MADE IN ITALY

50 ANNIVERSARY
1973 • 2023

# Heavy-duty solutions for critical applications

## Oil & Gas

## Utilities

## Industrial

AC UPS
DC UPS – DC CHARGERS
DC/AC INVERTERS

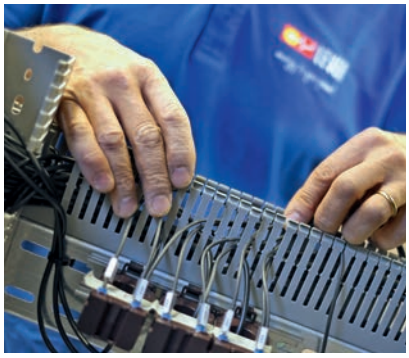
LEVER®
power solutions
since 1973

# Who we are:

LEVER is a global leader in power solution technologies for critical applications, i.e. Oil & Gas, Utilities and Industrial. Based in Verona, Italy, the Company was founded in 1973 and nowadays operates worldwide, with focus on Europe, Middle East, Russia, Africa and South America. We offer a complete range of solutions, covering various electrical applications in different areas of business:

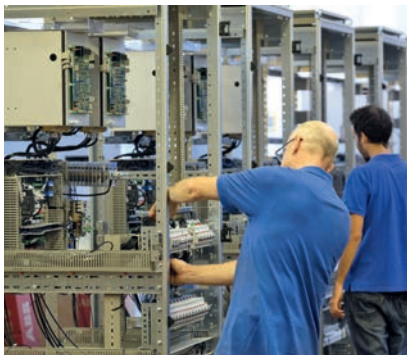
- DC Chargers/DC UPS, output current from 5 A to 2500 A with 24, 48, 110, 125, 220 Vdc output voltage
- Customized AC UPS, mainly for Oil & Gas applications, input 3Ph, output power from 5 to 600 kVA
- AC and DC distribution boards
- BMS, battery monitoring system
- NiCd and Lead Acid battery
- Battery steel racks and battery cabinets
- ATEX/Ex explosion-proof battery disjunction box
- Engineering, Testing & Commissioning and After Sales Service

**LEVER's success has been driven by a strong focus on research and development: the Company maintains its research center in Verona and has been continuously investing in R&D.**
**The result is a long track record of innovation. Many of the technologies that underlie our modern society, from industrial AC UPS to DC rectifiers battery chargers, were engineered and commercialized by LEVER. Today, LEVER stands as one of the main manufacturers of industrial AC UPS and DC Chargers, recognized by some of the most important EPCs and End Users all over the World.**



*Innovation & Experience*

*Production*



*Custom-made solutions*

# LEVER world presence


TOP LEVER MARKET
RELEVANT LEVER MARKET

>30% GRADUATES

>5% OF ANNUAL REVENUES IN R&D

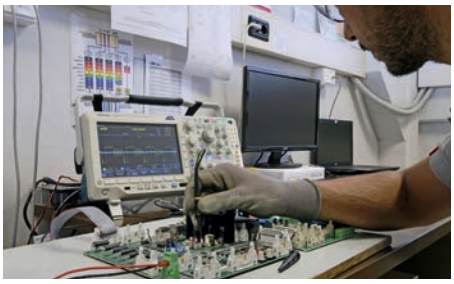
>3000m² BUILDING AREA

100% MADE IN ITALY
ITALIAN ENGINEERING AND MANUFACTURING

PRODUCTS APPROVED BY THE MOST REPUTED END-USERS IN EUROPE AND MIDDLE EAST

# Project-Oriented organization for EPC contractors

In LEVER, during the order execution, each internal process is monitored to ensure either that the final product will be exactly as agreed with the Customer, as well as the deadline given by the customer is respected. We pay a lot of efforts to ensure the documents availability at any time of the process, per specific needs of the job or of the Client. All the activities are made following a Project Plan, agreed with the Customer. Documents for approval, Manufacturing clearance, Factory Acceptance Test (FAT), Delivery, Testing & Commissioning, Site Acceptance Test (SAT), drawings as built and final book are usually managed by LEVER.



