Background information

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Pilz Annual Press Conference 2021

(Check against delivery)

Susanne Kunschert

Financial year 2020: Course defined by the Corona virus

The business activities of the Pilz corporate group in the last year were defined by the Corona crisis. The virus paralysed or significantly interfered with large parts of the global economy. This had considerable negative effects on the electrical and mechanical engineering sectors and so on our company. After a good start for Pilz in the first quarter of 2020, the Corona lockdown at the end of March resulted in a significant decline in orders. It wasn't until the Autumn that incoming orders increasingly began to stabilise.
So in 2020 the company recorded an overall turnover of 286.2 million Euro, a fall of 11.3 per cent in comparison with the previous year.

Markets and product areas: Downturns and rays of hope

Due to the Corona pandemic, Pilz's markets shrunk in all key industrial countries of Central Europe as well as parts of the Far East. The downturn affected all product areas – from control and drive technology to sensor technology and operating and monitoring.

Our machinery safety services were also affected. Lockdown and travel restrictions meant that access to customer's machinery was for a long time very limited, if not impossible.
As a result, carrying out risk analyses or verifying safety functions was only possible under difficult conditions. In special circumstances we resorted to digital media and technologies with colleagues and customers; smart glasses for example. Staff at the customer's

premises were equipped with video smart glasses, which transmitted the video material live to the Pilz engineer in the office, who could use it to carry out the assessment. Practice has shown that this type of support only makes sense under certain conditions and involves a great deal of time and technical commitment. It is not easy for digital technologies to replace on-site services.

Overall, despite the most difficult conditions, the international sales and service organisation managed to increase turnover, in Asia or the American continent for example. Even last year, some countries managed to achieve the largest orders in the history of the respective national subsidiary. We also got involved in safely converting existing machines in order to produce Corona face masks. The key factor for many customers was our organisation's ability to provide our solutions package across borders, at our customers' various international locations.

As an example I'd like to name the sports goods manufacturer Nike, who has been using our CMSE - Certified Machinery Safety Expert training programme since 2018. Since the programme started at Nike, 66 machinery safety specialists have completed their training; 43 people have been designated as certified machinery safety experts. Pilz support was mentioned specifically in the "Nike Impact Report 2020". Cooperation with Nike is coordinated by our Global Account Management team; the CMSE training is conducted by the Pilz experts at the respective location.

As a result of the increased global marketing and sales activities, our business was able to increase its share of exports still further. This now lies at 75.2 per cent (+ 0.9 percentage points over 2019).

Human resources: Investment for the future

We were able to lessen the impact of the reduced order levels not only through cost savings and short-time working, but also due to the solidarity throughout the whole Pilz Group. We look back on 2020 as a year that demanded a great deal of our company and employees. But together we managed to counter and withstand the crises. For that my brother and I are very grateful to everyone at Pilz!

We have seen only a moderate fall in the number of employees: as of 31.12.2020 the number of employees was 2,440 worldwide, a drop of 4.2 per cent. In Germany the number of employees fell by 3.4 per cent: from 1,128 to 1,091 (31.12.2020). This fall in Germany is due entirely to retirements and natural turnover. Compulsory redundancies in the wake of the global economic crisis were avoided.

We remain committed to training: all trainees were employed at the end of their training. 16 new trainees started their professional life at Pilz in 2020. In 2010 there were 4 trainees. As of 31.12.2020, 46 young people finished their training at Pilz in Ostfildern this year or completed a course at the Baden-Württemberg Cooperative State University.

The recent change at the top or our training division shows how entrenched in-company training is within the company. Klaus Schneider was responsible for training activities for 15 years; he was followed by Benedikt Windaus as Training Manager and Lucas Fischer as Trainer. Both are “home-grown” at Pilz, having completed a training course or dual course of study at Pilz, before gaining further qualifications and today running the training themselves.

According to the Federal Statistical Office in Germany, there were just over 450,000 new trainees in 2020; that's 9.4 per cent fewer than the previous year. According to the Federal Office, a decline of this magnitude is unique, due to the Corona virus. It's true that training figures have been trending downwards for some years, but unfortunately the pandemic has increased this negative trend. We are very concerned about this trend, as it will intensify the general skills shortage that we had already before the Corona virus. To a large extent Pilz covers its own requirement for specialist staff through its own training programme. And that's what we'll continue to do.

Resolutely innovative

Pilz is an innovative company by tradition. That remains the case even in difficult economic times: Even in 2020 Pilz continued to hold its R&D ratio at over 21 per cent.

Current proof of our innovative strength is the market launch of the safety relay myPNOZ in early 2021. The new product received official confirmation shortly after it was introduced: as part of the virtual Hannover Messe 2021, myPNOZ was nominated as one of the three finalists for the prestigious Hermes Award, the industry equivalent of an Oscar.

