Heavy-duty solutions for critical applications

Oil & Gas

Utilities

Industrial

AC UPS
DC UPS – DC CHARGERS
DC/AC INVERTERS

made in Italy

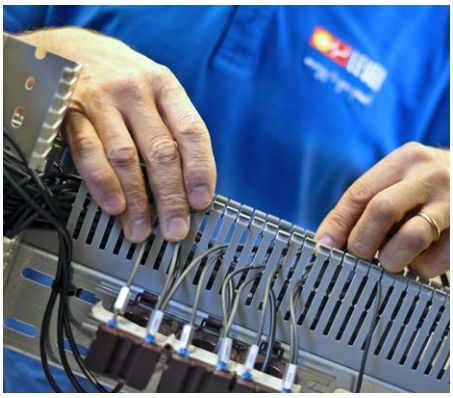
LEVER®
power solutions
since 1973

Who we are: LEVER in short

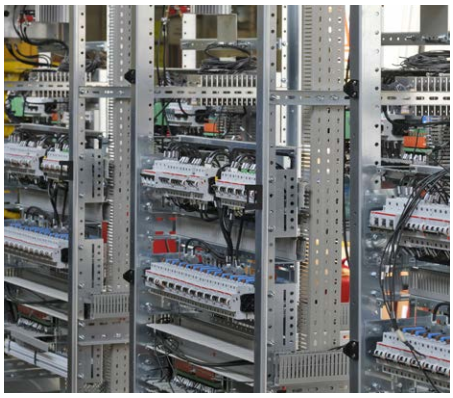
LEVER is a global leader in power solution technologies for critical applications, i.e. Oil & Gas, Utilities and Industrial. Based in Verona, Italy, the Company was founded in 1973 and nowadays it operates worldwide, focusing its business in Europe, Middle East, Russia, Africa and South America. We offer a complete range of solutions, covering various electrical applications in industrial 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 200 kVA with 110 Vdc and 220 Vdc DC bus voltage
- 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.

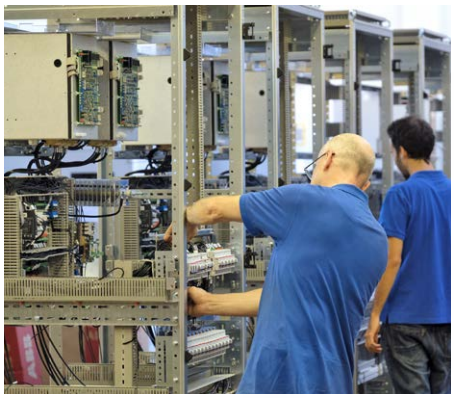
LEVER's success has been driven by a strong focus on research and development: the Company maintains its research center in Verona and has been continuously investing in R&D through all market conditions. The result is a long track record of innovation. Many of the technologies that underlie our modern society, from industrial AC UPS to DC rectifiers battery chargers, were engineered and commercialized by LEVER. Today, LEVER stands as the largest manufacturer of industrial AC UPS and DC Chargers, the largest provider of power solutions worldwide.



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

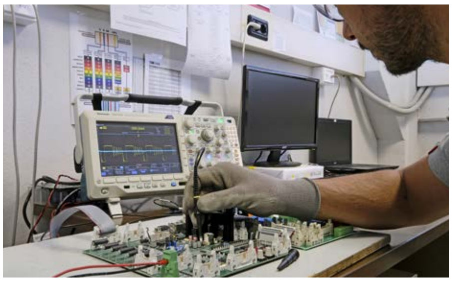
100% MADE IN ITALY

ITALIAN ENGINEERING AND MANUFACTURING

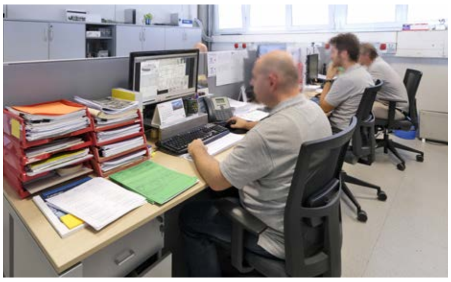
PRODUCTS APPROVED BY THE MOST REPUTED END-USERS IN EUROPE AND MIDDLE EAST

Project-Oriented organization

LEVER is a process-oriented organization where each internal process is monitored to ensure high performances in our products and in the overall organization efficiency. Our projects are developed following project management methodologies and the organization is innovation driven thanks to the strong R&D commitment.