*R&D – Engineering and Technical Department*

*FAT, Start-up & Commissioning*

*Training center*

# After Sales Service

LEVER service maintenance engineering

Our Service team is composed by experts and skilled engineers, trained to provide a high level technical support and very efficient after-sales service. LEVER's Service team supports Clients with:

- direct contact with LEVER Service organisation. Service personnel is always available and ready to provide advices and assistance regarding systems installation and maintenance
- fast on-site interventions, guaranteed by using advanced technologies and the professionalism of our Service personnel and Authorised Assistance Centers. LEVER Service guarantees that all the spare parts are original, tested and will come on time.
- offshore interventions: our personnel attended International Maritime Organization STCW/95 training courses and this enables us to work on offshore platforms.
- full assistance during the systems installation, start-up and commissioning, including on-site personnel training. Technical Service engineers can also verify site's safety and suitability.
- maintenance contracts, to minimise the risks and costs connected with UPS breakdowns. Several types of maintenance contracts are available, going from periodic inspections to comprehensive cover, including labour and materials.
- technical training courses, provided to the Client and to the Authorised Assistance Centre technicians, at the LEVER Training Centre.

# Environment Safety and Quality

LEVER's solutions and services are designed according to the Client's requirements and centred around improving reliability and increasing industrial productivity, while lowering environmental impact. We are 100% committed into minimizing environmental impact of our technologies and products, transferring this expertise also to our Clients and Suppliers and, at the same time, we aim to ensure that our manufacturing processes are safe and energy-efficient. Some of LEVER's efforts toward a cleaner world consists in reducing the use of energy and raw materials, phasing out hazardous materials, designing eco-efficient products and enhancing Suppliers' performance. LEVER ensures all manufacturing facilities and processes are **certificated ISO 9001:2015, ISO 14001:2015, ISO 45001:2018** international Standards on the management of quality, environment, health and safety risks.

# HIGH FREQUENCY RECTIFIER

LEAD ACID BATTERIES OR NICD OUTPUT VOLTAGE 24, 48, 110, 125, 220VDC AND CURRENT FROM 15A A 500A

# MIR

## HEAVY-DUTY MODULAR INDUSTRIAL RECTIFIER

The MIR model is the LEVER rectifier able to guarantee the maximum in the most demanding industrial environments with the modular

**N + 1 solution**

- MIR rectifier supply the loads in DC and at the same time keeps the batteries correctly charged, guaranteeing full continuity of service
- MIR uses power modules which, when suitably configured, generate high power systems and N + 1 solutions
- **AC/DC modules availlable:**
  **24Vdc – 400W**
  **48Vdc – 4kW**
  **110Vdc – 4,4kW**
  **220Vdc 4,4kW**
- The batteries are permanently connected in parallel to the DC loads, thus making the system highly reactive to impulse loads such as motors, medium / high voltage switchgears as coils, etc.
- **MIR modular technology is full Hot-swappable**

# SCR INDUSTRIAL RECTIFIER

OUTPUT VOLTAGE 24-48-110-125-220 VDC, OUTPUT CURRENT 30 A - 2500 A

# SME

## HEAVY-DUTY INDUSTRIAL DC UPS/ DC BATTERY CHARGER

Applications:

- Oil & Gas onshore and offshore
- Refineries and petrochemical plants
- Utilities & Power Generation
- Transportations
- Water desalination and treatment
- Energy stations for SCADA Remote Terminal Units
- All the industrial and process control applications

## Performances, flexibility and top reliability for critical applications

SME model is LEVER DC UPS/DC Charger designed to ensure the maximum power availability in the industrial environments requiring top performances.

The core of SME is the thyristors-based 6-pulse or 12-pulse total controlled rectifier bridge, which ensures a stable output DC voltage. The models with output current up to 250 A are completely naturally cooled.

It can be supplied in a single or redundant configuration, with change-over system designed as per Client's Technical Specifications.

Furthermore, the system is highly customizable, from the alarms to the LED signalizations and threshold levels, and it can be enhanced by the addition of many engineering options and accessories (e.g. blocking diode, drop cells, analog measurements, special cabinet IP protection degree, etc.)

The SME DC Charger complies with IEC 60146-1-1 and IEC 62040 Standards, including the recent IEC 62040-5-3, and it has been accordingly type-tested by CESI SpA, Italy.

