INSTALLATION AND MAINTENANCE MANUAL

2. TECHNICAL DATA

Nominal values:

Power supply voltage (V)	220-240 V (1~ - 50/60Hz)
Operating speed (RPM)	600 r.p.m – 2800 r.p.m
Protection rating	IP 55

Limits of use:

- Minimum ambient temperature: -10ºC
- Maximum ambient temperature: +40ºC
- Variation in the supply voltage: +/- 10%

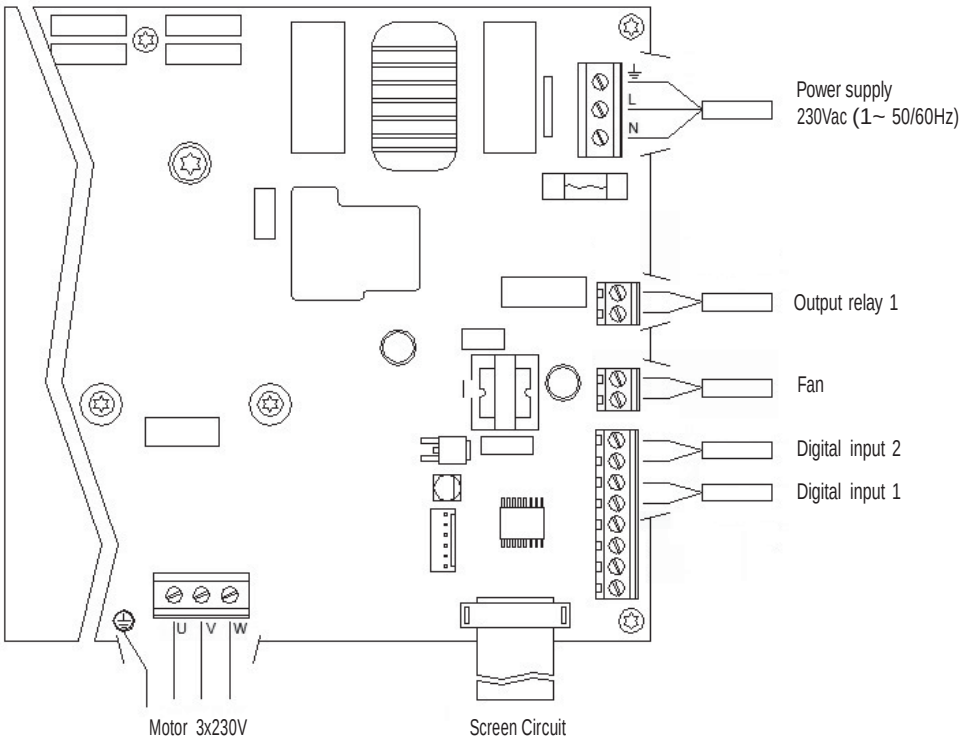
3. INSTALLATION / ASSEMBLY

Before installing the pump, carefully read the whole of this manual and consult the safety rules valid in each country.

Installation of the pump:

- It must be installed in a well ventilated area, protected from damp and direct exposure to the sun and rain. Failure to comply with these indications can significantly reduce the life of the speed variator.
- Before making the electrical connections, ensure the cable used to provide power to the pump is not live.
- Carefully verify the electrical data indicated in the specifications plate of the speed variator before connecting the electric current.
- The electric power cables to the pump must be of the correct size for the nominal consumption of the motor and the length of cable required.
- Also ensure that the grid has electrical protection; a high-sensitivity differential switch (30 mA, class B for industrial applications) is particularly recommended.
- In addition to the differential switch, it is advisable to install magnetothermal protection to control the power supply to the pump.

4. ELECTRICAL CONNECTIONS



Signal	Description
Fan	When wall-mounted, as there is no cooling from the motor's own fan, the ventilation system of the wall mounting shall be used for this cooling. This output is at 24Vdc and is activated whenever the pump is running.
Digital inputs 1 and 2	Any potential free contact that will perform the programmed functions can be connected to these inputs. N.B. Do not apply voltage to these inputs.

