



# SC-SAR714

## ENGINE DRIVEN IRRIGATION PUMP CONTROL PANEL



### INSTRUCTIONS FOR INSTALATION, USE AND CONFIGURATION

SC-SAR714 01-EN-Rev.0

06-2017



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## 2. SCOPE OF THE DOCUMENT

The purpose of this technical document is the exhaustive identification of elements and description of the aspects associated with the installation, application, operation and maintenance of the SC-SAR714 control panels

If the user needs to obtain more information regarding the design, justification of components, operation etc., please contact us at the following address [svecorp@svecorp.com](mailto:svecorp@svecorp.com)

## 3. BASIC DESCRIPTION

The SC-SAR714 is a engine driven pump control panel designed to easily start and stop the pump, and monitor the main engine parameters. SC-SAR714 has different audible displayed alarms to detect any abnormal operating parameter, any of the alarms can be used to stop the pump if desired

### 3.1. MAIN CHARACTERISTICS

N° MAIN CHARACTERISTICS		
01	DISPLAY	High brightness
02	4 MEASURING INSTRUMENTS IN DISPLAY	RPM / V Bat. / Hours accumulated / minutes discounter Clock
03	5 OUTPUTS	Crancking:
04		Fuel control
05		Preignition / Starter
06		In contacto
		Siren / Common alarm
07	9 INPUT	RPM Engine aux. alternator 7 contact inputs
08	PROGRAMMED DELAYED STOP	Desired work minutes setting
09	PROTECTION CASING	IP65 / IK10
10	SAFETY KEY	Operating mode switch: OFF /MAN /AUTO
11	EMERGENCY SHUTDOWN PUSHBUTTON	Lockable
12	SIREN	Built-in buzzer / Optional external siren output
13	VERSATILE	Configurable parameters Display/USB
N° PUMP OPERATION MANAGEMENT		
14	MAN: START and STOP pushbuttons	On front panel
15	AUTO: External order. Start by contact	Control panel terminal / Programmed delayed stop
16	OFF: Stop the pump and control panel	Safety. Consumption 0.00 Amp
N° BASIC FUNCTIONS INDEX		
17	Pre-crank control	Starter-Preignition
18	Battery charger alternator primer	D+
19	Pump crank control	Crank engine / Bendix
20	Fuel control	Electrovalve/ Shutdown solenoid
21	Common alarms output activation	Remote communication
22	Easy calibration of rpm	Valid for any type of engine



PROTECCIONES DE MOTOR y BOMBA			
01	Fail to start	10	Battery undervoltage
02	Fail to run	11	Battery overvoltage
04	Low fuel level	12	Emergency shutdown pressed
05	Low oil pressure	13	Optional alarm
06	High coolant temperature	14	Maintenance
07	Engine overspeed	15	No wáter in suction
08	RPM signal loss	17	Low pump discharge pressure
09	Battery charger loss	18	Unexpected operation

### 3.2. DECLARATION FOR CE COMPLIANCE

This document refers to SC-SAR714 control panel.

This product must be installed and operated by personnel with sufficient qualifications (according to EN-50-110-1)

**Declaration of CE Compliance**

SVE S.L. hereby declares that the SC-SAR714 control panel conform to the following directives:

- Electromagnetic compatibility, Directive CE: 2014/30/UE
- Low voltage, Directive 2014/35/UE
- Machinery Directive 2006/42/CEE

Specific regulations applied: **EN 61000-6-2, EN 61000-6-3, 61439-1, 61439-2, 60204-1.**

30/06/2017

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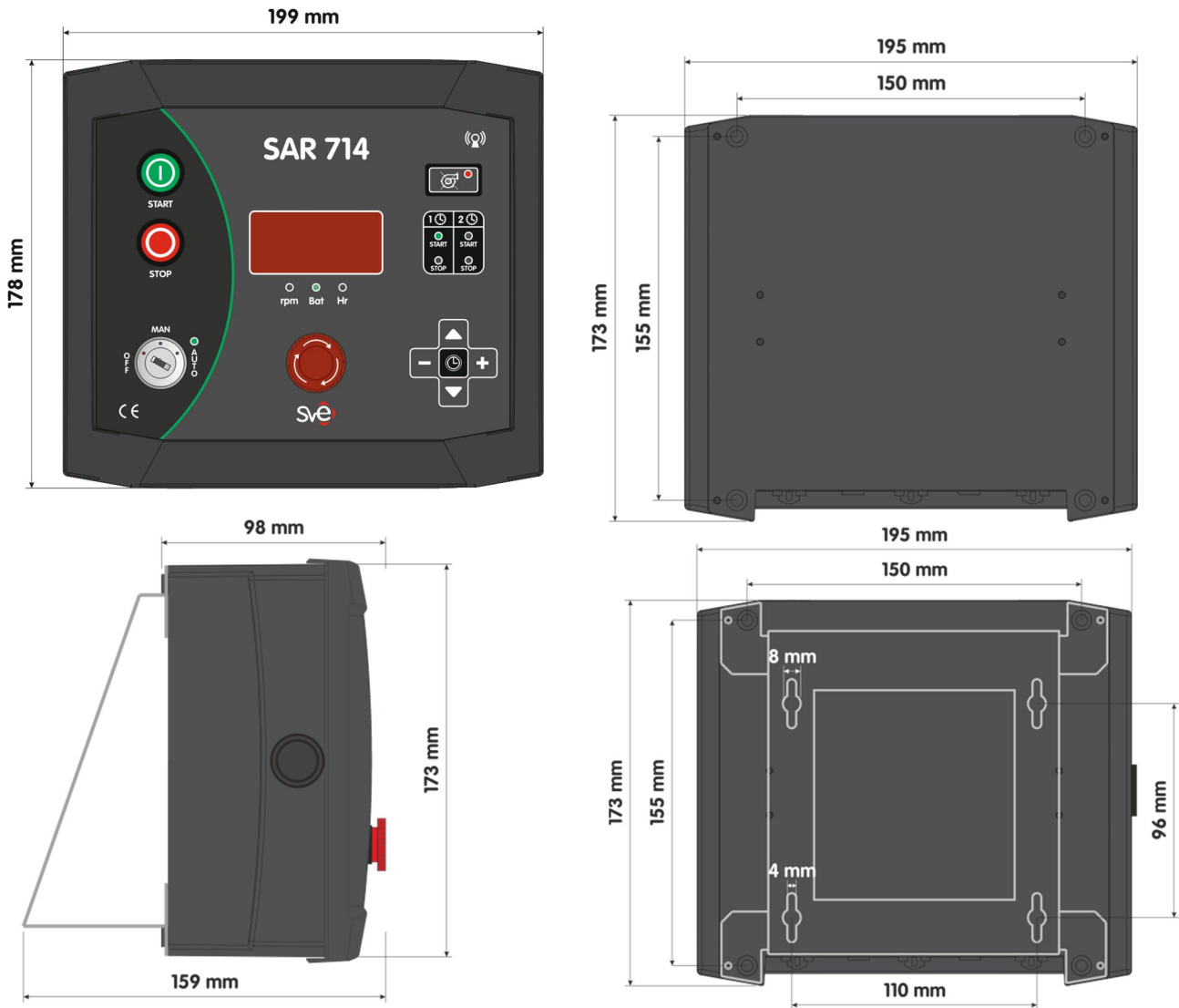
## 4. ASSEMBLY, DIAGRAMS AND CONNECTIONS

