

CONTROL UNIT FOR IRRIGATION MOTOR PUMP AND PUMP WATER PRESSURE CONTROL

CONVENTIONAL ENGINES

control unit TYPE

- CIM-136/4G (EUROPEAN NETWORK COVERAGE)
- CIM-136/4GW (WORLDWIDE NETWORK COVERAGE)

ENGINES EQUIPPED WITH CONTROL UNIT FOR ELECTRONIC CONTROL OF THE INJECTION SYSTEM

Control unit of type

- CIM-136FPT/4G(FTP motor)
- CIM-136JCB/4G(JCB motors)
- CIM-136JDE/4G(JOHN DEERE motors)
- CIM-136FPT/4GW (FTP Motors)
- CIM-136JCB/4GW (JCB Motors)
- CIM-136JCB/4GW (John Deere Motors)



TECHNICAL PROGRAMMING MANUAL

RESERVED TO THE
MANUFACTURER

E **ELCOS**®

PARMA ITALY

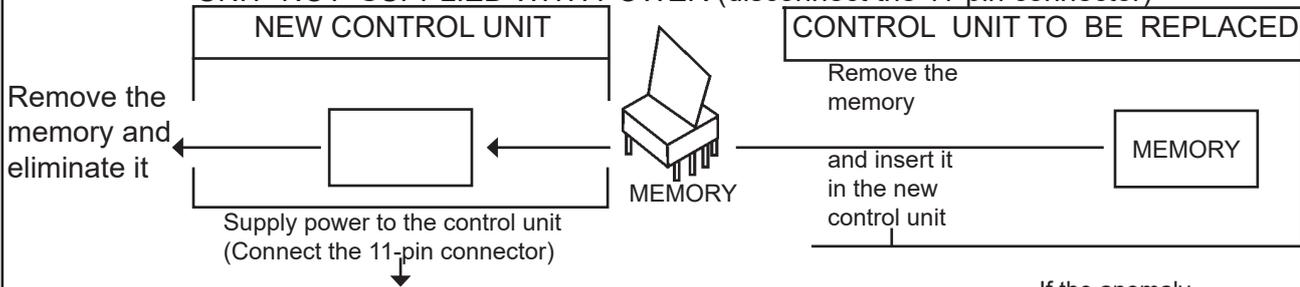
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REPLACING OF CONTROL UNIT

Before replacing the control unit we recommend transferring all the programming to the new control unit, if this is not carried out, the new control unit will operate with the factory-set programming. In this case it will be necessary to carry out programming of the amperometric transformer.

PROCEDURE TO BE CARRIED OUT
WITH ENGINE STOPPED AND CONTROL
UNIT NOT SUPPLIED WITH POWER (disconnect the 11-pin connector)



The following is read on the display

UPDATE THE CONTROL UNIT — or — MEMORY NOT INSTALLED



If the anomaly is activated during normal operation

MEMORY ERROR

the memory is no longer used.

To reset press



END OF TRANSFER — or — TRANSFER ERROR
Repeat the procedure



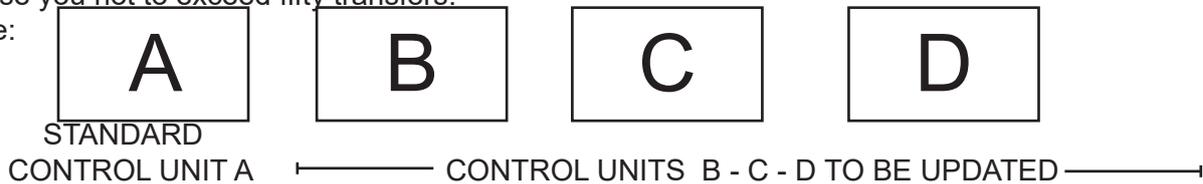
WARNING

THE TYPE AND REVISION OF THE TWO CONTROL UNITS MUST BE THE SAME.

TRANSFER OF PROGRAMMING OPERATIONS

It is possible to transfer the programming operations of a standard control unit onto several memories. We advise you not to exceed fifty transfers.

Example:



1. Switch off the power to the control units. (Disconnect the 11-pin connector)
2. Remove the memory from the control unit A.
3. Remove the memory from the control unit B.
4. Insert the memory B in the control unit A.
5. Supply power to the the control unit A. (Connect the 11-pin connector).
6. The following is read "UPDATE CONTROL UNIT".
7. Press the **STOP** button.
8. The following is read "SAVE DATA TO MEMORY"
9. Press the **START** button.
10. The following is read "END OF TRANSFER".
11. Switch off the power to the control unit A. (Disconnect the 11-pin connector)
12. Remove the memory from the control unit A.
13. Insert the memory B in the control unit B.
14. Supply power to the the control unit B. (Connect the 11-pin connector)
15. The following is read "UPDATE CONTROL UNIT".
16. Press the **START** button.
17. The following is read "END OF TRANSFER".
18. Repeat from point 3 for memories C and D.

CONTROL UNIT STAND BY

After 30 seconds of inactivity, the control unit enters STAND BY state, switching off completely all the signalling (led and display); selecting MAN or AUT the warning light pulsates. To exit STAND BY state press one of the buttons.

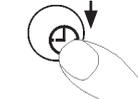
TECHNICAL PROGRAMMING

PROGRAMMING ACCESS

Press until the LED comes on.

USER PROGRAMMING

TECHNICAL PROGRAMMING



PRESS (10") AT THE SAME TIME TO DISPLAY: TECHNICAL PROGRAMMING

EXIT FROM PROGRAMMING MODE.

Press until the LED goes out.

