



# SCF C900-D-AS

## DIESEL ENGINE DRIVEN CONFIGURABLE-PROGRAMMABLE FIRE PUMPS CONTROL PANEL



**GENERAL  
TECHNICAL MANUAL**  
SCF C900-D-AS 01-EN-Rev. 0  
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## 1. SCOPE OF THE DOCUMENT

The purpose of this technical document is to explain the useful elements for the proper installation and use of the SCF C900-D-AS control panels.

If the user requires further information regarding design, component justification, operation, etc., please contact us at [svecorp@svecorp.com](mailto:svecorp@svecorp.com).

## 2. BASIC DESCRIPTION

The SCF C900-D-AS control panels are automatic, configurable and programmable instruments useful for managing the operation of diesel fire-fighting motor-pumps.

They control the starting and stopping of the **diesel**-pump, display the most relevant values and information and manage communication with both the surrounding elements and the remote guards.

### 3.1. MAIN CHARACTERISTICS

N°	TECHNICAL RULES AND REGULATIONS				
01		AS 2941 regulation 2013			
02		AS/NZS 3000:2018 Standard			
03	Compliance with technical rules and standards	EN 61439-1 Low-voltage switchgear			
04		CE marking EMC EN50130-4:2011 / IEC 62599-2:2010 / EN61000-6-3:2007			
05		CE marking for electrical safety. EN61010-1:2011			
N°	ELECTRICAL CHARACTERISTICS AND BATTERIES				
06	Rated supply voltage	From 85V to 265 VAC 50-60Hz depending on model			
07	Nominal Battery Voltage	12 VDC or 24 VDC depending on model			
08	Battery chargers	Models			
09		<b>SCA B12100</b>	<b>SCA B24050</b>	<b>SCA B24100</b>	
10	Rated load current	10 A	5 A	10 A	
11	Battery capacity (C10) supported	200 Ah	100 Ah	200 Ah	
12	DIN power	138.0 W	138.0 W	276.0 W	
13	Performance	85% at nominal power			
14	Deviation of buoyancy voltage	< 1% from 0% to 90% of rated load current			
15	Supported battery types (except SBA 2030)	Pb fluid open		Pb VRLA (AGM or GEL)	
		NiCd-(9-18 elements)		NiCd-(10-20 elements)	
16	Load current diversion	< 5% from 50% to 99% of float voltage			
17	Auxiliary battery voltage input	Actual battery voltage measurement without interference from the charging current			
18	Auxiliary battery temperature input	Regulation of voltage levels for Pb VRLA batteries			
N°	CONSTRUCTIVE CHARACTERISTICS				
19	External envelope	Degree of protection against access to hazardous parts IP65			
		NEMA Type 2			
		Degree of impact protection: IK10 Except Display			
		Flame-retardant grade: Fire extinguishers in <30s with dripping			
23	Display	TFT colour 3.5" 480x272 px			
24	Wiring	Fire resistance: RZ1 according to EN50200 (830° for 90min)			



25	Pressure sensors	2 pressure gauges via pressure transducer 0-16bar / 4-20mA They can be used to control system pressure and pump suction. Demand start and end pressures are configurable.	
26	Working temperatures	From -5°C to 60°C	
27	Relative humidity (non-condensing)	Functional: 20 to 95%.	
28	Refrigeration:	Natural convection	
29	Maximum altitude:	2000m	
30	Degree of contamination	2	
31	Overvoltage category: II	II	
32	Environment	EMC-1	
<b>N° PUMP and SYSTEM PROTECTIONS</b>			
33	Total system alarms	<2000 m	- Insulation voltage between phases and earth: 2000 VAC Maximum motor heating current: 10 AAC (2300 W)
34		<3000 m	- Insulation voltage between phases and earth: 1700 VAC - Maximum motor heating current: 8.7 AAC (2000 W)
35		<4000 m	- Insulation voltage between phases and earth: 1500 VAC - Maximum motor heating current: 7.7 AAC (1700 W) - Maximum current relays R1, R9, R10, R12: 9 ADC - Maximum relay current RG: 9 AAC
36		>4800 m	- A differential must be installed in the installation - Maximum motor heating current: 6 AAC - Maximum current relays R1, R9, R10, R12: 8 ADC - Maximum RG relay current: 8 AAC - Maximum total current between outputs Q1-Q3: 3.5 ADC
<b>N° PUMP START METHODS</b>			
37	Automatic Mode	Pressure switch line: Low system pressure	
38		Manometer: system pressure	
39		Water level contact: Low priming tank level	
40		Remote start contact	
41	Emergency start	"Start Battery " and " Control Battery " press buttons in front panel	
<b>N° ENGINE STARTING SYSTEM</b>			
42	2 Starting solenoids	levers: 1.000 Amp independent / adjacent included	
<b>N° MEASURING INSTRUMENTS</b>			
43	Batteries	2 Precision battery voltage voltmeters greater than 5%	
44		2 battery charging current ammeters with accuracy greater than 5%	
45		1 battery charging alternator current ammeter	
46	Engine	Engine coolant (water) temperature	
47		Engine coolant (oil )temperature	
48		Oil pressure	
49		Fuel tank level	
50		Engine speed in rpm	
51	General system	1 Thermometer: Temperature of the pump room	
52		1 Voltmeter: AC supply voltage. Accuracy >1%.	
53		1 System pressure manometer (pressure sensor with 4-20mA signal required)	
54		1 Flow meter	



N° OTHER INFORMATION ON DISPLAY		
55	Current date and time (RTC with independent battery)	Cumulative hours and minutes of engine operation
56	200 last events (starts, alarms, ...) . 1200 stored	Pump start demand type
57	200 last pressure variation records of the system. 12,000 stored	Active alarms.
58	50 pump test records	Pump room temperature
N° OTHER FEATURES		
59	Controlling of pressure switch lines with short-circuit and open-circuit alarms	Engine heating management via temperature reading
60	Connection controlling with start contactor coils with open-circuit and short-circuit alarms	Functional check of the cooling circuit
61	Mode selector key: Auto / Crank isolate	Embedded Web
N° LIGHT AND ACOUSTIC INDICATORS ON FRONT OF CONTROL PANEL		
62	Operating mode (key-selectable)	Auto
63		Crank Isolate
64	Pump states	Pump on demand
65		Pump start with Start battery/ Pump start with Control battery
66		Pump running with discharge pressure
67	Batteries	Start Battery / Control Battery correct
68		Chargers correct
69	Alarm	Common alarm
70	Other	Mains voltage present
71		Low oil pressure alarm
72		Engine High temperature alarm
73		Low fuel tank alarm
74		Engine failed to start alarm
75		Jacket heat alarm
76	Horn	75 dB measured at 1m
N° COMMUNICATIONS		
77	Micro USB connection type AB	Firmware update
78	WIFI connection	Embedded website
79	Ethernet: Modbus / TCP-IP protocol	LAN (Local Area Network). Optional, with E-IP not included as standard
80		WAN (Ethernet). Optional, with E-IP not included as standard
81		Point-to-point. Optional, with E-IP not included as standard
82	RS485 Modbus / RTU protocol	Optional E-485 module not included as standard
83	Power-free contacts	6 open contacts + 1 closed contact 30 VAC – 0.3 ADC
84		1 switched contacts 250 VAC – 10 ADC
N° LANGUAGES		
85	SPANISH / ENGLISH / FRENCH / PORTUGUESE / ITALIAN / DUTCH / SWEDISH	



## 2.1. CONTROL PANEL MODELS: CODIFICATION

Below the nomenclature codes for the SCF C900-D series products.

	BATTERY CHARGERS	MAINS VOLTAGE	STANDARD	MAXIMUM PRESSURE	LANGUAGE	FINISH
	12100: 12 VDC/10A	M220: 220 VAC	U→ EN 12845 / 17451 UNE 23500	16→ 16 bar	ES→ Spanish	A→ Additive
		M240: 240 VAC		40→ 40 bar	FR→ French	
	24050: 24 VDC / 5A		AS→ AS2941	300→ 300psi	EN→ English	
	24100: 24 VDC /10A		B→ LPC TB210	600→ 600psi	PT→ Portuguese	
			N→ NFPA 20		IT→ Italian	
			→ FM 1321/1323		SV→ Svenska	
			NUF→ FM1321+ UL218		→ Dutch	
			V→ VdS			
			→ r A2P			
Example:						
<b>SCF C900-D</b>	<b>12100</b>	<b>M23</b>	<b>AS</b>	<b>30</b>	<b>EN</b>	

## 2.2. CONTROL PANELS BASED ON BATTERY CAPACITY

N°	DESCRIPTION	Vn BATTERIES	BATTERY CAPACITY RANGE (C10)
<b>01</b>	SCF C900-D-AS -12100	12 VDC	284 Ah
<b>02</b>	SCF C900-D-AS -24050	24 VDC	142 Ah
<b>03</b>	SCF C900-D-AS -24100	24 VDC	284 Ah



## 2.3. LIMITED WARRANTY

Seller (SVE Corp.) warrants to the original purchaser that for the period of 1 year the products sold shall be free from defects in material and workmanship. If buyer claims that a product violates this Limited Warranty, the seller, upon notice promptly given, will either examine the product at buyer's site, or issue shipping instructions for return to the seller at buyer's expense, transportation charges prepaid. The seller's sole obligation under this Limited Warranty shall be, at its option, to repair, replace or refund the price of any product thereof which is proved to violate this Limited Warranty. In no event, whether based on contract, indemnity, warranty, tort (including negligence), strict liability or otherwise, shall the seller be liable to the buyer for special, indirect, incidental or consequential damages whatsoever including, without limitation, loss of profit or revenue. THIS LIMITED WARRANTY IS THE BUYER'S EXCLUSIVE REMEDY AND THE SELLER HEREBY EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

The foregoing shall constitute the sole remedy of the buyer and the sole liability of the seller. This Limited Warranty shall not apply to any product or component thereof which has been repaired or altered by anyone other than the seller's authorized personnel in any manner so as, in the seller's sole judgment, to affect its serviceability, or to any product that has been subject to alteration, accident, misuse, abuse, neglect or normal wear. This Limited Warranty shall not apply to products which have been assembled or installed or used in a manner contrary to the seller's printed instructions, or due to failure to follow the seller's printed instructions for operation and maintenance. Any technical assistance provided by the seller's personnel or representatives in system design is construed to be a proposal and not a recommendation. The responsibility for determining feasibility rests with the user and should be subject to test. Only the terms expressed in this Limited Warranty shall apply and no distributor, corporation or individual is authorized to amend, modify or extend this Limited Warranty in any way on resale.



## 4. CE DECLARATION OF CONFORMITY

This document relates to the SCF C900-D-AS range of control panels.

The SCF C900-D-AS control panel is used to automate the process of managing fire-fighting installations in accordance with the standards:

Standard:	AS 2941 regulation 2013
Standard:	AS/NZS 3000:2018 Standard
Standard:	EN 61439-1 Low-voltage switchgear

The assembly instructions and the description of qualities and operation refer only to the standard SCF C900-D-AS range of control panels. The different variants that may be developed in response to the particular requirements of different installations or maintenance work are therefore not mentioned.

This product must be installed and handled by sufficiently qualified personnel (according to EN-50-110-1).



SVE Corp. hereby declares under its own responsibility that the product SCF C900-D-AS is in compliance with the directives:

- Electromagnetic Compatibility Directive EC: 2014/30/EU
- Low Voltage Equipment Directive 2014/35/EU
- Machinery Directive 2006/42/EC

### Standards applied in particular:

- UNE EN 61000-6-3:2007 + A1:2012
- UNE EN 61000-3-2:2019 + A1:2021
- UNE EN 61000-3-3:2013 + A1:2013
- UNE EN 50130-4:2011 + A1:2014
- UNE EN 60529:2018 + AC2019-02
- UNE EN 60068-2-75:2014
- IEC EN 62311:2020
- EN 300 328 v2.1.1+ EN 300 328 v2.2.2
- IEC 61010-1:2010+CORR.1:2011+A1:2016 / EN 61010-1:2010 + A1:2018 / UNE EN 61010-1:2011 + A1:2020 /
- RoHS 211/65/UE
- A2P T1-1: 2020 - 5.2.1
- FM 1321/1323: 2018 - 5.

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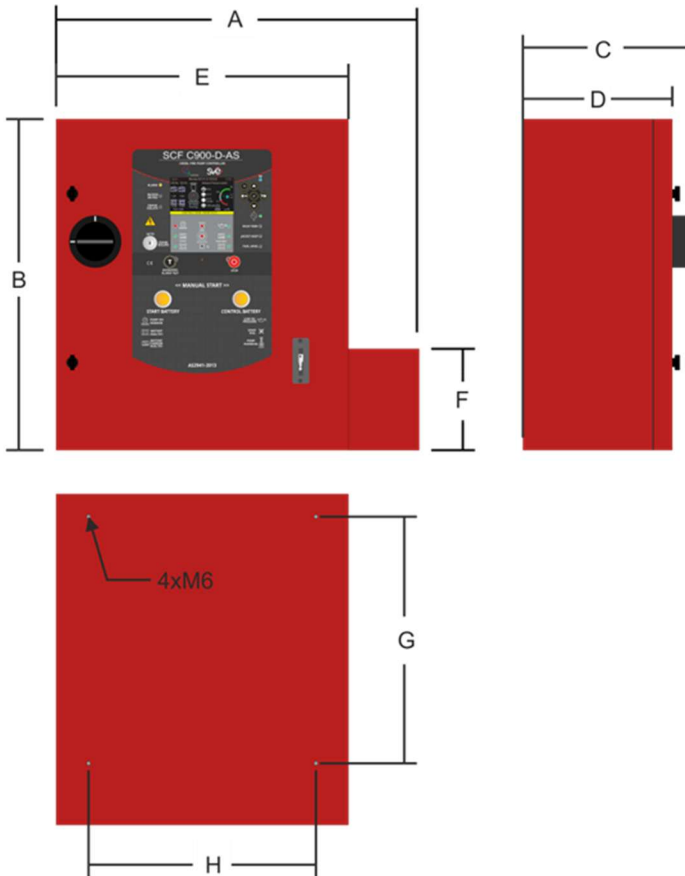


## 5. COMPONENTS, CONNECTIONS AND INSTALLATION

### 5.1. WEIGHT, DIMENSIONS AND FIXINGS

The SCF C900-D-AS control panel should be located as close as possible to the motor it controls and should be within the field of view of the user located near the motor; it is designed for either wall or metal bracket installation.

#### DIMENSIONS



#### DIMENSIONS (mm) and Weight

N°	CONTROL PANEL	A	B	C	D	E	F	G	H	Weight
T1	SCF C900-D-AS12030/ 12070 /12100/ 24050	490	510	270	230	450	140	380	350	21Kg



## 5.2. COMPOSITION OF THE CONTROL PANEL SCF C900-D-AS

The list of components that make up the SCF C900-D-AS control panel is as follows

N°	CONTROL PANEL	NOMINATIVE	QUANTITY
01	Enclosure SCF-900-D-AS	ENV1	1
02	SCA-B Battery Chargers	CA1, CA2	2
03	Disconnecter Switch (230 VAC)	S1	1
04	Circuit breaker	Q1	1
05	1609-SCF_C900-D_IO	TE1	1
06	1613-SCF_C900-D_HMI	TE2	1
07	Shunt resistor	R1	1
08	Ambient temperature transducer	B1	1
09	Push buttons	PU1. PU2	2
10	Start solenoids (Levers)	JA, KB	2
11	Mode selector Key (2 positions)	LL1	1



### 5.3. CONTROL PANEL TERMINALS SCF C900-D-AS

All electrical connections must comply with national and local electrical codes and standards.

For control wiring, use 1.5mm<sup>2</sup> cross-section cable.

For the power supply, it is advisable to use cables with a minimum cross-section of 2,5 mm

Battery cables R6, R8, R11, R11. A return cable must be installed for each battery. Cross-section of each cable according to the distance between the control panel and the batteries:

- o 3 m: 6 mm<sup>2</sup> (8 AWG) (1.2 Nm)
- o 10 m: 2 x 10 mm<sup>2</sup> (2x7 AWG) (1.2 Nm)

#### 5.3.1. TERMINALS ON CONTROL PANEL BOARD SCF C900-D-AS

N°	DENOMINATION		CONCEPT				
S1-T1	POWER AC PHASE (230 Vac)		AC power input				
S1-T2	POWER AC NEUTRAL (230 Vac)		AC power input				
N°	DENOMINATION		CONCEPT	TYPE	SIGNAL/POT	TENSION	LONG.
R1	OUT	O-FUEL SOLENOID VALVE	Solenoid or fuel valve	Relay	Max.10 A.	8-35Vdc	< 3m
R2	IN	I-CRANKING MOTOR VOLTAGE.	Voltage at cranking engine	Input	Signal	+ battery	< 3m
R3	IN	I-CONFIGURABLE INPUT R3	Input with configurable function	Input	Signal	+ battery	< 3m
R4	IN	I-LOW OIL PRESSURE CONTACT	Contact Low oil pressure	Input	Signal	- battery	< 3m
R5	IN	I-HIGH ENGINE TEMPERATURE CONTACT	Contact High coolant water temperature	Input	Signal	- battery	< 3m
R6	IN	I-BATTERY START (+)	Positive battery terminal A	Feeding	Max.25A	8-35Vdc	
R8	IN	I-BATTERY CONTROL (+)	Positive battery terminal B	Feeding	Max.25A	8-35Vdc	
R9	OUT	O-CRANCKING START	Battery start A	Relay	Max.10A	8-35Vdc	< 3m
R10	OUT	O-CRANCKING CONTROL	Battery start B	Relay	Max.10A	8-35Vdc	< 3m
R11	IN	I-BATTERY START (-)	Negative battery terminal A	Feeding		- battery	
R11	IN	I-BATTERY CONTROL (-)	Negative battery terminal B	Feeding		- battery	
R12	OUT	O-STOP FUEL SOLENOID	Fuel cut-off	Relay	Max.10A. 2,5s:50A	8-35Vdc	< 3m
N°	DENOMINATION		CONCEPT	TYPE	SIGNAL/POT	TENSION	LONG.
Q1	OUT	O-AUX ALTERNATOR PRIMMING	Auxiliary alternator priming Auxiliary	Transistor	**	8-35Vdc	< 3m
Q2	OUT	O-CONFIGURABLE OUTPUT Q2	Output with configurable function	Transistor	Max. 0,7A.	8-35Vdc	< 3m
Q3	OUT	O-CONFIGURABLE OUTPUT Q3	Output with configurable function	Transistor	Max. 0,7A.	8-35Vdc	< 3m
Q4	OUT	O-CONFIGURABLE OUTPUT Q4	Output with configurable function	Transistor	Max. 0,7A.	8-35Vdc	< 3m
Q5	<b>NO USE-DO NOT CONNECT</b>						
N°	DENOMINATION		CONCEPT	TYPE	SIGNAL/POT	TENSION	LONG.
Y1	OUT	O-PICKUP (+)	Speed sensor power supply	Output	Signal <100mA	8-35 V DC	< 3m
Y2	IN	I-PICKUP/W (rpm)	Speed sensor pick-up	Input	Signal	8-35 V DC	< 3m
Y3	IN	PICKUP SHIELD-GND	Speed sensor display	GND-Reference			
N°	DENOMINATION		CONCEPT	TYPE	SIGNAL/POT	TENSION	LONG.
D1	IN	I-LOW FUEL LEVEL	Low fuel contact	Input	Signal	(-)Vbat.	< 3m
D2	IN	I-CONFIGURABLE INPUT D2	Input with configurable function	Input	Signal	(-)Vbat.	< 3m
D3	IN	I-LOW ENGINE TEMPERATURE CONTACT	Motor low temperature contact	Input	Signal	(-)Vbat.	< 3m
D4	IN	I-CONFIGURABLE INPUT D4	Input with configurable function	Input	Signal	(-)Vbat.	< 3m



D5	IN	I-CONFIGURABLE INPUT D5	Input with configurable function	Input	Signal	(-)Vbat.	< 3m
D6	IN	I-CONFIGURABLE INPUT D6	Input with configurable function	Input	Signal	(-)Vbat.	< 3m
D7	IN	I-CONFIGURABLE INPUT D7	Input with configurable function	Input	Signal	(-)Vbat.	< 3m
D8	IN	I-CONFIGURABLE INPUT D8	Input with configurable function	Input	Signal	(-)Vbat.	< 3m
N°	DENOMINATION		CONCEPT	TYPE	SIGNAL/POT	TENSION	LONG.
P1	IN	I-PUMP DEMAND PRESSURE SWITCH	System pressure switch	Input	Signal	8-35Vdc	< 3m
P1-	O-REF. COMMON (-)			Output Reference			
P2	IN	I-REMOTE STOP	Contact remote stop	Input	Signal	(-)Vbat.	< 3m
P2-	O-REF. COMMON (-)			Output Reference			
P3	IN	I-REMOTE START	Contact remote start	Input	Signal	(-)Vbat.	< 3m
P3-	O-REF. COMMON (-)			Output Reference			
P4	IN	I-PUMP DISCHARGE PRESSURE	Contact pump discharge pressure	Input	Signal	(-)Vbat.	< 3m
P4-	O-REF. COMMON (-)						
P5	IN	I-CONFIGURABLE INPUT P5	Input with configurable function	Input	Signal	(-)Vbat.	< 3m
P5-	O-REF. COMMON (-)						
N°	DENOMINATION		CONCEPT	TYPE	SIGNAL/POT	TENSION	LONG.
T1	IN	I-CONFIGURABLE INPUT T1	Input with configurable function	Input	Signal	8-35Vdc	< 3m
T1-	O-REF. COMMON (-)			Output Reference			
T2	IN	I-CONFIGURABLE INPUT T2	Input with configurable function	Input	Signal	8-35Vdc	< 3m
T2-	O-REF. COMMON (-)			Output Reference			
T3	IN	I-CONFIGURABLE INPUT T3	Input with configurable function	Input	Signal	8-35Vdc	< 3m
T3-	O-REF. COMMON (-)			Output Reference			
N°	DENOMINATION		CONCEPT	TYPE	VALUE	LONG.	
W1	IN	I-ENGINE-OIL TEMPERATURE TRANSDUCER	Engine temperature transducer (oil)	Analogue input	Variable resistance	< 3m	
W1+	NO USE-DO NOT CONNECT						
W2	IN	I-PUMP DEMAND PRESSURE TRANSDUCER	Pressure transducer system	Analogue input	Variable resistance	< 3m	
W2+	OUT	O- TRANSDUCER POWER SUPPLY		Power supply 4-20mA	12Vdc	< 3m	
W3	IN	I-PUMP FLOW TRANSDUCER	Pump Flow transducer	Analogue input	Variable resistance	< 3m	
W3+	OUT	O- TRANSDUCER POWER SUPPLY		Power supply 4-20mA	12Vdc	< 3m	
W4	IN	I-OPTIONAL TRANSDUCER	Optional transducer	Analogue input	Variable resistance	< 3m	
W4+	OUT	O- TRANSDUCER POWER SUPPLY		Power supply 4-20mA	12Vdc	< 3m	
W5	IN	I-AMBIENT TEMPERATURE TRANSDUCER	Pump room temperature transducer	Analogue input	Variable resistance	< 3m	
W5+	NO USE-DO NOT CONNECT						
N°	DENOMINATION		CONCEPT	TYPE	VALUE	LONG.	
X1	IN	I-ENGINE-COOLANT WATER TEMPERATURE TRANSDUCER	Motor temperature transducer (water)	Analogue input	Variable resistance	< 3m	
X1+	NO USE-DO NOT CONNECT						
X2	IN	I-OIL PRESSURE TRANSDUCER	Engine oil pressure transducer	Analogue input	Variable resistance	< 3m	
X2+	NO USE-DO NOT CONNECT						
X3	IN	I-FUEL LEVEL TRANSDUCER	Fuel level transducer	Analogue input	Current 4-20mA	< 3m	
X3+	NO USE-DO NOT CONNECT						

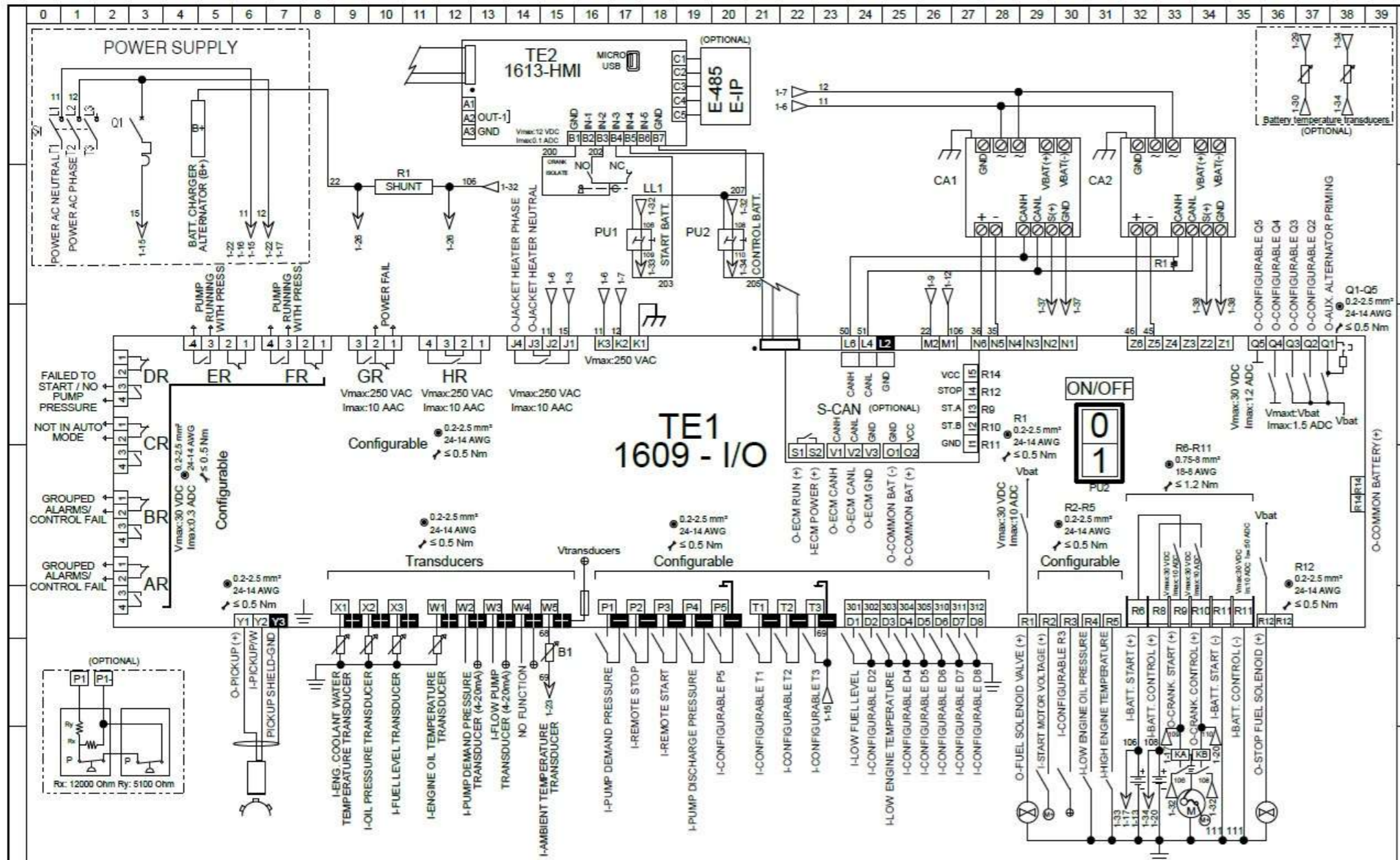


N°	DENOMINATION		CONCEPT	TYPE	POWER	TENSION	LONG.
J1	IN	I-JACKET HEATER PHASE	Phase 230Vac Heating resistor	Relay-Output	< 10 A	< 250Vac	< 3m
J2	IN	NEUTRAL	Neutral 230Vac	Input	< 10 A	< 250Vac	< 3m
J3	OUT	NEUTRAL	Neutral 230Vac	Output	< 10 A	< 250Vac	< 3m
J4	OUT	O-JACKET HEATER PHASE	Phase 230Vac Heating resistor	Relay-input	< 10 A	< 250Vac	< 3m
N°	DENOMINATION		CONCEPT	TYPE	POWER	TENSION	
AR1	IN	NC	O-RELAY-A: GROUPED ALARMS / CONTROL FAIL	Grouped alarms / Control system failure	Output: Relay	< 0,3A	< 30Vdc
AR2	OUT	NC					
AR3	IN	NO					
AR4	OUT	NO					
BR1	IN	NC	O-RELAY-B: GROUPED ALARMS / CONTROL FAIL	Grouped alarms / Control system failure	Output: Relay	< 0,3A	< 30Vdc
BR2	OUT	NC					
BR3	IN	NO					
BR4	OUT	NO					
CR1	IN	NC	O-RELAY-C: NOT IN AUTO MODE	Control panel not in AUTO mode	Output: Relay	< 0,3A	< 30Vdc
CR2	OUT	NC					
CR3	IN	NO					
CR4	OUT	NO					
DR1	IN	NC	O-RELAY-D: FAILED TO START	Pump failed to start	Output: Relay	< 0,3A	< 30Vdc
DR2	OUT	NC					
DR3	IN	NO					
DR4	OUT	NO					
ER1	IN	NC	O-RELAY-E: PUMP RUNNING WITH PRESSURE	Pump in pressure operation	Output: Relay	< 0,3A	< 30Vdc
ER2	OUT	NC					
ER3	IN	NO					
ER4	OUT	NO					
FR1	IN	NC	O-RELAY-F: PUMP RUNNING WITH PRESSURE	Pump in pressure operation	Output: Relay	< 0,3A	< 30Vdc
FR2	OUT	NC					
FR3	IN	NO					
FR4	OUT	NO					
GR1	IN	NC	O-RELAY-G: POWER FAIL	Mains power failure	Output: Relay	< 10A	< 270Vac
GR2	OUT	COM					
GR3	IN	NO					

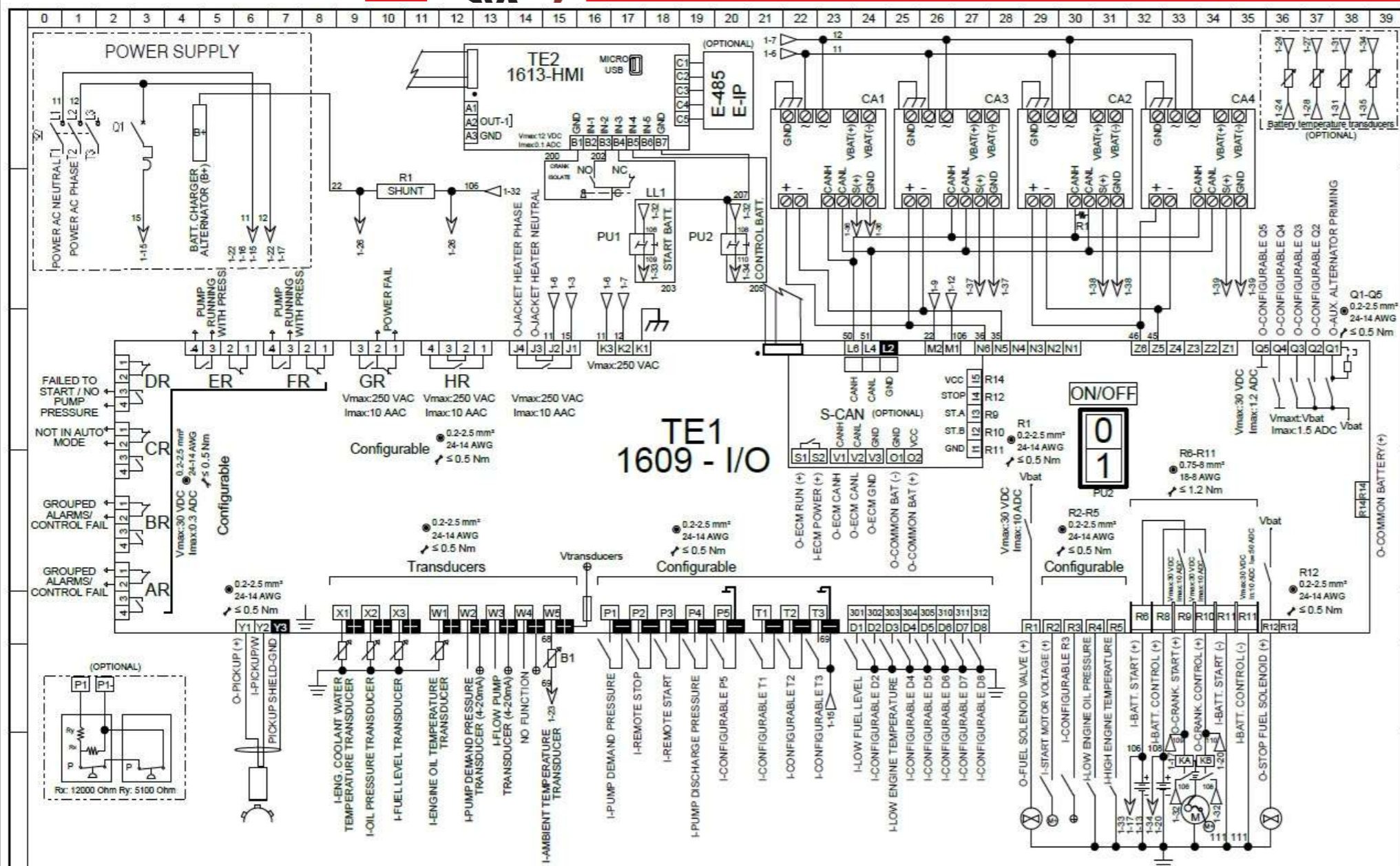
\*\* A jumper allows you to select whether the output is direct (Maximum 1 amp) or passes through a 47 Ohm resistor. The latter is useful for use as a battery charging alternator choke.