R&D



Technical Department

FAT, Start-up & Commissioning

Environment and quality

LEVER's solutions and services are designed according to the Clients requirements and are centered around improving reliability and increasing industrial productivity, while lowering the environmental impact. We seek to minimize the environmental impact of our technologies and products, passing this expertise on Clients and Suppliers, and at the same time we aim to ensure that our manufacturing processes are safe and energy-efficient. In our own operations, LEVER strives to reduce the use of energy and materials, streamlines the means of transporting goods, phases out hazardous materials, designs eco-efficient products, and enhances Suppliers' performance. LEVER ensures that the manufacturing facilities and processes comply with ISO 9001-2015, ISO 14001-2015 and OHSAS 18001-2007 international Standards on the management of quality, environment and health and safety risks.

IQNet
THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

SQS has issued an IQNet recognized certificate that the organization:

Lever S.r.l.
Viale del Lavoro, 17
37024 Negrar (VR)
Italy

has implemented and maintains a
Management System
for the following scope(s):
18, 19

which fulfills the requirements of the following standard(s):

ISO 9001:2015 Quality Management System
ISO 14001:2015 Environmental Management System
OHSAS 18001:2007 Occupational Health and Safety Management System

Issued on: 2018-07-11
Expires on: 2021-03-11

This attestation is directly linked to the IQNet Partner's original certificate and shall not be used as a stand-alone document

Registration Number: CH-16675

Alex Stoichitoiu
President of IQNet

Felix Müller
CEO SQS

IQNet Partners*:
AENOR Spain AFNOR Certification France APCER Portugal CCC Cyprus CISQ Italy
CQC China CQM China CQS Czech Republic Cro Cert Croatia DQS Holding GmbH Germany FCAV Brazil
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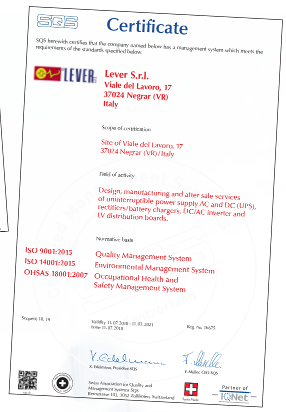
IRAM Argentina JQA Japan KFQ Korea MIRTEC Greece MSZT Hungary Nemko AS Norway NSAI Ireland
NYCE-SIGE México PCBC Poland Quality Austria Austria RR Russia SII Israel SIQ Slovenia
SIRIM QAS International Malaysia SQS Switzerland SRAC Romania TEST St Petersburg Russia TSE Turkey YUQS Serbia
IQNet is represented in the USA by: AFNOR Certification, CISQ, DQS Holding GmbH and NSAI Inc.
* The list of IQNet partners is valid at the time of issue of this certificate. Updated information is available under www.iqnet-certification.com



SQS Certificate

SQS herewith certifies that the company named below has a management system which meets the requirements of the standards specified below.

Lever S.r.l.
Viale del Lavoro, 17
37024 Negrar (VR)
Italy

Scope of certification
Site of Viale del Lavoro, 17
37024 Negrar (VR)/Italy

Field of activity
Design, manufacturing and after sale services of uninterruptible power supply AC and DC (UPS), rectifiers/battery chargers, DC/AC inverter and LV distribution boards.

