EUROATLAS

Power Converter Products

For Naval, Aviation and Land Applications

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POWERING THE WORLDS FORCES

INTRODUCTION

Since 1962, EUROATLAS has been developing and manufacturing customer specified power converter products for military and demanding commercial applications.

Today, our advanced electronic equipment for data processing, navigation, communication, control, and monitoring can be found almost everywhere - on land, on sea and in the air.

A reliable and precise electrical source for such equipment is essential. In fact, it can determine human survival. That's why the conception, design, production, and logistic support for power supplies should be performed by experts like us – with 60 years of experience.

1962

1962: Foundation of VAROATLAS by VARO, Inc. and ATLAS Elektronik as a 50/50 joint-venture.

1966

1966: Krupp took over ATLAS Elektronik.

1967

1967: Krupp sold all shares of VAROATLAS to VARO.

1975

1975: The General Manager acquired VAROATLAS from VARO and changed the name to EUROATLAS.

1978/79

1978/79: EUROATLAS acquired DR. JOVY GmbH and Specht Stromrichter GmbH, both located in Leer. The companies were merged to JOVYATLAS GmbH.

1989

1989: MagneTek acquired EUROATLAS and JOVYATLAS, both companies were incorporated into the sector „Power Technology Systems".

1991

1991: A new production facility in Bremen was launched, increasing the total facility to 2,900 m². Total site area is approx. 6,700 m².

1994

1994: The „Power Technology Systems" sector was acquired by the existing management team from MagneTek. The name of the sector was changed into POWER PARAGON, INC.

1998

1998: POWER PARAGON, Inc. became part of L-3 Communications.

2014

2014: EUROATLAS and JOVYATLAS legal entities were merged.

2015

2015: Wärtsilä acquired the business section Marine System International from L3. JOVYATLAS EUROATLAS is incorporated in the business line Electrical and Automation.

2018

2018: Modernization of production facility and investment in state of the art test equipment

2020

2020: EUROATLAS and JOVYATLAS legal entities were separated.

2021

8/2021: Mimir Group acquires EUROATLAS from Wärtsilä

9/2021: Scope extension of EN 9100:2018 certificate for Optronic branch

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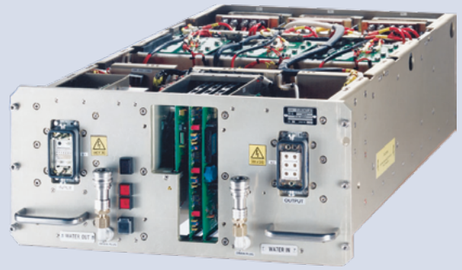
NAVAL



3-phase Converter
440 VAC/60 Hz to 350 VDC, Model 2038

The AC/DC converter module has a total output power of 35 kW and is designed for 19" rackmount. The converter was a customer specific development for the APAR (Active Phased Array Radar) which is a shipborne Multifunction Radar (MFR) manufactured by THALES Nederland. It is the first active electronically scanned array MFR employed on an operational warship.

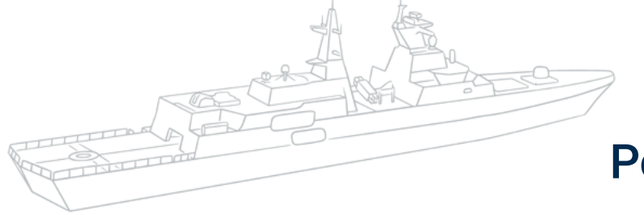
5 water-cooled converter modules are installed in a rack system and operate in parallel. Wärtsilä supplied the converter for the German F124 frigates, Dutch frigates, De-Zeven-Provinciën-class and the Danish frigates Iver Huitfeldt-class.

55 kVA UPS 55 kVA, In: 440 V/ 60 Hz, Out: 115 V, 60 Hz, Model 4086

- 55 kVA for 15min.
- UPS status panel
- Single battery monitoring
- Active balancing
- Self-cooling system
- High reliability & efficiency
- Available with vibration or shock mounts
- Fire extinguishing unit (optional available)
- ILS (Integrated Logistic Support)

30 kVA Submarine Power Conversion Cabinet, Model 1026

Model 1026 is designed for the installation on submarines and to supply all consumers on-board. The power conversion system is housed in painted stainless steel cabinets, where the inverter contains units and components for the required power conversion. All units and components are removable from the front. The power conversion system converts an input voltage of 360-560 Vdc into an output voltage of 3 x 230 V/60 Hz and an input voltage of 360-560 Vdc into an output voltage of 24 Vdc with galvanic insulation as required for sensitive equipment like electronic controls, weapon systems etc.