### 4.1. WEIGHT, ASSEMBLY AND DIMENSIONS

The SC-SAR714 control panel is designed for either wall or metal brackets installation

#### 4.1.1. DIMENSIONS

Below are the outer dimensions and the panel drillings necessary for the assembly.



#### 4.1.2. WEIGHT

Weight

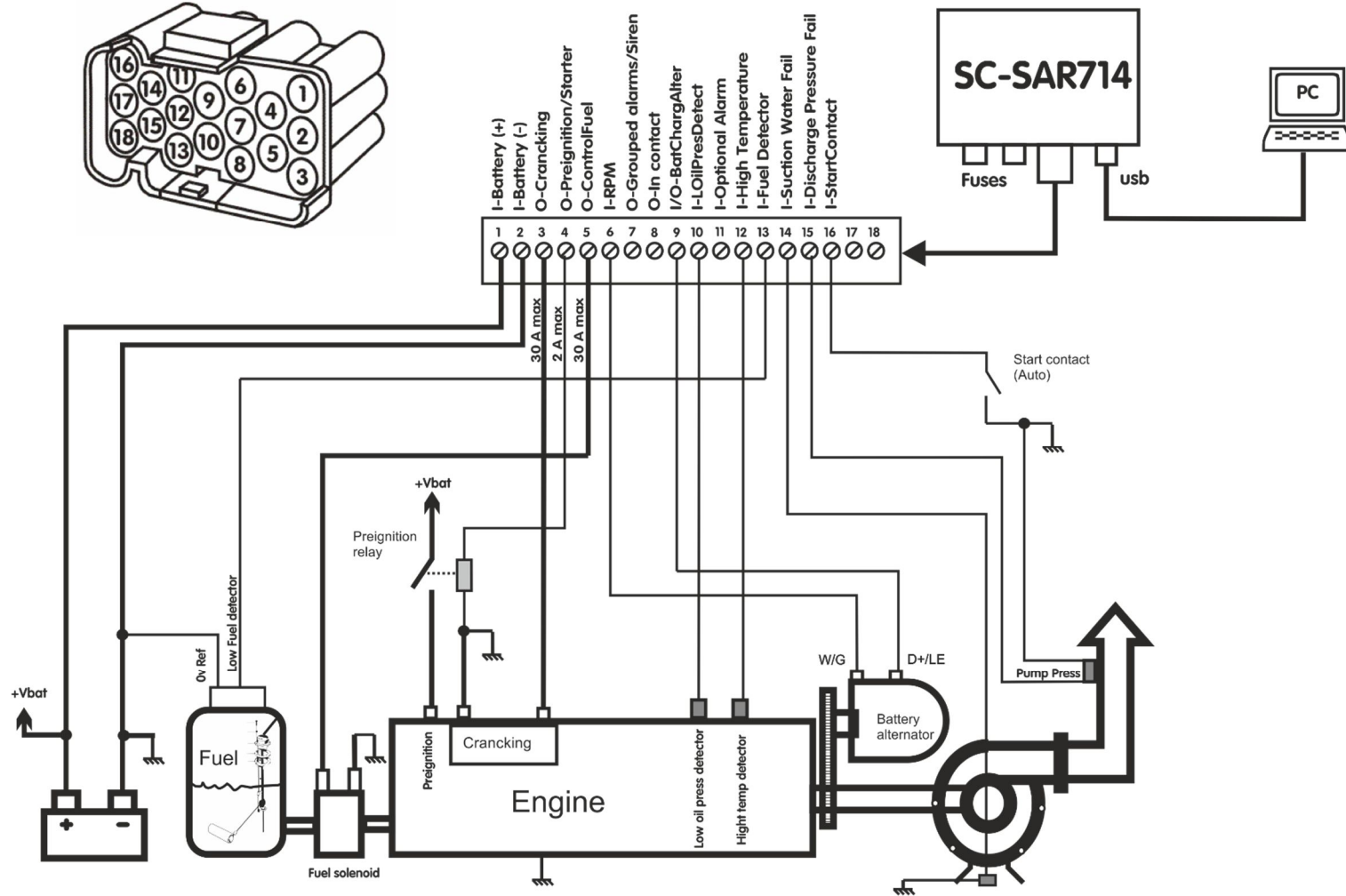
1.200 g



## 4.2. CONNECTION DIAGRAM

N° CONNECTION DIAGRAM SC-SAR714

01





### 4.3. DESCRIPTION OF THE TERMINALS

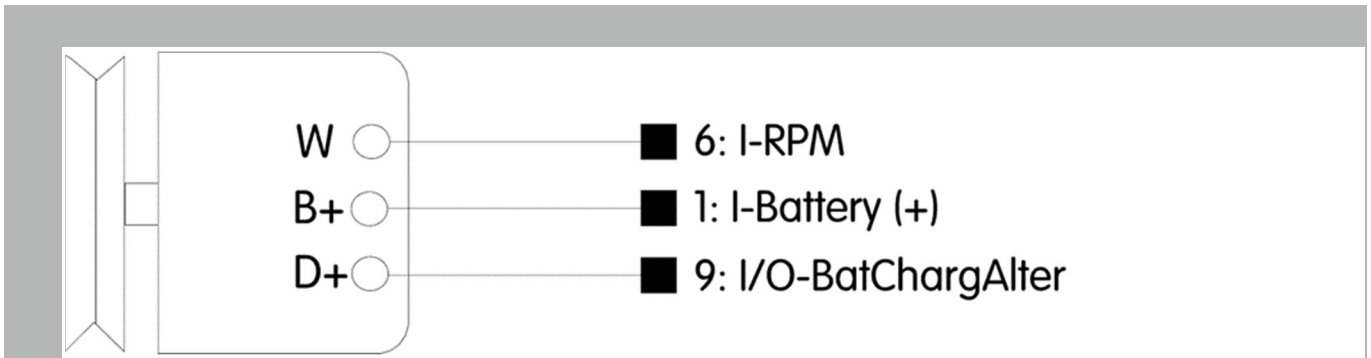
Below is a basic description of the different terminals:

N°	TAG	DESCRIPTION
T-1	<b>I-Battery (+)</b>	SC-SAR714 control panel power supply and Vbat reading
T-2	<b>I-Battery (-)</b>	Negative battery and voltage reference (0v). Connect to earth.
T-3	<b>O-Crancking</b>	VBat (+) Control of electric starter.
T-4	<b>O-Preignition/Starter</b>	Preignition: diesel engine
T-5	<b>O-ControlFuel</b>	Starter: petrol engine
T-6	<b>I-RPM</b>	VBat (+) Electrovalve/Solenoid control (Fuel regulation or shut-down)
T-7	<b>O-Grouped alarms / Siren</b>	Configurable output
T-8	<b>O-in contact</b>	Active whenever the motor-pump should be running
T-9	<b>I/O-BatChargAlter</b>	VBat (+/-) Battery charger alternator priming and battery charger alternator running detection.
T-10	<b>I-Oil Pres Detect</b>	VBat (-) Low oil pressure oil detection
T-11	<b>I-Optional Alarm</b>	VBat (-) Optional alarm detection
T-12	<b>I-High Temperature</b>	VBat (-) High engine temperatura detection
T-13	<b>I-Fuel Detector</b>	VBat (-) Low fuel level detection
T-14	<b>I-Suction wáter fail</b>	VBat (-) No wáter in the suction detection
T-15	<b>I-Discharge pressure fail</b>	VBat (-) Low pump discharge pressure detection
T-16	<b>I-StartContact</b>	VBat (-) Remote start contact detection
T-17	-	No used
T-18	-	No used