## Technical Features

- Output voltage: 24, 48, 110, 125, 220 Vdc
- Output current from 30 A to 2500 A
- Input voltage: 3Ph 400 – 440 – 480 Vac
- Clean and stable output DC voltage with voltage ripple <1% RMS
- Rectifier thyristor SCR-based, 6 or 12-pulse total controlled bridge
- Provided with input isolation transformer
- Natural cooling for models up to 250 A
- Three programmable levels of charge: floating, boost and commissioning charge
- Protection degree closed door up to IP54
- Equipped with a 4.3" HMI display, featuring an accurate overview of the system status, alarms, measurements and allowing settings adjustments
- Wide range of communication interfaces: Ethernet, Modbus, Profibus, dry contact SPDT board
- Modular floor standing cabinet 2200mm high
- Compatibility with lead acid VRLA, AGM, Gel and NiCd batteries
- Back up time: as required, from few minutes to several hours

# CUSTOM INDUSTRIAL AC UPS

OUTPUT POWER 5 KVA - 200 KVA, INPUT 3PH, OUTPUT 3PH OR 1PH - DCBUS 110V-220-360 VDC

# DPS

## ONLINE HEAVY-DUTY INDUSTRIAL DIGITAL AC UPS SYSTEM

### Applications:

- Oil & Gas onshore and offshore
- Refineries and petrochemical plants
- Utilities & Power Generation
- Transportations
- Water desalination and treatment
- All the industrial and process control applications

## High flexibility and maximum industrial reliability

DPS model is LEVER digital online AC UPS, specifically designed to power critical loads which require high quality of AC voltage waveform and the maximum reliability in harsh environmental conditions.
Fully digital technology-based with double microprocessor control, one for the rectifier unit and one for the inverter unit, LEVER DPS is fully custom-made, with a wide range of options to comply with Client's Technical Specifications and it can be supplied in redundant N+1 configuration.
DPS features two main operating modes: "On-Line", where the inverter unit is in operation and supplies power to the loads, and "Line-Interactive", where the output voltage is supplied by the emergency mains through the bypass to increase the efficiency of the system.
DPS is classified VFI-SS-111, it complies with IEC 62040 Standards and it has been accordingly type-tested by CESI SpA, Italy.

## Technical Features

- Output power from 5 to 200 kVA
- Input voltage: 3Ph 400 – 440 – 480 Vac
- Output voltage: 1Ph 115 – 230 Vac, 3Ph 400 – 440 – 480 Vac
- Pure sinewave output AC voltage with THDv < 1%
- Clean and stable battery DC voltage, with voltage ripple <1% RMS
- "On-Line", "Line-interactive" (inverter unit in hot stand-by) and "Manual" operating modes
- Rectifier thyristor SCR-based, 6 or 12-pulse total controlled bridge
- IGBT-based full bridge technology inverter unit
- Thyristor SCR-based static bypass switch, < 2 ms transfer time
- Equipped with a manual switch for maintenance without disconnecting the load
- Provided with input and output isolation transformers
- Natural cooling
- Three programmable levels of charge: floating, boost and commissioning charge
- Equipped with a 4.3" HMI display, featuring an accurate overview of the system status, alarms, measurements and allowing system settings adjustments
- Wide range of communication interfaces: Ethernet, Modbus, dry contact SPDT board
- Modular floor standing cabinet 2200mm high
- Compatibility with lead acid VRLA, AGM, Gel and NiCd batteries
- Back up time: as required, from few minutes to several hours

# CUSTOM INDUSTRIAL DC/AC INVERTER

OUTPUT 3PH OR 1PH, OUTPUT POWER 5 KVA - 200 KVA

# INV

## INDUSTRIAL DIGITAL DC/AC INVERTER

### Applications:

- Oil & Gas onshore and offshore
- Refineries and petrochemical plants
- Utilities & Power Generation
- Water desalination and treatment
- All the industrial and process control applications

## Industrial DC/AC inverter to supply critical loads

LEVER INV model offers a wide range of 1Ph and 3Ph inverters with IGBT-based inverter bridge. The system has been designed to continuously supply extra-low harmonics AC current to critical loads.

Fully digital technology-based, INV features two main operating modes: "On-Line", where the inverter unit is in operation and supplies power to the loads, and "Line-Interactive", where the output voltage is supplied by the emergency mains through the bypass to increase the efficiency of the system.

## Technical Features

- Output power from 5 to 200 kVA
- Input voltage: 110 Vdc, 220 Vdc
- Output voltage: 1Ph 115 Vac, 1Ph 230 Vac, 3Ph 400 Vac
- Pure sinewave output AC voltage with THDv < 1%
- IGBT-based full bridge technology inverter unit
- Static bypass switch, < 2 ms transfer time
- "On-Line", "Line-interactive" (inverter unit in hot stand-by) and "Manual" operating modes
- Equipped with a 4.3" HMI display, featuring an accurate overview of the system status, alarms, measurements and allowing settings adjustments
- Wide range of communication interfaces: Ethernet, Modbus, dry contact SPDT board
- Modular floor standing cabinet 2200mm high
- Compatibility with lead acid VRLA, AGM, Gel and NiCd batteries
- Easy integration with the DC Chargers already installed

