One Century of Measuring the Speed of Rotation

Rheintacho - yesterday, today, and tomorrow

One hundred years of company history - that reflects the development of technology from the very first diesel engines and the electrification of the cities as far as micro systems technology and the global computer networking of today. It also contains the experience of global economic crises and the „wirtschaftswunder"-years in post-war Germany, as well as the numerous individual fates of those related to the company, spanning three generations.

During those years, our company underwent many changes. It witnessed the coming and going of different technologies, and it had to consistently adapt to new market requirements. But it remained true to its mission: the precise and reliable measuring, controlling, and monitoring of the speed of rotation as the command variable for mechanical processes. Today, Rheintacho manufactures state-of-the-art sensors and instruments for measuring the speed of rotation. Our products are utilized in combustion engines and hydro motors, in paper and textile production facilities, as well as in general engineering.

From early on, our company has built its reputation with custom-made orders for difficult applications, as in power plants and on ships. This special know-how could later be applied to sensor technology and was systematically enhanced, both technically and organizationally.

We take pride in our first-rate product development that made us the technological leader in the field of recording and monitoring the speed of rotation of diesel engine and hydro motor applications. As a result of establishing highly efficient process control procedures, we are able to complete even the most exceptional order with short lead times.

From our company's past we have learned that long-term business relationships are the basis of success. Therefore we maintain fair partnerships with our customers, our employees, and our suppliers. Furthermore, we acknowledge our economical, social, and ecological responsibilities for we are part of a greater system.

Looking into the future, we expect continuing globalization and accelerating technological progress, particularly in the area of combined sensor technology. Thanks to our excellent personnel and with the support of our new sales offices in the UK and the USA, we feel well prepared for the years to come.

Executive Management

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The Development of Measurement Engineering at Rheintacho

Tachometer Types

For decades, tachometers have exclusively been used for the visual monitoring of velocities and speeds of rotation. Employing a variety of measuring principles, the engineering of tachometers required a high standard of craftsmanship in fine mechanics.

Rotary pendulum tachometer recorder in a printing plant around 1935

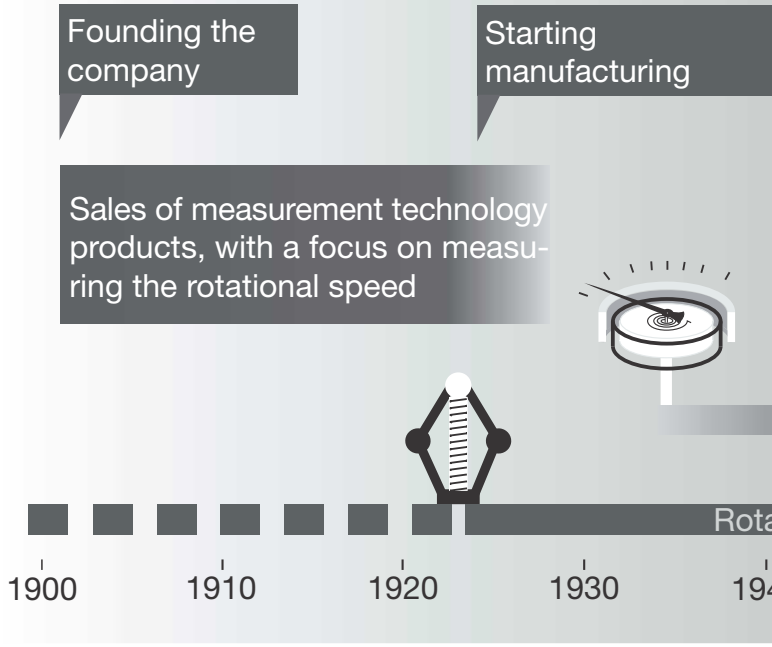
Rotary pendulum tachometer (mechanical centrifugal force)
Since rotary pendulum or centrifugal force tachometers are as old as the technology of rotation speed measurement itself, they naturally dominated the first decades at Rheintacho, before they were replaced by eddy-current tachometers and remote speed equipment.
In these early devices, flywheel masses were revolving around the driven spindle, while moving away from their axis due to centrifugal force. The centrifugal force was then transmitted to a pointer using a hairspring. The same concept was also applied in the production of hand-held tachometers as well as stationary tachometers and tachometer recorders.

Bi-fluid tachometer (fluid centrifugal force)
Likewise based on the principle of centrifugal force, the bi-fluid tachometer became an early patent for our company. Here, two non-mixing fluids indicated the speed of rotation in a capillary tube like in an oversized clinical thermometer. Even though the bi-fluid tachometer had its advantages - it was low-cost, precise, and showed only low friction - it was not sufficiently robust to succeed in the market.

