



EN MP-1024



MADE IN ITALY

CONTROL UNITS FOR

IRRIGATION MOTOR PUMPS



CEM-380-10



CEM-19X



CIM-19X

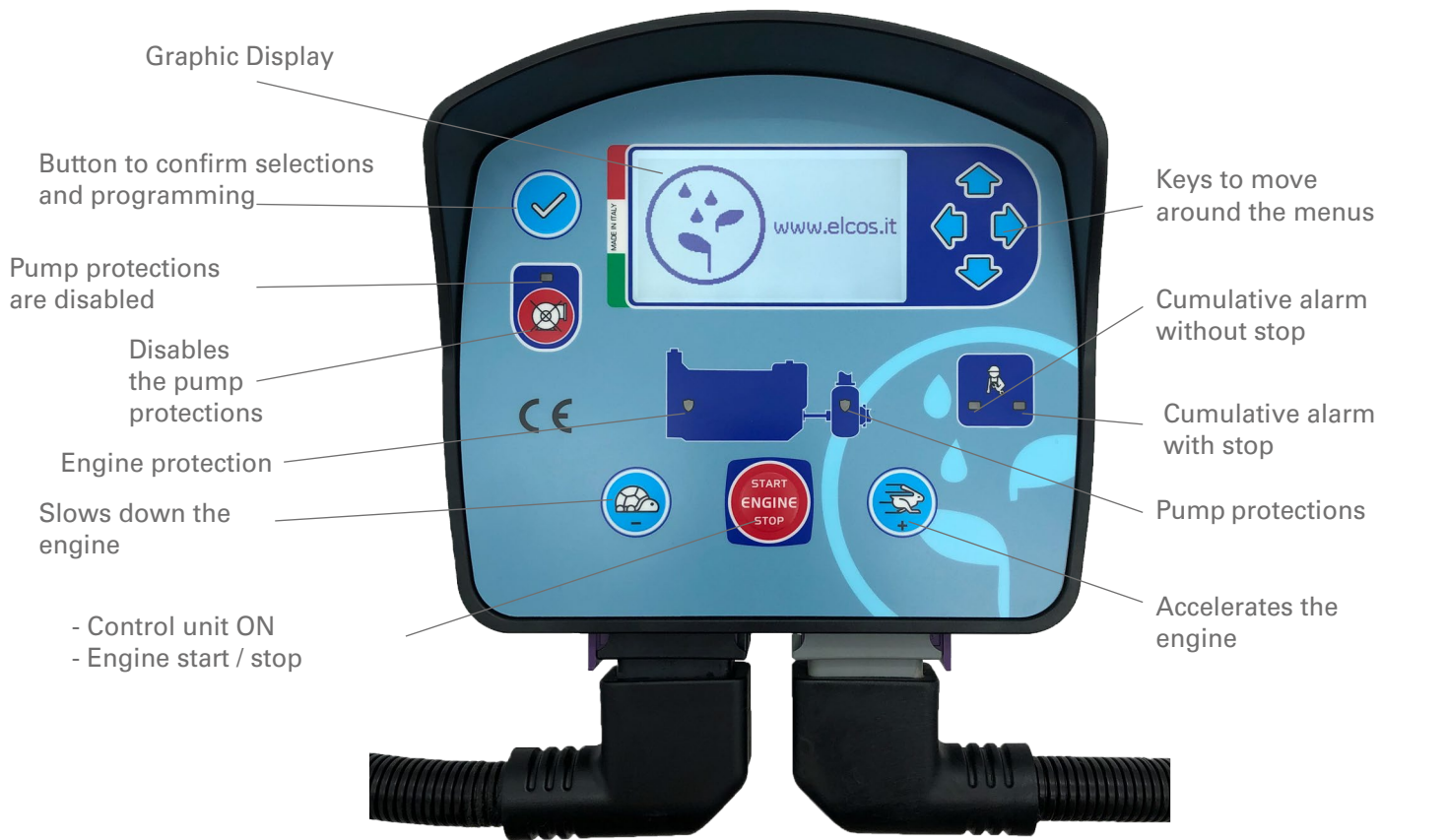


CEM-139

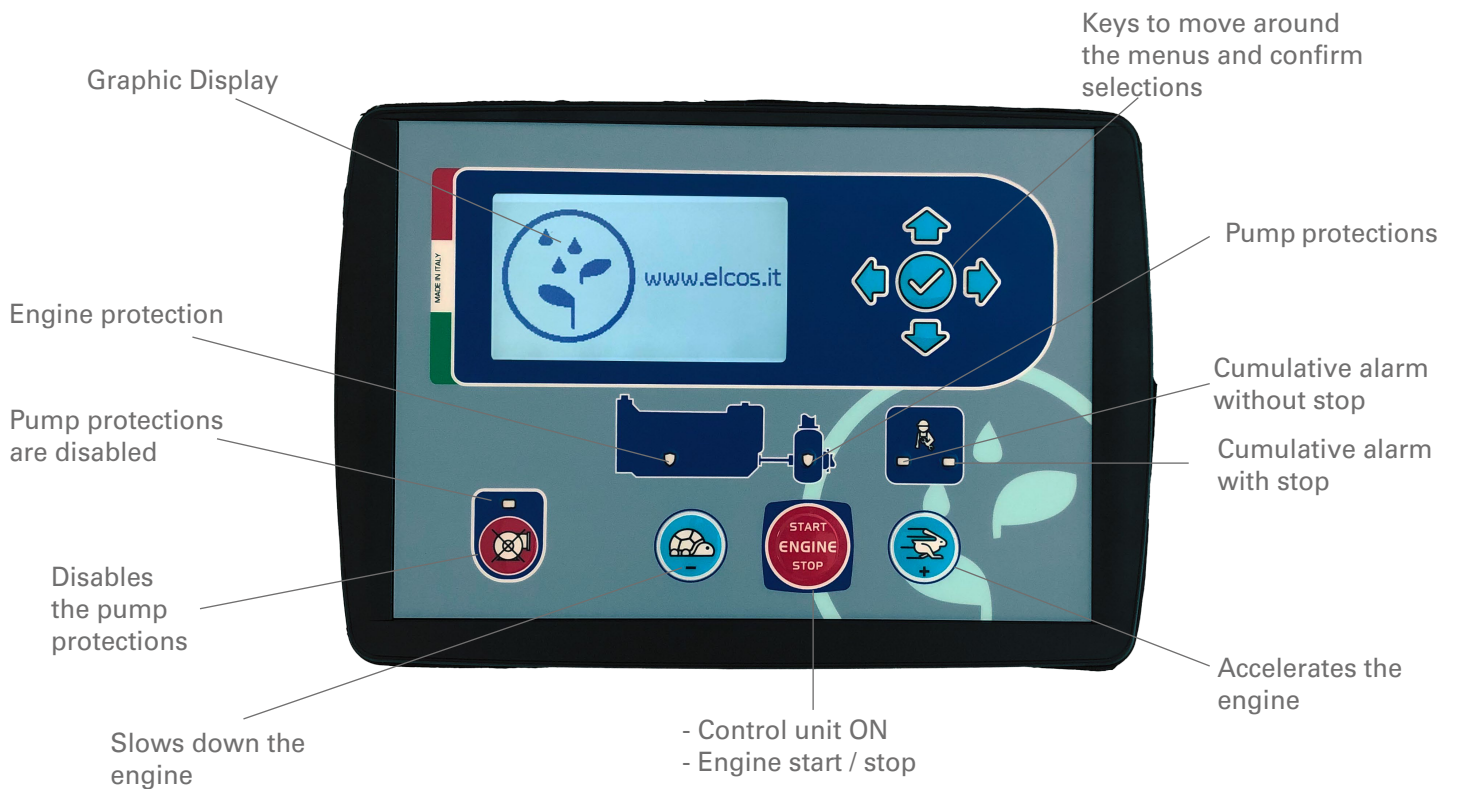
[illegible]

