

CONTACT



Durability, Proximity, Passion

130 YEARS

1893 - 2023



# Contents

## # 1 Durability

- 130 YEARS' EXPERIENCE IN THE GROUP	2
- A NEW HEAD OFFICE	3
- A WITNESS TO THE INDUSTRIAL UPHEAVALS OF THE 20TH CENTURY	4
- PYROMETRY AND INDUSTRIAL SENSORS	6
- METERING	7
- NUCLEAR	8
- EDUCATION	10
- AGRI-FOOD	11

## # 2 Proximity

- TAILORED PRODUCTS	12
- QUALITY SERVING OUR CUSTOMERS	13
- PRODUCTION	14
- CUSTOMER SATISFACTION	16
- OPEN TO THE WORLD	18

## # 3 Passion

- R&D	20
- ACCOMPANYING THE ENERGY TRANSITION	22
- A COMMITTED COMPANY	24
- INNOVATIONS AND NEW TECHNOLOGIES	26
- CELEBRATING 130 YEARS	28

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Accompanying  
our customers  
in their challenges,  
yesterday, today  
and tomorrow

From standard instruments to tailored products, some approved for several decades by major strategic players in the defence, rail or electricity generation sectors, from analogue to connected digital tools, our measuring instruments are aimed at a **broad customer base who expect the companies in the Chauvin Arnoux Group to ensure reliable measurements and contribute to people's safety and day-to-day continuity of service on their installations.**

Chauvin Arnoux has been dealing with these challenges with passion and determination for 130 years, ultimately contributing to progress in our world. Five generations of French industrial entrepreneurs, surrounded by talented, inventive, innovative, scientific, technical and multidisciplinary teams succeeding one another from one generation to the next to foster our values, our know-how, our expertise, our quality and our mainly French, integrated industrial model.

**This durability is supported by two pillars: innovation and the human aspects.** Both are without limit when driven by passion with the primary aim of satisfying customers' requirements with products which are constantly more innovative, ergonomic, simple to use, effective and reliable.

Those requirements have been constantly evolving since 1893, when Chauvin Arnoux was founded, in reaction to scientific and technological progress, changes in the regulations and varying economic and geopolitical situations.

In 2023, certain topics are being considered on a much larger scale, although they also apply locally. Concerns for our planet and recent events are having a significant impact on energy, encouraging businesses and individuals to be more efficient and vigilant in their day-to-day operations, while limiting their energy consumption, paying more attention to their impact and continuing to comply with the applicable regulations and standards.

**The mission of the Chauvin Arnoux Group fits perfectly into this approach seeking efficiency and progress,** since we develop measuring solutions every year on which our customers rely to define their orientations for improvement. Whether it involves testing, troubleshooting or monitoring certain sensitive parameters on their installation or production line, checking the installation's safety and compliance with standards, metering or converting energy, reducing costs or analysing power quality, our products are up to the job.

As a major actor in the world of measurement, we are necessarily progress and innovation-oriented. **Our involvement in research to boost our customers' performance with the help of our products (including energy performance) means we are necessarily part of this energy transition towards a more electric world.**

Measurement of electrical, physical and environmental quantities, spectrometry, metrological services and regulatory testing: **we are determined to develop a high-quality portfolio of offers which grows year after year to stay by your side in the future too.**

**Wolfgang Arnoux**  
Vice-President, Chauvin Arnoux Group



# #1 Durability

## 130 years' experience in the Group

Long, rich careers, confirmed skills and transmission to the next generation: at Chauvin Arnoux and in its entities, the transmission of know-how is a gentle process, with known, proven skills picking up the baton. That way, know-how and expertise are maintained.

### Proximity & a passion for business at Chauvin Arnoux and Manumasure

**Pascal Bonnouvrier**, Chauvin Arnoux's Sales Director, was as close to his sales team as he was to his customers. After joining aged 17 on the bottom rung of the ladder as an inspector in the "special developments" unit on the separate site at Courbevoie, he spent the remaining 50 years of his career in the Group. He learned his profession in the field, doing several operational jobs before becoming a sales engineer in the 1980s. *"Wherever there's a working factory, there's a potential sale,"* he used to say. This perseverance helped him to become an agency manager, a sales manager and finally Sales Director, France, for Chauvin Arnoux. He eventually handed over to **Régis Raelina** in April 2023. With his perfect knowledge of the field, the markets and our distributor partners, Chauvin Arnoux's new Sales Director began his career as a young sales engineer. After a few years in the Sales Department of Manumasure, he has returned to his origins and rejoined Chauvin Arnoux for this key management position. His expertise and passion for electrical measurement make him an advantage for our customers whom he intends to satisfy by following the same maxim as his predecessor: *"the secret to lasting in business is the relationship of trust established with the customer"*.

At Manumasure, our metrology and regulatory testing company, there was also a handover after the departure of Régis Raelina. **Emmanuel Falconnet**, who spent nearly two years alongside him as Business Strategy and Development Manager, has taken over the job of sales development. Thanks to his 17 years working in metrology for a major group, Emmanuel Falconnet has in-depth knowledge of the regulatory testing field in industry and the health sector. His aims are still to leave his mark at Manumasure and maintain customer satisfaction over the long term.

### Passion for innovative technologies at Indatech and legitimacy of the transfers of expertise within Chauvin Arnoux's R&D

INDATECH joined the Group in 2018, contributing its spectral analysis expertise to Chauvin Arnoux. The innovative little French startup founded in 2009 in Clapiers, near Montpellier, by **Sylvie Roussel** and **Fabien Chauchard**, two science PhD students, joined the Group five years ago and continues to develop innovative non-invasive optical solutions on the international markets for real-time testing of processes and complex solid or liquid products. In 2023, Sylvie Roussel, Indatech's Managing Director, decided to leave to the company in order to focus on another job. She passed the reins to her Technical Director and co-founder, Fabien Chauchard, who was appointed Managing Director of Indatech in January.

At Chauvin Arnoux, the Group's Research and Development teams were led for more than 30 years by **Didier Piaud** who also kept watch over the standards in the sector. Today, the challenge has been taken up by **Philippe Chapet**, previously in charge of the electronics laboratory at our headquarters in Asnières, who spent ten years working alongside him. He has been responsible for R&D since May 2023. For this young engineer, now aged 41, who joined the Group in 2012 as a project manager for flagship product ranges, this appointment represents both a challenge and legitimate source of continuity. His main objectives include keeping project development going despite component shortages and freeing up the internal design processes, backed by around forty people in the R&D departments at Asnières and Annecy. In the same way, **Thomas Forte** has taken over the leadership of the electronics laboratory, left vacant, after 12 years as an R&D Engineer with the Group.

At the R&D Department in Annecy-le-Vieux, after a career begun at Metrix (a company taken over by Chauvin Arnoux in 1997), **Francisque Pion** gave way to one of his long-term colleagues, **François Delaurat**, who joined the R&D Department in 2004, contributing his IT expertise as a former IT engineer while learning management skills.

### Production: maintaining our industrial facilities and know-how over the long term while renewing our human resources

Industry at Chauvin Arnoux is above all a diverse range of professions, human beings with broad skills and ever more advanced products. Three production sites in Normandy - Pont-L'Évêque, Vire and Villedieu-les-Poêles - handle production of our products from machining of the parts through to assembly and pad printing, as well as soldering and PCBs. The proximity of these three production sites enables us to follow a long-term strategy based on stable, high-performance products and investments in industrial plant to achieve our production targets. The challenge for our recently-appointed Industrial Director, **Sébastien Remy**, who has been in charge of these three sites since late 2021 after previously managing the site at Vire, is to ensure the transmission of existing skills while developing new qualifications on constantly-changing tools. His conclusion? *"We have to work to maintain our know-how and the specific features of our professions through internal training and sharing of expertise with our veterans."*

## In 2020, Chauvin Arnoux moved its Head Office

to Asnières-sur-Seine near Paris



### Three years ago

The story began with the anecdote recounting the foundation of Chauvin Arnoux by two measurement enthusiasts, **René Arnoux** and his friend **Raphaël Chauvin**, in a little annex to his family home near Montmartre in Paris. A century later, the Rue Championnet in the heart of Paris's 18th Arrondissement was the site of Chauvin Arnoux's production plant, before it was moved to Normandy due to insufficient space for expansion. A Head Office was inaugurated in 1993 on the occasion of the company's 100th anniversary. Attached to its history and its presence in the bohemian heart of Paris, it was with a certain nostalgia that, 3 years ago, the Chauvin Arnoux Group left its premises at 190, Rue Championnet, for its current headquarters on the banks of the river Seine, at the gates of the capital. Without renouncing its historical family culture as "engineers and manufacturers", the Chauvin Arnoux Group has opted for modernism and renewal to open up new horizons as the 5th generation of its owners takes over.

On September 21st, 2020, the company moved to Front Office, a magnificent site on the banks of the river at Asnières-Sur-Seine. It has taken over the entire 6th floor to group the multiple skills already present at the Group's Paris headquarters: R&D, sales, HR, marketing, communication,

administration, etc., and the Chauvin Arnoux Energy Special Developments team for the Naval Defence market. Spectralys, which joined the Group a few years previously, working on quality control using fluorescent technology in the agri-food sector, moved to 12 -16 rue Sarah Bernhardt 92600 Asnières-sur-Seine at the end of the year.

### Collaborative efficiency and synergy between teams

The move to Asnières has enabled us to optimize our operating and energy costs while benefiting from premises more suitable for the growth of our activities. They reflect the Group's image, balanced between history and modernity: a well-lit open-plan area, guest offices, elegant meeting rooms, optimized R&D premises and windows everywhere! In organizational terms, the Spectralys teams, initially based at Romainville, and Chauvin Arnoux's R&D were brought together, both geographically and collaboratively. Strong relationships were forged, notably between the R&D departments of Chauvin Arnoux Energy and Chauvin Arnoux, as well as Chauvin Arnoux Energy's teams in the agri-food sector. This proximity facilitates the flow of information between the entities and departments, while favouring collaborative dialogue around common developments or markets and pooling the resources.

### Advantages for well-being at work

We occupy 2,871 square metres, covering the entire 6th floor of the Front Office building in Asnières-Sur-Seine, which combines modernism, an architecture bathed in light and a commitment to energy performance. Just a few minutes away from public transport, with a free shuttle service and a covered carpark, the hundred or so Group staff members who work there can face the difficulties of Paris traffic with greater serenity. The inter-company restaurant on site on the building's ground floor is also a major advantage for well-being at work. The varied dishes are made on site and a bar selling coffee and pastries helps people to start the day with a smile. Visitors are welcome and are greeted warmly. A genuine shop window for the Group, our Head Office promotes an image of professionalism and durability for a company which has been working in the measurement sector for 130 years.

## #1 Durability

# Chauvin Arnoux, Chauvin Arnoux Energy and Pyrocontrôle, actors and witnesses of the industrial upheavals of the 20th century

Chauvin Arnoux is celebrating its 130th anniversary and remains ready for the challenges of tomorrow!



*"Nothing great was ever achieved without enthusiasm," according to R.W. Emerson*

And there was a lot of enthusiasm 130 years ago in 1893 when two passionate students of the electrical sciences, René Arnoux and his friend Raphaël Chauvin, came together to found the company which now proudly bears their names. History tells that they began working in a little storage building, "a garden with, in the middle, a small house and a lean-to which served as a laboratory" in the heart of Paris in Toulouse-Lautrec's 18th Arrondissement. Montmartre was the site of the first creative developments by these two "engineers and manufacturers", who counted among their acquaintances Pierre and Marie Curie, as well as other "companion" inventors who placed their first orders and accompanied them in their search for entrepreneurs. In 2023, Chauvin Arnoux has not forgotten its history, even though the company is turned resolutely towards the future. The creative DNA of the two co-founders is still there, in the teams and innovations, constituting the spearhead for the current success of the Group and its brands. In the 21st century, steeped in innovation since its foundation, this optimistic, creative company is proud of its contribution to France's industrial fabric and its French manufacturing know-how as it prepares its tools and its digital transition to win over new markets.