Power Conversion System

Each power conversion system consists of three equal inverter cabinets designed to be able to take-over the full load of another set of inverters. In normal mode two inverters are working at a time while the third remains in stand-by mode. In case of a faulty productive inverter, the stand-by inverter automatically starts up in parallel with the one still running. Any of the inverters may act as a stand-by cabinet.

During change-over time the running inverter is capable of taking the 200% load required. A Water Cooling system is placed at the rear inside part of each cabinet. The required water is provided on board via ball valves situated on top of the cabinets. If the Water Cooling is unavailable and air cooling becomes necessary, an Emergency Cooling drawer between the DC/DC Converter and the Output Transformer, may be pulled out and the manual lid on top of the converter may be opened to guarantee further cooling. A connector for a Fire Extinguisher is situated in front of each door of the cabinets for emergency purposes. If the fire extinguisher is used, a small flap on top of the cabinet will open to allow the extra volume of the CO_2 used to escape. Several converter fault detection circuits are provided to assist maintenance personnel in trouble shooting. The summary of all logic circuits for generating and processing fault messages, mainly implemented by a PLD, is called FDL (fault detection, processing and indication logic). The FDL is the technical implementation of BIT (built-in test) functions and fulfils the BIT-requirements of fault detection, fault assessment, fault indication (top priority indicated) and system protection.

Monitoring Panels are mounted at the front door of the inverter cabinet, which allows monitoring and control the equipment without opening the cabinet. Power available indications and measurements for output voltage and current are part of this monitoring panel. Respective signal shall be given to the hard wired connected integrated monitoring control system. The power conversion cabinet is equipped with an anti-condensation heating which will automatically be switched ON.

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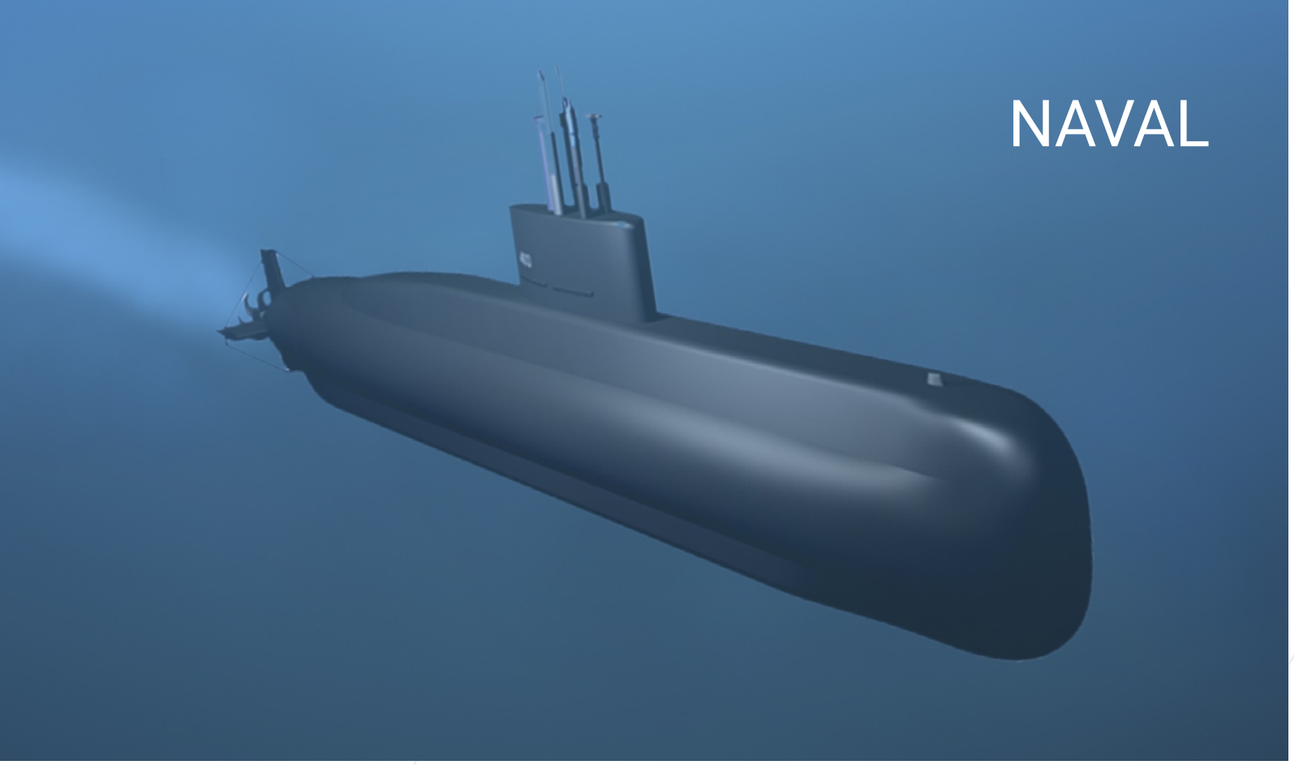

