

NAVAL INSTRUMENTATION



Our
instrumentation
and decision-
making solutions
for naval defense



Measure up



Chauvin Arnoux Energy is...

For more than 30 years, **Chauvin Arnoux Energy** has been implementing complete solutions dedicated to ship operation, the defense system, and monitoring of the propulsion systems and electrical circuits.



1500 systems installed



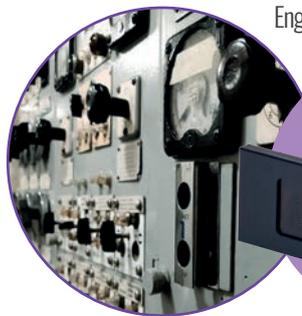
150 ships equipped by Chauvin Arnoux Energy



30 countries sailing the seas all over the world!



CA Energy's solutions for each of the ship's compartments



Engine rooms and electrical switchboards



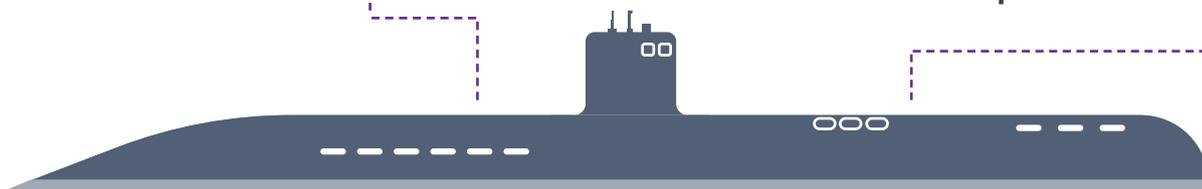
Panel meters, bargraphs, display units and repeaters



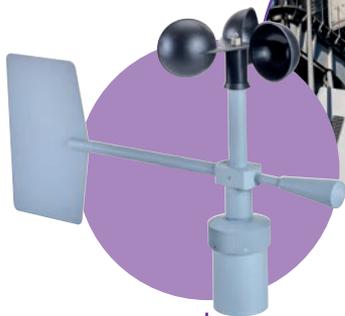
Marine environment and nuclear steam supply



Temperature sensors



Masts

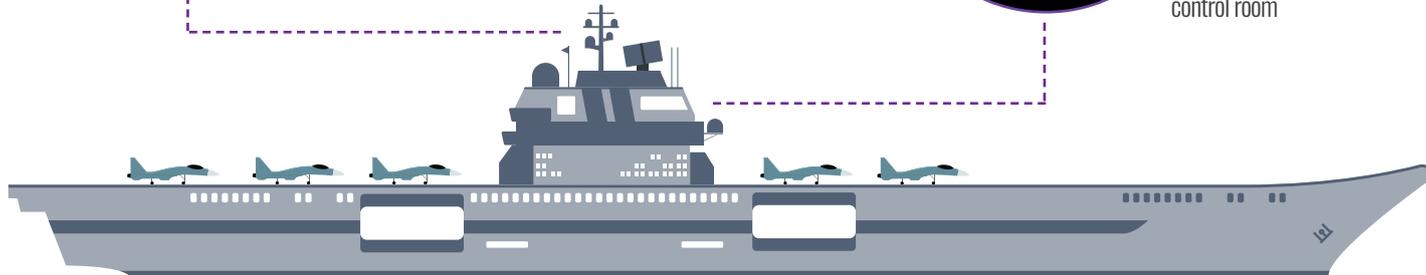


Environmental, temperature, air humidity and atmospheric pressure sensors

General Purpose Repeater, digital multifunction wind repeaters and display units



Bridge, ship control desk and control room



Engine rooms



Remote temperature indicators, sensors, tachometric boards and converters, process converters, frequency meters and panel meters

Digital weather sensors for military marine environments

AnemoVane

Combined sensor measuring the wind speed (anemometer with infrared sensor) and direction (synchro resolver vane).

