

CONTROL UNIT FOR IRRIGATION MOTOR PUMP AND PUMP WATER PRESSURE CONTROL

www.elcos.it

Type CIM-131



TECHNICAL PROGRAMMING MANUAL

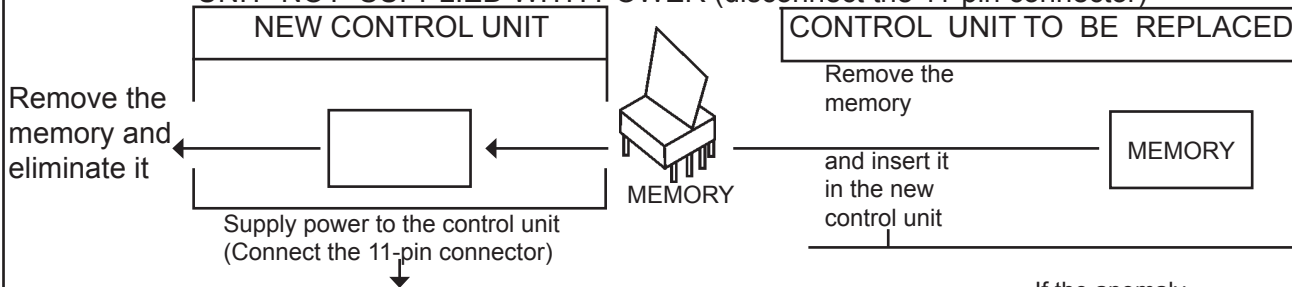
RESERVED TO THE
MANUFACTURER

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REPLACING OF CONTROL UNIT

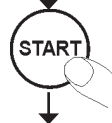
Before replacing the control unit we recommend transferring all the programming to the new control unit, if this is not carried out, the new control unit will operate with the factory-set programming. In this case it will be necessary to carry out programming of the amperometric transformer.

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



Press and wait for the transfer to be completed.

END OF TRANSFER — or — TRANSFER ERROR
Repeat the procedure

If the anomaly is activated during normal operation

MEMORY ERROR

the memory is no longer used.

To reset press



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.

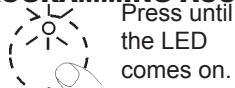
CONTROL UNIT STAND BY

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



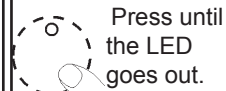
USER PROGRAMMING

TECHNICAL PROGRAMMING



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

EXIT FROM PROGRAMMING MODE.



LANGUAGE CHOICE	see on page 4	Italian Spanish	English Portuguese	French	German
CAN BUS	4	Engine type and make programming.			
CHOICE OF FUNCTIONS	5	Battery voltage. Irrigation/frost protection mode/boost. Priming mode.			
RESETTING	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	Preheating. Starting - pause - engine.	Intervention delay for insufficient pump water or pump water overpressure.		
	9	Failure to fill pipes. Pressure steady. Acceleration pause.	End of work due to underspeed. Flow switch intervention delay. Engine cooling. Stopping.		
MOTOR PUMP PROGRAMMING	10	Startup delay after closing of the call. Stopping delay after opening of the call. Engine warming.	Abnormal acceleration. Connection of general alarm Priming failure time.		
	12	Battery undervoltage. Battery overvoltage.	Low radiator fluid level. Anomaly of the charging alternator.		
	13	Overheating. Fuel reserve. No fuel.	Starting failure. End of work due to flow switch intervention. Available faults A1/A2.		
	14	Low oil pressure. Failure to fill pipes.			
MOTOR PUMP AND PLANT SETTINGS	15	insufficient pump water pressure. Pump water overpressure.			
	16	Maximum speed. Abnormal acceleration			
CHOICE OF TRANSMITTERS	17	Allowed oscillation. Setting the clutch engagement threshold, pump priming pressure, choice of radiator fluid level probe			
	18	Choice of previously programmed pressure-temperature transmitters.			
FLOAT OHM	19				
	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			

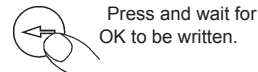
LANGUAGE CHOICE

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



Factory setting
ITALIANO

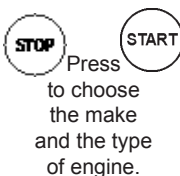


CAN Bus

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



PERKINS 1100



Press and wait for OK to be written



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).