LANGUAGE CHOICE	see on page 4	Italian German	English Portuguese	French	Spanish
CAN BUS	4	Engine type and make programming.			
CHOICE OF FUNCTIONS	5	Battery voltage. Irrigation/frost protection/boost modes. Priming mode.			
RESETTINGS	5	Change of indicated hours.			
ANOMALIES LOG	5	Anomalies that have occurred, Complete reset of the log.			
RUNNING ENGINE SETTING	6 13	Setting the running engine threshold, tachometer, overspeed and end of work of the underspeed, with signals coming from the charging alternator (D+ W). Signals coming from the CAN BUS of the engine control unit.			
PROGRAMMABLE TIMES	8 9 10	Preheating. Starting - pause - engine. Failure to fill pipes. Pressure steady. Acceleration pause. Startup delay after closing of the call. Stopping delay after opening of the call. Engine warming.	Intervention delay for insufficient pump water or pump water overpressure. End of work due to underspeed. Flow switch intervention delay. Engine cooling. Stopping. Abnormal acceleration. Connection of general alarm Priming failure time.		
MOTOR PUMP PROGRAMMING	12 13 14 15 16	Battery undervoltage. Battery overvoltage. Overheating. Fuel reserve. No fuel. Low oil pressure. Failure to fill pipes. insufficient pump water pressure. Pump water overpressure. Maximum speed. Abnormal acceleration Stop by timer. Low differential pressure. Flow switch end of work.	Low radiator fluid level. Anomaly of the charging alternator. Starting failure. End of work due to flow switch intervention. Available faults A1/A2.		
MOTOR PUMP AND PLANT SETTINGS	17	Allowed oscillation. Setting the clutch engagement threshold, pump priming pressure, choice of radiator fluid level probe			
CHOICE OF TRANSMITTERS	18 19	Choice of previously programmed pressure-temperature transmitters.			
FLOAT OHM	18	Choice of previously programmed fuel float. Programming of the ohmic values of the fuel float.			
TEMPERATURE TX. OHM	19	Programming of the ohmic values of the temperature transmitter.			
PRESSURE TX. OHM	19	Programming of the ohmic values of the pressure transmitter.			
SWITCH. OFF OF FUNC. AND PROT. DEV.	20	Switching off of functions. Control of connections to the protection probes.			
SWITCHING OFF INSTRUMENTS	20	Switching off of instruments			

LANGUAGE CHOICE

LANGUAGE CHOICE. The language set up in the factory is ITALIAN; the languages that can be selected are: ENGLISH - FRENCH - GERMAN - SPANISH and PORTUGUESE.

LINGUA



Press to select the language.

Factory setting

ITALIANO



Press and wait for OK to be written.

CAN Bus

ENGINE TYPE AND MAKE PROGRAMMING OPERATIONS Protocol CAN Bus SAE J1939

CHOICE OF MAKE AND TYPE OF ENGINE equipped with control unit for electronic control of the injection system.

CAN Bus



Press to choose the make and the type of engine.

PERKINS 1100



Press and wait for OK to be written

JOHN DEERE

PERKINS 1100

AIFO
FPT

JCB DIESEL MAX

.....

(Factory setting)



The signals of the tachometer.

The engine running detection function and the overspeed control are sent (CAN Bus) from the engine equipped with control unit for electronic control of the injection system.

NOTE: to switch on glow plug preheating program a time other than zero (see PREHEATING TIME on page 7).

NO ENGINE PROGRAMMED

CHOICE OF FUNCTIONS

BATTERY VOLTAGE. Factory setting 12V.

MODE: irrigation/frost protection /boost . Factory setting: IRRIGATION.

With the **frost protection** function engine warming and cooling are enabled, both with a time of 180 seconds.

With the **boost** function, the control unit manages pressure boosting systems. **See characteristics and operation on page 11.**

PRIMING MODE. Choose whether to operate the automatic priming pump before or after the engine start, after starting the engine or with "kirpy" vacuum priming pump. See description in the user instruction manual.

RESETTING OPERATIONS

CHANGE OF INDICATED HOURS. When the value of the hour meter is changed, the log is reset.

ANOMALIES HISTORICAL LOG

ANOMALIES LOG. The data of the last 100 anomalies that have stopped the engine are collected.

Press to consult the fault log. The following are displayed: the clock, the hour meter, the progressive number and a description of the faults that have occurred.

COMPLETE RESET OF THE LOG

ADJUSTMENTS OF RUNNING ENGINE THRESHOLD, TACHOMETER, OVERSPEED AND UNDERSPEED SIGNALS COMING FROM THE CHARGING ALTERNATOR

Adjustment with control unit connected to D+ (GREEN WIRE) of the pre-excitation alternator.

For detection of engine running just connect the GREEN WIRE.

D+ RUNNING ENGINE THRESHOLD ADJUSTMENT
 Normally no adjustment needs to be carried out, but if it is necessary to carry it out: stop the engine. Choose the threshold voltage coming from the charging alternator (terminal D+). Adjustment field 3÷12 (12V) 6÷24 (24V). Factory setting 7V (14V). Once it has been detected, it disables the starter motor and is displayed **(M)**.

Decreases **STOP** **START** Increases

Press to choose the voltage threshold.

Adjustment with control unit connected to W (WHITE/RED WIRE) of the pre-excitation alternator or to the yellow wire of the permanent magnets alternator.

ADJUSTMENTS WITH CHARGING ALTERNATOR FREQUENCY(W) NECESSARY PROGRAMMING

When the white/red wire is connected.

RPM/W CALIBRATION PRESS START

Start the primed motor pump with delivery closed with button **(START)**.

TACHOMETER ADJUSTMENTS
 Bring the engine to idle at constant known speed for example via a portable tachometer).

Decreases **STOP** **START** Increases

Press to obtain the right indication on the tachometer.

RUNNING ENGINE THRESHOLD ADJUSTMENT before carry out the tachometer adjustment. Normally no adjustment needs to be carried out, but if it is necessary to carry it out: **stop the engine.**

Decreases **STOP** **START** Increases

Press to choose the number of rounds at wich the starting motor has to be disconnected. Adjustment field 300 ÷ 4000 RPM.

OVERSPEED The protection system is activated 2 seconds after the end of the starting pulse. The intervention is memorized and stops the motor pump when the speed remains above the pre-set threshold (factory setting 4000 RPM) for the full duration of the activation delay (2 seconds). The fault is indicated on the display **OVERSPEED**.

Decreases **STOP** **START** Increases

Press and wait for OK to be written.

END OF WORK FUNCTION DUE TO UNDERSPEED INTERVENTION The function is enabled when the indication PUMP PROTECTION ACTIVE comes on **(P)**. Intervention occurs when the effective speed for maintaining the WORKING PRESSURE remains lower than the set threshold (10%) for the entire duration of the intervention delay. The intervention is not stored and stops the engine. Adjustment field 5% ÷ 30%. Intervention delay seepage 7-9.

DECCELERATION BEFORE STOPPING The factory setting is slow deceleration; it is possible to program quick deceleration.