"Full of confidence and drive for 2021"

Due to its global business operations, the Pilz Group is affected by international economic trends. The upturn in the Asia-Pacific region will likely strengthen the global economy. Even if the order situation has stabilised in the last few months, as I said, more precise economic

forecasts for 2021 remain difficult due to the Corona pandemic. Nevertheless we are looking to 2021 full of confidence and drive! We have complete faith that we will master the challenges of this year!

Thomas Pilz

Robotics by Pilz: Total solutions for robotics

The focus of “Robotics by Pilz” has always been on the application. As part of this strategy, in recent years Pilz has added new services to its portfolio, such as services for human-robot collaboration (HRC), as well as new products, such as the service robotics modules. We introduced these here for the first time in 2018.

As a result of the experiences gained in the market for lightweight robots, a market that’s characterised by increasingly cut-throat competition and growing price pressure, Pilz has decided to halt activities around the manipulator we developed in-house.

That does not mean that Pilz is withdrawing from robotics.

Our offer still consists of four components:

- Safety technology and services for robot applications. This includes our services portfolio and training, which is tailored to the life phases of a robot system
- A wide range of sensor technologies, including the new safe radar technology, which we will say a bit more about later
- Drive and control technology for robot kinematics
- Software packages and services for the Robot Operating System (ROS). ROS is an open source framework for writing software for robotics applications. It offers enormous flexibility

and demonstrates its strength particularly in dynamic environments.

Focus on intralogistics

I would like to use intralogistics to illustrate two examples of the hardware, software and services package “Robotics by Pilz”.

ROS software blocks for our safety laser scanner PSENscan

With our ROS packages, the safety laser scanner PSENscan not only supports productive, safe area monitoring but also dynamic navigation of automated guided vehicles (FTS). All the data needed for navigation is available without the need for additional programming. As a result, a SLAM algorithm (Simultaneous Localisation and Mapping) can be fed in, for example, to create maps of the environment and for positioning. This enables dynamic navigation and allows obstacles to be avoided. As a result users can implement mobile applications in production environments more dynamically and safely at all times.

Services page for safe AGV applications

Pilz supports users of such mobile applications as the first company to supply a holistic services package for safe AGV applications. In the early stage of the project the package comprises an on-site consultation at the customer’s premises, including feasibility studies before the project begins, so that safety aspects can be taken into account early.

On request Pilz can create a risk assessment for the selected AGV system, including an acceptance test at the manufacturer's.

The works managers are responsible for the use of robots and associated AGVs. We offer them acceptance and an on-site risk

assessment. This is used as the basis for defining the safety measures. The next steps are validation of the safety functions, with a view to the installation and integration of additional safety components (such as scanners or encoders), definition of the required protected fields or zones and safeguarding of the environment around the mobile system.

Finally Pilz advises and supports users right through to the point where compliance with official requirements such as CE marking in Europe or OSHA in the USA is checked for the entire application.

Susanne Kunschert

Machinery safety post-Brexit: CE becomes UKCA

Now that Brexit is complete, machine manufacturers and operators are asking what impact Britain's exit will have on machinery safety. That's because the United Kingdom is no longer subject to the provisions of the EU Machinery Directive.

The current regulations stipulate that when machines or safety components are placed on the market in the United Kingdom, the EU conformity assessment procedure with CE declaration of conformity and CE marking may continue to be used under certain conditions until 1 January 2022.

The British government has now established its own national conformity assessment procedure. A new mark has been introduced for this purpose – the UKCA mark ("United Kingdom Conformity Assessment – UKCA").

1 January 2022 is the deadline

What does that mean in practice? Apart from a few exceptions, all companies that have previously used the CE mark to confirm that their products complied with the necessary health and safety requirements will now also have to apply the UKCA mark, both on the product and in all technical documentation.

Pilz strongly advises people to deal with this as soon as possible, as it generally involves considerable effort – both in applying the mark itself and administratively in the technical documentation. According to current understanding, after 1 January 2022, companies that launch their products in the United Kingdom without a UKCA mark would be infringing the law or even committing a crime.

The challenges will be even greater if the United Kingdom also deviates in term of content from the directives applicable in the EU and associated harmonised standards. In this case it may be necessary to make additional technical adjustments to the product or machine itself. The work needed will depend on the degree of deviation, but in any case will require consistent follow-up and knowledge of the laws and standards.

Our experts are providing support already with advice during the change processes. They are working closely with the Pilz subsidiary in Great Britain, which can act as a manufacturer's national authorised representative, providing competent support in the process of achieving UKCA-compliance and dealing with any problems with local market surveillance authorities.