Control units suitable for connection with both mechanical engines and with STAGE III, STAGE IV final and STAGE V electronic injection engines.

CEM-190 and CEM-196



CIM-190 and CIM-196



DIESEL ENGINE

- Engine protection: LOW OIL PRESSURE, OVERHEATING, BELT BREAKAGE, FUEL LEVEL, COOLANT LEVEL, etc.
- Management of engines equipped with ECU - CAN BUS J1939.
- Management of STAGE V diesel engines: FPT, DOOSAN, DEUTZ, JCB, KOHLER, JOHN DEERE.
- Display of parameters: RPM, TEMPERATURE, PRESSURE, ENGINE, BATTERY VOLTAGE, etc.

PUMP PROTECTIONS

- Automatic acquisition of the water OVERPRESSURE AND UNDERPRESSURE VALUES.
- Malfunctions of OVERPRESSURE, UNDERPRESSURE, MAXIMUM PRESSURE, MINIMUM PRESSURE, etc.
- Management of a PRESSURE SWITCH or TRANSMITTER.
- Possibility to DISABLE the pump PROTECTIVE DEVICES.
- Recognition and management of the pump's CAVITATION.

STARTING AND STOPPING

- By PANEL.
- Via ELCOS SMARTCONTROL APP.
- Via DIGITAL INPUT.
- Via RS-485 INTERFACE.
- Via MINIMUM AND MAXIMUM LEVEL FLOAT SWITCHES (tank filling and emptying).

IRRIGATION FUNCTIONS

- Irrigation PRESSURE ADJUSTMENT.
- Engine SPEED ADJUSTMENT.
- Management of an external pulse WATER METER.
- Metering of the WATER SUPPLIED during irrigation via WATER METER or WORKING PRESSURE.
- Display of the INSTANTANEOUS FLOW of water.
- Management of an external FLOW SWITCH.
- Automatic management of PUMP PRIMING.
- Automatic management of PIPE FILLING.
- HOUR METER display.
- Setting to turn off the engine by TIMER.
- Recognition of END OF WORK.

PROGRAMMABLE INPUTS/OUTPUTS

- 8 totally programmable inputs that can be used as default FUNCTIONS-INPUT or FAULTS.
- 6 totally programmable outputs that can be used as default FUNCTIONS-OUTPUT or FAULT WARNINGS.
- Resistive inputs for ENGINE PROBES and FUEL FLOAT SWITCH.
- 4-20mA input for NEGATIVE PRESSURE SENSOR management.
- Expandable inputs and outputs via modules MDE-S01 and MDE-S02

MODEM 4G/LTE

- Management via SMS.
- Management via ELCOS SMART CONTROL APP.

CONNECTIONS

- TERMINAL BOARD on back panel in CIM-19x models.
- 2 polarised SEAL connectors in CEM-19x models.

USB PORT

- Possibility to set all parameters via PC and to download the event log with the ZW-Smart software.
- Possibility to update the FW of the control unit via the ZW-Smart software.

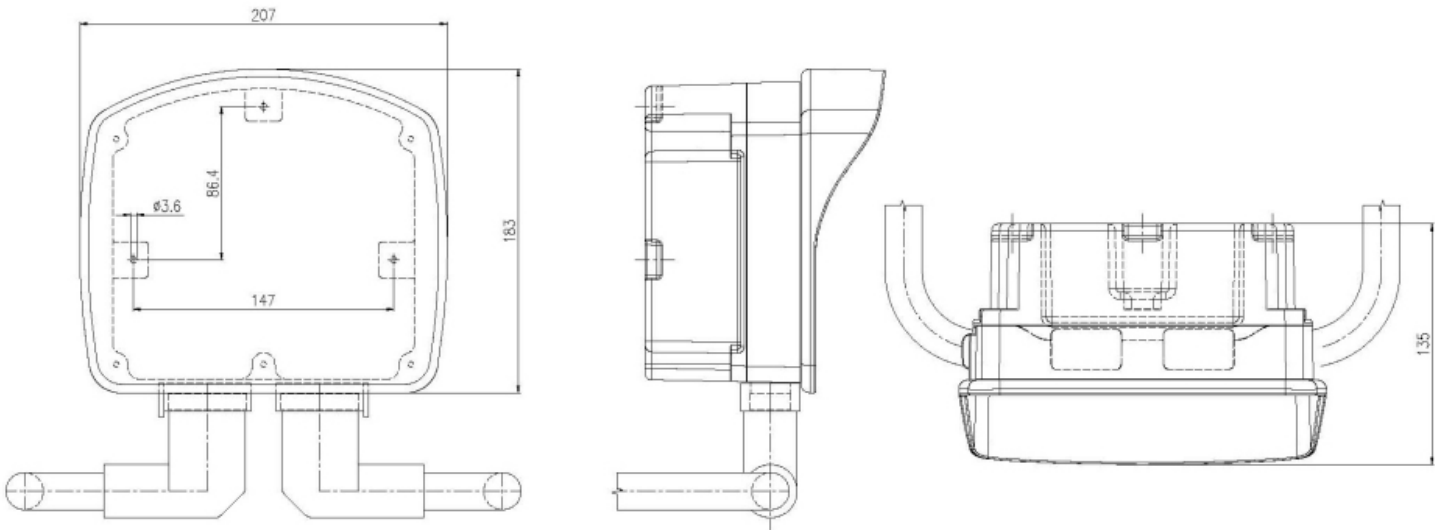
RS-485 CONNECTOR

- MODBUS protocol.
- Reading of operating PARAMETERS and sending of COMMANDS.