Decreases **STOP** **START** Increases

Slow deceleration (with cooling) Quick deceleration (without cooling)

Press to choose

SIGNALS COMING (CAN Bus protocol SAE J1939) FROM THE ENGINE EQUIPPED WITH CONTROL UNIT FOR THE ELECTRONIC CONTROL OF THE INJECTION SYSTEM.

With this signal do not connect the terminals. Running engine threshold adjustment. Normally no adjustment needs to be carried out, but if it is necessary to carry it out: stop the engine.

Decreases **STOP** **START** Increases

Press to choose the number of rounds at wich the starting motor has to be disconnected. Adjustment field 300 ÷ 4000 RPM.

TACHOMETER and OVERSPEED no adjustment

PROGRAMMABLE TIMES		
DESCRIPTION	SECONDS	
	ADJUSTMENT FIELD	FACTORY SETTING
PREHEATING TIME preheating operation time.	0 ÷60	0 (off)
STARTING TIME starting attempt operation time.	5÷20	5
PAUSE TIME pause between starting attempts.	1 ÷20	5
PIPES FILLING Begins after detection of engine running, ends when working pressure is reached.		
TIME OF FAILURE TO FILL PIPES	0 ÷1800	120
PRESSURE STEADY TIME (5 sec.) the pressure is checked after acceleration		
if the pressure is not increased there is a wait for an	PRESSURE STEADY TIME	0 ÷20
		5
ACCELERATION PAUSE TIME (15 sec.) when this time has expired acceleration starts again.	ACCELERATION PAUSE TIME	0 ÷60
		15
START UP DELAY AFTER CLOSING OF CALL On closing the call contact and when the delay time is up, the start up begins.	0 ÷600	1
STOPPING DELAY AFTER OPENING OF CALL On opening the call contact and when the delay time is up, the stopping begins.	0 ÷600	1
ENGINE WARMING TIME The motor pump starts with the accelerator idling, acceleration begins when this time has expired.	Zero function switched off 0 ÷300	0 Generally included in frost protection systems
INTERVENTION DELAY FOR INSUFFICIENT PUMP WATER or PUMP WATER OVER-PRESSURE after the increase or lowering of pump water pressure and when this time has expired the stopping process begins.	0 ÷ 300	5
END OF WORK TIME FOR UNDERSPEED (without flow switch). When the engine revolutions fall below the UNDERSPEED percentage (see programming on page 13) and this time has expired, the ENGINE COOLING time starts.	0 ÷240	120
FLOW SWITCH INTERVENTION DELAY End of work time with flow switch. In the absence of water flow and when this time has expired, the motor pump starts ENGINE COOLING.	1 ÷ 1800	20
DECELERATION TIME When the deceleration time has elapsed, and in any case after 120 seconds, the stopping cycle begins. For functions with slow acceleration and cooling cycle see page 12-13.	0 ÷120	30
ENGINE COOLING TIME The motor pump is decelerated, when this time has expired the stopping process begins.	Zero function switched off 0 ÷300	0 Generally included in frost protection systems
STOPPING TIME Stopping system operation time after the engine running signal has disappeared.	10 ÷55	20
TIME OF ABNORMAL ACCELERATION As a result of a leakage on the system, the engine tends to increase the revolutions to bring it back to working pressure. If the revolutions increase above the ABNORMAL ACCELERATION percentage (see programming on page 13) for the whole duration of that time, the engine stops.	0 ÷240	60
GENERAL ALARM CONNECTION TIME Number 350 means continual operation without time limits.	10 ÷350	350
PRIMING FAILURE TIME The priming probe does not sense the presence of water, when this time has expired the priming pump stops.	0÷300	240

PROGRAMMABLE TIMES

PREHEATING TIME. Preheating operation time. 0 seconds preheating off.

Diagram illustrating the programming steps for Preheating Time:

- Initial display: []
- Action: Press to display. (Icon: arrow pointing to a button)
- Display: [0]
- Unit: [SECONDS]
- Action: Press to change the time. (Icons: STOP and START buttons)
- Display: [0]
- Action: Press and wait for OK to be written. (Icon: arrow pointing to an OK button)
- Final display: [OK]

STARTING TIME. Starting attempt operation time.

Diagram illustrating the programming steps for Starting Time:

- Initial display: []
- Action: Press to display. (Icon: arrow pointing to a button)
- Display: [5]
- Unit: [SECONDS]
- Action: Press to change the time. (Icons: STOP and START buttons)
- Display: [5]
- Action: Press and wait for OK to be written. (Icon: arrow pointing to an OK button)
- Final display: [OK]

PAUSE TIME. Pause between starting attempts.

Diagram illustrating the programming steps for Pause Time:

- Initial display: []
- Action: Press to display. (Icon: arrow pointing to a button)
- Display: [5]
- Unit: [SECONDS]
- Action: Press to change the time. (Icons: STOP and START buttons)
- Display: [5]
- Action: Press and wait for OK to be written. (Icon: arrow pointing to an OK button)
- Final display: [OK]

TIME OF FAILURE TO FILL PIPES.

Begins after detection of engine running, ends when working pressure is reached.

Diagram illustrating the programming steps for Time of Failure to Fill Pipes:

- Initial display: []
- Action: Press to display. (Icon: arrow pointing to a button)
- Display: [120]
- Unit: [SECONDS]
- Action: Press to change the time. (Icons: STOP and START buttons)
- Display: [120]
- Action: Press and wait for OK to be written. (Icon: arrow pointing to an OK button)
- Final display: [OK]

STEADY PRESSURE TIME during pipe filling.

Diagram illustrating the programming steps for Steady Pressure Time:

- Initial display: []
- Action: Press to display. (Icon: arrow pointing to a button)
- Display: [10]
- Unit: [SECONDS]
- Action: Press to change the time. (Icons: STOP and START buttons)
- Display: [10]
- Action: Press and wait for OK to be written. (Icon: arrow pointing to an OK button)
- Final display: [OK]

ACCELERATION PAUSE TIME during filling pipes.

Diagram illustrating the programming steps for Acceleration Pause Time:

- Initial display: []
- Action: Press to display. (Icon: arrow pointing to a button)
- Display: [5]
- Unit: [SECONDS]
- Action: Press to change the time. (Icons: STOP and START buttons)
- Display: [5]
- Action: Press and wait for OK to be written. (Icon: arrow pointing to an OK button)
- Final display: [OK]

PROGRAMMABLE TIMES

STARTUP DELAY AFTER CLOSING OF THE CALL CONTACT.