Looking back, the 19th century was rich in scientific discoveries, as the century of steam, the Industrial Revolution and the rise of engineers. At a time when electricity was taking over, our two co-founders modestly developed a new technology: metrology to measure the electrical quantities, currents and resistance. The galvanometer, the sensors and 1927's Universal Tester (ancestor of the multimeter) were all launched at the behest of André Arnoux, the founder's son. The industrial age had begun and the company was growing. At the time, measuring instruments were made of "noble" materials, such as brass, copper, ebony

and varnished wood. The company used the black of Bakelite and the yellow of the brass mechanical parts to create its famous CA logo.

Alongside this, the needles and dials ensured the metrological accuracy of the measurements while new markets began to emerge in response to the rise of new technologies and the industrial age: rail, aviation and naval applications, but also photography. As is often the case in industry, was boosted innovation and, although Chauvin Arnoux's first subsidiary in Poland was destroyed during World War II, ten other subsidiaries would later open, from

# #1 Durability

## DID YOU KNOW?



### CHAUVIN ARNOUX AND PHOTOGRAPHY



Chauvin Arnoux began manufacturing "exposimeters" for the mass market which would later become the light meters used by photographers. The most famous is the "Cellophot" from 1952 which was integrated into cameras. Chauvin Arnoux later stopped manufacturing these products, focusing instead on the development of light meters.

Germany in 1965 to Sweden in 2003 for the Scandinavian market.

In the 1960s, plastic appeared and Chauvin Arnoux's instrumentation adapted to users' new needs for sturdy, lightweight instruments. Neoprene shockproof sheaths were developed (the patent dates from 1958), while the dials and other technologies were miniaturized, leading to the appearance of portable instrumentation. The CdA tester from 1979 and the CdA 600 clamp multimeter from 1982, made of yellow plastic, revolutionized portable on-site instrumentation, leading users to adopt the same colour coding as they appreciated the rugged design of these portable instruments.

Between "then" and "now", one brick at a time, through internal growth or takeovers of competitors or competing product ranges: Radiocontrol, Metrix (1997), Pyrocontrol and Enerdis in 1998, the electrochemicals branch of Heito in 2015, Spectralys Innovation in 2018 and Indatech in 2019. In this way, the Chauvin Arnoux Group has diversified and enhanced its offering to become a 1,000-employee industrial company doing business worldwide. Structured around its 6 expert companies - **Chauvin Arnoux, CA Energy, Pyrocontrol, Manumasure, Spectralys and Indatech** – the Group is growing its influence on the energy distribution, nuclear and naval markets, as well as agri-food and biotechnology more recently.

130 years after its foundation, Chauvin Arnoux has survived wars and economic crises, technological revolutions and component shortages, deadly flu epidemics and pandemics and continues to invest 11% of its sales revenues in Research and Development. Today, its 1,000 staff, hundreds of patents filed, multiple industrial design prizes, partner distributors and collaborations with universities help the company to stay young.

A firm of consultants recently stated that "family companies resist crises better". Chauvin Arnoux is above all a genuine human story made of passion and creativity, but it is also a story of science and discovery.

## DID YOU KNOW?



### CHAUVIN ARNOUX AND AVIATION

In 1909, the aeronautical engineer René Arnoux pushed back the limits of earth's gravity by developing innovative "flying plank wings" to stabilize a biplane.

Later on, at the 1913 Paris Air Show, René Arnoux proudly exhibited his revolutionary monoplane called the "Stablavion". This two-seater, low-wing aircraft was propelled by a 55 HP engine mounted in the thrust position.

As early as 1919, French engineer René Arnoux produced a revolutionary biplane propelled by a 130 HP rotary engine. This biplane's successful flights in 1922, with its unique vertical tail, drew admiration from the French Government's Service Technique de l'Aéronautique.

This success marked the beginnings of the prestigious "Société des Avions Simplex" aircraft company, which would go on to develop other revolutionary aircraft. A new era in aviation was ready for take-off.



## 1893

1895  
Galvanometer



1905  
Ohmmeter



1927  
Universal Tester



1965  
Naval instrumentation



1969  
Monoc



1973  
Tester



1987  
Multimeter



1994  
Clamp



2008  
Scopix oscilloscope



2022  
Qualistar Power Quality Analyser



## 2023

# #1 Durability



## FOCUS

### METRIX :

#### THE DAY CHAUVIN ARNOUX'S MAIN COMPETITOR BECAME THE GROUP'S ELECTRONICS BRAND

Today an emblematic brand known to generations of electricians and electronics engineers, Metrix is the Chauvin Arnoux Group's brand for its multimeters, power supplies, generators and oscilloscopes. Some of their instruments can still be encountered on lab benches in science classes and engineers young and old still speak nostalgically of their "METRIX", as they called the multimeters which they used in their measurement applications.

Metrix was founded in 1936, initially under the name CARTEX. It benefited from the economic recovery after the war to develop. Its initial activity involved manufacturing portable lampmeters for testing the operation of the valves in the radio-electricity sector. Demand exploded and CARTEX was soon well known, due to instruments such as its testers and frequency generators.

In 1946, the company changed its name to "Compagnie Générale de Métrologie" and began marketing its products under the registered trademark "Metrix". Based in Seynod near Annecy (France), the company contributed to local prosperity. Its success attracted the attention of major industrial companies and, in 1964, ITT (International Telegraph and Telephone) bought up the company and incorporated it into its instrumentation division to develop analogue and digital multimeters.

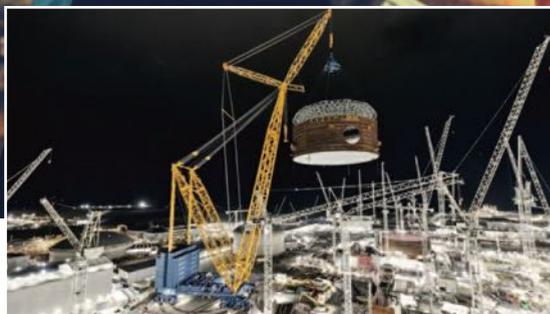
The company was then sold on and, in 1997, Metrix was taken over by Chauvin Arnoux, its main national competitor.

## Pyrocontrôle :

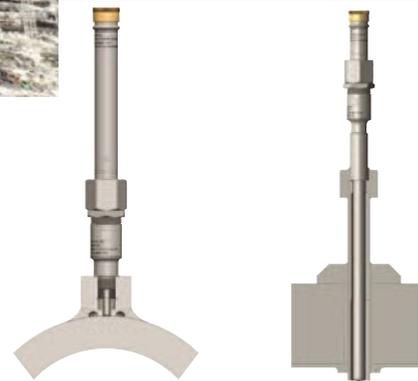
# Industrial pyrometry and sensors for the nuclear sector

Pyrocontrôle, a company acknowledged for its expertise in temperature sensor design, joined the Chauvin Arnoux Group in 1998 when it was purchased from the American company Engelhard. Industrial families often have similar histories and the story of Pyrocontrôle also began with one man's passion for industrial pyrometry and temperature control techniques. Adolphe Jacobzône, the son of Russian émigrés who moved to Normandy, was forty years old when he decided to set up Pyrocontrôle in Lyon on January 1st, 1945, after several years working in industrial pyrometry. With the end of the Second World War, temperature sensor production intensified and the name Pyrocontrôle was registered as a trademark.

In 1965 Daniel, the 26-year-old younger son already qualified as an engineer, took over the reins and contributed to the company's industrial expansion, making temperature sensors, thermocouples and resistance temperature probes. In the 1970s, the company saw rapid growth, notably thanks to a contract with the French Navy for nuclear sensors. 1978 saw Pyrocontrôle become a regular supplier of temperature probes for EDF. A patent was filed, followed in 1985 by a patent for a "sensor with reduced response time for temperature measurement inside a cooling fluid loop in pressurized water reactors" which certainly marked the high point for the company and its expertise on the Nuclear market. The American company Engelhard, which supplied the company with platinum for its temperature sensors, saw Pyrocontrôle as an opportunity to penetrate the



French market and bought up the company, signing the deal in London in 1987. A decade later, Engelhard sold Pyrocontrôle to the Chauvin Arnoux Group.



From the Compagnie des Compteurs in 1872 to Schlumberger - ENERTEC and then Enerdis,

metering has always been part of Chauvin Arnoux Energy's DNA



Gabriel Chamon

One of the oldest water and electricity meter manufacturing companies, the **Compagnie des Compteurs** was founded in 1872 by two men, Gabriel Chamon and a salesman, Nicolas, who came together to run a gas meter manufacturing workshop in France. Subsequently, with the acquisition of water and electricity distribution concessions, the Compagnie des Compteurs expanded its production to water and electricity meters. Construction of a factory in Montrouge began in 1917, eventually covering eight hectares. At the end of the 1920s, the company became a department of the Post and Telecommunications ministry before absorbing the Société des Constructions Radioélectriques du Centre in Saint-Étienne (oscilloscopes, function generators and other measuring instruments) at the end of the 1940s.



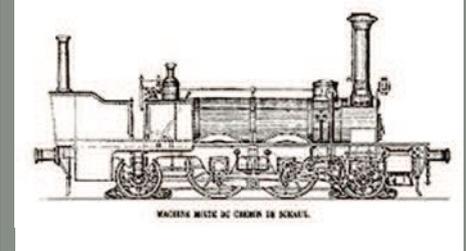
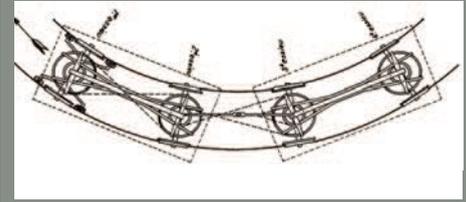
The *Compagnie des Compteurs* in Montrouge

In 1970, the firm controlled 79 companies employing more than 20,000 people (10 % of whom were engineers). It held 50 % of the market for electricity meters, 40 % for gas meters and 30% for water meters. It was then taken over by Schlumberger and renamed "Compteurs Schlumberger", before becoming "Schlumberger Industrie" in 1977, grouping the industrial production of Enertec for the electrical part, Flonic for the water metering part and Sereg for control equipment), still based in Montrouge. In 1986, Schlumberger sold part of its Enertec electrical business to Enerdis which remained in Montrouge and was eventually purchased by Chauvin Arnoux in 1998. In 2018, on the occasion of the Group's 125th anniversary, Enerdis was renamed "Chauvin Arnoux Energy".



## DID YOU KNOW?

### CHAUVIN ARNOUX AND RAIL TRANSPORT



Chauvin Arnoux's first industrial experience dates back to 1838 in the railway sector when Claude Arnoux invented a system for a train "with articulated axles" so that it could retain higher speeds on bends. He was awarded the "Grand Prix de Mécanique de l'Institut" for it in 1839. This process, called the "Arnoux system" would later equip the line from Paris to Sceaux.

Today, Chauvin Arnoux Energy remains present in the transport sector with its range of automation relays.



Historic lid from the Compagnie des Compteurs

Meters from the Compagnie dated to 1905

Schlumberger electricity meter



Schlumberger electricity meter

Ulys MCM meters from Chauvin Arnoux Energy, 2023



# #1 Durability

## More than 40 years of mastery in the Nuclear sector: **Pyrocontrôle & Chauvin Arnoux Energy in action**

The nuclear sector has been an essential aspect of electrical energy generation all over the world for several decades now. Through its subsidiaries Pyrocontrôle and Chauvin Arnoux Energy, Chauvin Arnoux has played a crucial role in this sector by supplying cutting-edge expertise for more than 40 years. Today, we invite you to explore with us the current evolution of the nuclear sector, its market potential and our company's recent achievements in this field.

### The Nuclear sector today: an evolving worldwide market

Worldwide, there are around 440 installed nuclear reactors spread over 32 countries, on average for 31 years, which means the maintenance and renovation market is particularly dynamic. The French installed base, with 56 operating reactors, is among the largest and directly accounts for several hundred thousand jobs via a sector grouping more than 2,500 companies. With its "Great Refit"\* project, EDF has given a specific dimension to the fourth series of ten-year inspections of its nuclear plants:

extending their operation by ten or twenty years and rebuilding a considerable reserve of skills for future projects.

In addition to the existing facilities, more than fifty reactors are being built worldwide, most of them 3rd-generation plants developed from the EPR Series currently in service to ensure even greater safety. There are also 4th-generation projects on the horizon, which will be able to consume the radioactive waste from the previous Series, thus removing the main objection to the decarbonized energy offered by the nuclear sector.