5.3.2. INTERNAL LAYOUT AND EXTERNAL CONNECTIONS

Nº SCF C900-D-AS SCHEME WITH BATTERY CHARGERS 12 VDC: 10A or 24 VDC: 5A



Page Created 12/03/2025	Drawn Checked	23/09/25 24/09/25	Responsible Responsible	ARG ISG		<p>CONNECTION SCHEME SCF C900-D-12100-AS-EN</p>	Page 1
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Version V1.0	Modified	Date	Responsible	Name

SVE Corp

CONNECTION SCHEME  
SCF C900-D-24100-AS-EN

Page  
1



## 5.4. ELECTRICAL CONNECTIONS

All electrical connections must comply with national and local electrical codes and standards.

The SCF C900-D-AS control panel offers IP65 protection but should always be located or protected so that it is not damaged by water escaping from pumps or pump connections.

### 5.4.1. WIRING CONNECTIONS

All cables used for connection on the control panel SCF C900-D-AS shall comply with a flammability rating of VW-1 and be halogen-free.

The following are the recommended conditions for both the pump-motor unit manufacturer and the fire-fighting system installer.

#### 5.4.1.1. CABLE SECTION AND TYPES

All cables used for connection to the SCF C900-D-AS control panel must comply with flammability rating VW-1 and be halogen-free.

Only copper conductors should be used.

All wiring between the controller and the diesel engine must be braided.

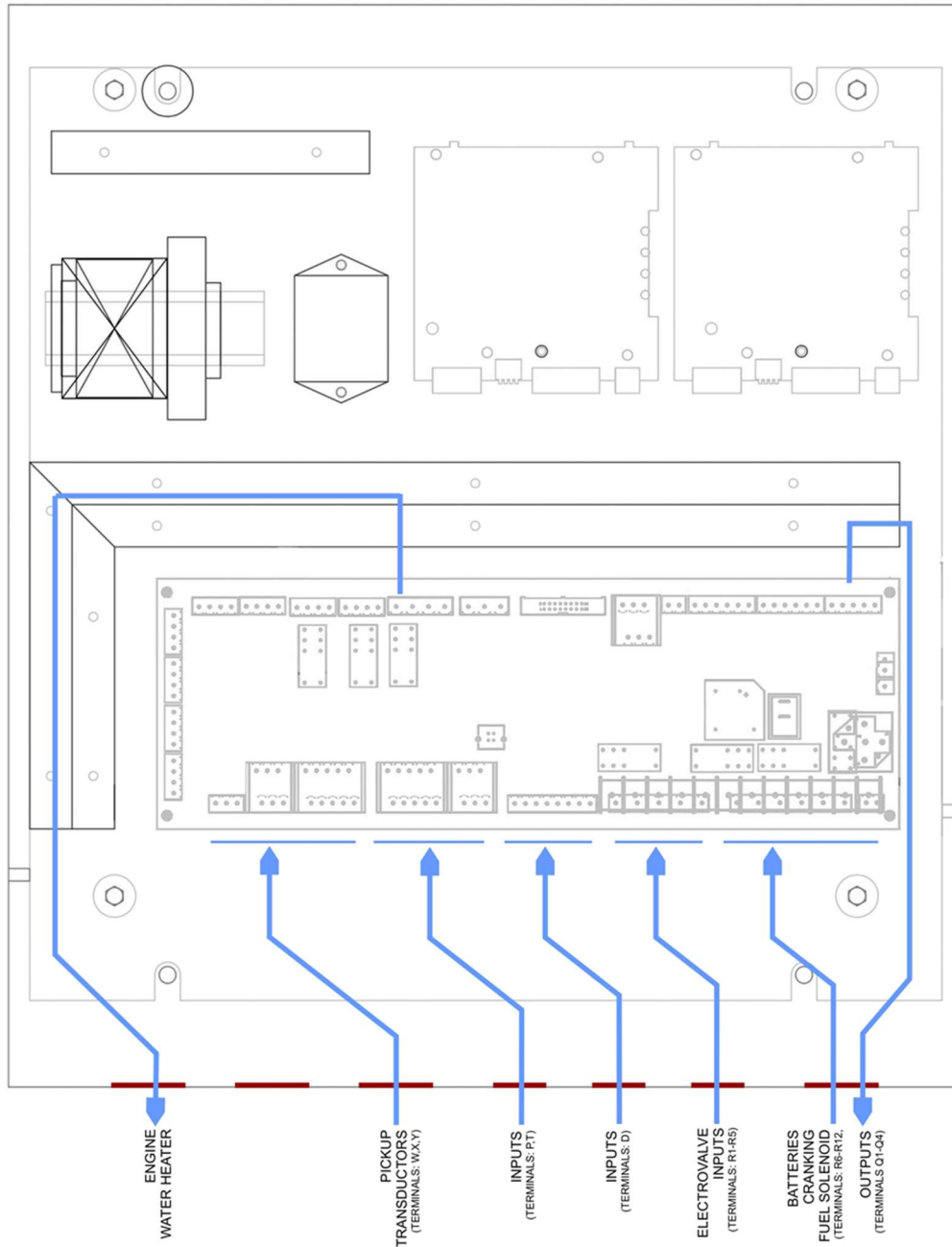
No	TERMINALS	CABLE TYPE	
0	AR – HR outputs	0.2 - 2.5 mm <sup>2</sup> (24-14AWG) (0.5 Nm)	
02	Q1 – Q5 outputs	0.2 - 2.5 mm <sup>2</sup> (24-14AWG) (0.5 Nm)	
0	Outputs R1-R12	2.5 mm <sup>2</sup> (14 AWG) (0.5 Nm)	
0	Inputs Y1-Y3	0.2 - 2.5 mm <sup>2</sup> (24-14 AWG) (0.5 Nm)	
0	Inputs X1-X3	0.2 - 2.5 mm <sup>2</sup> (24-14 AWG) (0.5 Nm)	
0	Inputs W1-W5	0.2 - 2.5 mm <sup>2</sup> (24-14 AWG) (0.5 Nm)	
07	Inputs P1-P5	0.2 - 2.5 mm <sup>2</sup> (24-14 AWG) (0.5 Nm)	
0	Inputs T1-T5	0.2 - 2.5 mm <sup>2</sup> (24-14 AWG) (0.5 Nm)	
09	Inputs D1-D8	0.2 - 2.5 mm <sup>2</sup> (24-14 AWG) (0.5 Nm)	
10	Inputs R2-R5	0.2 - 2.5 mm <sup>2</sup> (24-14 AWG) (0.5 Nm)	
11	Battery cables R6, R8, R11, R11	Depending on distance to batteries	< 3m: 6 mm <sup>2</sup> (10 AWG) (1.2 Nm)
			< 10 m: 2 x 10 mm <sup>2</sup> (2x8 AWG) (1.2 Nm)



### 5.4.1.2. PROPOSED CONNECTIONS FOR THE PUMP UNIT MANUFACTURER

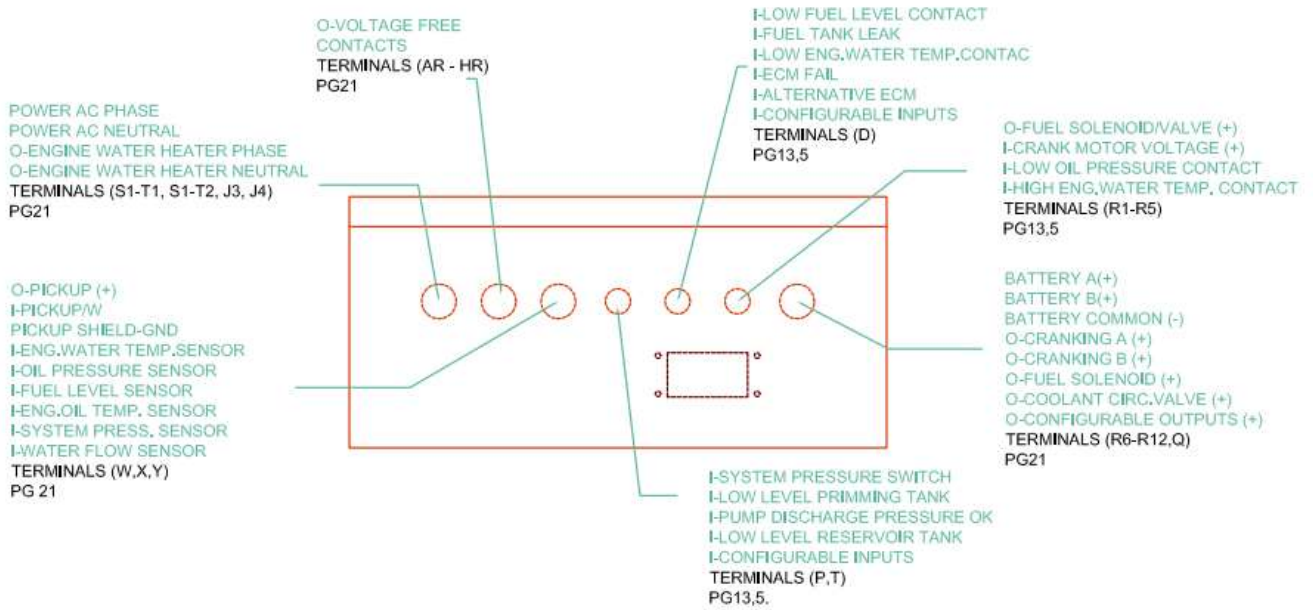
The following is the recommended organisation of the connection between the SCF C900-D-AS control panel and the motor pump assembly

The technical person in charge of the installation of the connecting cable hoses shall provide suitable means to continue to maintain the IP65 degree of protection of the assembly.

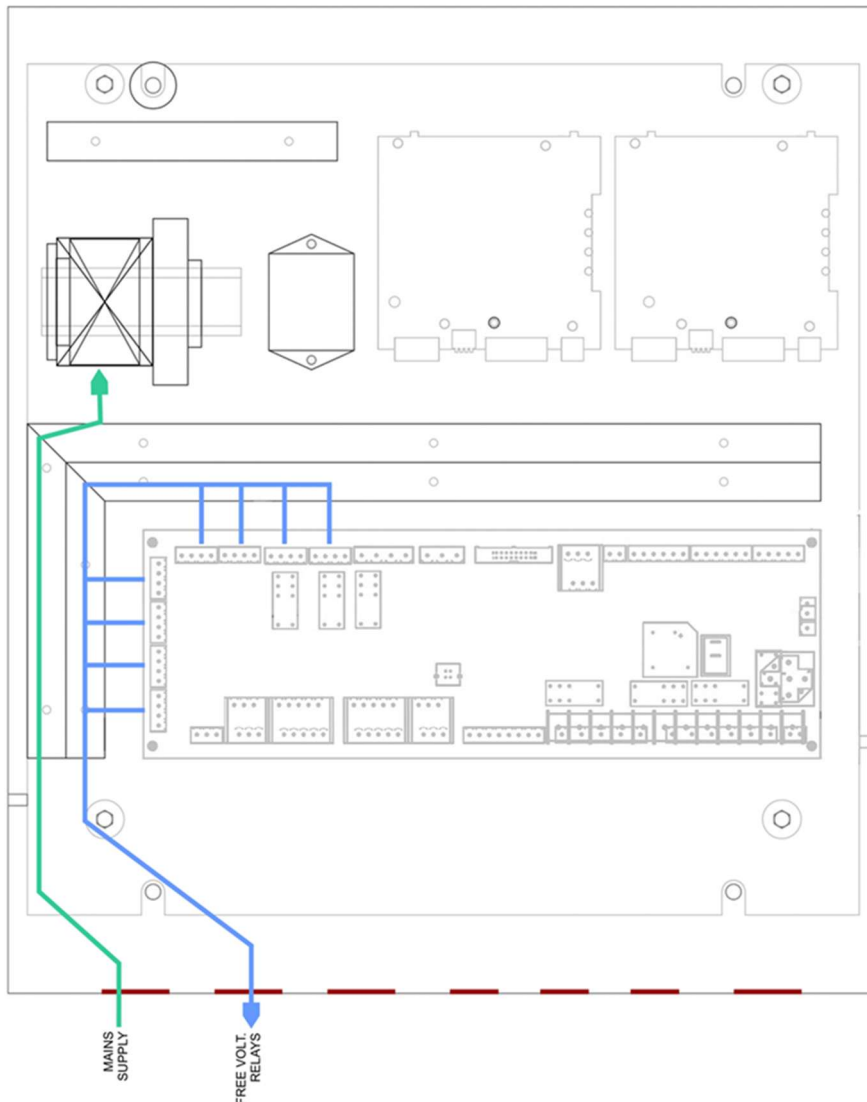




### 5.4.1.3. PROPOSAL FOR THE ORGANISATION OF CABLE HOSES

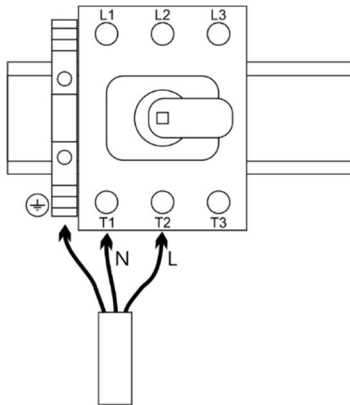


### 5.4.1.4. MOTOR PUMP ASSEMBLY INSTALLER CONNECTIONS





### 5.4.1.5. MAINS POWER SUPPLY CONNECTION



Mains cable cross-section for power consumption up to 15A: 2.5mm<sup>2</sup> Must be made via a permanent connection.

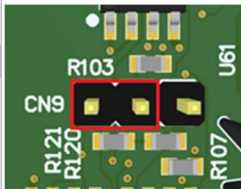
### 5.4.2. BATTERIES VIA 4 WIRES

In order to improve battery life and the accuracy and charging algorithm of the batteries, so that the battery charger always has accurate data on the voltage at the battery terminals, especially when the charging process is in stage 1 or stage 2 of charging. The SCA-B series battery chargers offer an extra connection (to be made outside the IO card) to the batteries, using 4 connection wires.

#### CONNECTION OF 2 CHARGERS WITH 4-WIRE BATTERIES

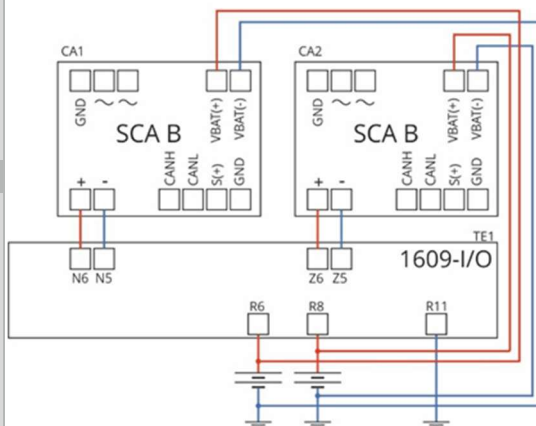
Placement of selector jumper

01



Cable connection outside the IO card

02

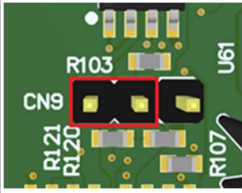




CONNECTION OF 4 CHARGERS WITH 4-WIRE BATTERIES

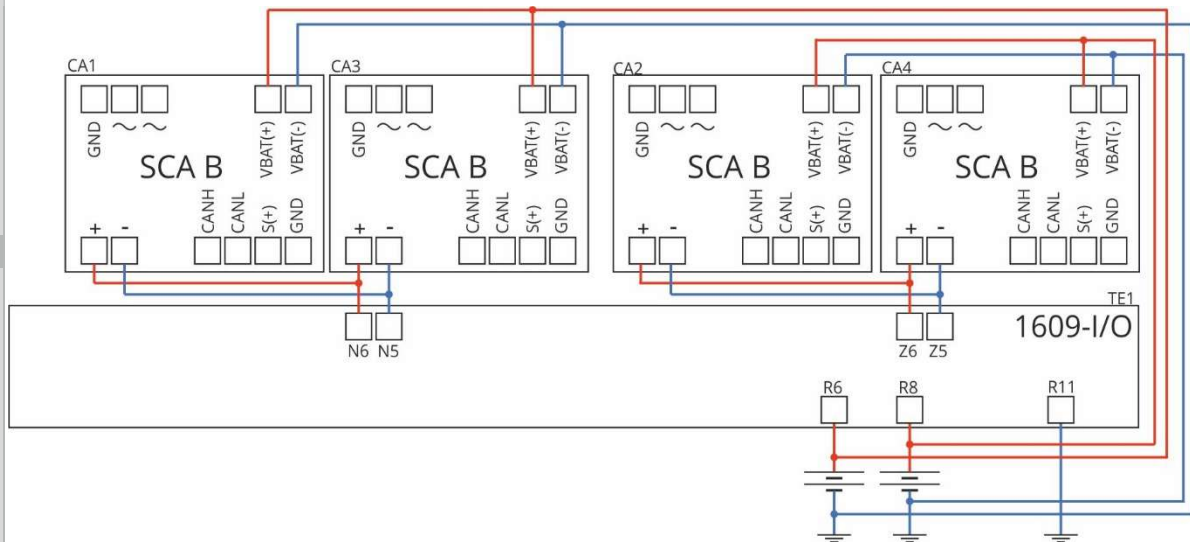
Placement of selector jumper

01



Cable connection outside the IO card

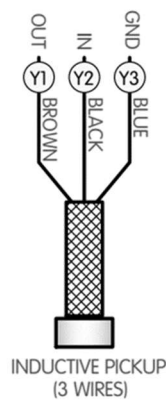
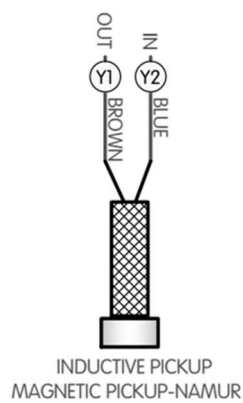
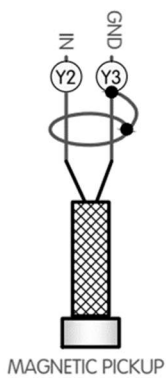
02



### 5.4.3. RPM SENSORS (PICK-UP)

The SCF C900-D-AS control panel accepts three types of Pick Up. The connections required in each situation are shown below:

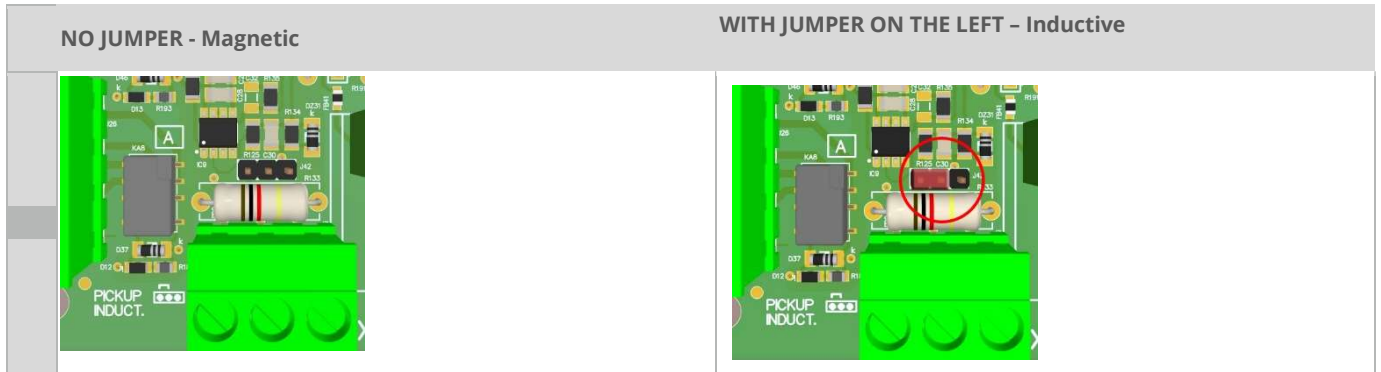
EED SENSORS RPM





The IO board has a jumper (J42) to select the type of pickup to be connected (magnetic or inductive).

The picture shows the position in the case of an inductive pickup: Jumper on the left.



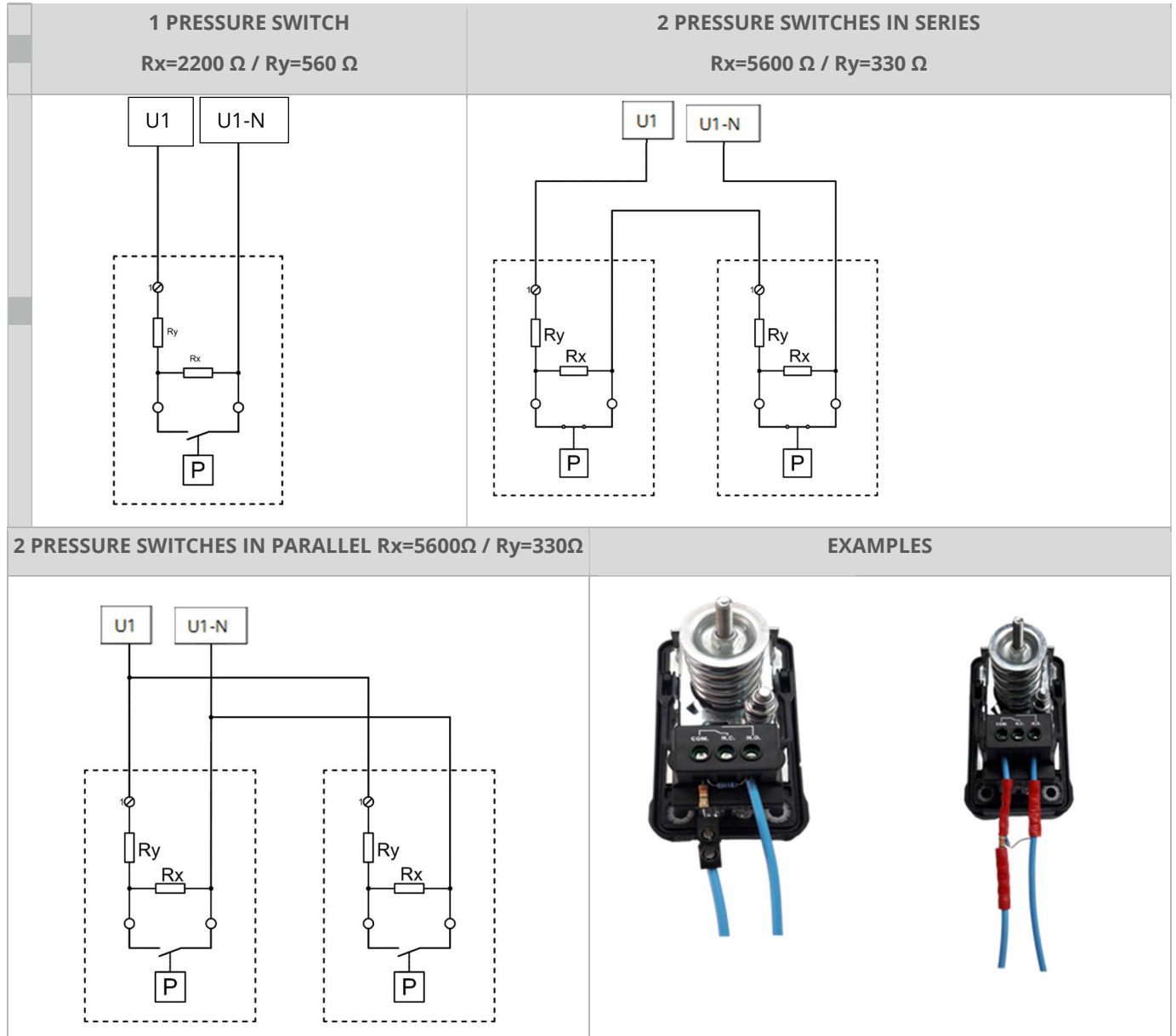


### 5.4.4. SHORT-CIRCUIT AND OPEN-CIRCUIT DETECTION ON PRESSURE SWITCHES

The SCF C900-D-AS control panel offers a very valuable security regarding the state (correct / short circuit / open circuit) of the system pressure switch line, necessary for the transmission of the activation demand to the motor pump. It will be necessary to set the parameter **C4.2** PRESSURE DEMAND SWITCH SYSTEM SHORT / OPEN as Yes.

The associated alarms are as follows: **AL33** PUMP DEMAND PRESSURE SWITCH SYSTEM SHORT CIRCUIT and **AL34** PUMP DEMAND PRESSURE SWITCH SYSTEM OPEN CIRCUIT.

Two resistors must be connected to the pressure switch(es) according to the following diagram:



The scheme is identical for one pressure switch or two pressure switches, either in parallel (closed contact with low pressure) or in series (open contact with low pressure).


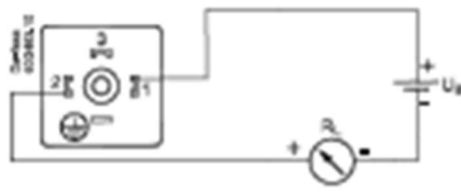
If these resistors are connected to the pressure switches, the SCF C900-D-AS control panel will still detect correctly the actuation of the pressure switches even if the configuration parameter **C4.2** PRESSURE SWITCH SYSTEM SHORT / OPEN is set without detection of SC (Short Circuit) and OC (Open Circuit).



### 5.4.5. PRESSURE SENSOR CONNECTION

The SCF C900-D-AS control panel can collect information from pressure transmitters with 4-20mA signal.


The connections of the above elements to the terminals of the control panel SCF C900-D-AS are shown below:

N°		PRESSURE SENSOR CONNECTIONS	
	 		
SYSTEM PRESSURE	Terminals	<b>W2</b> SYSTEM PRESSURE TRANSDUCER <b>W2+</b> TRANSDUCER POWER SUPPLY	
	Configuration parameters	<b>C6.1</b> ENABLE SYSTEM PRESSURE TRANSDUCER <b>C6.2</b> SCALE SYSTEM PRESSURE TRANSDUCER	

### 5.4.6. FLOWMETER CONNECTIONS

The SCF C900-D-AS control panel can collect information from a flow meter with 4-20mA signal, or a water meter with pulse outputs that the SCF C900-D-AS control panel itself will convert into a flow meter.

The connections of the above elements to the terminals of the control panel SCF C900-D-AS are shown below:

N°		FLOWMETER CONNECTIONS	
01	FLOW METER 4-20 mA 	Terminals: Configuration parameters	<b>W3</b> WATER FLOW TRANSDUCER <b>W3+</b> TRANSDUCER POWER SUPPLY <b>C6.3</b> ENABLE FLOW SENSOR <b>C6.4</b> SCALE PUMP FLOW SENSOR



## 6. ELEMENTS OF COMMAND AND REPRESENTATION

The SCF C900-D-AS control panel has a series of elements, isolator switch, pilot lights, push buttons and display, which facilitate the control of the motor pumps and make it possible to visualise their status and operating parameters.