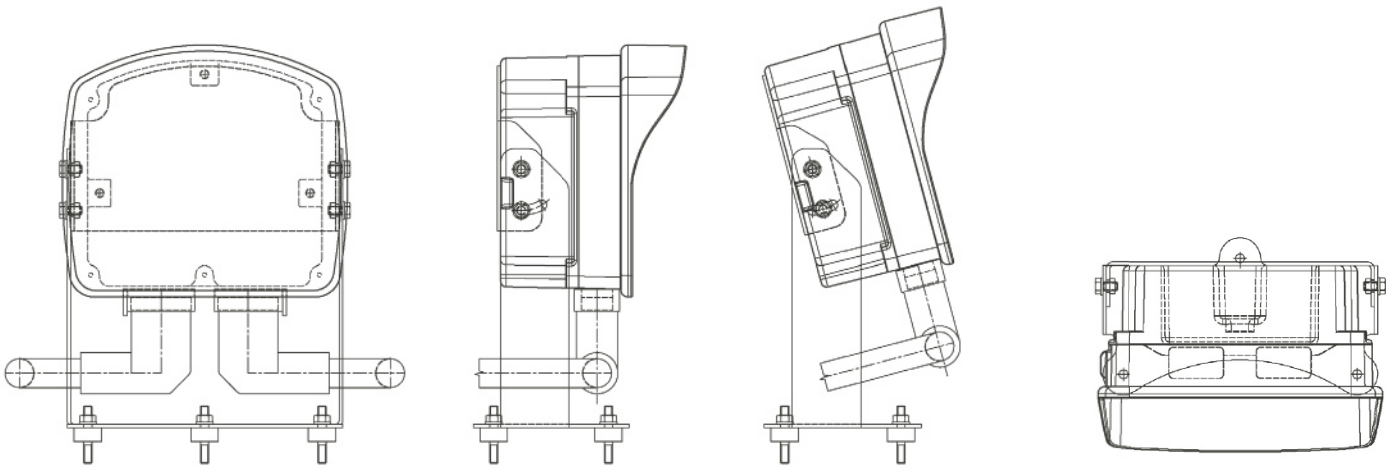
BENEFITS

- Large 240x128 dot graphic DISPLAY.
- NAVIGATION MENU with buttons for programming and for managing events.
- 7 LANGUAGES: ITA-ENG-FRA-DEU-SPA-POR-NLD.
- Possibility to customise THE LOGO displayed.
- Detailed EVENT LOG showing the last (over 5000) operations carried out, which can be displayed on the panel or downloaded via ELCOS ZW-SMART.
- PASSWORD protection against tampering with the parameters.
- All parameters CAN BE SET in order to customise the control unit's operation down to the finest detail.

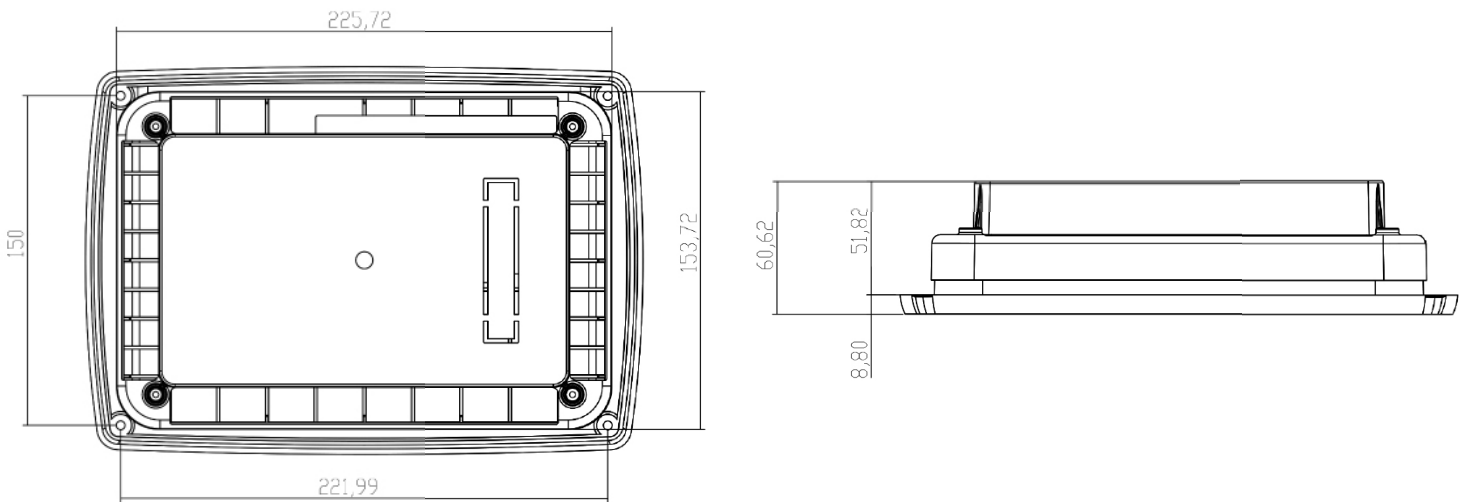
CEM-190-10, CEM-196-10, CEM-190-EM and CEM-196-EM



CRU-1901 reclining support for base assembly of the CEM-19X



CIM-190 and CIM-196



INFORMATION FOR ORDERING	
TYPE	CODE
CEM-190-10	00210744
CEM-196-10	00210745
CEM-190-EM	00210742
CEM-196-EM	00210743
CIM-190	00210740
CIM-196	00210741
STANDARD ACCESSORIES	
TYPE	CODE
CEM-190-10 ENGINE PRE-WIRED FEM. CONN. (FOR CEM ONLY)	70804466
CEM-190-10 TPA PRE-WIRED FEM. CONN. (FOR CEM ONLY)	70804467
CABLE FOR TPA-200 CEM-190	40500262
TRANSMITTER TPA-200	70500255
RED. F1/4"GAS-M3/8"GAS	70190241
CEP/CEM CLAMP KIT (FOR CEM ONLY)	40804362
MAGNET. ANTENNA WITH 3M CABLE (FOR CEM/CIM-196 ONLY)	70070187
SUPERSEAL 2-POLE CONNECTOR KIT (FOR CEM ONLY)	40804602
CABLE FOR TPA-200 (FOR CIM ONLY)	40500254
CABLE ADAPTER TPA-200 WITH FERRULE TERMINALS (FOR CIM ONLY)	40500261
CIM-190 MU KIT (FOR CIM ONLY)	40800445
ACCESSORIES MADE TO ORDER	
AST-015/00 ROD ELECTRODE, INCLUDING ACCESSORIES	40241012
E-25 SCREW ELECTRODES, INCLUDING ACCESSORIES	40190115
VAR-140 12V LINEAR ACTUATOR	00571543
VAR-144 24V LINEAR ACTUATOR	00571551
CRU-1901 SUPPORT FOR BASE ASSEMBLY (FOR CEM ONLY)	40493385
TPO/403 OIL PRESSURE TRANSMITTER	40500407
TTAO/402 WATER/OIL TEMPERATURE TRANSMITTER	40500411
GAR-15/62 FUEL FLOAT SWITCH	00530131
TPA-300 DIRTY WATER PRESSURE TRANSDUCER	70500257
TDA-190 WATER VACUUM TRANSDUCER	70500260
MDE-S01 DIGITAL INPUT/OUTPUT EXPANSION MODULE	00242341
MDE-S02 EXPANSION MODULE ANALOGUE INPUTS/OUTPUTS	00242342
SOFTWARE	
ELCOS SMART CONTROL (FOR CEM/CIM-196 ONLY)	
ZW-SMART	