- **Compact:** combines two functions
- **Long service life:** sensor with stainless-steel, full-mold cast body, counterweight and cable gland with extra-long-lasting bearings
- **Resistant:** suitable for harsh environments (corrosion)

PTU sensor

Combined sensor measuring atmospheric pressure, temperature (Pt1000 platinum sensor) and humidity of the air (capacitive polymer sensor)

- **Protection:** housing certified weather-proof by Meteo France
- **Long service life:** stainless-steel cable gland

Seawater temperature sensor

Seawater temperature measurement sensor (Pt100 platinum sensor)

- **Compact:** easy mounting
- **Complete:** thermowell supplied
- **Fast:** SOURIAU quarter-turn plug for easy mounting/removal

Product advantages

Rugged: choice of materials and coatings for extra protection against harsh environmental conditions and international standards (saline mist, wide temperature range, shocks and vibrations, EMC)

Simple: equipment self-test system and diagnostic software

Immediate: transmission of the data to the repeaters in the wind network.

Combined input for power supply, multifunction digital wind repeaters and communication.

Easy installation with tailored communication protocols



DID

YOU
KNOW

?

Pyrocontrole temperature sensors give you access to complementary products for processing your data in harsh and very harsh environments.

 **CHAUVIN
ARNOUX**
PYROCONTROLE

Meteorological data processing and display system



Wind repeater

Meteorological data processing and display system

- **Easy to read:** 6.5-inch LCD VGA color screen
- **High performance:** advanced algorithms comparing the data from all the sensors to provide a reliable, relevant indication of the various winds.
- **Complete:** data recovery from the wind-network sensors
 - Generation of the power for the network to supply the sensors
 - Flexible location of the repeater (Modbus RTU communication on RS485 medium)
 - System reliability insured by redundancy of the bus management repeaters
 - Programmable (various wind network topologies)



General Purpose Repeater

Multifunction meteorological and navigation data display system

- **Easy to read:** 12-inch LCD XGA color screen
- **Rugged:** cast aluminum housing capable of supporting 260 G (version on shock absorber), SOURIAU connectors
- **Complete:** recovery of the weather data from the multifunction digital wind repeaters and the navigation computers
- **Compatibility:** Ethernet and RS422 networks for the navigation data (redundancy)