45 kVA Transformer, Model 9037
Input: 230 VAC / 60 Hz, Output: 440 VAC / 60 Hz

6.5 kVA Transformer, Model 9038
Input: 230 VAC / 60 Hz, Output: 115 VAC / 60 Hz

Transformers

The Transformer, model 9037 and 9038 are designed for the installation on submarines to convert an input voltage of 230 V/60 Hz into an output voltage of 115 V/60 Hz with galvanic insulation. The 45 kVA transformer model 9037 is water-cooled, supported by two fans installed inside a drawer mounted on top.

In case of water-cooling failure the system offers an emergency air cooling via two plates mounted to the front and rear side of the cabinet, which protect the system from overheating. The system provides monitoring LEDs which display the current states of the transformer and signals possible faults. The 6.5 kVA transformer, 9038 is air-cooled by a fan mounted at the front side blowing the warm air out of the unit and a filter-protected air inlet at the rear side.

The system provides a monitoring assembly which displays the current states of the Transformer and signals possible faults. Fuse Inserts and circuit breakers protect the system from overvoltage damage.

Model 3396, 27 kVA

Model 3397, 2 x 15 kVA

Model 3398, 7 kVA

Inverters

The inverters, are housed in steel cabinet (IP43) containing several main units and various components which are necessary for static power conversion. All subassemblies and components are removable from the front. Inverters are fastened on its mounting surface either per shock absorbers SES 2000 or per attachment rails, depending of the design. The cabinet door contains a monitoring panel which holds the control and indication elements. The Inverters are designed for air cooling by means of integrated fans.

Furthermore, the inverters are equipped with an anti-condensation heating. The anti-condensation heating is switched on when the DC input voltage is applied and during stand-by condition. The inverters are able to supply an overload of 50% for 5 minutes. The outputs are short-circuit protected with constant current behavior and provide an output short current of approx. two times the nominal output current for 5 seconds at erroneous load conditions. Switch-off time was calculated for burning out respective load fuses and for protecting the cabling of the submarine.

Several inverter fault detection circuits are provided to assist maintenance personnel in troubleshooting. The summary of all logic circuits for generating and processing fault messages, mainly implemented by a PLD, is called FDL (fault detection, processing and indication logic).

DC/AC Inverter family designed and manufactured for the 209 Submarine Class

The static inverters convert a submarine battery voltage of 160 Vdc…320 Vdc into a high quality 120 V / 60 Hz, 120 V /400 Hz and 230 V / 50 Hz voltage. Our products consists of static power conversion equipment of the latest available technology. All components fulfill the requirements of naval standards. The electronic are housed in a stainless steel frame cabinet with steel walls according to the general requirements of naval ships. The topology of all three inverter types is equivalent.