Normative basis

ISO 9001:2015	Quality Management System
ISO 14001:2015	Environmental Management System
OHSAS 18001:2007	Occupational Health and Safety Management System

Scope(s) 18, 19
Validity 11.07.2018 – 11.03.2021
Issue 11.07.2018
Reg. no. 16675

X. Edelmann, President SQS
F. Müller, CEO SQS

Swiss Association for Quality and Management Systems SQS
Bernstrasse 103, 3052 Zollikofen, Switzerland

Swiss Made
Partner of IQNet

After Sales Service

Our Service team is composed by highly skilled engineers, trained to provide a competent technical support and efficient after-sales service. LEVER Service team supports Clients with:

- a dedicated call-centre for the 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 state-of-the-art technologies and the professionalism of the Service personnel and Authorised Assistance Centres. LEVER Service guarantees that all the spare parts used are original, tested and up to date
- offshore interventions: LEVER personnel attended International Maritime Organization STCW/95 training courses and it is enabled to work on the offshore platforms
- full assistance during the systems installation, start-up and commissioning, including on-site personnel training. Technical Service engineers can also verify site safety and suitability
- maintenance contracts, to minimise the risks and costs connected with UPS breakdowns. Several types of maintenance contracts are available, ranging from periodic inspections to comprehensive cover including labour and materials
- technical training courses, provided to the Clients and to the Authorised Assistance Centre technicians at the LEVER Training Centre.

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

DPS

ONLINE HEAVY-DUTY INDUSTRIAL DIGITAL AC UPS SYSTEM

LEVER AC UPS, 40kVA output power

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 the 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 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.
The DPS is classified VFI-SS-111, it complies with the IEC 62040 Standards and it has been accordingly type-tested by CESI SpA, Italy.

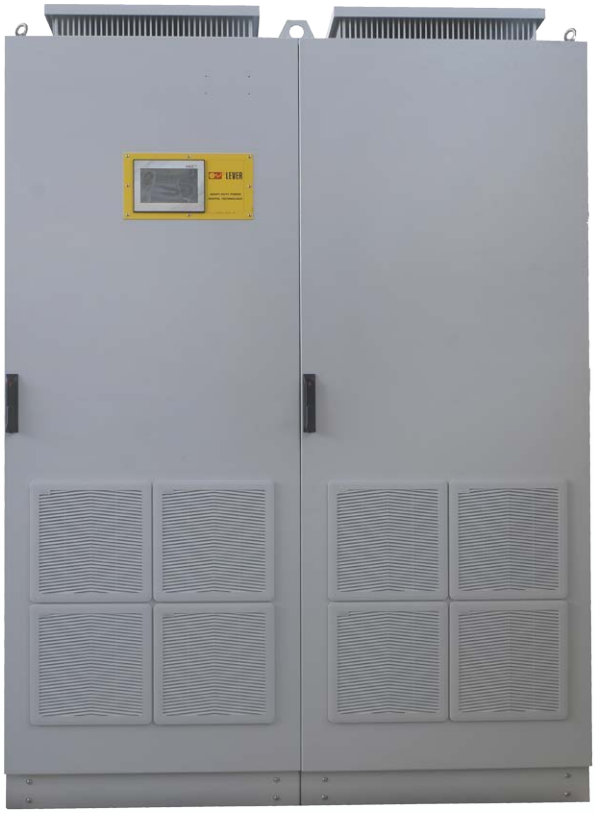
Technical Features

- 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

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

SME

HEAVY-DUTY INDUSTRIAL DC UPS/ DC BATTERY CHARGER



LEVER DC Charger, 400 A output current

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

The SME model is the LEVER DC UPS/DC Charger designed to ensure the maximum power availability in the industrial environments requiring top performances.
The core of the 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 changeover 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 the 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 <0.5% 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

LEVER DC Charger, 2100 A output current

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

The 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
- Thyristor SCR-based 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

EXPLOSION-PROOF BATTERY CIRCUIT BREAKER BOX

ATEX BATTERY DISJUNCTION BOX

LEVER designs and manufactures circuit breakers for the cut-off of the batteries in an explosion-proof box Ex-“d” or Ex-“e” to be installed in the battery room.
The circuit breaker will be sized according to the capacity of the battery bank. In particular it is designed to carry the maximum discharge current and to break the maximum fault current of the battery by sectioning off the necessary points on positive and negative polarity.
The circuit breaker is operating by a proper mechanical leverage on front cover of cut-off box and the cable entering is placed from bottom and through explosion-proof cable glands.