\* *The Great Refit (Grand Carénage) is an operation for the renovation and modernization of France's nuclear power plants, with the aim of extending the operating life of these nuclear installations beyond forty years in total safety.*

### A WORD FROM...



**FRANÇOIS DROUIN,**  
MANAGING DIRECTOR, PYROCONTROLE

**Pyrocontrôle has more than 50 years' experience in the Nuclear sector. What does the concept of durability mean for you?**

Durability is a natural requirement of Pyrocontrôle's customers in the nuclear sector. Pyrocontrôle's durability and attachment to this sector no longer need to be demonstrated as the nuclear industry has stood at the core of the company's strategy since the 1970s. In this industry, feedback is essential. It is synonymous with the long term. The fact that they benefit from several decades' experience in sensor design and operation is a guarantee of peace of mind for our customers.

**How is Pyrocontrôle currently positioned in this sector?**

Remember that the company has succeeded in becoming one of the nuclear industry's top suppliers. It has accompanied the development of French nuclear power and has evolved to handle the growing requirements in the sector. Pyrocontrôle benefits from highly experienced teams, integrated production and a robust quality system. Our facilities enable us to deliver temperature sensors in Europe and worldwide which meet our customers' very high expectations in terms of reliability and availability. Our probes contribute to the safety and security of nuclear power plants.

**How has Pyrocontrôle maintained its activity in this sector where business is cyclical?**

Pyrocontrôle has always maintained strong activity in the nuclear sector, notably thanks to a good balance between projects in France and international projects. When certain geographical zones saw a slowdown in investment plans, others took over. Pyrocontrôle is currently in a good position to face the coming challenges linked to renewal of nuclear power plants, particularly in Europe.

### Pyrocontrôle & Chauvin Arnoux Energy: actors on the nuclear market for 40 years

Chauvin Arnoux has consolidated its status as a key actor in the nuclear sector thanks to its subsidiaries Pyrocontrôle and Chauvin Arnoux Energy. This cutting-edge expertise, based in particular on an excellence-driven quality organization, has been developed and perfected over several decades, drawing on thorough understanding of the unique requirements and challenges involved in the nuclear industry. Product qualification, particularly in terms of resistance to radiation and earthquakes, traceability, inspections, the documentation system and obsolescence management are all essential skills developed and maintained by Chauvin Arnoux.

Drawing on its 40 years' experience in this field and its capacity to deal with new requirements, Chauvin Arnoux's ability to comply with increasingly strict requirements in the context following Fukushima is widely acknowledged in France and among reactor operators all over the world (China, Finland, South Africa, etc.).

# #1 Durability

The products proposed by Chauvin Arnoux are at the heart of the systems monitoring the infrastructure and reactors in nuclear power plants, which are essential for preventing incidents, maintaining operating reliability and ensuring compliance with the strict safety standards that govern the nuclear industry. The safety issues which they need to handle require qualification which may reach level K1, the most severe, intended for equipment installed inside the reactor building which must provide their functions in normal operating conditions, accident conditions and post-accident conditions, as well as in the event of seismic stresses. In particular, this equipment must guarantee the ability to withstand irradiation in the event of an accident or ageing, as well as in the event of earthquakes. K2-qualified equipment, also installed inside the reactor building, guarantees resistance to irradiation in the event of ageing or earthquake. K3-qualified equipment is present in the plant's other buildings but it contributes to safety of the processes and must be capable of withstanding earthquakes.

In our offering, Pyrocontrole's K1, K2 or K3-qualified probes are designed to measure the temperatures of the various reactor systems such as the primary pumps, the pressurizer and the tanks, thus allowing surveillance of the primary circuit. These sensors are also present in the secondary circuit and the ventilation system, covering a wide range of needs in a nuclear power plant.

Meanwhile, as a specialist in measuring and monitoring electrical installations, Chauvin Arnoux Energy proposes K3-qualified auxiliary relays for automation and command-control applications, as well as T82N measuring transducers, which are also K3-qualified and are dedicated to grid supervision.

The teams of experts from Chauvin Arnoux work in close collaboration with nuclear plant opera-

tors to design tailored solutions. The expertise of Pyrocontrole and Chauvin Arnoux Energy is not limited to supplying technical solutions, but also extends to understanding of the current and future requirements. Pyrocontrole and Chauvin Arnoux Energy constantly strive to anticipate the future changes in the nuclear industry while maintaining the conformity and availability of the products developed in the 1970s. This forward-looking vision guarantees that Chauvin Arnoux will remain at the forefront of the nuclear industry, ready to handle the technological and regulatory challenges of tomorrow.

## Award of tenders for the Hinkley Point C EPR plant in the UK

One of Chauvin Arnoux's most recent achievements in the nuclear sector is the award of tenders for the Hinkley Point C EPR in the UK. Pyrocontrole and Chauvin Arnoux Energy are contributing their unrivalled expertise in temperature measurement and in measuring and monitoring electrical grids, in order to guarantee satisfactory operation of these third-generation reactors.

## POK relays: an important component of nuclear safety

The POK monostable instantaneous relay offers a long life span and is particularly rugged, even in difficult operating environments and in the presence of significant temperature fluctuations. The product's excellent electrical and mechanical performance means it can be used even in the most of the most demanding applications, such as the command and indication functions in nuclear power plants.

In this way, the POK relay completes the range of instantaneous relays for nuclear applications from

Chauvin Arnoux Energy. Selected for the Hinkley Point EPR, this comes in addition to the historic success of the OK-B184 and RE3000N relays, several tens of thousands of which are used in the French nuclear plants currently operating and plants abroad from the same generation.

## T82N measuring transducers

Measuring transducers based on analogue technology have been used for many years in French and foreign nuclear power plants, starting with the first-generation T82. They provide the functions for measuring the electrical quantities (voltage, current, power, frequency, etc.) and transmitting the results via the analogue output in order to contribute to supervision of the power grids. This K3-qualified T82 range has now given way to the 2nd-generation T82N range, also comprising K3-qualified models proposed for the new EPR projects and replacement operations.

High-quality product assembly is essential in the nuclear sector. Chauvin Arnoux has consolidated its expertise by assembling the T82N on three production sites in France to ensure constant availability and unrivalled quality.

Drawing on its 40 years' experience, Chauvin Arnoux is ready to face future the challenges in the nuclear sector by supplying cutting-edge solutions to meet the growing need for clean, sustainable energy.



## FOCUS

### SMRs: NEW OPPORTUNITIES



SMRs (Small Modular Reactors) are low-power modular reactors, usually between 20 and 300 MW per unit, whereas the present reactors intended for electricity generation usually generate between 900 MW and 1650 MW in the case of EPRs. Designed for serial production in the factory and subsequent assembly on site, they are more compact, shorter and less costly to manufacture while guaranteeing a high level of safety. They complement large to medium-power reactors.

The aim of these mini-reactors is not to replace large power plants, but to generate safe, competitive low-carbon electricity, integrated into the smaller electrical grids and more remote areas. In this way, SMRs will be able to replace coal-fired power stations, which are heavy CO<sub>2</sub> emitters, in many countries. They also aim to supply electricity to energy-hungry industrial complexes, such as those encountered in the steel industry, petrochemicals and metallurgy.

The International Atomic Energy Agency (IAEA) has identified more than 80 SMR projects worldwide, and particularly in the USA, Canada, China, Russia and the United Kingdom.

The market for SMRs is significant, as there are more than 3,300 coal-fired power stations in countries open to civilian nuclear power which will have to be replaced by 2050.

# #1 Durability

## CHAUVIN ARNOUX, a historical partner of education



Taking advantage of its close, privileged links with the French National Education system, the Chauvin Arnoux Group accompanies the actors in education by participating in numerous events and offering measuring instruments which match teachers' needs.

### Chauvin Arnoux at the heart of events

Every year, the Chauvin Arnoux Group partners and accompanies numerous educational events intended to promote technological, vocational and scientific education by lending measuring instruments, providing jury members or supplying prizes.

- Each year, Chauvin Arnoux supports the "Concours Général des Métiers" general professional competition (CGM) via the MELEC scheme, whose goal is to prepare students for a vocational exam in a predetermined subject area and to reward the best high-school students (nearly 200 candidates every year). We take part as jury members and lend measuring instruments for the practical exams (MX535 installation testers, CA742 IP2x VAT + CA751 adapter, CA7028 LAN tester); this year, every candidate was gifted a CA702 multimeter.

- In May 2023, with the collaboration and participation of several companies including Chauvin Arnoux, the Nouvelle-Aquitaine educational region organized the first edition of the 2023 inter-regional MELEC Challenge.

This challenge was based first on preparation derived from a technical response and a video presentation for the customer (preselection phase), followed by the final phase involving completion of electrical works on a 3D model. The work was done by pairs of 16-year-old MELEC or CFA students from the same school in all three regions. The electrical works using connected instruments made it possible to control the house's electrical installations vocally. Commissioning of the installation enabled the teams in competition to use the measuring instruments loaned by Chauvin Arnoux, which also provided jury members and prizes for the candidates.

- The "Worldskills" are also an opportunity for Chauvin Arnoux to demonstrate its involvement by lending equipment for the practical events in the "electrical installation, industrial control, industrial production, equipment maintenance and industrial vehicle technology" categories.

This year, in September 2023, the whole world came to Lyon in France for the 47th WorldSkills competition: a major event which Chauvin Arnoux supports passionately!

### Measurement certification for students and teachers

A few years ago, to handle the new constraints and accompany tomorrow's professionals as usefully as possible, Chauvin Arnoux set up a **measurement certification** scheme in cooperation with the French National Education



system. The aim of this certification is to validate the students' knowledge of the role of measurement and familiarization with it. It is designed for vocational students in the electrical engineering, energy and maintenance sections. A real success!

### Measurements in applications... Real-life situations serving education

The purpose of Chauvin Arnoux's application measurement website is to put measuring instruments in real-life situations in various sectors of activity: Industry, tertiary sector, housing, energy generation, transmission and distribution, infrastructure, renewable energy, vehicles. Within each application, the instruments are linked to their measurement principle, standards and reference frameworks. Video tutorials and simplified user instructions have also been developed as a result. This application is freely accessible to accompany students in their day-to-day work.



#### FOCUS

### "MEASUREMENT PROFESSIONS" FRENCH HIGHER TECHNICAL DIPLOMA: MANUMESURE'S COMMITMENT

Manumasure, the expert in metrology and regulatory testing, has contributed actively to the renovation of the BTS TPIL\* syllabus, which became the "Measurement Professions" diploma in 2021.

The goal for Manumasure is to support better preparation of future Metrology specialists and to highlight experimental and scientific education around modules adapted to the measurement professions (dimensional, energy and environmental measurements, physics and chemistry, metrology, sensors and measuring instruments, signal processing, digital environments and safety at work).

*\*Physical techniques for industry and the laboratory*



# #1 Durability

**HypeReal**, meanwhile, can be used to indirectly assess the chemical composition of samples, their moisture content and other critical quality criteria, without modifying the sample or using toxic reagents.

**Spectralys**, a range of innovative sensors integrating fluorescent and infrared technologies, coupled or alone

**CEREALYS 2**, the only sensor to measure all the rheological and functional quality criteria of wheat and flour, proposes a unique coupling of fluorescence and infrared for unrivalled measurement of grain functionality in less than 2 minutes. This coupling significantly improves the performance of the calibration models.

The **AMALTHEYS** analyser, meanwhile, offers innovation for real-time quality control of all products in the dairy industry, from the raw materials to the intermediate and finished products. The simplicity and rapidity of the measurement make it possible to track raw materials fluctuations on a daily and monthly basis. It is then possible to adapt the recipes or processes to ensure the end-products' stability and conformity.

Finally, **FLUORALYS** is the first analyser capable of measuring in just 1 minute the level of acrylamide in products fried, roasted or cooked at high temperature to ensure the regulatory conformity and nutritive quality of these products.

## AGRI-FOOD:

### preparing tomorrow's world

The agri-food industry is currently facing multiple challenges: ensuring fairer sharing of value, acting for decarbonization, winning back export market share, meeting consumers' new expectations, modernizing its industrial potential, integrating the digital revolution, adapting its skills, improving the attractiveness of its professions, etc. It is to meet these challenges that the Chauvin Arnoux Group is actively contributing its experience and innovations on this crucial market for the future.