Key features of the inverters

- High efficiency
- Low noise
- Built-in self test feature
- High reliability (MTBF)
- Modular design
- Low lifecycle cost
- Complete integrated logistic support (ILS)

Custom options

- Different output power available as required by the onboard loads
- Input voltage range can be adapted to the submarine type and battery voltage
- Cabinet design can be modified according to the available space
- Output configuration either single phase or three phases
- Various output frequencies available

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DC/AC Mains Cabinet, Model 9039

Key features:

- Input and output EMI circuitry
- Low acoustic and structure borne noise
- System supervision
- Redundant threefold auxiliary power supplies
- Two redundant control electronics
- Water cooling system
- Emergency air cooling system
- Gas fire extinguishing system
- IP54 cabinet

The DC/AC Mains Cabinet is a switchboard designed for the installation on submarines. Its purpose is to distribute the DC and AC mains between

- Submarine batteries or DC shore supply and DC consumers and AC shore supply and AC consumers

The cabinet includes:

- Circuit breakers for distribution of power from the batteries to the DC mains
- Transformer for connecting the shore supply to the submarine AC mains.
- Circuit breakers for establishing redundant connections, and connections between the aft and forward mains.

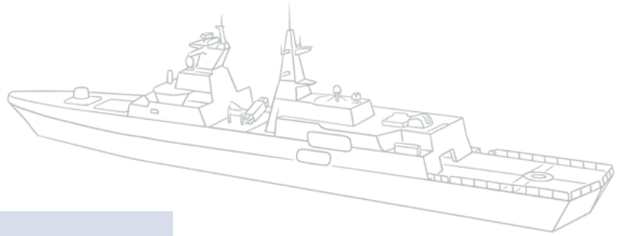
The DC/AC Mains Cabinet is housed in a painted stainless steel cabinet with front door All units and components are removable from the front. The DC/AC Mains Cabinet will be electrically connected to the submarine's power supply and consumers from the rear side of the DC/AC Mains Cabinet. A monitoring panel is located at the front door, it allows to monitor and control the equipment without opening the cabinet.

Power available indications and measurements for output voltage and current are part of this monitoring panel. The Ship Control and Monitoring System (SCMS) is the primary system for control and monitoring onboard the submarine. All information required to remotely control and monitor the DC/AC Mains Cabinet is transferred between the SCMS and the cabinet.

The DC shore supply model 2065 was developed for the supply of a conventional submarine.

Input supply can be either conventional 400V, 3ph, 50 Hz when using a land based shore grid, or 440V, 3ph, 60Hz (in accordance with STANAG 1008 Ed. 9) when operated from a surface vessel using the respective board supply.

The mechanical layout is primarily a 10 feet steel container with integrated switch cabinets for the charging station. A cooling system is mounted on the container walls and is removable for transportation in order to meet the customer requirement of 10ft size. The container can be certified with a CSC safety approval, allowing a comfortable transportation on sea.



140kW Submarine Shore Supply Model 2065

General features:

- Modular system
- Customized configurations
- Programmable output
- Local control & remote control
- High efficiency
- Integrated cooling system
- Monitoring system integrated
- Built-in test

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50 kVA Helicopter Supply, Model 4070.2
3 x 115 / 200 V – 400 Hz

The converter is designed to convert an AC voltage of 440 V / 60 Hz into a 28 VDC voltage. Output voltage control is maintaining the adjusted output voltage even at high pulse loads up to 1800 A for 10 seconds. State-of-the-art control electronic is integrated utilizing programmable logic devices and micro controllers and featuring onboard fault detection.

Features:

- Designed for naval vessels
- Output acc. MIL-STD 704F
- Overload capacity 1.8 kA / 10 sec
- Monitoring & Control TFT display
- DSP control electronic
- Integrated Logistic Support
- Customer specific modifications

28 VDC / 300 A Helicopter Starter,
Model 2056

The helicopter supplies are for installation on naval surface vessels. We are offering 28 VDC helicopter starter with up to 1800 A and a new version of 3-phase 115 / 200 V – 400 Hz helicopter supply.

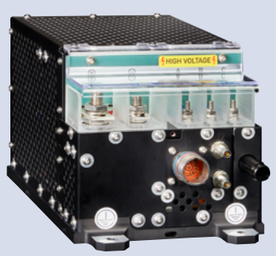
Features:

- 50 kVA with 225% overload for 5 sec.
- Input: 3 x 440 V / 60 Hz z Output: 3 x 115 V / 200 V / 400 Hz acc. MIL-STD 704F
- Soft start – external sensing
- Remote control panel
- CO2 fire distinguisher connection
- Shock mounts
- RS485 MODBUS interface Remote control panel

NAVAL

AVIATION

Converter Regulator Unit,
Model 2037



Rectifier Unit 28 VDC / 175 A,
Model 2063

The lightweight 28 VDC/175A rectifier unit has been custom designed for the SAAB multi-role fighter aircraft Gripen. The TRU fulfils exceptional reliability demands and meets all environmental requirements of common military standards for airborne equipment. The TRU supplies onboard electronic systems of the aircraft.

