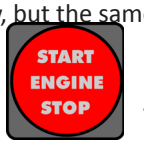
PANEL FOR CONTROL AND PROTECTION OF IRRIGATION MOTOR PUMPSET
TYPE CEM-390

RESERVED TO THE CONSTRUCTOR
MANUAL

TECHNICAL PROGRAMMING

ACCESS TO PROGRAMMING MODE

All programming must be done with the engine switched off. The programming procedure is the same for all parameters. As an example, the language programming is explained below, but the same procedure is used for all other programming.

Switch on the control unit by pressing the START button 

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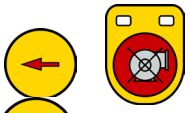
DO NOT START THE ENGINE.

Press the  buttons at the same time until the message disappears “TECHNICAL PROGRAMMING”.

Press the  to browse through the settings menu.

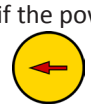
For example:

LANGUAGE CHOICE Press the  . The following message will appear on the display **LANGUAGE SELECTION** . After several seconds, the parameter to be changed will appear, for example: **ITALIAN ⬅** .

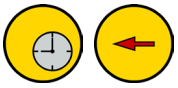
Press the  or  buttons to select the desired language. For example: **ENGLISH ⬅** .

To confirm the selection, press the  button until the message appears **PROGRAMMED** . Release the button.

Now the chosen parameter is programmed in the control unit. The settings are saved in a non-volatile memory, and are therefore maintained even if the power is switched off.

By pressing the  or  sbutton, the other parameters can be set.

If the parameter to be set has several variables, for example a threshold and a time, the display will show the following screens in sequence, for example: **PUMP WATER OVERPRESSURE** , after 3 seconds **2 BAR 3s ⬅** after 3 seconds **2 BAR 3s ⬅** . By pressing the  or  buttons, the variable indicated by the arrow can be modified. Press the  button for 5 seconds to confirm the choice. The following will appear: **PROGRAMMED** .

To exit the settings, press the  buttons at the same time or don’t press any button for 30 seconds.

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TECHNICAL PROGRAMMING

CHOICE OF LANGUAGE

Parameter	Default	Range
LANGUAGE SELECTION	ITALIAN	ITALIAN
		ENGLISH
		FRENCH
		GERMAN
		SPANISH
		PORTUGUESE

CHOICE OF FUNCTIONS

Parameter	Default	Range	Notes
STOP SYSTEMS	EXCITED WHEN RUNNING	EXCITED WHEN RUNNING	With “excited when stopped” consult our technical department.
		EXCITED WHEN STOPPED	
BATTERY VOLTAGE	12 V	12 V	Battery voltage selection.
		24 V	
BROWN CABLE	ALWAYS ATTACK	15/54	Contact 15/54 of the key or always active when the control unit is on.
		ALWAYS ATTACK	

RUNNING ENGINE ADJUSTMENT

Parameter	Default	Range	Notes
D+ THRESHOLD	7V (for 12 V battery) 14V (for 24 V battery)	3 ÷ 24 V	Engine running threshold with green wire connected to D+. Normally no adjustment is required.
RPM THRESHOLD	600RPM	300 ÷ 4000 RPM	Engine running threshold whit the RED/WHITE wire connected to the pre-excitation alternator W or the yellow wire of the permanent magnet alternator.
RPM RATIO	Procedure for calibrating the tachometer. Operation required when the RED/WHITE wires is connected to the pre-excitation charge alternator or the yellow wire of the permanent magnet alternator. After entering in the “TECHNICAL PROGRAMMING” and in the : “RUNNING ENGINE ADJUSTMENT”, Press the ←, the following window appears: **rpm/W RATIO PRESS START** . Press the START ENGINE STOP while the engine is running. When the engine starts the display shows this information. For example: **700RPM** . Press − or + until the correct setting is shown on the display. Press the ← and wait **PROGRAMMED** . After calibrating the tachometer, stop the engine by pressing the START/STOP button.		