### Solutions at each stage of production

#### Colorimetric inspection by Indatech

The colour of products is one of the most critical quality criteria for end-consumers. Production lines are traditionally equipped with optical devices for checking by the operator, but this remains subjective. The Spot4Line system

developed by Indatech, part of the Chauvin Arnoux Group, allows safe, reliable automatic LED analysis 24/7 and is capable of immediately identifying the slightest problem and quickly avoiding any loss of efficiency.

#### Testing products and formulations in the laboratory

Obtaining uniform blends which are stable over time is a guarantee of quality for consumers. Indatech's **Asuryan** and **Viserion** hyperspectral imaging solutions give you all the power of chemical imaging for checking the uniformity of powders (flour, etc.), or finished products (cookies, etc.).

#### Adapting to the variability of liquids

Some liquid products may show high variability, significantly affecting the manufacturing process. Indatech's solutions can be used to identify the variability and then adapt the transformation process or reject non-standard input products.



## FOCUS

### STATOP TEMPERATURE CONTROLLERS FOR THE PERFECT PIZZA!



A company based in Normandy has had the bright idea of producing a solution for distributing hot pizzas ready to eat. This machine, sold to pizza cooks, enabled caterers to continue selling their pizzas during lockdown. Delighted to be able to continue eating their favourite pizzas, customers gave this new way of ordering pizzas a big thumbs-up.

For each operation, the distributor takes the pizza from the cold area, raises it slightly to detach it from the cardboard packaging and then starts heating. This is when our Pyrocontrole temperature controllers (Statop 500 Series) come into play to monitor this step which, as we all know, will determine the ultimate taste of the pizza.

### PH PENS, THERMO-HYGROMETERS, THERMAL CAMERAS: CHAUVIN ARNOUX SOLUTIONS IN ALL FIELDS

Chauvin Arnoux's ultra-lightweight, waterproof IP65 pH pens, specially designed for the agri-food sector, can be used to check the fermentation and quality of dairy products, monitor the maturing of cheeses or measure the pH of agricultural soils. Chauvin Arnoux's thermo-hygrometers and thermal cameras, meanwhile, are particularly effective for checking that the development or storage constraints for agri-food products are respected.



# #2 Proximity

## The importance of tailored products and proofs of concept in industry

In the constantly changing world of technology and innovation, meeting customers' specific needs is crucial. Companies which excel in the design of tailored products and the demonstration of those products' feasibility are in prime position to succeed. The Chauvin Arnoux Group brings together companies which are remarkable examples of the value of tailored products and proofs of concept in industry.

**Chauvin Arnoux Energy** stood out from the crowd by proposing tailored solutions in response to its customers' specific requirements, particularly in the naval sector. By working in close collaboration with its customers, this company has been able to supply products perfectly suited to their specific needs. Their products, such as the anemovane, the PTU sensor, the temperature probe and the data concentration and communication unit, are the fruit of close collaboration with customers and are designed to fulfil the specific requirements in this field.

**Pyrocontrole** has achieved an essential position on the nuclear market by supplying high-accuracy probes specially designed to meet the strict requirements in this sector. Pyrocontrole's sensors are used to monitor the temperature of the nuclear infrastructure, thus guaranteeing safety and reliability during operation. Thanks to its thermal sensor design expertise, Pyrocontrole plays a central role in the safety of nuclear installations and the prevention of potential incidents. Their commitment to continuous innovation has strengthened their leadership on this highly specialized market.



**Spectralys** is an innovative company offering cutting-edge products such as Aqualys and Cerealys in the field of spectroscopy. Aqualys is a solution specially designed for analysing water. This technology allows quick, accurate detection of the various types of organic matter in water, which is essential for water quality monitoring, environmental research and the agri-food industry. Cerealys is a spectroscopic solution dedicated to analysing cereals and grain. It offers quick assessment of the components of cereals, thus improving the quality and safety of foodstuffs.

At **Indatech**, the goal of the ACCESS (Advanced Cell Control by Spectroscopic Sensors) project is to meet the challenge of producing innovative therapeutic drugs more profitably. By focusing on the optimization of Mesenchymal Stem Cells (MSCs) in the bioreactor, ACCESS uses innovative in-line optical sensors, Machine Learning algorithms and automated real-time feedback. In addition, it uses a Quality-by-Design (QbD) approach to model the process. The consortium includes MTInov and five complementary partners: Indatech, Ondalys, Cybernano, Ypso Facto and StemInov. Together, they aim to create an integrated French QbD/PAT offering with European scope for checking cell cultures in biotechnology.

The quality of Chauvin Arnoux's products is not just acknowledged by their users. Some major industrial groups send requests for tailored products (OEM products) to the various entities in the Group. These requests may be basic, such as changes to the brand name, colour, model name, etc., while others may lead to more significant modifications or even specific developments. Usually, this only involves entry-level products. The products from the Pyrocontrole, Chauvin Arnoux Energy and Chauvin Arnoux brands are open to this possibility.

Companies like Chauvin Arnoux Energy, Pyrocontrole and Indatech, which specialize in creating tailored products and highlighting the proofs of concept, play a key role in industry. They show how listening to customers, customizing our products and demonstrating their feasibility are precious advantages. These approaches boost customer confidence, stimulate innovation and propel these companies towards success.

## #2 Proximity

**130 years of quality**  
serving our customers!

For 130 years, the requirements of customers, the standards and the regulations have stood at the heart of the concerns of all our teams in the Chauvin Arnoux Group's sales departments, R&D, purchasing, manufacturing, service provision, logistics, etc.

For 130 years, all the measuring instruments and equipment that we manufacture are checked individually before delivery to our customers. In contracts involving specific requirements, additional checks (technical, traceability, etc.) are performed, sometimes upstream of production or even on our suppliers' sites, and we can send the results files to our customers.

For 130 years, all our new products have been the subject of validation tests before commercialization: functional and metrological tests, naturally, but also withstand tests in different application environments (temperature, electrical and mechanical endurance, shocks, vibrations, humidity, overvoltages, overloads, electromagnetic compatibility, reliability, etc.). The reports from these tests are included in the product files and, when applicable, can be used to justify placing voluntary conformity markings (UL, ETL) and the regulatory conformity markings (CE, UKCA, ATEX, MID, etc.) on the products.

The companies in the Chauvin Arnoux Group in France are **ISO 9001**-certified for product quality and mostly **ISO 14001**-certified for protection of the environment. These certifications have

only existed for about thirty years, but in the Chauvin Arnoux Group, most of their principles had long been implemented in various internal processes. The determination of the company and the management to provide our customers and partners with a guarantee of our commitment to their satisfaction and to protection of the environment has enabled us to obtain and maintain these certifications.

Similarly, to prepare for the future and adapt to the regulatory changes, we have for some years completed the R&D for new products with an environmental approach integrated into the projects so that we can go beyond our obligations: Eco-design, Product Life Cycle Analyses, Repairability Index Assessment, EcoPassport® PEP.

Lastly, the **COFRAC\*** accreditations of our metrology and test laboratories and inspection activities, like the **MASE\*** certifications for safety of operations on site, are proofs of our teams' commitment to the quality and safety of our services.

Protection of the environment, quality, reliability, the safety of our products and services and our teams' commitment to serving our customers have been the foundations of our brands' reputation for 130 years. And for the future, our plan for the Chauvin Arnoux Group is to continue developing an ambitious environmental policy, particularly in terms of sustainable development and social governance as part of a Corporate Social Responsibility (**CSR**) approach.

### SOME FIGURES ON OUR ACTION

Today:

**-11%**  
CO<sub>2</sub>

**-7%**  
WASTE

**REPAIRABILITY  
INDEX  
9/10**



### FOCUS

**MASE**  
AMELIORER LA PERFORMANCE SSE

The purpose of certification according to the **\*MASE** corporate safety improvement manual is to ensure that the objectives defined in the company's HSE (Health, Safety & Environment) policy are achieved.

**Manumasure**, the Group's services, regulatory testing and metrology company, has given priority to developing a Health, Safety and Environment policy for its own sites (12 agencies in France) and its operations on customer sites. This **MASE** certification makes it possible to work on sensitive sites or in controlled environments such as the Nuclear, Health or Petrochemicals sectors. This guarantees not only the quality of **Manumasure's** technical services provided in the agencies or directly on customer sites, but also respect for the environment and compliance with the regulations regard Health and Safety in the workplace.



### FOCUS



List of sites and scopes available at [www.cofrac.fr](http://www.cofrac.fr)

**\*COFRAC** (French accreditation committee). In France, only **COFRAC** is authorized to grant accreditations for laboratories and certification organizations. As an accrediting organization, it assesses and stipulates the independence, impartiality and competence of the laboratories and certification organizations for a given duration: 4 years for the first request and 5 years subsequently, with regular monitoring.

**COFRAC** accreditations acknowledge the metrology and testing skills of **Manumasure** and **Pyrocontrole** according to the NF EN ISO 17025 standard. The international scope of this reference standard gives access to export markets. Thanks to multilateral agreements signed by COFRAC, an accreditation granted in France is recognized all over Europe and in most countries worldwide.

## #2 Proximity

# Preservation of expertise and transmission at the heart of production: a guarantee of quality and durability

It is difficult to speak of production in the Chauvin Arnoux Group without evoking its history. From the legend describing creation of the first research workshop in a little shed in the garden of the family home in Rue Championnet, in the Paris of the late 19th century, to the current industrial coverage involving 8 production sites, mainly in France, the story of their discoveries and innovations is indeed fascinating.

### A story of passion for electrical measurement

It was the beginning of a story of passion for electrical measurement which led two friends, both skilled, qualified engineers, to specialize in manufacturing galvanometers, wattmeters, potentiometers and megohmmeters using electrical processes. The initial customers were engineers and scientists who later became

famous, lending credibility to the little company. Marie Curie placed her first order in 1899 under her husband Pierre's name, as the morals of the time required. With around twenty staff in 1912, the company was organized in specialized workshops and the success of the products from them was immediate. The period after the First World War saw automation of manufacturing by splitting up the assembly operations, speeding up execution and improving quality. The industrial age had begun. Two centuries later, in 2023 with the company celebrating its 130th anniversary, its "designer and manufacturer" DNA is still there. Production is really the beating heart of the Group and is organized into a range of expert professions sometimes forgotten in other industries and jealously preserved on our Norman sites in Vire, Villedieu-Les-Poêles and Reux (Pont-L'Evêque), as well as the specialized sites at Dover (USA), in China and in Italy, to deal with the development imperatives on the international markets and the specific standards in certain countries.

### Comprehensive industrial coverage specialized by factory

Today, the Chauvin Arnoux Group has eight production sites. As well as the three sites in Normandy, the Meyzieu site in the suburbs of Lyon was added in 1997 to manufacture temperature sensors, while the Milan production site stemming from the foundation of our Italian subsidiary opened in 1975, the Dover site in the US in 1977, Shanghai in China in 1998, and Clapiers, near Montpellier in 2018 for Indatech's solutions. 93% of the Group's products are designed in-house, mostly in France, for the electrical measuring instruments offering. Organized according to "Lean Manufacturing" principles, production lines for product ranges are designed in assembly workshops according to the sales forecasts and scheduled product launches. Each factory has its specialization. Vire focuses on producing the mechanical parts (machining, cutting, plastic injection, winding, tooling, etc.), while Villedieu-Les-Poêles makes the printed circuit boards inserted in the instruments. Final assembly of the products, quality control and shipment worldwide are handled at the Reux site, near Pont-L'Evêque. The temperature sensors and thermal solutions resulting from the takeover of Pyrocontrole in 1997 continue to be made on the Meyzieu site near Lyon.

Internationally, to comply with US standards and develop our offering on the American market, the CA AEMC site at Dover in the USA handles electrical adaptation of the measuring instruments for the American market and is specialized in designing data loggers. Acknowledged historically on the Italian market for their relays, notably in transport, AMRA's site near Milan has focused on designing and developing these ranges since its foundation by the Group in 1975.



