of the speed
104	Timer	SI	4	Setting of the timer
106	Motor stop	SI	2	Motor stops stirring
107	Motor start	SI	2	Motor starts stirring

Sampling time: 1s or more

Examples (CRC 16 bit for standard MODBUS)

Reading single register: Speed (rpm)

Request		Reply		
Field	(Hex)	Field	(Hex)	Description
Address	0x64	Address	0x64	
Control command	0x03	Control command	0x03	
High start address	0x00	Number of bytes	0x02	
Low start address	0x1B	High register value	0x01	340 (RPM)
Number of High registers	0x00	Low register value	0x54	
Number of Low registers	0x01	High CRC	0xF4	
High CRC	0xFD	Low CRC	0x23	
Low CRC	0xF8			

Reading multiple register: Serial number

Request		Reply		
Field	(Hex)	Field	(Hex)	Description
Address	0x64	Address	0x64	
Control command	0x03	Control command	0x03	
High start address	0x00	Number of bytes	0x06	
Low start address	0x02	High register value	0x31	12345 0x00 0x31 0x32 0x33 0x34 0x35
Number of High registers	0x00	Low register value	0x00	
Number of Low registers	0x03	High register value	0x33	
High CRC	0xAD	Low register value	0x32	
Low CRC	0xFE	High register value	0x35	
		Low register value	0x34	
		High CRC	0x0A	
		Low CRC	0x0A	

Writing single register: STOP rotation

Request				
Field	(Hex)			Description
Address	0x64			
Control command	0x06			
High start address	0x00			
Low start address	0x6A			
High register value	0x00			Stop rotation
Low register value	0x01			
High CRC	0x61			
Low CRC	0xE3			

Set up virtual serial port

Baudrate	9600
Bits	8
Stop Bit	1
Parity	None
Maximum number of registers for single request	24

5.2 RS232 protocol

Command	Value (range)	Command Options *	Function
SS	0 (OFF) 35 – 500 (RUN)	Q/N	Sets/Reads the speed of the motor in RPM.
TQ	None	Q	Reads the actual torque in Ncm sensed by the motor
PI	None	Q	Returns a string with product information (software version and serial number). e.g: OHS v1.0.7-1.1.6 SN_609379
MS	None	Q	Returns the controller's current status: MS1 = Motor stopped MS2 = Motor accelerating MS3 = Motor decelerating MS4 = Motor running at set RPM MS5 = Motor overloaded or motor stalled or driver fault condition detected
SN	None	Q	Returns the serial number of the controller.

*

Q Query command is allowed
N Command optionally accepts a value

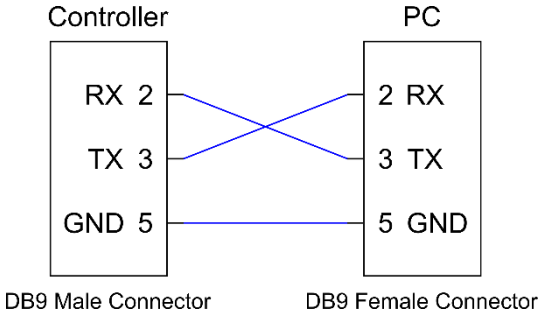
Protocol Syntax
Commands are case sensitive and must be in upper case.
The end-of-line character is a carriage return <CR>, or Hex 13. Do not add a linefeed to the end of line.

Query Format: <COMMAND><CR> This example queries the motors sensed torque. Example: Command = TQ<CR> Reply = TQ###.#<CR> Where ### is the sensed torque on the motor.	**Command Format:** < COMMAND ><Value><CR> This example sets the motor rotational speed. Example: Command = SS350<CR> Reply = SS350<CR>

Set up serial port

Baudrate [bps]	9600
Data bits	8
Stop bit	1
Parity	None

Serial cable pinout



6 VELP Ermes Configuration

VELP Ermes is a revolutionary cloud platform that transforms and improves your laboratory experience by creating an ecosystem of instruments, people and data. The VELP Ermes platform is able to reduce distances and accelerate scientific processes in total safety. In order to access on ERMES, you need to enable your VELP account by selecting "Configure your VELP ERMES account" at http://www.velp.com/en/login.