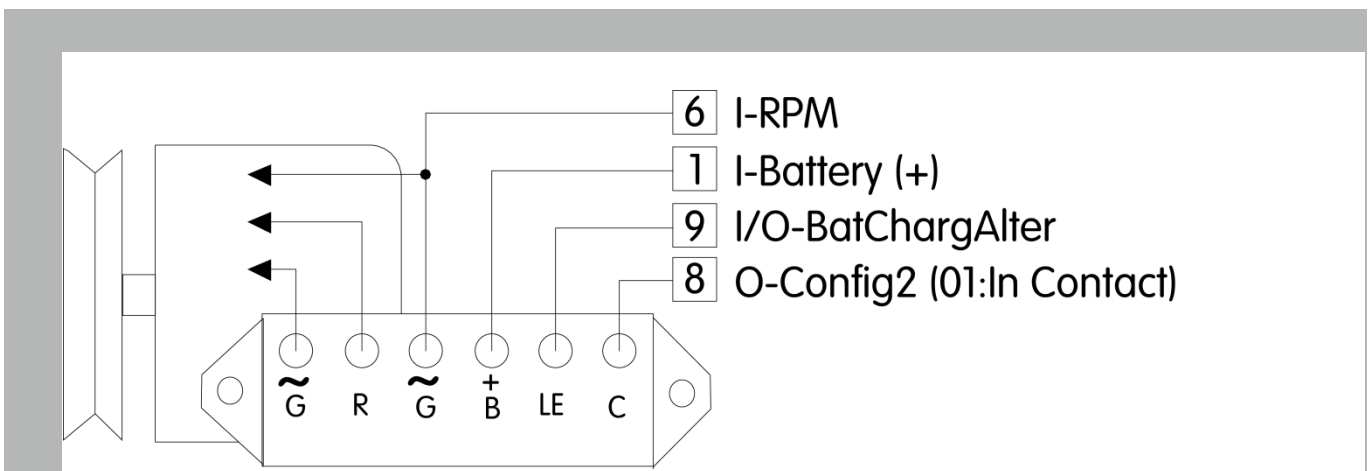


#### 4.4. rpm READING; W or G TERMINAL CONNECTIONS:

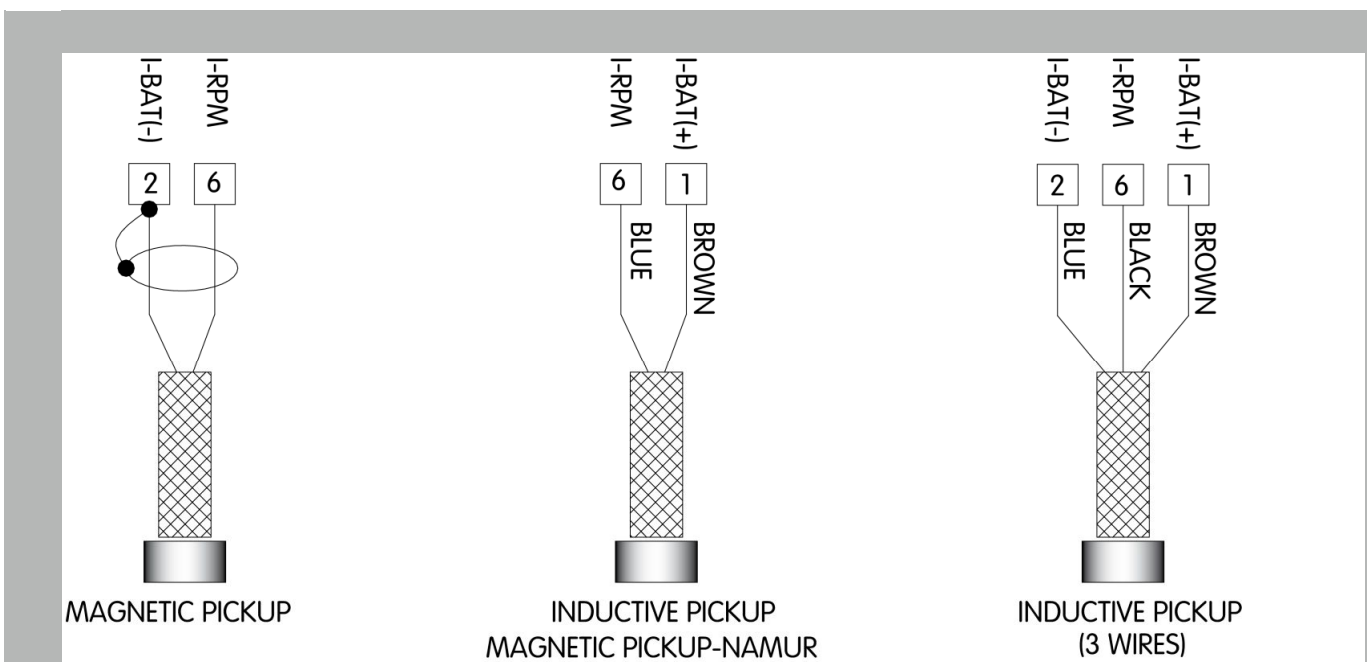
##### 4.4.1 ALTERNATOR WITH PREEXCITATION



##### 4.4.2 PERMANENT MAGNETIC GENERATOR WITH NO W TERMINAL



##### 4.4.3 PICK-UP CONNECTIONS

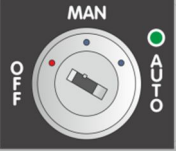





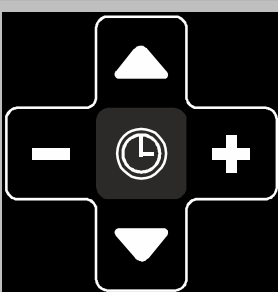








## 5. CONTROL AND DISPLAY ELEMENTS

The SC-SAR714 control panel has a series of elements, pilots, pushbuttons and display, which facilitate the control of the motor-pumps and allow to visualize their status and operating parameters.

MODE SWITCH	
	Power On / Off key and OFF/MAN/AUTO operation mode key Pilot light to indicate that the SC-SAR714 control panel is in AUTO mode
EMERGENCY SHUTDOWN PUSHBUTTON	
	Allows the pump to be shut down immediately in any operation mode. It is a lockable pushbutton.
CONTROL PUSHBUTTONS	
	Pump start pushbutton, See: Pump start
	Pump stop pushbutton, in MAN mode. See: Pump stop
PILOT LIGHTS	
	No wáter in suction indicator
	Delayed stop activated Indicador
DISPLAY AND DELAYED STOP CONTROL PUSHBUTTONS	
	Shows the current programmed time (minutes)
	Change of concept displayed
	Increase or decrease the minutes set in the delayed stop



DISPLAY	
	rpm: Engine revolutions per minute
	Bat: Engine battery voltage
	Hr: Total operation hours accumulated by the motor-pump
Pressing ▽ or ▲ will display the maximum and minimum values of each measurement to cause an alarm	
	The Alarms detected are displayed using the the message AL XX, where XX is the Alarm number. If the SC-SAR714 control panel detects several alarms, they are all displayed successively.

