

SCF122-DI-AS2941

DIESEL ENGINE FIRE PUMP CONTROLLER

AUSTRALIAN STANDARD AS 2941-2013

OPERATOR'S MANUAL FOR INSTALLATION, CONFIGURATION AND USE



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1 PRODUCT DESCRIPTION

SCF122-DI-AS2941

The SCF122-DI-AS2941 controllers are automatic and configurable instruments useful for managing the operation of diesel fire-fighting motor pumps.

They govern the start and stop of the pump, display the most relevant values and information and manage the communication with both the contour elements and the remote vigilants.

1.1. KEY FEATURES

N°	NORMAS Y REGLAS TECNICAS						
01	Compliance with current regulations and technical standards		AS 2941 regulation 2013				
02			AS/NZS 3000:2007 Standard				
N°	ELECTRICAL CHARACTERISTICS AND BATTERIES						
03	Nominal supply voltage		230V AC \pm 20%, 50-60Hz				
04	Rated battery voltage		12V DC o 24V DC depending on model				
05	Battery chargers		Models				
			12030	12070	12100	24035	24050
	Rated load current		3Amp	7 Amp	10 Amp	3,5 Amp	5 Amp
	Battery capacity (C10) supported		86 Ah	200Ah	285Ah	100Ah	142Ah
	DIN Power		41,4W	96,6W	138,0W	96,6W	138,0W
06	Performance (efficiency)		85% at rated power				
07	Float voltage deflection		< 1% from 0% to 90% rated current				
08	Battery types supported (except 12030)		Wet (vented) Lead Acid		VRLA (AGM or GEL)		
			NiCd-(9-18 cells)		NiCd-(10-20 cells)		
09	Desvío de la corriente de carga		< 5% desde el 50% al 99% de la tensión de flotación				
N°	CONSTRUCTIVE FEATURES						
10	Outdoor enclosure		Degree of protection against access to dangerous parts IP65				
11			Degree of protection against impact: IK10				
12			Fire Rating: Fire extinguishes in <30s with dripping				
13	Display		4 lines 20 characters				
14	Cabling		Halogen free				
15			Resistance to fire: RZ1 according to EN50200 (830° for 90min)				
16	Working Temperature		-5 ° C to 50 ° C				
N°	PUMP AND SYSTEM PROTECTIONS						
17	Total system alarms		17				
N°	PUMP STARTING METHODS						
18	Automatic mode	Pressure switch lines: Low pressure. Remote start					
19	Emergency Mode	Pushbuttons "Start Battery" and "Monitor Battery" on the front of the controller					
N°	MEASURING INSTRUMENTS						
20	Batteries		2 battery voltage voltmeters				
21			2 charging-current ammeters				
22			1 Engine charger alternator ammeter				
23	Engine		Fuel level				

24		Coolant temperature
25		Oil pressure
26		Engine speed in RPM
N°	OTHER INFORMATION OFFERED ON THE DISPLAY	
27	Date and time	Cumulative hours of operation
28	47-event history	17 pump and system alarms
N°	OTRAS CARACTERISTICAS	
29	Motor heating management via temperature reader	Automated weekly or monthly maintenance test (optional)
30	Fuel gauge management (optional)	Pump start-up using external command
31	Coolant loop start-up	
N°	INDICATORS IN CONTROLLER FRONT	
32	Operating mode	AUTO
33		CRANK ISOLATE Lock-key
34	Pump States	Start up demand
35		Pump running
36	Alarms	Main alarms
37	Buzzer	80dB
38	Others	Power on
39		Power fail
N°	COMMUNICATIONS	
40	Modbus / TCP-IP	LAN
41		RS485 Protocol Modbus / RTU
42		WAN (Internet)
43		Point to Point
44	Voltage Free Contacts	7 Potential free switching contacts: 30Vdc - 0.3Amp

1.2. PANEL RANGE DEPENDING ON ENGINE STARTING BATTERIES

	DENOMINATION	Battery voltage	Battery Capacity Range (C ₁₀)
01	SCF122DI-12030	12 V	43 Ah - 86 Ah
02	SCF122DI-12070	12 V	100 Ah – 200 Ah
03	SCF122DI-12100	12 V	142,5 Ah – 285 Ah
04	SCF122DI-24035	24 V	20Ah-100 Ah
05	SCF122DI-24050	24 V	71 Ah – 142 Ah

1.3. SCOPE OF THE DOCUMENT

This technical document is intended to cover most aspects associated with the installation, operation and maintenance of the SCF122-DI-AS2941 fire pumps controllers
 If the user needs to obtain more information regarding the design, justification of components, operation, etc., please contact us at the following address svecorp@svecorp.com

1.4. 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.

1.5. REGULATIONS AND CE COMPLIANCE DECLARATION

This document refers to the SCF122-DI-AS2941 electrical controller. Given their relevance, the features and function of the INIGMATIC DI22-AS2941 electronic PLC and SBB series battery chargers contained in the controller are also described.

The SCF122-DI-AS2941 controller serves to automate fire-protection installations in accordance with the following regulations:

- AS 2941 regulation 2013
- AS/NZS 3000:2007 Standard

We ask that you read this manual carefully before installation.

The instructions for mounting and description of features and operation refer only to the standard SCF122 DI-AS2941 controller. As such, the different variants that may be developed in response to the specific requirements of different installations or maintenance operations are not mentioned.

This product must be installed and handled by personnel with adequate training (in accordance with EN 50-110-1 regulations)

Declaration of EC compliance

SVE S.L. hereby declares that the SCF122-DI-AS2941 controller and its electronic PLC INIGMATIC D2941 conform to the following directives:

- **Electromagnetic compatibility, Directive CE: 2004/108/CE**
- **Low voltage, Directive 2006/95/CEE**
- **Machinery Directive 2006/42/CEE**

Specific regulations applied: **EN 61000-6-2, EN 61000-6-3, EN 61439-1, EN61439-2, EN60204-1.**



Alvaro Cristóbal Otxandio
Gerente de SVE S.L.

Mondragón 19/04/2017

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2 SCF122-DI-AS2941 CONTROLLER ELEMENTS

SCF122-DI-AS2941

The elements included in the SCF122-DI-AS2941 fire-protection pump controller are detailed below:

N°	EQUIPMENT	DENOMINATION	QUANTITY
01	SCF Casing	ENV1	1
02	IGNIMATIC D2941 controller	MC1	1
03	SCBB series batteries chargers	CA1, CA2	2
04	Isolator switch (380V)	S1	1
05	Diode rectifier bridge	D1	1
06	MCB	Q1,Q2,Q3	3
07	Changeover relays	K1,K2,K3,K4,K5;K6	6
08	Relay for Stop Solenoid	K7	1
09	Luminous buzzer (80dB)	H1	1
10	Manual start-up button	PU2,PU3	2
11	Alternator charger Ammeter	P1	1
12	Lockable key switch	LL1	1
13	Cranking Contact breakers	K8,k9	2