5. SCREEN FORMAT

Key	Function
V1	Zeitgesteuerte Pumpenaktivierung bei Geschwindigkeit 1
V2	Zeitgesteuerte Pumpenaktivierung bei Geschwindigkeit 2
V3	Zeitgesteuerte Pumpenaktivierung bei Geschwindigkeit 3
AUT	Aktivierung Automatikmodus Pumpe
STOP	Deaktivierung der Pumpe
BACK WASH	Für Aktivierung Rückspülzyklus
TIMER	Für direkten Zugriff auf die Zeitprogramme
F1	Auswahltaste für Bildschirminhalt
F2	Auswahltaste für Bildschirminhalt
▲▼	Navigation im Menü
POWER	Statusanzeige Spannungsversorgung
RUN	Statusanzeige ob die Pumpe in Betrieb ist
ALARM	Statusanzeige ob ein Fehler besteht

6. MAIN SCREEN

This screen will show the current status of the pump:

V	A	R	I	A	B	L	E		S	P	E	E	D		P	U	M	P	
		1	3	5	0		r	p	m				(		4	8	%	)	
			4	5	8		W												
1	1	:	5	8												M	e	n	u

It can directly view the instantaneous rotational speed of the motor and the instantaneous consumption of motor.

From this screen, if you click on the keys (▲) or (▼), you can directly access the display menu. This acts a short cut for checking data you need view without having to access the settings menu.

7. OPERATION MODE

The purpose of all pumps designed for swimming pool cleaning is to keep the water clean and in optimum condition. The most notable development is that with the logic of the speed variator, this process is achieved with high energy savings.

The variator enables the operation of a pump in the installation and also help to clean the filter, and more functions.

There is a daily setting of various filtration sequences (up to 4 sequences every day), in which the pump's operating speed can also be indicated.

The default of pump operation mode is automatic. Once time bands and the days of the week on which filtering is required have been indicated, the pump will filter at the speed indicated for each band. It is here where we must take into account that the slower the operating speed, the greater the energy savings.

The keyboard includes 3 buttons identified as V1, V2 and V3, which enable timed operation of the pump at the speed set in the corresponding parameter, in case the pump needs to be activated manually.

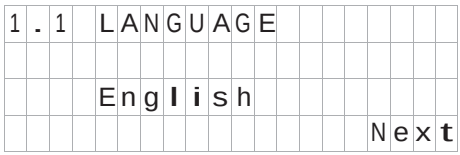
When the button "BACK WASH" is pressed, a simple wizard will guide you through cleaning the filter. This wizard will tell you to move the filter valves to cleaning mode, then rinse and finally back to filtration.

8. START-UP

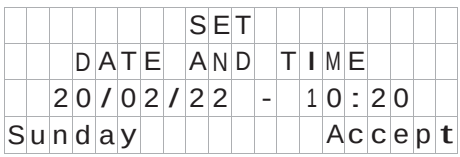
The first time you apply voltage to your unit, you will see parameter 1.1 that belongs to menu 1.General Config, which at the same time is the start-up wizard.

You will also see this screen if you restore the factory settings.

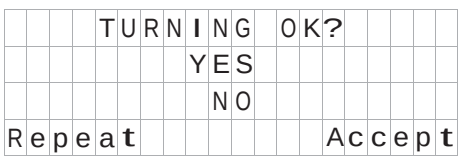
In this menu, enter the basic parameters of the installation prior to programming the time intervals that you wish to have the pump filtering.



Select the desired language with the (▼) key and, with the F2 key (Next), move on to parameter 1.2 to continue with the set-up wizard.