## 5.1. BUZZER

The SC-SAR714 control panel has an internal buzzer that goes on whenever a new alarm is detected or whenever the pump starts in AUTO mode. The activation of this buzzer is accompanied by the activation of the Output T-07: Grouped alarms / Siren.

The buzzer is disabled by pressing ▽ or ▲

## 6. PARAMETER CONFIGURATION

The SC-SAR714 control panel has extraordinary capacity to control the operation of multiple different types of pumps and models.

### 6.1. ACCESS TO CONFIGURATION MODE AND VALUES RECORD

PREREQUISITES	
	<ul style="list-style-type: none"> <li>• Mode selector switch in MAN mode</li> <li>• Engine stopped (simulate corresponding inputs)</li> <li>• Shows "Bat" on display</li> </ul>
ACCESS TO CONFIGURATION MODE	
	<p>Press ▽ ▲ at the same time for 3 seconds.</p> <p>The display shows "Conf" for two seconds followed by "PU: __" to enter the password. Enter password. See Configuration C-33: Configuration password</p> <p>Use + 0 - to modify the password value.</p> <p>Press ▲ or ▽ to accept.</p> <p>The message "Err" will be displayed if the password is incorrect. If it is correct, the first configuration parameter will be accessed.</p> <p>Press ▲ to access the first parameter</p>



### DISPLAY AND MODIFY PARAMETERS

**+ 0** - To modify the value displayed  
**Δ 0 ▽** To pass to the next/previous parameter.

### SAVE AND EXIT CONFIGURATION MODE

Save changes and exit: Press **Δ** and **▽** at the same time for 3 seconds

Cancel and exit without saving changes: Place the mode selector switch in OFF or press the  button