JOHN DEERE

PERKINS 1100

AIFO (FPT)

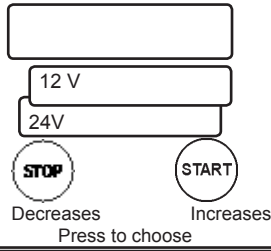
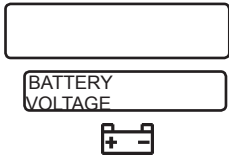
JCB DIESEL MAX

... ..
(Factory setting)

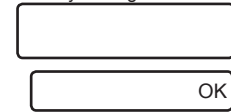
NO ENGINE PROGRAMMED

CHOICE OF FUNCTIONS

BATTERY VOLTAGE. Factory setting 12V.



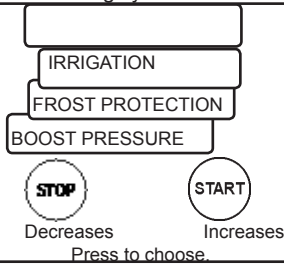
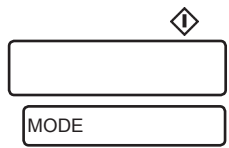
Factory setting



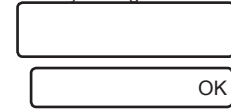
MODE: irrigation/frost protection/boost. Factory setting: IRRIGATION.

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

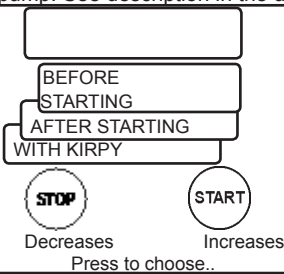
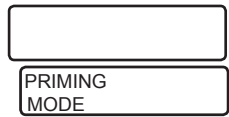
With the boost function, the control unit manages pressure boosting systems. **See characteristics and operation on page 11**



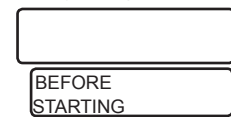
Factory setting



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.

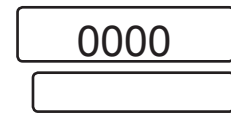
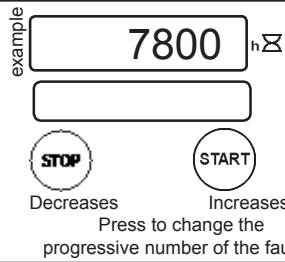
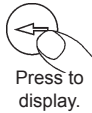
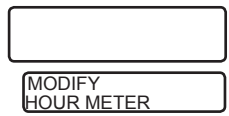


Factory setting



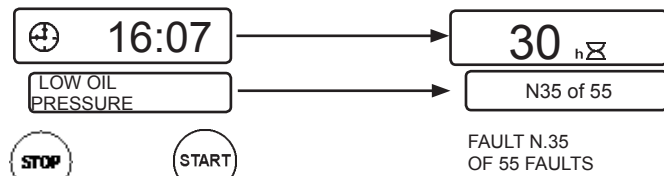
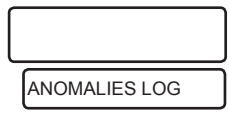
RESETTING OPERATIONS

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



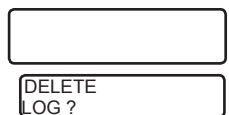
ANOMALIES HISTORICAL LOG

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..



Press simultaneously and wait for OK to be written.

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

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 Press to display.

Start the primed motor pump with delivery closed with button .

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

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.**

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

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 . 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 see page 7-9.

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

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.

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.	0 ÷1800	120
TIME OF FAILURE TO FILL PIPES		
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
	ACCELERATION PAUSE TIME	0 ÷60
ACCELERATION PAUSE TIME (15 sec.) when this time has expired acceleration starts again.		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 OVERPRESSURE 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.

Press to display.

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

Press to change the time.

Press and wait for OK to be written.

STARTING TIME. Starting attempt operation time.

Press to display..

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

Press to change the time.

Press and wait for OK to be written.

PAUSE TIME. Pause between starting attempts.

Press to display.

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

Press to change the time.

Press and wait for OK to be written.

TIME OF FAILURE TO FILL PIPES.

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

Press to display.

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

Press to change the time.

Press and wait for OK to be written.

STEADY PRESSURE TIME during pipe filling.

Press to display.

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

Press to change the time.

Press and wait for OK to be written.

ACCELERATION PAUSE TIME during filling pipes.

Press to display.

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





Press to change the time.

Press and wait for OK to be written.

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.

<input type="text"/>		<input type="text" value="1"/>	<input type="text" value="1"/>	
STARTUP DELAY AFTER CALL	Press to display.	SECONDS	OK	Press and wait for OK to be written.
Decreases   Increases Press to change the time.				

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

<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="0"/>	
DELAY AFTER OPENING OF CALL	Press to display.	SECONDS	OK	Press and wait for OK to be written.
Decreases   Increases Press to change the time.				