Eddy-current tachometer (magnetic induction)
Manufacturing of eddy-current tachometers started in the mid-thirties. A permanent magnet rotates with the tachometer spindle and generates eddy currents in a bell-shaped light metal armature, thus causing it to turn on its axis. The bell is joined to a hairspring that transmits its torque to the pointer. Since eddy-current tachometers were considerably cheaper to produce than rotary pendulum tachometers, they soon conquered a vast array of applications and gained paramount importance. Even though their significance declined in the seventies, they are still being considered today for applications intended for use without electronics.

Remote speed equipment: Tacho-generator and remote indicator (electrodynamics)
By the mid-fifties, Rheintacho was manufacturing the first tacho-generators. However, they were expensive to produce and very sensitive to ambient conditions. It took the company a few years before an improved version could be developed that captured the market at the start of the sixties. Tacho-generators are small generators that produce sinusoidal voltage proportional to the speed of rotation. The voltage is then transmitted to indicator devices via cable.
The possibility of separating the indicator from the measuring point, opened up numerous applications for this technique. With the dawning of sensor technology in the mid-seventies, however, the remote speed equipment lost its relevance for new applications. Being independent of supply voltage, it is still first choice for a number of applications where reliability is of the highest priority - in shipbuilding, for example. As one of the very few traditional manufacturers of tachometers, Rheintacho will continue to support the market segment of eddy-current tachometers and remote speed equipment.