ENGINE PROGRAMMING

Parameter	Subparameter	Default	Range	Notes
UNDERSPEED		0 RPM	0 ÷ 4000 RPM	The fault cuts in when the speed is equal to or lower than to the set threshold for at least 5 seconds. Causes the engine to stop. Protection is enabled once 10 seconds have elapsed from the exceedance of the threshold.
OVERSPEED		4000 RPM	0 ÷ 4000 RPM	The fault cuts in when the speed is higher than or equal to the set threshold for at least 2 seconds. Causes the engine to stop.
MAXIMUM SPEED		4000 RPM	0 ÷ 4000 RPM	The maximum RPM value that the engine can reach. When the engine reaches this value, the control unit does not allow the engine rpm to increase any further.
PREHEATING TIME		0 sec	0 ÷ 60 sec	The output is activated before start-up. 0Activated before start-up. 0 sec excluding preheating. A too long time may damage the glow plugs.
START-UP TIME		5 sec	5 ÷ 25 sec	Activation of the starter motor.
STOP TIME		20 sec	1 ÷ 60 sec	Activation time of the stopping system with the engine at a standstil.
DECELERATION PAUSES		0,0 sec	0,0 ÷ 3,0 sec	Allows the engine deceleration time to be varied. With the time at 0 seconds, the rpm variator decelerates the engine without pauses while running. Otherwise, the control unit activates the decelerator with 50mS pulses, spaced out with pauses of the programmed duration.
ENGINE HEATING		0 sec	0 ÷ 300 sec	Once deceleration is complete, the control unit waits for the cooling time before stopping the motor pump. Cooling does not take place if faults have occurred.
FUEL RESERVE		20 %	0 ÷ 100 %	The fault cuts in when the fuel level is less than or equal to the set threshold.
FUEL RESERVE	**THRESHOLD**	1 %	0 ÷ 100 %	The fault cuts in when the fuel level is less than or equal to the set threshold.
	STOP	WITHOUT STOP	WITH STOP	
			WITHOUT STOP	
OIL PRESSURE SWITCH CONTROL		BEFORE START-UP	WITH ENGINE RUNNING	Checks only the opening of the contact with the engine running.
			BEFORE START-UP	Checks also the closing of the contact with the engine switched off.
RADIATOR COOLANT LEVEL PROBE		NORMAL	NORMAL	If there is no liquid it switches off the ground signal.
			INVERTED	there is no liquid it switches on the ground signal.

Valid for firmware revision 1.06 and above

INSTRUMENT EXCLUSION

Parameter	Default	Notes
THERMOMETER	EXCLUDED	Displays the temperature of the engine when the temperature transmitter is connected to the WHITE/PURPLE wire.
OIL PRESSURE GAUGE	EXCLUDED	Displays the oil pressure of the engine when the pressure transmitter is connected to the WHITE/GREEN wire.
RPM COUNTER	INCLUDED	Displays the engine RPM. Used also to measure the running engine from RPM.
FUEL LEVEL INDICATOR	INCLUDED	Displays the percentage of fuel in the tank. When excluded, faults relating to the fuel level are ignored.
BATTERY VOLTMETER	INCLUDED	Displays the starting battery voltage measured between the RED and GREY wires.

EXCLUSION OF FUNCTIONS

Parameter	Default	Notes
WATER PRESSURE TRANSMITTER	INCLUDED	The TPA-200 water pressure transmitter can be excluded.
INSUFFICIENT PUMP WATER PRESSURE	INCLUDED	The underpressure pump water fault can be excluded.
WATER OVERPRESSURE	INCLUDED	The overpressure pump water fault can be excluded.
UNDERSPEED	EXCLUDED	Detected by the RED/WHITE wire.
OVERSPEED	EXCLUDED	Detected by the RED/WHITE wire.
ENGINE RPM VARIATOR	INCLUDED	Management of the engine rpm variator can be excluded. By excluding this function, the “hare” and “tortoise” buttons have no effect and the control unit does not perform the engine deceleration.
ALTERNATOR PRE-EXCITATION	INCLUDED	Include in pre-excitation alternators, exclude from other types of alternator.
MODEM GSM	EXCLUDED	If the modem module is not installed, it is not possible to include this function.
SMS FROM ALL FONES	EXCLUDED	If included, the control unit will accept SMS commands from all telephone numbers. If excluded, the control unit will only accept SMS commands from telephone numbers saved in the directory.
RING BEFORE SMS	EXCLUDED	If included, the control unit will cause the telephone to ring before sending an SMS. If excluded, the control unit will not cause the telephone to ring before sending an SMS.
STAND-BY	INCLUDED	If excluded, the control unit will never enter low-power mode.
NO FUEL-PERCENTAGE	EXCLUDED	If excluded, the insufficient fuel fault is triggered only when the float contact (ORANGE wire) closes to ground. If included, the insufficient fuel fault is managed solely by the percentage of diesel read by the float (ORANGE/BLUE wire). The threshold is programmable - see the engine settings.

