

# 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



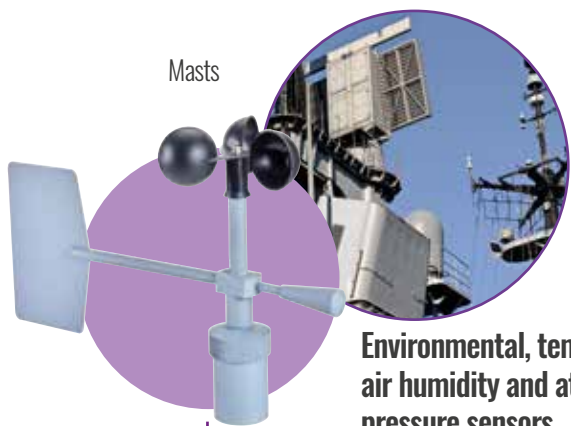
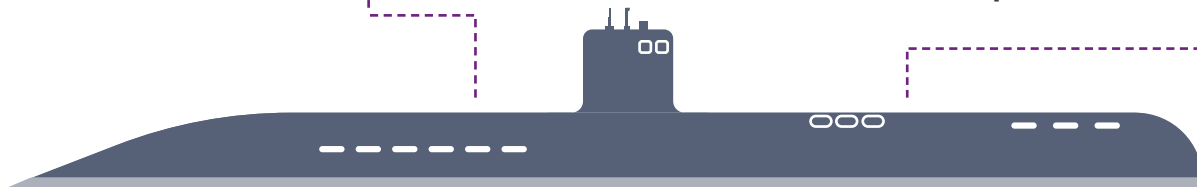
Panel meters, bargraphs, display units and repeaters