TECHNICAL SPECIFICATIONS		
SPECIFICATION	CEM-19X	CIM-19X
OPERATING RANGE	(8 - 48) Vdc; Batteries 12V,24V	
VOLTAGE DIP ON POWER SUPPLY	From 10 Vdc to 0 Vdc for 150ms	From 10 Vdc to 0 Vdc for 100ms
ABSORPTION WITH ENGINE NOT RUNNING	*-190	130 mA @ 12 V; 90 mA @ 24 V
	*-196	150 mA @ 12 V; 105 mA @ 24 V
ABSORPTION IN STAND-BY	~12 mA @ 12 V; ~10 mA @ 24 V	~15 mA @ 12 V; ~10 mA @ 24 V
MAX CURRENT OUTPUTS WITH +V BATTERY	0.5 A	
MAX CURRENT VAR AND VALVE	3 A	
MAX CURRENT OUTPUTS RELAY E-POWER	3 A (2 A @ 65°C)	-
MAX STARTING CURRENT (RELAY)	20 A @ 12 V; 10 A @ 24 V	3 A (2 A @ 65°C)
MAX STOPPING CURRENT (RELAY)	3 A (2 A @ 65°C)	
MAX CLEAN CONTACT OUTPUT CURRENT	-	3 A (2 A @ 65°C)
ANALOGUE INPUTS	OIL P, FUEL (0 - 380) Ω, ±2 %; TEMPERATURE (0 - 3200) Ω, ±2 %;	
ALTERNATOR W	(0.75 - 65) Vac	(50 - 2000) Hz
D+ ALTERNATOR	(0.5 ÷ 30) Vdc	
DIGITAL INPUTS (NEGATIVE)	H > 2 V	
	L ≤ 0.8 V	
USB 2.0 (USB-B CONNECTOR)	Max current = 3.3 mA @ 48 V	
RS-485	Not isolated. Maximum cable length 3 m.	
OPERATION/STORAGE	(-20 - 60)°C	
RELATIVE HUMIDITY	≤ 80%	
PROTECTION CLASS	IP 55	Rear = IP 20; Front = IP 54
WEIGHT	1.25kg	680g
WIRING LENGTH	2.80 m	-
MATERIAL	PC-ABS V0 and front panel in metal	PC/ABS V0
CONNECTIONS	2 SEAL connectors	rear terminal board



SMART CONTROL

Our software is available for free download from the iOS App Store, Android Play Store, or can be accessed via your web browser.

Enjoy free usage for the first 6 months after registration. After that, continue with a paid annual subscription available as a single license or multi-license, payable directly to ELCOS SRL.

4 easy steps

1

Install one of our compatible control units

2

Download the app for iOS or Android, or connect via the website

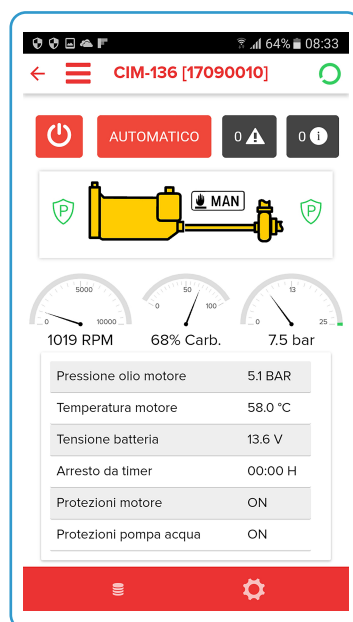
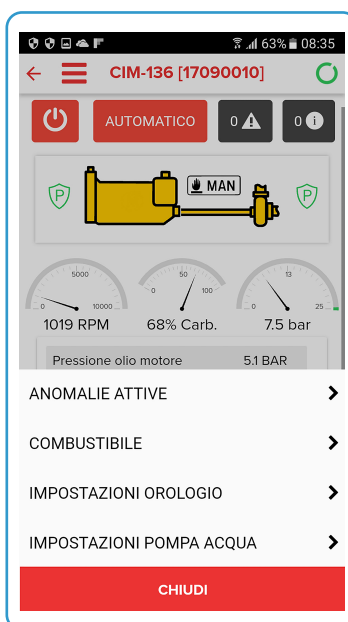
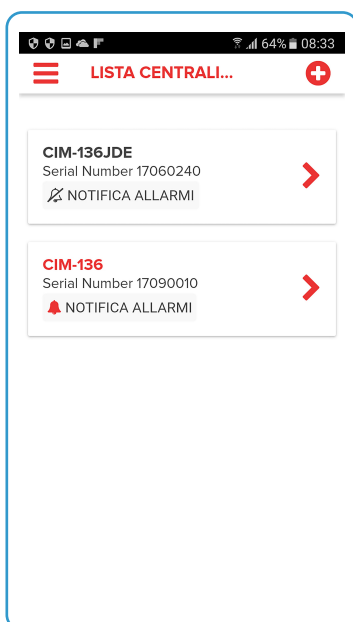
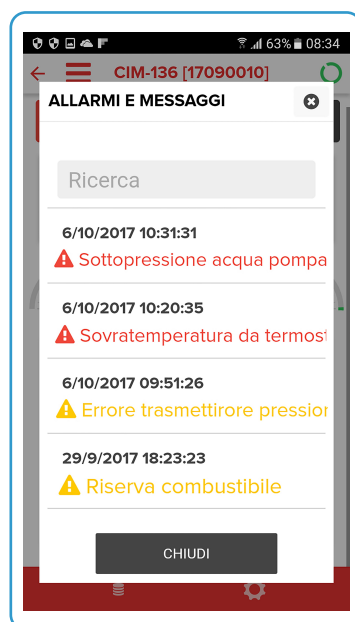
3

Create your account and pair your control unit

4

Control your control unit remotely and add additional units

The CEM-19X, CIM-19X and CIM-13X systems, managed with the ELCOS SMART CONTROL platform, have been proved to comply with INDUSTRY 4.0 requirements.