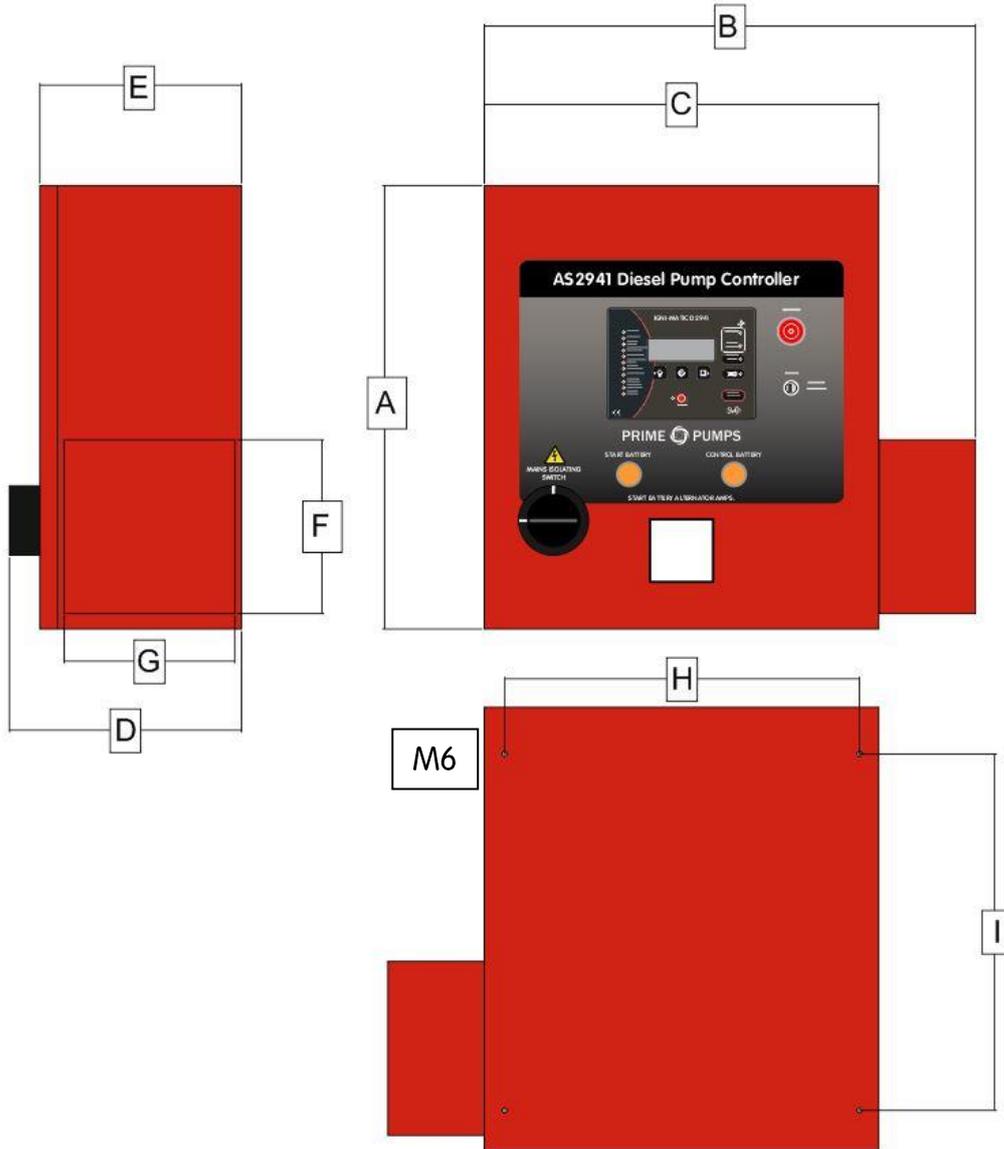
3 WIRING AND INSTALLATION

SCF122-DI-AS2941

3.1 MOUNTING AND DIMENSIONS

The SCF122-DI-AS2941 controller should be located as close as possible to the controlled engine and must be within the user's visual field near the engine; It is designed to be installed in wall or on metallic supports.

3.1.1 DIMENSIONS



DIMENSIONS (mm) & WEIGHT

N°	CONTROLLER	A	B	C	D	E	F	G	H	I	Weight
T1	SCF122-DI-AS2941	510	560	450	265	230	200	200	405	410	19,2Kg

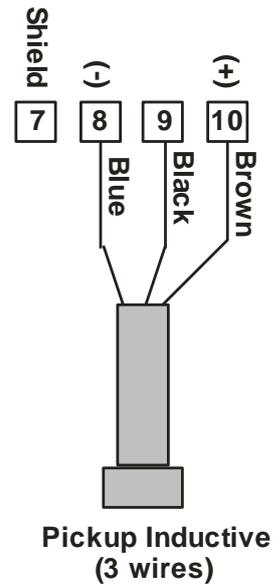
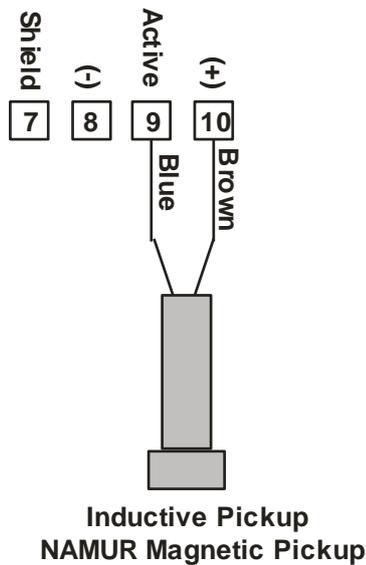
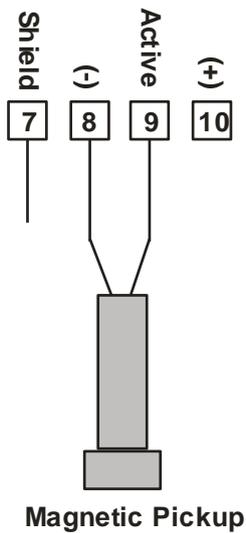
3.2 SCF122-DI-AS2941 PANEL TERMINALS

N°	DENOMINATION	CONCEPT
S1-T1	PHASE AC (230V)	AC Power input
S1-T2	NEUTRAL AC (230V)	AC Power input
PUMP-GROUP SIGNALS		
00	I- GND	Input: Earth
3	I-BATTERY COMMON (-)	Input Reference Common Negative / Earth Battery -Vbat
6	O-STOP (FUEL)	Output Stop (+ Vbat. 25 Amp)
7	I-PICK-UP SHIELD	Input: Pick-up shield
8	I-PICK-UP (-)	Input: Pick-up (-)
9	I-PICK-UP	Input: Pick-up (+)
10	O- BATTERY COMMON (+)	Output Positive output A and B common battery (+ Vbat)
11	I-HIGH TEMPERATURE CONTACT	Input: High coolant temperature alarm Thermostat .
12	I-TEMPERATURE SENSOR	Input: inlet coolant temperature sensor
13	I-LOW OIL PRESSURE CONTACT	Input Oil Low Pressure contact
14	I-OIL PRESSURE SENSOR	Input: Oil Pressure Sensor
15	O-REF. COMMON (-)	Output: Reference (-Vbat) for drive pressure OK
16	I-PUMP PRESSURE OK	Input: Pump pressure contact OK
17	I-LOW FUEL LEVEL CONTACT	Input: Low fuel detector contact
18	I-FUEL LEVEL SENSOR	Input:Fuel Level gauge sensor
19	I-BENDIX VOLTAGE (+)	Input: voltage on starter (+ Vbat)
20	-	-
SYSTEM SIGNALS		
21	I-B+	Input: Alternator battery charger
23	I-REMOTE STOP	Input: To stop the pump on closing of the circuit
24	O: REF. COMMON (-)	Output: Reference (-Vbat) for remote stop
25	I:REMOTE START	Input: To start the pump on closing of the circuit
26	O: REF. COMMON (-)	Output: Reference (-Vbat) for remote start
27	I: PRESSURE SWITCH	Input: System Pressure sensor input correct
28	O: REF. COMMON (-)	Output: Reference (-Vbat) for drive pressure OK
30	O: EXCITER BAT.CHARG. ALTERNAT	Output: for battery charger alternator (250mA for 12VDC)
31	O: ENGINE WARMING PHASE	Output: Phase AC voltage output to the motor warming
32	O: ENGINE WARMING NEUTRAL	Output: Neutral AC voltage output to the motor warming
33	GROUPED ALARMS / CONTROLLER FAILURE	Output potential free contacts grouped Alarm (33-34)
34		
35		
33'	GROUPED ALARMS / CONTROLLER FAILURE	Output potential free contacts grouped Alarm (33'-34')
34'		
35'		
36	NOT IN AUTO	Output potential free contacts not in AUTO (AL-1) (36-37)
37		
38		
39	START-UP FAILURE /NO PUMP PRESSURE	Output potential free contacts Start-Up Failure (AL-13) and drive pressure fault (AL-14) (39-41)
40		
41		
42	PUMP RUNNING	