Saab Gripen NG

Scope of supply: TRU 28 VDC/175A & CRU 37 VDC

Power conversion products, such as AC to DC converters, frequency converters, and DC to AC inverters are major components in almost every aircraft today.

All the power supplies currently in production have passed flight certification and through the years have achieved a solid reputation for high quality. The airborne product line includes a series of transformer rectifier units – TRUs – ranging from 20 to 300 A for the MRCA "Tornado", the Swedish fighter JAS 39 "Gripen", the "Tiger" helicopter, Indian AEW&C and others.

The purpose is the conversion of the aircraft prime power source of 115 V/200 V, 3 phases, 400 Hz to 28 VDC power. The TRUs have been developed for extreme environmental conditions, minimum space and weight requirements and maximum reliability. We can offer a wide range of solutions for military and commercial aircraft.

From the largest mobile ground power supply to the smallest lighting converter, we support our products from the design stage, through the qualification process and the service use.

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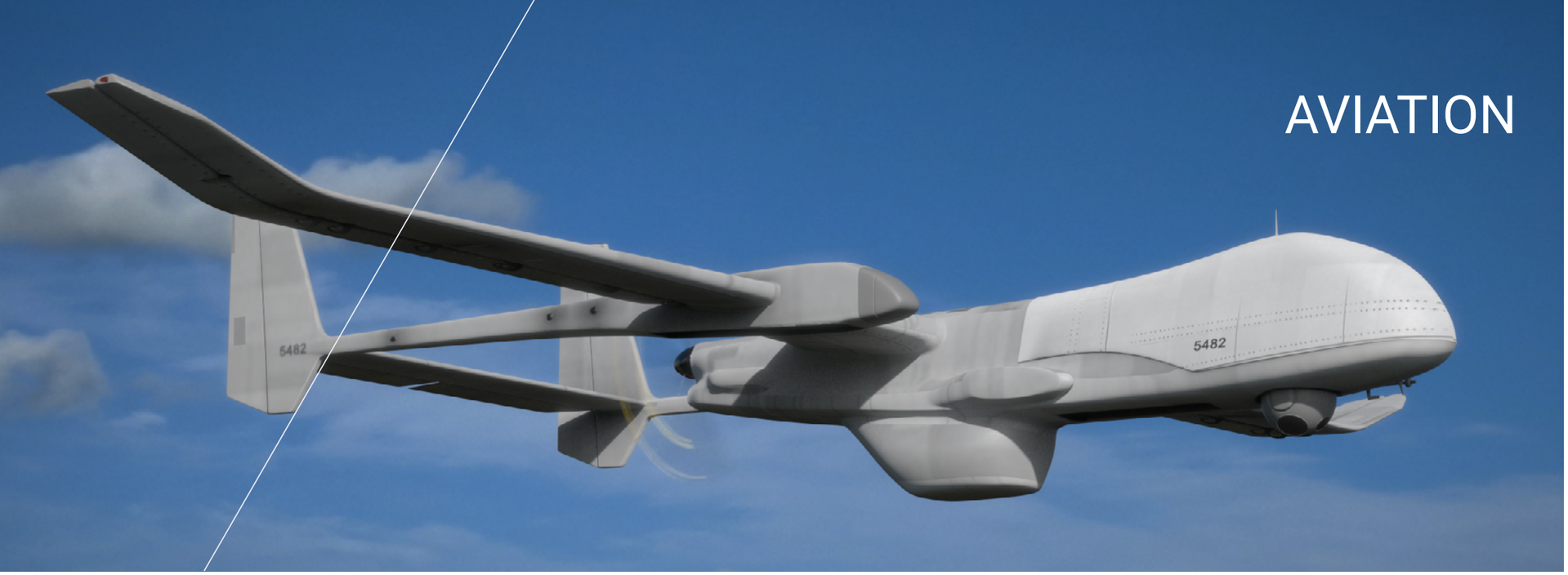


AVIATION

10 VA Mini Frequency Converter, Model 4074A

This lightweight solid-state miniature frequency converter is one of our latest developments for commercial aviation industries which is qualified at Airbus. It is used for razor outlets in the A350 and A380.The technical specification for the converter is applicable also for the A320, A330 and A340 families. The unit converts aircraft primary AC power of 115 volt, 360-800 Hz into 115 and 230 volt, 60 Hz. It is located in the lavatory and in the cabin and crew rest compartments.