### 6.1. ISOLATOR: S1

	<p>Allows the AC power supply to the controller to be disconnected, to facilitate installation and maintenance work.</p>
--	--

### 6.2. BUZZER: H1

<p>Capability: 75dB measured at 1m</p>	<p><b>ACTIVATION</b></p>	<p><b>DEACTIVATION</b></p>
	<p>Detection of an Alarm Pump start demand Pump in pressurised operation</p>	
	<p>Muted when the button  is pressed for 5s. Reactivates when the button is pressed again for 5s.</p>	

### 6.3. OPERATING MODE SELECTOR KEY

	<p>There is a key switch on the front of the control panel to select the AUTOMATIC mode of operation, or the CRANK ISOLATE mode.</p> <p>The key can only be removed in AUTO mode.</p>
--	---




### 6.4. EMERGENCY SELECTOR KEY

	<p>Secured by a breakable plastic protection. To be used only in an emergency situation and in the absence of the usual selector key.</p>
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## 6.5. PUSH BUTTONS





### 6.5.1. START AND STOP PUSH BUTTONS

 <b>START BATTERY</b>	Emergency start push button with START BATTERY
 <b>CONTROL BATTERY</b>	Emergency start push button with CONTROL BATTERY
 <b>STOP</b>	The STOP push button stops the pump whenever if there is no demand from the system.


### 6.5.2. OVERSPEED ALARM TEST

 <b>OVERSPEED ALARM TEST</b>	When the engine is running, if this button is pressed at least during 2s the overspeed alarm will be generated
--	--

### 6.5.3. MANAGEMENT BUTTONS OF DISPLAY

	<ul style="list-style-type: none"> <li>○ Menu and screen navigation</li> <li>○ Modification of values</li> </ul>
	<ul style="list-style-type: none"> <li>○ Exit</li> <li>○ Cancel</li> </ul>
	<ul style="list-style-type: none"> <li>○ Select</li> <li>○ Accept</li> </ul>
	<ul style="list-style-type: none"> <li>○ Menu entry from main screen</li> </ul>

### 6.5.4. LAMP AND BUZZER TEST









	<p>Allows simultaneous illumination of all control panel lamps.</p> <p>Lights up white</p>
---	--



## 6.6. LAMPS






















### 6.6.1. GREEN LAMPS

Indicate correct states of various systems

  A	The corresponding charger is working properly
 	SCF C900-D-AS receives correct power supply voltage.
 	Correct DC supply voltage at the corresponding battery
 	After some time with the engine running, the oil pressure, coolant water temperature and pump discharge pressure are checked.

### 6.6.2. RED LAMPS

Indicate correct states of various systems

<b>ALARM</b> 	Grouped alarms	 	Low oil pressure
<b>BUZZER MUTED</b> 	Buzzer muted. Press  for 5s	 	Low or high battery voltage
<b>CRANK ISOLATE</b> 	Crank Isolate	 	Engine failed to start
<b>HIGH TEMP.</b> 	Engine high temperature	 	Battery charger fail
<b>JACKET HEAT</b> 	Jacket high temperature	 	Engine Overspeed alarm
<b>FUEL LEVEL</b> 	Low fuel lever	 OVERSPEED ALARM TEST	
 	Mains power failure alarm		It detects that the pump is running and generates pressure.



### 6.6.3. OTHER LIGHTS

Highlight the correct status of different system elements.

	Start up demand
	Wifi generated by the SCF C900-D-AS control panel in operation
	The SCF C900-D-AS control panel requires the STOP button to be pressed.
	Over speed test available. Ready to be pressed.

## 6.7. DISPLAY

The SCF C900-D-AS control panel has a 3.5" TFT display that provides the most suitable human-machine interface function. The display will remain on under the following conditions:

- If the pump is running
- For 3 minutes after any key is pressed
- For 3 min after the occurrence of a new alarm

The most representative screens that make up the man-machine communication system in the SCF C900-D-AS control panel are shown below.

### 6.7.1. MAIN SYSTEM SCREEN

	<p>Top bar:</p> <ul style="list-style-type: none"> <li>• Mode of operation of the control panel</li> <li>• Date and time: Day week YYYY/MM/DD hh:mm:ss</li> <li>• Ambient temperature recorded in the pump room</li> </ul>
	<p>Battery zone:</p> <ul style="list-style-type: none"> <li>• Mains voltage and frequency.</li> <li>• Voltage at charger output</li> <li>• Condition of battery chargers.</li> <li>• Charger failure (yellow icon)</li> <li>• States: TEST / EQUALIZATION</li> <li>• Battery voltage START / CONTROL instantaneous.</li> <li>• Instantaneous START/CONTROL load current.</li> <li>• Batteries charge alternator load current</li> <li>• Hours until next battery equalisation.</li> <li>• State of the batteries</li> <li>• Battery failure (yellow icon)</li> </ul>
	<p>Pump zone:</p> <ul style="list-style-type: none"> <li>• Origin of the demand for start-up <ul style="list-style-type: none"> <li>▪ 2 System pressure transducers</li> <li>▪ 2 Pump demand pressure switches</li> <li>▪ Low priming tank level</li> <li>▪ Remote start</li> </ul> </li> <li>• Condition of the pump <ul style="list-style-type: none"> <li>▪ stop</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>▪ pause</li> <li>▪ stopping</li> <li>▪ engine running: Origin of the engine running detection</li> <li>▪ pump running generating pressure</li> <li>• Accumulated engine running hours and minutes</li> <li>• Number of starts over total number of configured starts</li> </ul>
	<p>Instruments:</p> <ul style="list-style-type: none"> <li>• Fuel Level</li> <li>• Engine coolant water temperature</li> <li>• Oil pressure</li> <li>• Engine oil temperature)</li> <li>• Engine speed</li> </ul>
	<p>Pressures:</p> <ul style="list-style-type: none"> <li>• System gauge pressure measured with transducer</li> <li>• Demand pressure value</li> <li>• End-of-demand pressure value</li> <li>• Pressure transducer full scale</li> <li>• Open / closed state of the pressure line</li> </ul>
	<p>Bottom bar:</p> <ul style="list-style-type: none"> <li>• Yellow pop-up bar indicating that an alarm is active</li> <li>• In the case of several active alarms, they shall be displayed alternately with 1s intervals between them.</li> </ul>

### 6.7.2. MAIN MENU

	Access	From the MAIN SCREEN by pressing any of the following push-buttons:
	Icons	<ul style="list-style-type: none"> <li>• Latest alarms</li> <li>• Registers</li> <li>• Maintenance</li> <li>• Configuration</li> <li>• Wifi</li> </ul>

### 6.7.3. LATEST ALARMS

	Access	
	<p>This screen shows a list of the last alarms that have occurred. Alarms may be reset by pressing the "horn off" key on this screen as on the main screen.</p>	



### 6.7.4. EVENTS LOG

<p style="text-align: center; margin: 0;">REGISTERS</p> <p style="margin: 5px 0;">EVENTS LOGS</p> <p style="margin: 5px 0;">PRESSURES HISTORY LOGS</p> <p style="margin: 5px 0;">PUMP PERFORMANCE TEST LOGS</p> <p style="margin: 5px 0;">STATISTICS</p> <p style="margin: 5px 0;">WEEKLY TEST LOGS</p>	<p>Access </p>
	<p>This screen shows, in different sections, all the information registered and gives access to the corresponding document downloads.</p>

<p style="text-align: center; margin: 0;">EVENTS LOGS <span style="float: right;">1/25</span></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">DATE</th> <th style="text-align: left;">TIME</th> <th></th> </tr> </thead> <tbody> <tr><td>2021.01.25</td><td>10:33:25</td><td>AL62-FAILED TO START ENGINE</td></tr> <tr><td>2021.01.25</td><td>10:32:05</td><td>AL07-LOW VOLTAGE BATTERY B</td></tr> <tr><td>2021.01.25</td><td>10:32:01</td><td>AL30-FAIL DISCHARGE PRESS PUMP</td></tr> <tr><td>2021.01.25</td><td>10:31:05</td><td>AL57-OVERSPEED</td></tr> <tr><td>2021.01.25</td><td>10:30:12</td><td>AL54-LOW LEVEL FUEL</td></tr> <tr><td>2021.01.25</td><td>10:29:23</td><td>R-AL58-LOW PRESSURE ENGINE OIL</td></tr> <tr><td>2021.01.25</td><td>10:28:45</td><td>AL58-LOW PRESSURE ENGINE OIL</td></tr> <tr><td>2021.01.25</td><td>10:27:59</td><td>LOW LEVEL PRIMING TANK CONT.:ON</td></tr> </tbody> </table>	DATE	TIME		2021.01.25	10:33:25	AL62-FAILED TO START ENGINE	2021.01.25	10:32:05	AL07-LOW VOLTAGE BATTERY B	2021.01.25	10:32:01	AL30-FAIL DISCHARGE PRESS PUMP	2021.01.25	10:31:05	AL57-OVERSPEED	2021.01.25	10:30:12	AL54-LOW LEVEL FUEL	2021.01.25	10:29:23	R-AL58-LOW PRESSURE ENGINE OIL	2021.01.25	10:28:45	AL58-LOW PRESSURE ENGINE OIL	2021.01.25	10:27:59	LOW LEVEL PRIMING TANK CONT.:ON	<p>EVENTS LOG</p> <p>The SCF C900-D-AS control panel stores the log of the last 1200 events indexed by date and time: hh:mm:ss of occurrence.</p> <p>The last 200 are displayed. All 1200 are viewable from the embedded web.</p>
DATE	TIME																											
2021.01.25	10:33:25	AL62-FAILED TO START ENGINE																										
2021.01.25	10:32:05	AL07-LOW VOLTAGE BATTERY B																										
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2021.01.25	10:29:23	R-AL58-LOW PRESSURE ENGINE OIL																										
2021.01.25	10:28:45	AL58-LOW PRESSURE ENGINE OIL																										
2021.01.25	10:27:59	LOW LEVEL PRIMING TANK CONT.:ON																										


<p style="text-align: center; margin: 0;">bar PRESSURES HISTORY LOGS <span style="float: right;">1/25</span></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">DATE</th> <th style="text-align: left;">TIME</th> <th style="text-align: left;">PRES</th> <th style="text-align: left;">START</th> <th style="text-align: left;">STOP</th> <th style="text-align: left;">DEM</th> <th style="text-align: left;">P.R.</th> </tr> </thead> <tbody> <tr><td>2021.01.25</td><td>10:33:25</td><td>15.3</td><td>08.5</td><td>08.8</td><td>N</td><td>N</td></tr> <tr><td>2021.01.25</td><td>10:32:05</td><td>15.1</td><td>08.5</td><td>08.8</td><td>N</td><td>N</td></tr> <tr><td>2021.01.25</td><td>10:32:01</td><td>14.8</td><td>08.5</td><td>08.8</td><td>N</td><td>Y</td></tr> <tr><td>2021.01.25</td><td>10:31:05</td><td>14.6</td><td>08.5</td><td>08.8</td><td>N</td><td>Y</td></tr> <tr><td>2021.01.25</td><td>10:30:12</td><td>10.3</td><td>08.5</td><td>08.8</td><td>Y</td><td>Y</td></tr> <tr><td>2021.01.25</td><td>10:29:23</td><td>08.2</td><td>08.5</td><td>08.8</td><td>Y</td><td>N</td></tr> <tr><td>2021.01.25</td><td>10:28:45</td><td>15.2</td><td>08.5</td><td>08.8</td><td>N</td><td>N</td></tr> <tr><td>2021.01.25</td><td>10:27:59</td><td>15.7</td><td>08.5</td><td>08.8</td><td>N</td><td>N</td></tr> </tbody> </table>	DATE	TIME	PRES	START	STOP	DEM	P.R.	2021.01.25	10:33:25	15.3	08.5	08.8	N	N	2021.01.25	10:32:05	15.1	08.5	08.8	N	N	2021.01.25	10:32:01	14.8	08.5	08.8	N	Y	2021.01.25	10:31:05	14.6	08.5	08.8	N	Y	2021.01.25	10:30:12	10.3	08.5	08.8	Y	Y	2021.01.25	10:29:23	08.2	08.5	08.8	Y	N	2021.01.25	10:28:45	15.2	08.5	08.8	N	N	2021.01.25	10:27:59	15.7	08.5	08.8	N	N	<p>PRESSURE RECORDING</p> <p>The SCF C900-D-AS control panel stores a record of the last 12,000 system pressure variations indexed by date and time: hh:mm:ss of occurrence.</p> <p>The last 200 are presented in display. All 12,000 can be viewed from the embedded website. In addition, the following information is presented in each line:</p> <ul style="list-style-type: none"> <li>• Pressure demand</li> <li>• End-of-demand pressure</li> <li>• Existence of start-up demand: Yes / No</li> <li>• Engine running: Yes / No</li> </ul>
DATE	TIME	PRES	START	STOP	DEM	P.R.																																																										
2021.01.25	10:33:25	15.3	08.5	08.8	N	N																																																										
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<p style="text-align: center; margin: 0;">PUMP PERFORMANCE TEST <span style="float: right;">1/50</span></p> <p style="margin: 5px 0;">ACAB 2021.01.25 10:33:25</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Pdisch.</th> <th style="text-align: left;">Psuct.</th> <th style="text-align: left;">Ppump</th> <th style="text-align: left;">Q</th> <th style="text-align: left;">rpm</th> <th style="text-align: left;">T(H2O)</th> <th style="text-align: left;">T(OIL)</th> <th style="text-align: left;">P(OIL)</th> </tr> <tr> <th style="text-align: left;">(bar)</th> <th style="text-align: left;">(bar)</th> <th style="text-align: left;">(bar)</th> <th style="text-align: left;">(m3h)</th> <th></th> <th style="text-align: left;">(°C)</th> <th style="text-align: left;">(°C)</th> <th style="text-align: left;">(bar)</th> </tr> </thead> <tbody> <tr> <td>5.6</td> <td>0.9</td> <td>4.7</td> <td>15</td> <td>3010</td> <td>35</td> <td>36</td> <td>5.3</td> </tr> <tr> <td>6.5</td> <td><u>0.8</u></td> <td>5.7</td> <td><u>16</u></td> <td>3020</td> <td>38</td> <td>39</td> <td>6.3</td> </tr> </tbody> </table> <p style="margin-top: 5px;"> <input checked="" type="checkbox"/> Save point    ▲▼ P/Q value ◀▶    ↻ Exit     </p>	Pdisch.	Psuct.	Ppump	Q	rpm	T(H2O)	T(OIL)	P(OIL)	(bar)	(bar)	(bar)	(m3h)		(°C)	(°C)	(bar)	5.6	0.9	4.7	15	3010	35	36	5.3	6.5	<u>0.8</u>	5.7	<u>16</u>	3020	38	39	6.3	<p>PUMP PERFORMANCE TEST LOGS</p> <p>The SCF C900-D-AS control panel stores up to 50 different test records. The 5 points stored for each test can be consulted.</p>
Pdisch.	Psuct.	Ppump	Q	rpm	T(H2O)	T(OIL)	P(OIL)																										
(bar)	(bar)	(bar)	(m3h)		(°C)	(°C)	(bar)																										
5.6	0.9	4.7	15	3010	35	36	5.3																										
6.5	<u>0.8</u>	5.7	<u>16</u>	3020	38	39	6.3																										



STATISTICS (HISTORICAL) 1/4	STATISTICS
<p>Commissioning date: 2022/01/01 10:25:33</p> <p>Time total pump running: 15h 25m</p> <p>Number of starts pump: 18</p> <p>Last pump start: 2022/01/15 14:23:35</p>	<p>The SCF C900-D-AS control panel stores different records useful for maintenance work on the motor-pump assembly. The information to be consulted on this screen is:</p> <ul style="list-style-type: none"> <li>• Total accumulated pump running time (hours and minutes)</li> <li>• Number of engine starts</li> <li>• Date and time of last start-up of the motor-pump assembly</li> <li>•</li> </ul>

### 6.7.5. MAINTENANCE

MAINTENANCE	Access 
<p>ABOUT...</p> <p>COMPANY AND CALENDAR</p> <p>IN-OUT TEST</p> <p>PUMP PERFORMANCE TEST.</p> <p>OVERSPEED TEST</p> <p>AUTOMATIC WEEKLY TEST PROGRAMMER</p>	<p>This screen shows the utilities focused on the technical maintenance personnel of the motor-pump assembly.</p>

COMPANY AND CALENDAR	COMPANY AND CALENDAR
<p>Svecorp</p> <p>0034943770035</p> <p>Maintenance schedule (Months): 5</p> <p>Last maintenance date: 23/02/2023</p> <p>Francisco</p> <p>Svecorp</p> <p>Next maintenance date: 23/07/2023</p> <p>Commissioning date: 10/01/2023</p>	<p>Provides details of the maintenance company, the commissioning date and the schedule of completed and future maintenance actions.</p>

IN-OUT TEST	IN-OUT TEST
<p>AUTO</p> <p>322 Ohm X1 ● ● W2 12.5mA</p> <p>--- X2 ● ● W3 ---</p> <p>--- X3 ● ● W4 4.3mA</p> <p>254 Ohm W1 ● ● W5 5689 Ohm</p>	<p>Provides information on the status and values of the digital and analogue inputs of the IO and HMI boards, as well as the status of the push buttons on the front panel of the SCF C900-D-AS control panel.</p>



<p>ACAB 2021.01.25 10:33:25</p> <table border="1"> <thead> <tr> <th>Pdisch. (bar)</th> <th>Psuct. (bar)</th> <th>Ppump (bar)</th> <th>Q (m3h)</th> <th>rpm</th> <th>T(H2O) (°C)</th> <th>T(OIL) (°C)</th> <th>P(O) (bar)</th> </tr> </thead> <tbody> <tr> <td>5.6</td> <td>0.9</td> <td>4.7</td> <td>15</td> <td>3010</td> <td>35</td> <td>36</td> <td>5.3</td> </tr> <tr> <td>6.5</td> <td>0.8</td> <td>5.7</td> <td>16</td> <td>3020</td> <td>38</td> <td>39</td> <td>6.3</td> </tr> </tbody> </table> <p>Save point P/Q value Exit</p>	Pdisch. (bar)	Psuct. (bar)	Ppump (bar)	Q (m3h)	rpm	T(H2O) (°C)	T(OIL) (°C)	P(O) (bar)	5.6	0.9	4.7	15	3010	35	36	5.3	6.5	0.8	5.7	16	3020	38	39	6.3	<p>PUMP PERFORMANCE TEST</p> <p>Provides the result of the performance tests that have been performed and recorded according to the procedure provided by the SCF C900-D-ASpanel.</p>
Pdisch. (bar)	Psuct. (bar)	Ppump (bar)	Q (m3h)	rpm	T(H2O) (°C)	T(OIL) (°C)	P(O) (bar)																		
5.6	0.9	4.7	15	3010	35	36	5.3																		
6.5	0.8	5.7	16	3020	38	39	6.3																		

<p>OVERSPEED TEST</p> <p>TEST ENABLED</p> <p>C3.3-Rated speed: 3000 rpm Overspeed limit (120%): 3600 rpm</p> <p>RATED SPEED (TEST): 2300 rpm OVERSPEED LIMIT (TEST): 2800 rpm CURRENT SPEED: ---</p> <p>Press TEST button to enable/disable the test</p> <p>PLEASE, START THE PUMP</p> <p>TEST</p>	<p>OVER SPEED TEST</p> <p>Offers the possibility to carry out engine overspeed tests and record their result.</p>
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### 6.7.6. CONFIGURATION

<p>SETTINGS</p> <p>CONFIGURATION PARAMETERS</p> <p>GENERAL</p> <p>CALIBRATION</p>	<p>Access </p> <p>This screen provides access to the configuration of the different parameters to adapt the control panel to the different possible conditions of each installation.</p> <ul style="list-style-type: none"> <li>Configurable parameters</li> <li>General configuration</li> <li>Calibration</li> </ul>
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### 6.7.7. WIFI

<p>CONEXION WIFI</p> <p>1. Seleccionar red wifi: SCF840DU_22020001</p> <p>2. Introducir contraseña: SveCorp_36B</p> <p>3. Leer código QR para acceder</p> <p>IP de acceso por navegador 192.168.63.1</p> <p>Web embebida</p>	<p>Access </p> <p>This screen provides the data necessary to access the web embedded in the SCF C900-D-AScontrol panel via the wireless wifi connection provided by the panel itself.</p>
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## 7. PRELIMINARY OPERATIONS AND COMMISSIONING

### 7.1. SAFETY



The SCF C900-D-AS control panel is designed to manage a system that is essential for the safety of buildings, property and people, and can also represent a risk to people operating on it as it is powered by AC voltage.


We therefore expressly point out that the system must only be operated by trained and authorised personnel who have read these instructions beforehand.

### 7.2. MANIPULATION


The following aspects shall be taken into account when handling the control panel:

- Transfers to the installation site by forklift or other mechanical means.
- Avoid sudden and forced movements of the body.
- When lifting the weight, bend your knees and spread them apart. The load should be close to the chest and under no circumstances should the back be bent.
- It will require 2 people to install it in position.

#### 7.2.1. MAINTENANCE

	<p>Access </p> <p>This screen shows the utilities focused on the technical maintenance personnel of the motor-pump assembly.</p>
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#### 7.2.2. CONFIGURACIÓN

	<p>Access </p> <p>This screen provides access to the configuration of the different parameters to adapt the control panel to the different possible conditions of each installation.</p> <ul style="list-style-type: none"> <li>▪ Configurable parameters</li> <li>▪ General configuration</li> <li>▪ Calibration</li> </ul>
--	---



### 7.2.3. WIFI

<div style="background-color: black; color: white; padding: 5px;"> <p style="text-align: center; margin: 0;"><b>WIFI CONNECTION</b></p> <p>1. Select wifi network: SCF840DU_20020001</p> <p>2. Enter password: SveCorp_36B</p> <p>3. Read QR code to access</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;">Navigator IP address: 192.168.63.1</div>  </div> <p style="text-align: right; font-size: small;">Embedded web</p> </div>	<p>Access</p>	
---	---------------	---

## 7.3. MOUNTING

The control panel shall be mounted on a metal structure capable of supporting the weight of the control panel. The 4 available fixing holes shall be used.

It shall be positioned close to the engine and at a height that allows it to be handled correctly.

Before starting, check all the information on the nameplate of the SCF C900-D-AS control panel.

Inspect all electrical connections, components and wiring for visible damage. Ensure that all electrical connections are tight before turning on the power.

Refer to the wiring diagram inside the SCF C900-D-AS control panel for all wiring information regarding the incoming AC power supply and motor wiring.

## 7.4. SCF C900-D-AS CONTROL PANEL SWITCH-ON/SWITCH-OFF

### SCF C900-D-AS CONTROL PANEL SWITCH-ON

The SCF C900-D-AS control panel is powered by the engine's own starter batteries which are in turn maintained by the SCA-B battery chargers, depending on the model, incorporated in the SCF C900-D-AS control panel.

To switch on the control panel SCF C900-D-AS, proceed as follows:

N°	CONTROL PANEL IGNITION SCF C900-D-AS
01	Make sure that switch S1 of the control panel is in OFF mode.
02	Make the connection of the alternating mains connection: 220 VAC / 240 VAC
03	Operate the switch located inside the electronic IO board inside of the control panel
04	Activate the circuit breaker Q1 inside the control panel.
05	Close the control panel door and switch isolator S1 to the ON position.



After 7s from the start, the SCF C900-D-AS control panel will measure the battery voltage to determine whether the nominal battery voltage is 12 VDC or 24 VDC to adapt the battery controlling and corresponding limits. A voltage reading above 17 VDC is considered as battery Vn= 24 VDC.

The battery measurement shall be repeated every 10 min to avoid an initial measurement of a battery Vn= 24 VDC and therefore with a measurement <17 VDC may generate an erroneous categorisation.



## SCF C900-D-AS CONTROL PANEL SWITCH-OFF

It is recommended to disconnect the power supply to the electronic control of the SCF C900-D-AS control panel by means of the switch installed inside the SCF C900-D-AS control panel when a long period of absence of AC mains power is foreseen, so that the consumption of the engine batteries by the controller does not impair the operation of the engine.






## 7.5. CHECK OF CONFIGURABLE PARAMETERS

The initial configuration with which the SCF C900-D-AS control panel leaves the factory takes into account the conditions of most diesel pump systems, but there are some parameters that need to be customised.


Make sure that the SCF C900-D-AS control panel has already been customised for the particular case, otherwise it must be adapted following the instructions in section "14 CONFIGURATION MENU".

## 7.6. PUMP INSPECTION INSTRUCTIONS

N° PUMP INSPECTION INSTRUCTIONS	
01	Follow the pre-check instructions of the pump-motor assembly manufacturer.
02	Check that the suction and discharge valves are 100% open.
03	Test that the pump starts with the push buttons <b>START</b>  and <b>CONTROL</b> 
04	Verify that the rated motor power in kW gives the rated flow and pressure on the pump nameplate.
05	Actuate  to stop the pump

## 7.7. SIGNAL INSPECTION INSTRUCTIONS

The correct functioning of the general elements of the installation as well as their connection to the control panel SCF C900-D-AS and the proper reception and management of the information must be ensured:



N° SIGNAL INSPECTION INSTRUCTIONS	
01	Check the correct status of the mode selector 
02	Check the status of the pressure detectors in the system and the reaction of the control panel SCF C900-D-AS to changes in the status of the pressure detectors.
03	Simulate the set of system alarms and check that they are reflected on the SCF80-D-U control panel display.



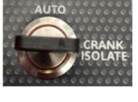

## 8. OPERATION

The three modes of operation offered by the SCF C900-D-AS control panel are described below:

### 8.1. AUTO MODE (Automatic)

N°	
01	 <p>Verify AUTO mode has been selected</p>
02	<p>START</p> <p>SCF830-D-AS receives a system demand to start the pump.</p>
03	 <p>SCF830-D-AS control panel does not detect any demand to start the pump. It is necessary to press the button when the blue light is on.</p>
	<p>Remote Stop</p> <p>Enable: <b>C4.18</b> ENABLE REMOTE STOP PUMP Assign the function <b>F03</b> REMOTE STOP to one of the configurable inputs. Close the remote stop activation contact.</p>
STOP	<p>AUTOMATIC STOP</p> <p>SCF C900-D-AS detects disappearance of running pump demand</p> <p>Enable: <b>C4.7</b> ENABLE AUTOMATIC STOP PUMP After detecting the disappearance of the demand SCF C900-D-AS will order the STOP after the time has elapsed: <b>C4.8</b>-DELAY TO AUTOMATIC STOP PUMP</p>
	<p>STOP DUE TO ALARM ACTION</p> <p>SCFC840-D-U will command the engine to stop, and start will be prevented if parameter <b>C3.14</b>- STOP BY ENGINE ALARMS is configured: YES and any of the following alarms are present: <b>AL50</b>-HIGH WATERTEMPERATURE ENGINE, <b>AL51</b>-HIGH OILTEMPERATURE ENGINE, <b>AL57</b>- OVERSPEED, <b>AL58</b>-LOW PRESSURE.ENGINE OIL</p>
	<p>LOCK OUT (not allowed by the rules) Orders the pump to stop and prevents it from starting</p> <p>Assign the function <b>F04</b> EMERGENCY LOCKOUT to one of the configurable inputs. Close the emergency lock activation contact</p>

### 8.2. CRANK ISOLATE

N°	
01	 <p>Verify that mode has been selected</p>
02	<p>START</p> <p>Starting the pump is avoided in this mode. Prevents the starter from being energized during maintenance</p>
03	 <p>SCF830-D-AS does not detect any demand to start the pump. It is necessary to press the button when the blue light is on.</p>



### 8.3. EMERGENCY START

N°		
01	Totally independent of the electronic control and the selected operating mode	
02	<b>START BATTERY</b>	Activate the start solenoid (Lever) corresponding to the Start battery
03	<b>CONTROL BATTERY</b>	Activate the start solenoid (Lever) corresponding to the Monitor battery

### 8.4. PUMP RUNNING DEMAND

The SCF C900-D-AS control panel shall recognise the existence of a pump start demand when any of the following conditions are met:

N°	DEMAND						
01	System pressure switch	Pressure switch	Terminals				
			<table border="1"> <tr> <td><b>P1</b></td> <td>I: SYSTEMPRESSURE SWITCH</td> </tr> <tr> <td><b>P1-</b></td> <td>O-REF. COMMON (-)</td> </tr> </table>	<b>P1</b>	I: SYSTEMPRESSURE SWITCH	<b>P1-</b>	O-REF. COMMON (-)
<b>P1</b>	I: SYSTEMPRESSURE SWITCH						
<b>P1-</b>	O-REF. COMMON (-)						
02	Contact low priming tank level	Contact	<table border="1"> <tr> <td><b>P3</b></td> <td>I-REMOTE START</td> </tr> <tr> <td><b>P3-</b></td> <td>O-REF. COMMON (-)</td> </tr> </table>	<b>P3</b>	I-REMOTE START	<b>P3-</b>	O-REF. COMMON (-)
			<b>P3</b>	I-REMOTE START			
<b>P3-</b>	O-REF. COMMON (-)						
04	System pressure sensor	Terminals	<table border="1"> <tr> <td><b>W2</b></td> <td>I-SYSTEM PRESSURE TRANSDUCER</td> </tr> <tr> <td><b>W2+</b></td> <td>O- TRANSDUCER POWER SUPPLY</td> </tr> </table>	<b>W2</b>	I-SYSTEM PRESSURE TRANSDUCER	<b>W2+</b>	O- TRANSDUCER POWER SUPPLY
			<b>W2</b>	I-SYSTEM PRESSURE TRANSDUCER			
<b>W2+</b>	O- TRANSDUCER POWER SUPPLY						

- Delayed actuation as configurable **C4.3** DELAY DEMAND-PUMP START
- Type of contact configurable (NO/NC) **C4.1** PRESSURE SWITCH CONTACT PUMP
- Enable **C4.4** ENABLE PUMP DEMAND BY TRANSDUCER
- It is activated when the measured system pressure value falls below the configurable value **C4.5** PRESSURE DEMAND PUMP and deactivated when the system pressure value exceeds the configurable value **C4.6** PRESSURE.NO DEMAND PUMP

### 8.5. ENGINE AND PUMP START

#### 8.5.1. START UP PROCESS SEQUENCE

N°	PUMP START SEQUENCE
01	SCF C900-D-AS will order up to six pump crank attempt (configurable <b>C-3.4</b> NUMBER OF CRANK ATTEMPTS) with the START A battery, each crank attempt will last 10s (configurable <b>C-3.6</b> START ATTEMPT DURATION) and there will a 10s pause between CRANK ATTEMPTS (configurable <b>C-3.7</b> DELAY BETWEEN SUCCESIVE PUMP CRANK)
02	If the engine starts during any of the six attempts, the pump start sequence will be terminated.
03	If the START batterie has failed, the next attempts will be done with the CONTROL battery. If both batteries have failed, then the start process will continue using both batteries in parallel for the rest of crank attempts.