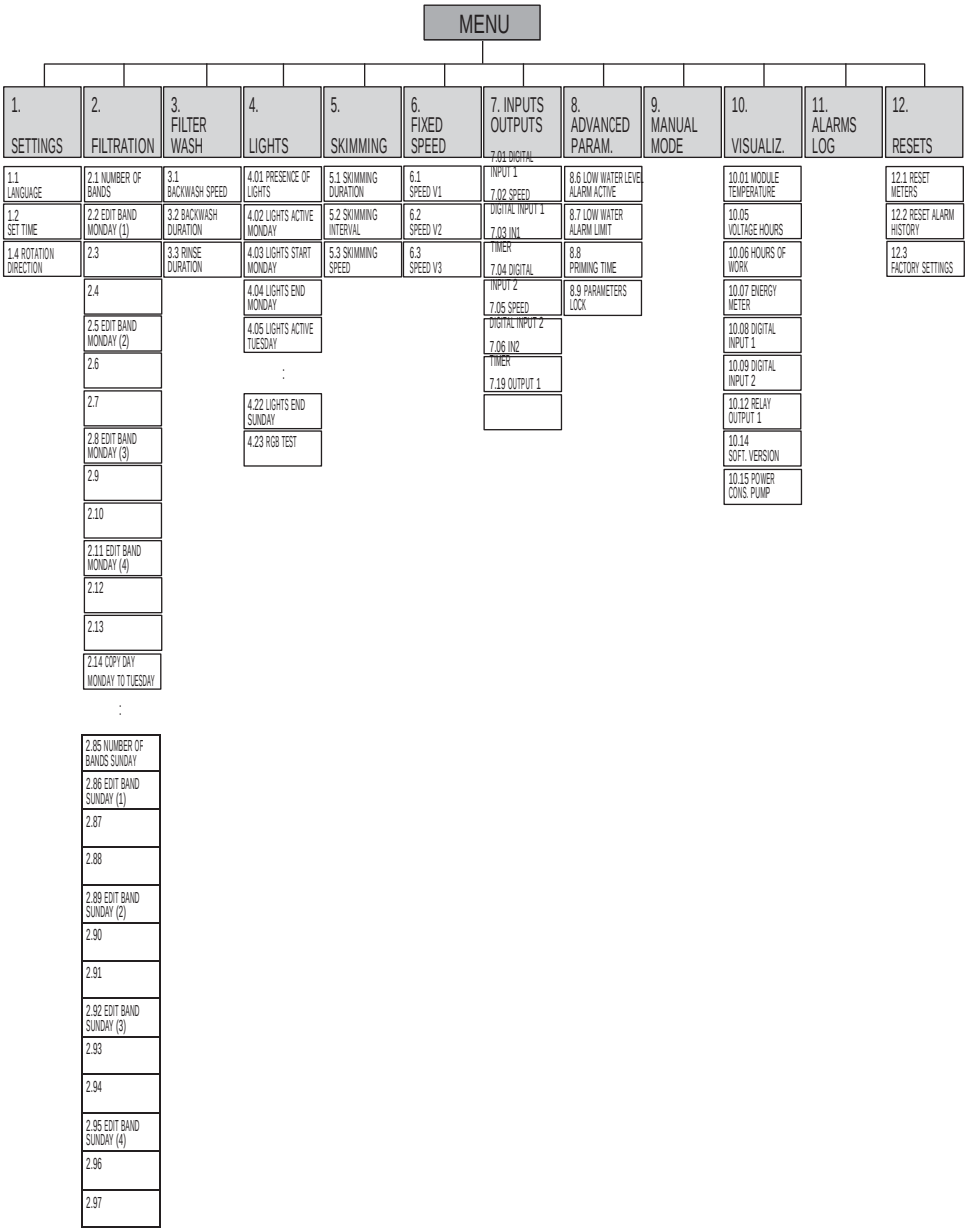
In this parameter enter the date and time. The speed variator will be governed by this for scheduling the start and stop times.
Continue with F2.



This screen shows a sequence of starting and stopping the motor at low speed, to be able to see if the motor is rotating in the correct direction. If it is not, the keys (▲) and (▼) invert the rotation direction.

This is the last screen in the startup wizard.

