SME-S

Heavy-duty industrial DC rectifier - battery charger

Thyristors (SCR) 1 Phase input

Lead acid or NiCd batteries

SME model is the LEVER state-of-the art rectifier, specifically designed to ensure the maximum power availability in the most demanding industrial environments

- **LEVER SME** rectifier supplies continuous DC loads and keeps the batteries charged, ensuring the full continuity of the services
- The **battery charging cycle** is managed in a completely **automatic way**, as per IEC 478-1
- The batteries are permanently connected to the DC loads, the system therefore can respond immediately to impulsive loads, such as electric motors, MV/HV circuit breaker release coils, etc
- **Engineered product, fully customizable** and with a wide range of **options**, the LEVER SME can be supplied in a **single** or **redundant configuration**, with a **change-over** system designed as per Client technical specifications

Applications

LEVER SME is designed and developed for all the DC applications **requiring strong technical** and **environmental requirements**

- **Oil & Gas** (petrochemicals offshore, onshore, pipelines)
- **Utilities & Power Generation** (power plant, transmission, distribution)
- **Transportations** (railway, airport, shipping)
- **Water** (desalination, treatment)
- **Instrumentation & Process control** (chemical, mining, steel, paper)
- All the **industrial** applications

Compliance

LEVER SME is type-tested by **CESI SpA** and complies with the following standards:

- IEC 60146-1-1 (Semiconductor converters)
- IEC 62040-1 (Safety requirements)
- IEC 62040-2 (Electromagnetic compatibility)
- IEC 62040-4 (Environmental aspects)
- IEC 62040-5-3 (DC UPS performance & requirements)

Key features

- **Thyristor** rectifier bridge
- System digitally controlled
- Flexible approach to provide tailored solution: fully customizable to comply with Client technical specifications
- Designed to withstand the harshest environmental conditions
- Compatibility with **lead acid** VRLA, AGM, Gel and **NiCd** batteries
- 3 automatic charging modes, 3 adjustable recharge voltage levels and manual charging mode
- Dry contacts, signalizations, alarms and adjustable time delay thresholds
- Battery charger voltage compensated in relation with temperature to extend the battery life

Main technical characteristics

➢ Construction design

The cabinet is **IP31 protection degree** with closed door and it is painted with **RAL 7035** oven-dried polyester epoxy powder. The cable inlet is on the bottom and a handy shaft leads to the terminal board. The internal layout is designed to allow an easy connection of power cords and the cables for the remote signals and controls

➢ Display interface HMI and mimic diagram

A human machine interface ensures the access to all the parameters. A **4.3" graphic display** in the front side gives the perfect overview of the measures and the alarms. A **mimic diagram**, with up to 20 adjustable signalizations, is available to give real-time information of the battery charger state

➢ Standard system

The SME rectifiers have been pre-configured with the most commonly requested features built-in as standards, with the necessary user documentation

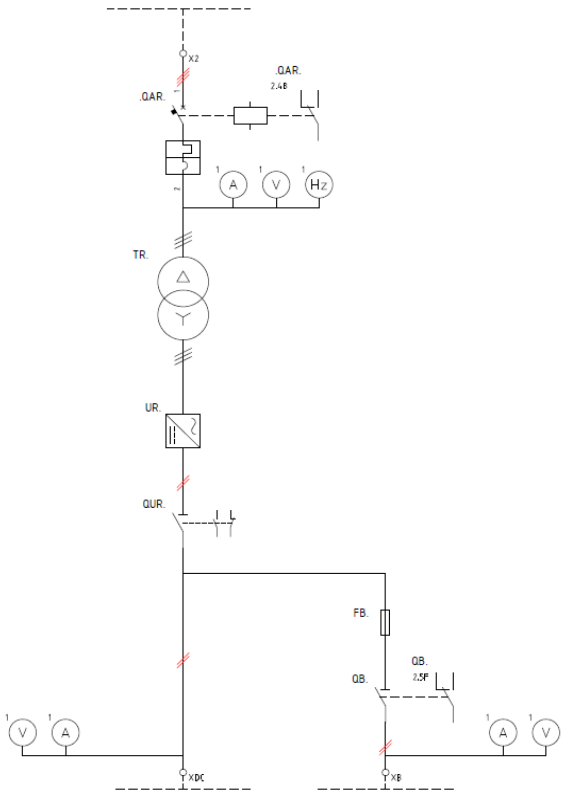
➢ Standard electrical and electronic components