#### 8.5.2. START UP SEQUENCE TERMINATION

SCF C900-D-AS control panel will terminate the automatic start up cycle after the following scenarios:

N°	END TO ENGINE START PROCESS
01	Detection of engine running
02	Termination of configured pump CRANK ATTEMPTS
03	Select Crank isolate mode



## 8.6. ENGINE RUNNING DETECTION

The SCF C900-D-AS control panel shall recognise that the engine is started when any of the following circumstances occur:

N° ENGINE RUNNING			
01	Detection of engine speed at least 25% of rated engine speed	Terminals	Reading by inductive or magnetic sensor of the rotational speed of the motor crown. See configurable parameters <b>C3.2</b> : NUMBER OF TEETH FLYWHEEL RING and <b>C3.3</b> : RATED SPEED;
		<b>Y1</b> O-PICKUP (+)	
		<b>Y2</b> I-PICKUP/W	
		<b>Y3</b> PICKUP SHIELD	Reading of the pulses emitted by the W terminal of the battery charging alternator. The configuration parameters affected are the same <b>C3.2</b> : NUMBER OF TEETH and <b>C3.3</b> : RATED SPEED. The configuration shall be empirical. By means of field tests.
02	Oil pressure signal	<b>R4</b> I-LOW OIL PRESSURE CONTACT	Oil pressure switch signal. Configurable action: <b>C3.5</b> : CRANK WITHDRAW FOR OIL PRESSURE. <b>This action is not recommended by current fire regulations.</b>
03	In the event that the SCF C900-D-AS control panel detects that the engine is running without a start command from the control panel, the status of the pump will be displayed as if it is running but the message "RUNNING BY" will be yellow and a pop-up message will be displayed indicating "ATTENTION: ENGINE RUNNING". If this situation persists for 5s the SCF C900-D-AS control panel will accept the situation, and all alarms monitoring will be activated		

## 8.7. HEATING RESISTOR MANAGEMENT

In order to keep the engine temperature within the appropriate ranges, the SCF C900-D-AS control panel offers the option of managing the heating resistor supply that is usually installed in the engine.

The features and operation of this device are described below.

N° HEATING RESISTOR		
01	Powered through the terminals	<b>J4</b> O-ENGINE WATER HEATER LIVE
		<b>J3</b> O-ENGINE WATER HEATER NEUTRAL
02	Maximum current	10 Amp protected by circuit breaker Q1
03	Activation of management	Permanent or temperature threshold activation can be selected according to parameter <b>C11.10</b> OUTPUT ENGINE HEATER
04	Connection	When the coolant temperature measured from the row water or oil falls below the configurable parameter <b>C3.16</b> MINIMUM HEATING TEMPERATURE
05	Disconnection	When the coolant temperature measured from the row water or oil exceeds the value of configurable parameter <b>C3.17</b> MAXIMUM HEATING TEMPERATURE



## 8.8. FUEL PASSAGE MANAGEMENT

The SCF C900-D-AS control panel manages the fuel flow to the engine as a tool to allow the engine to run or to force it to stop.

In accordance with current fire regulations, the passage of fuel shall be permitted at all times except when the SCF C900-D-AS control panel generates an engine STOP command with a limited duration.

N°		FUEL PASSAGE		
01	Related Terminals	R1	O-FUEL VALVE 8-35Vdc / 10A	
		R12	O-STOP FUEL SOLENOID 8-35Vdc / 25A	
02		C3.20	STOP SOLENOID OUTPUT CONTROL	
03	2-wire stop solenoid			
		3-wire stop solenoid		
04	Engine running		Output R1 O-FUEL VALVE remains activated, and output R12 O-STOP FUEL SOLENOID remains deactivated.	
05	Engine STOP	2 wires	Output R1 O-FUEL VALVE remains deactivated, and output R12 O-STOP FUEL SOLENOID is activated for a time specified in parameter C3.8 TIME STOPPING PUMP after which it will return to its deactivated state.	
		3 wires	Output R1 O-FUEL VALVE is activated for 1,5s and output R12 O-STOP FUEL SOLENOID is activated for a time specified in parameter C3.8 TIME STOPPING PUMP after which it will return to its deactivated state	

## 8.9. CONTROL OF THE COOLANT CIRCUIT

The SCF C900-D-AS control panel manages the engine water cooling circuit as follows:

N°		COOLANTE CIRCUIT	
01	Terminal	Q2	O-COOLANT CIRCUIT VALVE 8-35 VDC / 1A
02	Activation	Control panel SCF C900-D-AS detects pump running	
		or	
02	Activation	The SCF C900-D-AS control panel initiates a MAN start process via the push buttons on the front panel.	
		or	
02	Activation	The SCF C900-D-AS control panel initiates an AUTO start process when a start demand is detected.	
03	Deactivation	The SCF C900-D-AS control panel starts the engine STOP process.	



## 8.10. BATTERY VOLTAGE MEASUREMENT

Given the importance of the batteries in the correct operation of the system, the SCF C900-D-AS control panel must constantly and accurately control the status of the batteries.

The SCF C900-D-AS control panel performs two types of battery voltage readings:

N° TYPES OF BATTERY VOLTAGE MEASUREMENT	
01	Permanent The permanent reading result is displayed on the Display, also useful for the generation of faulty or non-existent BATTERY alarms.
02	Every 5 minutes More accurate reading with charger inhibition for alarm generation <b>AL-06</b> LOW VOLTAGE BATTERY START <b>AL-07</b> LOW VOLTAGE BATTERY CONTROL, <b>AL-08</b> HIGH VOLTAGE BATTERY START, <b>AL-09</b> HIGH VOLTAGE BATTERY CONTROL

## 8.11. PRIMING AUXILIARY ALTERNATOR (BATTERY CHARGING)

N° AUXILIARY ALTERNATOR PRIMING	
	<b>O-CONFIG-1</b> : ENGINE ALTERNATOR EXCITER 8-35 VDC
01	Terminal <b>Q1</b> This function can be programmed in any of the configurable outputs but the output of terminal Q1 already has a resistor to limit the current to approximately 250mA / 510mA for 12 or 24 VDC, respectively. It is necessary to place the jumper next to the terminal in position "C".
02	Activation At the start of each start cycle. It is necessary to configure <b>C3.9</b> -AUXILIARY ALTERNATOR PRIMING: YES
03	Duration <b>C3.19</b> DELAY END OF COOLING
04	Deactivation When the SCF C900-D-AS control panel starts the engine STOP process.

## 8.12. MEASURED COMPENSATION RESISTIVE TRANSDUCERS

The SCF C900-D-AS control panel has 4 inputs for resistive transducer measurements (Inputs X1, X2, X3 and W1). These transducers offer a resistive value depending on the magnitude they are measuring and take as reference the pump chassis itself (battery negative); the SCF40-D control panel, however, has the reference of its own common negative battery terminal **R11**. Between the two references there may be an accentuated voltage drop when the chargers are in full operation and emitting the maximum of their rated current, i.e. when the batteries are particularly discharged.

The SCF C900-D-AS control panel offers an algorithm that can be used to obtain a better and more accurate reading of the values provided by the resistive values even under the worst conditions.

N° MEASURED TRANSDUCER COMPENSATION	
01	Terminals <b>P1</b> <b>P2</b> <b>P3</b> Connect any of these terminals directly to the pump chassis. <b>P4</b> <b>P4</b>
02	Activation Set the function <b>F20</b> - CORRECTION OF ANALOG MEASUREMENTS in the designated input.

## 8.13. PICKUP SIGNAL REPETITION



If parameter **C20.6.2** - Standard: FOC or LPCB: YES, is selected, SCF C900-D-AS will output a pulsed signal through terminal **Q4** with a frequency proportional to the signal received at input **Y2-PICKUP**, so that it can be connected to an instrument that displays engine rpm. To do this, parameter **C11.4-CONFIGURABLE** OUTPUT **Q4**: F00-NO FUNCTION must be configured.

output frequency = input frequency / Maximum input frequency: 10 kHz



## 8.14. COMMISSIONING RECORD

For the purposes of warranty management, the SCF C900-D-AS control panel provides the option of recording the date on which the installation was properly commissioned.

N° COMMISSIONING LOG	
01	Access Access the maintenance menu by pressing 
02	Access the START-UP REGISTRY
03	Activation Press 
04	Result The SCF C900-D-AS control panel registers the current date as the start-up date of the system.

## 8.15. INSTALLATION MAINTENANCE LOG

In order to assist in the management of maintenance work, the SCF C900-D-AS control panel can be reminded by means of pop-up screens of the need for scheduled maintenance to be carried out after the time set by the person responsible for carrying out the maintenance has elapsed.

On the SCF C900-D-AS control panel, you can view and edit the following related information:

- Time period between one maintenance action and the next one
- Date of last maintenance carried out
- Date of next maintenance
- Details of the maintenance company (Name + phone number)



## 9. ALARMS

One of the basic functions of the SCF C900-D-AS control panel is the protection of the supply system and the motor pump. This task is carried out through the permanent controlling of the electrical, mechanical and hydraulic variables and the actions consequent to the alarms that may be generated.

### 9.1. ALARM PERFORMANCE

The detection of an alarm triggers:

N°	ACTIONS			
01	No alarm causes the pump to stop			
2	Display on the alarm screen of a line describing the alarm.			
03	Switching on the light			
04	Activation of the siren.			
05	Indelible recording of the alarm in the event log			
06	Actuation of the potential-free contact output:	Terminals		
		AR1	NC	O-COMMON ALARM / CONTROL FAIL
		AR2	NC	
		AR3	NO	
AR4	NO			
07	Actuation of the potential-free contact output:	Terminals		
		BR1	NC	O-COMMON ALARM / CONTROL FAIL
		BR2	NC	
		BR3	NO	
BR4	NO			

### 9.2. ALARM RESET

To erase the lines on the display that show the last alarms that have occurred, proceed as follows:

N°	RESET ALARMS
01	Mute the horn by pressing the push button
02	Rectify the cause of the fault so that the alarm is no longer active.
03	Delete the text from the display by pressing the push button  again

### 9.3. ALARM LIST

N°	NAME	DESCRIPTION	SPECIFIC ACTION	PARTNER CONFIG.
AL01	FAULT VOLTAGE POWER SUPPLY	SCF C900-D-AS detects and processes mains voltage or frequency outside the tolerance threshold.	Remote signal	<b>C7.3:</b> MINIMUM POWER SUPPLY VOLTAGE <b>C7.4:</b> MAXIMUM POWER SUPPLY VOLTAGE <b>C7.5:</b> DELAY POWER SUPPLY VOLTAGE ALARM
		Terminals <b>S1-T1</b> POWER AC PHASE <b>S1-T2</b> POWER AC NEUTRAL	Terminals <b>GR1</b> NC <b>GR2</b> NC <b>GR3</b> NO <b>GR4</b> NO	
AL03	FAULT FREQUENCY POWER SUPPLY	SCF C900-D-AS detects and processes mains frequency more than 10% off nominal value Activation delay 3s.	This alarm is self-resetting	<b>C7.2:</b> NOMINAL FREQUENCY



N°	NAME	DESCRIPTION	SPECIFIC ACTION	PARTNER CONFIG.				
AL06	LOW VOLTAGE BATTERY START	The alarm is generated if SCF C900-D-AS detects and processes that the voltage of BATTERY START is below 12V or 24V (depending on 12 or 24 Vn batteries) in three successive readings.	This alarm is self-resetting when normal conditions are restored.					
AL07	LOW VOLTAGE BATTERY CONTROL	The alarm is generated if SCF C900-D-AS detects and processes that the voltage of BATTERY CONTROL is below 12V or 24V (depending on 12 or 24 Vn batteries) in three successive readings.	This alarm is self-resetting when normal conditions are restored.					
AL08	HIGH VOLTAGE BATTERY START	The alarm is generated if SCF C900-D-AS detects and processes that the battery voltage A is 25% above nominal. (15,6 Vdc for 12 Vdc. 31,2 Vdc for 24 Vdc).	This alarm is self-resetting when normal conditions are restored.					
AL09	HIGH VOLTAGE BATTERY CONTROL	The alarm is generated if SCF C900-D-AS detects and processes that the voltage of BATTERY CONTROL is 25% above the nominal voltage. (15,6 Vdc for 12 Vdc. 31,2 Vdc for 24 Vdc).	This alarm is self-resetting when normal conditions are restored.					
AL10	BATTERY START DEFECTIVE	SCF C900-D-AS detects BATTERY START voltage below 8Vdc or 16Vdc (12/24Vdc nominal) for 0.5sec,						
AL11	BATTERY CONTROL DEFECTIVE	SCF C900-D-AS detects BATTERY CONTROL voltage below 8Vdc or 16Vdc (12/24Vdc nominal) for 0.5sec,						
AL12	FAULT BATTERY CHARGER START	SCF C900-D-AS stops receiving the correct charger status signal from battery START	This alarm is self-resetting when normal conditions are restored.					
AL13	FAULT BATTERY CHARGER CONTROL	SCF C900-D-AS stops receiving the correct charger status signal from battery CONTROL	This alarm is self-resetting when normal conditions are restored.					
AL14	TRIPPED VOLTAGE PEAK SUPPRESSOR	OK device signal taken from the device and connected to the input " VOLTAGE PEAK SUPPRESSOR is not received.						
AL27	LOW FLOW COOLANT WATER	The signal is received from the device connected to the input "LOW FLOW COOLANT WATER".						
AL30	FAULT DISCHARGE PRESSURE PUMP	SCF C900-D-AS does not receive a boost pressure generation signal from the pump even though the engine is running,		<b>C3.10</b> DELAY DELAYED ALARMS WATCH				
		<table border="1"> <tr> <td>Ter min als</td> <td><b>P3</b></td> <td>PUMP DISCHARGE PRESSURE OK</td> </tr> <tr> <td></td> <td><b>P3 -</b></td> <td><b>O-REF. COMMON (-)</b></td> </tr> </table>	Ter min als	<b>P3</b>	PUMP DISCHARGE PRESSURE OK		<b>P3 -</b>	<b>O-REF. COMMON (-)</b>
Ter min als	<b>P3</b>	PUMP DISCHARGE PRESSURE OK						
	<b>P3 -</b>	<b>O-REF. COMMON (-)</b>						
AL31	LOW LEVEL RESERVOIR TANK	SCF C900-D-AS receives the signal via the input:		<b>C-AL31</b> LOW WATER RESERVOIR LEVEL				
		<table border="1"> <tr> <td>Ter min als</td> <td><b>P4</b></td> <td>I-LOW LEVEL RESERVOIR TANK</td> </tr> <tr> <td></td> <td><b>P4 -</b></td> <td><b>O-REF. COMMON (-)</b></td> </tr> </table>	Ter min als	<b>P4</b>	I-LOW LEVEL RESERVOIR TANK		<b>P4 -</b>	<b>O-REF. COMMON (-)</b>
Ter min als	<b>P4</b>	I-LOW LEVEL RESERVOIR TANK						
	<b>P4 -</b>	<b>O-REF. COMMON (-)</b>						



N°	NAME	DESCRIPTION	SPECIFIC ACTION	ASSOCIATED CONFIGURATION		
AL32	LOW LEVEL PRIMING TANK	SCF C900-D-AS receives the signal through the input:	SCF C900-D-AS Process and generate pump start demand	<b>C4-17:</b> CONTACT LOW LEVEL PRIMING TANK		
		<table border="1"> <tr> <td>Termin</td> <td><b>P2</b></td> <td>I-LOW LEVEL PRIMING TANK</td> </tr> <tr> <td>als</td> <td><b>P2 -</b></td> <td><b>O-REF. COMMON (-)</b></td> </tr> </table>			Termin	<b>P2</b>
Termin	<b>P2</b>	I-LOW LEVEL PRIMING TANK				
als	<b>P2 -</b>	<b>O-REF. COMMON (-)</b>				
AL33	PRESSURE SWITCH SYSTEM SHORT CIRCUIT	SCF C900-D-AS detects and processes the pressure switch line is shorted.		<b>C4.2</b> PRESSURE SWITCH SYSTEM SHORT / OPEN CIRCUIT		
		<table border="1"> <tr> <td>Termin</td> <td><b>P1</b></td> <td>I-SYSTEM PRESSURE SWITCH</td> </tr> <tr> <td>als</td> <td><b>P1-</b></td> <td><b>O-REF. COMMON (-)</b></td> </tr> </table>			Termin	<b>P1</b>
Termin	<b>P1</b>	I-SYSTEM PRESSURE SWITCH				
als	<b>P1-</b>	<b>O-REF. COMMON (-)</b>				
AL34	PRESSURE SWITCH SYSTEM OPEN CIRCUIT	SCF C900-D-AS detects and processes the pressure switch line is cut or open circuit.		<b>C4.2</b> PRESSURE SWITCH SYSTEM SHORT OPEN CIRCUIT		
		<table border="1"> <tr> <td>Termin</td> <td><b>P1</b></td> <td>I-SYSTEM PRESSURE SWITCH</td> </tr> <tr> <td>als</td> <td><b>P1 -</b></td> <td><b>O-REF. COMMON (-)</b></td> </tr> </table>			Termin	<b>P1</b>
Termin	<b>P1</b>	I-SYSTEM PRESSURE SWITCH				
als	<b>P1 -</b>	<b>O-REF. COMMON (-)</b>				
AL35	PRESSURE SWITCH 2 PUMP SHORT-CIRCUIT	SCF C900-D-AS detects and processes that the pressure switch line is short-circuited.		<b>C4.2</b> PUMP PRESSURE SWITCH SHORT / OPEN		
		<table border="1"> <tr> <td>Termin</td> <td><b>P1</b></td> <td>I-SYSTEMPRESSURE SWITCH</td> </tr> <tr> <td>als</td> <td><b>P1-</b></td> <td><b>O-REF. COMMON (-)</b></td> </tr> </table>			Termin	<b>P1</b>
Termin	<b>P1</b>	I-SYSTEMPRESSURE SWITCH				
als	<b>P1-</b>	<b>O-REF. COMMON (-)</b>				
AL36	PRESSURE SWITCH 2 PUMP OPEN CIRCUIT	SCF C900-D-AS detects and processes whether the pressure switch line is broken or in an open circuit.		<b>C4.2</b> SHORT PUMP PRESSURE SWITCH / OPEN		
		<table border="1"> <tr> <td>Termin</td> <td><b>P1</b></td> <td>I-SYSTEM PRESSURE SWITCH</td> </tr> <tr> <td>als</td> <td><b>P1 -</b></td> <td><b>O-REF. COMMON (-)</b></td> </tr> </table>			Termin	<b>P1</b>
Termin	<b>P1</b>	I-SYSTEM PRESSURE SWITCH				
als	<b>P1 -</b>	<b>O-REF. COMMON (-)</b>				
AL39	FAULT SYSTEM PRESSURE TRANSDUCER	The pressure sensor provides a measurement outside its nominal range of 4-20mA.		<b>C6.1</b> ENABLE SYSTEM PRESSURE TRANSDUCER		
		<table border="1"> <tr> <td>Termin</td> <td><b>W2</b></td> <td>I-SYSTEM PRESSURE TRANSDUCER</td> </tr> <tr> <td>als</td> <td><b>W2+</b></td> <td><b>O-REF. COMMON (-)</b></td> </tr> </table>			Termin	<b>W2</b>
Termin	<b>W2</b>	I-SYSTEM PRESSURE TRANSDUCER				
als	<b>W2+</b>	<b>O-REF. COMMON (-)</b>				
AL40	FAULT COMMUNICATIONS I/O	SCF C900-D-AS detects and processes that communication has been lost between the front-end electronics board and the I/O board inside the control panel.				
AL43	FAULT COMMUNICATIONS WIFI	SCF C900-D-AS detects and processes that WIFI communication has been lost.				
AL44	LOW AMBIENT TEMPERATURE	SCF C900-D-AS detects and processes that the temperature in the room is lower for at least 2min than the set temperature. 10°C (50°F) or SCF C900-D-AS receives the signal through the input "low room temperature"		<b>C-AL44</b> MINIMUM AMBIENT TEMPERATURE From -10°C (14°F) to the high temperature alarm limit ( <b>AL45</b> )		
AL45	HIGH AMBIENT TEMPERATURE	SCF C900-D-AS detects and processes that the temperature in the room is higher for at least 2 min. than the set temperature. 40°C (104°F)		<b>C-AL45</b> MAXIMUM AMBIENT TEMPERATURE From the low temperature alarm limit ( <b>AL44</b> ) up to 60°C.		
AL46	ROOM TEMPERATURE TRANSDUCER FAILURE	Room temperature transducer is detected to be switched off				



N°	NAME	DESCRIPTION	SPECIFIC ACTION	ASSOCIATED CONFIGURATION
AL50	HIGH TEMPERATURE WATER ENGINE	It is activated when the signal is received through the input:	SCF C900-D-AS commands stop <b>C-3.14</b> PUMP STOPPED BY ENGINE ALARMS: Yes  Latches the pump at standstill. Alarm must be reset to allow start-up.	<b>C-AL50</b> HIGH TEMPERATURE ENGINE  <b>C3.14</b> PUMP STOPPED BY ENGINE ALARMS: Yes  <b>C3.10</b> DELAY DELAYED ALARMS WATCH
		Terminal <b>R5</b> I HIGH WATER ENGINE TEMPERATURE CONTACT		
		Or if the motor temperature being measured by the SCF C900-D-AS through the input:		
		Terminal <b>X1</b> I-ENGINE-WATER ENGINE TEMPERATURE TRANSDUCER		
		It rises above the value considered as an alarm. 100°C (212°F)		
		Controlling is delayed from the detection of engine running; when the "Alarms in service" light is illuminated.		
AL51	HIGH ENGINE OIL TEMPERATURE	It is activated when the signal is received through the input:	SCF C900-D-AS commands stop <b>C-3.14</b> PUMP STOPPED BY ENGINE ALARMS: Yes  Latches the pump at standstill. Alarm must be reset to allow start-up.	<b>C-AL51</b> HIGH ENGINE OIL TEMPERATURE  <b>C3.14</b> PUMP STOPPED BY ENGINE ALARMS: Yes  <b>C3.10</b> DELAY DELAYED ALARMS WATCH
		Terminal <b>Conf. F30</b> I HIGH ENGINE OIL TEMPERATURE CONTACT		
		Or if the motor temperature being measured by the SCF C900-D-AS through the input:		
		Terminal <b>W1</b> I-ENGINE-OIL TEMPERATURE TRANSDUCER		
		It rises above the value considered as an alarm. 100°C (212°F)		
		Monitoring is delayed from the detection of engine running; when the "Alarms in service" light is illuminated.		
AL52	LOW ENGINE TEMPERATURE	It is activated when the signal is received through the input:		<b>C9.11</b> CONFIGURABLE INPUT <b>D3</b> select <b>F-17</b> LOW TEMPERATURE COOLANT WATER  <b>CAL52</b> LOW ENGINE TEMPERATURE
		Terminal <b>D3</b> I-LOW ENGINE TEMPERATURE CONTACT		
		Or if the motor temperature being measured by the SCF C900-D-AS through the input:		
		Terminal <b>X1</b> I-WATER TEMPERATURE TRANSDUCER		
		Falls below the value considered as an alarm 5°C (41°F)		
AL53	LOW ENGINE OIL TEMPERATURE	It is activated when the signal is received through the input:		<b>C9.11</b> CONFIGURABLE INPUT <b>D3</b> select <b>F-31</b> LOW TEMPERATURE COOLANT WATER  <b>CAL52</b> LOW ENGINE TEMPERATURE
		Terminal <b>Conf. F30</b> I-LOW ENGINE OIL TEMPERATURE CONTACT		
		Or if the motor temperature being measured by the SCF C900-D-AS through the input:		



N°	NAME	DESCRIPTION	ASSOCIATED CONFIGURATION
		<p>Terminal <b>W1</b> I-OIL TEMPERATURE SENSOR</p> <p>Falls below the value considered as an alarm. 5°C (41°F)</p>	
<b>AL54</b>	LOW FUEL LEVEL	<p>The signal is received via the input:</p> <p>Terminal <b>D1</b> I-LOW FUEL LEVEL CONTACT</p> <p>Or if the fuel tank level is being measured by the SCF C900-D-AS through the inlet:</p> <p>Terminal <b>X3</b> I-FUEL LEVEL TRANSDUCER</p> <p>And the measured value falls below the set value. 10%</p>	<p>This alarm is self-resetting when normal conditions are restored.</p> <p><b>C-AL54</b>: LOW FUEL LEVEL</p>
<b>AL56</b>	FAULT ENGINE SPEED SENSOR	<p>Generated if SCF C900-D-AS does not detect a Pick-Up signal or the motor speed does not exceed 25% of the nominal speed.</p> <p>Delayed surveillance 10 sec. from detection of engine running;</p>	<p><b>C3.2</b> NUMBER OF TEETH FLYWHEEL RING</p> <p><b>C3.3</b> RATED SPEED</p>
<b>AL57</b>	OVERSPEED	<p>SCF C900-D-AS detects and processes an engine speed equal to or greater than 120% of its rated speed.</p>	<p>SCF C900-D-AS commands stop <b>C-3.14</b> PUMP STOPPED BY ENGINE ALARMS: Yes</p> <p><b>C3.3</b>: RATED SPEED</p> <p><b>C3.14</b> PUMP STOPPED BY ENGINE ALARMS: Yes</p> <p>Latches the pump at standstill. Alarm must be reset to allow start-up.</p>
<b>AL58</b>	LOW PRESSURE ENGINE OIL	<p>It is activated when the signal is received through the input:</p> <p>Terminal <b>R4</b> I-LOW OIL PRESSURE CONTACT</p> <p>Controlling is delayed from the detection of engine running; when the "Alarms in service" light is illuminated.</p>	<p>SCF C900-D-AS commands stop <b>C-3.14</b> PUMP STOPPED BY ENGINE ALARMS: Yes</p> <p><b>C3.10</b> DELAY DELAYED ALARMS WATCH</p> <p><b>C-AL58</b> LOW OIL PRESSURE</p>
<b>AL59</b>	JACKET HEATER FAILURE	<p>SCF C900-D-AS detects and processes the tripping of the heating resistor supply protector.</p>	
<b>AL60</b>	FAULT CRANKING MOTOR VOLTAGE	<p>SCF C900-D-AS does not receive a positive voltage signal from the auxiliary starter (Bendix) at the moment SCF C900-D-AS gives a start pulse.</p> <p>Terminal <b>R2</b> I-CRANKING MOTOR VOLTAGE (+)</p>	<p><b>C-AL60</b> FAULT CRANKING MOTOR VOLTAGE</p>
<b>AL61</b>	FAULT AUXILIARY ALTERNATOR	<p>SCF C900-D-AS receives the signal via the input:</p> <p>Terminal <b>D7</b> I-AUX ALTERNATOR FAIL</p> <p>Surveillance is delayed since detection of engine running;</p>	<p><b>C3.10</b> DELAY DELAYED ALARMS WATCH</p>




N°	NAME	DESCRIPTION	SPECIFIC ACTION	PARTNER CONFIG.								
AL62	FAILED TO START ENGINE	The start attempts set in AUTO mode have been exhausted without starting the engine.	Signal at a distance:  <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>CR1</td><td>NC</td></tr> <tr><td>CR2</td><td>NC</td></tr> <tr><td>CR3</td><td>NO</td></tr> <tr><td>CR4</td><td>NO</td></tr> </table>	CR1	NC	CR2	NC	CR3	NO	CR4	NO	C3.4: NUMBER OF START-UP PUMP
CR1	NC											
CR2	NC											
CR3	NO											
CR4	NO											
N°	NAME	DESCRIPTION	PARTNER CONFIG.									
AL63	FAULT CRANK SOLENOID	SCF C900-D-AS detects a break or short-circuit in the output cable to the motor starter contactor coils. Failure occurs for resistance greater than 1K8 Ohm.										
AL64	FAULT DC POWER SUPPLY	SCF C900-D-AS detects and processes that the battery voltage A-B is less than 5 Vdc for at least 3 consecutive readings spaced 5 minutes apart.										
AL66	ECM ALTERNATIVE POSITION	SCF C900-D-AS receives the signal via the input: <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>Termin als</td><td>D5</td><td>I-ECM SELECTED ALTERNATIVE POSITION</td></tr> </table>	Termin als	D5	I-ECM SELECTED ALTERNATIVE POSITION							
Termin als	D5	I-ECM SELECTED ALTERNATIVE POSITION										
AL69	ECM FAULT	SCF C900-D-AS receives the signal via the input: <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>Termin als</td><td>D4</td><td>I-ECM FAULT</td></tr> </table>	Termin als	D4	I-ECM FAULT							
Termin als	D4	I-ECM FAULT										
AL72	LOW FLOW COOLANT WATER	SCF C900-D-AS receives the signal via the input: <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>Termin als</td><td>D6</td><td>I-LOW RAW WATER FLOW</td></tr> </table> <p>Controlling is delayed from the detection of engine running; when the "Alarms in service" light is illuminated.</p>	Termin als	D6	I-LOW RAW WATER FLOW	C3.10 DELAY DELAYED ALARMS WATCH						
Termin als	D6	I-LOW RAW WATER FLOW										
AL74	FUEL TANK LEAK	SCF C900-D-AS receives the signal via the input: <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>Termin als</td><td>D2</td><td>I-FUEL TANK LEAK</td></tr> </table>	Termin als	D2	I-FUEL TANK LEAK							
Termin als	D2	I-FUEL TANK LEAK										
AL76	FAULT FUEL LEVEL TRANSDUCER	Fuel transducer disconnection detected	C6.11-FUEL LEVEL TRANSDUCER									
AL77	FAULT OIL PRESSURE TRANSDUCER	Oil pressure transducer disconnection detected for 5 seconds	C6.9-OIL PRESSURE TRANSDUCER									
AL78	FAULT WATER TEMPERATURE TRANSDUCER	Disconnection of the water temperature transducer is detected for 5 seconds	C6.10- TRANSDUCER COOLANT WATER TEMPERATURE									
AL79	FAULT OIL TEMPERATURE TRANSDUCER	Disconnection of oil temperature transducer detected	C6.12-OIL TEMPERATURE TRANSDUCER									
AL80	RUNNING FAILURE	All elements indicating that the engine is running disappear for at least 15s without the control panel SCF C900-D-AS having commanded the engine to stop	C3.10 DELAY DELAYED ALARMS WATCH									



## 10. EVENTS LOG

The SCF C900-D-AS control panel stores the most relevant information produced in the motor-pump system, thus providing a very useful tool for maintenance operations and diagnosis of the causes of incidents.

	<p>Access </p> <p>This screen shows, in different sections, all the information registered and gives access to the corresponding document downloads.</p>
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### 10.1. EVENTS LOG

The SCF C900-D-AS control panel stores the most relevant information occurring in the motor-pump system, thus providing a very useful tool for maintenance operations and diagnosis of the causes of incidents.