ENGINE WARMING TIME.






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

Zero seconds function off

<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="0"/>	
WARMING TIME	Press to display.	SECONDS	OK	Press and wait for OK to be written.
				
Decreases   Increases Press to change the time.				





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.

<input type="text"/>		<input type="text" value="5"/>	<input type="text" value="5"/>	
INSUFFICIENT PUMP WATER INTERVENTION DELAY	Press to display.	SECONDS	OK	Press and wait for OK to be written.
				
Decreases   Increases Press to change the time.				





END OF WORK TIME FOR UNDERSPEED.

To complete programming see page 6 UNDERSPEED PERCENTAGE.

<input type="text"/>		<input type="text" value="120"/>	<input type="text" value="120"/>	
UNDERSPEED END OF WORK TIME	Press to display.	SECONDS	OK	Press and wait for OK to be written.
Decreases   Increases Press to change the time.				

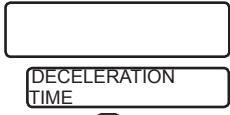

FLOW SWITCH INTERVENTION DELAY.



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

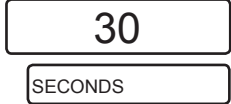
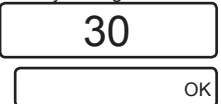

<input type="text"/>		<input type="text" value="20"/>	<input type="text" value="20"/>	
FLOW SWITCH INTERVENTION DELAY	Press to display.	SECONDS	OK	Press and wait for OK to be written.
Decreases   Increases Press to change the time.				

PROGRAMMABLE TIMES

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



 Premere per visualizzare.

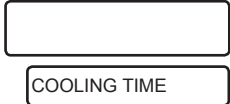

Decreases   Increases
 Press to change the time



Factory setting 


 Press and wait for OK to be written.


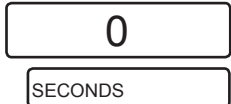
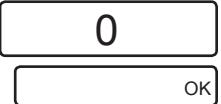

ENGINE COOLING TIME.

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

Zero seconds function off





 Press to display.



Decreases   Increases
 Press to change the time

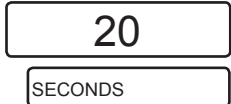
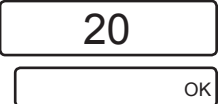





 Press and wait for OK to be written.

STOPPING TIME

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

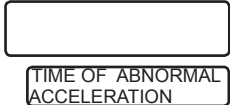



 Press to display.



Decreases   Increases
 Press to change the time.

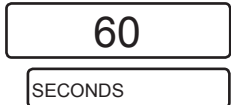
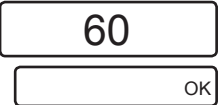




 Press and wait for OK to be written.

TIME OF ABNORMAL ACCELERATION.

To complete programming see page 13 OVERREV PERCENTAGE.




 Press to display.


Decreases   Increases
 Press to change the time.

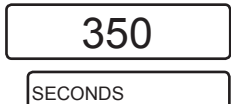
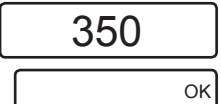




 Press and wait for OK to be written.

GENERAL ALARM CONNECTION TIME.

Number 350 means continual operation without time limits.





 Press to display.



Decreases   Increases
 Press to change the time.


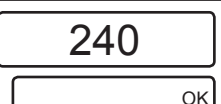




 Press and wait for OK to be written.

PUMP PRIMING FAILURE TIME.

Can be set from 0 to 300 sec.



 Press to display.

Decreases   Increases
 Press to change the time.




 Press and wait for OK to be written.

BOOST MODE

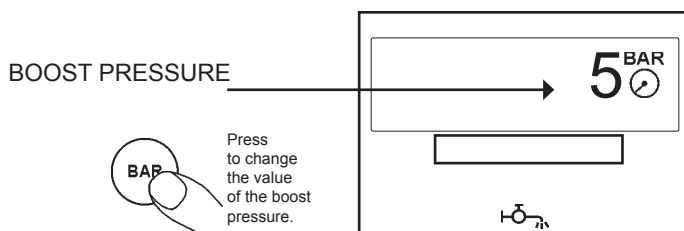
BOOST MODE

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	FAC- TORY SET- TING		PRO- GRAM- MABLE	FACTORY SETTING		
BATTERY UNDER- VOLTAGE	BATTERY  UNDER-VOL- TAGE	BATTERY	Always active	2	11 (12V) 22 (24V)	NOT	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	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	NOT	WITH STOP	The temperature detected by the transmit- ter exceeds the set threshold.	14
FUEL RESERVE	RESERVE  Flashing	FUEL FLOAT TERMINAL T	Always active	5	10%	NOT	=	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	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	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	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	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	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	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- ve 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		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- ve 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.