## FOCUS

### 4 PRODUCTION SITES IN FRANCE

- **Site at Villedieu les Poêles** (Manche): production of PCBs. Nearly 800,000 components per week.
- **Site at Pont-L'Evêque** (Reux, Calvados): adjustment and inspection of finished products. Worldwide shipping platform.
- **Site at Vire** (Calvados): manufacturing of mechanical parts; machining, cutting, stamping, sheet metal work, injection press.
- **Site at Meyzieu** (Lyon): design of tailored temperature sensors.



## #2 Proximity

### Constantly investing to maintain industrial capabilities

In the last few years, investment has been stepped up, helping both to preserve our industrial capabilities so that we can not only handle our current production and to face the future and offer our workshops new technological possibilities so that we can deal with the products of tomorrow. Since 2020, several injection moulding presses, several numerically-controlled lathes and a spark machining system have been installed on the Vire site. The Villedieu-les-Poêles and Reux sites have not been neglected, since they have seen the arrival of new control stations enabling new products to be manufactured, as well as the optical inspection equipment commercialized by our subsidiary Indatech.

### Preserving human expertise: more than thirty professions

Without the men and women present in our workshops, our machines would do nothing. Bar turners, milling machine operators, adjusters, operators, sheet metal cutting specialists, cablers, printers, etc., all contribute to the creation of each mechanical part or printed circuit board in the end-products which will be assembled on the Reux site. Diverse professions which Chauvin Arnoux preserves jealously, including mechanics, machining, production of moulds and press tools, plastic injection, SMD wiring and wave soldering, assembly and calibration, quality control and logistics, in order to maintain the production line and the metrological quality of our instruments. Technological developments are taken on board by the teams thanks to training and transmission of know-how to guarantee development of our performance over the long term.

## 3 international production sites

# to stay close to the markets

USA



CHINA



ITALY



### A WORD FROM...

SÉBASTIEN REMY,  
INDUSTRIAL DIRECTOR,  
CHAUVIN ARNOUX



"Major challenges await us in the next 130 years. Our complex industrial activity, with its numerous professions, has to comply with a growing mass of performance criteria. Indeed, industrial performance is no longer restricted simply to the economic aspects, and we have to take on board new performance criteria, particularly to deal with environmental and energy issues. Investments in new equipment help us to achieve our performance targets, but nothing would be possible without the technical skills. In our business, many technical professions are in short supply and our main challenge for the coming years involves maintaining knowledge and know-how on our various sites. In this field, investments in new technologies will also help us to attract future talents to our industrial professions which too often receive bad press".



### DID YOU KNOW?

MEYZIEU INDUSTRIAL SITE  
(RHÔNE)



Production at Pyrocontrolle can be defined as a combination of modern industrial methods and mastery of know-how passed down the generations since the company's foundation in 1946. The precision of the movements needed to assemble its products (micro-soldering, assembly under a binocular magnifier) guarantees that its customers' temperature sensors will be reliable over time and can be used in all types of industry. It also ensures the level of safety demanded by customers working in Atex, high-pressure or nuclear environments. Pyrocontrolle also manually manufactures qualified products in small and medium-sized series.



### DID YOU KNOW?

AMRA SpA, the Chauvin Arnoux Group's Italian subsidiary is one of the leading companies manufacturing the **electromechanical relays** specific to the **rail** and **electricity distribution** sectors.

The hub at Macherio, in the province of Monza and Brianza, is where all out **electromechanical relays** are manufactured and is the skills centre for the Chauvin Arnoux Group's relays.

AMRA relays are used in electricity generation, **transmission** and **distribution**, in **rail transport** for the **rolling stock** and **fixed installations**, in the petrochemicals sector, and in heavy industry and naval applications.

## #2 Proximity

# Customer satisfaction, the Group's key objective

Customer satisfaction has always been a major objective for the Group. Today, the Chauvin Arnoux Group has teams of experts in France and worldwide, specially trained for each brand to accompany and advise customers on the ground. Digital tools, which help to optimize the customer experience, are widely used.



### Listening and proximity: our DNA

At a time when digital applications and social media are everywhere, the company has preserved its family culture and gives priority to customer relations:

- A network of five regional sales agencies in France enables us to support projects locally.
- 12 technical proximity centres and a fleet of mobile laboratories at Manumesure are ideal for operations on customer sites or in the agencies.
- Every year, market managers for Industry, distribution, education, T&D, etc., develop a policy for accompanying customers and the partnerships on these markets.

Internationally, more than 3,000 distributor partners guided by our travelling sales teams accompany projects on markets all round the world.

Finally, the Group attaches great importance to the concept of "after-sales service", an essential point which has always been part of the Group's DNA.

**Within the Chauvin Arnoux Group's 6 companies and 10 subsidiaries**, the teams are trained not only on each product launched but also in market intelligence, the evolution of the international standards and client applications such as energy efficiency, infrared thermography and the regulatory aspects.

Product seminars, market research presentations, webinars and precise product packages are all part of the day-to-day life of Chauvin Arnoux's sales staff. Following the path laid down by our founders, these teams are passionate about customer relations. For example, who better than scientists could develop Indatech's spectroscopy solutions or optimize the fluorescence technology at Spectralys, while simultaneously keeping a clear idea of the expectations on the chemicals, medical, agri-food or water markets?

Through its 6 companies and its subsidiaries and despite the upheavals caused by the COVID period, the Chauvin Arnoux Group takes part in more than 30 professional trade fairs on average every year in more than 10 countries.

Our presence at trade fairs in France and worldwide, designed to favour interaction between the Group's customers, products and companies, remains crucial and is consistent with our view of customer relations.

Because we want our exhibition booths to meet your expectations and needs, we always give priority to three complementary aims: welcome, effectiveness of the offering and interactivity.

### Digital tools: a new technological and commercial challenge

For our Export Department, for example, it appears difficult to cover the business in the set of territories for which it is responsible without digital tools. We have to move quickly to promote our new products, support our local distributor partners, raise the profile of the Chauvin Arnoux brand and stick as closely as possible to the markets using tools in the local language.

For example, Google Ads campaigns are particularly useful: they rely on landing pages, a sort of online promotion indexed with keywords specific to the Group's professions and products. They let users download a catalogue and propose a form enabling the prospects to identify themselves, while offering relevant answers to their queries or allowing them to watch a video remotely.

Whether for advertising, emailshots, sales literature, promotions, presentations, or Google Ads, digital tools are here to stay.

Thanks to this focus on customer satisfaction, the Chauvin Arnoux Group and its companies grow their businesses by tracking customers' needs as closely as possible. Detailed referencing on digital marketplaces, conferences and video calls organized via professional platforms helps to consolidate the links that bind Chauvin Arnoux to its customers and distributors.

These tools are useful for sales, but they also boost the brand's image and notoriety. At the scale of the Group, the Communication Department continues to expand its digital team and develop its presence on social media. The Group's different brands have once again seen their numbers of followers rise on LinkedIn, Facebook and Twitter (X) this year: a genuine success!

Social media are also involved in promoting our brands nationally and internationally by increasing their visibility among their community and prospects. They are now a crucial tool for any structure, even in industrial environments.

## #2 Proximity

### Communication adapted to customers' needs

At Chauvin Arnoux, we have been developing content for more than 15 years to give you total satisfaction. Relevance and accessibility are the two essential criteria around which we have built all our content so that you can be informed of the latest product news in just a few clicks.

We are determined to place you at the heart of our communication. Customer relations are essential in the life of a company.

The aim of developing our communication is to give meaning to our products by proposing relevant, attractive content which makes us stand out. To give the fullest possible information on the uses and specifications of our products, we have developed Case Studies. The goal of this type of content is to use practical cases to explain how to use our products in various situations. The match between your activity and use of the product is then established instantly.

neously. All our Case Studies are accessible on our website [www.chauvin-arnoux.com](http://www.chauvin-arnoux.com) in the "Publications" tab.

Our aim is to continue our communication strategy based on proximity and responsiveness through its digital media in order to keep you informed in "real time". The purpose of digitizing our communication is to meet your expectations in a single click without wasting any time.

### E-commerce: allowing online purchases while personalizing the customer experience

If they wish, web users browsing our product pages can select products from the broad offering proposed and purchase them via the shopping basket familiar to everyone. This e-commerce functionality is totally integrated in the pages presenting our offers.

Chauvin Arnoux has been determined to make direct product purchases accessible to web

users for whom access is not easy via the traditional channels (geographical zones with few distributors or lack of access to professional distribution networks).

Complementing the approach proposed by our distributor partners, this functionality boosts the already significant interest of the web users who, every day, browse our web pages offering comprehensive information on our expertise and products.

The set of products offered for sale depends on the customer's delivery zone. This system helps to customize the product offering so that it complies with the local standards and constraints.

### Tailored for quality

**8 R&D departments and 8 production sites in France and worldwide enable the Chauvin Arnoux Group to design and manufacture the Group's offering.** For example, Pyrocontrole's site near Lyon handles production of tailored temperature sensors according to the customers' specifications. Chauvin Arnoux Energy's "Special Developments" unit designs and develops specific instruments dedicated to naval and defence applications. The quality organization present in each company and at head office supports and checks on compliance with manufacturing processes and the applicable standards. The company is ISO 9001 and ISO 14001-certified, while Manumasure's activity has all the necessary COFRAC accreditations and 2 MASE accreditations (safety of hazardous industrial sites) bearing witness to the competence and impartiality of its laboratories.

Chauvin Arnoux above all proposes global solutions rather than a simple product.

Beyond the product, Chauvin Arnoux proposes personalized accompaniment for its customers. The company develops tools, websites, tutorials and product animations to help customers become familiar with the instruments.

Similarly, training seminars, demo breakfasts and professional trade fairs help our teams to remain in constant, direct contact with customers and report on their expectations.



## FOCUS

### MANUMESURE: PROXIMITY, EFFECTIVENESS AND TIME SAVING!

– Online requests for quotations help save considerable time and have enjoyed genuine success among our customers. They boost the quality of Manumasure's customer service and offers proactive services related to the company's activities.

– **Computerized management of instrument fleets: M-LINK, Manumasure's management software, can be used to monitor your metrology.**

**A response matching the requirements:**

#### Management

- Fleet inventory
- Display and possible extraction of life cycle datasheets in pdf format

#### Optimization

- Planning of operations
- Real-time instrument locations

#### Control

- Automatic reminder of instrument calibrations by email
- Identification of instruments whose calibration is late

#### Multi-user software



– **Manumasure's vehicle fleet: a new look at your service!**

A new, dynamic graphic design serving mobility, proximity and our customers.

With its 12 technical centres and a mobile team of experts, the company provides full coverage of France, thus guaranteeing a quick response close to customers' needs.



## #2 Proximity

# The Chauvin Arnoux Group, open to the world

Founded 130 years ago, the Chauvin Arnoux Group has multiplied its sales outlets on all five continents through its 10 commercial and industrial subsidiaries and its distributor partners. Each of these subsidiaries is responsible for commercializing all the Group's products in their zone, relying on a network of distributors.

The Group's presence in other countries is provided by the Export sales departments of Chauvin Arnoux Test & Measurement, Pyrocontrole, Chauvin Arnoux Energy and Indatech, who rely locally on a vast network of specialized distributors who thus ensure close relationships with customers.

International business is one of the Chauvin Arnoux Group's strengths as it represents 55% of its annual revenues, while the other 45% are made on the French market.

### Chauvin Arnoux exports for its customers' benefit!

Today, the Chauvin Arnoux Group benefits from international coverage thanks to the combined action of its Export sales departments and its subsidiaries, who have the same vision based on "shared success serving the customer".

To accompany customers in France and internationally, the Chauvin Arnoux Group develops its communication media and some interfaces in no fewer than 14 languages (product catalogues, websites, etc.). The Group has launched this approach in order to make our products' specifications and performance levels easier to understand for a broad panel of customers.

Again with the ultimate aim of customer satisfaction, our subsidiaries commercialize the offers proposed by the Group's French companies\*. They manage the orders and ensure that an appropriate stock of finished products is maintained so that they can respond to their customers' orders as quickly as possible.

*\* Some subsidiaries like China and the USA have their own design centres and/or production centres.*

### Doing business in a changing context

Our daily challenge is to stimulate sales in all our branches of expertise in each of the international sales zones. To achieve this, we can rely on the commitment, talent and creativity of our teams who strive to offer the best possible service for our brands.