To be able to communicate, the instrument needs to be in the operating range of laboratory Wi-Fi (2.4 GHz) and be configured as follows:

- Switch on the Controller advance and select AP in the menu Set-up Wi-Fi (see chapter 7.5).
- Using the PC/Tablet/Mobile phone, select the RC_SERIAL NUMBER available on the Wi-Fi list, in order to connect directly to the instrument.
- Open a browser on the PC/Tablet/Mobile phone and insert the address 192.168.240.1 to reach the configuration page. Insert “admin” “admin” when requested as user name and password.
- Set the parameters required to connect to your Wi-Fi (network name, password, security, mac address, etc.) according to your internal procedure and save. If necessary, contact your IT administrator.
- Select menu Ermes from the Service menu (see chapter 7.6) and proceed with the product registration from the VELP Ermes platform. For more information see FAQ on VELP website.

NOTE: To access to VELP Ermes is necessary to have a VELP account.

7 Menu

By clicking Menu button (13) the following figure appears

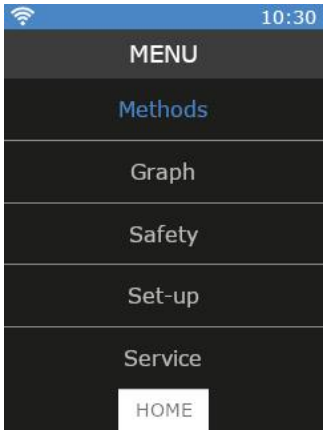


Figure 5. Main Menù

It’s possible to move among submenus rotating the speed control knob (C).

Enter in a submenu with a click of the speed control knob (C) once it’s highlighted in blue.

Press Home to go back to the main screen.

7.1 Menu Structure

- Menu
  - Methods
    - Method 01 → Steps, Start time, Intermittent mode, Loop
    - …
    - Method 10
  - Graph
  - Safety
    - Speed Limit
    - Torque Limit
    - Temperature Limit → Delta T, Interval time, Speed reduction
    - Acceleration → Slow, Standard, Fast
    - Vibration Sensor → OFF, Low, Medium, High
  - Set-up
    - Motor type → 5:1 - 500 - 1/4, 6:1 - 417 - 1/11, 10:1 - 250 - 1/4, 5:1 - 500 - 3/8
    - Start Mode → Stop (A), Run (B)
    - Wi-Fi Set-up → OFF, ON, AP
    - Wi-Fi Information
    - Display → Brightness, Torque, Temperature
    - Time & Date → Set Time, Set Date
    - Temperature Unit → °C, °F
    - Language → English, Italiano, ….
    - Protocol → Modbus, RS232
  - Service
    - Reset Torque
    - Real Torque
    - Pt100 Alignment
    - Reset Parameters
    - Update Software
    - Counter
    - Ermes
    - Advance Settings
- Timer
- CW/CCW

7.2 Methods

In this submenu it is possible to set 10 different methods.

Once set, a method becomes white in the method list and a blue bar appears on the left.

Press START to begin the method.