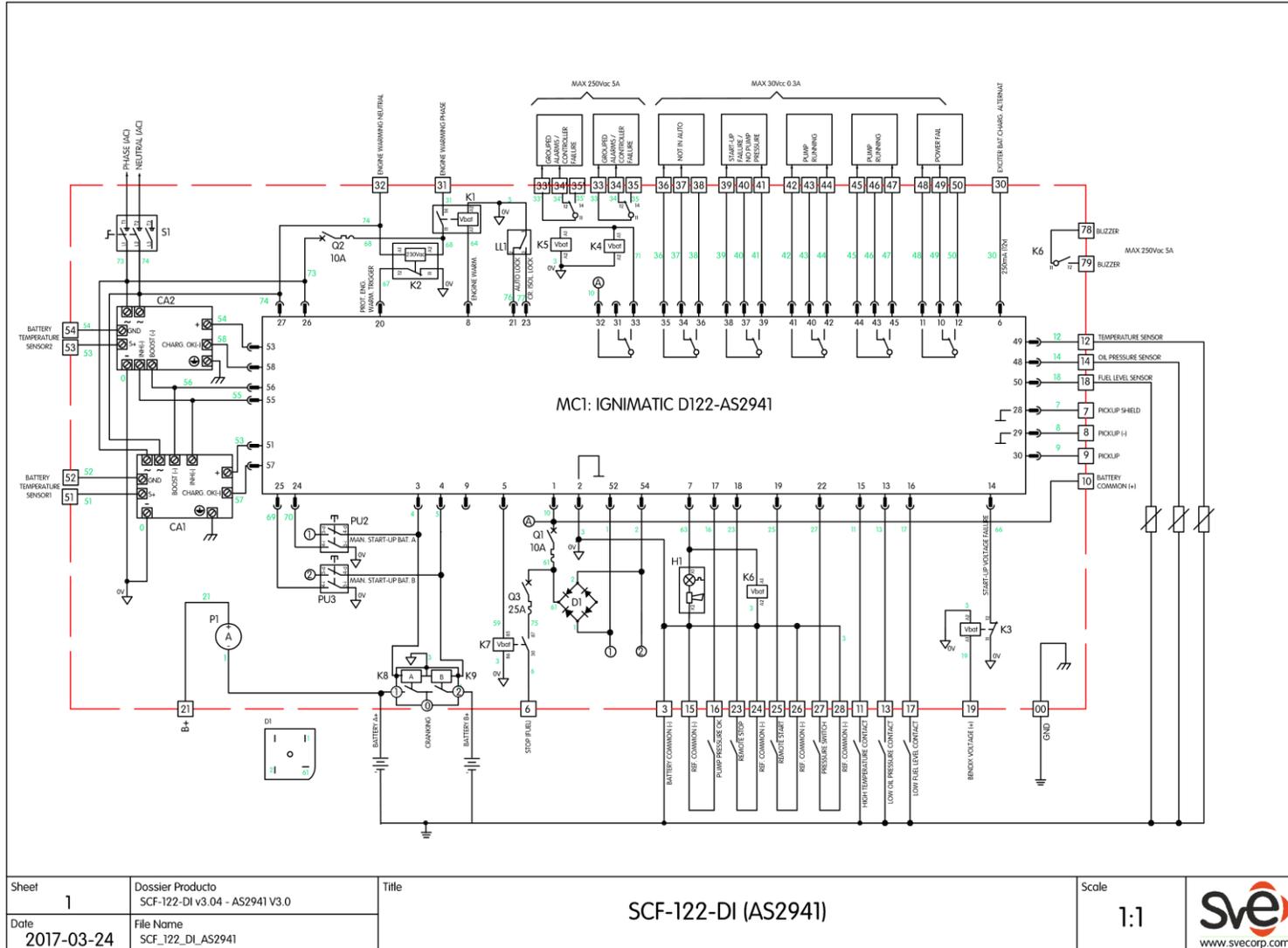
43		Output potential free contacts with Pressure Pump Running (42-44)
44		
45		
46	PUMP RUNNING	Output potential free contacts with Pressure Pump Running (45-47)
47		
48		
49	POWER FAIL	Output potential free contacts Fail Mains supply voltage (AL-2) (48-49)
50		
51	I: BAT TEMP SENSOR-1	Input: Battery temperature sensor-1
52	O: REF. COMMON (-)	Output: Reference (-Vbat) for temperature sensor-1
53	I: BAT. TEMP. SENSOR-2	Input: Battery temperature sensor-2
54	O: REF. COMMON (-)	Output: Reference (-Vbat) for temperature sensor-2
78		
79	O: BUZZER	Output: Voltage free contact for external buzzer

3.2.1 RPM CAPTURERS (PICK-UP)

SCF122-DI-AS2941 panel accepts two types of Pick Up. The necessary connections in each situation are given below:



3.3 SCF122-DI-AS2941 CONTROL PANEL INTERNAL WIRING



4 CONTROL AND DISPLAY ELEMENTS

SCF122-DI-AS2941

The SCF122-DI-AS2941 controller contains a number of elements that allow appropriate management of pump groups and offers the necessary information regarding the status of their fundamental parameters.

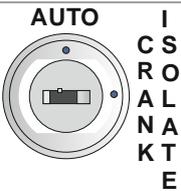
4.1 ISOLATING SWITCH SI

It allows the management of AC current supply to the controller, such that it can be cut off when undertaking installation or maintenance work. Capable of being locked in the "on" position.

4.2 BUZZER

	Capacity: 80 dB Activation in the following circumstances:	Alarm detection
		No Auto Mode
		Pump start demand
		Pump running

4.3 START BLOCK KEY AND INDICATOR

		Key switch to prevent the starter from being energized during maintenance operations and to keep the fire pump controller in the locked "automatic" position
--	--	--

4.4 PUSH BUTTONS

4.4.1 START AND STOP PUSH-BUTTONS

	The "Start battery manual start-up" and "Stop battery manual start-up" buttons allow ordering start-up using either one or both batteries simultaneously. These buttons and their associated circuits are entirely independent of the IGNI-MATIC D122 PLC, in order to avoid an anomaly in the controller from impeding manual use of the device.
	The button orders the shutdown of the pump only if there is no signal indicating either low system pressure or remote start.

4.4.2 ALARMS PUSH BUTTONS

	Pushing this button clears the alarms shown on the display
	Pushing this button interrupts buzzer activation. If the buzzer is produced again by another alarm different to the first, it is necessary to press the button again
	When the engine is running, if this button is pressed the overspeed alarm will be generated

4.5 LIGHTS AND INDICATORS

4.5.1 LIGHT AND DISPLAY PUSH BUTTONS

	LIGHT AND DISPLAY ILLUMINATION TEST It allows the simultaneous illumination of all the LEDs on the IGNI-MATIC D122 controller, and can therefore be used to test the status of these lights
	MEASURING INSTRUMENTS It gives direct access to the screen related to the engines's measuring instruments.
	SCREEN SCROLL It allows access to successive screens with each pressing

4.5.2 YELLOW LIGHT

START UP DEMAND	Start demand is present
------------------------	-------------------------

4.5.3 GREEN LIGHT

POWER ON	Mains is present
-----------------	------------------

4.5.4 RED LIGHT

POWER FAIL	Mains power failure alarm
FAILURE OF ENGINE TO START AUTO	The maximum of 6 programed start-up attempts in AUTO mode have been completed without success
PUMP RUNNING	Pump running
BATTERY CHARGE FAILURE	"START BAT.CHARGER FAIL" or "MONITOR BAT.CHARGER FAIL"
BATTERY LOW VOLTAGE	"START BAT. LOW VOLTAGE" or "MONITOR BAT. LOW VOLTAGE"
LOW FUEL LEVEL	External signal at terminal 17. Or by sensor (Configuration C-19) Minimum level (Configuration C-20)
OVERSPEED SHUTDOWN	Engine speed at or above 120% of the rated speed.
HIGH ENGINE TEMPERATURE	High engine temperature
LOW OIL PRESSURE	Low Oil pressure

4.6 DISPLAY

The IGNIMATIC D2941 PLC is equipped with an LCD display of 20x4 characters, offering superior person-machine interface.

Given below is the collection of screens offered in the IGNIMATIC-D122-AS2941

4.6.1 SCREEN N°1: MAIN SCREEN	
	Time and date
	System availability
	Cumulative motor hours and minutes

4.6.2 SCREEN N°2: BATTERIES	
	A/B Battery voltage
	A/B Charging current
	Time remaining until next deep-cycle boost-charge process

Minimum voltage displayed: **0.10 Vcc.**
 Maximum voltage displayed: **40.00 Vcc.**
 Definition: **0.10 Vcc**
 Minimum current displayed: **0.10 Acc.**
 Maximum current displayed: **5.00 Acc.**
 Definition: **0.10 Acc**

4.6.3 SCREEN N°3: ENGINE	
	Fuel level
	Coolant temperature
	Oil pressure
	RPM

Fuel level

Range of fuel levels displayed (minimum-maximum):0%-100%

Resolution:5%

Coolant temperature

Range of temperatures displayed (minimum-maximum):..0-120°C

Resolution:1°C

Oil pressure

Range of pressures displayed (minimum-maximum):0-10 Bar

Resolution:0.5 Bar

Frequency (RPM)

Range of frequencies displayed (minimum-maximum):0-600 RPM

Resolution:5%

5 PREVIOUS OPERATIONS AND SETTING UP

SCF122-DI-AS2941

5.1 SECURITY



The SCF122-DI-AS2941 controller is designed to control an essential system for building safety. Furthermore it can represent a risk for operators given that it is supplied by 230V AV current.

As such, we expressly advice that the system be manipulated by trained and authorised personnel, who have previously read these instructions.

Initial configuration

The initial factory-setting configuration of the IGNIMATIC D2941 takes into account the conditions relevant to the majority of pump systems, but it is essential that some parameters be personalised. Ask your provider whether your device has already been personalised according to your particular case; if not, you will need to adapt it by following the instructions outlined in the section **PARAMETER CONFIGURATION**.

6 OPERATION

SCF122-DI-AS2941

6.1 START UP

6.1.1 BEGINNING OF START UP SEQUENCE

AUTOMATIC MODE	Pressure Switch. (closing terminal 27 to terminal 28) NC / NO according to parameter (Configuration C-31) Action may be delayed according to parameter (Configuration C-8)
	Remote Start (closing terminal 25 to terminal 26)
ANY MODE	 The action of either of the two buttons located on the front of the SCF122-DI-AS2941 panel.