## 6.2. CONFIGURABLE PARAMETER TABLES

### 6.2.1 ENGINE PARAMETERS CONFIGURATION

N°	TAG	FUNCTION	FACTORY SET	OTHERS
C-1	Engine type	Engine type options	00-Diesel	01-Petrol
C-2	Fuel Control	Fuel to engine supply operation. Terminal T-5: O-ControlFuel	00-Passage electrovalve	01-Solenoid shutdown
C-3	Enable engine speed reading	Enable speed reading through Terminal T-6: I-RPM, needed for engine running detection Alarms AL-07: Engine overspeed and Alarm AL-08: RPM Signal loss	0n	Off
C-4	Nominal speed	Engine nominal speed (hundreds rpm)	15 (1500 rpm)	08/50
C-5	Enable charger alternator priming	Enable battery charger alternator priming	0n	Off
C-6	Enable end of crank by D+/LE	Enable end of engine crank due to battery charger alternator detection	0n	Off
C-7	Enable end of crank by oil pressure	Enable end of engine crank due to oil pressure detection	Off	On
C-8	Enable end of crank by rpm	Enable end of engine crank due to rpm detection over 25% of nominal rpm Configuration C-04: Nominal speed	0n	Off
C-9	N° Crank Pulses	Number of crank attempts	3	1-99
C-10	Preignition time	Preignition time (sec)	10	00-99
C-11	Starter time	Starter time (tens of second)	15	00-99
C-12	Max. crank time.	Maximum crank engine time for each attempt (sec)	10	1-99
C-13	Shutdown time	Fuel constriction solenoid activation time (sec)	15	02-99
C-14	N° Hours first maintenance	First maintenance warning (tens of hours)	10 (100Hours)	00-99
C-15	N° Hours between maintenance	Maintenance warning period (tens of hours)	25 (250Hours)	00-99



## 6.2.2 ALARMS CONFIGURATION

N°	TAG	FUNCTION	FACTORY SET	OTHERS
C-16	Vow fuel alarm operation	Operation associated to Alarm AI-04 Very low fuel detection	00-Warning	01-Shutdown
C-17	Battery charge alarm operation	Operation associated to Alarm AI-09 Battery charger loss detection	00-Warning	01-Shutdown
C-18	Battery charger alarm delay	Delay time (sec) for monitoring of Alarm AI-09 Battery charger alternator loss after detecting Engine running	10	1-99
C-19	rpm signal alarm delay	Delay time (sec) for monitoring of Alarm AI-08 RPM signal loss after detecting engine running	10	0-15
C-20	Enable overspeed alarm	Enable Alarm AI-07 Engine overspeed	On	Off
C-21	Optional alarm contact type	Input type of terminal T-11: I-Optional alarm related to Alarm AI-13 Optional Alarm	00-Open no alarm	01-Close no alarm
C-22	Optional alarm operation	Operation associated to Alarm AI-13 Optional Alarm	00-Warning	01-Shutdown
C-23	Low oil pressure alarm delay	Delay time (sec) for monitoring of Alarm AI-05 Low oil pressure after detecting engine running	10	1-99
C-24	%-Battery undervoltage alarm	% decrease relative to the nominal battery voltage which triggers Alarm AI-10 Low battery voltage	17	0-99
C-25	%-Battery overvoltage alarm	% increase relative to the nominal battery voltage which triggers Alarm AI-11 High battery voltage	25	0-99
C-26	Water alarms delay	Delay time (sec) for monitoring of Alarm AI-15 No wáter in suction and AL-17 Low pump discharge pressure after detecting engine running	60	0-99
C-27	No wáter in suction alarm contact type	Input type of terminal T-14 I- suction wáter fail related to Alarm AI-15 No wáter in suction	00-Open Pressure OK no alarm	01-Closed pressure OK no alarm
C-28	No wáter in suction alarm operation	AI-15 No wáter in suction alarm operation	00-Warning	01-Shutdown
C-29	Low pump discharge pressure alarm contact type	Input type of terminal T-15 I- Discharge pressure fail related to Alarm AI-15 Low pump discharge pressure alarm	00-Open Pressure OK no alarm	01-Closed pressure OK no alarm
C-30	Low pump discharge pressure alarm operation	AI-17 Low pump discharge pressure alarm operation	00-Warning	01-Shutdown
C-31	Maximum siren duration time	Maximum siren duration time (minutes)	3	01-99
C-32	Grouped alarms/Siren output	Option output T-07: O-Grouped alarms/Siren output	00-Grouped alamas	01-Siren



### 6.2.3 OTHER PARAMETERS CONFIGURATION

N°	TAG	FUNCTION	FACTORY SET	OTHERS
C-33	Configuration password	Configuration access password	00	00-99
C-34	Speed constant value K	K value is used to calculate pumps rpm. K value is proportional to the number of teeth/poles. K is calculated by multiplying the number of teeth by 10 Example: 102 teeth -> K= 1020	100	1-2000

## 7. OPERATION



The SC-SAR714 control panel is designed to control a water pumping system and, in consequence, may present a risk to people operating it.


It is expressly stated that the system must be handled by authorised, trained personnel who have read and understood these instructions.

### Initial configuration:

**The defect configuration of the SC-SAR714 control panel takes into account the conditions of most pumps, although some parameters will need to be customised. Ask your supplier if the system has already been personalised; if it has not, follow the instructions in the section CONFIGURATION**

### 7.1. MOTOR-PUMP START

The conditions necessary to start the pump and operate the SC-SAR714 control panel are described below.

CONDITION	DESCRIPTION
MAN mode:	 . pushbutton operation. A single pulse starts the start process
AUTO mode:	Any of the AUTO mode start conditions active. Remote Start and Delayed stop
Absence of alarms that cause the pump to stop	

### 7.1.1 ENGINE CRANK

#### 7.1.1.1. PRE-CRANK

FUNCTION	TYPE	DESCRIPTION
Siren	C-32 Siren	Initially activated for 10 seconds in AUTO mode
Fuel Control	Terminal T-5: O-ControlFuel	Activated if C-2: Fuel Control=Passage electrovalve or disabled if C-2: Fuel Control=Solenoid shutdown
In Contact:	Terminal T-8: O-in contact	Activated



### 7.1.1.2. CRANK PULSES

FUNCTION	TYPE	DESCRIPTION
<b>Preignition</b>	Terminal T-4: O-Preignición /Starter	Activated when configured C-1: Engine Type= Diesel for time C-10: Preignition time
<b>Starter</b>	Terminal T-4: O-Preignición /Starter	Activated when configured C-1: Engine Type= Petrol for time C-11: Starter time
<b>Battery Charger Alternator</b>	Terminal T-9: I/O-BatChargAlter	The control panel supplies a current (250 to 500 mA) to prime the battery charger alternator (if C-05: Ena-Charge alt prime=On is configured, continues with the next step without waiting for timer).
<b>Crank</b>	Terminal T-3: O-Cranking	If it is a diesel engine, it waits for the pre-ignition process to pass. If it is a petrol engine, it is activated at the same time as the starter.