On closing the call contact and when the delay time is up, the start up begins.

STARTUP DELAY AFTER CALL

Press to display.

1 SECONDS

Decreases **STOP** **START** Increases

Press to change the time.

1 OK

Press and wait for OK to be written.

STOPPING DELAY AFTER OPENING OF THE CALL CONTACT.

On opening the call contact and when the delay time is up, the engine stops.

Zero seconds function off

DELAY AFTER OPENING OF CALL

Press to display.

0 SECONDS

Decreases **STOP** **START** Increases

Press to change the time.

0 OK

Press and wait for OK to be written.

ENGINE WARMING TIME.

The motor pump starts with the accelerator idling, acceleration begins when this time has expired.

Zero seconds function off

WARMING TIME

Press to display.

0 SECONDS

Decreases **STOP** **START** Increases

Press to change the time.

0 OK

Press and wait for OK to be written.

INTERVENTION DELAY FOR INSUFFICIENT PUMP WATER OR PUMP WATER OVERPRESSURE.

After the increase or lowering of pump water pressure and when this time has expired the stopping process begins.

INSUFFICIENT PUMP WATER INTERVENTION DELAY

Press to display.

5 SECONDS

Decreases **STOP** **START** Increases

Press to change the time.

5 OK

Press and wait for OK to be written.

END OF WORK TIME FOR UNDERSPEED.

To complete programming see page 6 UNDERSPEED PERCENTAGE.

UNDERSPEED END OF WORK TIME

Press to display.

120 SECONDS

Decreases **STOP** **START** Increases

Press to change the time.

120 OK

Press and wait for OK to be written.

FLOW SWITCH INTERVENTION DELAY.

In the absence of water flow and when this time has expired, the motor pump stops.

FLOW SWITCH INTERVENTION DELAY

Press to display.

20 SECONDS

Decreases **STOP** **START** Increases

Press to change the time.

20 OK

Press and wait for OK to be written.

PROGRAMMABLE TIMES

DECELERATION TIME. Can be set from 10 to 120 sec.

DECELERATION TIME

Premere per visualizzare.

30 SECONDS

Factory setting 30 OK

Decreases STOP START Increases

Press to change the time

Press and wait for OK to be written.

ENGINE COOLING TIME.

The motorpump is decelerated, when this time has expired the stopping process begins.

Zero seconds function off

COOLING TIME

Press to display.

0 SECONDS

0 OK

Decreases STOP START Increases

Press to change the time

Press and wait for OK to be written.

STOPPING TIME

Stopping system operation time after the engine running signal has disappeared.

STOPPING TIME

Press to display.

20 SECONDS

20 OK

Decreases STOP START Increases

Press to change the time.

Press and wait for OK to be written.

TIME OF ABNORMAL ACCELERATION.

To complete programming see page 13 OVERREV PERCENTAGE.

TIME OF ABNORMAL ACCELERATION

Press to display.

60 SECONDS

60 OK

Decreases STOP START Increases

Press to change the time.

Press and wait for OK to be written.

GENERAL ALARM CONNECTION TIME.

Number 350 means continual operation without time limits.

GENERAL ALARM CONNECTION TIME

Press to display.

350 SECONDS

350 OK

Decreases STOP START Increases

Press to change the time.

Press and wait for OK to be written.

PUMP PRIMING FAILURE TIME.

Can be set from 0 to 300 sec.

PUMP PRIMING FAILURE TIME

Press to display.

240 SECONDS

240 OK

Decreases STOP START Increases

Press to change the time.

Press and wait for OK to be written.

BOOST MODE

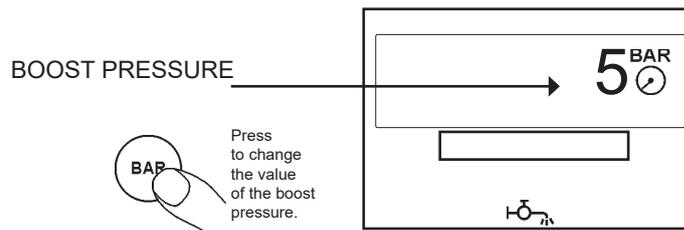
BOOST MODE

In boost mode, the control unit manages pressure boosting systems. It has the following characteristics:

- the AUTOMATIC mode is off and therefore pressure control is not possible.
- The subpressure fault is not enabled.
- The accelerator control (VAR) is switched off.

BOOST PRESSURE ADJUSTMENT

The BAR button can be used to change the boost pressure; this value is stored and kept in memory even after a switch off



OPERATION

- When the water pressure rises above the boost value, the motor pump is activated **CALL ACTIVE**.
- When the pressure falls below the boost pressure value -0.5 bar, the control unit stops the engine **CALL NOT ACTIVE**.

ENGINE AND PUMP PROTECTION DEVICES

The ENGINE PROTECTION DEVICES are enabled when indicator  comes on (10 seconds after detection of engine running ). The PUMP PROTECTION is enabled when  comes on (after 2 consecutive minutes of sufficient water pressure, indicated by NORMAL PRESSURE indicator  and in any case 10 minutes after the pump started). Intervention due to a fault enables the GENERAL ALARM.