9. SETUP MENU (SCHEMATIC)



10. SETUP MENU

1. SETTINGS						
Par.	Description	Units	VALUES			Notes
			Default	Min.	Max.	
1.1	LANGUAGE	1.1	English	--	--	To define the language used to interact with the variator.
1.2	SET TIME					To adjust the date and time of the variator.
1.4	ROTATION DIRECTION		0	0	1	Modify the motor rotation direction, if it is rotating anticlockwise.

2. FILTRATION						
Par.	Description	Units	VALUES			Notes
			Default	Min.	Max.	
2.01	NUMBER OF BANDS MONDAY		0	0	4	The number of times the swimming pool water must be recirculated per day (Monday).
2.02	EDIT BAND MONDAY* (1)		00:00			Sets the start time of band 1.
2.03			24:00			Sets the end time of band 1.
2.04		rpm	1400	600	2800	Sets the rotational speed of band 1.
2.05	EDIT BAND MONDAY (2)		00:00			Sets the start time of band 2.
2.06			24:00			Sets the end time of band 2.
2.07		rpm	1400	600	2800	Sets the rotational speed of band 2.
2.08	EDIT BAND MONDAY (3)		00:00			Sets the start time of band 3.
2.09			24:00			Sets the end time of band 3.
2.10		rpm	1400	600	2800	Sets the rotational speed of band 3.
2.11	EDIT BAND MONDAY (4)		00:00			Sets the start time of band 4.
2.12			24:00			Sets the end time of band 4.
2.13		rpm	1400	600	2800	Sets the rotational speed of band 4.
2.14	COPY DAY MONDAY TO TUESDAY**					Enables you to copy the previous time settings to the next day (Tuesday).

Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
2.86	EDIT BAND SUNDAY (1)		00:00			Sets the start time of band 1.
2.87			24:00			Sets the end time of band 1.
2.88		rpm	1400	600	2800	Sets the rotational speed of band 1.
2.89	EDIT BAND SUNDAY (2)		00:00			Sets the start time of band 2.
2.90			24:00			Sets the end time of band 2.
2.91		rpm	1400	600	2800	Sets the rotational speed of band 2.
2.92	EDIT BAND SUNDAY (3)		00:00			Sets the start time of band 3.
2.93			24:00			Sets the end time of band 3.
2.94		rpm	1400	600	2800	Sets the rotational speed of band 3.
2.95	EDIT BAND SUNDAY (4)		00:00			Sets the start time of band 4.
2.96			24:00			Sets the end time of band 4.
2.97		rpm	1400	600	2800	Sets the rotational speed of band 4.

* There is a complete configuration for every day of the week. This manual only explains how to configure Monday and Sunday, as a summary, but the process is the same for the other days of the week.

** When the day's settings are complete, it allows you to copy this configuration directly to the following day, saving time when setting every day individually.

3. FILTER WASH						
Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
3.01	WASH SPEED	rpm	2800	600	2800	Sets the speed of the pump for the filter cleaning process.
3.02	WASH DURATION	min	5	1	60	Pump operating time during the filter wash process.
3.03	RINSE DURATION	min	1	0	60	Once the filter is clean, the operating time of the pump for rinse the remaining dirty water from the filter.

4. LIGHTS						
Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
4.01	PRESENCE OF LIGHTS		NO	NO	SI	There are spotlights in the pool and I use output 1 to activate them.
4.02	LIGHTS ACTIVE MONDAY		ON	ON	OFF	We indicate that we want the floodlights to be activated on Monday.
4.03	LIGHTS START MONDAY		00:00	00:00	23:59	Start time of the lighting cycle on Mondays.
4.04	LIGHTS END MONDAY		00:00	00:00	23:59	End of lighting cycle time on Mondays.
4.05	LIGHTS ACTIVE TUESDAY		ON	ON	OFF	We indicate that we want the floodlights to be activated on Tuesday.
4.22	LIGHTS END SUNDAY		00:00	00:00	23:59	End of lighting cycle time on Sundays.
4.23	RGB TEST					Change of colour sequence in RGB spotlights.