OUTPUT VOLTAGE 24-48-110 VDC, OUTPUT CURRENT 5 A - 80 A

AMS INDUSTRIAL DC UPS/DC BATTERY CHARGER

Applications:

- Utilities (MV/HV electrical substations)
- Power Generation
- Transportations
- All the industrial and process control applications

Modular DC charger for small and medium-sized applications

LEVER AMS model is the chopper IGBT-based DC Charger, tailored for small and medium-sized applications, especially in the Utility and Industrial sector. The AMS DC Charger is available in standard configurations, for advantageous solutions and short delivery times, and it can be customized with many optionals (e.g. drop cells, Modbus board, earth pole, etc.) as per Client's requirements.

Technical Features

- Output voltage: 24, 48, 110 Vdc
- Output current from 5 A to 80 A
- Input voltage: 1Ph 230 Vac, 3Ph 400 Vac
- Output DC voltage ripple < 1% RMS
- Provided with input isolation transformer
- Completely naturally cooled
- Low MTTR thanks to the modular technology of the conversion units
- Available in single and parallel configurations (dual redundancy or power parallel)
- Floor standing cabinet 1600mm high
- Wide range of communication interfaces: Modbus, dry contact SPDT board
- Compatibility with lead acid VRLA, AGM, Gel and NiCd batteries
- Back up time: as required, from few minutes to several hours

LOW VOLTAGE DISTRIBUTION BOARDS

Since 1973 LEVER manufactures AC and DC low voltage distribution boards as per Client's Technical Specifications and needs. LEVER distribution boards comply with IEC 61439 Standard. The enclosure is an industrial automation cabinet 2200mm high, with galvanized metal sheet and 70 micron thick polyester epoxy powder RAL 7035 paint (other colors are also available upon request). LEVER distribution boards can be equipped with modular circuit breakers, switches, protection relays, analog and digital measuring instruments.

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
- 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
- Can be integrated to all LEVER AC UPS, DC Chargers and DC/AC inverters