This history is displayed in two different ways/places:

- SCF C900-D-AS Display: Up to 200 records
- Embedded Web: Up to 1200 records

	<p>EVENT LOG</p> <p>The SCF C900-D-AS control panel stores the log of the last 1200 events indexed by date and time: hh:mm:ss of occurrence.</p> <p>The last 200 are displayed. All 1200 are viewable from the embedded web.</p>
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#### 10.1.1. LIST OF REGISTRABLE EVENTS

The list of recordable events is presented below:

N°	NAME	DESCRIPTION
E001	AL62- FAILED TO START ENGINE	Alarm Start failure
E002	AL07-LOW BATTERY CONTROL VOLTAGE	Alarm Low battery voltage CONTROL
E003	AL30-FAULT DISCHARGE PRESSURE PUMP	Alarm Pressure failure
E004	AL57-OVERSPEED	Alarm. Engine overspeed
E005	AL54-LOW FUEL LEVEL	Low fuel level alarm
E006	AL58-LOW OIL PRESSURE	Low oil pressure alarm
E007	CONTACT LOW PRIMING TANK LEVEL: ON	Activated low level priming tank input
E008	AL31- LOW RESERVOIR TANK	Low water reserve alarm
E009	AL12-FAULT BATTERY CHARGER START	Alarm Charger failure START
E010	AL13- FAULT BATTERY CHARGER CONTROL	Alarm Charger failure CONTROL



E011	AL59- TRIPPED HEATER PROTECTION	Alarm Triggering of heating protections
E012	AL50-HIGH ENGINE WATER TEMPERATURE ENGINE	High Engine Water Temperature Alarm
E013	AL01- FAULT VOLTAGE POWER SUPPLY	Alarm Mains failure
E016	AL56-FAULT ENGINE SPEED SENSOR	Alarm Fault Signal Speed
E017	AL06-LOW BATTERY VOLTAGE START	Alarm Low battery voltage START
E018	OFF MODE	OFF mode
E019	AUTO MODE	AUTO mode
E020	MAN MODE	MAN mode
E021	PUMP START	Pump start-up order
E022	PUMP STOP	Pump stop command
E023	REMOTE START CONTACT: ON	Remote start contact activated
E024	REMOTE START CONTACT: OFF	Remote start contact deactivated
E025	AL60-FAULT CRANKING MOTOR VOLTAGE	Alarm Starter motor voltage failure
E040	PUMP DEMAND PRESSURE SWITCH DEMAND: ON	Pump demand pressure switch demand contact ON
E049	AL52-LOW ENGINE WATER TEMPERATURE	Low engine water temperature alarm
E050	AL52-LOW ENGINE OIL TEMPERATURE	Low engine oil temperature alarm
E053	CONTACT LOW PRIMING TANK LEVEL: OFF	Low level priming tank input deactivated
E054	PUMP DEMAND PRESSURE SWITCH DEMAND: OFF	Pump demand pressure switch demand contact OFF
E056	CORRECT ELECTRICAL NETWORK	Network reset
E059	AL61-FAULT AUXILIARY ALTERNATOR	Auxiliary alternator failure alarm
E062	AL80- RUNNING FAILURE	Running failure alarm
E063	AL08-HIGH BATTERY VOLTAGE START	AlarmHigh voltage BATTERY START
E068	START BUTTON	Press the START button on the control panel panel at MAN
E069	STOP BUTTON	Press the STOP button on the control panel panel in MAN
E092	AL03-FAULT FREQUENCY POWER SUPPLY	Alarm Incorrect mains frequency
E100	AL33-PRESSURE SWITCH SYSTEM SHORT CIRCUIT	Alarm Pump demand pressure switch short-circuited
E101	AL34-PRESSURE SWITCH SYSTEM OPEN CIRCUIT	Alarm Pump demand pressure switch in open circuit
E108	AL32- LOW LEVEL PRIMING TANK	Low Priming Tank Level Alarm
E116	AL39-FAULT SYSTEM PRESSURE TRANSDUCER	Alarm System pressure transducer failure
E119	MANUALLY CONFIGURED	The control panel has been configured manually.
E122	DELETED EVENTS	Events have been removed
E124	AL40-FAULT COMMUNICATIONS I/O	Alarm HMI - I/O communication fault
E125	AL66-ECM SELECTED ALTERNATIVE POSITION	ECM alarm in alternative position
E128	AL69- ECM FAULT	ECM Fault Alarm
E131	AL72- LOW FLOW COOLANT WATER	Low cooling water flow alarm
E133	AL74-FUEL TANK LEAK	Fuel tank leak alarm
E134	AL63-FAULT CRANK SOLENOID	Starter coils failure alarm
E135	AL09-HIGH VOLTAGE BATTERY CONTROL	Alarm High battery voltage CONTROL
E137	AL64-FAULT DC POWER SUPPLY	Alarm Battery power failure
E138	AL10-BATTERY START DEFECTIVE	Alarm BATTERY START defective
E139	AL11-BATTERY CONTROL DEFECTIVE	Alarm BATTERY CONTROL defective
E140	TRANSDUCER DEMAND: ON	Demand detected by pressure transducer
E141	TRANSDUCER DEMAND: OFF	Demand for pressure transducers disappears
E145	LOCKOUT: ON	Activated input lockout
E146	LOCKOUT: OFF	Lockout input deactivated
E151	PUMP RUNNING	Engine running detection
E152	ENGINE STOPPED	Stalled engine detection
E153	REMOTELY CONFIGURED	Remotely configured (Wifi)
E155	REMOTE STOP INPUT: ON	Remote stop input enabled



E156	REMOTE STOP INPUT: OFF	Remote stop input disabled
E158	MAINTENANCE PERFORMED	New maintenance has been carried out
E163	AL14- TRIPPED VOLTAGE PEAK SUPPRESSOR	Surge suppressor device tripped
E174	CONTROL PANEL ON	The control panel has been switched on
E182	R-AL01- FAULT VOLTAGE POWER SUPPLY	Reset alarm 01
E184	R-AL03-FAULT FREQUENCY POWER SUPPLY	Reset alarm 03
E187	R-AL30-PUMP DISCHARGE PRESSURE FAILURE	Reset alarm 30
E190	R-AL31- LOW LEVEL RESERVOIR TANK	Reset alarm 31
E191	R-AL32- LOW LEVEL PRIMING TANK	Reset alarm 32
E192	R-AL12- FAULT BATTERY CHARGER START	Reset alarm 12
E194	R-AL06-LOW VOLTAGE BATTERY START	Reset alarm 06
E195	R-AL33-PRESSURE SWITCH SYSTEM SHORT CIRCUIT	Reset alarm 33
E196	R-AL34-PRESSURE SWITCH SYSTEM OPEN CIRCUIT	Reset alarm 34
E202	R-AL39-FAULT SYSTEM PRESSURE TRANSDUCER	Reset alarm 39
E203	R-AL62- FAILED TO START ENGINE	Reset alarm 62
E211	R-AL14-TRIPPED VOLTAGE PEAK SUPPRESSOR	Reset alarm 14
E225	PUMP DEMAND: ON	Pump start demand activated
E226	PUMP DEMAND: OFF	All sources of demand disappear
E227	PUMP RUNNING WITH PRESSURE	Engine running and with active boost pressure
E228	R-AL57-OVERSPEED	Reset alarm 57
E229	R-AL58-LOW OIL PRESSURE	Reset alarm 58
E230	R-AL50-HIGH ENGINE WATER TEMPERATURE ENGINE	Reset alarm 50
E231	R-AL54-LOW FUEL LEVEL	Reset alarm 54
E232	R-AL07-LOW VOLTAGE BATTERY CONTROL	Reset alarm 07
E233	R-AL13-BATTERY CHARGER FAILURE CONTROL	Reset alarm 13
E234	R-AL59- TRIPPED HEATER PROTECTION	Reset alarm 10
E235	R-AL60- FAULT CRANKING MOTOR VOLTAGE	Reset alarm 60
E236	R-AL56- FAULT ENGINE SPEED SENSOR	Reset alarm 56
E237	R-AL40-FAULT COMMUNICATIONS I/O	Reset alarm 40
E238	R-AL66-ECM ALTERNATIVE POSITION	Reset alarm 66
E241	R-AL69-ECM FAULT	Reset alarm 69
E244	R-AL72-LOW FLOW COOLANT WATER	Reset alarm 72
E246	R-AL74-FUEL TANK LEAK	Reset alarm 74
E247	R-AL63-FAULT CRANK SOLENOID	Reset alarm 63
E248	R-AL52-LOW ENGINE WATER TEMPERATURE	Reset alarm 52
E250	R-AL64-FAULT DC POWER SUPPLY	Reset alarm 64
E251	R-AL08-HIGH VOLTAGE BATTERY START	Reset alarm 08
E252	R-AL09-HIGH VOLTAGE BATTERY CONTROL	Reset alarm 09
E253	R-AL10-BATTERY START DEFECTIVE	Reset alarm 10
E254	R-AL11-BATTERY CONTROLDEFECTIVE	Reset alarm 11
E256	R-AL61- FAULT AUXILIARY ALTERNATOR	Reset alarm 61
E257	MANUAL ALARMS RESET	Manual alarm reset, with push button
E262	AL43-WIFI COMMUNICATION FAILURE	HMI - WIFI Communication Failure Alarm
E263	R-AL43-WIFI COMMUNICATION FAILURE	Reset alarm 43
E273	AL44-LOW TEMPERATURE ROOM	Low room temperature alarm
E274	R-AL44-LOW TEMPERATURE ROOM	Reset alarm 44
E275	AL45-HIGH TEMPERATURE ROOM	High room temperature alarm
E276	R-AL45-HIGH TEMPERATURE ROOM	Reset alarm 45
E277	AL46-ROOM TEMPERATURE TRANSDUCER FAILURE	Alarm Room temperature transducer failure



E278	R-AL46-ROOM TEMPERATURE TRANSDUCER FAILURE	Reset alarm 46
E279	AL76-FUEL GAUGE FAILURE	Alarm Fuel level transducer failure
E280	R-AL76-FUEL GAUGE FAILURE	Reset alarm 76
E281	AL77-OIL PRESSURE TRANSDUCER FAILURE	Alarm Oil pressure transducer failure
E282	R-AL77-FAILURE OIL PRESSURE TRANSDUCER	Reset alarm 77
E283	AL78-WATER TEMPERATURE TRANSDUCER FAILURE	Alarm Water temperature transducer failure
E284	R-AL78-WATER TEMPERATURE TRANSDUCER FAILURE	Reset alarm 78
E285	AL79-OIL TEMPERATURE TRANSDUCER FAILURE	Alarm Oil temperature transducer failure
E286	R-AL79-OIL TEMPERATURE TRANSDUCER FAILURE	Reset alarm 79
E297	START DEMAND SENSOR FAILURE: ON	Pump start demand due to sensor failure: ON
E298	START DEMAND SENSOR FAILURE: OFF	Pump start demand due to sensor fault: OFF
E299	R-AL51-HIGH ENGINE OIL TEMPERATURE	Reset alarm 51
E300	AL53-LOW ENGINE OIL TEMPERATURE	Low engine oil temperature alarm
E301	R-AL53-LOW ENGINE OIL TEMPERATURE	Alarm 53 reset
E302	BATTERY EQUALISATION: ON	Equalisation process started
E303	BATTERY EQUALISATION: OFF	Equalisation process completed
E304	R-AL80-RUNNING FAILURE	Alarm 80 reset
E305	OVERSPEED TEST OK	
E306	OVERSPEED TEST NOT OK	
E315	AL87-FUEL VALVE FAULT	Fuel valve fault alarm
E316	R-AL87-FUEL VALVE FAULT	Alarm 87 reset
E317	AL81-OBSTRUCTION FAULT	Obstruction fault alarm
E318	R-AL81- OBSTRUCTION FAULT	Alarm 81 reset
E319	AL82-VENTILATION OUTLET OPEN FAULT	Ventilation outlet opening fault alarm
E320	R-AL82- VENTILATION OUTPUTS OPEN FAULT	Alarm 82 reset
E321	AL48-TRANSD. FAILURE 2 SYSTEM PRESSURE	Transducer 2 fault alarm
E322	R-AL48-TRANSD. FAILURE 2 SYSTEM PRESSURE	Alarm 48 reset
E323	AL49-DIFFERENCE MEASURED BY SYSTEM PRESSURE TRANSDUCERS	System pressure transducer measurement fault alarm
E324	R- AL49-DIFFERENCE MEASURED BY SYSTEM PRESSURE TRANSDUCERS	Alarm 49 reset
E325	TRANSDUCER 2 DEMAND: ON	Demand detected by pressure transducer 2
E326	TRANSDUCER 2 DEMAND: OFF	Demand from pressure transducer 2 disappears.
E327	AL83-LOW WATER LEVEL IN MOTOR	Low engine water level alarm
E328	R-AL83-LOW ENGINE WATER LEVEL	Alarm 83 reset
E345	R-AL84-START RELAY FAULT (CAN)	Alarm 84 reset
E346	R-AL85-LOW COOLANT LEVEL	Alarm 85 reset
E351	AL88-COOLING WATER VALVE FAULT	Cooling water valve fault alarm
E352	R-AL88-COOLING WATER VALVE FAULT	Alarm 88 reset
E363	AL89-START MOTOR CONNECTION FAULT	Start motor connection fault alarm
E364	R-AL89-START MOTOR CONNECTION FAULT	Alarm 89 reset
E383	AL255	Water reserve empty alarm
E384	R-AL255-WATER RESERVOIR EMPTY	Alarm reset 255
E385	AL256-FLOW METER ACTIVATED	Flow meter alarm activated
E386	R-AL256-FLOW METER ACTIVATED	Reset alarm 256
E387	AL257-RELIEF VALVE OPEN	Relief valve open alarm
E388	R- AL257-RELIEF VALVE OPEN	Alarm 257 reset



## 10.2. PRESSURE RECORDING

The SCF C900-D-AS control panel stores up to 12,000 system pressure readings from the **W2** I-SYSTEM PRESSURE TRANSDUCER.

Each pressure capture is performed when any of the following conditions occur:

N°	PRESSURE CAPTURE
01	Activation of start-up demand
02	Deactivation of start-up demand
03	The pump changes its status from stop to running or vice versa.
04	Pressure variation: Capture every minute if there is a variation of at least <b>C2.14</b> RECORD SYSTEM PRESSURE VARIATION between the previously captured pressure and the current capture.
05	Every 30S whatever happens

For each capture, a record is made in which the following data is provided:

N°	DATA IN EACH PRESSURE RECORD
01	Date and time: YY/MM/DD hh:mm:ss
02	System pressure read: XX.X bar
03	Current set demand activation pressure: <b>C4.5</b> PRESSURE DEMAND PUMP
04	End of demand pressure currently set: <b>C4.6</b> PRESSURE NO DEMAND PUMP
05	Status records: (Only visible in software and by downloading the file via USB flash drive.)
06	Status 0: Demand status: 1: Start-up demand exists 0: No start-up demand  Status 1: Pump status: 1: On the move 0: Stop

## VISUALISATION OF PRESSURE RECORDINGS ON DISPLAY

bar	PRESSURES HISTORY LOGS						1/25	PRESSURE RECORDING
DATE	TIME	PRES	START	STOP	DEM	P.R.		
2021.01.25	10:33:25	15.3	08.5	08.8	N	N	The SCF C900-D-AS control panel stores a record of the last 12,000 system pressure variations indexed by date and time: hh:mm:ss of occurrence. The last 200 are presented in display. All 12,000 can be viewed from the embedded website. In addition, the following information is presented in each line: <ul style="list-style-type: none"> <li>• Pressure demand</li> <li>• No demand pressure</li> <li>• Existence of start-up demand: Yes / No</li> <li>• Engine running: Yes / No</li> </ul>	
2021.01.25	10:32:05	15.1	08.5	08.8	N	N		
2021.01.25	10:32:01	14.8	08.5	08.8	N	Y		
2021.01.25	10:31:05	14.6	08.5	08.8	N	Y		
2021.01.25	10:30:12	10.3	08.5	08.8	Y	Y		
2021.01.25	10:29:23	08.2	08.5	08.8	Y	N		
2021.01.25	10:28:45	15.2	08.5	08.8	N	N		
2021.01.25	10:27:59	15.7	08.5	08.8	N	N		



### 10.3. PUMP PERFORMANCE TEST

The SCF C900-D-AS control panel allows recording and storing in memory the results of the periodic tests prescribed in most of the international standards and technical rules for fire-fighting installations.

It is possible to store up to 50 tests, each of which consists of the storage of the values collected at a maximum of 5 points. Each of the 50 stored tests is identified by 4 characters entered by the user responsible for carrying out the test and the Date/Time when the test was carried out:

Each of the capture points that make up each test records the following information collected at the time of point gestation (provided that a sensor is connected):

N°	PUMP PERFORMANCE TEST		
<b>P<sub>DISCH</sub>:</b>	Discharge or system pressure measured at manifold	<b>RPM:</b>	Engine speed
<b>P<sub>SUCT</sub>:</b>	Pump suction pressure	<b>T(h2o):</b>	Engine water temperature
<b>P<sub>PUMP</sub>:</b>	Pump pressure (Pdisch - Psuct)	<b>T(oil):</b>	Engine oil temperature
<b>Q:</b>	Flow rate	<b>P (oil):</b>	Engine oil pressure

In case one of the following transducers is not present or enabled:

- o Discharge pressure
- o Suction pressure
- o Flow rate

The value of the corresponding physical measurement may be entered manually.

#### 10.3.1. VISUALIZATION OF PUMP PERFORMANCE ON DISPLAY SCF840-D

	<p>PUMP PERFORMANCE TEST REGISTERS</p> <p>The SCF C900-D-AS control panel stores up to 50 different test records. The 5 stored points of each test can be consulted.</p>
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## 10.4. STATISTICS

In order to facilitate maintenance work and to assist in the identification of possible faults in the pump motor set, the SCF C900-D-AS control panel creates and stores a number of valuable records which are displayed on the screen.

The list of statistical records is shown below.

STATISTICAL REGISTERS			
1	Maximum and minimum Mains voltage	8	Maximum engine oil pressure
2	Maximum and minimum Battery A voltage	9	Maximum and minimum system pressure
3	Maximum and minimum Battery B voltage	10	Maximum and minimum engine speed
4	Maximum battery A charging current	11	Maximum and minimum Ambient temperature: - Temperatures above 60°C / 140°F will be indicated as > 60°C / > 140°F - Temperatures below -10°C / 14°F will be indicated as < -10°C / < 14°F
5	Maximum charging B current battery		
6	Maximum and minimum Engine water temperature		
7	Maximum and minimum Engine oil temperature		

In addition to the values of the records, the time Day / hour / min / s at which they have been produced will be shown.

The statistical records are grouped in two tables according to the time at which they were first stored, thus we have:

### a) HISTORICAL

This table contains the records generated since the first switching on of the SCF C900-D-AS control panel and cannot be deleted by the user.

In addition to the values in this table, the following values are shown:

- Total pump start time (hours and minutes)
- Number of pump starts
- Date and time of last pump start

### b) PERIOD

Here are the records generated since the last time the user generated and reset the period and the previously saved values.

#### 10.4.1. VISUALIZATION OF STATISTICS ON DISPLAY SCF C900-D-AS

<p style="text-align: center;">STATISTICS (HISTORICAL) 1/4</p> <p>Commissioning date: 2022/01/01 10:25:33</p> <p>Time total pump running: 15h 25m</p> <p>Number of starts pump: 18</p> <p>Last pump start: 2022/01/15 14:23:35</p>	<p style="text-align: center;">STATISTICS (HISTORICAL) 2/4</p> <p>System pressure Max: 8.6 bar 2023/01/01 10:25:33 Min: 8.3 bar 2023/02/05 11:33:10</p> <p>Power supply voltage Max: 239 V 2023/02/01 10:15:21 Min: 228 V 2023/02/05 11:33:10</p> <p>Ambient temp. Max: 28.5 °C 2023/01/01 10:25:33 Min: 15.2 °C 2023/02/05 11:33:10</p>	<p style="text-align: center;">STATISTICS (HISTORICAL) 3/4</p> <p>Engine water temp. Max: 85°C 2023/01/18 20:18:33 Min: 28°C 2023/02/01 06:18:10</p> <p>Engine oil temp. Max: 88°C 2023/01/18 20:19:21 Min: 26°C 2023/02/05 05:02:10</p> <p>Engine oil pressure Max: 7.1bar 2023/01/14 10:25:33</p> <p>Speed Max: 3020rpm 2023/01/18 21:10:10 Min: 2995rpm 2023/02/05 09:18:15</p>
<p style="text-align: center;">STATISTICS (HISTORICAL) 4/4</p> <p>Battery voltage A Max: 13.8V 2023/01/18 20:18:33 Min: 12.8V 2023/02/01 06:18:10</p> <p>Battery voltage B Max: 13.9V 2023/01/18 20:19:21 Min: 13.0V 2023/02/05 05:02:10</p> <p>Battery charg. A Amps Max: 7.1A 2023/01/14 10:25:33</p> <p>Battery charg. B Amps Max: 6.8A 2023/01/18 21:10:10</p>	<p style="text-align: center;">STATISTICS (PERIOD) 1/4</p> <p>Start date: 2023/02/18 10:00:33</p> <p>Time total pump running: 15h 25m</p> <p>Number of starts pump: 18</p> <p style="text-align: right;">Re-start Period and Values </p>	



## 11. MAINTENANCE

In order to facilitate maintenance work and to assist in the identification of possible faults in the pump motor set, the SCF C900-D-AS control panel creates and stores a series of valuable records which are displayed on the screen.

<p style="text-align: center; margin: 0;">MAINTENANCE</p> <ul style="list-style-type: none"> <li style="padding: 2px 5px;">ABOUT...</li> <li style="padding: 2px 5px;">COMPANY AND CALENDAR</li> <li style="padding: 2px 5px;">IN-OUT TEST</li> <li style="padding: 2px 5px;">PUMP PERFORMANCE TEST.</li> <li style="padding: 2px 5px;">OVERSPEED TEST</li> <li style="padding: 2px 5px;">AUTOMATIC WEEKLY TEST PROGRAMMER</li> </ul>	<p>Access </p> <hr/> <p>This screen shows the utilities focused on the technical maintenance personnel of the motor-pump set.</p>
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### 11.1. COMPANY AND CALENDAR

The contact details of the assigned maintenance company as well as the date of the last and next maintenance action can be entered into the SCF C900-D-AS panel via the embedded web and wifi connection.

Nº MODIFIABLE DATA ON THE EMBEDDED WEBSITE			
1	Configure the period of time between maintenances	4	Enter the date of commissioning of the installation.
2	Consult the date of the last maintenance carried out	5	Enter the details of the maintenance company (name + telephone number).
3	Register a new maintenance		

Data entered via the embedded web can be displayed on the SCF C900-D-AS control panel display.

Nº SCF C900-D-AS DISPLAY DATA VISUALISATION			
1	Name and telephone number of maintenance company	4	Date of next maintenance
2	Period until the next maintenance action	5	Date of commissioning of the installation
3	Date, company and person who has carried out the last maintenance		

#### 11.1.1. INSTALLATION COMMISSIONING REGISTER

For the purposes of warranty management, the SCF C900-D-AS control panel provides the option of recording the date on which the installation was properly commissioned.

Nº INSTALLATION COMMISSIONING REGISTER		
1	Access	In case no date has been previously registered, "---" and a flashing symbol  will be displayed indicating that registration is pending.
2	Activation	Pulse
3	Result	The SCF C900-D-AS control panel registers the current date as the commissioning date of the system.
4	In case the control panel is switched on continuously for 1 week (168h), the commissioning date is automatically recorded.	



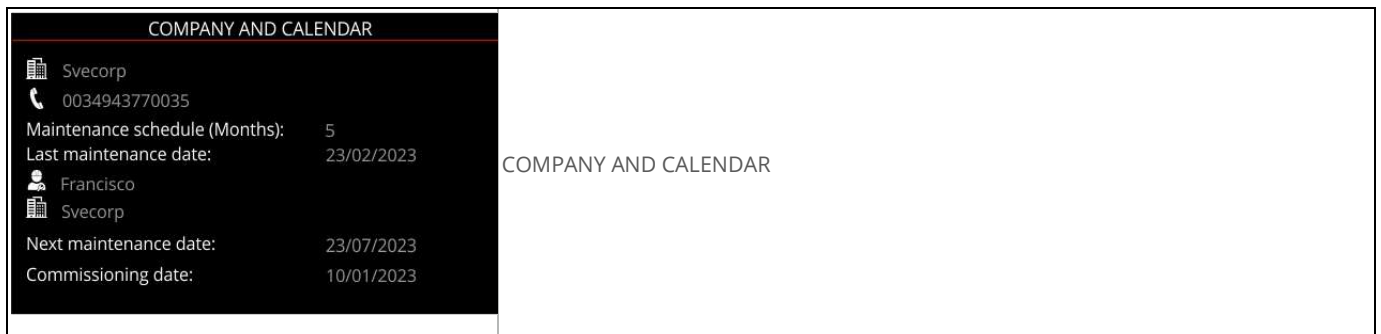
### 11.1.2. INSTALLATION MAINTENANCE RECORD

In order to assist in the management of maintenance work, the SCF C900-D-AS control panel will be able to remind by means of pop-up screens the need for scheduled maintenance to be carried out once the time established by the person responsible for carrying out the maintenance has elapsed.

On the SCF C900-D-AS control panel, the following related information can be displayed and edited:

- Time period between one maintenance action and the next.
- Date of the last maintenance performed
- Date of the next maintenance
- Details of the maintenance company (Name + phone number)

The screen available on the display of the SCF C900-D-AS control panel is shown below.







### 11.2. INPUT/OUTPUT TEST

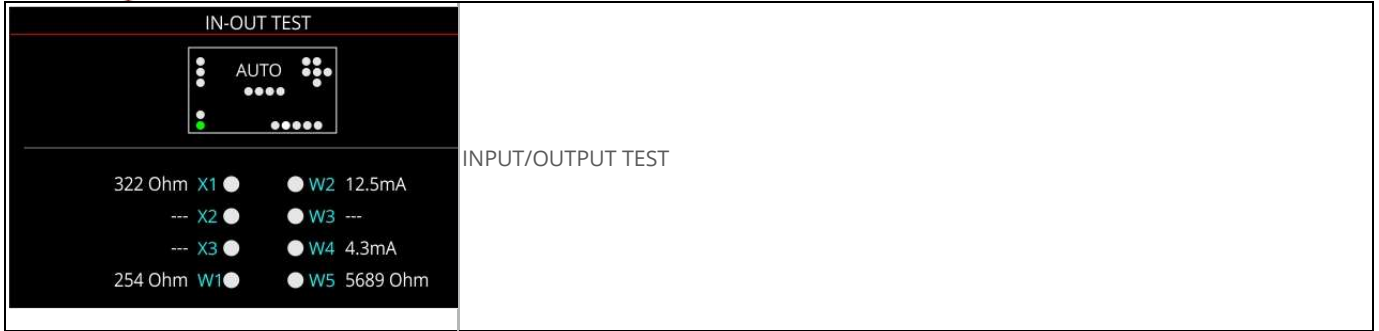
The SCF C900-D-AS control panel offers the possibility to check the way in which all external information managed by it is received and output.

This is a very useful tool both in the commissioning of the installation and in periodic maintenance operations, as it allows the operation of all electrical and mechanical signals to be checked and their correct detection and processing by the SCF C900-D-AS control panel to be verified.

The information available on display is as follows:

Nº	INPUT/OUTPUT TEST	
01	Status of control panel and HMI inputs	A green circle indicates active
02	Status of control panel and HMI outputs	A green circle indicates active
03	Detection status of the R9 and R10 starting coils	A yellow circle indicates failure
04	Status of push buttons	A green circle indicates that it is pressed
05	Resistance value of resistive transducer inputs (X1-X3, W1)	 Pressing  displays the resistance values read by the SCF C900-D-AS panel.
06	Current value of 4-20mA transducer inputs (W2-W5)	 Pressing  displays the Amp values read by the SCF C900-D-AS panel.

The screen available on the display of the SCF C900-D-AS control panel is shown below.



### 11.3. PUMP PERFORMANCE TEST

The SCF C900-D-AS control panel allows recording and storing in memory the results of the periodic tests prescribed in most of the international standards and technical rules for fire-fighting installations.

The storage of up to 50 tests is allowed, each of which will consist of the storage of the values collected in a maximum of 5 points. Each of the 50 stored tests is identified by 4 characters entered by the user responsible for carrying out the test and the Date/Time when the test was carried out:

Each of the capture points that make up each test shall record the following information collected at the time of point gestation (provided that a sensor is connected):

N°	PUMP PERFORMANCE TEST		
<b>P<sub>DISCH</sub>:</b>	Discharge or system pressure measured at manifold	<b>RPM:</b>	Engine speed
<b>P<sub>SUCT</sub>:</b>	Pump suction pressure	<b>T(h2o):</b>	Engine water temperature
<b>P<sub>PUMP</sub>:</b>	Pump pressure (Pdisch - Psuct)	<b>T(oil):</b>	Engine oil temperature
<b>Q:</b>	Flow rate	<b>P (oil):</b>	Engine oil pressure

#### 11.3.1. PRECONDITIONS

N°	PUMP PRE-TEST CHECKS	
01	Discharge or system pressure	<b>W2</b> I-SYSTEM PRESSURE TRANSDUCER Parameters: <b>C6.1</b> ENABLE SYSTEM PRESSURE TRANSDUCER and <b>C6.2</b> SCALE SYSTEM PRESSURE TRANSDUCER
02	Flow rate	<b>W4</b> I-PUMP FLOW TRANSDUCER Parameters: <b>C6.3</b> ENABLE FLOW SENSOR: Yes, and <b>C6.4</b> SCALE FLOW SENSOR
		No external flow measurement. Manual input Parameter(s): <b>C6.3</b> : ENABLE FLOW SENSOR: No



### 11.3.2. ACCESS AND EXIT TO PUMP TEST

The pump test is accessed via the maintenance screen.