# INDUSTRIAL UPS

## ELECTA

10KVA-20KVA 3PH/1PH
10KVA-200KVA 3PH/3PH

- Transformers less
- Complete range 10-200 kVA
- High efficiency up to 96,5%
- Zero impact source
- Flexibility of use
- Advanced communications

Electa series is ideal for protecting data centres and telecommunications systems, IT networks and critical systems in general, where the risks connected with poor energy supply can compromise the continuity of activities and services. The Electa series is available from 10-200 kVA models on-line double conversion technology in accordance with VFI-SS-111 classification (as set out in standard IEC EN 62040-3). Electa is designed and built using state-of-the-art technology and components. It is controlled by a DSP (Digital Signal Processor) microprocessor, to provide maximum protection to the powered loads with no impact on downstream systems, and optimised energy savings.

## VEGA

10KVA-100KVA 3PH/1PH
10KVA-80KVA 3PH/3PH

- Transformers based
- Efficiency Control System (ECS)
- Robust and reliable
- Galvanic isolation
- High overload capacity
- Extensive parallel configurations

Vega series UPS provide maximum protection and power quality for mission critical loads, including data centres, industrial processes, telecommunications, security and electro-medical systems. Vega is an on-line double conversion UPS (VFI SS 111 - IEC EN 62040-3) with a transformer isolated inverter. Vega range includes three-phase input and single-phase output versions from 10 to 100 kVA, and three-phase input and output versions from 10 to 800 kVA. All versions are provided with a 6-pulse thyristor-based rectifier, with or without optional harmonic filters. A 12-pulse thyristor-based rectifier is available on request for the 60 and 80 kVA versions with or without optional harmonic filters.

## VEGA HP

100KVA-600KVA

- Transformers based
- IGBT-based rectifier technology
- Compact and reliable
- Galvanic isolation
- High overload capacity
- LCD graphic display

Vega HP series from 100 to 600 kVA is the LEVER UPS solution for installations requiring high energy efficiency and maximum power availability. Vega HP Series provides maximum protection and power quality for data centres and industrial loads. The UPS has an IGBT-based rectifier, DSP (Digital Signal Processors) technology and provides true On-line, double conversion power protection, (VFI SS 11 - Voltage and Frequency Independent in accordance with IEC EN 62040-3).

## BATTERY CIRCUIT BREAKERS

# BATTERY
DISJUNCTION BOX

Battery circuit breakers for safe and hazardous area.

## CUSTOM INDUSTRIAL DISTRIBUTION BOARDS

# LOW VOLTAGE
DISTRIBUTION BOARDS

## BATTERY MONITORING SYSTEM

# FALCON
BMS

Based on its experience and high technological know-how, LEVER has engineered FALCON, a versatile equipment allowing to monitor the main functional parameters of industrial battery.
FALCON provides a valuable support for the preventive maintenance operations and for the immediate identification of failures.

- Easy installation
- Accurate measurements of battery voltages, currents and temperatures
- Provided with a display and dry contact SPDT board
- It can be installed inside a battery cabinet or on wall (for batteries on rack)
- Alarms recording included
- Compatibility with lead acid VRLA, AGM, Gel and NiCd batteries
- It can be integrated to all LEVER AC UPS, DC Chargers and DC/AC inverters