MAIN RECENT PROJECTS

PROJECT	COUNTRY	APPLICATION	NUMBER OF UNITS	AC UPS	DC UPS	INVERTER	PRODUCTS
INDUSTRIAL AC UPS FOR NORTH SEA TOLMOUNT OFFSHORE PLATFORM	UNITED KINGDOM	OIL & GAS	1	✓			- CUSTOM AC UPS 3PH-1PH 100 KVA - DISTRIBUTION BOARDS - NICD BATTERY
PROJECT MAIDA AND SELARGIUS SUBSTATIONS	ITALY	UTILITIES & POWER PLANT	12		✓	✓	- CUSTOM DC UPS 110V, 250A (4 PZ) - CUSTOM DC UPS 220V, 150A (4 PZ) - CUSTOM DC/AC INVERTER 5 KVA (4 PZ) - FALCON BATTERY MONITORING SYSTEM - LEAD ACID VRLA BATTERY
PROJECT TUBA DEPOT IRAQ	IRAQ	OIL & GAS	1	✓			- CUSTOM AC UPS 3PH-1PH 20 KVA - DISTRIBUTION BOARDS - NICD BATTERY
DPC INDUSTRIAL II AND DAHARIZ PROJECTS	OMAN	UTILITIES & POWER PLANT	2		✓		- CUSTOM DC UPS 110V, 2X150A - CUSTOM DC UPS 48V, 2X60A - DISTRIBUTION BOARDS - NICD BATTERY
PROJECT ABU DHABI UMM AL NAR POWER AND DESALINATION PLANT	UAE	UTILITIES & POWER PLANT	6		✓		- CUSTOM DC UPS +24V, 2100A AND -24V, 1100A - CUSTOM DC UPS 110V, 1100A - CUSTOM DC UPS +24V, 850A AND -24V, 400A - CUSTOM DC UPS 110V, 500A - CUSTOM DC UPS 19.6V, 350A - CUSTOM DC UPS 12V, 120A
EMERGENCY SYSTEM FOR THE OFFSHORE PLATFORM IN NORTH FIELD BRAVO	QATAR	OIL & GAS	2	✓	✓		- CUSTOM DC UPS 48V, 2X120A - CUSTOM AC UPS 3PH-1PH 40 KVA - DISTRIBUTION BOARDS - FALCON BATTERY MONITORING SYSTEM - NICD BATTERY
AC UPS FOR TARANTO REFINERY	ITALY	OIL & GAS	1	✓			- CUSTOM AC UPS 3PH-3PH 40 KVA - DISTRIBUTION BOARDS - NICD BATTERY
PROJECT ABU DHABI AL TAWEELAH DESALINATION PLANT	UAE	UTILITIES & POWER PLANT	4		✓		- CUSTOM DC UPS 24V, 250A - CUSTOM DC UPS 110V, 80A - CUSTOM DC UPS 110V, 60A - CUSTOM DC UPS 110V, 50A
DC CHARGERS FOR SCADA REMOTE TERMINAL UNITS IN THE BURGAN OIL FIELD	KUWAIT	OIL & GAS	22		✓		- CUSTOM DC UPS 24V, 120A (3 PZ) - CUSTOM DC UPS 24V, 95A (9 PZ) - CUSTOM DC UPS 24V, 85A - CUSTOM DC UPS 24V, 80A (2 PZ) - CUSTOM DC UPS 24V, 60A (7 PZ)
HVDC INTERCONNECTION ITALY AND FRANCE PIOSSASCO SUBSTATION	ITALY	UTILITIES & POWER PLANT	6		✓	✓	- CUSTOM DC UPS 110V, 400A (4 PZ) - CUSTOM DC/AC INVERTER 10 KVA (2 PZ) - DISTRIBUTION BOARDS - LEAD ACID VRLA BATTERY
EMERGENCY SYSTEMS FOR PETROCHEMICAL PLANT IN FERRARA (ITALY)	ITALY	OIL & GAS	7	✓	✓		- CUSTOM DC UPS 110V, 2X250A - CUSTOM DC UPS 110V, 2X100A (2 PZ) - CUSTOM DC UPS 220V, 2X100A - CUSTOM AC UPS 3PH-3PH 30 KVA - CUSTOM AC UPS 3PH-3PH 10 KVA (2 PZ) - LEAD ACID VRLA BATTERY
DC CHARGERS FOR THE BARAKAH NUCLEAR POWER PLANT	UAE	UTILITIES & POWER PLANT	6		✓		- CUSTOM DC UPS 110V, 300A - LEAD ACID VRLA BATTERY
DC CHARGERS FOR 132/11KV SUBSTATIONS IN DUBAI	UAE	UTILITIES & POWER PLANT	12		✓		- CUSTOM DC UPS 110V, 2X300A (6 PZ) - CUSTOM DC UPS 110V, 120A (6 PZ) - FALCON BATTERY MONITORING SYSTEMS
PROJECT VAL D'AGRI (PZ) OIL FIELD	ITALY	OIL & GAS	6	✓	✓		- CUSTOM DC UPS 110V, 160A (2 PZ) - CUSTOM DC UPS 110V, 65A - CUSTOM AC UPS 3PH-3PH 30 KVA (2 PZ) - CUSTOM AC UPS 3PH-3PH 20 KVA - LEAD ACID VRLA BATTERY
DC CHARGERS FOR SAUDI ELECTRICAL SUBSTATIONS	KSA	UTILITIES & POWER PLANT	4		✓		- CUSTOM DC UPS 125V, 290A
EMERGENCY SYSTEMS FOR BURGAS REFINERY	BULGARY	OIL & GAS	12	✓	✓		- CUSTOM AC UPS 3PH-3PH 120 KVA (2 PZ) - CUSTOM AC UPS 3PH-3PH 100 KVA - CUSTOM AC UPS 3PH-3PH 80 KVA (2 PZ) - CUSTOM AC UPS 3PH-3PH 40 KVA - CUSTOM AC UPS 3PH-3PH 20 KVA (4 PZ) - CUSTOM DC UPS 220V, 100A (2 PZ) - LEAD ACID VRLA BATTERY

LEVER®
power solutions
since 1973

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