N°			
1	Access		

### 11.3.3. PUMP TEST DEVELOPMENT

The process of generating and displaying pump test records is described below:

N°																																																															
01	Select AUTO mode  and start de pump																																																														
02	Enter voluntary identifier of the user performing the new test.																																																														
03	Capture each test point (up to 5) that make up each pump test record:		<table border="1"> <thead> <tr> <th></th> <th>bar</th> <th>REGISTRO CURVA DE LA BOMBA</th> <th>1/50</th> </tr> </thead> <tbody> <tr> <td>Prueba</td> <td>2021.01.25</td> <td>10:33:25</td> <td></td> </tr> <tr> <td></td> <td>ACAB</td> <td></td> <td></td> </tr> <tr> <th></th> <th>Pbomba</th> <th>Psucc.</th> <th>Q(m3/h)</th> <th>rpm</th> <th>T(H2O)</th> <th>T(OIL)</th> <th>P(OIL)</th> </tr> <tr> <td>1</td> <td>5.6</td> <td>00.0</td> <td>1.2</td> <td>1500</td> <td>35</td> <td>36</td> <td>5.3</td> </tr> <tr> <td>2</td> <td>6.5</td> <td>00.0</td> <td>3.2</td> <td>2000</td> <td>38</td> <td>39</td> <td>6.3</td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		bar	REGISTRO CURVA DE LA BOMBA	1/50	Prueba	2021.01.25	10:33:25			ACAB				Pbomba	Psucc.	Q(m3/h)	rpm	T(H2O)	T(OIL)	P(OIL)	1	5.6	00.0	1.2	1500	35	36	5.3	2	6.5	00.0	3.2	2000	38	39	6.3	3								4								5							
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2	6.5	00.0	3.2	2000	38	39	6.3																																																								
3																																																															
4																																																															
5																																																															
04	End pump test. Save or Discard																																																														

### 11.3.4. VISUALISATION OF PUMP TESTS

REGISTERS		
	Access	
	<p>This screen shows, in different sections, all the information registered and gives access to the corresponding document downloads.</p>	



REGISTRO CURVA DE LA BOMBA							
bar							1/50
Prueba	2021.01.25 10:33:25						
ACAB							
Pbomba	Psucc.	Q(m3/h)	rpm	T(H2O)	T(OIL)	P(OIL)	
1	5.6	00.0	1.2	1500	35	36	5.3
2	6.5	00.0	3.2	2000	38	39	6.3
3							
4							
5							
✓ Guardar punto    ▲▼ Valor Q    ↻ Salir							

PUMP TEST RECORDS

The SCF C900-D-AS control panel stores up to 50 different test records. The 5 points stored for each test can be consulted.

## 11.4. ENGINE OVERSPEED TEST

The SCF C900-D-AS control panels allow the verification of the overspeed alarm. This is an intrinsic function in the NFPA 20 instrument panels and has been integrated into the SCF C900-D-AS panel itself for those cases where there is no need to opt for a separate instrument panel and have all the functions in the SCF C900-D-AS control panel itself.

### 11.4.1. ACCESS TO OVERSPEED TEST

Access to the overspeed test is via the maintenance screen.

Nº			
1	Access		MAINTENANCE ABOUT... COMPANY AND CALENDAR IN-OUT TEST PUMP PERFORMANCE TEST. OVERSPEED TEST AUTOMATIC WEEKLY TEST PROGRAMMER

Nº	OVER SPEED TEST PROCESS	
1		<p>Press the  button on the front of the SCF C900-D-AS panel.</p> <p>The overspeed limit will take the value of <b>C3.3</b> Nominal speed -200 rpm (will turn blue).</p> <p>The nominal (test) speed will be equal to the overspeed limit (Test) /1.2 (will turn blue).</p> <p>If the pump was not previously started, a yellow message will be displayed: "START THE PUMP".</p> <p>Once the pump has been detected as started, the test will end if the over speed alarm occurs (test OK) or if 25s elapse without detecting the alarm (test Not OK).</p> <p>The test result will be recorded in the events log.</p> <p>After the test is finished, the nominal values for speed and overspeed will return to their original figures.</p>



## 12. COMMUNICATIONS

The SCF C900-D-AS control panel offers the following communications options:

N°			
01	Ethernet MODBUS TCP/IP	SCF C900-D-AS ← ----- → PC	By means of the SCOM903 card. Not supplied by default. Order from SVE Corp.
02	RS485 MODBUS / RTU	SCF C900-D-AS ← ----- → PC	By means of the SCOM901 card. Not supplied by default. Order from SVE Corp.

A more extensive description of each of the options set out in the table above follows:

### 12.1 ETHERNET COMMUNICATION

The SCF C900-D-AS control panel has a port on the rear of the door which, by inserting the E-IP card, optionally supplied separately, allows Ethernet communication and thus allows all the status and data generated in the panel to be collected on a remote PC.

The characteristics of the elements that constitute this type of communication are described below.

N°	ETHERNET COMMUNICATION FEATURES		
01	IP address assignment: C14.6-ETHERNET IP ASSIGNMENT	DHCP: The IP address to the SCF C900-D-AS is dynamically assigned.	
		Fixed IP: SCF C900-D-AS sets the IP to be assigned to it when it enters the network. The IP address, Subnet Mask and Gateway must be configured in the controller.	
02	Network types	<b>LAN (Local Area Network)</b>	SCF C900-D-AS will be connected to a server, router, switch, etc. via an Ethernet cable. Controlling is done from a PC connected to the same network.
		<b>WAN (Ethernet)</b>	SCF C900-D-AS will be connected to a router, which in turn is connected to the Internet. Controlling is done from a PC connected anywhere.
		<b>Point to point:</b>	The connection is made between the SCF C900-D-AS and the PC using a crossover cable.
03	Protocol	Modbus TCP	

### 12.2 COMMUNICATION RS 485

The SCF C900-D-AS control panel has a port on the rear of the door which, by inserting the E-485 card, optionally supplied separately, allows RS485 communication and thus allows all the status and data generated in the panel to be collected on a remote PC.

Through this communication, the SCF C900-D-AS control panel's internal parameter setting functions can be carried out and the status of the installation can be controlled from a remote PC.

The characteristics of the elements that constitute this type of communication are described below.

N°	RS485 COMMUNICATION FEATURES		
01	Type of network	RS485	
02	Maximum cabling distance	1.200 m	
03	Connection mode	<b>Options</b>	9600 8N2 / 9600 8E1 / 19200 8N2 / 19200 8E1 / 115200 8N2 115200 8E1 / 115200 8N1
04	Protocol	Modbus RTU	




## 13. CONFIGURATION MENU

The control panels of the SCF C900-D-AS series offer the possibility of being adapted to the requirements of the installations, to the criteria of engineering companies, manufacturers of motor-pump assemblies, etc...

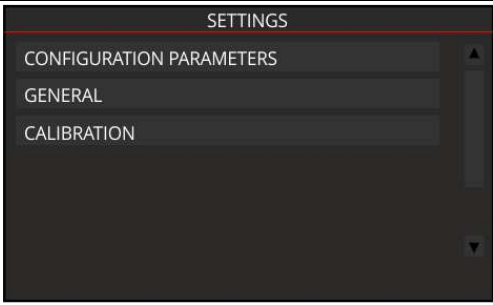

### 13.1. UTILITIES

#### 13.1.1. PREREQUISITES

The following are the conditions necessary to access the configuration option:

N°	
01	Control panel SCF C900-D-AS mains or battery powered
02	Operating mode CRANK ISOLATE 

#### 13.1.2. ACCESS TO THE CONFIGURATION MENU

	<p>Access </p> <p>This screen provides access to the configuration of the different parameters to adapt the control panel to the different possible conditions of each installation.</p> <ul style="list-style-type: none"> <li>▪ Configurable parameters</li> <li>▪ General configuration</li> <li>▪ Calibration</li> </ul>
--	---

## 13.2. CONFIGURATION OPTIONS

### 13.2.1. PARAMETERS

The parameters with which the SCF C900-D-AS control panels are configured at the factory are in accordance with the most common requirements of the pump-motor units and with the current fire-fighting standards covered by this manual:

N°	REFERENCE STANDARDS
01	AS 2941 regulation 2013
02	AS/NZS 3000:2018 Standard
03	EN 61439-1 Low-voltage switchgear

The values with which the parameters of the SCF C900-D-AS control panel are configured are called "default values". In the CONFIGURABLE PARAMETERS table, they are shaded and in bold. **The selection of other values by the user may result in the SCF C900-D-AS controller operating differently from those indicated in the standards and therefore the installer is fully responsible for the general operation of the installation.** In any case, the SCF C900-D-AS control panel manufacturer has exclusive access to the so-called OEM parameters.

To modify the value of any parameter the SCF C900-D-AS control panel will request the entry of a password. The password with which the SCF C900-D-AS control panel is configured at the factory is 0000 configurable **C15.1** PASSWORD



The following is a list of the different configuration parameters classified according to the following index:

N°	INDEX	N°	
C3	Diesel pump	C8	Batteries / Chargers
C4	Start/stop conditions	C9	Configurables inputs
C5	System	C10	Potential-free relay outputs
C6	Transducers	C11	Configurables outputs
C7	Electricity grid		

C3 DIESEL MOTOR PUMP				
N°	NAME	DESCRIPTION	SELECTABLE OPTIONS	
C3.1	ENABLE ENGINE SPEED MEASUREMENT	Engine rpm measurement	No	Yes
C3.2	NUMBER OF TEETH FLYWHEEL RING	Number of teeth of the engine flywheel ring. (If C3.1 = yes)	100	From 1 to 250
C3.3	RATED SPEED	Rated engine speed RPM. (If C3.1 = yes)	2000	From 1000 to 5100
C3.4	NUMBER OF START-UP ATTEMPTS	Maximum number of planned start attempts between the two batteries	6	From 1 to 99s
C3.5	CRANCK WITHDRAW FOR OIL PRESSURE	Oil pressure engine running detection	No	Yes / No
C3.6	TIME MAXIMUM PUMP START	Duration in sec. of each start attempt	10	From 1 to 99s
C3.7	DELAY BETWEEN SUCCESIVE PUMP CRANK	Duration in sec. of pause between start attemp	20	From 1 to 99s
C3.8	TIME STOPPING PUMP	Duration of the fuel cut-off command to achieve engine shutdown	8	From 2 to 99s
C3.9	AUXILIARY ALTERNATOR PRIMING	Engine alternator priming	SI	No
C3.10	DELAY DELAYED ALARMS WHATCH	Delayed controlling of alarms upon detection of engine running: AL30, AL50, AL51, AL58, AL61	5	From 0 to 99s
C3.13	PUMP DISCHARGE PRESSURE SWITCH	Type of contact of the discharge pressure signal P3 I-PUMP DISCHARGE PRESSURE SWITCH	Closed with pressure OK	Closed / open with pressure OK
C3.14	PUMP STOPPED BY ENGINE ALARMS	STOP by alarms AL57- OVER SPEED, AL58: LOW OIL PRESSURE and AL50: HIGH ENGINE WATER TEMPERATURE AL51: HIGH ENGINE OIL TEMPERATURE	No	Yes/No
C3.15	OUTPUT ENGINE HEATER	Heating output function	Temperature control	Temperature control / Always on
C3.16	MINIMUM HEATING TEMPERATURE	Minimum engine temperature engine heating process activation. If C3.15= Temperature control	40°C (104°F)	20°C / 80°F at MAXIMUM HEATING TEMPERATURE Value (C3.17)
C3.17	MAXIMUM HEATING TEMPERATURE	Maximum engine temperature for engine heating process deactivation If C3.15= Temperature control	80°C (176°F)	From MINIMUM HEATING TEMPERATURE value (C3.16) to 100 °C /212°C
C3.18	COOLING CIRCUIT CONTROL	Type of cooling valve activation	Powered by engine running	Powered with engine stopped
C3.19	DELAY END OF COOLING	Delay after engine shutdown to deactivate the delayed cooling signal	5	0-250min
C3.20	STOP SOLENOID OUTPUT CONTROL	Stop solenoid output control	2 wires (R12)	2 wires (R12) 3 wires (R12-pull y R1-hold)



C4 START/STOP CONDITIONS				
N°	NAME	DESCRIPTION	SELECTABLE OPTIONS	
C4.1	PRESSURE SWITCH CONTACT PUMP	Type of contact of the system pressure switch line <b>P1</b> I-PRESSURE SWITCH	<b>Open with pressure OK</b>	Closed / open with pressure OK
C4.2	PRESSURE SWITCH SYSTEM SHORT / OPEN	Short-circuit or open-circuit fault controlling of the pressure switch line <b>P1</b> I-PRESSURE SWITCH	<b>No</b>	Yes/No
C4.3	DELAY DEMAND-PUMP START	Delay between detection of start demand and start of pump start cycle	<b>0</b>	0 to 240s
C4.4	ENABLE PUMP START BY TRANSDUCER	Enablement is required so that demand can be generated from the system pressure transducer. . (If <b>C6.1</b> = yes)	<b>No</b>	Yes/No
C4.5	PRESSURE DEMAND PUMP	System pressure read by the system pressure transducer below which the pump start demand generation is processed. . (If <b>C4.4</b> = yes)	<b>5.0 bar</b>	From 0 to value of <b>C4.6</b>
C4.6	PRESSURE NO DEMAND PUMP	System pressure read by the system pressure transducer above which the pump start demand disappearance is processed.	<b>6.0 bar</b>	From <b>C4.5</b> up to the nominal value of the pressure sensor used <b>C6.2</b> SCALE SYSTEM PRESSURE TRANSDUCER
C4.7	ENABLE AUTOMATIC STOP PUMP	Enable SCF C900-D-AS to automatically stop the pump when the demand disappears.	<b>No</b>	No/Yes
C4.8	DELAY AUTOMATIC STOP PUMP	Delay in minutes after disappearance of demand to give stop order	<b>0</b>	0-250min
C4.13	ENABLE POWER SUPPLY FAULT-PUMP START	Enable pump start demand on electric mains failure	<b>No</b>	No/Yes
C4.14	DELAY POWER SUPPLY FAULT - PUMP START	Delay in seconds between mains failure detection and pump start demand generation. (If <b>C4.13</b> = yes)	<b>0</b>	0-250
C4.15	DELAY POWER SUPPLY RETURN-PUMP STOP	Delay in seconds between detection of mains return and generation of the end of pump demand (If <b>C4.13</b> = yes)	<b>0</b>	0-250s
C4.17	LOW LEVEL PRIMING TANK CONTACT	Contact type of low-level priming tank signal contact <b>P2</b> I-LOW LEVEL PRIMING TANK	<b>Closed with low level</b>	Closed / open with low level
C4.18	ENABLE REMOTE STOP PUMP	Enabling stop in AUTO mode by remote contact connected to one of the configurable inputs.	<b>Yes</b>	No/Yes
C5 SYSTEM				
N°	NAME	DESCRIPTION	SELECTABLE OPTIONS	
C5.1	UNITS PRESSURE	Unit of magnitude of pressure measures	<b>bar</b>	bar PSI kgf/cm2 Mh2O kPa
C5.2	UNITS TEMPERATURE	Units of temperatures measures	<b>°C</b>	°C / °F
C5.3	FLOW UNITS	Unit of flow measurement	<b>m3/h</b>	m3/h Gal/min
C5.4	DISPLAY OFF DELAY TIME	Display off delay time	<b>5 min</b>	Never, 1-99 min
C6 TRANSDUCERS				
N°	NAME	DESCRIPTION	SELECTABLE OPTIONS	
C6.1	ENABLE SYSTEM PRESSURE TRANSDUCER	Hydraulic system pressure transducer (4-20mA) connected <b>W2-I</b> SYSTEM PRESSURE TRANSDUCER	<b>No</b>	No/YES
C6.2	SCALE SYSTEM PRESSURE TRANSDUCER	Pressure value corresponding to the 20mA of the pressure transducer. (If <b>C6.1</b> = yes)	<b>16bar</b>	1 to 100 bar 0 to 1500PSI



				0 to 100.0 Kgf/cm2 0 to 1020 mH2O 0 to 10000kPa
<b>C6.3</b>	ENABLE FLOW SENSOR	Water flow transducer (4-20mA) connected in <b>W4-I</b> PUMP FLOW TRANSDUCER	<b>No</b>	Yes / No
<b>C6.4</b>	SCALE FLOW TRANSDUCER	End of scale in m <sup>3</sup> /h for 20mA reading of flow transducer. . (If <b>C6.3</b> = yes)	<b>100</b>	1-10000 m3/h
<b>C6.8</b>	RECORD SYSTEM PRESSURE VARIATION	Variation of the system pressure causing a recording (If <b>C6.1</b> = yes)	<b>0.1 bar</b>	0.1-10 bar 1-150 PSI 0.1-10 Kgf/cm2 1-150mH2O 1-10000KPa
<b>C6.9</b>	OIL PRESSURE TRANSDUCER	Oil Pressure Sensor Terminal: <b>X2</b> I-OIL PRESSURE TRANSDUCER	<b>VDO360-081-030-009/FAE14980</b>	None VDO360-081-030-009/FAE14980 FAE14630 WEMA SRP10 VEGLIA-ELCOS TPO/403 DATCON 0250x-00 Configurable
<b>C6.10</b>	TRANSDUCER COOLANT WATER TEMPERATURE	Coolant wáter temperature transducer Terminal: <b>X1</b> I-ENGINE WATER TEMPERATURE TRANSDUCER	<b>VDO 801-001/803-001</b>	None VDO 801-004/803-001 VDO 801-001/803-001 FAE 31020 34080 WEMA SP3 DATCON VEGLIA ELCOS TTAO/402 IVECO Configurable
<b>C6.11</b>	FUEL LEVEL TRANSDUCER	Fuel tank level transducer Terminal <b>X3</b> : I-FUEL LEVEL TRANSDUCER	<b>None</b>	None VDO 221-825-011 VDO 226-801-015-001 AST BIGES 310 861-T WEMA 323234 VDO 221-825-025-002 VEGLIA DATCON 0230x_xx Configurable
<b>C6.12</b>	OIL TEMPERATURE TRANSDUCER	Oil temperature transducer Terminal: <b>W1</b> I- ENGINE OIL TEMPERATURE TRANSDUCER	<b>None</b>	None VDO 801-004/803-004 VDO 801-001/803-001 FAE 31020 34080 WEMA SP3 DATCON VEGLIA ELCOS TTAO/402 IVECO Configurable
<b>C6.13</b>	ENABLE PUMP SUCTION PRESSURE TRANSDUCER	Hydraulic system pressure transducer (4-20mA) connected W4-I SUCTION PRESSURE TRANSDUCER	<b>No</b>	No/YES
<b>C6.14</b>	PUMP SUCTION PRESSURE TRANSDUCER FULL SCALE	Pressure value corresponding to 20mA of the pressure transducer	<b>16 bar</b>	1 to 100 bar 0 to 1500 PSI



				0 to 100.0 Kg/cm <sup>2</sup> 0 to 1020 mH <sub>2</sub> O 0 to 10000 kPa
<b>C6.15</b>	MAXIMUM DIFFERENCE BETWEEN TRANSDUCER READINGS	Maximum difference allowed between the measurements provided by the two pressure transducers in the system (If C6.1 = YES)	<b>0.5 bar</b>	0.1-10 bar 1-150 psi 0.1-10 kgf/cm <sup>2</sup> 1-150 mH <sub>2</sub> O 1-1000 kPa

### C7 ELECTRIC MAINS

N°	NAME	DESCRIPTION	SELECTABLE OPTIONS	
<b>C7.2</b>	NOMINAL FREQUENCY	Electric mains frequency	<b>50HZ</b>	50 / 60HZ
<b>C7.3</b>	MINIMUM POWER SUPPLY VOLTAGE	Minimum voltage between phases tolerated below which SCF C900-D-AS generates <b>AL01</b> FAULT VOLTAGE POWER SUPPLY	<b>180Vac</b>	From 100 Vac to <b>C7.4</b>
<b>C7.4</b>	MAXIMUM POWER SUPPLY VOLTAGE	Maximum tolerated phase-to-phase voltage above which SCF C900-D-AS generates <b>AL01</b> FAULT VOLTAGE POWER SUPPLY	<b>260Vac</b>	From <b>C7.3</b> to 300Vac
<b>C7.5</b>	DELAY POWER SUPPLY VOLTAGE ALARM	Out-of-limit tolerance time to generate power supply alarms <b>AL01, AL02, AL03</b>	<b>15</b>	0 To 99s

### C8 BATTERIES / BATTERY CHARGERS

N°	NAME	DESCRIPTION	SELECTABLE OPTIONS	
<b>C8.1</b>	DELAY BATTERY EQUALISATION	Period in hours between battery equalisation actions by the chargers	<b>600</b>	NO / From 10 to 990
<b>C8.2</b>	TIME BATTERY EQUALISATION	Duration in minutes of the battery equalisation performance	<b>15</b>	From 15 to 50 minutes
<b>C8.3</b>	ENABLE ENGINE AUXILIARY ALTERNATOR CURRENT	enable engine auxiliary alternator current	<b>Yes</b>	Yes / No

### C9 CONFIGURABLE INPUTS

N°	NAME	SELECTABLE OPTIONS
<b>C9.1</b>	CONFIGURABLE INPUT P1	<b>F01-PUMP DEMAND PRESSURE SWITCH</b> * List of options
<b>C9.2</b>	CONFIGURABLE INPUT P2	<b>F03-REMOTE STOP</b> * List of options
<b>C9.3</b>	CONFIGURABLE INPUT P3	<b>F02- REMOTE START</b> * List of options
<b>C9.4</b>	CONFIGURABLE INPUT P4	<b>F11- PUMP DISCHARGE PRESSURE SWITCH</b> * List of options
<b>C9.5</b>	CONFIGURABLE INPUT P5	<b>F00-NO FUNCTION</b> * List of options
<b>C9.6</b>	CONFIGURABLE INPUT T1	<b>F00-NO FUNCTION</b> * List of options
<b>C9.7</b>	CONFIGURABLE INPUT T2	<b>F00-NO FUNCTION</b> * List of options
<b>C9.8</b>	CONFIGURABLE INPUT T3	<b>F00-NO FUNCTION</b> * List of options
<b>C9.9</b>	CONFIGURABLE INPUT D1	<b>F14-LOW FUEL LEVEL</b> * List of options
<b>C9.10</b>	CONFIGURABLE INPUT D2	<b>F00-NO FUNCTION</b> * List of options
<b>C9.11</b>	CONFIGURABLE INPUT D3	<b>F17-LOW ENGINE TEMPERATURE CONTACT</b> * List of options
<b>C9.12</b>	CONFIGURABLE INPUT D4	<b>F00-NO FUNCTION</b> * List of options
<b>C9.13</b>	CONFIGURABLE INPUT D5	<b>F00-NO FUNCTION</b> * List of options
<b>C9.14</b>	CONFIGURABLE INPUT D6	<b>F00-NO FUNCTION</b> * List of options
<b>C9.15</b>	CONFIGURABLE INPUT D7	<b>F00-NO FUNCTION</b> * List of options
<b>C9.16</b>	CONFIGURABLE INPUT D8	<b>F00-NO FUNCTION</b> * List of options
<b>C9.17</b>	CONFIGURABLE INPUT R2	<b>F15-CRANKING MOTOR VOLTAGE</b> * List of options
<b>C9.18</b>	CONFIGURABLE INPUT R3	<b>F00-NO FUNCTION</b> * List of options



<b>C9.19</b>	CONFIGURABLE INPUT R4	<b>F13-LOW OIL PRESSURE</b>	* List of options
<b>C9.20</b>	CONFIGURABLE INPUT R5	<b>F12-HIGH ENGINE WATER TEMPERATURE</b>	* List of options
<b>C9.21</b>	CONFIGURABLE INPUT X1	<b>F00-NOT IN USE</b>	* List of options
<b>C9.22</b>	CONFIGURABLE INPUT X2	<b>F00-NOT USED</b>	* List of options
<b>C9.23</b>	CONFIGURABLE INPUT X3	<b>F00-NOT USED</b>	* List of options
<b>C9.24</b>	CONFIGURABLE INPUT W1	<b>F00-NOT USED</b>	* List of options
<b>C9.25</b>	CONFIGURABLE INPUT W2	<b>F00-NOT USED</b>	* List of options
<b>C9.26</b>	CONFIGURABLE INPUT W3	<b>TP02 PUMP FLOW TRANSDUCER</b>	* List of options

**\*LIST OF OPTIONS FOR CONFIGURABLE INPUTS**

<b>N°</b>	<b>*LIST OF OPTIONS FOR CONFIGURABLE INPUTS</b>
<b>F00</b>	NO FUNCTION
<b>F01</b>	PRESSURE SWITCH 1 PUMP DEMAND
<b>F02</b>	REMOTE START
<b>F03</b>	REMOTE STOP
<b>F04</b>	LOCKDOWN
<b>F05</b>	SEND STATUS VIA COMMUNICATION
<b>F06</b>	AUXILIARY ALTERNATOR FAILURE
<b>F07</b>	LOW FLOW COOLANT WATER
<b>F08</b>	TRIPPED VOLTAGE PEAK SUPPRESSOR
<b>F09</b>	LOW PRIMING TANK LEVEL
<b>F10</b>	LOW LEVEL RESERVOIR TANK
<b>F11</b>	PUMP DISCHARGE PRESSURE SWITCH
<b>F12</b>	HIGH ENGINE WATER TEMPERATURE
<b>F13</b>	LOW OIL PRESSURE
<b>F14</b>	LOW FUEL LEVEL
<b>F15</b>	CRANKING MOTOR VOLTAGE
<b>F16</b>	FUEL TANK LEAKAGE
<b>F17</b>	LOW ENGINE WATER TEMPERATURE
<b>F18</b>	ECM FAULT
<b>F19</b>	ECM SELECTED ALTERNATIVE POSITION
<b>F20</b>	CORRECTING TRANSDUCER MEASUREMENTS
<b>F21</b>	ENGINE RUNNING
<b>F22</b>	OVERSPEED
<b>F23</b>	FUEL INJECTION FAILURE
<b>F24</b>	ECM WARNING
<b>F25</b>	LOW SUCTION PRESSURE
<b>F26</b>	HIGH COOLANT WATER TEMPERATURE
<b>F27</b>	DELUGE VALVE
<b>F28</b>	MANUAL REMOTE START
<b>F29</b>	HIGH FUEL LEVEL
<b>F30</b>	HIGH ENGINE OIL TEMPERATURE
<b>F31</b>	LOW ENGINE OIL TEMPERATURE
<b>F32</b>	PRESSURE SWITCH 2 PUMP DEMAND



F33	LOW ROOM TEMPERATURE
F34	VENTILATION BLINDS
F35	OBSTRUCTION FAULT
F36	LOW WATER LEVEL IN MOTOR
F37	FUEL VALVE
F38	COOLING WATER VALVE
F39	START MOTOR CONNECTION MONITORING
F40	EMPTY WATER RESERVOIR
F41	ACTIVE FLOW METER
F42	RELIEF VALVE OPEN

#### C10 CONFIGURABLE POTENTIAL-FREE RELAY OUTPUTS

N°	NAME	SELECTABLE OPTIONS	
C10.1	OUTPUT CONFIGURABLE AR RELAY	F13 COMMON ALARMS	** List of options
C10.2	CONFIGURABLE OUTPUT BR RELAY	F13 COMMON ALARMS	** List of options
C10.3	OUTPUT CONFIGURABLE CR RELAY	F09 NOT IN AUTOMATIC MODE	** List of options
C10.4	CONFIGURABLE OUTPUT DR RELAY	F29 FAILED TO START/NO PRESSURE	** List of options
C10.5	CONFIGURABLE OUTPUT ER RELAY	F08 PUMP RUNNING WITH PRESSURE	** List of options
C10.6	CONFIGURABLE OUTPUT FR RELAY	F08 PUMP RUNNING WITH PRESSURE	** List of options
C10.7	CONFIGURABLE OUTPUT GR RELAY	F26 FAULT VOLTAGE POWER SUPPLY	** List of options

#### C11 CONFIGURABLE OUTPUTS

N°	NAME	SELECTABLE OPTIONS	
C11.1	CONFIGURABLE OUTPUT Q1 (Note 2)	F07-AUXILIARY ALTERNATOR PRIMING	** List of options
C11.2	CONFIGURABLE OUTPUT Q2	F05-COOLING CONTROL	** List of options
C11.3	CONFIGURABLE OUTPUT Q3	F00-NO FUNCTION	** List of options
C11.4	CONFIGURABLE OUTPUT Q4	F00-NO FUNCTION	** List of options

#### \*\* LIST OF OPTIONS FOR CONFIGURABLE OUTPUTS

N°	**LIST OF OPTIONS FOR THE CONFIGURABLE OUTPUTS	
RS00	NO FUNCTION	
RS01	ELECTRONICS ACTIVE: both the interface card and the control card are working.	
RS02	FUEL SOLENOID VALVE	
RS03	ENGINE STOP SOLENOID	
RS04	DRAIN VALVE	
RS05	COOLING CONTROL	
RS06	DELAYED COOLING CONTROL	
RS07	AUXILIARY ALTERNATOR PRIMING (2)	Place the jumper in position "C" in the case of configuring this output with the function <b>F07</b> AUXILIARY ALTERNATOR PRIMING. For the rest of the options, place it in the other position
RS08	PUMP IN SERVICE WITH PRESSURE	
RS09	NOT IN AUTOMATIC MODE	
RS10	AUTO START INHIBITED	NFPA-20 proprietary function: The pump cannot start because one of the following conditions is present: <b>AL16</b> -OVERSPEED, <b>AL62</b> -FAILED TO START ENGINE, not in AUTO, input <b>F04</b>



		LOCKOUT activated (In this case it would start input <b>F02</b> -REMOTE MANUAL START has been activated).
RS11	PUMP START DEMAND	
RS12	RISK OF FAILURE Activated when any of the alarms in the list are present	AL31-LOW WATER RESERVE LEVEL
		AL32-LOW PRIMING TANK LEVEL
		AL33-PRESSOSTAT 1 PUMP SHORT CIRCUIT
		AL34-PRESSURE SWITCH 1 PUMP OPEN CIRCUIT
		AL35-PRESSURE SWITCH 2 PUMP SHORT CIRCUIT
		AL36-PRESSURE SWITCH 2 PUMP OPEN CIRCUIT
		AL39-SYSTEM PRESSURE TRANSDUCER FAILURE
		AL40-I/O COMMUNICATION FAULT
		AL43-WIFI COMMUNICATION FAULT
		AL44-LOW ROOM TEMPERATURE
		AL45-HIGH ROOM TEMPERATURE
		AL46-ROOM TEMPERATURE TRANSDUCER FAULT
		AL48-SYSTEM PRESSURE TRANSDUCER 2 FAULT
		AL49-DIFFERENCE BETWEEN SYSTEM PRESSURE TRANSDUCERS
		AL54-LOW FUEL LEVEL
		AL63-START COIL FAILURE
		AL68-ECM WARNING
AL69-ECM FAULT		
AL73-HIGH FUEL LEVEL		
AL74-FUEL TANK LEAK		
AL76-FUEL TRANSMISSION FAULT		
AL80-DRIVING FAULT		
AL81-OBSTRUCTION FAULT		
AL82-VENTILATION OUTLET OPENING FAULT		
AL83-LOW ENGINE WATER LEVEL		
RS13	COMMON ALARMS	
RS14	NO ACTIVE ALARMS	
RS15	SIREN	
RS16	AL54 - LOW FUEL LEVEL	Any fuel alarm is active
RS17	AL06 - LOW BATTERY VOLTAGE A	
RS18	AL07 - LOW BATTERY VOLTAGE B	
RS19	AL57 - OVERSPEED	
RS20	AL58 - LOW OIL PRESSURE	
RS21	AL30 - FAULT DISCHARGE PRESSURE PUMP	
RS22	AL59 - TRIPPED HEATER PROTECTION	
RS23	AL12 - FAULT BATTERY CHARGER A	
RS24	AL13 - FAULT BATTERY CHARGER B	
RS25	AL50 / AL51 - HIGH ENGINE WATER TEMPERATURE	
RS26	FAULT VOLTAGE POWER SUPPLY	
RS27	AL32-LOW LEVEL PRIMING TANK	
RS28	AL31-LOW LEVEL RESERVOIR TANK	
RS29	FAILED TO START ENGINE	AL62- FAILED TO START ENGINE
		AL30 PUMP DRIVE PRESSURE FAILURE
RS30	MOTOR RUNNING	
RS31	IN AUTO MODE WITHOUT ALARMS	It is activated when the SCF C900-D-AS control panel is in automatic mode, the emergency lock input is not active and there are no active alarms. The NC contact of the AR-GR relays



		is used to obtain the desired function. In the case of configuring this function in an output other than those relays, a relay must be connected to the output and its normally closed contact must be used.
RS33	GENERAL FAULT Activated when any of the alarms in the list are present	AL01-MAINS FAULT AL03-MAINS FREQUENCY FAULT AL06-LOW BATTERY VOLTAGE A AL07-LOW BATTERY VOLTAGE B AL08-HIGH BATTERY VOLTAGE A AL09-HIGH VOLTAGE BATTERY B AL10-BATTERY A DEFECTIVE AL11-BATTERY B DEFECTIVE AL12-CHARGER FAILURE A AL13-CHARGER B FAILURE AL14-OVERVOLTAGE PROTECTION FAILURE AL30-PUMP DRIVE PRESSURE FAULT AL50-HIGH ENGINE WATER TEMPERATURE AL51-HIGH MOTOR OIL TEMPERATURE AL52-LOW ENGINE WATER TEMPERATURE AL53-LOW MOTOR OIL TEMPERATURE AL56-MOTOR SPEED SENSOR FAILURE AL57-OVERSPEED AL58-LOW OIL PRESSURE AL59-HEATING PROTECTION TRIP AL60-STARTER MOTOR VOLTAGE FAULT AL61-AUXILIARY ALTERNATOR FAULT AL64-DC POWER SUPPLY FAILURE AL66-ECM ALTERNATE POSITION AL67-FUEL INJECTION FAILURE AL70-LOW SUCTION PRESSURE AL72-LOW COOLING WATER FLOW AL75-TEST FAILURE AL77-OIL PRESSURE TRANSMISSION FAULT AL78-WATER TEMPERATURE TRANSMISSION FAULT AL79-OIL TEMPERATURE TRANSMISSION FAILURE
RS34	FILTER VALVE OBSTRUCTION	
RS35	PUMP ROOM FAULT Activated when any of the alarms in the list are present	AL44-LOW ROOM TEMPERATURE AL31-LOW WATER RESERVE LEVEL AL255-WATER RESERVE EMPTY AL256-FLOW METER ACTIVATED AL257-RELIEF VALVE OPEN AL52-LOW ENGINE WATER TEMPERATURE AL53-LOW ENGINE OIL TEMPERATURE AL73-FUEL LEVEL HIGH AL74-FUEL TANK LEAK

Note-(2):

Place the jumper in position "C" in the case of configuring this output with the function **F07** AUXILIARY ALTERNATOR PRIMING. For the rest of the options, place it in the other position.