6.1.2 START UP SEQUENCE

When starting by Pressure Switch or Remote Start	The IGNIMATIC D2941 PLC will order up to 6 start-up attempts (number of attempts configurable C-4), with the "START" battery each of a configurable duration (C-6: 1-99 seconds, with a default duration 10 seconds) and with a pause of 20 seconds between each attempt.
When starting by the push buttons	Each of the buttons works using the energy of one of the two batteries. The simultaneous activation of the two buttons puts the batteries in parallel and energizes the starter motor using both

6.1.3 TERMINATION OF START UP SEQUENCE

Either of the circumstances:	Detection of engine running
	Exhaustion of the 6 start-up attempts

6.2 ENGINE RUNNING DETECTION

The IGNI-MATIC D2941 PLC will recognise the engine is running and will respond accordingly when it receives the signal via the pick-up reader that the engine is at least 25% of its rated RPM

If desired, the operator can select in the configuration menu for withdrawal of cranking process to also take place in response to detection of the engine's oil pressure. **This action is not recommended under current fire-protection regulations.**

6.3 STOP

6.3.1 BEGINNING OF STOP SEQUENCE

The engine stop will be ordered when any of the following conditions is met:



The **STOP** button is pressed on the on the front of SCF-DI-AS2941 control panel

Remote Stop (closing terminal 23 to terminal 24)

Overspeed Alarm appearance

6.3.2 STOP SEQUENCE

The fuel for engine is cut during the time set in Configuration C-7 (15s) by activating stop output (terminal 6)

6.4 HEATING RESISTANCE MANAGEMENT

In order to maintain the engine within the suitable ranks, SCF122-DI-AS2941 panel offers the option of connecting a heating resistance between the protected outputs 31 and 32

The feeding of the mentioned resistance is conditioned by the temperature measured by the corresponding sensor and reflected in the display of the controller IGNI-MATIC D2941.

The rank of activation and disconnection of the heating resistance is selectable in the configuration menu with parameters Configuration C-21 and Configuration C-22 by the following way:

- Minimum coolant temperature (Configuration C-21): Temperature below which the feeding of the heating resistance activates.
- Maximum coolant temperature (Configuration C-22): Temperature over which the feeding of the heating resistance is deactivated.

6.5 BATTERY CHARGER ALTERNATOR EXCITER

At the time of giving a start pulse a current of 250mA for 12VDC is injected through SCF-DI-AS2941 controller output terminal 30 O: EXCITER BAT.CHARG. ALTERNAT for 10 seconds

7 ALARMS

SCF122-DI-AS2941

One of the basic functions of the SCF122-D2941 is the protection of the pump system. This task is achieved through permanent surveillance of the electrical and mechanical variables and the subsequent activation of the available alarms. The presence of an alarm will always be shown on the IGNI-MATIC D2941 display. The available alarms together with their meaning and function are as follows:

The existence of an alarm causes:

- Red ALARM LED lit
- Performance Output potential free contact (terminals: 33/34/35 (NC grouped Alarms: → 33/34 connected)

Message on the controller SCF122-DI display
Red alarm LEDs lit
Performance Voltage free contact (terminals: 33/34/35 and 33'/34'/35' (NC grouped Alarms: 33/34 or 34' and 34' connected)
Activation of the internal and external buzzer

7.1 ALARMS RESET

The following instructions must be followed to reset the alarms:

Rectify the cause of the fault

Press:

7.2 LIST OF ALARMS

:

N°	DISPLAY	DESCRIPTION	SPECIFIC ACTION
AL-1	NOT IN AUTOMATIC MODE	The controller is in CRANK ISOLATE mode	Output: Terminals 36/37/38 not in Auto →36-37 connected
AL-2	POWER FAIL	It has been detected a failure in the AC power supply to the controller. The activation of this alarm can be delayed as indicated in (Configuration C-9)	Output: Terminals 48/49/50 Mains failure →49-49 connected See (Conf C-26) Self-reset when the mains returns
AL-3	OVERSPEED	It has been detected a engine speed at or above 120% of the rated speed (Configuration C-3)	Stops the engine
AL-4	LOW OIL PRESSURE	It has been received a signal at terminal 13 from the oil pressure gauge indicating low oil pressure. Delayed (Configuration C-10) from engine running.	Configurable Pump Stop (Conf C-12) (not recommended by standards)
AL-5	OVER TEMPERATURE	While engine is running, It has been received a signal at terminal 11 from the thermostat	Configurable Pump Stop (Conf. C-12) (not recommended by standards)
AL-6	LOW FUEL LEVEL	It has been received the corresponding external signal at terminal 17. And by sensor (Configuration C-19) Minimum level (Configuration	-

		C-20)	
AL-7	START BAT.LOW VOLT.	It has been internally detected a battery voltage below 10V (in the case of a 12V battery) or 20V (in the case of a 24 Vn battery) for at least 5 minutes.	-
AL-8	MONITOR BAT.LOW VOLT	It has been internally detected a battery voltage below 10V (in the case of a 12Vn battery) or 20V (in the case of a 24 V battery) for at least 5 minutes.	-
AL-9	START BAT.CHARG.FAIL	It has been ceased to received the signal from the SCBB chargers indicating correct charger status	-
AL-10	MONIT.BAT.CHARG.FAIL	It has been ceased to received the signal from the SCBB chargers indicating correct charger status	-
AL-11	HEATING PROTECTION	It has been received a signal via the relay M2 contact indicating the tripping of the corresponding protector	-
AL-12	START VOLTAGE FAIL.	It has not been receiving positive voltage from the "bendix" terminal 19 when engine start-up is being ordered using either of the batteries.	-
AL-13	FAILED TO START	The maximum of 6 programed start-up attempts in AUTO mode have been completed without success	Output: Terminals 39/40/41 Start-up failure →39-40 connected
AL-14	PUMP FAILURE PRESSURE	It has not been received a signal at terminal 16 from the pressure gauge indicating discharge pressure OK. Delayed (C-10) from engine running.	Configurable Pump Stop (Conf. C-12) (not recommended by standards)
AL-15	-	-	-
AL-16	-	-	-
AL-17	PICK UP FAILURE	It has not been received the Pick-Up signal or the measured valued is under 25% Nominal speed (Conf. C-3) when engine is running	-
AL-18	COOLANT TEMP.FAULT	Coolant temperature measured by the sensor is below 20°C. if configured C-18 with some type of temperature sensor and Conf. C-32 " Coolant Temp. Fault Enable" is enabled	-

8 PARAMETERS CONFIGURATION

SCF122-DI-AS2941

The IGNI-MATIC D2941 PLC offers an extraordinary capacity for adaptation to any type of pump as well as to the specific needs of different users. It is adapted to the specific demands of each installation by means of correct configuration of its modifiable parameters.

The controller's pre-programmed factory settings for parameters, alerts and times correspond to the most common needs of pump installations and to currently applicable fire-protection regulations. We refer to these factory settings as "default parameters." In table II these parameters appear underlined and in bold font.

The date and time on the controller must be previously configured.

8.1 STARTING CONDITIONS

SCF122-DI-AS2941 controller connected and supplied by battery.

Engine Stopped

Press the buttons   at the same time for 3 seconds

8.1.1 UTILITIES OF THE PUSH-BUTTONS

The following are the valid buttons for this function with their respective utilities:

	Selects the next option or increases the displayed value
	Selects the previous option or decreases the displayed value
	To access the content of the selected option indicated by the cursor *. Accept the value of the parameter and move to the next parameter

8.2 EXITING CONFIGURATION MODE

Once the desired values for each configurable parameter have been established, the configuration process is completed as follows:

Press the buttons   at the same time for 3 seconds

The screen will display the message "DATA SAVED"

8.3 CONFIGURATION OPTIONS

The display shows "MAIN MENU":

Nº	SCREEN	CONFIGURABLE OPTIONS
1	EVENTS LOG	DAY/MONTH HOUR:MINUTE EVENT
2	DATE / TIME	DAY/MONTH/YEAR HOUR:MINUTE
3	LANGUAGE	ESPAÑOL / ENGLISH / FRANÇAIS / PORTUGUES
4	PARAMETERS	ACCES CONFIGURABLE PARAMETERS

The selected option in progress is shown preceded by the * symbol

8.3.1 EVENTS LOG

To access this screen the IGNI-MATIC D2941 PLC will require the entry of an access code (factory code: 0000).

The most recent 47 events produced in the installation are displayed, showing the following properties:

- Alarms
- Start-ups
- Operation modes: AUTOMATIC / CRANK ISOLATE

The information is displayed in the following format: DD/MM HH:MM EVENT

This screen is read-only and cannot be modified.

The following abbreviations are used in the event history:

MESSAGE ON SCREEN	CONCEPT
L.BAT A	LOW VOLTAGE BATTERY A
L.BAT B	LOW VOLTAGE BATTERY B
PICKUP F	PICKUP FAILURE
START F.	START-UP FAILURE
LPTK	LOW PRIMING TANK LEVEL
OVERSPEE	OVERSPEED
LOW.FUEL	LOW FUEL LEVEL
L.OIL P.	LOW OIL PRESSURE
OVERTEMP	HIGH TEMPERATURE
MAINS OK	MAINS OK
MAINS F.	POWER FAIL
STARTING	STARTUP ORDER
STOPPING	SHUTDOWN ORDER
CHAR.F. A	CHARGER A FAILURE
CHAR.F. B	CHARGER B FAILURE
P.DRIV.F	PUMP WATER PRESSURE FAILURE
L.WATER	LOW WATER RESERVE
HEAT PR.	HEATING PROTECTION TRIP
AUTO	AUTOMATIC MODE
C.ISOLAT	CRANK ISOLATE MODE
TEST ON	TEST TERMINAL ACTIVATED
TEST OFF	TEST TERMINAL DEACTIVATED
REM ON	REMOTE EXTERNAL STARTUP ORDER ON

REM OFF	REMOTE EXTERNAL STARTUP ORDER OFF
LPP ON	SYSTEM PRESSURE O.K. INPUT OPEN
LPP OFF	SYSTEM PRESSURE O.K. INPUT CLOSED (TO BATTERY NEGATIVE)
COOL.T.F	COOLANT TEMPERATURE FAULT

8.3.2 DATE / TIME

Each time the IGNI-MATIC D12941 is connected after having been disconnected, the time and date must be set.