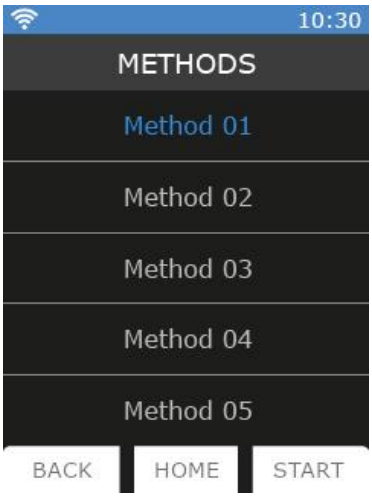


Figure 6. Methods

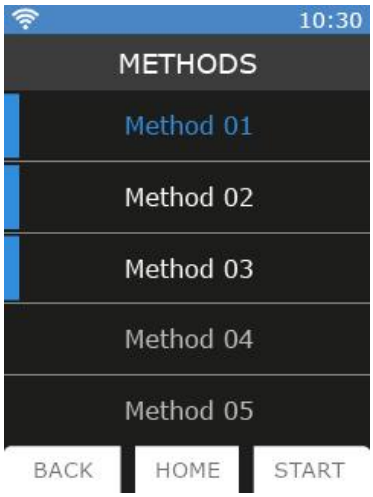


Figure 7. Methods set

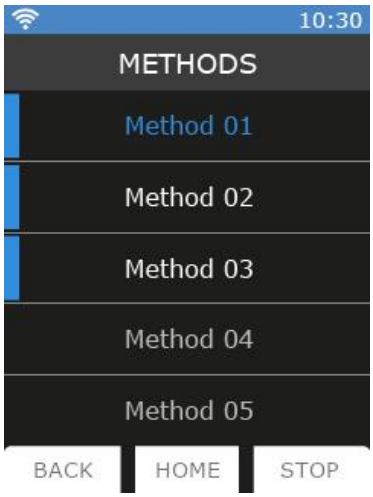


Figure 8. Stop Method

When a Method is working, on the main screen the current method (15) is shown.

It's not possible to modify speed, gear, or the timer.

It's possible to navigate in menu.

To stop a method before its end, enter in the method list and click STOP (Figure 8).

7.2.1 Method set-up

In each method it's possible to set parameters in Figure . Once method parameters are set, they are highlighted in white with a blue bar on the left as shown in Figure 10.

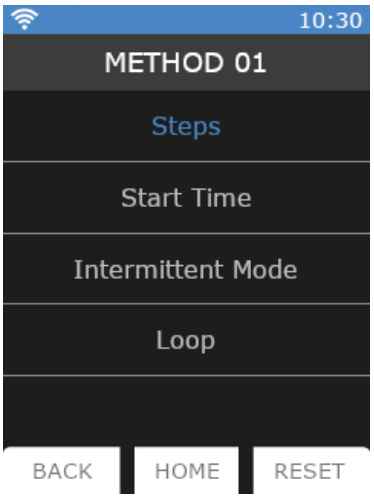


Figure 9. Method parameters

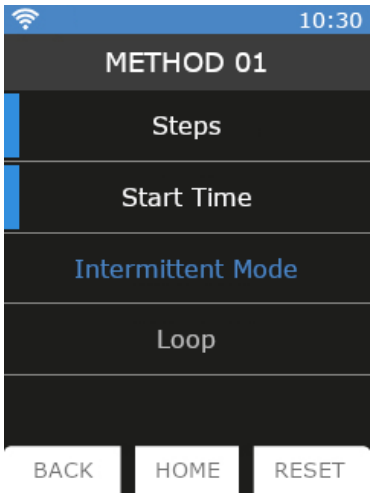
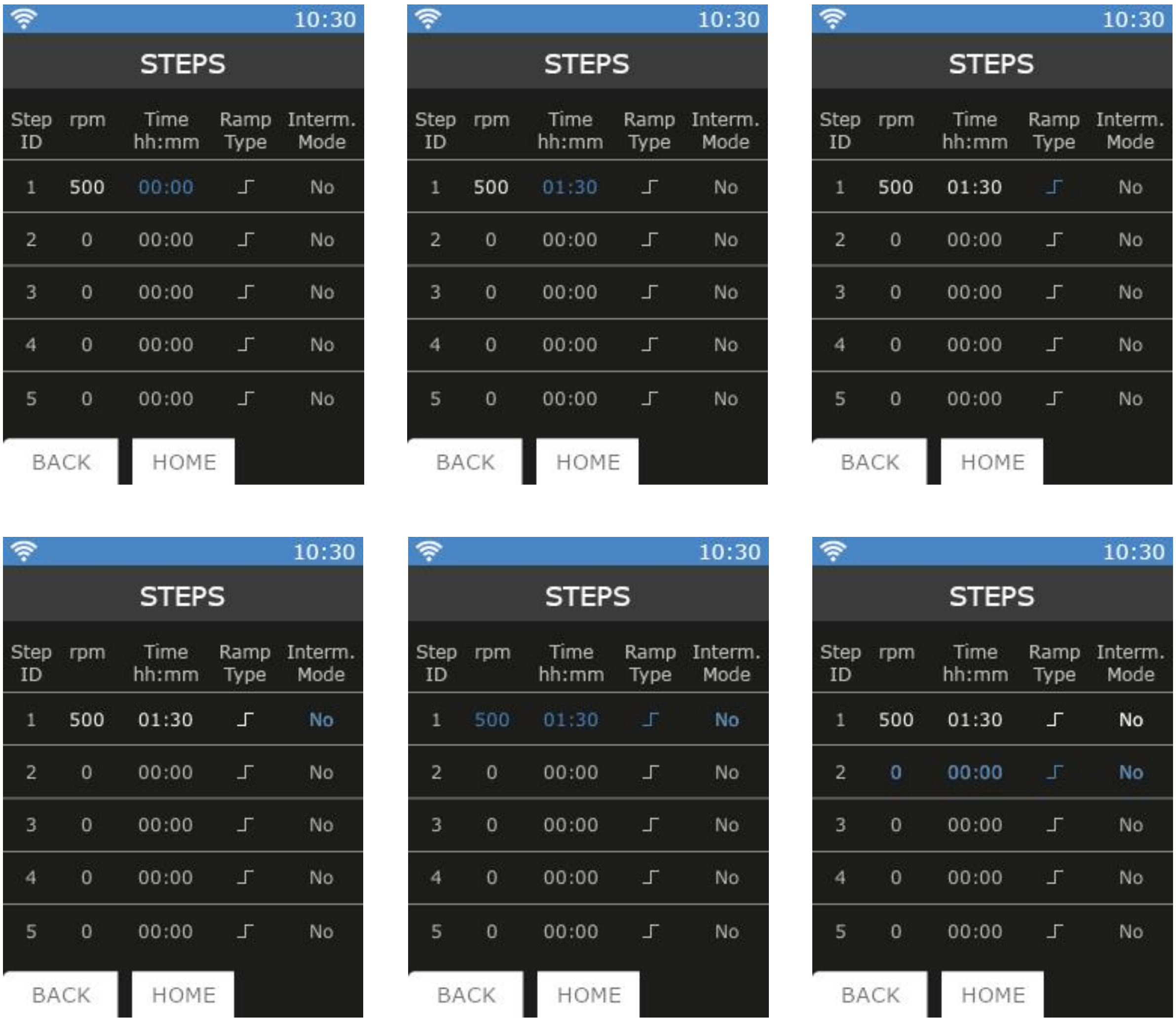