C14 COMMUNICATIONS				
No	NAME	DESCRIPTION	SELECTABLE OPTIONS	
<b>C14.1 RS 485</b>				
C14.1.1	MODBUS: ADDRESS	Address for RS485 communication	1	1 to 247
C14.1.2	MODBUS: SPEED	Speed for RS485 communication	9600 8N2	9600 8N2 9600 8E1 19200 8N2 19200 8E1 115200 8N2 115200 8E1 115200 8N1
<b>C14.2 ETHERNET</b>				
C14.2.1	MODBUS: ADDRESS	Address for ETHERNET communication	1	1 to 247
C14.2.2	MODBUS: SPEED	Speed for ETHERNET communication	9600 8N2	9600 8N2 9600 8E1 19200 8N2 19200 8E1 115200 8N2 115200 8E1 115200 8N1
C14.2.3	ETHERNET: IP ASSIGNMENT	IP assignment for ETHERNET communication	Dynamic IP	Static IP
C14.2.4	ETHERNET: IP ADDRESS	IP address	192.168.0.101	
C14.2.5	ETHERNET: SUBNET MASK	Subnet mask	255	
C14.2.6	ETHERNET: GATEWAY	Gateway	192.168.0.1	
<b>C14 CANBUS</b>				
C14.3.1	CANBUS MOTOR COMMUNICATION	Enable CANBUS communication with engine	No	Yes
<b>C14.4 WIFI</b>				
C14.4.1	DISABLE WIFI CONNECTION	Disable WiFi connection	No	Yes

C15 SECURITY				
N°	NAME	DESCRIPTION	SELECTABLE OPTIONS	
C15.1	NEW KEY	Password for parameter modification	0000	From 0 to 9999

C-20 OEM (MANUFACTURER) PARAMETERS				
No	NAME	DESCRIPTION	SELECTABLE OPTIONS	
<b>C20.3 DIESEL MOTOR PUMP</b>				
C20.3.1	START SPEED CALCULATION INTERVAL	Interval between speed measurements during the start-up process	100 ms	100 – 500 ms (100 ms intervals)
<b>C20.5 BATTERIES</b>				
C20.5.4	NUMBER OF BATTERIES	Number of starter batteries	2	1
C20.5.5	SMART CHARGER	Enable smart charger	Yes	No
C20.5.6	MULTIPLE CHARGER	Work with 2 chargers for each battery	No	Yes
C20.5.7	CANBUS COMMUNICATION	CANbus communication	Yes	No



C20.6		FINISH		
C20.6.2	REGULATIONS	Adaptation of SCF C900-D-NF to the requirements of different regulations	<b>N: NFPA20</b>	UNE23500 LPCB FOC AS2941 NFPA20 WBMP-D5 APCAD
C20.6.3	ENABLE PRESSURE SWITCH VALVES	Enable pressure switches	<b>No</b>	Yes
C20.6.4	SUB-FINISH	Only configurable with Standard = NFPA20	<b>UL FM certified</b>	NFPA20 not certified
C20.6.5	ACTION	Water or foam system	<b>AUTO – Pressure</b>	AUTO – No pressure

### 13.2.2. CALIBRATION OF MEASUREMENTS

It allows fine adjustment of the analogue electrical measurements so that the values shown on the SCF C900-D-AS control panel display match and do not conflict with any external measuring instrument that may serve as a standard.


The user shall enter in the list of parameters the values provided by the external instrument; in this way the SCF C900-D-AS control panel will adapt its scale of values to the values marked by this reference.

CALIBRATION OF MEASUREMENTS		
N°	NAME	DESCRIPTION
01	BATTERY VOLTAGE A	Battery voltage A
02	BATTERY VOLTAGE B	Battery voltage B
03	MAINS SUPPLY VOLTAGE	AC mains power supply voltage
04	CURRENT CHARGER A	Current at which the charger A charges the BATTERY START
05	CURRENT CHARGER B	Current at which charger B charges battery B
06	PRESSURE TRANSDUCER P.4 mA	Value of system pressure at 4mA point
07	PRESSURE TRANSDUCER P.20 mA	System pressure value at 20mA point
08	TRANSDUCER FLOW P.4 mA	Pump flow rate value for transducer at 4mA point
09	TRANSDUCER FLOW P.20 mA	Pump flow rate value for transducer at 4mA point
10	SPEED	Engine speed rpm



### 13.2.3. SPEED CALIBRATION (W-SIGNAL)

In the case of working with the signal provided by the W terminal of the engine alternator instead of an inductive or magnetic pick-up, the frequency of the signal obtained from the W terminal is not directly related to the number of teeth of the engine girth gear, but is affected by other factors.

The calibration shall be carried out with the aid of an external tachometer as a reference.

N° SPEED CALIBRATION	
01	 Access
	Select CALIBRATION
	Select SPEED
02	Calibration Starting the engine manually



		<p>Display the rotational speed rpm on the external auxiliary tachometer</p> <p>Enter the speed rpm displayed on the external tachometer in the SCF C900-D-AS by editing the value after having pressed </p>
03		<p>To display the value of the constant so that it can be entered on subsequent SCF C900-D-AS control panels with the same type of motor. Press the butt </p>



## 14. ANNEXES

### 14.1. ANNEX A-1 SCF C900-D-AS CONTROLLER

#### A-1.1 SCF C900-D-AS CONTROLLER INPUT AND OUTPUT TERMINALS

N°	CHARACTERISTICS OF TERMINALS	
01	TERMINALS FROM R6 TO R11	
02	Terminal type:	Screw connector
03	Terminal with	8mm <sup>2</sup>
04	Maximum ring allowed	M4
05	Cable with allowed	6mm <sup>2</sup> (10 AWG)
06	Maximum tightening torque	0.5 Nm
07	OTHER TERMINALS	
08	Terminal type:	Pluggable, screw terminal
09	Recommended minimum cross-sectional area for the control wires	0,75 mm <sup>2</sup> . (21 AWG)
10	Minimum cable cross-section allowed	0,2 mm <sup>2</sup> (24 AWG)
11	Maximum cross-sectional area for the control wires	2,5 mm <sup>2</sup> . (10 AWG)
12	Maximum tightening torque	0.5 Nm
N°	CONTROL PANEL POWER SUPPLY	
13	Minimum voltage:	10 VDC
14	Voltage drop during engine start:	0 VDC during 50ms
15	Maximum voltage:	35 VDC (protected up to 60 VDC)
16	Power consumption (Backlight display OFF)	4 W (12 VDC) // 4.2 W (24 VDC)
17	Power consumption (Backlight display ON)	4.8 W (12 VDC) // 5.2 W (24 VDC)
18	Power consumption 24 hrs	9 Ah (12 VDC) // 5 Ah (24 VDC)
N°	DIGITAL INPUTS	
18	Inputs number: Active when connecting terminal to (-) Vbat	18
19	Inputs number: Active when connecting terminal to (+) Vbat	2 (Terminals R2 and R3)
N°	ANALOG INPUT	
20	Number of input:	5 (X1-X3, W1 and W5)



21	Operation:	Transducer with variable resistor connected to 4/20 mA current (Selectable with bridge in electronic card)
22	Minimum resistor:	0 $\Omega$
23	Maximum resistor:	5 k $\Omega$
24	Number of input:	3 (W2-W4)
25	Operation:	4 /20 mA transducer
26	Resolution	0.1 bar $\rightarrow$ Res = PNom/1986
<b>N°</b>	<b>OUTPUTS FOR ACTUATION</b>	
<b>27</b>	<b>Terminals R1, R9, R10</b>	
28	Output type	Relay
29	Maximum power:	10 A.
30	Protection:	None
31	Open coil detection (R9 and R10): Resistance > 1k4 ohm causes alarm	
<b>32</b>	<b>Terminal R12</b>	
33	Output type:	Relay
34	Maximum power:	10 Amp (50Amp/2.5sec)
35	Protection:	PTC
<b>36</b>	<b>Terminals A to F</b>	
37	Output type:	Relay
38	Output type:	Open Contact and Closed Contact
39	Maximum power:	10W (30 VAC 0.3 A)
<b>40</b>	<b>Terminals G to H</b>	
41	Output type:	Relay
42	Output type:	Change over contacts
43	Maximum voltage:	230 VAC
44	Maximum current:	10 A
<b>45</b>	<b>Terminals J3 and J4</b>	
46	Output type:	Relay
47	Maximum voltage:	230 VAC
48	Maximum current:	10 A
<b>49</b>	<b>Terminals Q1 to Q3</b>	
50	Output type:	Relay
51	Maximum voltage:	230Vac



52	Maximum current:	10A
53	Q1 Output: A 47-ohm resistor (jumper selection) can be inserted to limit the current output. For 12V this would be approximately 250mA. This is useful for priming the auxiliary alternator.	
54	<b>Terminals Q4</b>	
55	Output type:	Transistor (Negative)
56	Maximum power:	1,2 A

## 14.2. ANNEX A-2 DISPLAYED INFORMATION VALUES AND RANGES

N° ENGINE SENSORS			
01	Oil pressure	Maximum and minimum displayed levels:	0-10 bar or 10-16 bar depending on sensor
		Resolution:	0.5 bar or 0.1 Bar depending on sensor
02	Engine temperature (water)	Maximum and minimum displayed levels:	0-120°C (depending on sensor)
		Resolution:	1°C
03	Diesel fuel tank	Maximum and minimum displayed levels:	0%-100%
		Resolution:	5%
04	Engine oil temperature (oil)	Maximum and minimum displayed levels:	0-120°C (depending on sensor)
		Resolution:	1°C
N° BATTERIES AND BATTERY CHARGERS			
05	Displayed minimum voltage:	0.10 VDC	
06	Displayed maximum voltage:	35.00 VDC	
07	Definition:	0.10 VDC	
08	Displayed minimum current:	0.10 A	
09	Displayed maximum current:	12.00 A	
10	Definition:	0.10 A	
N° ELECTRICAL MEASUREMENTS			
11	Sampling frequency:	125 Hz	
12	Minimum frequency:	0 Hz	
13	Maximum frequency:	75,0 Hz	
14	Frequency resolution:	0,5 Hz	
15	Minimum current in shunt	0,5 A	
16	Maximum current in shunt	12 A.	
17	Current resolution:	0.1 A	



18	Mains Minimum voltage	100 VAC
19	Mains Maximum voltage	300 VAC
20	Voltage resolution:	1 VAC
N°	<b>SPEED SENSOR / PICK UP</b>	
21	Maximum voltage pickup:	30 VDC
22	Minimum voltage pickup:	3 VDC
23	Maximum pickup frequency:	20KHz
24	Speed measurement resolution	1RPM
25	Error in motor speed measurement	<1%

### 14.3. ANNEX A-3 WASTE MANAGEMENT

In accordance with Directive 2002/96/EC. Whenever electrical or electronic components are used, they must be stored, collected, treated, recycled, or disposed of separately from other waste.

### 14.4. ANNEX A-4 CLEANING THE SCF C900-D-AS CONTROL PANEL

The following recommended practices should be followed when cleaning the control panel:

- Disconnect the power supply.
- Use a cloth slightly dampened with water.
- Do not spray water under pressure onto the panel.

### 14.5. ANNEX A-5 SCA-B(X) BATTERY CHARGERS

#### MAIN CHARACTERISTICS

N°.	DISTINGUISHING FEATURES				
01	Supported battery types	Pb fluid open	Pb VRLA AGM or GEL	NiCd 9-18 elements	NiCd 10-20 elements
02	Configurable nominal battery voltage	12 VDC or 24 VDC depending on configuration			
03	Topology	High flyback frequency (70 kHz operating frequency), which facilitates miniaturisation of components and promotes greater efficiency in device performance.			
04	Power factor correction device	Implements a boost topology that operates in critical conduction mode, known as 'CCM SMPS' Prevents saturation of the magnetic components, thus avoiding their possible deterioration or destruction.			
05	Extra wide supply voltage range	The 85 VAC to 305 VAC voltage range finish with the power factor corrector option minimises thermal dissipation and harmonic distortion in the low voltage range.			
06	Low electro-magnetic emissions	With double stage $\pi$ filter to reduce the conducted emissions introduced into the network.			



07	High internal and contour temperature protection	Heat-generating and temperature-sensitive elements are equipped with specific detection and protection systems. Output power limitation depending on ambient temperature		
08	Equalisation	In lead-acid batteries. It destroys sulphate and agitates the electrolyte, restoring the usefulness of a battery with impaired capacity.		
09	Output voltage compensation depending on battery temperature	A temperature probe must be installed on one of the battery electrodes.		
10	4-wire connection to the battery	Eliminates the voltage drop inherent in power cables and optimises the voltage applied directly to the batteries.  This control method significantly improves charging accuracy and contributes to the extended life of the batteries.		
11	CAN bus communication	Communication with SVE Corp. electronic cards. Allows configuration of battery type, sending of voltages, currents, alarms, reception of start and end of charging process commands, etc.		
12	Display on a screen	Use the communication and display features of the SVE control panels to view all information relating to the batteries and the charger itself.		
13	Robust design	Overall design and component selection to increase product durability over 10 years		
14	Compliance with standards	UL1236		
N°.	<b>ELECTRICAL CHARACTERISTICS</b>			
15	Connectable in series or parallel	To provide 2 x Vn or 2 x In respectively		
16	Rated supply voltage	With power factor correction module (PFC): 110 - 277 VAC		
17		Without power factor correction module: 220 - 277 VAC		
18	Power frequency	50-60 Hz [47-63 Hz].		
19	Maximum load current	5,00 ADC / 7,00 ADC / 10,00 ADC depending on model		
20	Maximum battery power output	146.8 W (DIN 41773: 96.6 W)		
21	Performance	>75% at nominal power (see graph point 2.5)		
22	Dielectric strength	Line - Output: 3000 VAC		
23		Line - GND: 3000 VAC		
24		Output - GND: 500 VAC (<100 MΩ at 500 VAC)		
N°.	<b>LOADING CHARACTERISTICS</b>			
25	Charging system	3 phases (V-I)		
26	Float voltage at 20°C according to DIN 41773	<b>Pb fluid open</b>	13.50 VDC	27,00 VDC
27		<b>Pb VRLA (AGM or GEL)</b>	13.20 VDC	26.40 VDC
28		<b>NiCd-(9-18 elements)</b>	12.75 VDC	25.20 VDC
29		<b>NiCd-(10-20 elements)</b>	14.10 VDC	28.00 VDC
<b>Caution: Consult battery supplier.</b> This value may differ significantly from manufacturer to manufacturer. Consult SVE Corp. if different voltages are required.				
30	Minimum battery voltage to start charging	0,00 VDC		
31	Output voltage deviation	Source mode	< 2% from 0% to 90% of rated load current	
32		Charger mode	Charging phase 1: ≤ 2%. Charging phase 2, 3 and float: ≤ 1%.	
33	Ripple	Source mode	≤ 5% of rated voltage (peak-to-peak) with a resistive consumption of 90% of rated power.	



34		Charger mode	RMS to average current ratio < 1.2
<b>N° PROTECTIONS</b>			
35	Safety standard	EN 60950 (Safety information)	
36	Power supply input protection	Fuse not user accessible	
37		Protection against switching on/off of the power supply while the battery is connected to its output; including faulty battery.	
38	Over-current protection	Short-circuit on battery output (self-resettable)	
39	Reverse polarity protection	Battery reverse polarity (self-resettable)	
40	Battery output overvoltage	Up to 2x battery Vn or 50 VDC for 1s	
41	Battery connection / disconnection	Allows the battery to be connected and disconnected in the presence of mains power.	
<b>N° TEMPERATURE</b>			
42	Functional	-5°C to 70°C at full power, and up to 80°C with automatic power reduction to limit its internal temperature and avoid its deterioration (EN 60068-2).	
43	Storage	-40°C to 85°C	
44	Cooling	Natural convection cooling	
<b>N° RELATIVE HUMIDITY (NON-CONDENSING)</b>			
45	Functional	20% a 90%	
46	Storage	10% a 90%	
<b>N° PHYSICAL CHARACTERISTICS</b>			
47	Dimensions	125mm x 107mm x 65mm	
48	Weight	440gr	
49	Fixing	On mounting plate	
50	Battery output terminals	Pluggable (2.5 mm <sup>2</sup> (AWG 10))	
51	Input terminals	L - N - GND: Plug-in (2,5 mm <sup>2</sup> AWG 10)	
<b>N° SIGNALLING</b>			
52	Signalling lamps	ON	SCA-B(X) AC powered.
		BATTERY FAULT	Detection thresholds: <12 VDC / >15 VDC or <24 VDC / >30 VDC depending on the model

### 14.5.1. CHARGING TIME

Charging time is relevant in applications such as emergency power generators or diesel fire pumps, because even though the battery is normally charged, after one or more start-up attempts a quick recovery of the battery is recommended in order to bring the system back to optimal conditions for new demand.

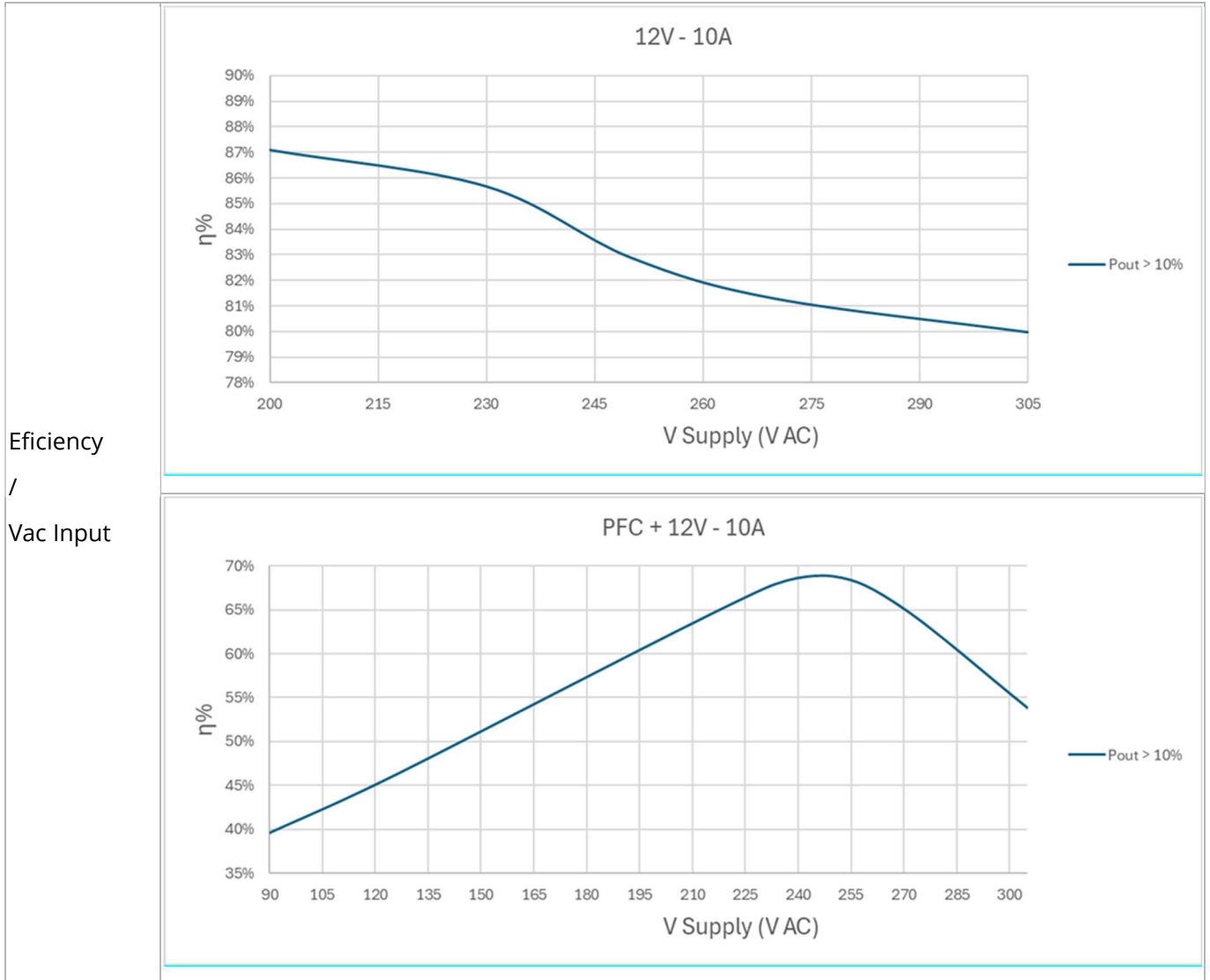
SCA-B(X) series battery chargers minimise both charging time and damage to the battery, under normal circumstances a battery will be charged from its minimum level to 80% of its capacity with the charger at full power. As an example, an SCA-B12070 charger connected to a 200Ah battery recovers over 160Ah in 24h, while the remaining capacity is charged at lower current maximising battery life.



### 14.5.2. EFFICIENCY

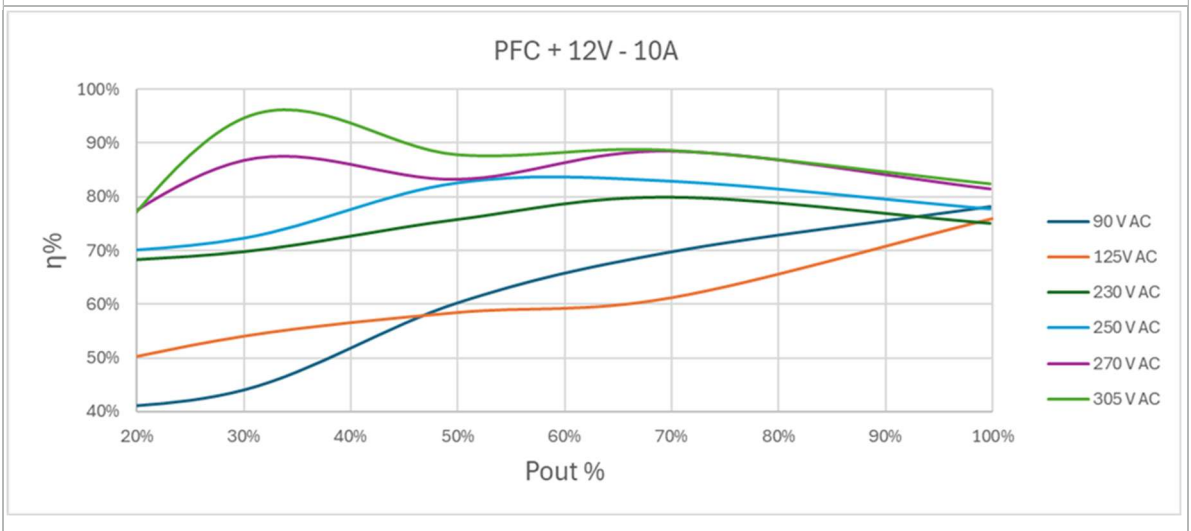
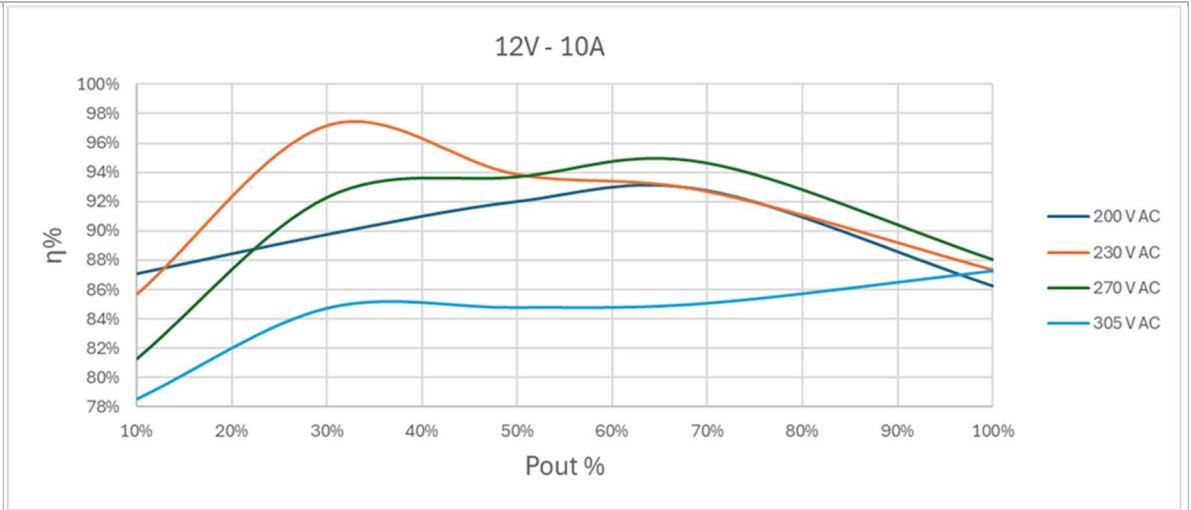
The SCA-B(X) series battery chargers offer a high efficiency  $\geq 75\%$  for the entire supply voltage range between 85 VAC and 277 VAC.

The efficiency curves are presented below.





Efficiency  
/  
Max Output  
Power





### 14.5.3. EC DECLARATION OF CONFORMITY

This document refers to the SCA-B(X) series battery chargers.

This product must be installed and handled by sufficiently qualified personnel (according to EN-50-110-1).

## DECLARATION OF CONFORMITY



SVE Corp. hereby declares under its own responsibility that the product SCA-B(X) is in compliance with the directives:

- EC Electromagnetic Compatibility Directive: 2004/108/EC
- Low Voltage Equipment Directive 2006/95/EEC
- Machinery Directive 2006/42/EEC
- Standards applied in particular:
  - EN 50130-4 Alarm systems. Part 4: Electromagnetic compatibility.
  - EN 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use.
  - EN 61000-6-3: Electromagnetic compatibility (EMC). Part 6-3: Generic standards.
  - EN 61000-6-4: Electromagnetic compatibility (EMC). Part 6-4: Generic standards.
  - EN 61000-3-2: Electromagnetic compatibility (EMC). Part 3-2: Limits.
  - EN 61000-4-2: Electromagnetic compatibility (EMC). Part 4-2: Test and measurement techniques.
  - EN 61000-4-3: Electromagnetic compatibility (EMC). Part 4-3: Test and measurement techniques - Electromagnetic compatibility (EMC).
  - EN 61000-4-4: Electromagnetic compatibility (EMC). Part 4-4: Test and measurement techniques.
  - EN 61000-4-5: Electromagnetic compatibility (EMC). Part 4-5: Test and measurement techniques.
  - EN 61000-4-6: Electromagnetic compatibility (EMC). Part 4-6: Test and measurement techniques - Electromagnetic compatibility (EMC).
  - EN 61000-4-8: Electromagnetic compatibility (EMC). Part 4-8: Test and measurement techniques.
  - EN 61000-4-11: Electromagnetic compatibility (EMC). Part 4-11: Test and measurement techniques.