Compatible control units:
CEM-196-10, CEM-196-EM, CIM-196, CIM-136/4GW, CIM-137/4GW, CIM-138/4GW
(EQUIPPED WITH INTEGRATED MODEM 4G-LTE)

FEATURES

- Remote control and supervision of multiple units from a single account, via APP (IOS or ANDROID) and WEB BROWSER
- Confirmation of commands issued received
- On/off command of single motor pump system
- Operation mode selection (AUTOMATIC or MANUAL)
- Controller-managed faults displayed as text notifications, even when the APP is off or running in the background
- Fault differentiation (yellow faults leave engine running, red faults stop engine)
- Option to display complete fault log for the connected control unit
- Multiple functions can be displayed in a single screen (operation, mode, status, engine overload protection enabled, pump overload protection enabled, RPM, fuel percentage, water pressure, engine temperature, engine oil pressure, battery voltage, timer)
- Option to program the control unit clock with system start and stop times
- Option to program fuel management, pressure setpoint, underpressure and overpressure differentials and to enable or disable pump overload protections

ZW-SMART PROGRAMMING SOFTWARE



An ELCOS control unit equipped with an RS-232, RS-485 or USB port can be connected to a PC and programmed using the free ZW-Smart software, available for download at www.elcos.it.

This procedure facilitates both faster programming of the control unit and mass programming by allowing you to store, upload or import specific configurations.

CONTROL UNIT FOR IRRIGATION MOTOR PUMP

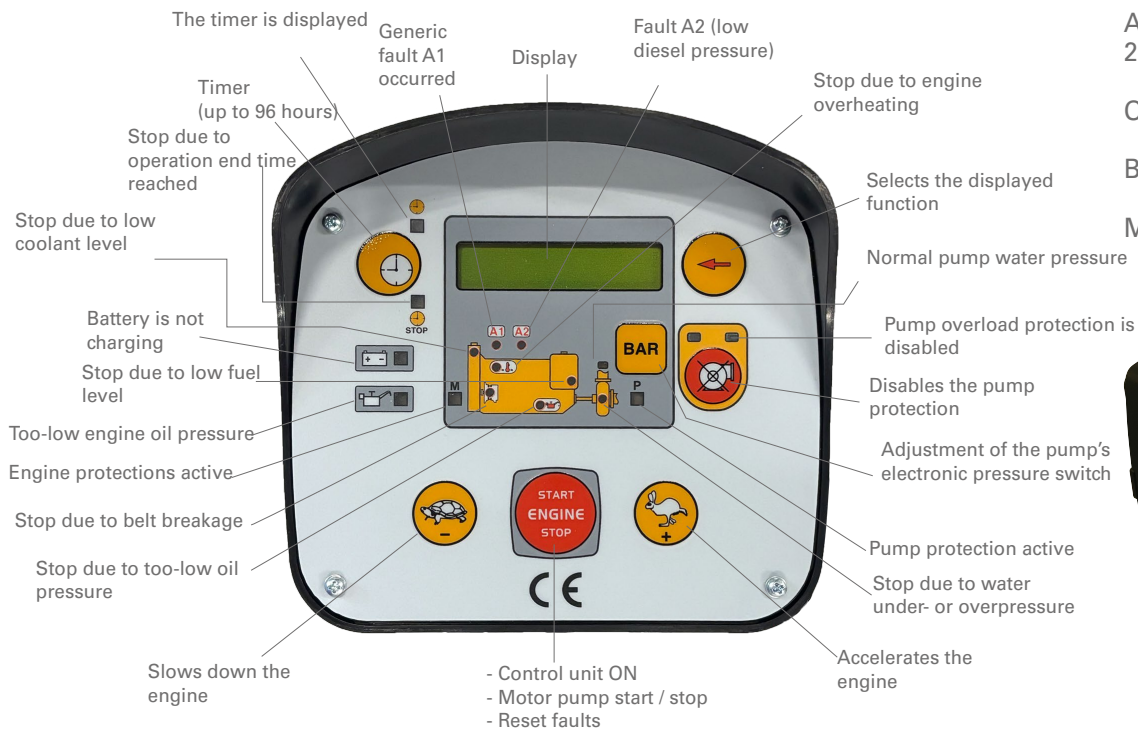
CEM-390



Button start and stop

Complete with electronic pressure switch and digital pump water pressure gauge.

Starts, monitors and protects the motor pump and stops it in the event of a malfunction thanks to a solenoid valve or electromagnet.
Displays the main motor pump engine parameters, including engine water temperature and oil pressure.
Enables manual adjustment of the engine rpm and automatic slow deceleration before stop, via a linear actuator, VAR-140 or VAR-144 24V models.



ANCHORING SYSTEMS WITH 2 OR 3 CLAMPS

On request:

BASE ASSEMBLY SUPPORT

Model: CRU-003 and CRU-004



**UP
GRADE**

CEM-380-10

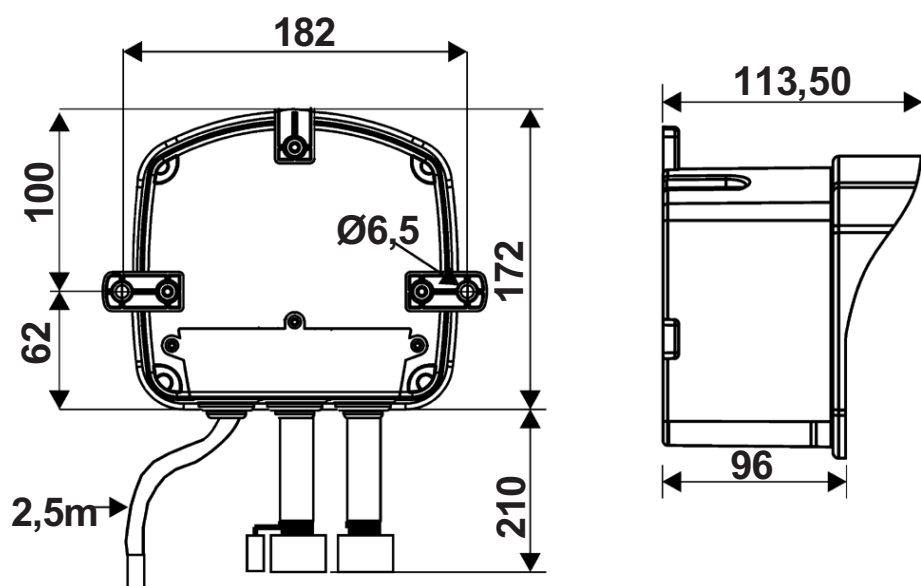


Start and stop with key

Complete with electronic pressure switch and digital water pressure gauge.

Starts, monitors and protects the motor pump and stops it in the event of a malfunction thanks to a solenoid valve or electromagnet.

Displays the main motor pump engine parameters, including engine water temperature and oil pressure.