DESCRIPTION FAULTS OR FUNCTIONS	INDICATION ON THE FRONT PANEL	MOTOR PUMP PROBE	INSTANT OF ACTIVATION (seconds)	INTERVEN- TION DELAY (seconds)	PRO- GRAMMED THRESHOLD (FACTORY SETTING)	STORES THE FUNC- TION	DECELERATION		EN- GINE COO- LING	STOP		INTERVENTION OCCURS WHEN:	FOR PRO- GRAM- MING SEE PAGE:
							PRO- GRAM- MABLE	FACTO- RY SET- TING		PRO- GRAM- MABLE	FACTO- RY SET- TING		
BATTERY UNDER- VOLTAGE	BATTERY  UNDER-VOL- TAGGE	BATTERY	Always active	2	11 (12V) 22 (24V)	NOT	=	NOT	NOT	DOES NOT STOP	Battery voltage remains lower than the programmed threshold for the whole of the intervention delay time.	14	
BATTERY OVER- VOLTAGE	BATTERY OVER- VOLTAGE			5	16 (12V) 32 (24V)	YES	SLOW	NOT	YES		Battery voltage exceeds the programmed threshold for the whole of the intervention time.	14	
OVER- HEATING DETECTED BY THERMOSTA- TIC SWITCH	OVER- HEATING 	THERMOSTA- TIC SWITCH	Always active	2	=	YES	SLOW	YES	NOT	WITH STOP	The temperature detected by the transmitter exceeds the set threshold.	14	
FUEL RESERVE	RESERVE  Flashing	FUEL FLOAT TERMINAL T	Always active	5	10%	NOT	=	NOT	NOT	DOES NOT STOP	The fuel level remains lower than the threshold for the whole of the intervention delay time.	14	
NO FUEL	NO FUEL  Always on	FUEL FLOAT TERMINAL W		5	1%	YES	SLOW	YES	NOT	WITH STOP			
LOW OIL PRESSURE	LOW OIL PRESSURE 	OIL PRESS- SURE SWITCH	10 after detec- tion of running engine	2	=	YES	QUICK	NOT	NOT	WITH STOP	The pressure is lower than the threshold set by the pressure switch.	15	
STOPPING FAILURE	STOPPING FAILURE 	ELECTRO- VALVE OR ELECTRO- MAGNET	After the stop command	60	=	YES	=	NOT	NOT	DOES NOT STOP	The engine running signal is detected after the stop command and the intervention delay time has elapsed.	No pro- gram- ming is possible.	
LOW RADIATOR FLUID LEVEL	LOW RADIATOR LEVEL 	LEVEL PROBE	Always active	5	=	YES	SLOW	NOT	NOT	WITH STOP	The coolant falls below the electrode and the intervention delay has elapsed.	15	
CHARGING ALTERNATOR FAULT (BELT BREAKAGE)	CHARGING ALTERNATOR FAULT 	ALTERNATOR	10 after detec- tion of running engine	5	=	YES	SLOW	NOT	NOT	WITH STOP	Alternator does not recharge the battery and the intervention delay time has elapsed.	15	
STARTING FAILURE	STARTING FAILURE 	BATTERY -STARTING MOTOR	Always active	=	=	YES	=	NOT	NOT	WITH STOP	The whole series of starting attempts is unable to start the engine.	15	

DESCRIPTION FAULTS OR FUNCTIONS	INDICATION ON THE FRONT PANEL	MOTOR PUMP PROBE	INSTANT OF ACTIVATION (seconds)	INTERVEN- TION DELAY (seconds)	PRO- GRAMMED THRESHOLD (FACTORY AD- JUSTMENT)	STORES THE FUNC- TION	DECELERATION		EN- GINE COO- LING	STOP		INTERVENTION OCCURS WHEN:	FOR PRO- GRAM- MING SEE PAGE:
							PRO- GRAM- MABLE	FAC- TORY SET- TING		PRO- GRAM- MABLE	FACTORY SETTING		
THE FUNCTION END OF WORK DUE TO FLOW SWITCH INTER- VENTION	END OF WORK FLOW SWITCH 	FLOW SWITCH	When the pump protection acti- vative warning light  comes on	20	=	NOT	YES	SLOW	YES	NOT	WITH STOP	There is no water flow and the intervention delay has elapsed.	16
AVAILABLE FAULT INPUT A1	A1	=	Always active	5	=	YES	YES	SLOW	YES	YES	WITH STOP	The input is negative (-) and the interven- tion delay has elapsed.	15
AVAILABLE FAULT INPUT A2	A2	=	With running engine										
FAILURE TO PRIME MAIN PUMP	FAILURE TO PRIME  (flashing)	-WATER LEVEL PROBE -ELECTRONIC PRESSURE SWITCH	With running engine	240	=	YES	NOT	=	NOT	NOT	WITH STOP	The priming probe does not sense water presence and the intervention delay has elapsed.	10
FAILURE TO FILL PIPES	FAILURE TO FILL	ELECTRONIC PRESSURE SWITCH	With running engine	120	=	YES	YES	SLOW	NOT	YES	WITH STOP	The working pressure is not reached and the intervention delay has elapsed.	16
OVERSPEED	OVER- SPEED 		Always active	2	4000RPM	YES	NOT	=	NOT	NOT	WITH STOP	The speed remains higher than the pro- grammed threshold for the entire duration of the intervention delay.	16
THE FUNCTION END OF WORK DUE TO UNDERSPEED INTERVENTION	UNDERSPEED END OF WORK 	ALTERNATOR TERMINAL W	When the pump protection acti- vative warning light  comes on	120	Allowed decel- eration percen- tage 10%	NOT	YES	SLOW	YES	NOT	WITH STOP	The speed drops below the program- med threshold and the working pressure remains constant for the entire duration of the intervention delay.	16
INSUFFICIENT PUMP WATER PRESSURE	INSUFFICIENT WATER PRES- SURE 	ELECTRONIC PRESSURE SWITCH	After detection of working pressure and in any case 600" after the pump started.	5	=	YES	YES	SLOW	YES	NOT	WITH STOP	The pump water pressure remains lower for the entire duration of the intervention delay.	16
PUMP WATER OVER- PRESSURE	PUMP OVER- PRESSURE 											The pump water pressure remains higher for the entire duration of the intervention delay.	16
ABNORMAL ACCELER- ATION	ABNORMAL ACCELER- ATION		With running engine	60	Allowed accel- eration percen- tage 20%	YES	YES	=	NOT	NOT	WITH STOP	The speed remains higher than the pro- grammed threshold for the entire duration of the abnormal acceleration time.	16
EMERGENCY STOP	EMERGENCY STOP 	EMERGENCY BUTTON	Always active	=	=	YES	NOT	=	NOT	NOT	WITH STOP	Emergency button is pressed.	No program- ming is possible.
CANBUS ANOMALY	CANBUS ANOMALY	ENGINE CONTROL UNIT		=	=	=	=	=	=	=	DOES NOT STOP	The CIM control unit does not communica- te with the engine control unit.	
ADJUSTMENT ERROR	ADJUSTMENT ERROR	ALTERNATOR TERMINAL W	With running engine	120	=	YES	=	=	NOT	NOT	WITH STOP	The rotation speed of the engine has not changed after 120 seconds.	19
PUMP WATER PRESSURE TRANSMITTER DISCONNECTED	TPA DISCON- NECTED	ELECTRONIC PRESSURE SWITCH	Always active	60	=	YES	NOT	SLOW	NOT	NOT	WITH STOP	The pressure transmitter circuit is discon- nected.	

