GLOBAL SOLUTIONS

Leroy-Somer has established a group of multi skilled engineers dedicated to Naval Defence activities. This resource guarantees the global management of projects with the direct participation of the Research and Development department.

Leroy-Somer clients are assisted throughout the viability study up until the equipment is put into service and also guarantees the phases of material qualification and staff training.

Leroy-Somer are experts in the solutions of integrating motors and converters. This concept guarantees the integration of the required performances and the reliability of the system.

Thanks to these numerous developments and achievements, teams within Leroy-Somer have capitalized on their vast expertise within this domain, allowing them to respond to needs with respect to specification, design, manufacture and validation.

Continuous investments in research and development confirm Leroy-Somer as a specialist in alternators for energy supply and electric motors, controlled by power electronics on board combat ships and submarines.

A LEADER IN MARINE ACTIVITY

AN INNOVATIVE PARTNER

World leader in the design and manufacture in alternators and drive systems, Leroy-Somer is present in all those countries equipped with Naval Defence.

SURFACE SHIPS

SUBMARINES

Discreet shock resistant motors for submarines.
Motors with high mass power 25kg = 100kw for torpedo propulsion.
Shock resistant, non magnetic motors for sensitive auxiliaries.

Discreet asynchronous MNR motors intagrated with a frequency converter.

Energy management

Discreet

Security

Secure alternators for emergency energy production.

Flexibility

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.

Navalisation and qualification

of frequency converters.
Leroy-Somer has established a group of multi skilled engineers dedicated to Naval Defence activities. This resource guarantees the global management of projects with the direct participation of the Research and Development department.

Leroy-Somer clients are assisted throughout the viability study up until the equipment is put into service and also guarantees the phases of material qualification and staff training.

Leroy-Somer are experts in the solutions of integrating motors and converters. This concept guarantees the integration of the required performances and the reliability of the system.

Thanks to these numerous developments and achievements, teams within Leroy-Somer have capitalized on their vast expertise within this domain, allowing them to respond to needs with respect to specification, design, manufacture and validation.

Continuous investments in research and development confirm Leroy-Somer as a specialist in alternators for energy supply and electric motors, controlled by power electronics on board combat ships and submarines.

A LEADER IN MARINE ACTIVITY

Concealment

Compactness

Detection

Discreet shock resistant motors for submarines.

Motors with high mass power 25kg = 100kw for torpedo propulsion.

Shock resistant, non magnetic motors for sensitive auxiliaries.

Energy management

Discreet asynchronous MNR motors integrated with a frequency converter.

Flexibility

Navalisation and qualification of frequency converters.

Security

Secure alternators for emergency energy production.

AN INOVATIVE PARTNER

World leader in the design and manufacture in alternators and drive systems, Leroy-Somer is present in all those countries equipped with Naval Defence.
Leroy-Somer has established a group of multi skilled engineers dedicated to Naval Defence activities. This resource guarantees the global management of projects with the direct participation of the Research and Development department.

Leroy-Somer clients are assisted throughout the viability study up until the equipment is put into service and also guarantees the phases of material qualification and staff training.

Leroy-Somer are experts in the solutions of integrating motors and converters. This concept guarantees the integration of the required performances and the reliability of the system.

Thanks to these numerous developments and achievements, teams within Leroy-Somer have capitalized on their vast expertise within this domain, allowing them to respond to needs with respect to specification, design, manufacture and validation.

Continuous investments in research and development confirm Leroy-Somer as a specialist in alternators for energy supply and electric motors, controlled by power electronics on board combat ships and submarines.

A LEADER IN MARINE ACTIVITY

Concealment
Compactness
Detection
Discreet shock resistant motors for submarines.
Motors with high mass power 25kg = 100kw for torpedo propulsion.
Shock resistant, non magnetic motors for sensitive auxiliaries.

Energy management
Discreet asynchronous MNR motors intagrated with a frequency converter.

Flexibility
Navalisation and qualification of frequency converters.

Security
Secure alternators for emergency energy production.

AN INOVATIVE PARTNER

World leader in the design and manufacture in alternators and drive systems, Leroy-Somer is present in all those countries equipped with Naval Defence.
1 LEROY-SOMER also offers a range of asynchronous motors with aluminium housing up to 90kW complying with Def Stan 08-120 and 08-123 standards.