Data concentration and communication unit

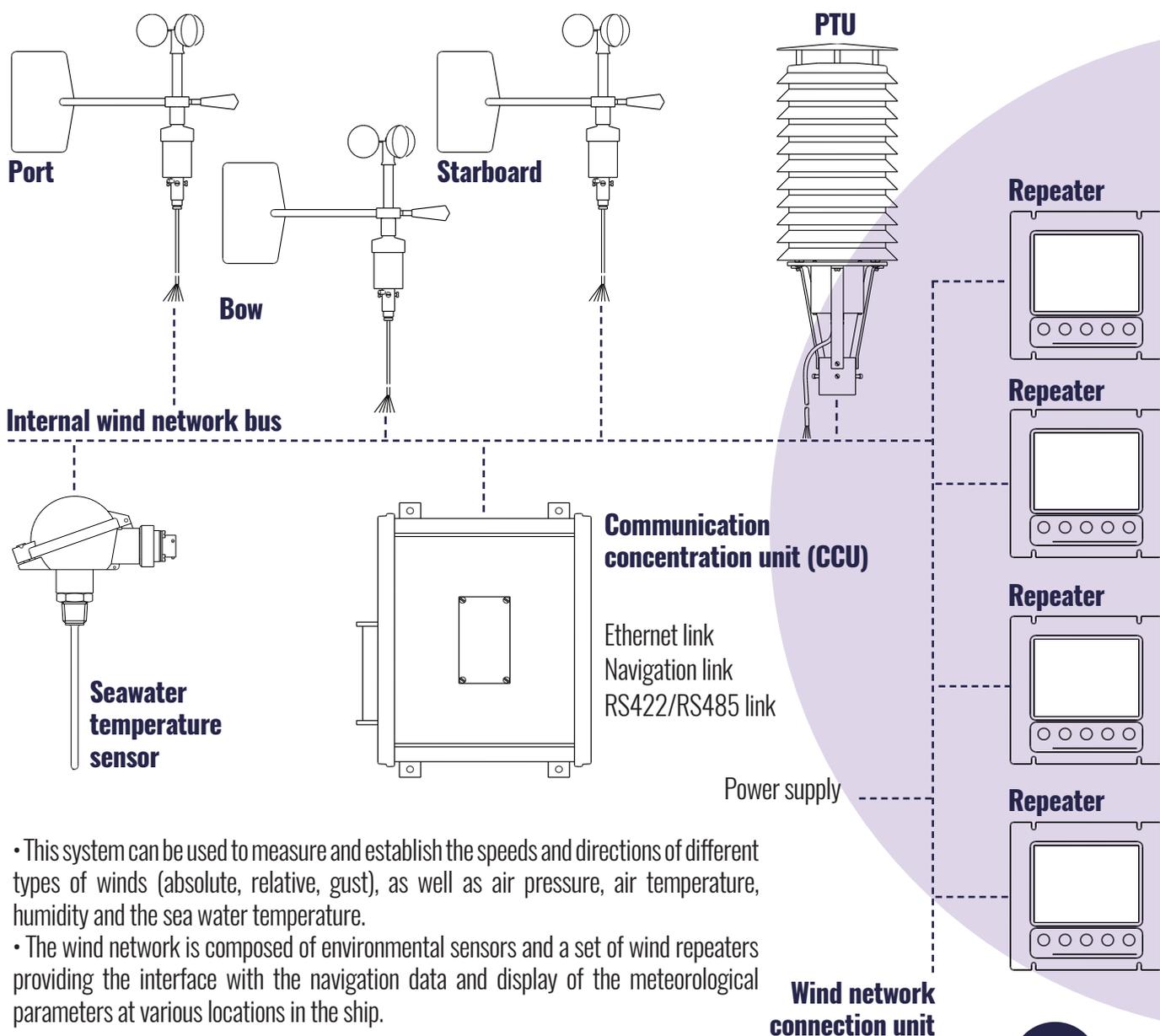
The communication concentration unit can be used to interface the meteorological information and the navigation data on the control screens.

- **Rugged:** metal housing inside a waterproof cast aluminum enclosure
- **Versatile:** multiple input and output connections (interfacing with the navigation computers and wind network, distribution via 4 subscriber links using various programmable protocols)
- **Complete:** protocol gateway and datalogger function

Product advantages

These devices allow sequencing of the wind sensors, as well as recording and distribution of the weather data to the various subscribers on the ship.

CA Energy proposes systems for establishing the ship's meteorological situation



Advantages of the network

An internal digital network dedicated to operation of the ship

- **Reliable:** ability to detect faulty sensors and display units, data redundancy between the repeaters
- **Adaptable:** plug-and-play replacement of system elements
- **Practical/High-performance:** designed and developed to power the system's elements throughout the ship and allow them to communicate
- **Flexible:** enhances the environmental measurements with the data from the navigation system to build new datasets.

DID

**YOU
KNOW**

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Thanks to feedback from experience and proven algorithms, the digitized wind network now gives reliable wind information whatever the vessel's position.

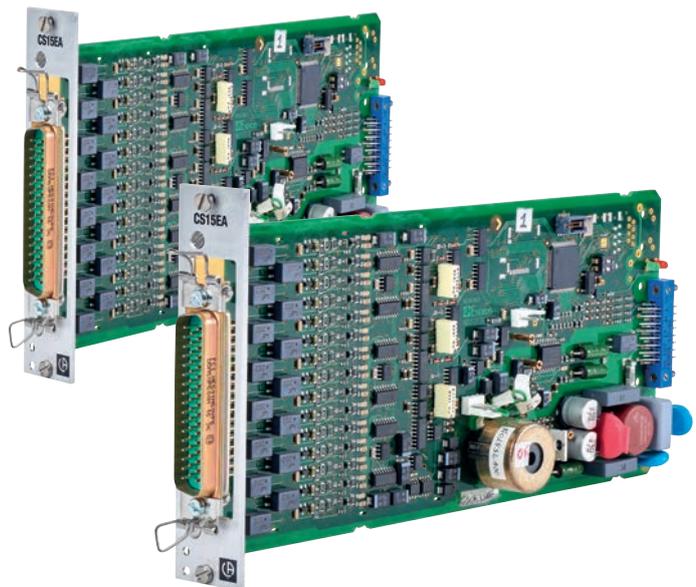
Monitoring and indication of the statuses and temperatures of the engines and exhaust line shafting



Digital temperature scanner

This fully-featured instrument can be used to monitor the temperature and report the statuses of the engines and certain propulsion elements such as the cylinders and the line shafting.