MOTOR PUMP PROGRAMMING

BATTERY UNDERVOLTAGE. Adjustment field : 8 ÷ 12 (12V) 16 ÷ 24 (24V)
 Factory adjustment 11 (12V) 22 (24V)

Press to display. **VOLT 11** **VOLT 11** Press and wait for OK to be written.

Decreases Increases

Factory setting

BATTERY OVERVOLTAGE. Adjustment field: 12 ÷ 18 (12V) 24 ÷ 36 (24V)
 Factory adjustment 16 (12V) 32 (24V)

Press to display. **VOLT 16** **VOLT 16** Press and wait for OK to be written.

Decreases Increases

Factory setting

Slow deceleration (with cooling) Press to choose Quick deceleration (without cooling)

ENGINE OVERHEATING

Factory settings it is possible to program Quick deceleration Slow deceleration

Press to display. Press and wait for OK to be written.

Factory setting

Slow deceleration (with cooling) Quick deceleration (without cooling) Quick deceleration (without cooling)

FUEL RESERVE. Adjustment field 99%
 Factory setting 10%

Press to display. **10%** **10%** Press and wait for OK to be written.

Decreases Increases

Factory setting 10%

NO FUEL. The fault is triggered when the fuel level stays below or is equal to the set threshold. Adjustment from 0 to 99%. See how to programme on page 20 "NO FUEL - PERCENTAGE". The type of deceleration can be programmed = SLOW or quick. Factory set at 1% with quick deceleration.

Press to display. **1%** **1%** Press and wait for OK to be written.

Decreases Increases

Factory setting = 1% Slow deceleration Quick deceleration (without cooling)

MOTOR PUMP PROGRAMMING

LOW OIL PRESSURE. Factory setting. Quick deceleration.
It is possible to program. Slow deceleration.

Press to display.

Factory setting

Quick deceleration

Slow deceleration (with cooling)

Quick deceleration (without cooling)

Press and wait for OK to be written.

LOW LEVEL RADIATOR COOLANT. Factory setting. Quick deceleration.
It is possible to program. Slow deceleration.

Press to display.

Factory setting

Quick deceleration

Slow deceleration (with cooling)

Quick deceleration (without cooling)

Press and wait for OK to be written.

CHARGING ALTERNATOR ANOMALY. Factory setting. Quick deceleration.
It is possible to program. Slow deceleration.

Press to display.

Factory setting

Quick deceleration

Slow deceleration

Quick deceleration

Press and wait for OK to be written.

STARTING FAILURE. Factory setting 4 starting attempts.
It is possible to program up to 10 attempts.

Press to display.

Decreases **STOP** **START** Increases

Factory setting 4 starting attempts.

Press and wait for OK to be written.

(1) FLOW SWITCH END OF WORK FUNCTION (see on page 16).

AVAILABLE FAULT INPUTS A1 (ORANGE/BROWN). A2 (BLACK/BLUE). Factory setting. STOP. Slow deceleration.
It is possible to program. NO STOP Quick deceleration.

ACTIVATION
A1 always active
A2 with running engine

Press to display A1.

Factory setting: STOP.

Slow deceleration (with cooling)

Quick deceleration (without cooling)

Press and wait for OK to be written.

FAILURE TO FILL PIPES Factory setting: Quick deceleration.
It is possible to program: Slow deceleration

Press to display.

Decreases **STOP** **START** Increases

Factory setting

Slow deceleration

Quick deceleration

Press and wait for OK to be written.

- OVERSPEED
- UNDERSPEED END OF WORK

For programming see page 6.

MOTOR PUMP PROGRAMMING

INSUFFICIENT PUMP WATER PRESSURE Factory setting: Quick deceleration.
It is possible to program: Slow deceleration. Intervention delay (15") see "PROGRAMMABLE TIMES"

Press to display.

Slow deceleration (with cooling) Quick deceleration (without cooling)

Factory setting

Press and wait for OK to be written.

PUMP WATER OVERPRESSURE. Factory setting: quick deceleration, differential 2 bar.
It is possible to program: slow deceleration, the differential may be adjusted by 1-1,5-2-2,5-3-3,5. For working pressure contained of between 1 and 4 bars the overpressure differential is set at 1 bar. Intervention delay (5") see PROGRAMMABLE TIMES.

Press to display.

Decreases STOP START Increases

Slow deceleration (with cooling) Quick deceleration (without cooling)

Press to choose

Differential

Factory setting: differential 2 BAR

Press and wait for OK to be written.

MAXIMUM SPEED. This is the maximum RPM value that the engine can reach. When the engine reaches this value, the control unit will not allow the rpm of the engine to be increased further, neither with manual control nor in automatic mode.
Adjustment range = 0 ÷ 4000 Factory setting 4000 RPM.

Press to display.

Decreases STOP START Increases

Press and wait for OK to be written.

ABNORMAL ACCELERATION The function is enabled with engine running: Intervention occurs whethe effective speed for maintaining the working pressure remains higher than the set threshold (20%) for the entire duration of the intervention delay. The intervention is stored and stops the engine. Adjustment field 10% ÷ 50%. Intervention delay see page 7-10.

Press to display.

Percentage

Decreases STOP START Increases

Press and wait for OK to be written.

STOP BY TIMER. Factory setting: Slow deceleration.
It is possible to program: Quick deceleration.

Press to display.

Slow deceleration Quick deceleration

Factory setting

Press and wait for OK to be written

LOW DIFFERENTIAL PRESSURE Factory setting: differential 2 bar.
It is possible to program: differential, the differential may be adjusted by 0,5- 1-1,5-2-2,5-3. For working pressure contained of between 1 and 4 bars the low differential pressure is set at 1 bar. Intervention delay (5") see PROGRAMMABLE TIMES.

Press to display.

Decreases STOP START Increases

Slow deceleration (with cooling) Quick deceleration (without cooling)

Press to choose

Differential

Factory setting: differential 2 BAR

Press and wait for OK to be written.