April 2024

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Alvaro Cristóbal Otxandio  
General Manager / Director General





#### 14.5.4. CONNECTIONS AND INSTALLATION

The battery chargers of the SCA-B(X) series are designed to be installed inside and protected by a control panel. They can be permanently connected to the battery even when starting the diesel engine.

- DIMENSIONS AND FIXINGS**

DIMENSIONS (mm)	
<b>FIXING</b>	Polyamide fibre fixings
<b>WEIGHT</b>	440 g

#### 14.5.5. ASSEMBLY AND CONNECTIONS

To ensure optimum cooling, SCA-B(X) series battery chargers shall be installed in the correct orientation, and in a manner that allows a clearance of not less than 100 mm, both above and below, and at least 30 mm on both sides.

- It is the responsibility of the operator or installer not to exceed the specified maximum ambient temperatures, failure to do so will result in a longer charging time due to temperature-dependent current limitation.
- The GND of the SCA-B(X) series battery chargers must be connected to the ground of the control panel where it is installed.
- SCA-B(X) series battery charger terminals accept 2.5 mm<sup>2</sup> cable and respect a clearance and creepage distance of:
  - 4 mm between poles (L-N)
  - 8 mm between power supply pole and earth
  - 8 mm between supply and output poles.



### 14.5.6. DESIGNATION OF CONNECTION TERMINALS

CN1							
ID	TYPE	D/A	DENOMINATION	SIGNAL/POT	POTENTIAL	SECTION	LENGTH
CN1-1	OUT	GND	EARTH				< 3m
CN1-2	IN		RED - NEUTRAL	Max. 2 AAC	< 305 VAC	2.5 mm <sup>2</sup> (AWG 10)	< 3m
CN1-3	IN		NETWORK - PHASE	Max. 2 AAC	< 305 VAC	2.5 mm <sup>2</sup> (AWG 10)	< 3m
CN2							
ID	TYPE	D/A	TITLE	SIGNAL/POT	POTENTIAL	SECTION	LENGTH
CN2-1	I/O	COM	CANH	Signal		0,5 mm <sup>2</sup> (AWG 24)	< 3m
CN2-2	I/O	COM	CANL	Signal		0,5 mm <sup>2</sup> (AWG 24)	< 3m
CN2-3	IN	ANALOG	I-TEMPERATURE (LM335)	Signal		0,5 mm <sup>2</sup> (AWG 24)	< 3m
CN2-4	OUT	GND	GND TEMPERATURE	Signal		0,5 mm <sup>2</sup> (AWG 24)	< 3m
CN2-5	IN	ANALOG	+V. BATTERY	Signal	8-35 VDC	2.5 mm <sup>2</sup> (AWG 10)	< 3m
CN2-6	IN	ANALOG	-V. BATTERY	Signal	8-35 VDC	2.5 mm <sup>2</sup> (AWG 10)	< 3m
CN3							
ID	TYPE	D/A	TITLE	SIGNAL/POT	POTENTIAL	SECTION	LENGTH
CN3-1	OUT		+ V. CHARGER	Max.10 ADC	8-35 VDC	2.5 mm <sup>2</sup> (AWG 10)	< 3m
CN3-2	OUT		- V. CHARGER	Max.10 ADC	8-35 VDC	2.5 mm <sup>2</sup> (AWG 10)	< 3m



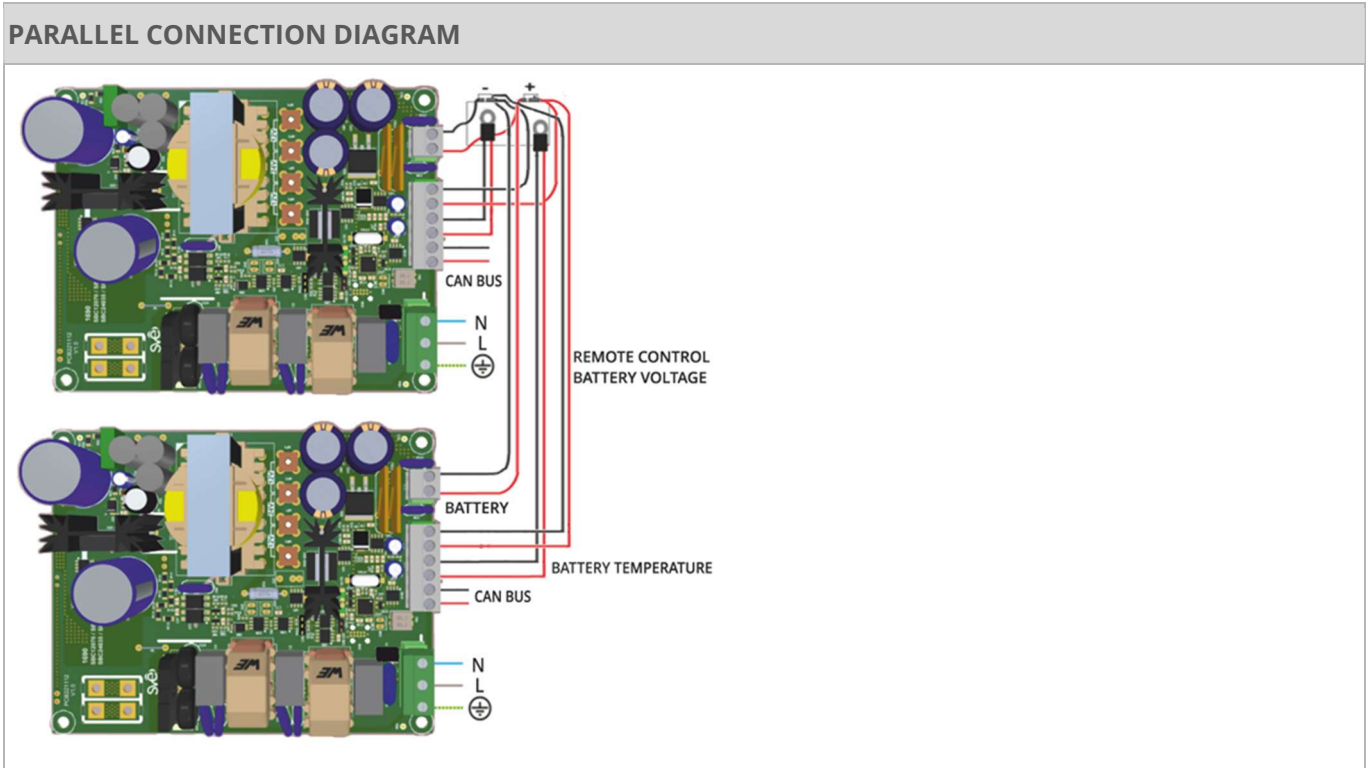
14.5.7. CONNECTION DIAGRAM

WITHOUT PERMANENT BATTERY VOLTAGE SENSOR and WITH BATTERY TEMPERATUR PROBE	
<p>CN9 Bridge</p>	
<p>Wiring diagram</p>	
WITH PERMANENT BATTERY VOLTAGE SENSOR and WITH BATTERY TEMPERATUR PROBE	
<p>CN9 Bridge</p>	
<p>Wiring diagram</p>	



### 14.5.8. SERIAL / PARALLEL CONNECTIONS

The battery chargers of the SCA-B(X) series allow the operation of up to 2 chargers in parallel without active load sharing, to charge a 12 VDC battery with two 12 VDC chargers, or a 24 VDC battery with two 24 VDC chargers, thus doubling the nominal charging current.



### 14.5.9. 12 VDC / 24 VDC CONFIGURATION

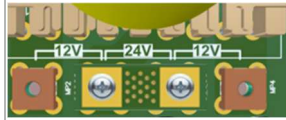
The SCA charger can charge both 12 VDC and 24 VDC batteries. To do so, it must be configured.

On the PCB itself there are plates that allow bridges to be made at the output of the transformer. It will be necessary to use M4x7 screws. In addition, it will be necessary to make a point in the CN7 position in the case of the 24 VDC charger.

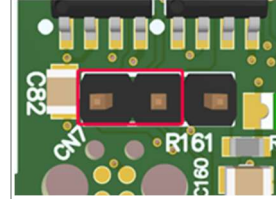
12 VDC / 24 VDC CONFIGURATION		
Remove the PCB boards		
Put them in the right position		
12 VDC configuration		Jumper over CN7 



24 VDC configuration



Jumper over CN7



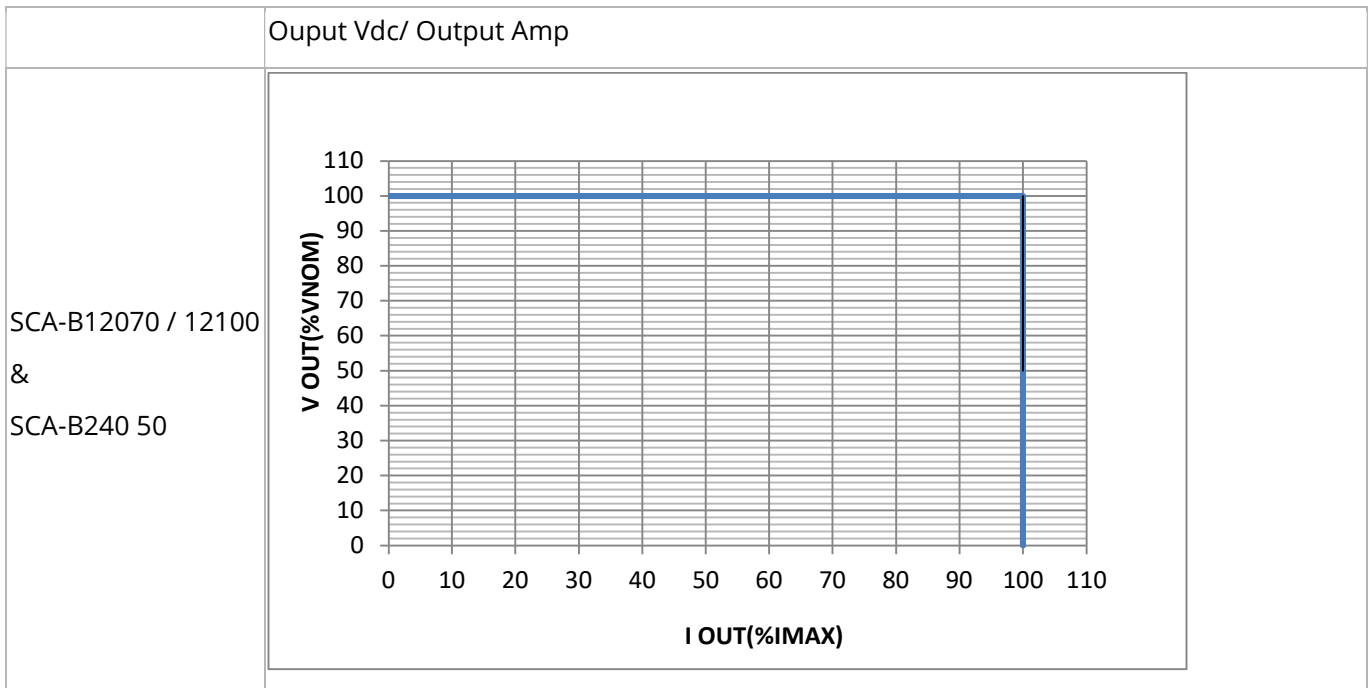
### 14.5.10. OPERATION

The battery chargers of the SCA-B(X) series can work as power supply units or as battery chargers depending on the setpoint received via CANbus.

#### 14.5.10.1. OPERATION AS A STABILISED POWER SUPPLY

When used as a power supply, SCA-B(X) series battery chargers supply a constant voltage with the following characteristics:

- Output voltage:  $V_n$
- Maximum output current:  $I_n$ .
- Voltage ripple:  $\leq 5\%$  voltage deviation for any current up to 90% of  $I_n$





## 14.5.10.2. OPERATION AS A BATTERY CHARGER

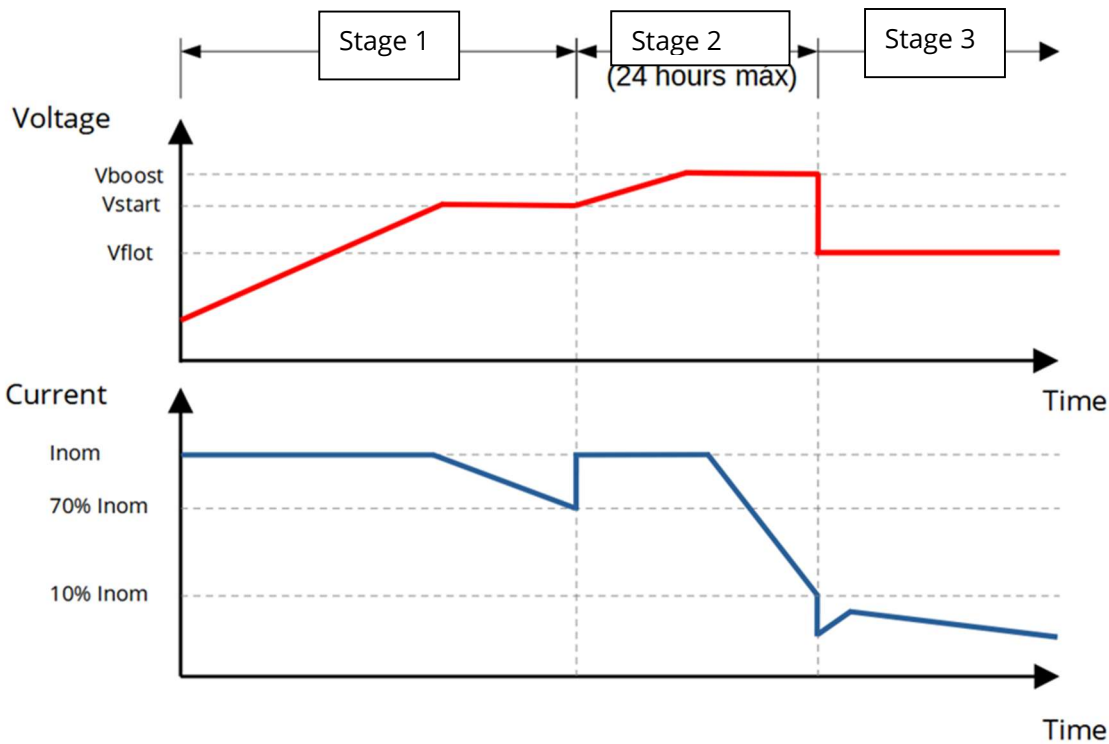
### 14.5.10.2.1. CHARGING SYSTEM

The battery chargers of the SCA-B(X) series provide a three-stage battery charging system that follows one after the other depending on the voltage and current conditions of the battery.

The charging process is initiated in stage 1: Absorption when any of the following circumstances occur:

- As soon as the charger is powered from the mains while connected to the battery, the battery charger will be able to charge the battery.
- When the battery voltage drops below  $V_n$  for more than 5s or after the battery has been disconnected and reconnected.
- When a charge inhibit process that has lasted longer than 30 s has been completed.

The charging stages are shown in the graph below:



VOLTAGES IN THE CHARGING STAGES				
	Pb Fluid	VRLA (AGM)	NiCd 9	Ni Cd 10
<b>V Float</b>	$V_n + 12.5\%$ : 13.5 VDC or 27.0 VDC	$V_n + 10\%$ (25°C): 13.2 VDC or 26.4 VDC	12.75 VDC or 25.2 VDC	14.1 VDC or 28.0 VDC
<b>V Start</b>	$V_n + 20\%$ : 14.4 VDC or 28.8 VDC	$V_n + 12\%$ (25°C): 13,44 VDC or 26,88 VDC	13.2 VDC or 26.4 VDC	14.64 VDC or 29.28 VDC
<b>V Boost</b>	$V_n + 22\%$ : 14,7 VDC or 29,3 VDC	$V_n + 12\%$ (25°C): 13,44 VDC or 26,88 VDC	0.9 $V_n + 22.22\%$ : 13.2 VDC or 26.4 VDC	$V_n + 22.22\%$ : 14.64 VDC or 29.28 VDC

\* Fast charge voltage does not exceed 45.8%  $V_n$



The 3 phases of charging and the circumstances leading to the transition from one to the other are described below:

DESCRIPTION OF THE LOADING PHASES	
<b>Stage-1: Absorption</b>	SCA-B(X) maintains a constant current $I_n$ until the voltage at its output terminals reaches $V_{Start}$ and/or the current allowed by the battery drops below 70% of $I_n$ .
<b>Stage-2: Bulk</b>	SCA-B(X) maintains voltage control on $V_{boost}$ until the battery output current drops below 1.00 A (12 VDC) or 0.83 A (24 VDC) or after 24 hours of charging.
<b>Stage -3: Float</b>	SCA-B(X) maintains voltage control at $V_{float}$ , above $V_n$ . After 48h it limits the current to a maximum of 0.5 ADC.

#### 14.5.10.2.2. EQUALISATION (only in open fluid Pb batteries)

Process activated and deactivated by command received via CANbus

The battery chargers of the SCA-B(X) series incorporate the equalisation function (desulphation, refreshing,) applicable to fluid lead batteries which allows the sulphate to be destroyed and the electrolyte to be agitated, thus restoring the usefulness of a battery with deteriorated capacity;

#### ACTIVATION / DEACTIVATION

Via CANbus communication

Activation of equalisation	Duration
1s pulse	15 minutes
Pulse maintained for at least 15 minutes	Up to equalisation end pulse. o Exhaustion of the maximum allowed duration: 180 minutes

#### ACTION

During the equalisation process SCA-B(X) :

- It raises its output voltage to  $V_{equ.}$ :  $V_n + 22\%$  That is: 14.64 VDC or 29.28 VDC depending on the charger model.
- The maximum current is limited by SCA-B(X) to 50% of  $I_n$ .

#### 14.5.10.2.3. INHIBITION

Process activated and deactivated by command received via CANbus

The battery chargers of the SCA-B(X) series may cease to operate in order to promote various actions in their environment that could be detrimental to their development.

#### ACTIVATION / DEACTIVATION

Via CANbus communication

#### ACTION



The battery chargers of the SCA-B(X) series output a voltage of 9 VDC (12 VDC) or 14 VDC (24 VDC) alternately with the voltage of the charging stage in which they are at the time of activation of the inhibition in 500ms sequences. Until the inhibition process is deactivated or a maximum of 30s.

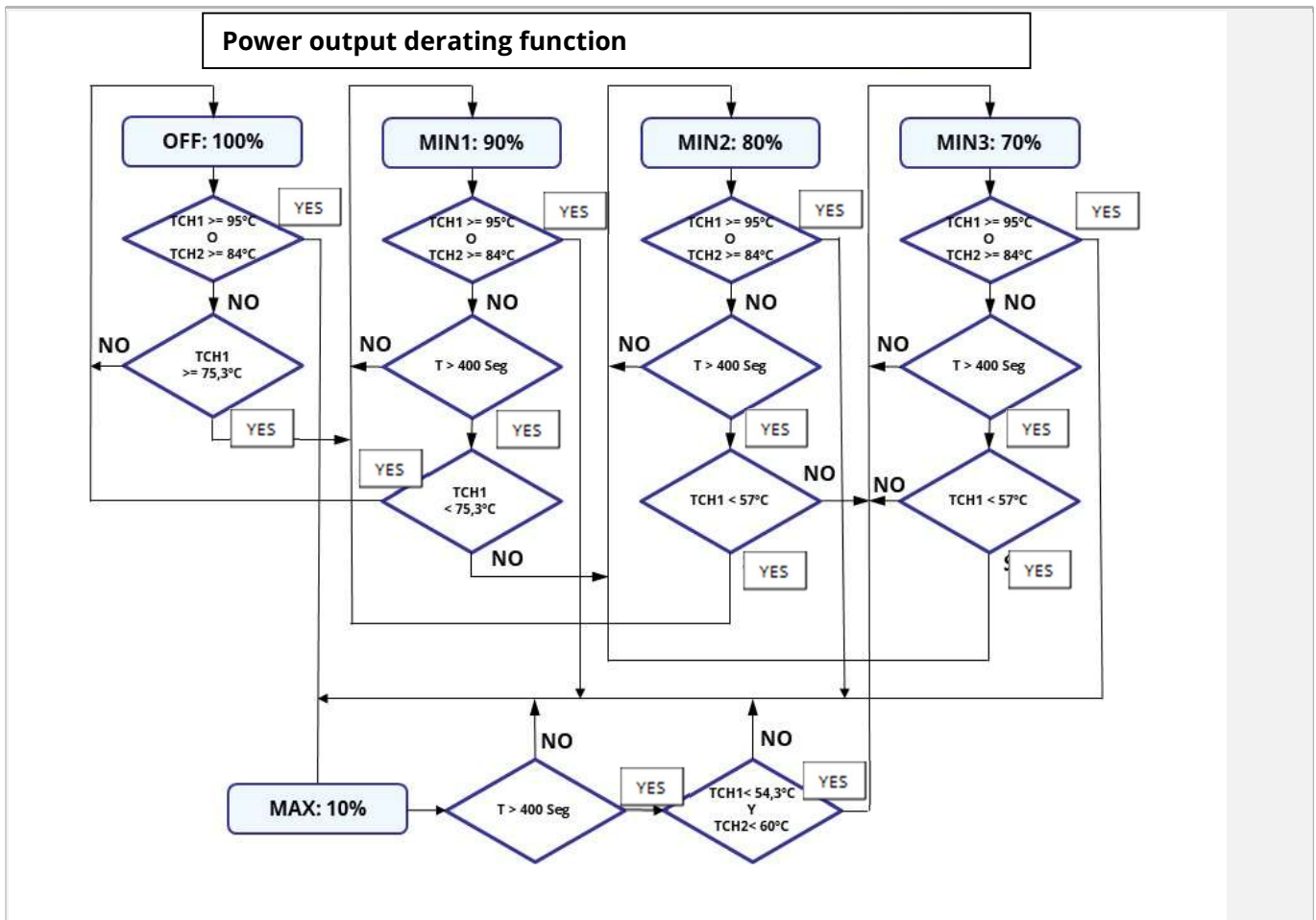
If the battery charger of the SCA-B(X) series was not previously in stage 1 at the time of the start of the inhibition process, the charging process will be restarted again in phase 1.

#### 14.5.10.2.4. LIMITATION OF OUTPUT POWER DEPENDING ON AMBIENT TEMPERATURE

SCA-B(X) series battery chargers are specifically designed to safeguard the battery charging process uninterruptedly, without shutting down, even when subjected to high ambient temperatures and/or overexertion working conditions.

The SCA-B(X) series battery chargers are equipped with internal temperature monitoring of critical elements such as the primary (TCH1) and secondary (TCH2) switching transistors as well as intelligence that allows it to take action based on these conditions.

The following graph illustrates the behaviour of the SCA-B(X) series battery chargers in relation to the ambient temperature conditions against which they must be protected.

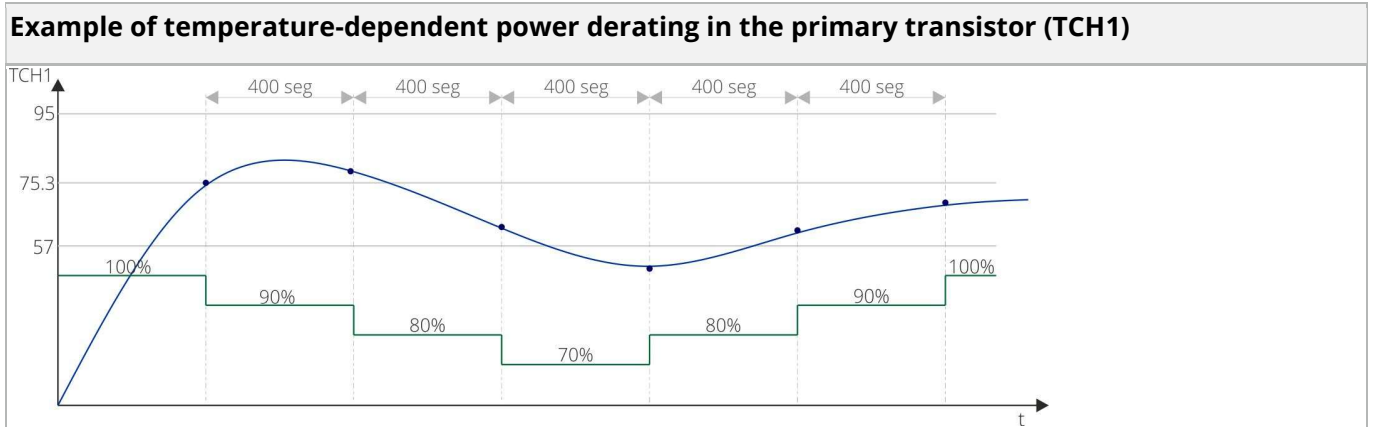


#### POWER LIMITATION ON CHARGER OUTPUT

<b>LIMITATION 0: 100% POWER:</b>	As long as the temperature of the primary transistor (TCH1) does not exceed 75.3°C; if it does, it goes to LIMIT 1.
<b>LIMITATION 1: POWER 90%:</b>	After 400 s in LIMIT 1 if the temperature of the primary transistor (TCH1) remains above 75.3°C then LIMIT 2 is accessed otherwise it returns to LIMIT 0.



<b>LIMITATION 2: POWER 80%:</b>	After 400 s in LIMITATION 1 if the temperature of the primary transistor (TCH1) remains above 57°C then LIMITATION 3 is accessed otherwise it returns to LIMITATION 1.
<b>LIMITATION 3: POWER 70%:</b>	After 400 s in LIMITATION 1 if the temperature of the primary transistor (TCH1) remains above 57°C then LIMITATION 4 is accessed otherwise it returns to LIMITATION 2.
<b>LIMITATION 4: POWER 10%:</b>	A reading is taken every 400 s. to verify that the temperature of the primary (TCH1) is below 54.3°C and the temperature of the secondary (TCH2) is below 60°C. In this case, it returns to LIMITATION 3.



#### 14.5.10.2.5. COMPENSATION OF SCA-B(X) OUTPUT VOLTAGE AS A FUNCTION OF BATTERY TEMPERATURE

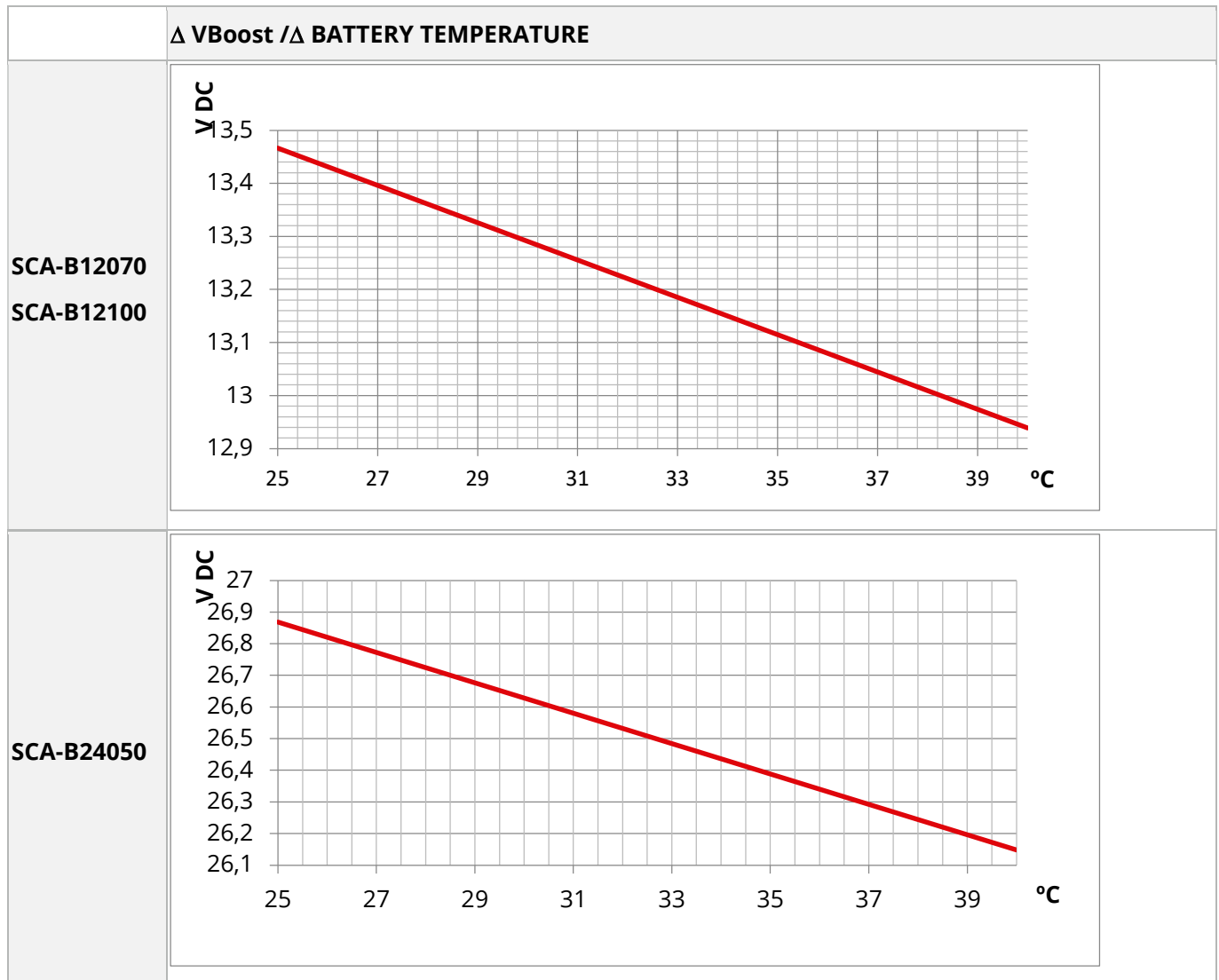
Since Pb VRLA batteries are very temperature sensitive, especially above 25°C, SCA-B(X) series battery chargers can reduce VBoost and VFloat to compensate for the VBoost effect and prevent cell degradation.

It is necessary to install a temperature probe on one of the battery electrodes and between the CN2-3 I-TEMPERATURE CN2-4 GND TEMPERATURE and terminals of SCA-B(X).

<b>TEMPERATURE PROBE</b>	
<ul style="list-style-type: none"> <li>• 2 wires</li> <li>• Output: 0 V at 0°Kelvin .</li> <li>• Gain: 10mVolts /° Kelvin</li> </ul>	



The derating of VBoost and VFloat is standard: -4 mVDC per °C and element, from 25°C up to 40°C limit above which the load is interrupted; i.e. -24mV/°C for Vn:12 VDC or -48mV/°C for Vn: 24VDC.



## WASTE MANAGEMENT

According to directive 2002/96/EC. Whenever electrical or electronic components are used, they must be stored, collected, treated, recycled or disposed of separately from the rest.

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