Figure 10. Method parameters set

Steps

- 5 steps can be set for each method.
- All steps are programmable with speed, timer, ramp, and intermittent mode.
- A Method is considered set when at least speed and timer are set for one step.

Figure 11



- Rpm: set point speed
- Time: countdown performed for each step visualized also on the main screen
- Ramp: if ▮▮ is selected, Controller stirs for all the time at the speed set

  if ◢ is selected, Controller reaches the speed set in time selected
- Interm. Mode: if YES is selected, but no intermittent mode is set for the method, Controller works in continuous mode.

Start Time	➢ It allows to set an hour at which the method starts. ➢ Enter in the menu, rotate speed control knob (C) till the desired hour. Click the knob to confirm. ➢ Even if a Start Time is set, the method begins if START button in method list is clicked.
Intermittent Mode	➢ It allows to set stirring period and stop period alternatively. ➢ Enter in the menu, rotate speed control knob (C) till the desired working time. Click to confirm. ➢ Rotate speed control knob (C) till the desired pause time. Click to confirm. ➢ Click again the knob to modify set values.
Loop	➢ It allows to repeat the whole method N times. ➢ Enter in the menu, rotate speed control knob (C) till the desired value. Click to confirm.

Click RESET to erase all method values.

7.3 Graph

In this submenu it is possible to visualize the graph of the current analysis.

Click RESET to erase the graph. Only the last 60 minutes are shown. Click ZOOM to see the last 3 minutes.

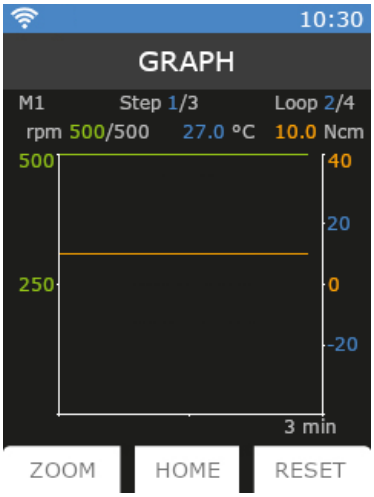


Figure 12. Graph with method

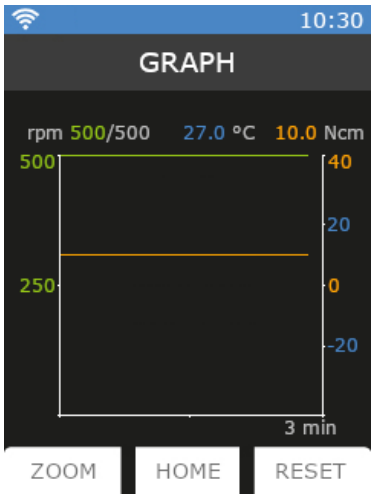


Figure 13. Graph without method

When a method is set graph appears as in Figure . When a method is not set, graph appears as in Figure 13.