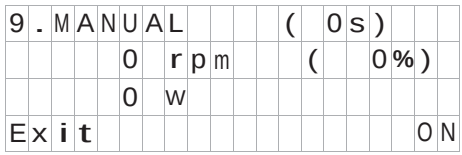
5. SKIMMING						
Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
5.01	SKIMMING DURATION	min	2	0	5	To program the duration of the surface cleaning program (SKIMMING) of the pool. If 0 minutes is indicated, SKIMMING is disabled.
5.02	SKIMMING INTERVAL	h	3	1	24	Indicate how often the SKIMMING program is to be started.
5.03	SKIMMING SPEED	rpm	2800	600	2800	Tell the pump what speed is required for the SKIMMING program.

6. FIXED SPEED						
Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
6.01	SPEED V1	rpm	950	600	2800	Set the speed at which the pump is to run at speed V1.
6.02	SPEED V2	rpm	1400	600	2800	Set the speed at which the pump is to run at speed V2.
6.03	SPEED V3	rpm	2800	600	2800	Set the speed at which the pump is to run at speed V3.

7. INPUTS OUTPUTS						
Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
7.01	DIGITAL INPUT 1		Unused	Unused External stop External stop INV Fixed speed Fixed speed INV		An input can be used to perform a remote stop (the INV option is for a contact that opens to switch on) or for the pump to operate at a certain speed when the input 1 is activated or deactivated (INV option).
7.02	SPEED IN 1	rpm	1400	600	2800	If digital input 1 is enabled for fixed speed, indicate the speed at which it is to operate when this input is given.
7.03	TIMER IN 1	s	OFF	1	60	In case of enabling the digital input 1 for fixed speed, we indicate the speed at which we want it to work when this input is given.
7.04	DIGITAL INPUT 2	Idem parameter 7.01 but for input 2.				
7.05	SPEED IN 2	Idem parameter 7.02 but for input 2.				
7.06	TIMER IN 2	Idem parameter 7.03 but for input 2.				
7.19	OUTPUT 1		OFF	OFF Salt chlorinator Wash Alarm (NO) Alarm (NA) Run Clock (NO) Clock (NA)		Relay 1 can be programed to be activated (or deactivated for NC-terminated options) whenever the pump is started, when the pump is filtering (saline chlorinator), when an alarm occurs or when a certain programming cycle is running.

8. ADVANCED PARAMETERS						
Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
8.06	LOW WATER LEVEL ALARM ACTIVE		ON	ON	OFF	Enables the constant monitoring of the pump running dry, if this occurs.
8.07	LOW WATER ALARM LIMIT	%	60	50	90	Value used in the mathematical algorithm that calculates the pump running dry.
8.08	PRIMING TIME	min	2	1	10	During the priming time, the detection of running dry will not be operative even though the monitoring is enabled.
8.09	PARAMETERS LOCK		OFF	ON	OFF	ON: Parameter editing is blocked. OFF: All parameters can be edited. To change from ON to OFF, the password 1357 must be entered.

9. MANUAL MODE



The objective of this screen is to test the pump operation, at a specific speed, for a controlled time, to correctly select the operating speeds of the cycles in section 2 of the settings menu.
Press F2 to activate the pump initially for 2 minutes at the maximum frequency of the pump. Each time you press the F2 key increases the operating time on a scale of 2 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours or 8 hours. At any time, by pressing the F1 key, you can stop the pump operation.
Every time you press the keys (▲) or (▼) you increase or decrease, respectively, the operating speed of the pump by 10 rpm.