Marine environment and nuclear steam supply



Temperature sensors



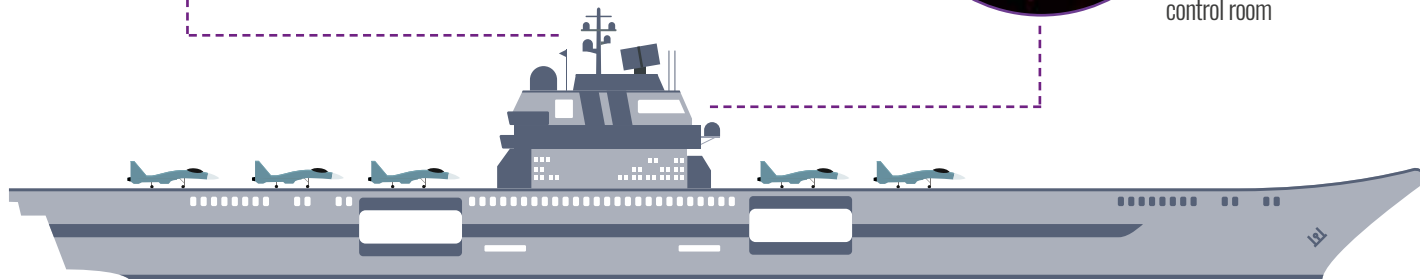
Masts

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

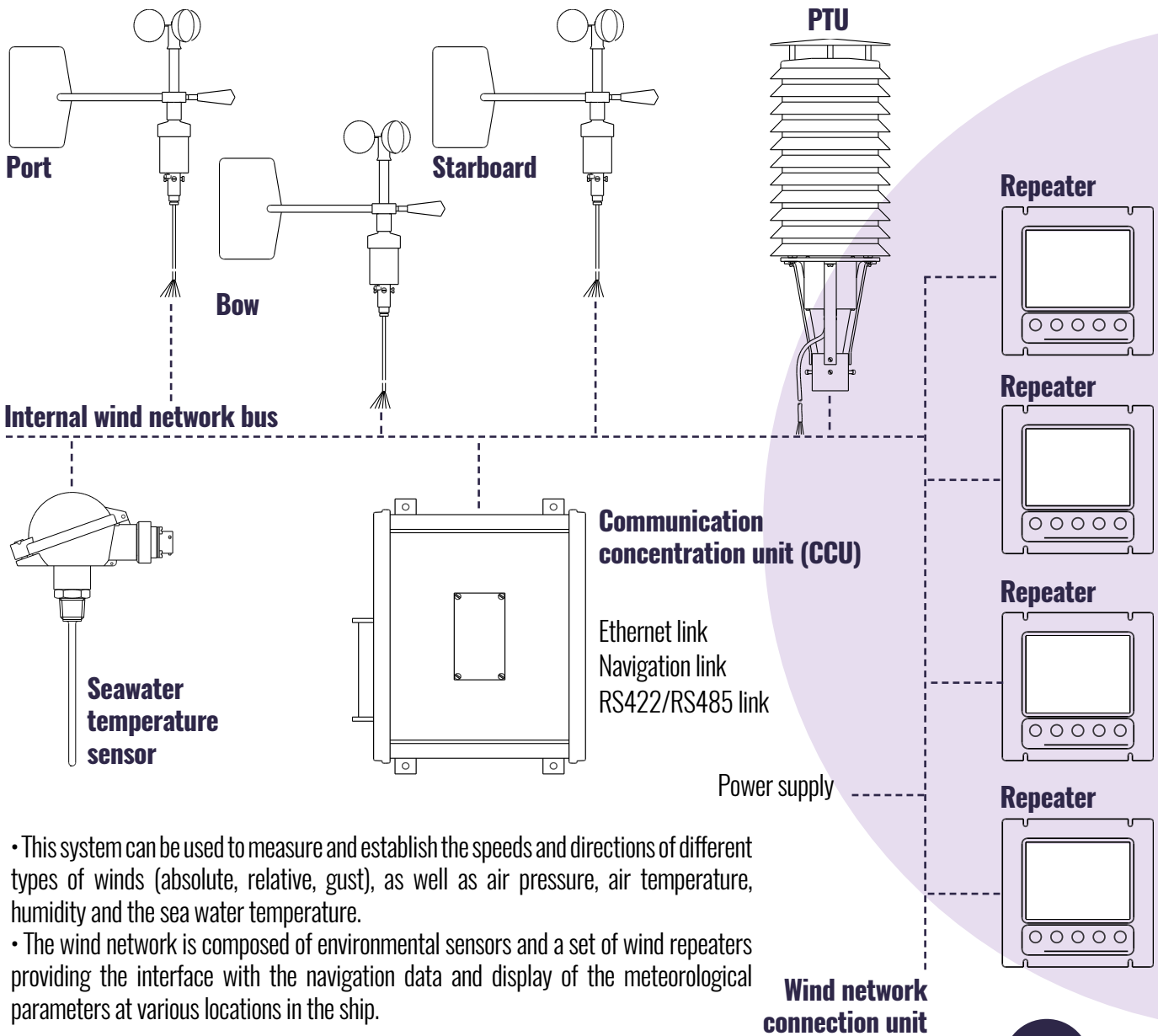
The communication concentration unit can be used to interface the meteorological information and the navigation data on the control screens.

- **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**

**?**

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

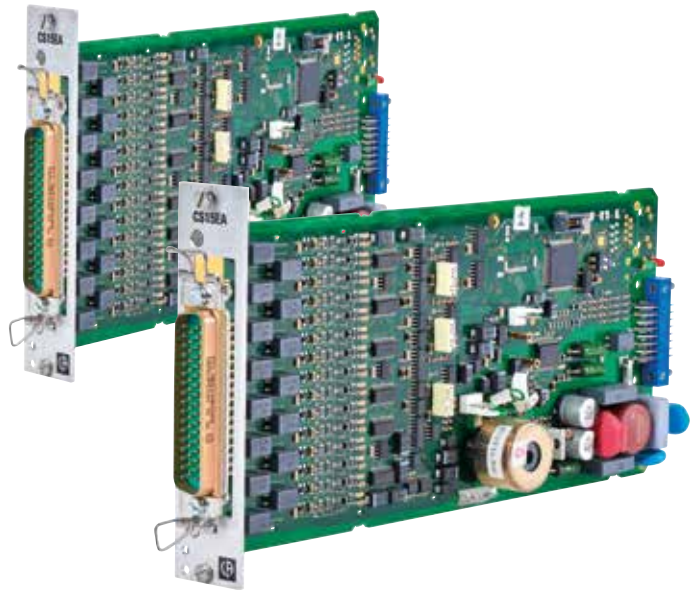
# Monitoring and indication of the statuses and temperatures of the engines and exhaust line shafting



## 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,  
Singapore, Taiwan

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