FLOW SWITCH END OF WORK FUNCTION. Factory setting: Slow deceleration. It is possible to program: Quick deceleration.
(1) It is possible to program: intervention delay (20") see programmable times.

Press to display.

Slow deceleration (with cooling) Quick deceleration (without cooling)

Press to choose.

Factory setting

Press and wait for OK to be written

ADJUSTMENT OF MOTOR PUMP AND SYSTEM

ALLOWED OSCILLATION of the working pressure: it may be adjusted at $\pm 0,1 \div 1,5$ bar

Press to display.

Decreases **STOP** **START** Increases
Press to change the time.

Press and wait for OK to be written.

CLUTCH ENGAGEMENT THRESHOLD ADJUSTMENT.

ADJUSTMENT FIELD 600 ÷ 3000 RPM

FACTORY ADJUSTMENT AT 800 RPM.

The clutch engages when the set threshold is reached and remains engaged for the entire work cycle with automatic control. It disengages when the engine must stop and the RPM fall below the set threshold.

Press to display..

Decreases **STOP** **START** Increases

Press and wait for OK to be written.

PUMP PRIMING PRESSURE.

ADJUSTMENT FIELD 0,5 ÷ 3 bar. Factory adjustment 1 bar.

Press to display.

Decreases **STOP** **START** Increases
Press to choose.

Press and wait for OK to be written.

CHOICE OF RADIATOR LIQUID LEVEL PROBE

Press to display.

Decreases **STOP** **START** Increases
Press to choose.

Press and wait for OK to be written.

Factory setting

ATS-015/00

RADIATOR CORE
IN THE ABSENCE OF LIQUID THE CORE SIGNAL IS REMOVED
NORMAL

RADIATOR CORE
IN THE ABSENCE OF LIQUID THE CORE SIGNAL IS ACTIVE
REVERSED

CHOICE OF THE PREVIOUSLY PROGRAMMED FUEL FLOAT

 CHOICE OF FUEL FLOAT

 Press to view the selected fuel floats.

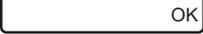
STOP Press to choose. Factory setting. **START**

VEGLIA

VDO

DATCON

PROGRAMM.

To program ohmic values of the fuel float, hold down button  and wait until  is written, press button  to select  and continue with programming.

FLOAT	TANK LEVEL	OHM
VEGLIA (factory setting)	FULL	0
	EMPTY	300
VDO	FULL	180
	EMPTY	0
DATCON	FULL	37
	EMPTY	240

 VDO OK
Example

 Press and wait for OK to be written.

PROGRAMMING OF THE OHMIC VALUES OF THE FUEL FLOAT.

It is possible to program 10 resistive values corresponding to the characteristic curves of other floats.

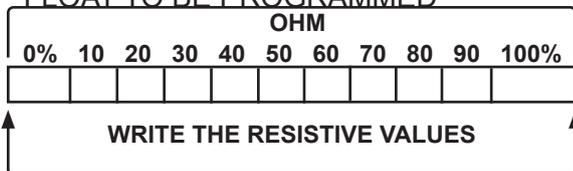


CAUTION: it is necessary to programme at least two values (to obtain a good precision in fuel control we recommend programming at least 4 values).

When programming just one value or non monotonic values,

the fault is detected 

PROGRAMMING OF CORRESPONDENCE FLOAT TO BE PROGRAMMED



PROGRAMMING

 10
---- OHM

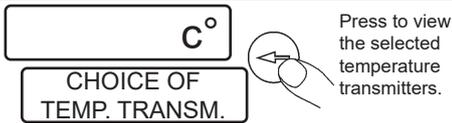
Decreases **STOP** **START** Increases

 50
OK
Example

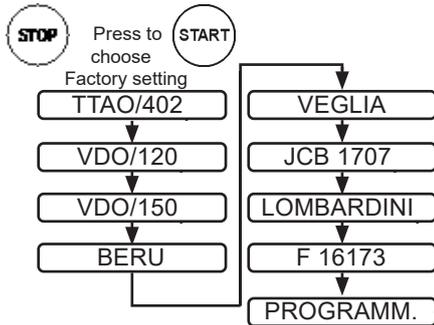
 Hold down and wait for OK to be written.

 Press briefly to show the carried out programmations.

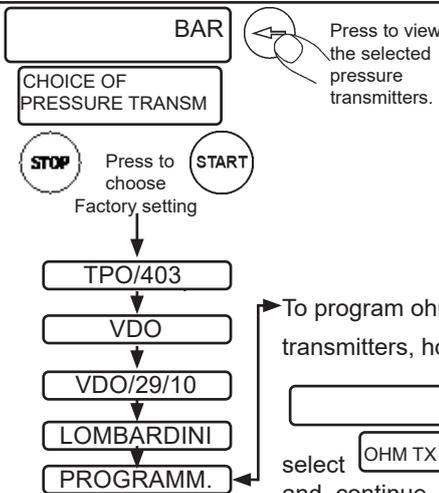
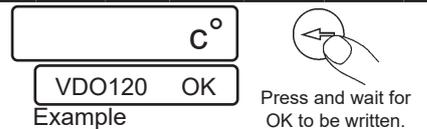
CHOICE OF THE PREVIOUSLY PROGRAMMED TEMPERATURE AND PRESSURE TRANSMITTERS



	25°C	50°C	70°C	80°C	85°C	90°C	95°C	100°C	120°C	130°C	OHM
TTAO/402	1185	375	190	130	110	95	80	70	40		
VDO/120	548	287	95	69	59	51	44	38	22	17	
VDO/150	498	323	183	113	96	83	73	62	37	29	
BERU		1100	567	395	319	278	227	165			
VEGLIA		708	399	245	210	175	153	130	75	59	
JCB 1707	503	200	105	78	67	59	51	45			
Fitted in engine Lombardini	927	322	155	112	96	83	71	62	36	29	
F 16173 Fitted in engine AIFO		834	436	322	280	243	213	187	113	89	



	0 BAR	1 BAR	2 BAR	3 BAR	4 BAR	5 BAR	6 BAR	7 BAR	8 BAR	9 BAR	OHM
TPO/403	270	251	203	157	114	79	52				
VDO	10		50		85		119		152		
VDO/29/10	9	38	57	77	99	114	134	149	164	180	
Fitted in engine Lombardini	10	31	52	71	90	107	124	140	156	170	



To program ohmic values of the temperature and pressure transmitters, hold down button and wait until is written, press button to select or and continue with programming .