10. VISUALIZATION

Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
10.01	MODULE TEMPERATURE	ºC				Shows the current temperature of the power module. If the temperature is very high, the speed variator itself will limit the speed of the pump to prevent the electronics of the speed variator being damaged.
10.05	VOLTAGE HOURS	Hours				Indicates the hours the pump has been connected to the electricity grid regardless of whether it has been running or not.
10.06	HOURS OF WORK	Hours				Indicates the hours of pump operation.
10.07	ENERGY METER	kWh				Indicates the pump consumption in kWh.
10.08	DIGITAL INPUT 1		0	0	1	Indicates whether input 1 is enabled or not; if it is enabled, the reason for this.
10.09	DIGITAL INPUT 2		0	0	1	Indicates whether input 2 is enabled or not; if it is enabled, the reason for this.
10.12	RELAY OUTPUT 1		0	0	1	Indicates whether output 1 is active or not.
10.14	SOFTWARE VERSION	W				Indicates the software version of the control board (display) as well as the power board (aluminium radiator).
10.15	POWER CONSUMPTION PUMP	W				Indicates the instantaneous power consumed by the pump.

11. ALARMS LOG
Shows a log of anomalies of the pump where the speed variator is connected, indicating the date, the time and the anomaly that occurred. This information is very important for detecting possible anomalies in the functioning of the installation.

12. RESETS						
Par.	Description	Units.	VALUES			Notes
			Default	Min.	Max.	
12.01	RESET METERS		NO	NO	YES	Enter YES to delete the voltage hours and the energy meter.
12.02	RESET ALARM HISTORY		NO	NO	YES	Enter YES to reset all the faults stored in the alarm history.
12.03	FACTORY SETTINGS		NO	NO	YES	This parameter will remove all the settings entered in the configuration of the variator, returning it to its initial status, as it was when installed for the first time.

11. ALARMS

Message	Reasons	Solution(s)
ALARM F01 OVERCURRENT	Indicates excessive consumption in the motor.	Check that the pump rotates freely with no obstructions.
ALARM F02 SHORT CIRCUIT	The motor is communicated or has burnt out.	Disconnect the motor from the variator and check that the message disappears. If this is not the case, contact your nearest technical service.
	Not all wires have been connected.	Check that all the cables of the motor are correctly connected to the motor itself and also to the variator. Also supervise the correct wiring of the frequency converter's power supply.
	Internal fault in the variator.	Contact your nearest technical service.
ALARM F03 EXCESS TEMPERATURE OF THE MODULE	The power module has reached a very high temperature, compromising its reliability.	Ensure the ambient temperature does not exceed the extremes set out in this manual. Ensure the variator is properly ventilated; in this case check that the pump has a fan and that the fan cover has been installed.
ALARM F04 INPUT VOLTAGE	The variator is not receiving electric current, of is outside of the upper and lower limits.	The electrical supply to the variator has been interrupted. The electrical connection cable from the mains electricity to the variator has been disconnected.

Message	Reasons	Solution(s)
ALARM F06 MOTOR FAULT	The motor is communicated/disconnected. Loss of synchronism.	Check that the cables to the motor are properly connected, as the variator is not detecting the motor, or it is burnt out. There may also be a loss of synchronism of the motor during operation due to a significant, quick change in the pumping conditions.
ALARM F07 LOW WATER LEVEL	The variator detects that the pump is working without water in the body of the pump.	Ensure the pump aspirates the fluid correctly.
ALARM X13 INTERNAL ERROR	There is no communication between the control panel (cover), and the power plate (radiator). Internal fault in the variator.	Check that the flat cable that communicates both electronic circuits are well connected and tightened. There may be one-off read error of the firmware. We recommend cutting the power to the variator for a few minutes. If, when the power is reconnected to the variator, the message remains, contact your nearest technical service.

12. WARRANTY

The guarantee on the speed variator is 24 months from the date of purchase: The use of non-original spare parts, alterations or improper use shall render the product warranty void.

13. DISPOSAL AND ENVIRONMENTAL ASPECTS

To dispose of the parts that comprise the speed variator, you must abide by the current regulations and laws of the country where the product is used. In any case, do not dispose of polluting parts into the environment.

This symbol on the product indicates that it should not be disposed of with other household waste.

This stipulation only refers to the disposal of equipment within the European Union (2012/19 /EU). It is the user's responsibility to dispose of the equipment by delivering it to a designated collection point for the recycling and disposal of electrical equipment. For more information about equipment collection points, contact your local waste disposal agency.