### 7.1.1.3. END OF CRANK PULSES

Crank pulse is taken as finished when any of the following conditions come about:

FIN DE IMPULSO DE ARRANQUE	
<b>Engine running detection</b>	See Engine running detection
<b>Alarm trigger</b>	See Alarms
<b>Crank time expire</b>	Configuration: C-12: Max. crank time has expired

The operations carried out are as follows:

FUNCTION	TYPE	DESCRIPTION
<b>Crank</b>	Terminal T-3: O-Cranking	Disabled

### 7.1.1.4. NUMBER OF CRANK PULSES

FUNCTION	TYPE	DESCRIPTION
<b>Fuel Control</b>	Terminal T-5: O-ControlFuel	Terminal T-5: O-ControlFuel
<b>Pause</b>	If it is a petrol engine, it is disabled if Configuration: C-2: Fuel Control=Electrovalve or enabled if Configuration: C-2: Fuel Control=Solenoid.	
<b>Pulse counter</b>	Times a 6 sec pause	
<b>New pulse</b>	Counts the number of crank attempts and checks if this exceeds the maximum configured Configuration: C-9: N° Crank Pulse.	




### 7.1.2 ENABLE ALARMS MONITORING

Monitoring of the following conditional alarms is enabled when it is detected that the engine is running

ALARM	
Alarm: AL-05: Low oil pressure	Alarm AL-15: No wáter in suction
Alarm: AL-08: RPM Signal loss	Alarm AL-16: Low pump discharge pressure
Alarm: AL-09: Battery alternator loss	

### 7.2. STOP THE MOTOR-PUMP

Dará comienzo al proceso de apagado de la motobomba cuando ocurra alguna de las siguientes condiciones:

CONDITION	DESCRIPTION
<b>OFF Mode</b>	This is to turn off the SC-SAR714 control panel
 <b>MAN Mode: STOP pushbutton operation</b>	Common stop in MAN mode
<b>AUTO mode: Absence of Start conditions in AUTO mode</b>	Disappearance of the conditions which led to start
<b>Alarm</b>	An alarm goes on, causing the pump to stop.

The stop process is carried out as follows:

#### 7.2.1 ENGINE SHUTDOWN

The engine is shut down (fuel shut off):

FUNCTION	TYPE	DESCRIPTION
<b>Fuel Control</b>	Terminal T-5: Fuel Control	Disabled if C-2: Fuel Control=Regulation electrovalve or active if C-2: Fuel Control=Solenoid. When configured as solenoid, this signal will remain active for the time configured C-13: Shutdown time.
<b>En contacto:</b>	Terminal T-8: O-in contact	Disabled

#### 7.2.2 DISABLE ALARM MONITORING

Monitoring of the following conditional alarms is disabled when the engine shuts down:

ALARM	
Alarm: AL-05: Low oil pressure	Alarm AL-15: No wáter in suction
Alarm: AL-08: RPM Signal loss	Alarm AL-16: Low pump discharge pressure
Alarm: AL-09: Battery alternator loss	



### 7.2.3 SHUTDOWN CHECK:

If the SC-SAR714 control panel still detects Engine running once the shutdown process has finished, Alarm AL-18: Unexpected operation will be activated.

## 7.3. START CONDITIONS IN AUTO MODE

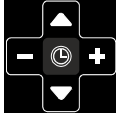




SC-SAR714 control panel can manage pump activity without any operator personnel present (AUTO mode).

### 7.3.1 START BY CONTACT

<b>ACTIVATION</b>	
Terminal connection:	T-16: I-StartContact to Vbat (-)
<b>DISABLING</b>	
Releasing the Terminal:	T-16: I-StartContact of Vbat (-).

### 7.3.2 START WITH DELAYED STOP

SC-SAR714 control panel offers the option of setting the time that the motor-pump keeps running, after having been started by the user.

ENABLING	DELAYED STOP ADJUST
	Use the buttons: 
<b>Desired work minutes setting</b>	Presionar el pulsador  Se presentan los minutos actualmente programados.
	Press <b>-</b> and <b>+</b> (if pressed for several seconds the value changes more quickly) buttons to select the number of desired minutes for the motor-pump to remain running until the SC-SAR714 control panel orders the stop. Maximum duration: 9,999 minutes
<b>Start of the running</b>	 Stat de motor-pumpo operating  . Pass the selector key to AUTO mode
<b>Pump running time</b>	The motor-pump will remain running until the programmed time has been consumed, in which case it will stop automatically (Time will remain at 0000)
<b>End of the running</b>	The motor-pump will remain running until the programmed time has run out. In MAN mode the motor pump will turn off when pressed 





## 7.4. ENGINE RUNNING DETECTION

SC-SAR714 control panel permanently checks if any of the following signals indicate that the engine is running

CONCEPT	ENABLE	ACTIVATION
<b>Oil Pressure</b>	C-7: Enable end of crank pressure = On	Engine running if Terminal T-10: I- LOilPresDetect is released from VBat (-) for at least 5 sec.
<b>Battery charger alternator</b>	C-6: Enable end of crank D+ = On	Engine running if Terminal T-9: I/O-BatChargAlter is released from VBat (-).
<b>RPM</b>	C-3 Enable speed reading = On C-8: Enable end of crank rpm = On	Engine running if engine speed is greater than 25% of nominal speed Configuration C-4: Nominal speed.

## 7.5. ENGINE SPEED READING AND CALIBRATION

When commissioning pump, it is necessary to adapt the RPM value displayed to the actual engine turning speed, since different signals can be received via Pick-Up, W or LE for different engines.

The value that relates the pulses received to the actual speed of rotation is the parameter of Configuration C-34: Speed constant.