The format on screen is: DD/MM/YY HH:MM

8.3.3 LANGUAGE

The available languages of operation of the IGNI-MATIC D2941 are Spanish, English, French and Portuguese

8.4 CONFIGURABLE PARAMETERS

To access this screen the IGNI-MATIC D2941 PLC will require the entry of an access code (Factory code :0000. Configuration C-27)

In this section parameters can be configured to allow adaptation of the IGNI-MATIC D2941 to most possible installations whether in accordance with or independent of regulations. **In the latter case, the SCF122-D2941 controller will not function according to regulations and as such the general function of the installation will be entirely the responsibility of the installing company:**

Given below is the table of configurable parameters and their possible values:

Nº	CONCEPT	MESSAGE ON SCREEN	SELECTABLE OPTIONS	
C-1	Frequency of panel power supply	MAINS FREQUENCY	50 Hz	60 Hz
C-2	Number of teeth in motor sprocket	NO. OF TEETH	100	1 a 250
C-3	Nominal speed in RPM	NOMINAL SPEED.	1500	1000 a 5100 rpm
C-4	Maximum number of start-up attempts	NO. STARTUP ATTEMPTS	6	1 a 99
C-5	Detection of motor running for oil pressure	WITHDRAW STARTUP FOR OIL PRESSURE	NO	YES
C-6	Duration of each start-up attempt	DURATION STARTUP	15	1 a 99 sec
C-7	Duration of motor shut-down order	DURATION SHUTDOWN	6	2 a 99 sec
C-8	Delay: low system pressure-automatic start-up	DELAY LOW PRESSURE-STARTUP	0	0 a 99 sec
C-9	Delay between mains failure and alarm production	DELAY POWER FAIL ALARM	10	0 a 99 sec
C-10	Delay between engine working and pump pressure monitorization	DELAY PUMP PRESSURE	10	1 a 99 sec
C-11	Contact pump pressure failure	CONTACT PRES. PUMP FAILURE	CLOSED WITHOUT PRESSURE	OPENED WITHOUT PRESSURE
C-12	Action of alarms	ACTIONS OF ALARMS	WARNING	SHUTDOWN
C-13	Activate forced (boost) battery charge every ... hours	BOOST CHARGE BATTERIES EVERY	600	10 a 990 hours
C-14	Duration of forced (boost) charge. 0=No boost charge	BOOST CHARGE DURATION	10	0 (inactive) to 250 minutes
C-15	Nº de batteries	NUM. DE BATTERIES	2	1
C-16	Configurable input (terminal 29)	CONFIG INPUT	EXT. ORDER	FLUXOSTAT

C-17	Oil pressure sensor	PRESSURE	WEMA SRP10	VDO360-081-030-009/FAE14980 FAE14630 WEMA SRP10 ELCOS TPO/403 – VEGLIA (
C-18	Temperature sensor	TEMPERATURE	WEMA SP3	VDO 801-004/803-002 VDO 801-001/803-001 FAE 31020 34080 WEMA SP3 ELCOS TTAO/402 IVECO
C-19	Fuel level sensor	FUEL	NONE	TVDO 221-825-011 VDO 226-801-015-001 AST BIGES 310 861-T WEMA 323234 DATCON 0230x_xx
C-20	Minimum fuel tank level (AL-6)	MIN.FUEL ALARM	65	10 -100 %
C-21	Minimum coolant temperature for heating resistance management	MIN.TEMPERATURE / HEATING	45	20 -100 °C
C-22	Maximum coolant temperature for heating resistance management	MAX. TEMPERATURE / HEATING	49	20 -100 °C
C-23	Activation of periodic test	TEST	No	Yes/No
C-24	Period of periodic test	TEST FREQUENCY	Weekly	Monthly
C-25	Output type coolant valve	OUTPUT TYPE COOLANT VALVE	NO	NO/NC
C-26	Changeover relay output (48-49-50)	CONFIG. RELAY OUTPUT	Mains failure	See Table
C-27	Security Key	CONFIG. KEY	0000	0000-9999
C-28	Communication RS485 MODBUS Speed	RS485 SPEED	9600 8N2	9600 8N2 / 9600 8E1 / 19200 8N2 / 19200 8E1
C-29	Identifier RS485 MODBUS	RS485 MODBUS ID	1	0-255
C-30	Ethernet IP asignation type	IP ASIGNATION	DHCP	IP DETERMINED
C-31	Contact pressure switch type	SYSTEM PRESS. OK	OPENED PRESS. OK	CLOSED PRESSURE OK
C-32	Low temperatura alarm enable	LOW. TEMP.ALARM	NO	YES

The information extracted from the configurable output CONFIG. OUTPUT C-26 (terminals 48/49/50) can be selected from the options given in this table.

DRAINAGE valve
AL-13 STARTUP alarm
AL-2 MAINS alarm
AL-7LOW.V.BAT.A alarm
AL-16 PICKUP alarm
AL-8 LOW.V.BAT.B alarm
AL-3 OVERSPEED alarm
AL-6 LOWFUEL alarm
AL-4 LOWOILPRESSURE alarm
AL-16 -
AL-14 FEED PRESSURE alarm
AL-15 -
AL-11 LOSSHEATINGPROTECTION alarm
AL-9 CHARG.BAT.A alarm
AL-10 CHARG.BAT.B alarm
AL-12 VOLTAGE.FAIL. STARTERMOTOR alarm
AL-5 HIGHTEMP alarm

ANNEXES:

9 A-1 PLC IGNI-MATIC D2941

SCF122-DI-AS2941

TERMINAL CHARACTERISTICS

Connector type: **Extractable screw.**

Minimum recommended cable cross-section: **0.75mm².**

Maximum admitted cable cross-section: **2.5 mm².**

POWER SUPPLY

Minimum voltage: **8Vcc**

Start-up voltage drop: **0Vcc for 50ms**

Maximum voltage: **35Vcc (Protected up to 60V)**

ELECTRICAL MEASUREMENTS

Sampling frequency: **125 Hz**

Minimum frequency: **0 Hz**

Maximum frequency: **75.0 Hz**

Frequency resolution: **0.5Hz**

Minimum current in shunt: **0.5 Amp**

Maximum current in shunt: **5Amp.**

Current resolution: **2%**

INPUTS AND OUTPUTS

Digital inputs

Number of inputs: **16**

Function: **Performance upon connection of terminal to earth**

Analogue inputs

Number of inputs: **5**

Function: **Variable resistance connected to the input**

Minimum resistance: **0 Ohm**

Maximum resistance: **350 Ohm**

Start-up outputs

Output type: **Transistor**

Maximum power: **2 Amp. (Peaks up to 5 Amp)**

Protection: **Short-circuit**

Shutdown outputs

Output type: **Transistor**

Maximum power: **20 Amp. (Peaks up to 50 Amp)**

Protection: **Short-circuit**

Switching outputs:

Number of outputs: **6**

Output type: **Switching relay**

Maximum power: **1 Amp. (Peaks up to 4 Amp)**

Other outputs:

Number of outputs: **7**

Output type: **Transistor**

Maximum power: **1 Amp. (Peaks up to 4 Amp)**

Protection: **Short-circuit**

10 A-2 SBB SERIES BATTERY CHARGERS

SCF122-DI-AS2941

SBB-(X) series is a series of robust and highly efficient battery chargers and power supplies with high frequency switch mode technology.

As battery chargers the SBB-(X) are specially designed for emergency generators and engine driven fire pump starting batteries. Designed to be permanently connected to the battery they continuously monitor the status of batteries and always keep them in peak capacity. SBB-(X) battery chargers remain operational during the engine start process.

