SME 12 Pulse

Heavy-duty industrial DC rectifier - battery charger

Thyristors (SCR 12 Pulse) 3 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

- **Management of the two branches (master and slave) through two separate control boards**
- **CAN-bus communication between the two control boards**
- **Increased reliability compared to a 6 Pulse, as it is possible to supply at least partially the load in case of failure of one of the two SCR module**
- System digitally controlled
- Designed to withstand the harshest environmental conditions (55°C, 95% humidity)
- 3 automatic charging modes, 3 adjustable recharge voltage levels and manual charging model

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 system has a natural ventilated top. 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

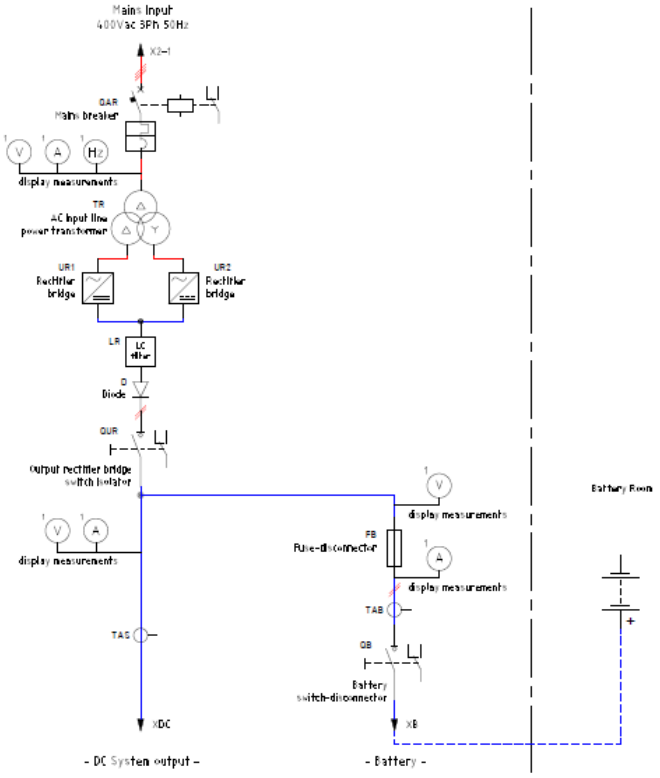
➢ Standard electrical and electronic components

- Input isolation transformer
- Input terminals blocks
- Input power breaker (MCB or MCCB depending on size)
- Fast fuse for rectifier bridge protection
- Digital Control system
- L-C filter
- Standard PVC cables H07V-K(FS17)
- 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
- Cabinet with natural cooling
- Bottom side cable entry
- Standard cable marking
- Copper earth bar

SME indicative single line drawing



Main options

- ➢ Blocking Diode
- ➢ Drop cell
- ➢ Battery MCCB with reversed polarity protection
- ➢ 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		60	80	100	120	150	200	250	300	400	500	600	800	1000	1200	1500	2000
INPUT																	
Input Rated Voltage		400Vac 3Phase (Other voltage available)															
Range input Voltage		+/-10% full operation; +15/-20% with derating															
Frequency range (selectable)		46Hz ~ 64 Hz															
Input current at full load (A)	24Vdc	4	5	6.5	7,5	9.5	13	16	19	25	31	38	50	63	76	95	126
	48Vdc	7.5	9,5	12	14	18	24	30	35	47	58	70	93	117	140	175	234
	110Vdc	16	21	26	31	39	50	61	73	96	120	145	192	240	290	363	480
	125Vdc	16	21	26	31	39	50	61	73	96	120	145	192	240	290	363	480
	220Vdc	29	39	50	58	73	97	120	143	191	239	286	382	478	572		
THDi		<12%															
Power Factor		≧ 0.8 at 100% Load															
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)															
	110Vdc	98 ~ 170 Vdc (adjustable)															
	125Vdc																
	220Vdc	190 ~ 300 Vdc (adjustable)															
Charging Current (adjustable) - A		6~60	8~80	10~100	12~120	15~150	20~200	25~250	30~300	40~400	50~500	60~600	80~800	100~1000	120~1200	150~1500	200~2000
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		+/-1%															
Output voltage ripple		<1% RMS															
Overload capacity		Overload not admitted (only through batteries)															
Charging Characteristic		IU, IUT, I1I2U, U1U2I (DIN 41773)															
SYSTEMS																	
Technology		SCR thyristor-based rectifier bridge 12-Pulse															
Insulation		Floating battery; input/output insulation															
Efficiency		88~92%															
Cooling		**Natural**										**Forced**					
PHYSICAL																	
Dimension (WxD) Height is 2200 (mm) for all ranges	24Vdc	800x800	800x800	800x800	800x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	2000x800	2000x800	2400x800
	48Vdc	800x800	800x800	800x800	800x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	2000x800	2000x800	2400x800
	110Vdc	800x800	800x800	800x800	800x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	2000x800	2000x800	2000x800	2400x800	2400x800	3000x800
	125Vdc	800x800	800x800	800x800	800x800	1600x800	1600x800	1600x800	1600x800	1600x800	1600x800	2000x800	2000x800	2000x800	2400x800	2400x800	3000x800
	220Vdc	1000x800	1000x800	1000x800	1000x800	1600x800	1600x800	1600x800	1600x800	2000x800	2000x800	2000x800	2000x800	2000x800	2400x800		
Net Weight (kg)		360	480	520	560	740	840	880	960	1040	1200	1380	1520	1680	1850	2100	2350
IP Rating / Color		IP31 (IP42-IP54 optional depending on the range) - RAL7035											IP20 - RAL7035				
WIRING																	
Type wiring		FG17 – 450/750V flexible single pole wire for internal cabinet wiring, PVC 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															