The process is described below

### 7.5.1 OBTAINING THE SPEED CONSTANT (C-34)

If the pump K value is unknown Configuration C-50 Speed constant value K, follow steps below:


CONCEPTO	DESCRIPCION
<b>Input terminal</b>	<ul style="list-style-type: none"> <li>Terminal T-6: I-RPM</li> </ul>
<b>Connections</b>	<ul style="list-style-type: none"> <li>In accordance with Diagram 2 and diagram 3: Pick-Up connections (rpm reading)</li> </ul>
<b>Enable</b>	<ul style="list-style-type: none"> <li>Configuration. C-03 Enable engine speed reading = On</li> </ul>
<b>Prerequisites</b>	<ul style="list-style-type: none"> <li>Control panel switch in mode: MAN</li> <li>Engine switched off</li> <li>Shows "RPM" on display: Press one of the ▽ ▲ buttons until the rpm is read</li> </ul>
<b>ACCESS TO CALIBRATION MODE</b>	
<ul style="list-style-type: none"> <li>Press the ▽ ▲ pushbuttons at the same time for 3 seconds. The rpm pilot light flashes and monitoring of Alarm AI-07: Overspeed is disabled.</li> <li>Enter password Configuration C-33: Configuration password</li> <li>PU: _ will appear in the display</li> <li>Use the + or - buttons to modify the value.</li> <li>Press the buttons ▲ or ▽ to accept the value entered.</li> </ul>	
<b>CALIBRATION</b>	
<div style="text-align: center;"> </div> <ul style="list-style-type: none"> <li>Start up the pump: Press  and allow speed to stabilise.</li> <li>Modify the value displayed using the buttons+ or - until it matches the rpm value read through an external system (such as a tachometer).</li> </ul>	



### SAVE AND EXIT CALIBRATION MODE

Press  $\nabla$   $\Delta$  buttons for 3 seconds: the changes are saved, the rpm reading pilot light stops flashing and the calibration mode ends, once again activating monitoring of Alarm AL-07: Overspeed.



Cancel calibration: Press  or place the switch in OFF mode to leave RPM calibration mode without saving the calibration.

## 7.5.2 KNOWN SPEED CONSTANT K VALUE (C-34)

### 7.5.1.1. CONNECTION TO TERMINAL W or G

If K value is known Configuration C-34 Speed constant value K directly input K value as explained in section 6 PARAMETERS CONFIGURATION

### 7.5.1.2. CONNECTION TO SPEED PICK UP SENSOR

If the teeth number are known and a magnetic or inductive pickup sensor is going to be used to monitor the pump speed, the K value that needs to be entered in the Configuration C-34 Speed constant value K is 10 x #number of teeth. For example if your gear has 102 teeth enter number 1020.

## 8. ALARMS

One of the basic functions of the SC-SAR714 control panel is to protect the whole pumping unit. This task is performed by permanently monitoring the mechanical and electrical variables and by actuating according to the different alarms that might be generated.

Common alarm operations:

OPERATION		DESCRIPTION
Display	The corresponding alarm code is presented automatically from Alarm AI-01 to Alarm AI-18	
Output T-7 O-Grouped alarms / Siren	Activated	

### 8.1. ALARMS LIST

N°	TAG	DESCRIPTION	SHUTDOWN
AL-01	Fail to start	The attempt to crank the pump was unsuccessful. See: pump start.	Yes
AL-02	Fail to run	It is detected that the engine has shut down unexpectedly. See: Engine running detection	Yes
AL-04	Low fuel level	Activated by detector Terminal T-13: I-detector	Configuration: C-18: Low fuel alarm operation
AL-05	Low oil pressure	Activated by detector: Terminal T-10: I-LOilPresDetect: VBat (-) Delayed monitoring: Configuration: C-23: Low oil pressure alarm delay after detecting Engine Running. See: pump start	Yes



AL-06	High coolant temperature	Activated by detector T-12: High temperature VBat (-)	Yes
AL-07	Engine overspeed	The engine has exceeded its nominal speed by 20% See: Configuration: C-4: Nominal speed for more than 2 seconds. Monitoring may be disabled, See: Configuration: C-03: Enable speed reading and C-20: Enable overspeed alarm.	Yes
AL-08	RPM signal loss	Activated by detector: Terminal T-6: I -RPM Delayed monitoring: Configuration: C-19: rpm alarm signal delay after detecting Engine running or having received the rpm signal at some time It is considered that speed signal has been lost with a reading of less than 25% of nominal speed for at least 10s Configuration: C-04: Nominal speed	No
AL-09	Battery charger loss	Activated by detector: Terminal T-9: I/O BatChargAlter,; VBat (-) Delayed monitoring: Configuration: C-18: Battery charger alarm delay after detecting Engine running. See: pump start The engine has a battery charger alternator with Terminals (D+ or LE)	Configuration: C-17: Battery charger alarm action
AL-10	Battery undervoltage	The battery voltage is received in the Terminal: T-1 I-Battery (+) relative to the Terminal: T-2 I-Battery (-). Activated when battery voltage is below the value Configuration C-24: %-Battery undervoltage alarm of its nominal value for two consecutive minutes. See note on Nominal battery voltage	No
AL-11	Battery overvoltage	The battery voltage is received in the Terminal: T-1 I-Battery (+) relative to the Terminal: T-2 I-Battery (-). Activated when battery voltage is above the value Configuration C-25: %-Battery overvoltage alarm of its nominal value for two consecutive minutes. <b>Note: Nominal battery voltage:</b> The SC-SAR714 control panel assumes that the battery's nominal voltage is 12 V DC if less than 17 V DC is detected when turned on, and 24.V.DC if more than 17.V.DC is detected.	No
AL-12	Emergency shutdown pressed	Emergency pushbutton operator in the SC-SAR714 control panel	Yes
AL-13	Optional alarm	Activated by detector input T-11: I-Optional Alarm VBat (-) The type of contact connected can be configured C-21 Configuration: Optional alarm contact Type	Configuración: C-22: Optional alarm operation
AL-14	Maintenance	The nº of hours to carry out first maintenance Configuration C-14: Nº Hours First Maintenance or the nº of hours of operation between maintenance Configuration C-15: Nº Hours Between Maintenance has been exceeded.	No