Below the battery types supported by the SBB-(X) series:

BATTERY TYPE
Wet (vented) Lead Acid
VRLA (AGM or GEL)
NiCd-(9-18 cells)
NiCd-(10-20 cells)

10.1 MAIN FEATURES

N°	ELECTRICAL FEATURES			
01	Nominal battery voltage	12V DC or 24V DC depending on model		
02	Power supply operating voltage	85V AC- 265V AC		
03	Power supply operating frequency	47Hz-63 Hz.		
04	Nominal charge current	3,5 A DC y 7,0 A DC depending on model		
05	Output battery power	102,5w (DIN 41773: 96,6w)		
06	Performance	>85% at nominal power (see graph chapter 5)		
07	Electrical rigidity	Line – Output: 2000V AC		
08		Line – GND: 2000V AC		
09		Output - GND: 2000V AC (<100MOHM at 500V AC)		
N°	CHARGE CHARACTERISTICS			
10	Charging system	3 Phase (V-I): Bulk / Absorption / Float and equalization		
11	Float voltages at 20°C per DIN 41773	Wet (vented) Lead Acid	13.50V DC	27.00V DC
12		VRLA (AGM or GEL)	13.20V DC	26.40V DC
13		NiCd-(9-18 cells)	12.42V DC	24.84V DC
14		NiCd-(10-20 cells)	13.80V DC	27.60V DC
CAUTION: consult battery supplier. This value can differ greatly between different manufacturers. Consult svecorp@svecorp.com if you require different tensions.				
15	Minimum battery voltage	6V DC		
16	Float/boost voltage drift	Power supply mode: < 2% from 0% to 90% of the nominal charge current		
17		Battery charger mode: ≤ 1%, during the 2nd and 3rd charge phases and for the whole power supply voltage		
18	Charge current drift	≤ 2%, during the 1st charge phase, from 80% to 110% of the battery nominal voltage and for the whole supply voltage range		
19	Voltage ripple	Power supply mode: <5%		

20		Battery Charger mode: <1,2%
N°	PROTECTIONS	
21	Safety standards	EN 60950 (Safety information)
22		Fuse
23	Power supply protection	Protection against power supply connection / disconnection when battery connected; Even when wrong battery connected.
24	Overcurrent protection	Short circuit on output to battery (self-resetting)
25	Reverse polarity protection	Battery reverse polarity (self-resetting)
26	Overvoltage in output to battery	Up to 2 times battery Vn or 50V DC
27	Over-Temperature	30 °C to 50 °C at full charge rate, and up to 70 °C with automatic reduction of charge rate to limit temperature and prevent its deterioration. (EN 60068-2)
N°	SIGNALING	
28	Pilot light ON (green)	The charger is connected to the supply line
29	Pilot light CHARGING (green)	Battery charger charge above 5% In
30	Pilot light BATTERY FAULT (red)	Out of range battery voltage: 80% to 120% Vn
31	Pilot light EQUAL. (blue)	Equalization mode
N°	PHYSICAL CHARACTERISTICS	
33	Dimensions	117.5mm x 59.5mm x 131mm
34	Weight	250gr
35	Mounting	DIN rail: EN 50022 35mm
36	Output terminals to battery	Pluggable (from 0.2mm ² to 2.5 mm ²)
37	Input terminals	L – N - GND: Pluggable (de 0,2mm ² a 2,5 mm ²)
38	Temperature	Use: -30° to 70°C internal temperature sensor
30		Storage: -40°C to 85°C
40	Relative humidity (non-condensing)	Use: 20% to 95%
41		Storage: 10% a 95%
42	Cooling	Natural convection

10.2 CHARGING TIME

Starting batteries charging time is very relevant for safety elements such as emergency generators and engine driven fire pumps. Although these starting batteries are normally fully charged after one or more engine starts is highly recommended to rapidly recharge the batteries to keep the system in optimum conditions so it can successfully satisfy a new demand.

High efficiency SBB-(X) battery chargers minimize charging times and maximize battery life. SBB-(X) models will charge, under normal circumstances, a battery from its minimum level to 80% of its capacity at full charging rate and they will keep charging at a lower rate until the battery is 100% charged. As an example, SBB-12070 charger connected to a 200Ah battery recovers more than 160Ah in 24 h while the remaining capacity is charged at lower current, maximizing battery life.

10.3 CE DECLARATION OF CONFORMMMITY

This document refers to the SBB-(X) battery chargers.

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

CE declaration of conformity

Hereby, SVE S.L. declares under its responsibility that SBB-(X) products comply with provisions of the directives below:

- Electromagnetic compatibility directive CE: 2004/108/CE
- Low voltage directive 2006/95/CEE
- Machinery directive 2006/42/CEE
- Applied standards:
 - EN 60950 (Safety information): Safety. Part 1: General requirements
 - EN 50178 (General standard): Electronic equipment for use in power installations
 - EN 61000-6-2 (Generic immunity): Generic standards. Immunity standard for industrial environments
 - EN 61000-6-4 (Generic emission)
 - EN 61003-2 (Limits for harmonics current)
 - EN 61000-4-2: Electromagnetic compatibility (CEM). Part 4-2: Measuring and testing techniques. Electrostatic Discharge Immunity Test
 - EN 61000-4-3: Radiated, radio-frequency, electromagnetic field immunity test
 - EN 61000-4-4: Electrical Fast Transient
 - EN 61000-4-5: Surge immunity test

05/02/2016

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10.4 INSTALATION AND CONNECTIONS

- To ensure optimum cooling SBB-(X) must be installed in the correct location allowing not less than 100 mm free space above and below and at least 30 mm free space on both sides.
- It is up to the operator or installer to make sure that the SBB-(X) model is installed in an environment that does not exceed specified ambient temperatures. Failure to comply with the installation instructions would lead to greater battery charge times.
- SBB-(X) ground (GND) must be connected to the ground (GND) terminal of the electrical panel box where is installed.

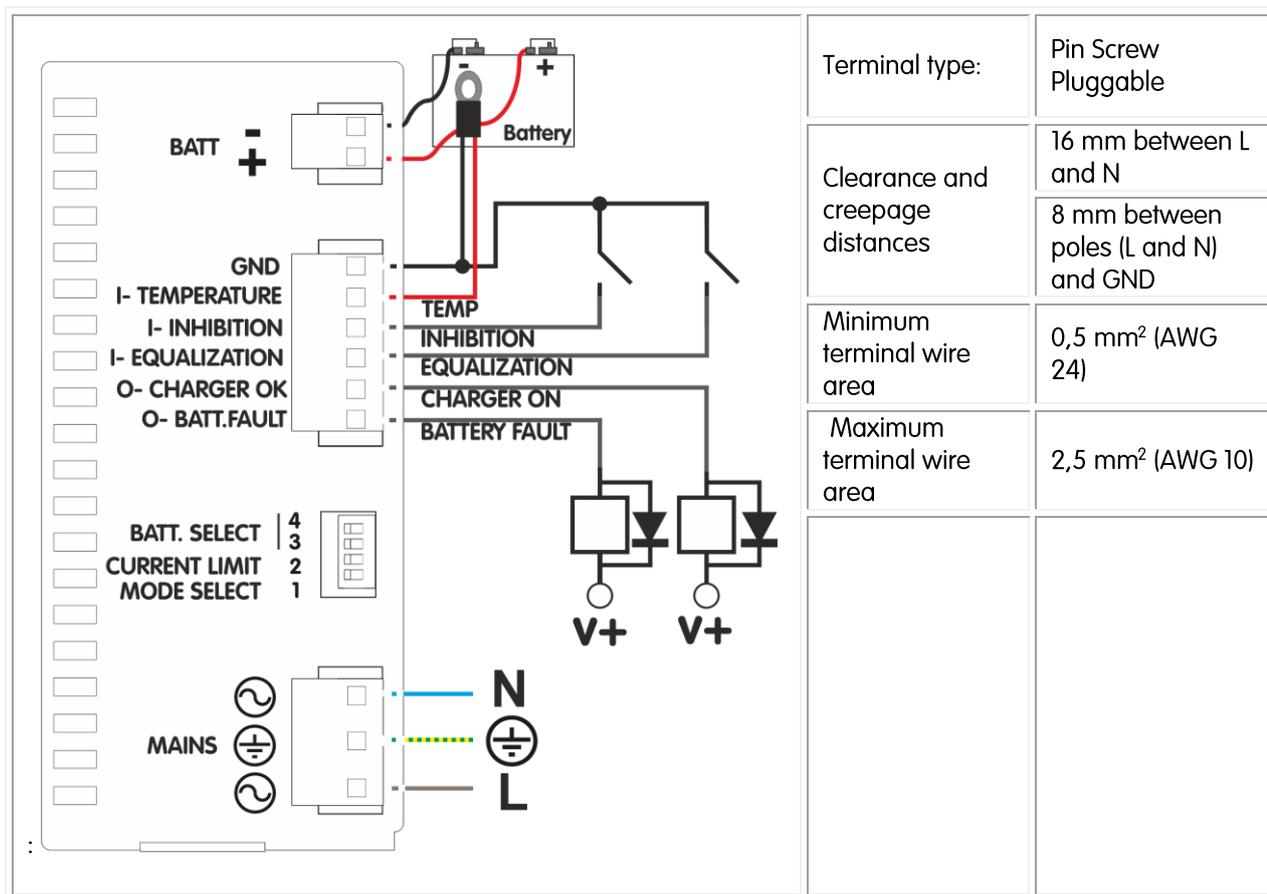
i. CONNECTION TERMINALS

BATTERY CHARGE OUTPUTS	
+VBAT	Output: Battery positive
-VBAT	Output: Battery negative
CONTROL INPUT AND OUTPUTS	
GND	Control input and output reference
I-TEMP(+)	Input: Temperature sensor positive LM335 (10mv/°C)
I-INH.	Input: Inhibit
I-EQUAL	Input: Equalization
O-CH.OK	Output: Charger O.K
O-FAULT	Output: Battery failure
SUPPLY INPUTS	
	Input: Line / Phase
	Input: Earth / Reference
	Input: Neutral

ii. INPUT / CONTROL OUTPUTS CHARACTERISTICS

I-INH.	Input: Activated when connected to GND supports ± 50 volt without breakage of any component.
I-EQUAL	
O-CH.OK	Output. OC: Open collector limited in power to 500 mA, protected against contact with battery and reverse voltages $\pm 40V$ DC
O-FAULT	

iii. CONNECTION DIAGRAM



10.5 PILOT LIGHTS IN CHARGER

ON	SBB-(X) supplied with alternating current If charger mode is selected, there must exist at least Battery 6V DC in the output +,-
CHARGING	Stays Lit during the 1st charge phase: "Bulk"
	Blinking during the 2nd charge phase: "Absorption"
	Blinks every two seconds during the 3rd charge phase: "Float" If current exceeds 5% of the In Off if current does not exceed this intensity 5% of the In
BATTERY FAULT	Detection thresholds: <12V / >15V DC or <24V / >30V DC (according to model) Delay in signaling: 5 minutes
EQUALIZATION	Lit when Equalization mode is active