- **Rugged:** extensive temperature withstand range and HE military-type connection technology
- **Compact and flexible:** 120 analog measurement channels (current, voltage, temperature, etc.), multiple logic outputs (on alarms) and analog outputs available.
- **Adaptable:** addition of boards in the form of internal/external add-on racks
- **Tailored:** configuration tool for managing alarms on threshold detection, combinatory logic, recording capacity and modbus mapping, totally customizable by the user with the possibility of implementing different communication protocols



Product advantages

Ideal, compact, single-channel instrument. Can be used to indicate the critical states of the ship's engines. Suitable for both surface and submarine vessels.

Digital, analog and pseudo-analog panel meters for electrical parameters

Multi-purpose panel meters

Digital and pseudo-analog panel meters: digital or dial display of analog and/or numeric parameters.

- **Adaptable:** comprehensive software and customization of the product
- **Digital technology:** complex transfer functions, Ethernet or RS485 communication
- **Easy to read:** pseudo-analog panel meter. 360° display
- Formats: round or rectangular barrel



Analog panel meters

Customizable panel meters (dials, scale, deflection, etc.).

- **Extra protection:** IP55 – IK08.
- **Accuracy class:** 1.5
- **Adaptable:** small-diameter barrel for multiple connection possibilities
- **Conformity:** IEC 60051-1 standard
- **Functions:** AC ammeter, AC voltmeter, maximum ammeter, DC ammeter, DC voltmeter and frequency meter



Panel meters with additional unit

Additional functions: wattmeter, varmeter and phasemeter



Product advantages

Chauvin Arnoux Energy offers a range of panel meters meeting naval standards, with the possibility of tailored specifications.

- **Numerous references:** NATO-certified

Speed measurement on rotating machines



Inductive and magnetic tachometric sensors

Propulsion system engine speed measurement

- **Comprehensive offer:** magnetic technology for accuracy at high speed and inductive technology for accuracy at medium speed and rotation direction detection
- **Rugged:** electromagnetic design with long service life, vibration resistance, wide temperature range
- **Outputs via wires or connectors**

Tachometric converters and processing of process data

Conversion and processing of the data from the tachometric sensors

- **Compatible:** With inductive or magnetic sensors and other technologies (Hall effect, etc.)
- **Customizable:** fault management and configurable alarms
- **Software and reinforced hardware:** SIL2 compliance
- **Signal conversion and processing:** measurements, threshold functions... and transmission to the outputs (Ethernet Profinet, RS485 Modbus, analog outputs, 8 on-off relays)
- **Process input:** for MTAC



Exists in Europe board format and in a casing for converters dedicated to tachometry



Product advantages

Range of products suitable for harsh environments, particularly in the reducer bearings of gearboxes.

Our customized complementary services

Logistical support



Development service
according to specifications



Technical support
via the after sales service



References

NAVAL GROUP France
NAVAL GROUP Far East
BOUSTEAD DCNS Naval Corporation PIRIOU
ENGIE

REYES
ENGIE
SCHNEIDER ELECTRIC
AMM POGGIOLI
LOCNAV



Our 5 key features, our specialist know-how



Monitoring

of the critical parameters for navigation, implementation of the weapons systems and operation of the ship



Acquisition & Distribution

of weather data



Temperature monitoring systems

for the engines, line shafting and rotating machines



Control

of the electrical power generating and distribution chain



Temperature sensors and accessories

for nuclear environments, surface ships and submarines

Partner countries

Australia, Brazil, Chile,
Egypt, France, India,
Malaysia, Saudi Arabia,
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