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

Factory setting

Press and wait for OK to be written.

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

Press to display.

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

Slow deceleration (with cooling) **STOP** **START** Quick deceleration (without cooling)

Press to choose

Factory setting

Press and wait for OK to be written.

ENGINE OVERHEATING

Factory settings it is possible to program Quick deceleration Slow deceleration

Press to display.

Factory setting

Press and wait for OK to be written.

Slow deceleration (with cooling) **STOP** **START** Quick deceleration (without cooling) Quick deceleration (without cooling)

FUEL RESERVE. Adjustment field 99%
 Factory setting 10%

Press to display.

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

Factory setting 10%

Press and wait for OK to be written.

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.

Slow deceleration (with cooling) **STOP** **START** Quick deceleration (without cooling)

Factory setting = 10% **STOP** Slow deceleration

Factory setting

Press and wait for OK to be written.

MOTOR PUMP PROGRAMMING

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

LOW LEVEL COOLER FLUID. Factory setting. Quick deceleration.
It is possible to program. Slow deceleration.

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

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

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

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

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

- 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)

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 when the 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 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

DIFFERENTIAL LOW PRESSURE. Factory setting: differential 2 bar.
It is possible to program. 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 pressure differential is set at 1 bar. Intervention delay (5") see PROGRAMMABLE TIMES.

Press to display.

Decreases STOP START Increases

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)

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

BAR

ALLOWED OSCILLATION

Press to display.

0,2 BAR

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

Press to change the time.

0,2 BAR

OK

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.

CLUTCH ENGAGEMENT

Press to display..

800 RPM

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

800 RPM

OK

Press and wait for OK to be written.

PUMP PRIMING PRESSURE.

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

BAR

PRIMING PRESSURE

Press to display.

1 BAR

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

Press to choose.

1 BAR

OK

Press and wait for OK to be written.

CHOICE OF RADIATOR LIQUID LEVEL PROBE

NORMAL

Press to display.

NORMAL

REVERSED

Factory setting

OK

Press and wait for OK to be written.

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

Press to choose.

ATS-015/00

RADIATOR CORE

IN THE ABSENCE OF LIQUID THE CORE SIGNAL IS REMOVED

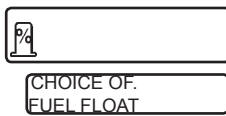
NORMAL

RADIATOR CORE

IN THE ABSENCE OF LIQUID THE CORE SIGNAL IS ACTIVE

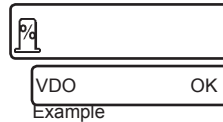
REVERSED

CHOICE OF THE PREVIOUSLY PROGRAMMED FUEL FLOAT



To program ohmic values of the temperature and pressure transmitters, 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



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.

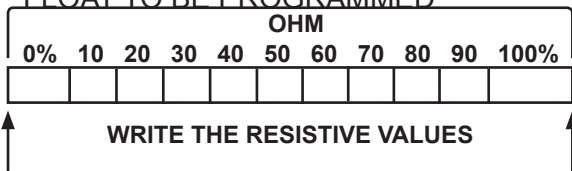


CAUTION: it is necessary to programme at least two values (to obtain a good precision in fuel control we recommend programming at least 4 values).

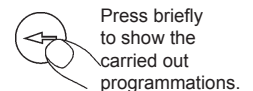
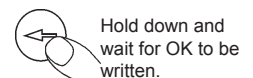
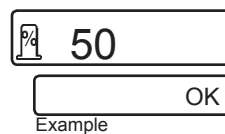
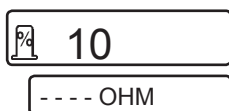
When programming just one value or non monotonic values,

the fault is detected

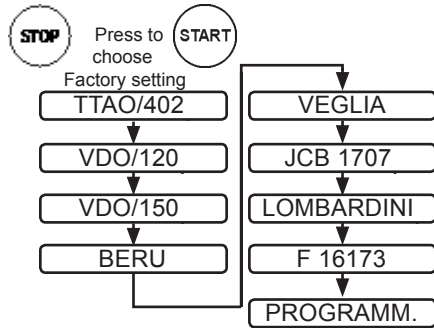
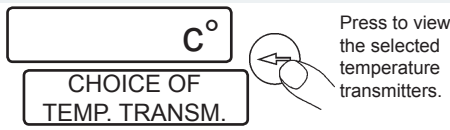
PROGRAMMING OF CORRESPONDENCE FLOAT TO BE PROGRAMMED



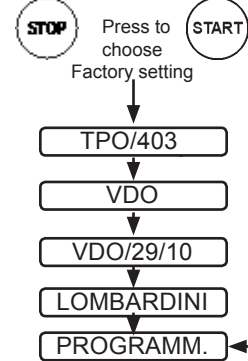
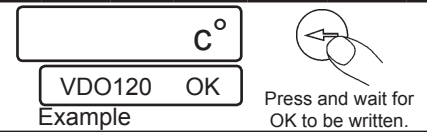
PROGRAMMING



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 **OHM TX TEMPERATURE** or **PRESSIURE** and continue with programming .