10.6 CONTROL INPUTS / OUTPUTS

I-INH.	Input: Stops battery charge process while it is active
I-EQUAL	Input: Activates equalization mode
O-CH.OK	Output: Activates together with the Charger ON pilot light
O-FAULT	Output: Activates together with the Battery Fault pilot light

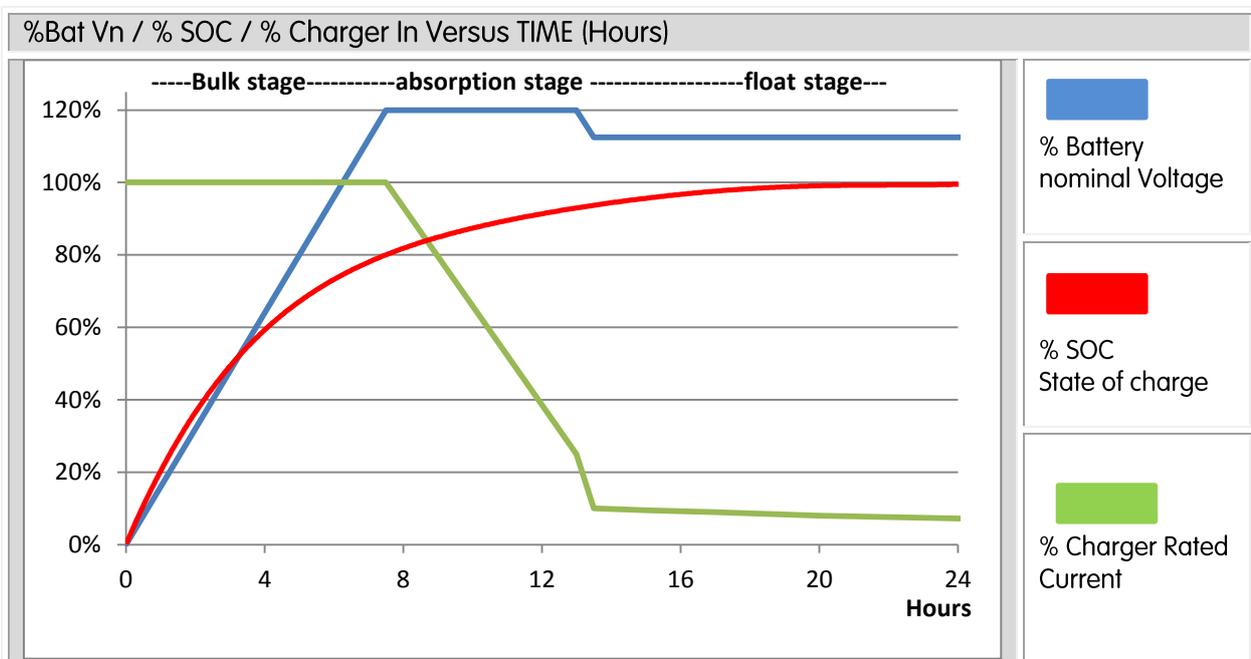
10.7 MICRO-SWITCH SELECTOR

SWITCH	OFF	ON	
SW-1:	Battery charger mode	Power supply mode	
SW-2:	-	50% power reduction (SBB-12070)	
SW-3 and SW4:	V FLOAT	V CHARGE	Battery types
OFF/OFF	13.5V / 27.0V	14,40V / 28.80V	Wet (vented) Lead Acid
OFF/ON	13.2V / 26.4V	13.44V / 26.88V	Lead-Acid VRLA(AGM or GEL)
ON/OFF	12.42V / 24.8V	13.20V / 26.40V	NiCd-9 / Ni-Cd18
ON/ON	12.8V / 25.6V	14.64V / 29.28V	NiCd-10 / Ni-Cd20

10.8 FUNCTIONING AS BATTERY CHARGER

iv. CHARGING SYSTEM

SBB-(X) provides a three phase battery charging system represented in the following graphic:



Below a description of the each of the 3 charge phases:

CHARGE PHASES	
PHASE-1: Bulk	SBB-(X) maintains I_{nom} intensity constant until the voltage on its output terminals reaches V_{nom}
PHASE-2: Absorption	SBB-(X) maintains voltage control at V_{Boost} until the output current intensity to the battery drops below 25% of I_{nom} or after 6 hours
PHASE-3: Float	SBB-(X) maintains voltage control in V_{Float} , limiting the current to a maximum of 10% I_{nom}

SBB-(X) will start in charge phase 1 whenever is connect to a power line, the battery voltage descends from V_{nom} for more than 5 seconds, or finalizes a battery charger inhibition longer than 30 seconds.

v. EQUALIZATION (only for Wet (vented) Lead Acid batteries)

SBB-(X) incorporates an equalization function (desulfation, restoration, etc) by carrying out a controlled overvoltage process. By equalizing the battery outer layer of the plate, including the sulphate coating, is blown off, thereby rejuvenating the battery and allowing all the surface area of the plates to interact with the electrolyte.

Equalization mode activates when SBB-(X) terminal I-EQUAL is connected to GND and only if the Wet (vented) Lead Acid battery type is selected.

- A short contact (1 second) at I-EQUAL input causes the activation of the Equalization mode for 15 minutes.
- A contact maintained for over 15 minutes causes the equalization mode maintenance until the order is complete or after 3 hours.

During the equalization process SBB-(X):

- Raises its voltage output to $V_{eq.} = V_{nom} + 22\%$ this is: 14.64V DC or 29.28V DC depending on the charger model.