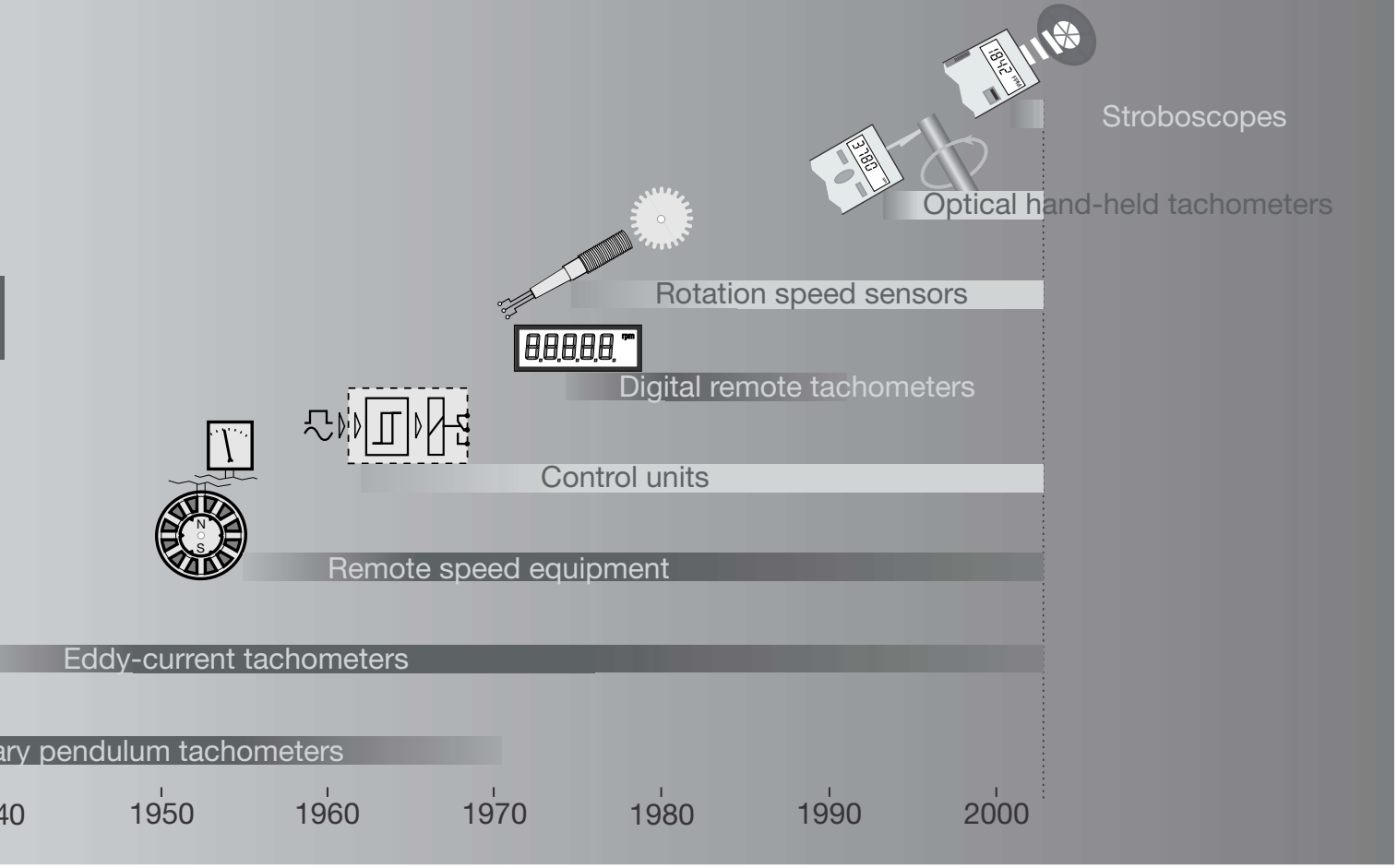
The Rheintacho Chronology



What mattered most
Tachometers had to be precise and robust at the same time. Often they were used with heavy machinery and exposed to considerable vibration and shock. Thus, the bearings of the tachometer spindles had to be of the highest quality. For eddy-current tachometers, special low friction stone bearings were used, which allowed the small forces of eddy currents to take effect. With rotary pendulum tachometers, the dimensioning of the flywheel masses necessary to gauge the measurement range was difficult. Magnetizing the permanent magnets for eddy-current tachometers or remote speed equipment for the same purpose required quite as much skill. Because the measurement ranges for tachometers could not be gauged with 100% accuracy, scale gradations were painted manually according to test bench results.

Hand-held tachometers

Hand-held tachometers are exemplary for the continuity of our company. From the start of manufacturing until today, hand-held tachometers have consistently contributed a substantial portion to our sales.



Electronic Speed Measurement

In the sixties, the era of simply reading the data came to an end. For the automatic operating and controlling of machines and plant facilities, measurement signals now represented a factor of increasing importance. Rheintacho thus evolved accordingly into a sensor and electronics specialist.

Control units
From the early sixties onwards, rotation speed based switching gained greater significance. Part of the rotary pendulum tachometers had already been equipped with switches. Now, special electronic control units were designed to be used in combination with tacho-generators. Since the late seventies, these devices were able to process the frequency signals of sensors. With the advancing of central control engineering, they took over mainly protective functions. Our company's latest monitoring unit for the speed of rotation is a programmable, extremely flexibly configurable device originating in the year 2002.

Rotation speed sensors
In the early seventies, Rheintacho developed the first rotation speed sensors. They were basically simple coils that transferred changes in magnetic flow into sinusoidal frequency signals. In 1975, they were followed by Hall effect sensors which already transmitted pulse-shaped frequency signals, ideal for digital controls. After some preliminary testing, Rheintacho decided against optical sensors which were prone to soiling and less robust than magneto-sensitive sensors. Today, five families of sensors based on different principles of magnetic measurement are available at Rheintacho. As a general concept, the sensors are placed opposite of ferromagnetic gears that are positioned on the spindles to be measured. As early as the eighties, most of the new applications relied on rotation speed sensors for measuring the speed of rotation. Their production cost amounted to only a fraction of the previous tachometer cost.

Digital remote tachometers
Among the devices for measuring the speed of rotation, digital remote tachometers were only short-lived. When programmable logic controllers penetrated the market towards the end of the eighties, the mere indicating of data as the measurements' only purpose was definitely a thing of the past. Where required, the speeds of rotation were now being displayed at central line control stations. Over time, several generations of digital remote tachometers were developed at Rheintacho, each complying with the state of the art in circuitry, from radio tubes to CMOS-technology.

Initially, they were based on rotary pendulum technology, but in the mid-sixties, they were replaced by a second generation of hand-held tachometers, using eddy-current technology. This change not only reduced production cost, but allowed for different measurement ranges at the same time. Parallel to the development of digital remote tachometers, digital hand-held tachometers were designed and later enhanced by integrating an optical concept of measurement. As one of its latest introductions to the market, Rheintacho has recently developed a high-intensity, yet compact stroboscope.




The company's course through history

The early years - from dealership to manufacturing plant
After being founded as a dealership in 1901, the company was acquired by the Münzner-family in 1920, and was to be steered by Hermann Münzner for the next 35 years. From the beginning, Hermann Münzner had been striving to start his own production, and he reached his goal in only four years: Based on a workforce of three mechanics, the manufacturing of tachometers began in 1924 under the name of "Rheinische Tachometerbau-Anstalt Münzner & Co" (Rhinish Tachometer Manufacturing Institution Münzner & Company).