7.4 Safety

In this submenu it's possible to set all limits linked to the safety depending on the working conditions

Speed Limit	➢ It allows to set the speed full scale. ➢ The maximum speed value is set by default. ➢ Enter in the menu, rotate speed control knob (C) by 100 rpm steps till the desired value. Click to confirm.
Torque Limit	➢ It allows to set the torque limit. ➢ The maximum value is set by default. ➢ Enter in the menu, rotate speed control knob (C) by 10 Ncm steps till the desired value. Click to confirm.
Temperature Limit	➢ It allows to set a speed reduction if Pt100 detects a certain temperature increase (or decrease) in a defined time.

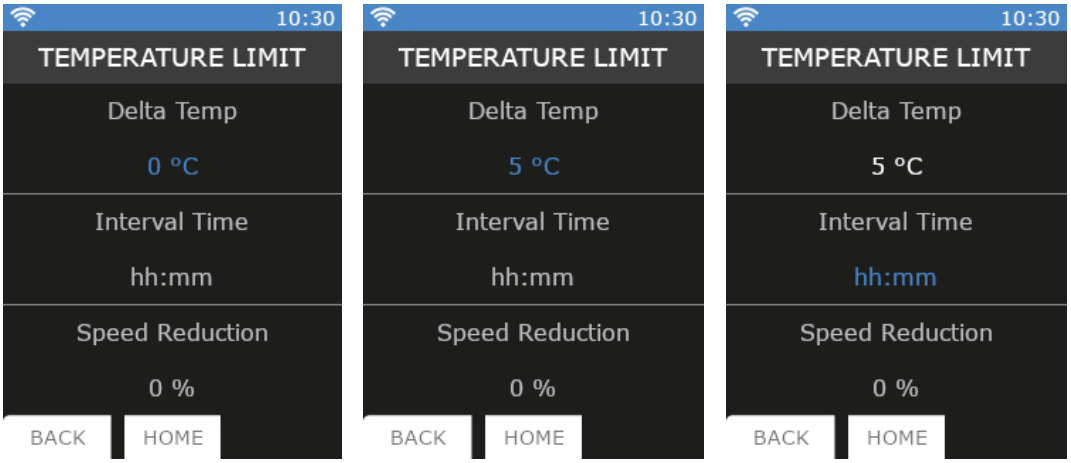


Figure 14. Temperature Limit

- Enter in the menu, rotate speed control knob (C) till the delta temperature desired value. Click to confirm.
- Rotate the knob (C) to set the interval time in which the delta temperature has to be considered. Click to confirm.
- Rotate the knob (C) to set the percentage of speed reduction desired if the selected delta temperature is detected in the set interval time. Click to confirm.
- Speed reduction can be set by 10% steps.

Acceleration	➢ It allows to choose among 3 different acceleration types when the instrument starts to stir or when a higher set point value is set. ➢ Enter in the menu, select Slow, Medium, or Fast depending on the customer application. Select Slow to reduce torque peaks. ➢ Click speed control knob (C) to confirm.
Vibration sensor	➢ It allows to set a vibration sensitivity level. ➢ Enter in the menu, rotate speed control knob (C) to select OFF, Low, Medium or High. Click to confirm. ➢ When vibration sensor level is set different than OFF, appears on the blue upper bar (3).