- Input isolation transformer
- Input terminals blocks
- Input power breaker
- Digital Control system
- L-C filter
- Modbus RTU interface (over RS485)
- Modbus TCP interface (over Ethernet)
- Dry contacts SPDT module
- HMI display 4.3"

➢ Standard mechanical components

- Floor mounted cabinet
- Cabinet protection degree IP31 with closed door
- Cabinet protection degree IP20 with open door
- Colour RAL 7035 – powdered textured painting
- Bottom side cable entry
- Standard cable marking
- Copper earth bar

SME indicative single line drawing



Main options

- Blocking Diode
- Drop cell
- Kit IP42 cabinet protection degree
- DC Earth Fault protection
- Redundant configuration with change-over system
- Tailored alarms, LEDs and dry contacts signalizations
- Input/Output analog voltmeter and ammeter
- Other cabinet RAL colours
- FALCON battery monitoring system
- PCB Boards tropicalization
- Kit for internal light and power outlet
- Profibus DP interface (over RS485)
- Standard IEC 61850
- Customizable battery and ambient temperature management
- DC distribution board as per Client Specifications

RATED OUTPUT CURRENT (A)		30	60	80	100
INPUT					
Input Rated Voltage		230Vac 1Phase (Other voltage availlable)			
Range input Voltage		+/-10% full operation; +15/-20% with derating			
Frequency range (selectable)		46Hz ~ 64 Hz			
Input current at full load (A)	24Vdc	7	14	18	22
	48Vdc	13,5	27	36	43
	60Vdc	17	34	45	54
	110Vdc	26	51		
	125Vdc	26	51		
Power transformer		Input isulation power transformer - Class H - Natural cooled			
OUTPUT					
Range Output voltage with rated main 400Vac	24Vdc	18 ~ 37 Vdc (adjustable)			
	48Vdc	30 ~ 70 Vdc (adjustable)			
	60Vdc	38 ~ 88 Vdc (adjustable)			
	110Vdc	98 ~ 170 Vdc (adjustable)			
	125Vdc				
Charging Current (adjustable) - A		3~30	6~60	8~80	10~100
Recharge voltage compensation		-0.11% x V x °C			
Charging Voltage per cell (adjustable)		2,27/2,4/2,7 Lead acid batteries ; 1,41/1,55/1,7Vdc NiCd Floating / Boost / Equalizing (commissioning)			
Static voltage regulation		+/-2%			
Output voltage ripple		<2% RMS			
Overload capacity		Overload not admitted (only through batteries connected)			
Charging Characteristic		IU, IUT, I1I2U, U1U2I (DIN 41773)			
SYSTEMS					
Technology		SCR thyristor-based rectifier bridge			
Isulation		Floating battery; input/output isolation			
Efficiency		90%			
Cooling		Natural			
PHYSICAL					
Dimension (WxD) **Height is 1600 (mm) for all range**	24Vdc	600x650	600x650	600x650	600x650
	48Vdc	600x650	600x650	600x650	600x650
	60Vdc	600x650	600x650	600x650	600x650
	110Vdc	600x650	600x650		
	125Vdc	600x650	600x650		
Net Weight (kgs)					
IP Rating / Color		IP31 (IP42-IP54 optional depending on the range) - RAL7035			
WIRING					
Type wiring		FG17 – 450/750V flexible single pole wire for internal cabinet wiring, HEPR isolation quality G17			
Standard reference		EN 50575:2014; EN 60228; EN 50575; 2014/35/UE; 2011/65/UE			
FIRE PERFORMANCE		EN 50575:2014+A1:2016; Class Cca-s1b, d1, a1			
STANDARDS					
Standard		IEC 62040-1, IEC 62040-2, IEC 62040-4, IEC 62040-5-3, IEC 60146-1-1			
Regulations		European directives: 2014/35/EU low voltage Directive; 2014/30/EU electromagnetic compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2; RoHS compliant			
ENVIRONMENT					
Operating Temperature		-10°C ~ 50°C			
Storage Temperature		-20°C ~ 70°C			
Operation Humidity		<95 % and non-condensated			
Operation Altitude		<2000 m (derating according to EN 62040-3)			
Acoustic Noise Level @ 1 meter (dBA)		<65 dBA			
MANAGEMENT					
Connectivity interface		Modbus TCP/IP, Modbus RTU (optional), IEC 61850 (optional)			
Optional SNMP		Power management from SNMP manager and web browser			
SPDT allarm board		Voltage-free contacts (configurable)			
LCD Display		4.3" HMI LDC lisplay with all the measurements, settings, optical alarms, historical events			