20 kW Transformer Rectifier Unit, Model 2062

The 20 kW TRU is designed to convert a 3-ph aircraft AC voltage of 115/200 V - 400 Hz into a voltage of 270 VDC. The TRU consists state-of-the-art power conversion components and provides a galvanic isolation and was developed for a US defense program. All components are housed in a modular aluminum cabinet designed according to the general requirements of military aircraft.

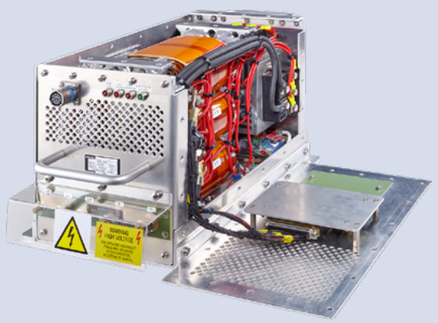
Features:

- 24 pulse rectifier
- Input EMI supression filter
- Front panel LED indicators & external monitoring interface connector
- Wide temperature range -40°C to +71°C
- High efficiency > 95% z Low weight and dimension
- RTCA DO 160G z MIL-STD 704F
- Galvanic isolation

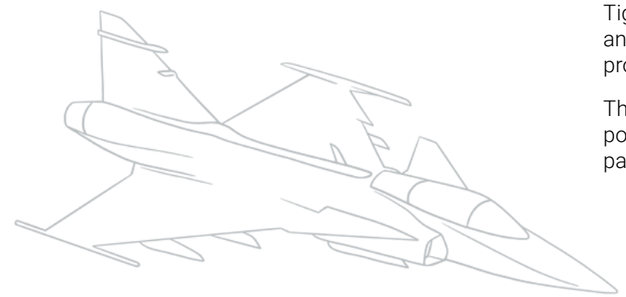
The high efficient & lightweight 45 kW ATRU was designed and developed by Wärtsilä for the Airforce of India for the latest aircraft generation of the EMBRAER 145 AEW & C for powering the onboard aircraft radar system developed by DRDO India.

Features:

- 18 pulse rectifier z Input EMI suppression filter
- Output filter
- Build in monitoring electronic
- Front panel LED indicators & external monitoring interface connector
- Power / weight ratio: > 1.0 kW/kg
- High efficiency > 95% z MTBF: > 75.000 h
- Operating temperature range: -40°C up to +70°C
- High reliability by using passive components
- MIL-STD 810E, 704E



45 kW ATRU, Model 2052



Both units where custom designed and qualified for the Tiger multi-combat helicopter.Germany, France, Spain and Australia are operating the helicopter which has been proved during several international tasks.

The STV-LIE supplies the onboard weapon system and the power distribution box features various functions and is part of the Trigat weapon system.

Model 5034, STV-LIE

Model 9023, PDB (power distribution box)

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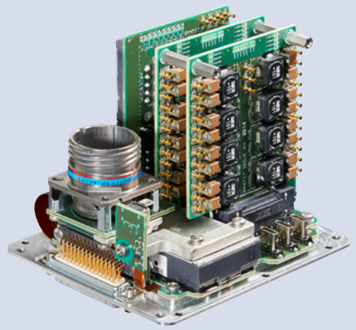


Cockpit Light Control Unit, Model 5041

Key features:

- Low weight of only 1.200g
- RTCA DO-178C / DO-254 /DO-160
- Shock / Vibration / Gun-Fire / Bump
- EMI acc. MIL-STD 461F
- DAL C
- Operation from -40°C to +70°C
- Conduction cooled
- IP54 aluminum housing
- Programmable outputs
- Scalable in no. of output channels 8/16/24/32

The Cockpit Light Control Unit (CLCU) is designed for fixed wing or rotary wing aircraft to supply cockpit control lamps (bulb or LED) with a programmable voltage individually. The system is supplied by a 28 VDC source.