ALTERNATORS AND DRIVE SYSTEMS FOR NAVAL DEFENCE

ALTERNATORS / 1 to 16 MWe
MOTORS / 0.55 to 750 kW
POWERFUL ELECTRONICS / 5 to 2500 A
LIFE EXPECTANCY

MAIN REFERENCES
There are special requirements concerning on board energy production combat or military ships. Lero-Somer has designed a special range of Navy alternators producing electric energy for on board power or electric propulsion power. Main features are:
- low noise and vibrations level
- 10g residual acceleration
- IP44 enclosed, IP54 in option
- direct seawater coolant
- insulation class H for low and medium voltage
- antifriction bearings or sleeve bearings
- excellent transient response
- electrical design complying with the STANAG 1008 standard
- analogue or digital voltage regulator

Available range
• Speed: 4 to 18 poles
• Power: 1 to 16 MWe
• Voltage: from 380 V to 15 kV

Ships are in operation for prolonged periods of time, often longer than the usual life expectancy for the industrial components. Lero-Somer includes this fundamental requirement in its product design and manufacture.
• Modular construction to high manufacturing standards
• Integration of the manufacturing process
• Life expectancy of the different ranges
• Crew training
• Logistical support and associated services.

These measures help minimise the risk of obsolescence and also help the companies manage these events.

Aircraft carrier
Charles De Gaulle
Principe de Asturias
Andréa Doria
Frigates
Lafayette
Bravo
Sawari II
Delta
Horizon
HMS Océan
T23 - T45
F100 - F310
Submarines
Agosta 90B
Scorpène
SNLE NG
SNLE/SNA (MCO)

Projection and command ship
Mistral
Tonnerre
Sirocco

The range of Leroy-Somer electric motors is adapted to combat conditions and to the different types of ships.
• Guaranteed electric performances
• Shock resistant up to 168G (level II)
• Vibration resistant
• Low noise and vibration emissions
• Low electromagnetic emissions (EMC)
• Designed for use with electronic speed variation
• Reliability and long life expectancy
• Safety motors for high temperatures and hazardous atmospheres

Leroy-Somer offers a new range of electronic converters adapted for naval defence.

ISO 9001

Ranges
1  
MNN MNR MNI
Low magnetic
Power 0.5 to 55 kW 0.5 to 55 kW 0.5 to 55 kW 2 to 55 kW
Special range up to 110 kW up to 750 kW up to 750 kW
Shock resistancy 120 G level I 15 G level I 15 G level I 15 G level I
(STANAG 4-141 and 4-150) 168 G level II 21 G level II 21 G level II 21 G level II
Low noise and vibration emissions +++ ++ + ++
(MIL STD 1474 D and 740 2)
Electrical characteristics STANAG 1008-8 STANAG 1008-8 STANAG 1008-8 STANAG 1008-8
EMC STANAG 4437-2 STANAG 4437-2 STANAG 4437-2 STANAG 4437-2

Generating set with
LSA 938 kVA alternator
UMVX 500 E
MDX 80 E
Generating set with the courtesy of Wartsilä
LSA 2000 kVA alternator
with the courtesy of Wartsilä

Flexibility
Performances
• Chassis or cubicle solutions
• Protection index to IP55
• Adaptation to on board networks
- alternating 50 / 60 Hz, 230 to 500 V
- continuous 255 to 504 V
• Discreet acoustics (noise and vibration)
- High chopping frequency
- Water or air cooling
• Electromagnetic environment
- immunity : specially adapted EMC filter
- design requirements for mechanics and electronics
- complies with military standards (GAM EG 13, STANAG 4437, MIL STD 461 C)
• Shock resistance (15G) and vibration resistance
• Network
- Shock resistance to manoeuvres 1100 Volts 3 ms
- Immune to micro supply disconnections
• Security
• Communication
• Expertise
- Automatic testing at each power up:
  - Components (Control board, power board, inverter and rectifier module, transformer, etc …)
  - Detection (motor short circuit…..)
- Immediate recording of main data preceding an eventual shutdown
- Specially adapted software:
  - parameterisations (transfer and recording)
  - supervision
  - diagnostics
- Main fieldbus (Modbus, Ethernet…)
- Product qualification using prototypes (testing and calculations…..)
- Associated logistics documentation
- MTBF and MTTR optimisation
LEROY-SOMER also offers a range of asynchronous motors with aluminium housing up to 90kW complying with Def Stan 08-120 and 08-123 standards.

ALTERNATORS AND DRIVE SYSTEMS FOR NAVAL DEFENCE

- ALTERNATORS / 1 to 16 MWe
- MOTORS / 0.55 to 750 kW
- POWERFUL ELECTRONICS / 5 to 2500 A
- LIFE EXPECTANCY

MAIN REFERENCES
There are special requirements concerning on board energy production combat or military ships. Leroy-Somer has designed a special range of Navy alternators producing electric energy for on board power or electric propulsion power. Main features are:

- low noise and vibrations level
- 10g residual acceleration
- IP44 enclosed, IP54 in option
- direct seawater coolant
- insulation class H for low and medium voltage
- antifriction bearings or sleeve bearings
- excellent transient response
- electrical design complying with the STANAG 1008 standard
- analogue or digital voltage regulator

Available range
• Speed: 4 to 18 poles
• Power: 1 to 16 MWe
• Voltage: from 380 V to 15 kV

Ships are in operation for prolonged periods of time, often longer than the usual life expectancy for the industrial components. Leroy-Somer includes this fundamental requirement in its product design and manufacture.