This involves promoting the products via the support departments, such as marketing and communication, but also multiple operations in the field. Indeed, the management and accompaniment of distributors located in all the countries where the Chauvin Arnoux's products are distributed are key factors for establishing close links with customers.

### Export Sales at Pyrocontrole

Two people are at the head of Pyrocontrole's Export sales department. Their job is to guarantee good customer relations by negotiating and taking orders while ensuring that the shipments and documentation for export outside the EU are managed correctly.

Their customers are located on all the continents and their main business sectors are chemicals and petrochemicals, oil refining and the automotive industry (production of tyres).

These customers account for 30% of Pyrocontrole's sales revenues, excluding nuclear business.



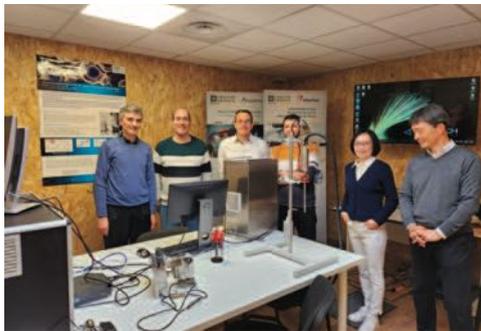
## Happy 20th birthday to our Swedish subsidiary CA Mätssystem AB!

### International sales at Chauvin Arnoux Energy

Chauvin Arnoux Energy's sales teams are structured according to skill centres. In this way, each market (nuclear, electricity transmission and distribution, rail and naval) benefits from highly qualified experts. As for all the companies in the Chauvin Arnoux Group, the qualification of all its staff is a fundamental criterion in order to understand customers' concerns and respond to each requirement, whether or not it involves a tailored product.

When all the business sectors are taken together, international sales represent 45 % of Chauvin Arnoux Energy's revenues, a growing trend in light of the figures for 2023.

### Indatech invites its partner distributors in France



Indatech's Export sales department enjoys close, strong relations with its distributor partners abroad, mostly in Europe but also in the US. Together, they work hand in hand and, following a proximity-based approach, they were all invited to get to know one another during a week's training in France, travelling from Indatech's premises in the south of France to the Group's head office in the capital.

They discussed the current issues on the market and shared common perspectives for the future. Then, to congratulate the eight partner distributors, an Awards Ceremony was organized.

This trip to France was rich in discoveries blending the Chauvin Arnoux Group's history and French culture. Indeed, during the days spent in Paris, all the partner distributors were able to visit the Group's new headquarters in Asnières-sur-Seine.

The programme also included a visit to Montmartre, an essential area with special significance for the Group because it was Chauvin Arnoux's historical home. It was in this area of Paris's 18th Arrondissement that Chauvin Arnoux was founded and where the company had its headquarters for nearly 130 years before moving to Asnières-sur-Seine in 2020.

So it was with the voice of Edith Piaf ringing in their ears that Indatech's partner distributors walked the same streets as our founders, Raphaël Chauvin and René Arnoux.

A trip shared by passionate measurement specialists and marked by constructive dialogue, all in a deliciously French atmosphere. Nothing like it for strengthening and prolonging existing relations between the distributor partners and the teams at Indatech.

### The Chauvin Arnoux Group is ready for the future



*"Our ambition has not changed. We work every day to satisfy our customers as far as we can and with as much proximity as possible. In this sense, we accompany them with the seriousness and quality which have made our reputation in the fields where we currently operate and in those where our motto will take on its full significance: "Measure up","* concludes **Jean-Paul Araque**, International Director, Chauvin Arnoux Group.

1936

Foundation of the Polish subsidiary (destroyed during the Second World War)

1965

Foundation of the German subsidiary (CA GmbH)

1975

Foundation of the Italian subsidiary (CA AMRA)

1977

Foundation of the US subsidiary (CA Inc.)

1986

Foundation of the British subsidiary (CA UK)

1988

Foundation of the Spanish subsidiary (CA Iberica)

1996

Foundation of the Austrian and Swiss subsidiaries (CA GesmbH and CA AG, respectively)

1998

Foundation of the Chinese subsidiary (CA Pujiang)

2002

Foundation of the Lebanese subsidiary (CAMIE)

2003

Foundation of the Swedish subsidiary (CA MÄTSYSTEM AB)

# #3 Passion

## R&D, an inestimable source of added value for the Chauvin Arnoux Group!

Since its foundation 130 years ago, Chauvin Arnoux has followed an unrivalled path, becoming a front-line actor in the field of electrical and electronic measurement. Throughout its history rich in achievements, the company has succeeded in maintaining its leadership through an unshaking commitment to innovation and integrated production. In this article, we dip into the world of Chauvin Arnoux and explore the crucial importance of Research and Development (R&D) for the company's success and reputation.

### A tradition of innovation

Ever since it was founded, Chauvin Arnoux has followed a philosophy focused on innovation. The company was founded in 1893 on the strength of the conviction of two men, Raphael Chauvin and René Arnoux with, as its leitmotiv, the idea that to remain relevant and competitive, the company must constantly extend the limits of technology and design. This daring vision quickly led to the creation of a research and development department dedicated to the exploration of innovative solutions to improve our products and production processes.

### A WORD FROM...

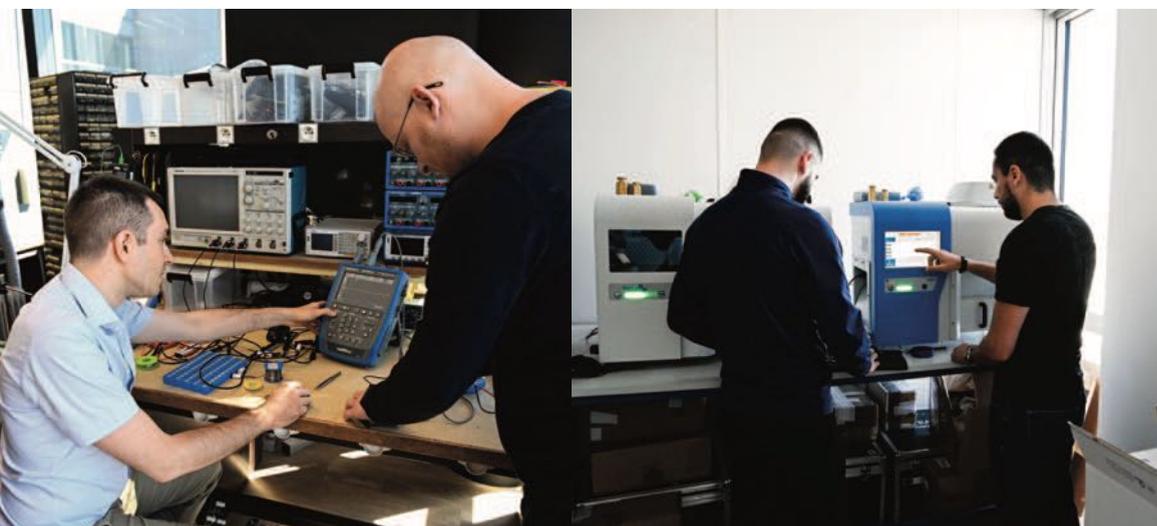


**PHILIPPE CHAPET**  
R&D DIRECTOR

"In our company's entrance hall, an elegant marble slab from the 19th century bears the following inscription engraved in gold letters: "Engineers & Manufacturers". These words are not just a slogan, but reflect the very essence of our company since 1893, thus symbolizing the cornerstone of our culture and identity, which is still present today.

Research and Development continue to occupy a privileged position in our corporate culture, thus boosting our ability to remain competitive and to respond enthusiastically to our customers' requests.

And in 2023, "Engineers & Manufacturers" has evolved into "Engineers & Eco-manufacturers".



# #3 Passion

## The pillar that is Research and Development

La R&D has long been the pillar supporting Chauvin Arnoux's success. The company understands that, to stand out in a constantly changing market, it is crucial to invest in cutting-edge research. R&D at Chauvin Arnoux is not limited to its laboratories, but extends to all aspects of the company. This means that each staff member is encouraged to contribute to innovation, whether they work in product design, production or commercialization.

## Products at the cutting edge of technology

Thanks to its commitment to R&D, Chauvin Arnoux has succeeded in developing a diverse range of high-quality products which are now used all over the world. From electrical measuring instruments to sophisticated electronic test instruments, each product is the result of years of research, development and optimization. These instruments are designed to meet the specific needs of professionals in the electrical and electronics sectors, offering reliable performance and accurate measurements.

## The impact of R&D

Constant investment in R&D has enabled Chauvin Arnoux to remain competitive on the world electrical and electronic measurement market. The company also plays an essential role in innovation in industry, contributing to evolution of the standards and technologies in the products and sectors. Furthermore, R&D at Chauvin Arnoux has helped to boost its reputation for quality and reliability, leading to a loyal customer base and solid partnerships with other industry leaders.

## Responding quickly to the market's requirements

Thanks to our total mastery of the production line, we can quickly adapt our products to handle changes on the market and our customers' specific requests. This enables us to remain at the forefront of our industry, anticipating emerging requirements and supplying tailored solutions.

Innovation and integrated production are part of our DNA and key factors for our success. We are proud of our heritage and impatient to continue innovating and evolving over the next 130 years and beyond.

### IN FIGURES

**130 years**  
of R&D

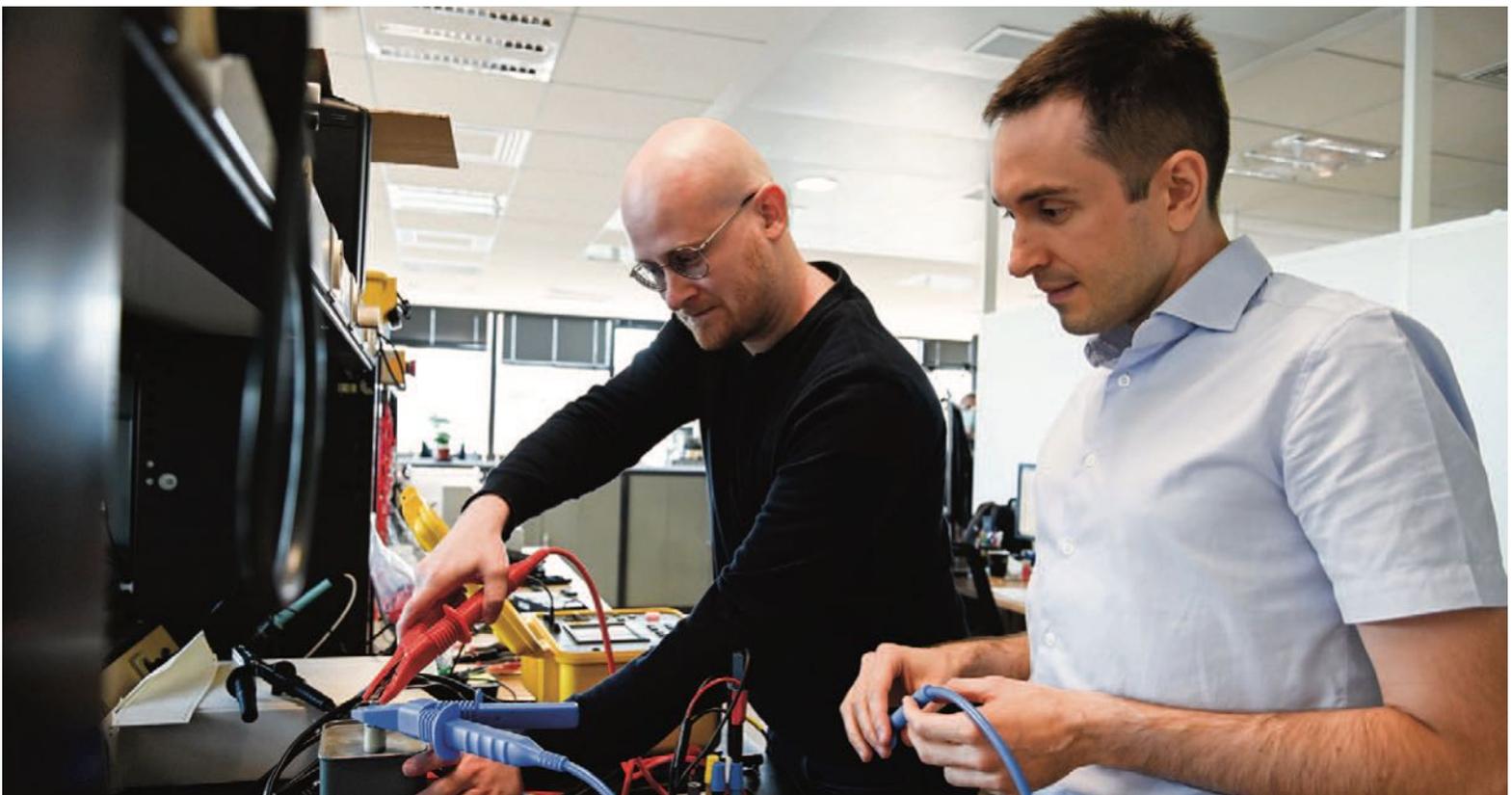
**50 engineers**  
in R&D

**More than 300**  
patents filed

**25 products**  
developed per year

**8 R&D departments**  
worldwide

**11%**  
of sales revenues invested  
in R&D



## #3 Passion

# Accompanying our customers for their energy transition: **Chauvin Arnoux's position**

In a tense environment where our companies are facing economic, environmental and geopolitical issues for access to natural resources, as an industrial company, we have an eco-responsible role to play in the energy transition.