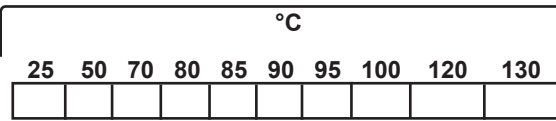


PROGRAMMING OF THE OHMIC VALUES OF THE TEMPERATURE AND PRESSURE TRANSMITTERS (PROBES)

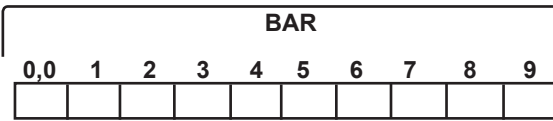
The control unit is set in the factory for pressure and temperature transmitters type TPO/403 (pressure) and TTAO/402 (temperature). A max. of 10 resistive values can be set corresponding to the characteristic curves of other pressure and temperature transmitters.

PROGRAMMING OF CORRESPONDENCE

TEMPERATURE TRANSMITTER TO BE PROGRAMMED

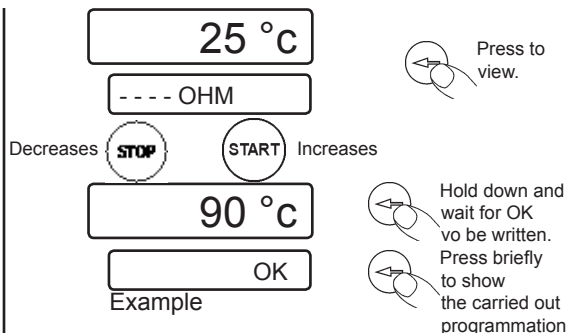


PRESSURE TRANSMITTER TO BE PROGRAMMED-



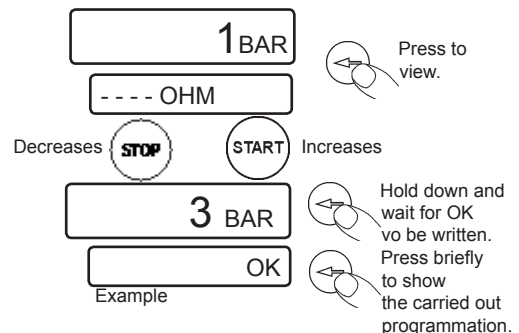
WRITE THE RESISTIVE VALUES

TEMPERATURE TRANSMITTERS



PROGRAMMING OPERATIONS

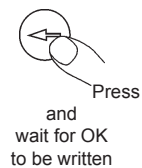
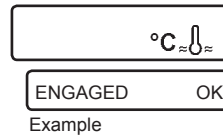
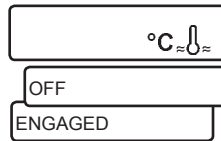
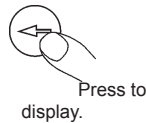
PRESSURE TRANSMITTERS



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 **TRANSMITTERS TABLE NOT CORRECT** 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 . 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 . The pressure value selected IS NOT deleted when the engine is stopped with button or .		•			UNDERVOLTAGE Battery undervoltage
MANUAL Manual mode	•				OVERVOLTAGE Battery overvoltage
AUTOMATIC Automatic mode	•				ALTERNATOR ANOMALY charging alternator anomaly
OFF OFF mode	•				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.
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 .	•				ABNORMAL ACCELERATION Pipe leakage controlled within the limits of the system.
AUTOMATIC PUMP PRIMING OFF The motor pump starts also with the pump not primed.	•				SPEED VARIATOR
				•	DTC VEHICLE 2 FTP Enabling of VEHICLE 2 faults of the connections between FTP engines and CIM control units.
				•	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.

ENGAGED	OFF	SWITCHING OFF OF INSTRUMENTS
•		(1) THERMOMETER °C ≈ (2) Water or oil thermometer
•		(1) PRESSURE GAUGE BAR (2) Oil pressure gauge
•		T FUEL Fuel level indicator
•		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.