# Main Recent Project

| PROJECT | COUNTRY | APPLICATION | NUMBERS OF UNITS | AC UPS | DC UPS | INVERTER |
|---|---|---|---|---|---|---|
| Battery chargers for plant TRANSGRID | AUSTRALIA | Utilities & Power Plant | 2 | | ✓ | |
| C.T. E. "Alessandro Volata" Montalto di Castro (VT) | ITALY | Utilities & Power Plant | 11 | ✓ | ✓ | ✓ |
| Neste Rotterdam Site Development | NETHERLANDS | Cogeneration | 12 | ✓ | ✓ | |
| Baleine Phase 1 Surf | IVORY COAST | Oil & Gas | 2 | ✓ | | |
| Dahshour Compression Station Unit No 5&6 | EGYPT | Oil & Gas | 3 | ✓ | ✓ | |
| New Naphtha Complex Project - 076971C | GREECE | Oil & Gas | 5 | ✓ | ✓ | |
| Butterfly Project UPS ITB 090 | GERMANY | Industry | 4 | ✓ | ✓ | |
| Project N15907 - Water Transmission Scheme from Taweelah to Ajban | UAE | Utilities & Power Plant | 14 | ✓ | ✓ | |
| DC Charger for KOC Substation at Gathering Centre-15 | KUWAIT | Oil & Gas | 1 | | ✓ | |
| Al-Ahdab oil field to Al-Zubaydia power station project | IRAQ | Oil & Gas | 2 | ✓ | | |
| ENI Bolgiano MV Substations | ITALY | Oil & Gas | 6 | | ✓ | |
| Emergency systems for Eni Porto Torres I Solar Power Plant | ITALY | Oil & Gas | 4 | ✓ | ✓ | |
| Rolling Mill Plant Ukraine | UKRAINE | Steel Plant | 2 | | ✓ | |
| UPS for Cape Town Airport I | SOUTH AFRICA | Airport | 50 | ✓ | | |
| Antirio, Petalas, Aloina and Molikeio substations | GREECE | Utilities & Power Plant | 3 | | ✓ | |
| Tempa Rossa Project | ITALY | Oil & Gas | 1 | ✓ | | |
| Rectifiers for Savona Port | ITALY | Port | 4 | | ✓ | |
| MEW Shadadiya 400/132 kV and 132/11 kV Substation | KUWAIT | Utilities & Power Plant | 15 | | ✓ | |
| Industrial UPS and rectifiers for Airport of Jakarta | INDONESIA | Airport | 12 | ✓ | ✓ | |
| Geothermal plant Cerro Pabellon project | CHILE | Utilities & Power Plant | 14 | | ✓ | ✓ |
| Zadco Temporary AC industrial system | UAE | Oil & Gas | 1 | ✓ | | |
| ENI Clara NW offshore platform | ITALY | Oil & Gas | 1 | ✓ | ✓ | |
| HVDC interconnection Montenegro-Italy | ITALY MONTENEGRO | Utilities & Power Plant | 7 | ✓ | ✓ | ✓ |

| PROJECT | COUNTRY | APPLICATION | NUMBERS OF UNITS | AC UPS | DC UPS | INVERTER |
|---|---|---|---|---|---|---|
| Odidi Node project | NIGERIA | Oil & Gas | 3 | ✓ | | |
| Hyosung Sonelgaz Algeria Project | ALGERIA | Utilities & Power Plant | 1 | | ✓ | |
| Khor Al Zubair Project | IRAQ | Oil & Gas | 4 | ✓ | | |
| Rectifiers for Vietnam Navy | VIETNAM | Military | 2 | | ✓ | |
| Industrial Ac Ups For North Sea Tolmount Offshore Platform | UNITED KINGDOM | Oil & Gas | 1 | ✓ | | |
| Project Maida And Selargius Substations | ITALY | Utilities & Power Plant | 12 | | ✓ | ✓ |
| Project Tuba Depot Iraq | IRAQ | Oil & Gas | 1 | ✓ | | |
| Dpc Industrial Ii And Dahariz Projects | OMAN | Utilities & Power Plant | 2 | | ✓ | |
| Project Abu Dhabi Umm Al Nar Power And Desalination Plant | UAE | Utilities & Power Plant | 6 | | ✓ | |
| Emergency System For The Offshore Platform In North Field Bravo | QATAR | Oil & Gas | 2 | ✓ | ✓ | |
| Ac Ups For Taranto Refinery | ITALY | Oil & Gas | 2 | ✓ | | |
| Project Abu Dhabi Al Taweelah Desalination Plant | UAE | Utilities & Power Plant | 4 | | ✓ | |
| Dc Chargers For Scada Remote Terminal Units In The Burgan Oil Field | KUWAIT | Oil & Gas | 22 | | ✓ | |
| Hvdc Interconnection Italy And France Piossasco Substation | ITALY | Utilities & Power Plant | 6 | | ✓ | ✓ |
| Emergency Systems For Petrochemical Plant In Ferrara (Italy) | ITALY | Oil & Gas | 7 | ✓ | ✓ | |
| Dc Chargers For The Barakah Nuclear Power Plant | UAE | Utilities & Power Plant | 6 | | ✓ | |
| Dc Chargers For 132/11Kv Substations In Dubai | UAE | Utilities & Power Plant | 12 | | ✓ | |
| Project Val D'agri (Pz) Oil Field | ITALY | Oil & Gas | 6 | ✓ | ✓ | |
| Dc Chargers For Saudi Electrical Substations | KSA | Utilities & Power Plant | 4 | | ✓ | |
| Emergency Systems For Burgas Refinery | BULGARY | Oil & Gas | 12 | ✓ | ✓ | |

LEVER®
power solutions
since 1973

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