AL-15	<b>No wáter in suction</b>	<p>Activated by detector input T-14: I-Suction Water Fail VBat (-)</p> <p>Delayed monitoring: Configuration: C-26: Water alarms delay after detecting Engine Running. Or if at any time water has been detected for at least 1 minute and disappears for at least 6 seconds</p> <p>The type of contact connected can be configured C-27 Configuration: No wáter in suction alarm contact type</p>	<p>Configuration: C-28: No water in suction alarm action</p>
AL-17	<b>Low pump discharge pressure</b>	<p>Se activa por detector de la entrada T-16: I-Discharge pressure fail</p> <p>Vigilancia demorada: Configuración: C-26: Demora alarmas agua después de haber detectado Motor en Marcha. Ver: Encendido de la motobomba</p> <p>Se puede seleccionar el tipo de contacto que activará esta alarma: C-29: Contacto alarma fallo de presión de impulsión</p> <p>Activated by detector input T-16: I-Discharge pressure Fail VBat (-)</p> <p>Delayed monitoring: Configuration: C-26: Water alarms delay after detecting Engine Running. See: pump start</p> <p>The type of contact connected can be configured C-29 Configuration: Low pump discharge pressure alarm contact type</p>	<p>Configuration: C-30: Low pump discharge pressure alarm action</p>
AL-18	<b>Unexpected operation</b>	<p>The SC-SAR714 control panel detects engine running whilst it should be shut down</p>	<p>No</p>

## 8.2. RESETTING AND DELETING ALARMS IN DISPLAY

The Alarms which do not cause the pump to shut down disappear from the Display automatically when the cause disappears.

In order to reset and restart the pump following the alarm which caused it to shut down, it is necessary to shutdown the SC-SAR714 control panel once the cause which led to the pump shutting down has disappeared.

### 8.2.1 PUMP MAINTENANCE ALARM RESET

The Alarm AL-14 Maintenance is reset by pressing the  $\nabla$   $\Delta$  buttons at the same time whilst the operation hours are displayed (Hr). It doesn't matter if the pump is running or not. The Hr pilot light will stop flashing.



## 9. TECHNICAL CHARACTERISTICS

### 9.1. ENVIRONMENT

Operation temperature range	-10 °C (BS EN 60068-2-1) to 60 °C (BS EN 60068-2-2)
IP protection:	IP65

### 9.2. POWER SUPPLY

V DC (Supply voltage):	From 8 V DC to 35 V DC
Controller consumption ON	STOP: 100 mA (12 V DC) or 70 mA (24 V DC) Alternator Primer: 320 mA (12 V DC) or 500 mA (24 V DC) START < 200 mA
Consumption in OFF mode	0 mA
Consumption on Standby (AUTO mode)	<10 mA
Protection from reverse supply	YES
Protection from overvoltage	NO
Fuse protection	F1: 30 Amp (6.3 x32)
	F2: 6 Amp (6.3 x 32)

### 9.3. INPUT/OUTPUT TERMINALS

Terminal type	Mate-N-Lok type connector: 18 terminals
Minimum cable section in Terminals	0.5 mm <sup>2</sup> (AWG 24)
Maximum cable section in Terminals	2.5 mm <sup>2</sup> (AWG 10)

### 9.4. OUTPUT SIGNAL CHARACTERISTICS

#### Terminal T-3: O-Cranking / Terminal T-5: O-Control fuel

Active output voltage	(+) V battery (±10%)
Inactive output voltage	0v (±0.1 v) with exterior resistor R < 20 kOhm
Protection from overvoltage	No
Maximum current	30 A
Surge protection	30 A (fuse)

#### Terminal T-4:O-Preignition/Starter

Active output voltage	(+) V battery (±10%)
Inactive output voltage:	0v (±0.1 v) with exterior resistor R < 20 kOhm
Protection from overvoltage	No
Maximum current	2 A
Surge protection	6 A (fuse)



**Terminal T-7: O-Grouped alarms / Siren Terminal T-8: O-In contact.**

Active output voltage	(+) V battery ( $\pm 10\%$ )
Inactive output voltage	0v ( $\pm 0.1$ v) with exterior resistor $R < 20$ kOhm
Surge protection	No
Maximum current	2 A
Surge protection	6 A (fuse)

## 9.5. INPUT SIGNAL CHARACTERISTICS

### 9.5.1 CONTACT DETECTION INPUTS

**Terminal T-10: I-LOilPresDetect / Terminal T-11: I-Optional Alarm / Terminal T-12: I-High Temperature / Terminal T-13: I-Fuel detector / Terminal T-14: I-Suction water fail / Terminal T-15: I-Discharge pressure fail / Terminal T-16: I-Start contact**

Active input voltage	(-) V battery
Inactive input voltage	(+) V battery
Detection voltage	$(V_{bat} - V_{detec}) > 4v$
Non-detection voltage	$(V_{bat} - V_{detec}) < 2v$
Pull-up resistor	2k2 ( $\pm 5\%$ )
Protection	Optocoupled input, $V_{max}: 40$ VDC, $V_{min}: 0v$
Closed contact current	5.5 mA ( $V_{bat}: 12v$ ), 11mA ( $V_{bat}: 24v$ )

### 9.5.2. PICK-UP, W and G~ INPUT

**Terminal T-6: I-RPM**

Minimum voltage	Compatible for G~ and W magnetic and inductive pick-up
Minimum high level voltage	2.5 V (1 Hz) to 5V (10 kHz)
Maximum low level voltage	1.5V
Maximum voltage Terminal 6	30V RMS
Impedance Terminal 6	1k1 Ohm
Max frequency in Terminal 6	7 KHz
Maximum RPM	5000 (resolution $< 10$ , precision $\pm 10$ )
Display RPM reading adjustment	See Engine speed reading and calibration

### 9.5.3. ALTERNATOR INPUT/OUTPUT (D+)

**Terminal T-9: I/O-BatChargAlter**

Primer intensity with 12v battery	320 mA
Primer intensity with 24v battery	500 mA



#### 9.5.4 REFERENCE STANDARDS

Electrical safety	UNE-EN 60950-1:2007
Electromagnetic emissions	UNE-EN 6100-6-4:2007+/A1:2011
Electromagnetic immunity	UNE-EN 6100-6-2:2006+ ERRATUM:2009



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