ANCHORING SYSTEMS WITH
2 OR 3 CLAMPS

On request:

BASE ASSEMBLY SUPPORT

Model: CRU-003 and CRU-004



CONTROL UNITS FOR IRRIGATION MOTOR PUMP

CEM-370



CONVENTIONAL PUMP WATER PRESSURE SWITCH AND GAUGE to be installed externally

ANCHORING SYSTEMS WITH 2 OR 3 CLAMPS

On request:

BASE ASSEMBLY SUPPORT

Model: CRU-003 and CRU-004



Start/stop with key

Starts, monitors and protects the motor pump and stops it in the event of a malfunction thanks to a solenoid valve or electromagnet.
Displays the main motor pump engine parameters.

CEM-217

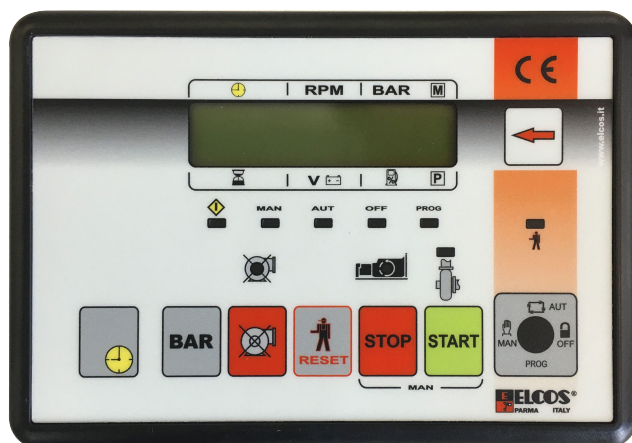


Start/stop with buttons

They start, monitor and protect the motor pump and stop it in the event of a malfunction thanks to a solenoid valve or electromagnet.
They display the main motor pump engine parameters.

Complete with electronic pressure switch and digital pump water pressure gauge.

CEM-117



REMOTE COMMANDS (START AND STOP) VIA EXTERNAL CONTACTS

CONTROL UNITS FOR MOBILE IRRIGATION SYSTEMS

CIM-13X

Start/stop with buttons

Manual or Automatic operation

CAN BUS connection: versions available for engines equipped with electronic injection system control
STAGE III: FPT, JCB, JOHN DEERE.

The CIM-136/4GW, CIM-137/4GW and CIM-138/4GW models are equipped with 4G/LTE modem for remote system control via SMS text messages or the ELCOS SMART CONTROL platform.



On request:

BASE ASSEMBLY SUPPORT

CRU-CIM type

CONTROL UNITS AVAILABLE UNTIL STOCK RUNS OUT, REPLACED BY THE CEM-380-10 MODEL.

CONTROL UNITS FOR IRRIGATION MOTOR PUMPS

CEM-250/10

Start/stop with key

They start, monitor and protect the motor pump and stop it in the event of a malfunction thanks to a solenoid valve or electromagnet. They display the main motor pump engine parameters, including engine water temperature and oil pressure.



CIM-250/10

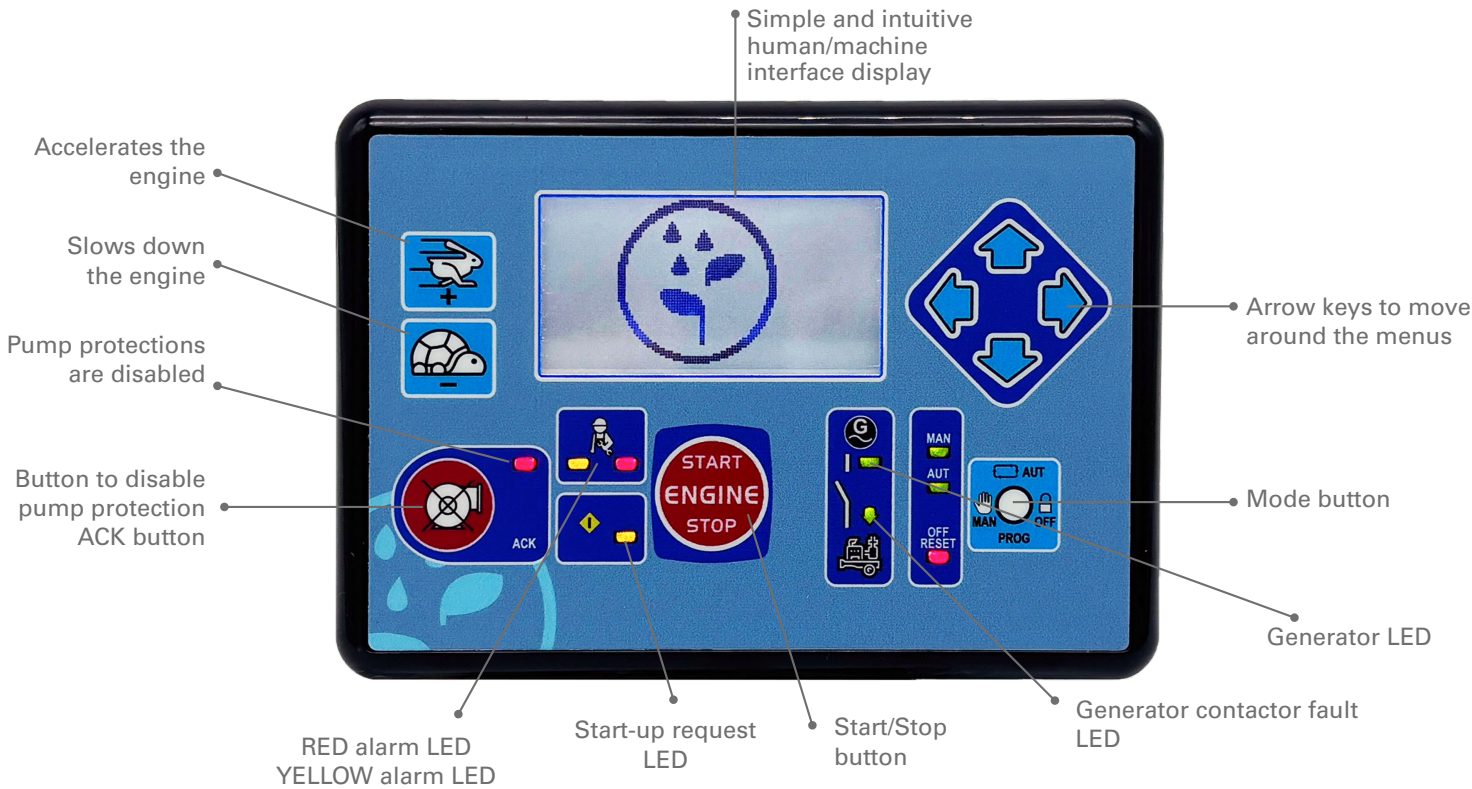


CONTROL UNIT FOR COMMAND AND PROTECTION OF COMBINED SYSTEM
GENERATING SET WITH IRRIGATION PUMP



CEM-139

This controls and commands a generator and an irrigation motor pump.
It manages a water pressure transmitter with digital pressure gauge.
It enables manual adjustment of the engine rpm and stopping if a fault occurs.
It automatically manages the inclusion of the generator on the load through a contactor.