7.5 Set-up

Motor Type	➢ It allows to set the type of the motor connected to the instrument ➢ Enter in the menu, rotate speed control knob (C) to select the motor connected physically. Click to confirm. ➢ **Motor 5:1 – 500 rpm – 1/4:** 4 poles, 24V, 1/4HP, Max 12A, Max speed 500 rpm, Max torque 280 Ncm ➢ **Motor 6:1 – 417 rpm – 1/11:** 4 poles, 24V, 1/11HP, Max 4.4A, Max speed 417 rpm, Max torque 115 Ncm ➢ **Motor 10:1 – 250 rpm – 1/4:** 4 poles, 24V, 1/4HP, Max 12A, Max speed 250 rpm, Max torque 621 Ncm ➢ **Motor 5:1 – 500 rpm – 3/8:** 4 poles, 24V, 3/8HP, Max 18A, Max speed 500 rpm, Max torque 485 Ncm ➢ **Motor 10:1 – 250 rpm – 3/8:** 4 poles, 24V, 3/8HP, Max 18A, Max speed 250 rpm, Max torque 938 Ncm
Start Mode	➢ It allows to set instrument's restart mode in case of blackout or power loss. ➢ Enter in the menu, rotate speed control knob (C) to select Stop or Run. Click to confirm. ➢ **Stop**: when the instrument is switched on, it's requested a click of the control knob to start stirring. ➢ **Run:** when the instrument is switched on, it restarts to work with the last set point set. ➢ If Stop is selected, A appears on the blue upper bar (2). ➢ If Run is selected, B appears on the blue upper bar (2).
Wi-Fi Set-up	➢ It allows to switch on Wi-Fi module for IoT transmission. ➢ Enter in the menu, rotate speed control knob (C) to select ON or OFF. Click to confirm. ➢ When Wi-Fi is ON, appears on the blue upper bar (1).
Wi-Fi Information	➢ It describes all Wi-Fi information (MAC address, Power of signal, Wi-Fi name).
Display	➢ It allows for brightness to be set or if torque and temperature should be displayed on the main screen. ➢ Enter in the menu and scroll with speed control knob (C). Click to enter in submenus. ➢ Brightness: enter in this submenu, rotate speed control knob (C) to select the desired brightness value. Click to confirm. ➢ Brightness can be set by 10% steps. ➢ Torque: enter in this submenu, rotate speed control knob (C) to choose between ON or OFF if the display of torque on the main screen is desired or not. Click to confirm.

	➢ Temperature: enter in this submenu, rotate speed control knob (C) to choose between ON or OFF if the display of temperature on the main screen is desired or not. Click to confirm ➢ If torque and temperature are displayed on the main screen, the display menu appears as in Figure 15. ➢ When temperature is displayed but Pt100 probe is not inserted in the instrument, the main screen appears as in Figure .

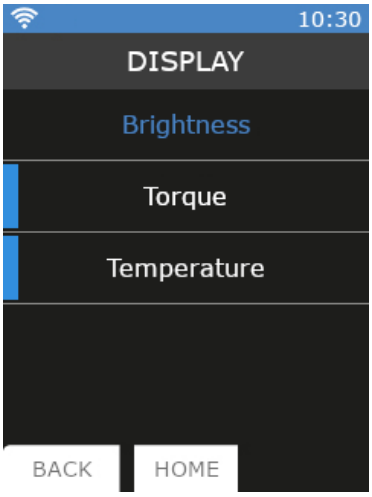


Figure 15. Torque and temperature shown

Figure 16. Main without temperature probe

Time & Date	➢ It allows to set hour and date. ➢ Enter in the menu and select Set Time. Rotate speed control knob (C) till the right time. Click to confirm. ➢ Return to the previous page clicking BACK button. ➢ Select Set Date. Rotate speed control knob (C) till the right day. Click to confirm ➢ Repeat the operation for month and year.
Temperature Unit	➢ It allows to choose temperature unit that has to be visualized between °C and °F.
Language	➢ It allows to select the interface language. ➢ Enter in the menu, rotate speed control knob (C) to select language. Click to confirm.
Protocol	➢ It allows to choose type of protocol between Modbus and RS232

7.6 Service

Reset Torque	➢ It allows to reset the current torque. Click with the speed control knob (C) to reset torque.
Real Torque	➢ It allows to return to real torque value ➢ Click with the speed control knob (C) to return to real torque value ➢ Negative torques can't be visualized anymore
Pt100 Alignment	➢ It allows for the alignment of the Pt100 probe to a reference thermometer. ➢ Enter in the menu, rotate speed control knob (C) to select the desired alignment value (from -10.0°C to 10.0°C). Click to confirm. ➢ Alignment sensitivity 0.1°C
Reset Parameters	➢ It allows to return to default value for all functions ➢ Click with the speed control knob (C) to reset parameters
Update Software	➢ It allows to update the device with a new software version ➢ Software version, dedicated program to be installed in the PC, and software installation guide have to be requested by e-mail to service@velp.it
Counter	➢ It allows to see the number of instrument working hours
Ermes	➢ It allows to connect the instrument to Ermes Cloud

8 Error messages

When the display shows an error message, the stirring function stops automatically.