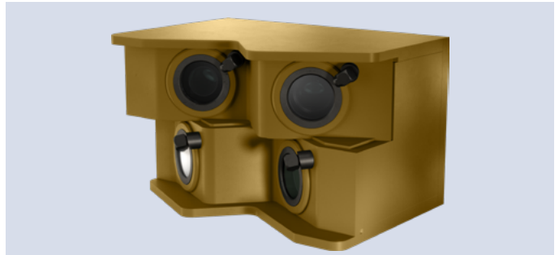
The CLCU contains overall 16 separate output channels which are controlled by one of two external potentiometers, depending on the deposited transfer function. The transfer function is a piece wise linear function built of 10 sampling points to match the control voltage individually for each channel.

All channels are represented by Pulse Width Modulated (PWM) Signals converted to DC voltages by second order low pass filter. The equipment consists state-of-the-art static power conversion equipment designed under the measures of the latest available technology.

By using an appropriate PC software the user is able to parameterize the CLCU and to communicate with the internal memory that includes system monitoring data.

Key features:

- All weather housing, IP68K
- Operating temp: -40 to +85°C
- Extreme low latency digital image processing
- Image stitching algorithm for wide HFOV
- Various sensors are supported
- Optional rotatable and tilt unit
- High pressure cleaning with air and water
- Focus range: 1.2 m to infinity
- Sequential microprocessor controlled cleaning, never blind



Wide HFOV dual channel camera module for front & rearview, day and night vision, P/N:

EUROATLAS has developed a new Digital Camera Vision System known as WOLFEYE VISION SYSTEM. This system has the ability to integrate into APC, MBT, SPHS and other special purpose military vehicles. High modularity supports a large number of combinations connected via Ethernet according to NGVA standards.

EUROATLAS WOLFEYE VISION SYSTEM design fully supports situational awareness to the Driver, Commander and Chief of Section's station and crew in an up- tempo environment. Additionally, the system would help the crew to clear the vehicle when conducting pivot steer during a mission and address a potential safety issue in situations of lower visibility.

Advanced and patent pending system technology would reduce risk of the enemy sneaking up on the vehicle and entering.

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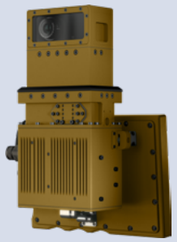


Driver & commander periscope For day and night vision with EPU and monitor, P/N: 010031

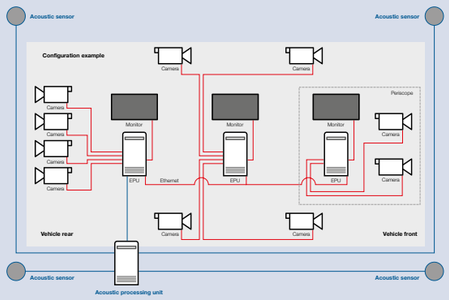
Key Features:

- Fast push-pull installation
- Robust, modular and compact design
- Detachable and adjustable monitor
- Latest camera sensor technology
- All weather housing, IP68K
- Easy maintenance & low maintenance cost
- Digital image processing with low latency
- Operating temperature -40 to +71°C
- Military embedded computer, soldered RAM & SLC memory
- H265 Recording on USB 3.0
- Ethernet Interface, NGVA ready

Key Features:

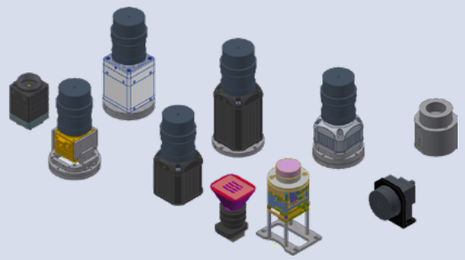
- Dimensions available: 7” / 9” / 10.25”
- Resolution: WXGA / FHD
- Integrated 5-way Joystick
- Illuminated keys, dimmable
- IP65 housing
- Detachable and adjustable
- Operating temp: -40 to +71°C
- Ergonomic and intuitive HMI
- MIL-STD 38999 Connectors
- MIL-STD 1275, MIL-STD 810G

9” Monitor module with keys & joystick, P/N: 010061



Scalable from single sensor to full 360° SAS NGVA ready, Acoustic thread detection optional