ENGINE

It can manage conventional engines or engines equipped with an electronic injection control unit (ECU) that supports the CAN BUS J1939 protocol.

Traditional Engines

- DIESEL: In diesel engines, the GLOW PLUG function-output is used to pilot the engine’s PRE-HEATING AND POST-HEATING.
- PETROL: In petrol engines, the PETROL STARTER function-output is used; this activates during even-numbered start-up attempts (2, 4, etc.).

ECU-EQUIPPED ENGINES

When an ECU-equipped engine is used, the control unit dialogues with it in order to:

- Adjust the engine rpm
- Gather the values read (temperature, RPM, pressures, etc.)
- Gather active engine fault codes

The control unit supports different types of engines, selected via the parameter in ENGINE ECU > ENGINETYPE

ENGINE TYPE	SUPPORTED ENGINES
NO CAN BUS	Engines without engine ECU
SAE J1939 GENERIC	Generic engine with ECU compliant with standard SAE J1939
FPT STAGE V	FPT F34, F36, N45, N67 engines
DOOSAN STAGE V	Doosan D18, D24, D34 engines
KOHLER STAGE V	KDI2504TCR, KDI1903TCR, KDI3404TCR Kohler engines

CTR-087/0N CTR-087/0S



In case of a fault, the protection devices stop the tractor/pump thanks to an electromagnet or solenoid valve due to:

- Low coolant level
- Inefficient battery charge alternator (belt breakage)
- Low oil pressure
- Overheating
- Inadequate pump water pressure

PROTECTION DEVICES EMBEDDED IN POLYURETHANE RESIN

In case of a fault, the protection devices stop the engine thanks to an electromagnet or solenoid valve.



DIP-521/00

- Low oil pressure
- Overheating
- Inefficient battery charge alternator (belt breakage)



DIM-807/00

- Low coolant level
- Inefficient battery charge alternator (belt breakage)
- Low oil pressure
- Overheating
- Fuel reserve (no engine stop)
- Inadequate pump water pressure
- Timer trigger
- Oil and battery warnings integrated into the device

ACCESSORIES

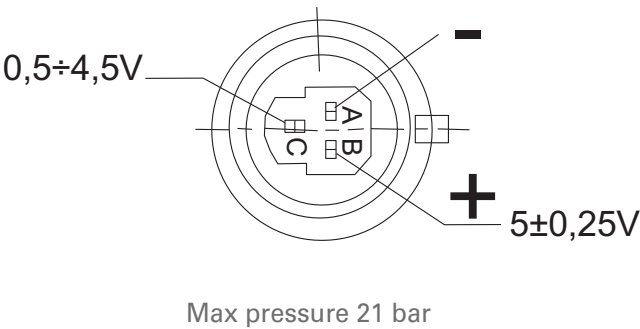
ELECTRONIC IRRIGATION WATER PRESSURE TRANSDUCERS (0-5V)
(FOR CEM/CIM-19X, CEM-390, CEM-380-10, CEM/CIM-250/10)

TPA-200 FOR
CLEAN WATER



TPA-300 FOR
DIRTY WATER AND
SEWAGE





bar	Vdc
0.00	0,530
5.00	1,327
10.00	2,122
15.00	2,917
20.00	3,712
25.00	4,507

ELECTRONIC IRRIGATION WATER VACUUM TRANSDUCER (4-20mA)
(FOR CEM/CIM-19X)



Measurement range	(-1 ÷ 9) bar
Overload pressure	14 bar
Breaking pressure	30 bar
Accuracy	+/- 0.5%FS

TWO-WIRE LINEAR ACTUATORS FOR ACCELERATOR LEVER CONTROL
(FOR CEM/CIM-19X, CEM-390, CIM-131, CIM-132, CIM-137/4GW, CIM-138/4GW)

VAR-140 12V



STROKE 70 mm
FORCE 30 kg

VAR-144 24V



STROKE 90 mm
FORCE 80 kg

SIX-WIRE LINEAR ACTUATOR FOR ACCELERATOR LEVER CONTROL
(FOR CIM-130, CIM-136/4GW)



VARIABLE STROKE
REMOTE AND FRONT PANEL COMMAND

ADJUSTABLE 60 mm STROKE
FORCE 30 kg

PULL ELECTROMAGNETS FOR DIESEL ENGINE STOP

INTERMITTENT SERVICE



ESI-046/00

TYPE	STROKE mm	FORCE kg	
		At stroke start	At stroke end
ESI-046/00	35	1	25
ESI-060/00	50	5	50



ESI-060/00

CONTINUOUS SERVICE



ESC-046/00

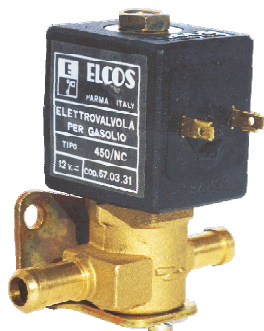
TYPE	STROKE mm	FORCE kg	
		At stroke start	At stroke end
ESC-046/00	35	3	12
ESC-060/00	50	7.5	30



ESC-060/00

STOP SOLENOID VALVES (NORMALLY CLOSED)

450/NC



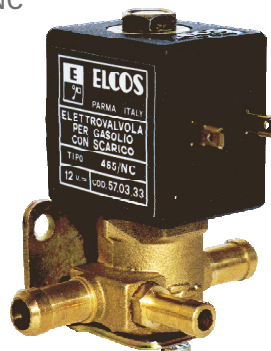
480/14



WITHOUT EXHAUST FOR
ENGINES WITH MEMBRANE
FUEL PUMP

WITH EXHAUST FOR ENGINES
WITH PISTON FUEL PUMP

455/NC



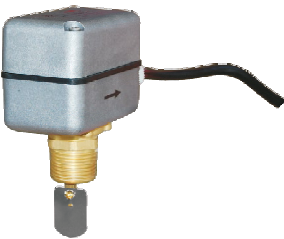
485/14



ACCESSORIES

WATER FLOW SWITCH

FAP-200



MAXIMUM PRESSURE: 10 bar
THREAD: M1" NPT
ASSEMBLY ORIENTATION: VERTICAL ON HORIZONTAL TUBES
ADJUSTMENT: FOUR POSSIBLE COMBINATIONS
POWER CABLE LENGTH: 2.5 m