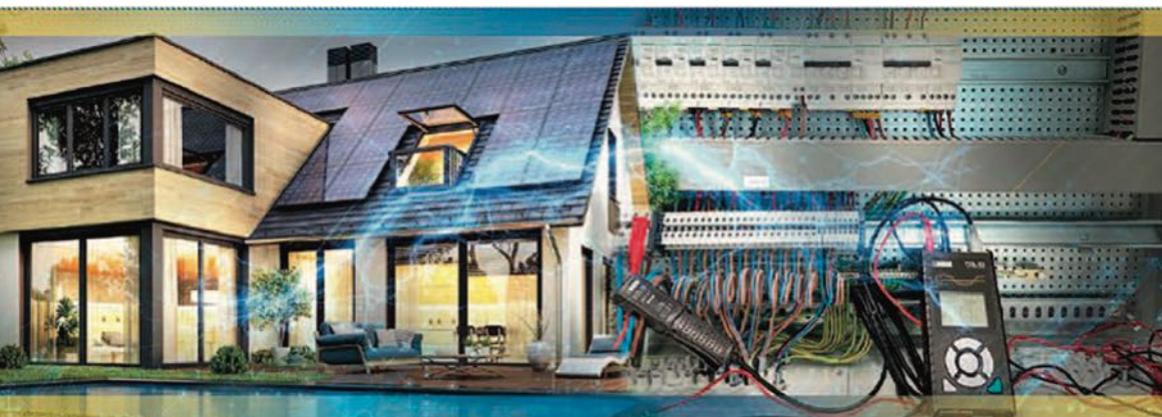
This term, which is very fashionable at the moment, defines all the changes to the system for generating, distributing and consuming energy required to make it more environmentally-friendly. But in the Chauvin Arnoux Group, the reality of this term is nothing new. It is present at the heart of our product developments, our R&D expertise and our energy solutions know-how.

It's been 130 years since the Group first made measurement its vocation – one might even call it a passion: the passion for measurement. This covers measurement of all the physical, electrical and thermal quantities supported by Chauvin Arnoux, Chauvin Arnoux Energy, Pyrocontrole, Manumasure and, more recently, spectral measurement by Indatech and Spectralys, opening up new prospects.

Active on all fronts for energy efficiency, from control of losses, the search for alternative energy solutions and resource savings to the reduction of production costs, the Chauvin Arnoux Group is already prepared to accompany the energy transition. Whether for industry, the tertiary sector, construction or self-employed electricians, the portable instruments and energy control solutions developed by Chauvin Arnoux are anchored in the current concerns aiming to avoid energy losses, control costs and improve energy quality. Our emblematic Qualistar range of power quality analysers and the PEL loggers (energy meters) are excellent examples of this.

### Solutions for monitoring, controlling and metering energy

We are all concerned by reducing our energy consumption and avoiding operating losses. The portable, magnetized energy meters in the PEL Series are high-performance, practical tools for recording disturbances on an electrical grid. With continuous recording in an electrical cabinet and simple analysis of the data measured, users can target the zones or periods needed to achieve savings..



PEL LOGGERS



QUALISTAR POWER QUALITY ANALYSERS

## #3 Passion

Used with flexible sensors, they are installed in places where access is often difficult (electrical cabinets, installations, etc.) for continuous recording on the installation without interruption. Simultaneously loggers and power quality analysers, the instruments in the Qualistar range have been ideal tools since their first generation was launched for energy quality tests, troubleshooting and continuous measurement logging over long periods without halting the industrial process. This range, which quickly became the flagship at Chauvin Arnoux, collects the data concerning the quality of the electrical grid and the energy management necessary to maintain the performance of electrical grids, is today at the heart of our expectations in terms of energy efficiency.

### Multifunction photovoltaic tester serving new types of energy

At a time when natural alternative energy sources are coming to the fore, the number of solar power installations is growing worldwide among both companies and private individuals. In the context of an approach aimed at guaranteeing a more sustainable energy supply for them and reduce their carbon footprint, increasing numbers of industrial companies are installing solar panels to power their sites. Since July 2023 in France, a decree has imposed environmental obligations regarding the generation of renewable energy and reduction of the impact of solar radiation. All buildings with a site coverage of more than 500 square metres are concerned with the final deadline for compliance set on January 1st, 2028. Existing carparks (not including residential carparks) will thus have to install parasols equipped with solar panels over at least 50% of their total surface area. At the same time, there is growing demand for technicians capable of troubleshooting photovoltaic systems already in place.

The FTV 500 multifunction instrument from Chauvin Arnoux can be used to test the operation of solar panels installed on the roof of a building and their optimum performance level. It also guarantees the safety of the photovoltaic installation and simultaneously checks the open-circuit voltage (Voc), the short-circuit current, (Isc), the irradiation (W/m<sup>2</sup>) and the ambient temperature. In the same way, the solution integrates the continuity tests for the earth bonding and the insulation test. All this is applied to a system which, it should be remembered, cannot be switched off and is therefore constantly powered up.

### Pyrometry and temperature control to help our customers produce decarbonized energy

Pyrocontrole, the Group company designing temperature sensors and thermal solutions has been involved for more than 50 years in a type of energy generation which has recently returned to the spotlight: nuclear power. It supplies a large number of qualified sensors for the infrastructure and temperature monitoring of the primary pumps, the pressurizer or the tanks in the primary circuit for the current and future international EPR projects: quick-response sensors, surface sensors, pool sensors, motor bearing sensors, etc. Similarly, the solutions for mastering the sizing and control of thermal industrial processes contribute to decarbonization of our customers' industries. We also help our customers to develop new, non-polluting energy sources such as hydrogen.

For more than 40 years, anchored in the long term, the Chauvin Arnoux Energy offering has contributed to the development of EPR projects (see our article on page 8) thanks to its K3-qualified range of instantaneous relays, panel meters and transducers. The company also develops a number of solutions in partnership

with installers seeking to support the modernization of low-voltage grids with GridWatch. This solution for supervising MV/LV electrical transformer stations coupled with Ulys MCM multi-channel meters can be used to secure and optimize grid maintenance costs. Indeed, the Group has installed it on its own production sites, including Vire in Normandy, for even closer control of its energy consumption.

### The Group's societal commitment to protection of the environment

Our Group's support for protection of the environment and limitation of the industrial impact on our surroundings is also a key concern for us. Our metrology and regulatory testing brand, Manumasure, offers industries services to measure pollutants, gas and noise in our environment and is ideal for the new regulations on preventing exposure to nuisances in the workplace.

But the real heroes of our Group's durability and continued growth are all the men and women working behind the technology on our production sites, in our R&D teams, in our sales agencies and in our offices. Their shared goal to accompany our customers' energy transition has been in the Group's DNA for many years. It is our continued proximity to our customers which ensures that we can understand their needs, anticipate the state of tomorrow's markets and guarantee durability for our products.



## #3 Passion

# A company committed to protection of our environment: Chauvin Arnoux is innovating!

There's been a lot of talk! The necessity of protecting our environment for our quality of life and the idea of wellbeing at work are crucial concepts whose importance has grown in the last few years. The environment in which we work has a significant effect on our health. Wellbeing at work directly influences employee satisfaction and, as surveys have proved, affects productivity and professional fulfilment. Aware of these new issues, the Chauvin Arnoux Group has focused on solutions which contribute to improving our day-to-day lives, measuring the quality of our environment and fostering wellbeing at work. Find out all about it in this article!

### New services from Manumasure for checking noise levels and air quality on the workstations

The quality of life at work includes numerous factors linked to the professional environment, working conditions, staff satisfaction and their wellbeing inside the company. The goal is to create favourable, satisfactory working conditions. Safety is one of the key factors for quality of life at work. Ensuring that employees work in a safe environment and are aware of the protocols to follow is a priority for companies. To guarantee safety in the workplace, employers can in particular implement prevention initiatives aiming to eliminate or limit the harmful effects on workers' health: polluted environment, noise, etc. To meet the need for safety in the workplace, Manumasure, the Chauvin Arnoux Group's metrology and services company, has developed new services measuring air quality and noise. Occupational Exposure Level (OEL) analysis is carried out to assess the air quality and workers' noise exposure is determined using dosimeters. The regulatory OEL measurements are governed by a decree dated 15/12/2009 and are performed directly on the operators. For this new air quality service, Manumasure is in the process of obtaining COFRAC –LAB REF 27 accreditation.

### A range of environmental measuring instruments: focus on air quality testers in buildings open to the public and the CA 1954 thermal camera from Chauvin Arnoux

Checking the temperature, measuring air speed and air flow, checking the pressure, monitoring air quality, measuring humidity and the level of lighting, etc.: for each use and each professional, Chauvin Arnoux proposes a whole range of solutions. Chauvin Arnoux commercializes products for checking the ambient environment in offices and collective areas, childcare centres, hospital rooms and private homes to improve the comfort and health of the people there. These instruments include a thermo-hygrometer, a thermo-anemometer, a light meter, a sound level meter and contact thermometers, which are all needed to check the operation of the air-conditioning and ventilation-systems and the levels of noise, CO<sub>2</sub>, humidity and lighting. The CA 1510 tester provides three continuous measurements which are important for air quality: the level of CO<sub>2</sub>, humidity and temperature. An audible and visual alert on this magnetized instrument mounted on an internal partition warns users if the authorized or regulatory parameters programmed are exceeded. An effective response to the new decrees dated December 27th, 2022, concerning assessment of the ventilation systems and measurement of the pollutants performed in the context of indoor air quality monitoring.



## #3 Passion

preparation and can be used on any type of water. Software suitable for every need completes this innovative technology.

### Indatech's Asuryan solution to guarantee human health through extremely precise detection of molecules of interest

The physical and chemical quality of a drug is ensured at every stage from its design through to its distribution in a pharmacy. This quality is based on the drug's characteristics and properties, guaranteeing its efficacy, safety and compliance with the applicable standards. Drug quality standards are notably defined by the Pharmacopeia which is a collection of standards concerning medicines. The Pharmacopeia indicates that one of the essential aspects contributing to the quality of a drug is its composition and its purity. Indeed, each component must always be pure, high-quality and in very precise quantities. It is thus crucial for scientists to identify and precisely quantify the molecules present in their formulations.

To support the pharmaceutical industries in their quality control, Indatech has developed Asuryan, a technology based on UV-Visible spectroscopy allowing precise analysis of pharmaceutical matrices of different types. Asuryan's versatility offers high sensitivity and measurement accuracy over a wide range of products and concentrations. This innovation is used in particular to handle inline measurements on low concentrations of substances.

the infrared flow received which can then be converted into a temperature reading by means of the calibration curves. After processing, an infrared image is then reconstituted. A good way of checking hot spots in an electrical installation to avoid overvoltages and energy losses (sources of cold, draughts, etc.) from buildings, doors or windows.

### Water quality and recycling: the Aqualys project from Spectralys puts a value on resource savings!

In France, water management and quality is governed by a number of laws and regulations. In particular, there is the EU Framework Directive on Water, which obliges member states, including France, to ensure that its surface water and underground water are in good condition, as well as standards concerning pollutant emissions (governed by the French Environmental Code) in water and even the Public Health Code which establishes standards for drinking water quality.