The Great Depression - perseverance is the word
A few years later, the company had grown to 25 employees and become one of the leading manufacturers of tachometers in Germany. Then, in 1929, the beginning of the world's major economic crisis brought the company into deep water: The scant incoming of orders had employees and management worry about the wages from week to week.

Between 1933 and 1945 - first upturn than war
In the years after 1933, the company recovered from the Great Depression and was able to strengthen its market position. With the onset of war in 1939, however, manufacturing had to succumb more and more to military objectives. To increase the production of goods of greater importance to warfare, like cannon igniters, the manufacturing of tachometers had been limited to a few types. Eddy-current tachometers, for instance, were now intended for heaters of aircraft engines and supplied to the Junkers company. As the war continued, the company's major concern turned to the individual fate of each of the dedicated employees; yet a great number of the original work force had to be replaced and for the first time was predominated by women and girls.

The postwar era - anything is better than doing nothing
Starting anew after the war had ended proved to be a challenge for everybody. For those company employees who were returning from the front, the company symbolized a safe harbor and signal of hope. Hermann Münzner and his plant manager tried to provide work for their people and had to take it wherever they could find it. Printing and typesetting machines from burned out production sites were repaired, cigarette lighters, for which the buyer yet had to organize flint stones, were produced, and finally, supplier-manufactured parts were delivered to Rhodiaseta, which had been selected as a priority company for the textile trade by the French military government. Adaptability, improvisational skills and, most of all, the strong standing together of management and employees, helped the company to survive these challenging times. Even the dismantlement of all modern machinery could not break their spirits.

Reconstruction and „wirtschaftswunder“ - full steam ahead
As a result of the monetary reform in 1948 and the taking effect of the Marshall plan the following year, Germany experienced a period of

The original company site and address for many decades on the "Gewerbekanal" (Trade canal) in Freiburg. Here the manufacturing of tachometers began in 1924.

Hermann Münzner shaped the company for 35 years. Today, the business is family-run in the third generation.

enthusiastic reconstruction. By 1952, the company again reached employment levels and productivity rates of 1936. Thanks to a favorable loan from the Reconstruction Loan Corporation, the company building could be raised to make room for the manufacturing of modern electrical tachometers. All through the sixties, Rheintacho Messtechnik GmbH contributed to the „wirtschaftswunder“ and continued to expand until it reached 120 employees in 1970.

The seventies - growth comes to a halt
In the early seventies, the economy was shrinking considerably. Yet Rheintacho had already made plans for expanding the business and moved manufacturing to a newly built production site in 1972. Only assembly and administration remained in the original company buildings. Due to the oil price shock in 1973/74, any further plans for expansion had to be put on ice. Instead, the two departments that had still kept their original address were also transferred to the recently constructed manufacturing facility. Thus, the former addition became the company's new headquarters and still serves Rheintacho as the company base of today.

The revolutionary eighties - changes are chances
The fast developing micro electronics technology had started a restructuring process that affected our company from the seventies until well into the nineties. At the same time, sensor technology was advancing likewise and lead to the displacement of the more expensive mechanical and electro-mechanical tachometers. This technological progress in times of a tough economy forced Rheintacho into rationalization. The new technologies had to be integrated into engineering processes, personnel expenditures had to be adjusted to the economic environment, and the organizational structure had to be re-defined. An accounting system was established that helped to identify non-contributing product lines; a new, proactive marketing strategy attained better access to the markets; a significant increase in funding for engineering and development resulted in more technologically advanced products.

Through the nineties and into the new millennium with new verve
During the nineties, the re-engineering of operational processes continued. A quality management system in compliance with ISO 9001 was established. The development of new products and customized solutions now had to follow a defined product development process. Furthermore, a modern ienterprise resource planning system was introduced, controlling every business procedure, from the incoming of an order to ordering components to shipping. And most importantly for our internal and external business relationships, a company culture was established based on the principles of fair partnership. All these changes also found their expression in a new name: Since 1998, the company is operating as "Rheintacho Messtechnik GmbH" (Rhine-tachometer Measurement Engineering Ltd.). Also at the end of the nineties, Rheintacho opened offices in the UK and the USA, one being a majority holding, the other a start-up. To strengthen our position in the North American market, the company Pioneer Electric & Research became a 100% subsidiary by the end of 2001.