The maximum current is limited by SBB-(X) to 50% of the I_{nom}

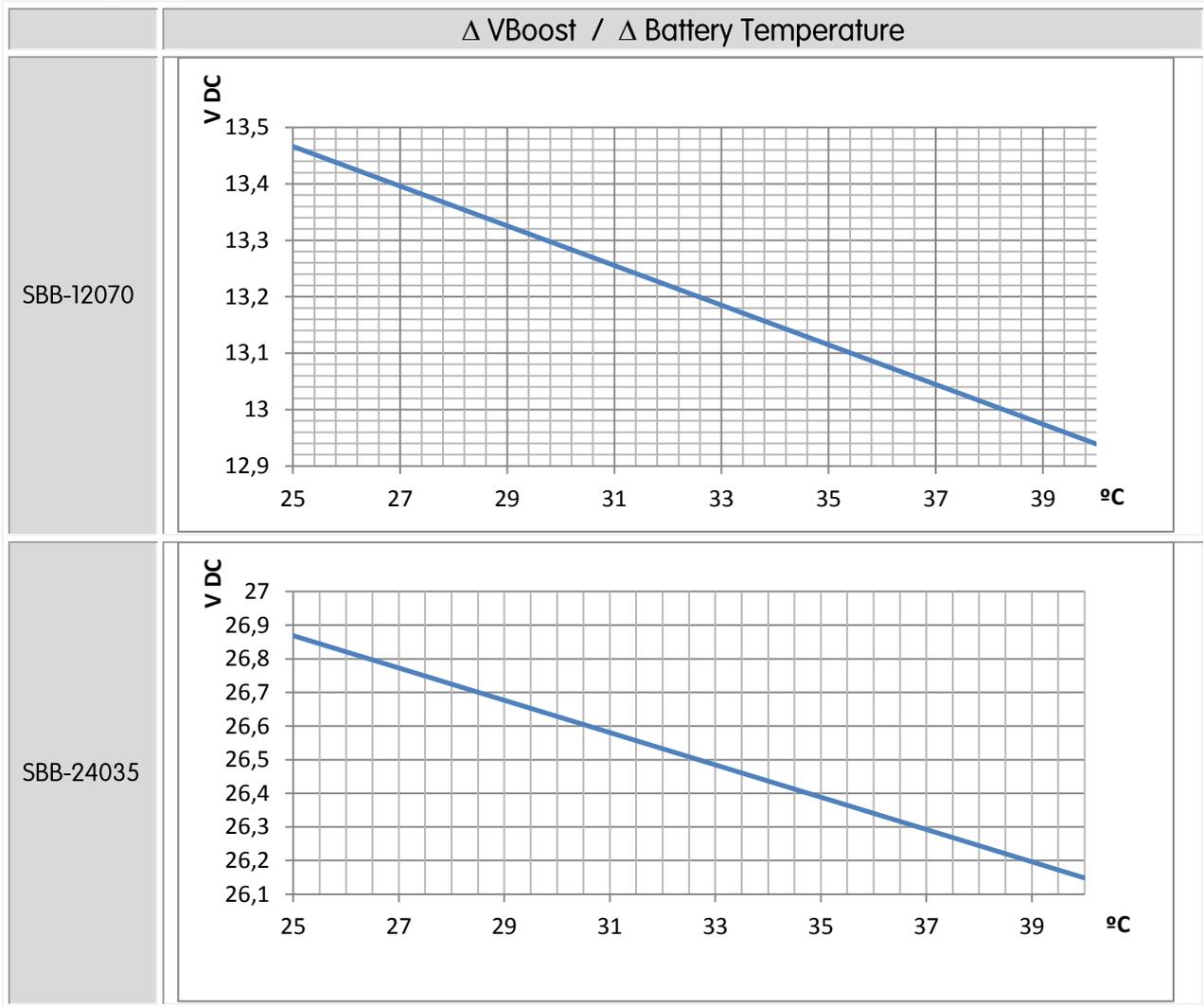
vi. BATTERY TEMPERATURE COMPENSATION

Given that Lead-Acid VRLA batteries are very sensitive to temperature, especially when temperature is above 25°C, SBB-(X) can reduce V_{Boost} and V_{Float} to compensate the high temperature adverse effects and prevent the degradation of the battery cells.

It is necessary to install a temperature probe in one of the electrodes of the battery and connect it to the terminals GND and I-Temperature of the SBB-(X)

Temperature probe	
<ul style="list-style-type: none"> • 2 wires • Output: 0V at 0°Kelvin . • Gain: 10miliVolts /° Kelvin 	

VBoost and VFloat decrease the standard: - 4mV /°C/cell, starting at 25 °C and up to 40 °C limit above which the charge stops; i.e. - 24mV /°C for Vn: 12VDC or - 48mV /°C for Vn: 24v.



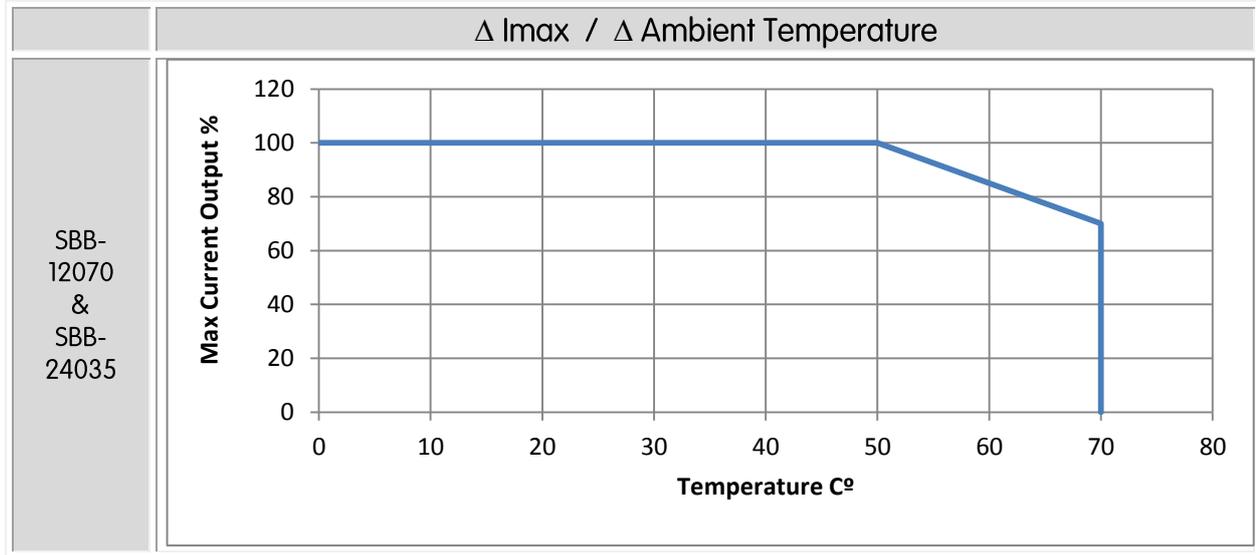
vii. INHIBITION

SBB-(X) will stop acting as a battery charger or power supply when terminal I-INH. is connected to GND.

10.9 SBB-(X) OVER-TEMPERATURE PROTECTION

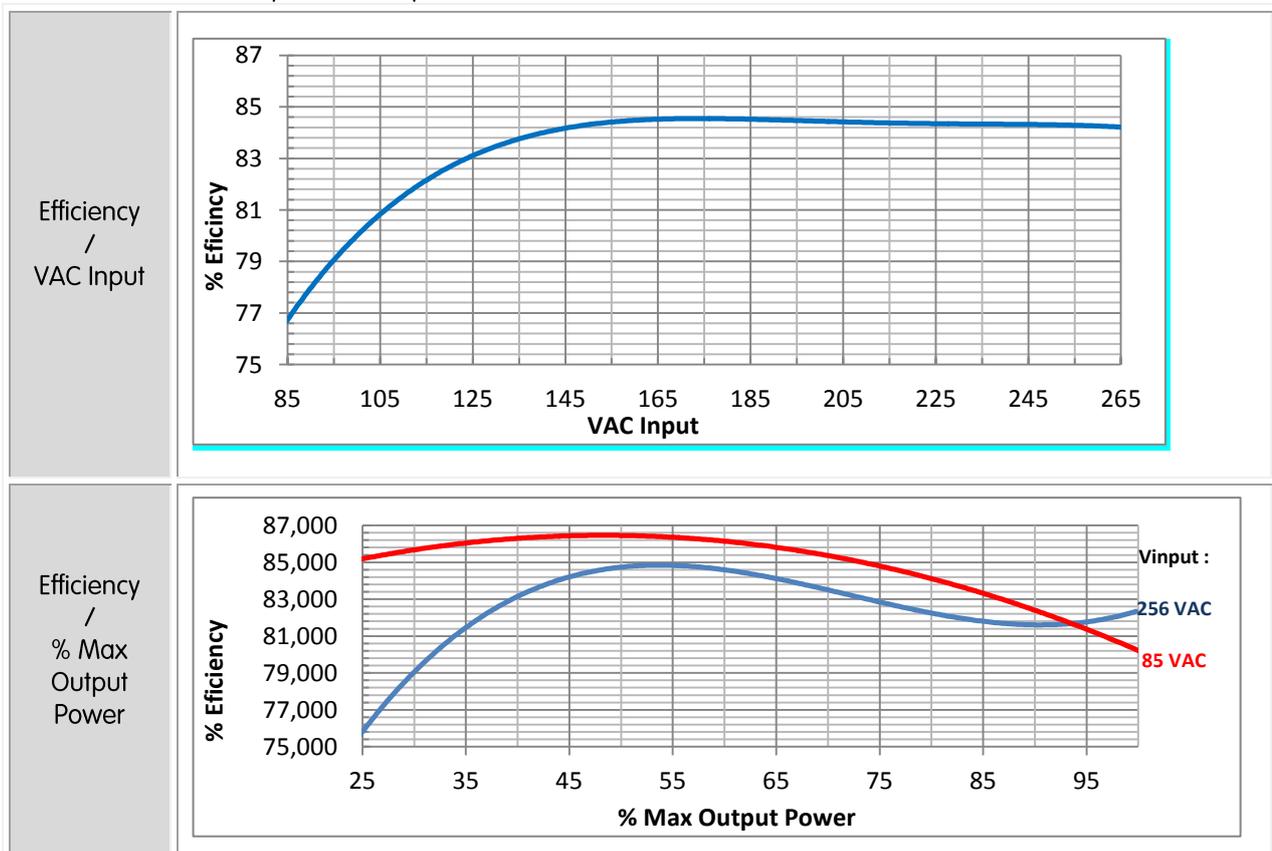
To prevent the deterioration of internal components due to the temperature SBB-(X) has the capability to decrease the charge current as the ambient temperature increases above certain levels.

Below the graphs that shows the ambient temperature against the charge current that can be delivered to the battery.



10.10 EFFICIENCY

SBB-(X) offers a high efficiency $\geq 75\%$ for the whole power supply operating voltage range between 85V AC and 265V AC. The efficiency curves are presented below.



10.11 WASTE MANAGEMENT

According to the 2002/96/EC Waste Electrical and Electronic Equipment Directive, electrical and electronic components must be stored, collected, treated, recycled or disposed of separately from the rest.



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