Susanne Kunschert

Solutions for safe machine control

Part of our core competency includes safety controllers such as the safe small controller PNOZmulti 2, which brings plant and machinery to a safe state in the event of an error or danger. Equally the small controller PNOZmulti 2 is the heart and mind of safe automation applications. In this product segment we have been market leader from day one.

Users are increasingly asking for complete solutions that are “ready to use”. For this we combine the small controller PNOZmulti 2 with safe sensors such as light curtains, safety gate systems or position switches, for example. When packaged it is possible to avoid interface problems and reduce configuration and commissioning work.

Packages comprising controller and sensor technology

Packaged solutions like this, comprising safe sensor and control technology, are used in the packaging industry for example. The focus here is on simple and therefore fast access to the machine, for example, when more frequent intervention in the process is needed to refill packaging materials or remove producer goods. Classic guards such as accessible gates disrupt access to the machine, which could lead to manipulation of this type of safeguard.

Another solution is safe protection zone monitoring via radar technology. This is used predominantly under rugged application conditions and extreme temperature variations, where optoelectronic sensors reach their limits due to temperature, dust, dirt, rain, light, sparks or shocks.

Here once again we are talking about a system package that makes setup and operation easier for users. Our radar system PSENradar, which as a certified, complete package consists of up to six radar

sensors, a control unit and the small controller PNOZmulti 2. In the next few months the certified, complete solution will be joined by a new radar sensor and a new analysing unit. Due to its design this “new” solution will then be suitable for Category 3 / Performance Level d (PL d), including for use in robotics applications.

Susanne Kunschert

From a set of keys to industrial access management

“Key” is a word and object with great symbolic power. That’s because the act of opening a door, unlocking a lock, is associated with authority, competence and responsibility.

Until now it has been up to the person to carry the right key for the right lock. We’re all familiar with the huge set of keys that results and I’m sure you too will have spent time trying to identify the right key from a set.

What you see here is a modern, digital set of keys from Pilz for industrial access management. We call the reader unit PITreader.

Always the matching key

With this, people no longer need to search for the matching key. Instead, the permissions or functions assigned to them are managed in a database and stored on the key.

Originally the product was designed as a safe operating mode selector switch, which the operator can use to select between setup mode,

maintenance or productive mode for example. We have added digital technologies to the product, such as contactless RFID transmission, OPC UA Server and web server for rights management.

So a comprehensive solution for industrial access management was developed, which can be used to cover wholly different areas:

- Access to the process, to change machine parameters on CNC machines or recipes in the foodstuffs and luxury food industry for example.
- Physical access to machines and machine cells for the machine operator and
- Remote access to the machine, enabling remote maintenance of the inside.

One solution for safety and security

Users obtain a solution that's both safe and secure: when the reader unit PITreader is combined with the safe controllers from Pilz, users obtain a solution that satisfies all the requirements of machinery and workplace safety and guarantees people's physical integrity.

Combined with operator panels and standard machine controllers, the result is a security solution that protects the machine from manipulation and misuse by unqualified staff and also serves as know-how protection. The possibilities of the digital key even extend to enabling special industrial USB ports, one of the main gateways in security incidents.

As a result the digital key contributes towards achieving corporate objectives and protecting values. Companies can use it to protect their staff and intellectual property. They will meet liability protection

requirements in relation to statutory obligations and will achieve their productivity goals more easily by reducing downtimes due to misuse, for example.

Services for OT security

However, as safety and security are more than just products, we are also expanding our services package to include security in operational technology (OT), i.e. in the field of plant and machinery.

The aim of industrial security is to guarantee plant and machine availability as well as the integrity and confidentiality of machine data and processes. If an attacker succeeds in exploiting a vulnerability, the consequences for the company can be devastating, ranging from production standstill to risk to humans if safety measures are targeted for manipulation.

We now share our knowledge in this field in the form of training and consulting services.

We provide comprehensive advice to companies – from the risk assessment through to engineering and verification of the security requirements. Step by step we guarantee plant and network security, system integrity and the safety of components.

Susanne Kunschert

Pilz Academy: Creating proximity in digital worlds

As I mentioned at the start, the Corona pandemic had and continues to have a massive impact on our services division. That also includes our

range of training courses. With our Pilz Academy we have been providing worldwide training in automation, machinery safety and industrial security for more than 20 years.

When the Corona pandemic first emerged, the focus was on maintaining our training programme. We extended our existing facilities (software and hardware) and digitised the whole of our training material. From May of last year, the focus was then to develop digital events as a stand-alone training format.

Train the trainer

One essential aspect was to train the trainer. Firstly they had to adjust to not being able to see the gestures and facial expressions of the delegates and to speak into a camera. We also trained the trainers in how to motivate the delegates to contribute and exchange views in digital learning spaces. Essentially it's about creating confidence and proximity among delegates.