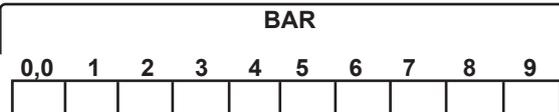
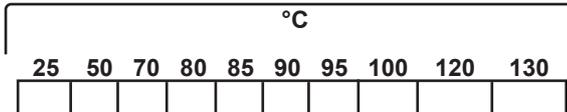
PROGRAMMING OF THE OHMIC VALUES OF THE TEMPERATURE AND PRESSURE TRANSMITTERS (PROBES)

The control unit is set in the factory for pressure and temperature transmitters type TPO/403 (pressure) and TTAO/402 (temperature). A max. of 10 resistive values can be set corresponding to the characteristic curves of other pressure and temperature transmitters.

PROGRAMMING OF CORRESPONDENCE

TEMPERATURE TRANSMITTER TO BE PROGRAMMED

PRESSURE TRANSMITTER TO BE PROGRAMMED-

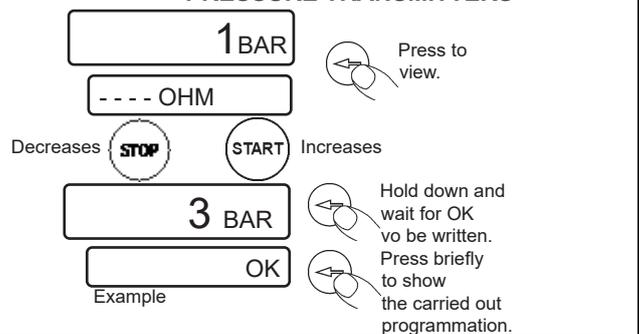
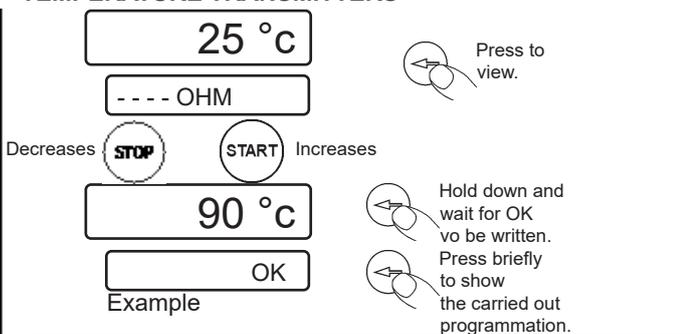


WRITE THE RESISTIVE VALUES

TEMPERATURE TRANSMITTERS

PROGRAMMING OPERATIONS

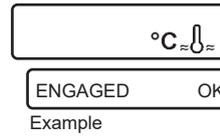
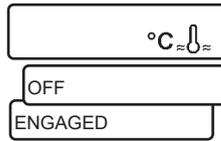
PRESSURE TRANSMITTERS



CAUTION: it is necessary to programme at least two values (For precision in temperature and pressure control we recommend programming at least 4 values). When programming just one value or non-monotonic values, the fault is detected.

SWITCHING OFF OF FUNCTIONS AND INSTRUMENTS

Instruments and functions can be switched off and engaged by following the procedures given below.



SWITCHING OFF OF FUNCTIONS AND PROTECTIONS DEVICES

FACTORY SETTINGS

	ENGAGED	OFF	ENGAGED	OFF	
LOW WATER PRESSURE insufficient pump water pressure	•		•		OVERPRESSURE pump water overpressure
NO FLOW flow switch intervention	•		•		WATER PRESSURE TRANSMITTER pump water transmitters
SUBPRESSURE RESET ENGAGED The subpressure value is deleted when the engine is stopped with button or . OFF The subpressure value IS NOT deleted when the engine is stopped with button or . Setting the subpressure see page 4 of the user instruction manual.	•				UNDERSPEED END OF WORK
WORKING PRESSURE RESET ENGAGED The pressure value selected is deleted when the engine is stopped with button or . OFF The pressure value selected IS NOT deleted when the engine is stopped with button or .					UNDERVOLTAGE Battery undervoltage
					OVERVOLTAGE Battery overvoltage
					ALTERNATOR ANOMALY charging alternator anomaly
					PRE-EXCITATION With pre-excitation off, the pre-excitation load (resistors) of the control unit is disabled. After switching off, it is essential to check that the alternator is charging.
					ABNORMAL ACCELERATION Pipe leakage controlled within the limits of the system.
TELEPHONE GSM Modem	•		•		SPEED VARIATOR
SMS FROM ALL FONES • ON: the control unit accepts SMS commands from all telephone numbers. • OFF: the control unit accepts SMS commands only from telephone numbers	•			•	DTC VEHICLE 2 FTP Enabling of VEHICLE 2 faults of the connections between FTP engines and CIM control units.
END OF WORK TEXT MESSAGE • ENABLED Sends a text message every time the motor pump finishes irrigation (end of work). • OFF When the motor pump finishes the work cycle, no message is sent.					NO FUEL - PERCENTAGE • ENABLED The no-fuel fault is not managed by the float contact (orange wire) but by the percentage (orange/blue wire). • OFF The insufficient fuel fault is triggered only when the float contact (orange wire) closes towards ground.
RING BEFORE SMS Telephone of the control unit has two ways to notify: • ENGAGED ring by telephonic call before sending a SMS message. • OFF no ring before sending a SMS message.				•	
MANUAL Manual mode	•				SWITCHING OFF OF INSTRUMENTS
AUTOMATIC Automatic mode	•				(1) THERMOMETER °C ≈ (2) Water or oil thermometer
OFF OFF mode	•				(1) PRESSURE GAUGE BAR (2) Oil pressure gauge
GENERAL ALARM Switching off is possible when this intervenes to warn of the imminent automatic starting except for CALL starting. This cannot be switched off when the intervention is caused by a fault .	•				T FUEL Fuel level indicator
AUTOMATIC PUMP PRIMING OFF The motor pump starts also with the pump not primed.	•				TACHOMETER (2)
					VOLTMETER Battery voltmeter

(1) It is possible to switch on both instruments, by cutting the BLACK/VIOLET bridge (see:wiring diagram).
(2) SWITCHES ON/OFF also the measurement produced by the engine control unit.