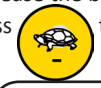
PUMP WATER PRESSURE

Parameter	Sub-parameter	Default	Range	Notes
UPPER DIFFERENTTIAL OVERPRESSURE	**DIFFERENTIAL**	2 BAR	0,5 ÷ 3,0 BAR	The control unit is regulated with an overpressure differential of 2 bar which is automatically added to the operating pressure, for example, if the operating pressure is 9 bar, the overpressure threshold is 11 bar. For working pressures greater than 4 BAR.
	DELAY	5 SEC	0 ÷ 9999 SEC	
UPPER DIFFERENTIAL LOW PRESSURE	**DIFFERENTIAL**	2 BAR	0,5 ÷ 3,0 BAR	The control unit is regulated with an underpressure differential of 2 bar which is automatically subtracted from the operating pressure, for example, if the operating pressure is 9 bar, the underpressure threshold is 7 bar. For working pressures greater than 4 BAR.
	DELAY	5 SEC	0 ÷ 9999 SEC	
LOWER DIFFERENTTIAL OVERPRESSURE	**DIFFERENTIAL**	1 BAR	0,5 ÷ 3,0 BAR	For working pressures lower than 4 BAR.
LOWER DIFFERENTIAL LOW PRESSURE	**DIFFERENTIAL**	1 BAR	0,5 ÷ 3,0 BAR	For working pressures lower than 4 BAR.
MAXIMUM ALLOWED PRESSURE		25 BAR	1 ÷ 25,0 BAR	When the water pressure exceeds the threshold, the control unit immediately stops the motor pump. This control is always enabled. Performs deceleration.

FAULT AVAILABLE (ORANGE/BROWN wire)

Parameter	Default	Range	Notes
ACTIVATION	ENABLED WHEN RUNNING	ALWAYS ACTIVE ENABLED WHEN RUNNING	Sensor activation time
DELAY	5 SEC	0 ÷ 9999 SEC	The event is triggered after the cut-in delay.
FAULT TEXT	“FAUST AVAILABLE”	“0 ÷ Z”	Text displayed when the fault is triggered. The text is not translated automatically. A change of language resets the default to the chosen language.

HOW TO TYPE THE TEXT of the available fault

Press the  button to choose the letter or number: ”0 ÷ 9” and “A ÷ Z”. Release the button for at least 1 second and the letter or number will stay written on the display. To delete the character, hold the  . Press  to move the cursor.

Press the  button for 5 seconds to set the text. The following will appear **PROGRAMMED**.

CHOICE OF TRANSMITTERS

Parameter	Default	Range	Notes		
TEMPERATURE TRANSMITTER	TTAO/402	TTAO/402 VDO/120 VDO/150 BERU VEGLIA F16173 JCB/1707 LOMBARDINI DUTG DAEWOOD	Tables already entered in the control unit.		
PRESSURE TRANSMITTER	TPO/403	TPO/403 VDO VDO 29/10 LOMBARDINI [10-180]Ohm [240-33,5]Ohm DD6E [10-185]Ohm	Tables already entered in the control unit.		
FUEL FLOAT	VEGLIA		Resistance OHM	TANK LEVEL	Tables already entered in the control unit.
		VEGLIA	0 ohm	Full	
			300 ohm	Empty	
		VDO	180 ohm	Full	
			0 ohm	Empty	
		DATCON	37 ohm	Full	
			240 ohm	Empty	
		[10-180]Ohm	10 ohm	Full	
			180 ohm	Empty	
		[240-33,5]Ohm	240 ohm	Full	
			34 ohm	Empty	
		DUMP	90 ohm	Full	
			5 ohm	Empty	
		EUROSWITCH	184 ohm	Full	
			3 0hm	Empty	

HOUR METER MODIFICATION

Parameter	Range	Notes
TOTAL OPERATING HOURS	0 ÷ 59999 h	Used to modify the operating hour intervals.

DEVICE

Parameter	Default	Range	Notes
LCD CONTRAST	-10%	-30 ÷ +30%	It is possible to modify the LCD display contrast.
BRIGHTNESS	70%	0 ÷ 100%	The brightness of the LCD display backlight can be changed.
BOARD ADDRESS	1	1 ÷ 32	Address of the control unit with MODBus RTU Slave protocol.
RS232 SERIAL PORT	9600 BPS	1200 2400 4800 9600 19200 38400 115200	Communication speed.
	E,8,1	E,8,1 N,8,1	Communication parameters.

Valid for firmware revision 1.06 and above