Specially designed to fulfil the standards' requirements concerning water quality, the Aqualys 3D fluorimeter from Spectralys can be used to analyse water pollution almost instantaneously. It takes less than 1 minute. In the laboratory, a factory or a water treatment plant, Aqualys measures and precisely quantifies the levels of organic matter (COD, BOD, turbidity) dissolved or in suspension in the water. The instrument also helps to detect leaks and their origins on the production lines by taking a spectral fingerprint. This technology does not require any sample



AQUALYS FROM SPECTRALYS



CA 1954 THERMAL CAMERA

Depending on their temperature, objects emit characteristic electromagnetic radiation. The CA 1954 thermal camera measures this radiation on wavelengths between 8 and 14  $\mu\text{m}$  which are in the infrared range. An optical system collects the flow emitted by the object targeted and forms an image of the scene on the detector. The CA 1954 camera's detector (called a microbolometer) comprises a matrix of 160 x 120 pixels. Each of these pixels measures

### DID YOU KNOW?



#### WHAT IS SPECTROSCOPY?

Spectroscopy is the study of the spectra of the electromagnetic radiation emitted, absorbed or reflected by a substance. This discipline relies on the principle that different types of atoms and molecules interact with light in a characteristic way when subjected to electromagnetic radiation.

This is an essential analytical technique for scientists, as it lets them identify and characterize chemical species, as well as determining molecular structure.

There are several types of spectroscopy: infrared (IR) spectroscopy, UV-visible spectroscopy, Raman spectroscopy (discovered by Sir Chandrasekhara Venkata Raman), nuclear magnetic resonance (NMR), fluorescence, etc.

This technology plays a crucial role in scientific research, industry, medicine, the environment and many other fields, since it provides key information about matter at molecular scale.



## #3 Passion

# Innovations & new technologies!

## The Chauvin Arnoux Group, an actor in the current economic climate, is facing the challenges of tomorrow

After long delocalizing their factories to take advantage of lower labour costs, French companies are now changing course. Producing in France has become not just a trend but almost a label! "Made in France" is in all the adverts and companies now proudly display the French rosette which had fallen out of use. Chauvin Arnoux is not really concerned by this reversal as it has always produced in France. The company's strategy has been based on French manufacture for 130 years and has maintained its factories in Normandy and near Lyon over the long term. "Designed and Made in France" has been indicated on our products and communication for many years and it marks the Group's commitment to quality and customer service. But how can you produce in Europe at acceptable prices for the market in a country where production costs are said to be high? According to the French State, which has just launched its Grand Plan France 2030 to revive French industry, technology and innovation will be the pillars supporting this transformation. Robotization, automation, etc., should help to rethink production lines to reduce costs, while ensuring better working conditions for operators, who become more effective and productive without risking their health. The challenge is no longer to produce in large quantities but to adapt production to the fluctuations in the market requirements and to anticipate upcoming technologies.

**Experimental research  
serving industry:  
Chauvin Arnoux's  
commitment**



"Brighter", a perfect name for a joint University / Corporate project launched by LYN-RED (a company in Grenoble specialized in infrared detectors) and partly financed by the European Commission for three years. The request for proposals launched in April 2022 selected Chauvin Arnoux alongside around fifteen companies grouped in a consortium covering 5 European countries and Turkey. Built around academics, research centres (CNRS) and companies, the consortium's goal is to work on new technologies and/or capitalize on existing technologies in order to develop a multispectral bolometer integrated in a thermal camera. Chauvin Arnoux joined this research group as a French designer and manufacturer commercializing a range of infrared cameras, chosen for its French expertise regarding "cooled" infrared sensors to develop a multispectral bolometer for absolute thermography and optical imaging of gases. All the stakeholders in the value chain are involved: academics, microbolometer manufacturers, algorithm developers, camera integrators and end-users. They are working together to define the best trade-offs for all use cases. The applications are varied: savings on equipment and energy in the industrial sector, effective, affordable monitoring of infrastructure and trains, design of sensors for self-driving vehicles, reduction in the number of road accident

victims and better control of gas emissions in towns and industrial areas. These new uses served by European industry should help Europe to increase its market share in the infrared imaging market.

**Indatech wins  
the governmental request  
for proposals in the context  
of the "France Relance 2030"  
recovery programme and  
the great biodrugs challenge  
with the ClimBIN and Access  
consortiums**

In 2022, a call for expressions of interest backed by nearly 800 million euros was launched on the theme "New biotherapies and production tools" with the ambitious aim of speeding up the development of biodrug production and making France a leader in the strategic health sector. By 2025, the objective is to succeed in producing at least 10 biodrugs against cancer and chronic diseases as such as those linked to age. In other words, this represents a major challenge for our entity Indatech which is now working inside the ClimBIN consortium and leading another, Access, alongside academics, pharmaceutical groups and industries. The idea is to pool varied expertise, whether in terms of academic scientific research or industrial solutions to be developed. In this way, Indatech is contributing its unique dual technology combining Raman Spectroscopy and multi-angle UVfor automation of the cell culture systems. The sensors developed by Indatech will allow real-time inline



measurement directly inside the bioreactor without prior sample preparation. This real-time, in-situ quality supervision helps to optimize yields while reducing time-wasting and production costs. The Access (Advanced Cell Control by Spectroscopic Sensors) consortium led by Indatech, meanwhile, aims to take on a major challenge: optimizing stem cell cultures in bioreactors through in-line inspection of production using the sensors designed by the company. The goal is to structure a French offering with a European scope.

**By renewing its partnership with the Ionesco LabCol at Poitiers University (France), Chauvin Arnoux has committed to experimental scientific research**



The initial idea is a simple one for the State: joint creation of knowledge or know-how by academic research laboratories and SMEs. On the one hand, academic researchers are funded for research projects by the French National Research Agency (ANR), and on the other, industrial structures (small or medium-sized enterprises which do not always have R&D teams or the necessary availability and time, rely on the academic research specific to their industrial environment. Launched in 2018, the purpose of the LabCom (common laboratory) requests for proposals is to foster and financially support the commitment of these two actors to building a structured partnership.

Already partners in joint projects, Poitiers University and Chauvin Arnoux naturally joined forces when they initiated the operation in 2018. The IONESCO LabCom headed by Erik Etien, funded initially by the ANR for 4 years and by the company, has led to the development of 3 research projects in the field of the electrical measurement. One of these ended with the implementation of an Android application now used by a product range commercialized by Chauvin Arnoux.

Although a large number of partnerships were set up in this way in 2018 during the first requests for proposals, a significant number of such University/SME alliances have since encountered difficulties and shut down. Indeed, the duo relies on the fragile balance between continuing corporate investment, agreement on the sharing of intellectual property and economic return on investment for the company in order to maintain the laboratory over the long term. Chauvin Arnoux and Poitiers University's alliance in setting up the "Ionesco" LabCom (common lab) four years ago has been so successful that they are renewing their partnership in a LabCol (collaborative lab). In fact, the laboratory became collaborative after the end of the ANR funding. Now global to the whole university and independent, it is funded by the company, various subsidies and the financial fruits of completed research projects.

The tasks of each party are clearly defined. On the one hand, in the University, the researchers and postgrads work on promising experimental research avenues, new scientific technologies which may give rise to applications or product functions. On the other hand, exploitation of the discoveries in a subsequent industrialization phase helps the company to grow on competitive markets. This brings advantages for everyone. The researchers' wages and research work are funded and the results are even exploited after commercialization. The company no longer has to put in long hours of sometimes vain research and experimentation for little economic gain. There are three projects currently under way in the Ionesco LabCol for Chauvin Arnoux and CA Energy, two of which are new: an instrument for very simply measuring the energy consumed by a motor, a software sensor to characterize transformers and an advanced motor tester. One patent has already been filed and others are pending, a way for the Chauvin Arnoux Group to maintain its vocation as inventors.

- 1838** Invention of the patented "Arnoux system" used in the rail sector: an articulated process with radiating axles used on the Sceaux rail line in France.
- 1905** Invention of the hand-cranked ohmmeter.
- 1913** The "Stablavion", invented by René Arnoux, is presented at the Paris Air Show.
- 1917** 1st precision wattmeter
- 1927** Patent filed for the Universal Tester, the ancestor of the multimeter
- 1934** Invention of the transformer clamp: the 1st current clamp
- 1952** The "cellophot posemeter", a light meter invented by Chauvin Arnoux, is incorporated into cameras.
- 1960** The first Monoc, with a single switch and dial. It was the ancestor of today's testers.
- 1982** Launch of an innovative series of multimeters, the COMIPA models combining a light meter, a sound level meter and thermometers. Precursors of the multifunction testers used for environmental measurements.
- 1993** Celebration of Chauvin Arnoux's first century in Paris
- 2012** TrueInRush innovation for current measurement in power loggers
- 2022** Latest generation of the QualiStar2 industrial power quality analysers

# #3 Passion

*"In the end, although 130 years seems a lot, it's just the beginning of a story – our story."*

## 130 years can be measured!

We came together for passionate debates and will surely be back in another 130 years



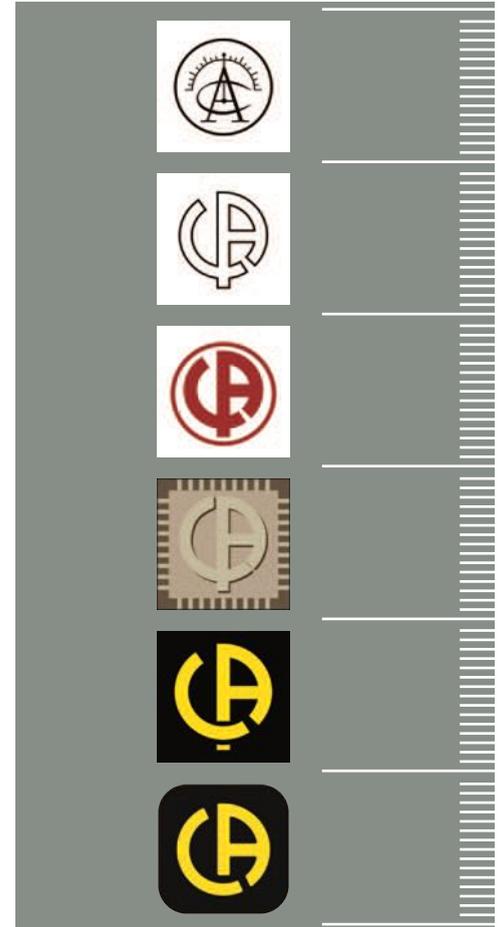
In 1893, Raphaël Chauvin and René Arnoux set up a partnership and, since then, the adventure has never stopped and the number of innovations developed for our customers is now too high to count. What's important is the progress which we create so that, together, we can continue to Measure Up. After more than 130 years in business, the Chauvin Arnoux Group is still guided by hard-working, cohesive family ethics.

### An anniversary celebrated worldwide

To mark this special anniversary year, events were organized on every Chauvin Arnoux site in France and in our international subsidiaries.

2023 saw a number of summer lunch parties and competitions: competition for the best **130th Anniversary** cake, photo competition on the theme **"The Fabulous History of the CA Cube"**, etc. Chauvin Arnoux's 130th anniversary was given the joyful celebration it deserved.

Eleven summer lunch parties were organized worldwide and more than 850 came together for the occasion. At Chauvin Arnoux, these twice-yearly lunches represent precious moments of conviviality which bring teams closer and foster group dynamics at the international level.



### KEY FIGURES

**7**  
SUMMER LUNCH PARTIES IN FRANCE

**4**  
SUMMER LUNCH PARTIES PARTIES IN OUR SUBSIDIARIES ABROAD

**MORE THAN 850**  
STAFF ATTENDED



### From our history...

In 1838, in the early days of rail transport, Claude Arnoux, the father of René Arnoux (Chauvin Arnoux's co-founder), invented an ingenious system for a train "with articulated axles" called the "Arnoux system", which significantly improved trains' rolling and speed on bends, thus reducing premature wear of the rails. In 1856, this led to a "royal" distinction from the British Empire: an official document with Queen Victoria's royal seal. A recognition which would mark the beginning of a fine family history!



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