Error code	Cause
AL1	Motor doesn't start stirring
AL2	High internal motor temperature
AL3	Motor overload
AL4	High driver temperature
AL5	Safety relè fault
AL10	Vibrations too high
AL11	Temperature too high (only with Pt100 inserted)
AL12	Temperature too low (only with Pt100 inserted)

To remove the error message, disconnect the instrument from the power supply.
If alarm persists on the display, please contact VELP Scientifica's technical service department. service@velp.it

9 Maintenance

Maintenance	➢ No routine or extraordinary maintenance is necessary; ➢ Repairs must be carried out by authorized Velp personnel only; ➢ Instrument must be transported into 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 a non-flammable non-aggressive detergent.

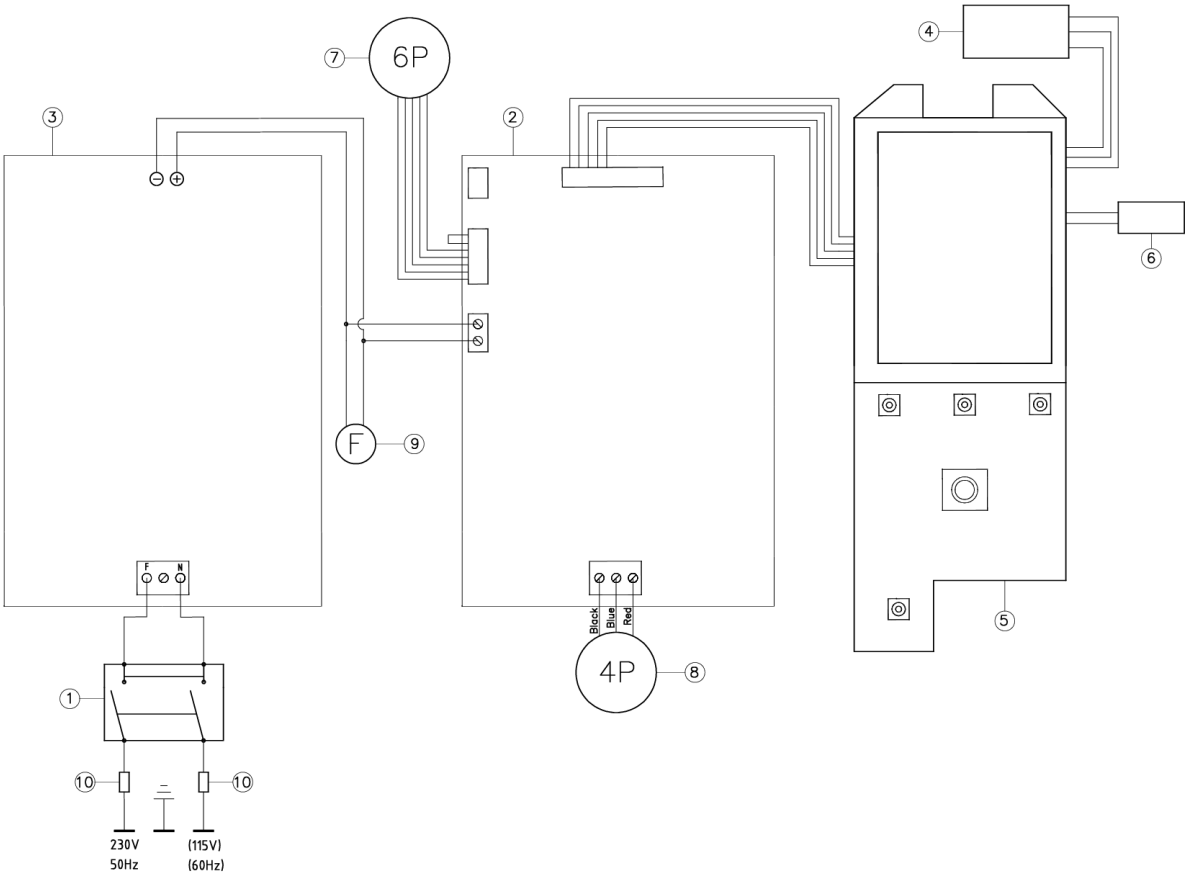
10 Technical data

	Model	F201A0500CG
General features	Power supply	230/115V – 50/60 Hz (+/-10%)
	Dimensions (WxHxD)	75x150x190 mm (2.95x5.90x7.48 in)
	Weight	2,5 kg (5,51 lb)
	Power input	500 W
	Construction material (structure)	Stainless steel
	Working in continuous	Admitted
	Settable restart modality	Stop or work
	Noisiness	<< 60 dBa
	Environmental temperature admitted	+5…+40 °C
	Storage temperature admitted	-10…+60 °C
	Max humidity	80%
	Overvoltage category	II
	Pollution degree CEI EN61010-1	2
	Max altitude	2000 m
Stirring	Programmable speed range	35…500 rpm (dependent on motor type, see chap. 7.5)
	Speed selection	1 rpm step
	Rpm accuracy	± 1
	Stirring alarm	Motor fault
Torque	Max torque admitted	113…938 Ncm (dependent on motor type, see chap. 7.5)
Counters	Board counter	Working hours

11 Accessories

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

12 Wiring diagram / Schéma électrique



1. Main switch / Interruttore generale / Interrupteur général / Interruptor general / Netzschalter
2. Main board / Scheda base / Carte d'alimentation / Tarjeta de potencia / Grundkarte
3. Switching power supply / Alimentatore / Bloc d'alimentation / Fuente de alimentacion / Netzteil
4. USB and RS232 board / Scheda USB e RS232 / Carte USB et RS232 / Tarjeta USB y RS232 / USB und RS232 karte
5. Display board / Scheda display / Carte display / Tarjeta display / Displaykarte
6. Pt100 connection / Connessione Pt100 / Connecteur Pt100 / Conector Pt100/ Pt100 Stecker
7. 6 poles connector / Connettore 6 poli / Connecteur à 6 pôles / Conector de 6 polos / 6-poliger Stecker
8. 4 poles connector / Connettore 4 poli / Connecteur à 4 pôles / Conector de 4 polos / 4-poliger Stecker