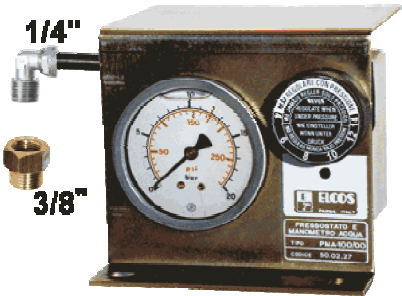
PUMP WATER PRESSURE SWITCHES
(FOR CEM-370, DIM-807/00, CTR-087)



PRESSURE SWITCHES

PA-100/00 (4-14 bar)
PA-101/00 (1-3 bar)
PA-102/00 (2-5 bar)

PRESSURE SWITCHES AND
GAUGES
PMA-100/00 (4-14 bar)
PMA-101/00 (1-3 bar)
PMA-102/00 (2-5 bar)
PMS-100/00 (double pressure switch 4-14 bar)

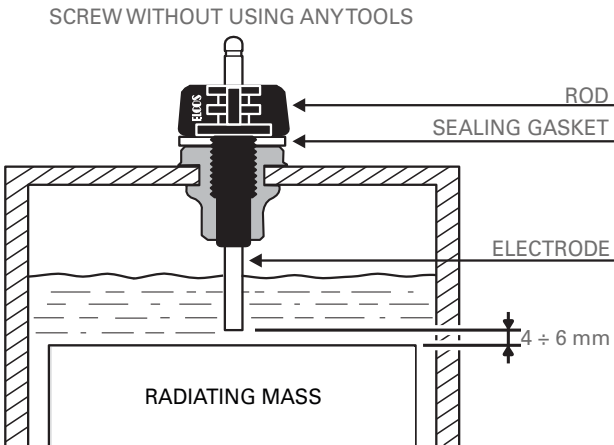


RADIATOR LEVEL SENSOR

for expansion tank made of
PLASTIC: E 25 (SCREW ELECTRODE PAIR)
METAL: AST-015/00 (ROD)

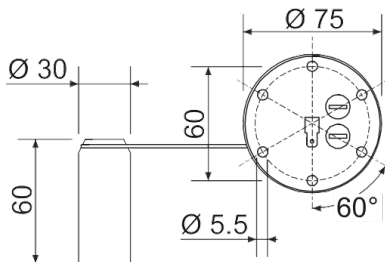
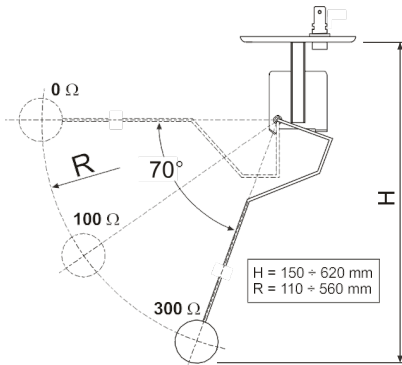
RED. NIPPLES FOR AST-015/00

REDUCING NIPPLES	FEMALE	MALE
10 x 1.5 - 1/4" BSPP	M10 x 1.5	1/4" BSPP
10 x 1.5 - 1/2" BSPP	M10 x 1.5	1/2" BSPP
10 x 1.5 - M14 x 1.5	M10 x 1.5	M14 x 1.5



FUEL FLOAT SWITCH WITH ADJUSTABLE ARM AND WITHOUT PICK-UP TUBE

GAR-15/62



ENGINE THERMOSTATS (WATER/OIL)



WATER OVERTEMPERATURE
(M14 x 1.5THREAD)
97 °C
105 °C
110 °C



OIL OVERTEMPERATURE
(M14 x 1.5THREAD)
130 °C

ENGINE PRESSURE SWITCHES (OIL)

PO10/431 M10 x 1 THREAD
PO12/401 M 12 x 1.5THREAD
PO1.8/441 1/8" x 27 NPTTHREAD



OIL PRESSURE TRANSMITTER

TPO/403
(M10 x 1 thread)



PRESSURE	RESISTANCE
0.0 bar	270 Ω
0.5 bar	270 Ω
1.0 bar	251 Ω
1.5 bar	225 Ω
2.0 bar	203 Ω
2.5 bar	180 Ω
3.0 bar	157 Ω
3.5 bar	134 Ω
4.0 bar	114 Ω
4.5 bar	96 Ω
5.0 bar	79 Ω
5.5 bar	63 Ω
6.0 bar	52 Ω

TTAO/402
(M14 x 1.5 thread)



TEMPERATURE	RESISTANCE	TEMPERATURE	RESISTANCE
20 °C	1095 Ω	75 °C	168 Ω
25 °C	896 Ω	80 °C	145 Ω
30 °C	741 Ω	85 °C	127 Ω
35 °C	615 Ω	90 °C	110 Ω
40 °C	513 Ω	95 °C	97 Ω
45 °C	432 Ω	100 °C	85 Ω
50 °C	365 Ω	105 °C	75 Ω
55 °C	315 Ω	110 °C	65 Ω
60 °C	266 Ω	115 °C	59 Ω
65 °C	226 Ω	120 °C	53 Ω
70 °C	196 Ω	125 °C	48 Ω

REDUCING NIPPLES

REDUCING NIPPLES FOR TPO/403

REDUCING NIPPLES	FEMALE	MALE
10 x 1 - 10 x 1.25	M10 x 1	M10 x 1.25
10 x 1 - 10 x 1.5	M10 x 1	M10 x 1.5
10 x 1 - 12 x 1.5	M10 x 1	M12 x 1.5
10 x 1 - 14 x 1.5	M10 x 1	M14 x 1.5

REDUCING NIPPLES FOR THERMOSTATS AND TTAO/402

REDUCING NIPPLES	FEMALE	MALE
14 - 16	M14 x 1.5	M16 x 1.5
14 - 18	M14 x 1.5	M18 x 1.5
14 - 20	M14 x 1.5	M20 x 1.5
14 - 22	M14 x 1.5	M22 x 1.5
14 - 5/8" 18 UNF	M14 x 1.5	5/8" 18 UNF
14 - 3/8" 18 NPTF	M14 x 1.5	3/8" 18 NPTF
14 - 3/8" BSPP	M14 x 1.5	3/8" BSPP
14 - 1/2" BSPP	M14 x 1.5	1/2" BSPP



Elcos S.r.l. designs and produces manual and automatic switchboards, control units, remote monitoring systems, battery chargers, water heaters, oil sump heaters and other components for use on Generating Sets, Irrigation Motor Pumps, Fire-Fighting Motor Pumps (compliant with the EN 12845 standard) and other industrial diesel engine-related applications, such as motor welders and motor compressors.



Elcos Srl -
Via Arandora Star, 28/A - 43122 PARMA (ITALY)
Tel. +39 0521 772021
www.elcos.it - info@elcos.it



EN MP-1024