LWIR / SWIR / CMOS / I²CMOS / EBCMOS / CCD

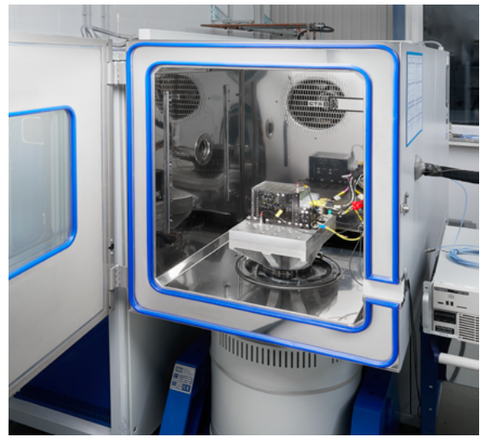


A choices of 12 different sensors and technologies available, for each vehicle and mission the right setup

EUROATLAS at a glance

Capabilities:

- Customer specified products for demanding and mission critical applications
- Technical support during customer’s design phase
- Comprehensive technical and commercial offering
- Product design planning, design review and design verification
- In-house production
- Production control, monitoring and continuous improvement process
- ILS (Integrated logistic support)
- Worldwide installation, aftersales service and support



EUROATLAS has developed over decades various special manufacturing processes and testing capabilities which adds value and pace during product prototype phase and transition to series production.

In-house production capabilities:

- Mechanical workshop
- Transformer winding machine and vacuum chamber
- Advanced Vapor-Phase-Reflow-Soldering System
- Wave Soldering Machine
- Electrical testing up to 1 Megawatt
- Advanced Burn-In climate and vibration test chamber for critical airborne power conversion products
- Worldwide installation and aftersales support
- ILS (Integrated logistic support)
- Worldwide aftersales service and support

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QM System

The EUROATLAS quality management system is approved and certified by DNV, DAkks as stated below to be in compliance with the Quality Management System Standards:

International Standard EN 9100:2018, "Quality Management Systems – Requirements", certified since 1991

EN 9100:2018 based on ISO 9001:2015, "Aerospace – Quality Management Systems – Requirements for Aviation, Space and Defense Organizations", certified since 2005

The quality management system is implemented to comply with the agreed quality standards, government and customer requirements according to the NATO standard AQAP 2110, "NATO Quality Assurance Requirements for Design, Development and Production".


DNV

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

EUROATLAS GmbH

Zum Panrepel 2, 28307 Bremen, Germany

has been found to conform to the Quality Management System standards:

EN9100:2018 and ISO 9001:2015
(technically equivalent to AS9100D and JISQ9100:2016)

and has been audited in accordance with the requirements of EN 9104-001:2013

Type of certification structure: **Single Site**

This certificate is valid for the following scope:

Design, development, production, sales & marketing of DC/AC inverters; AC/AC frequency converters; DC/DC converters; AC/DC rectifiers and converters; day & night image processing systems

BDLI

DAkkS

Integrated Logistic Support


VERTRAULICH

120° Tag/Nacht Fahrersichtsystem – Betriebsanleitung

Sicherheit

2.3 Personalqualifikation

WARNUNG!

2.4 Allgemeine Gefahren

WARNUNG!

Our ILS department ensures coordination, interconnection, integration and networking of logistic support in compliance with applicable standards. Under this approach all data originate from a common data pool and are linked to respective manuals, spare parts lists, reliability analyses, etc., thus ensuring an essential network for all the sub-disciplines of ILS, e.g. spare parts management, operation and maintenance.

The common goal of all EUROATLAS ILS activities is ensuring a maximum availability of the system that is to be supported. The field of work and responsibility of our ILS department is the provision of all instructions, specifications, information and documentation required by customers (end-users) to complete all the tasks (operation, maintenance, repair) related to the lifecycle management (sustainment, life expectancy and renewal) of a technical system.

The EUROATLAS ILS service comprise:

- Customized documentation for end-users and training
- Reliability, maintainability and safety engineering
- Optimized provision of spare part support
- Obsolescence Management

EUROATLAS

EUROATLAS is an experienced and reliable manufacturer of ruggedly designed power conversion products for advanced military and civilian applications since 1962.

EUROATLAS GmbH

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Specifications are subject to change without prior notice.

01.2022 / Bock's Office