- Modular construction to high manufacturing standards
- Integration of the manufacturing process
- Life expectancy of the different ranges
- Crew training
- Logistical support and associated services.

These measures help minimise the risk of obsolescence and also help the companies manage these events.

Aircraft carrier
Charles De Gaulle
Principe de Asturias
Andréa Doria
Frigates
Lafayette
Bravo
Sawari II
Delta
Horizon
HMS Océan
T23 - T45
F100 - F310
Submarines
Agosta 90B
Scorpène
SNLE NG
SNLE/SNA (MCO)

Projection and command ship
Mistral
Tonnerre
Sirocco

The range of Leroy-Somer electric motors is adapted to combat conditions and to the different types of ships.

- Guaranteed electric performances
- Shock resistant up to 168G (level II)
- Vibration resistant
- Low noise and vibration emissions
- Low electromagnetic emissions (EMC)
- Designed for use with electronic speed variation
- Reliability and long life expectancy
- Safety motors for high temperatures and hazardous atmospheres

Leroy-Somer offers a new range of electronic converters adapted for naval defence.

ISO 9001 ISO 9001 ISO 9001

Ranges

- MNN / N Low magnetic
- MNR / R Power
- MNI / I Power
- Special range up to 750 kW
- Shock resistancy 168 G level II
- Low noise and vibration emissions +++ ++ + ++
- Electrical characteristics
- EMC
- LS 938 kVA alternator
- UMVX 500 E
- MDX 80 E

Generating set with
LSA 2000 kVA alternator
with the courtesy of Wartsilä

Performances

- Chassis or cubicle solutions
- Protection index to IP55
- Adaptation to on board networks
- alternating 50 / 60 Hz, 230 to 500 V
- continuous 255 to 504 V
- Discreet acoustics (noise and vibration)
- High chopping frequency
- Water or air cooling

Electromagnetic environment

- immunity : specially adapted EMC filter
- design requirements for mechanics and electronics
- complies with military standards (GAM EG 13, STANAG 4437, MIL STD 461 C)
- Shock resistance (15G) and vibration resistance

Network

- Shock resistance to manoeuvres 1100 Volts 3 ms
- Immune to micro supply disconnections

Security

- Automatic testing at each power up:
  - Components (Control board, power board, inverter and rectifier module, transformer, etc …)
  - Detection (motor short circuit….)
- Immediate recording of main data preceding an eventual shutdown

Communication

- Specially adapted software:
  - parameterisations (transfer and recording)
  - supervision
  - diagnostics
- Main fieldbus (Modbus, Ethernet…)

Expertise

- Product qualification using prototypes (testing and calculations…..)
- Associated logistics documentation
- MTBF and MTTR optimisation
GLOBAL SOLUTIONS

Leroy-Somer has established a group of multi skilled engineers dedicated to Naval Defence activities. This resource guarantees the global management of projects with the direct participation of the Research and Development department.

Leroy-Somer clients are assisted throughout the viability study up until the equipment is put into service and also guarantees the phases of material qualification and staff training.

Leroy-Somer are experts in the solutions of integrating motors and converters. This concept guarantees the integration of the required performances and the reliability of the system.

Thanks to these numerous developments and achievements, teams within Leroy-Somer have capitalized on their vast expertise within this domain, allowing them to respond to needs with respect to specification, design, manufacture and validation.

Continuous investments in research and development confirm Leroy-Somer as a specialist in alternators for energy supply and electric motors, controlled by power electronics on board combat ships and submarines.

A LEADER IN MARINE ACTIVITY

Concealment
Compactness
Detection
Discreet shock resistant motors for submarines.
Motors with high mass power 25kg = 100kw for torpedo propulsion.
Shock resistant, non magnetic motors for sensitive auxiliaries.

Energy management
Discreet asynchronous MNR motors integrated with a frequency converter.

Flexibility
Navalisation and qualification of frequency converters.

Security
Secure alternators for emergency energy production.

AN INOVATIVE PARTNER

World leader in the design and manufacture in alternators and drive systems, Leroy-Somer is present in all those countries equipped with Naval Defence.

SURFACE SHIPS

SUBMARINES

Photography DCN property, all rights reserved
do not duplicate