9. Fan / Ventola / Ventilateur / Ventilador / Ventilator
10. Retarded fuses 5A / Fusibili ritardati 5A / Fusibles retardés 5A / Fusibles retardados 5A / Retardierte Sicherungen 5A

13 Declaration of conformity CE

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

EN61010-2-051 (2015)	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-051: Particular requirements for laboratory equipment for mixing and stirring
EN61010-2-010 (2014)	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-010: Particular requirements for laboratory equipment for the heating of materials
EN 62479:2010	Assessment of electronic and electrical equipment related to human exposure restrictions for
electromagnetic	fields (10M Hz - 300 GHz).
EN 301 489-1 V2.2.0	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Common technical requirements.
EN 301 489-17 V3.2.0	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment; Specific conditions for Broadband Data Transmission Systems.
EN 300 328 V2.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation
techniques;	Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
2011/65/EU (RoHS)	Restriction of the use of certain hazardous substances
2012/19/EU (RAEE)	On waste electrical and electronic equipment
EN 61010-1 (2010)	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements.
CFR 47 Part 18 (FCC)	Electronic Code of Federal Regulations – Industrial, Scientific and Medical equipment applications and Authorizations.
UL 61010-1	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use – Part 1: General Requirements.
CAN/CSA-C22.2	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use – Part 1: General Requirements.

and satisfies the essential requirements of the following directives:

- Machinery directive 2006/42/EC
- Radio Equipment Directive (RED)2014/53/EU
- plus modifications

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Our instruments are manufactured in Italy according to the IEC 1010-1 and CE regulation.

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Heating Magnetic Stirrers
Heating Plates
Overhead stirrers
Vortex mixers
Homogenizers
COD Thermoreactors
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Cooled Incubators
Flocculators
Overhead Shakers
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Radiation Detector
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Pumps

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