We resolve this, for example, by sometimes using two trainers who alternate, or with targeted interruptions, e.g. using real-time polling tools.

To train our 120 trainers worldwide we developed a global train-the-trainer programme with E-Learning modules that cover these exact requirements. The Academy now also offers such training internally for staff who give talks online or regularly give presentations.

To use an example, we have converted the CMSE® - Certified Machinery Safety Expert qualification into a fully digitised, cloud-based learning environment. Delegates have online access to all training content, incl. commenting and editing options; they can call up exam

assignments and send live feedback to the trainer. Exercises and 3D machine models are available in the workshop area for visualisation. We have integrated around 60 questionnaires or survey elements. Surveys can be implemented live using polling tools such as Mentimeter, for example.

What will remain after the Corona virus?

When we look to a time after the Corona virus, we are convinced that the training landscape will have changed. Our trainers agree that knowledge transfer is now possible to an equivalent level using online formats, particularly in the case of foundation or basic courses. So online training will remain a permanent part of our training programme. And face-to-face training will be expanded to include E-Learning components: blended learning, as it's called, will combine the best of both worlds.

However, we can also report that when delegates have the choice between face-to-face and digital learning, the majority (70 - 80 per cent) would currently choose face-to-face training. Emotional aspects and social interaction are the key factors. Networking during breaks, discussions and conversations are what make the difference for analogue events.

Susanne Kunschert

MyPNOZ: The benefit lies in the process

At the start we mentioned our new safety relay myPNOZ, which was nominated for the Hermes Award. It is a great example of how Pilz is

using the opportunities of digitisation to add value to products. The key factor is that handling of this product has been completely designed from new. We structured it differently, based on a fully digitised workflow, so we could offer the customer added value, saving time and costs, right from the first point of contact with our product.

I'm happy to describe what that looks like in practice:

Until now, if customers wanted to implement a certain safety application, they would first need to find the most suitable product in terms of function and the necessary safety requirements. As safety functions always arise from a combination of several products (e.g. E-STOP pushbutton, light barrier and relay), it is up to users to ensure that they combine and interact correctly. Once on site users had to assemble, install and wire the individual components, perform the configuration and, before commissioning, program the solution and test the logic as well as check that the configuration was correct.

Everything in one tool

With myPNOZ it’s different. The “myPNOZ Creator” is called up with knowledge of the safety level and which type of sensor is to be used. This online tool is a product catalogue, selection guide and engineering platform in one and includes simulation, documentation and ordering.

Users determine the number, type and logic of the safety functions, following a transparent procedure that’s kept simple. No knowledge of programming is required. The Creator detects any logic errors in the safety function sequence. If the selected logic connections are valid, the myPNOZ Creator automatically calculates which modules are needed and the sequence in which these must be inserted. Along with the documentation, users also receive a wiring diagram. They

can now order their myPNOZ in the desired configuration almost at the touch of a button.

In other words: the individual modules of a myPNOZ are assembled in batch size 1 in accordance with the customer's requirements. So users receive a pre-assembled device, ready to install. All that's needed is a screwdriver for installation in the control cabinet.

Overall, thanks to the Creator, myPNOZ significantly reduces a product's total cost of ownership, as tool support makes selection and ordering easier and avoids error sources. As the units are assembled individually, users only buy and pay for the functionality that they need.

Thomas Pilz

Digitisation: The way forward for Pilz

Today we have been able to demonstrate various forms in which digitisation is being implemented at Pilz:

- Our training programme as an example for the digitisation of our existing offer
- Our digital key PITreader for access permission as an example of new digital offers or innovations and
- Our safety relay myPNOZ with the Creator as an example of new digital business or customer processes.

And we will continue down this path: Pilz – the spirit of safety in digital automation. That is our aspiration.

The journey begins in our own company, with IT. Digitisation always begins by scrutinising your own IT infrastructure and your ability to offer customers added value. myPNOZ has clearly made its mark in this regard.

Streamlined for digitisation

But I'd like to draw your attention to yet another aspect:

Over time, Industrie 4.0 has now arrived at a critical point. When it was conceived 10 years ago, data security and the accompanying legislation were not so much to the forefront as they are today. Cyber Security Law and the GDPR now decide whether operational technology (OT) and information technology (IT) can actually enable companies to benefit from Industrie 4.0.

The legal frameworks present an enormous challenge for more and more companies when it comes to implementing digitisation, because provisions such as the General Data Protection Regulation or the Works Constitution Act can slow companies down when it comes to introducing digital tools.

In most cases, medium-sized technology companies have absolutely no monetary interest in personal data and so have to put a lot of effort into ensuring that any personal data in Industrie 4.0 business areas is anonymised. And in businesses, virtually any software launch and change is subject to the co-determination of the works council.

These are two examples of tangible disadvantages that German and European companies face today in contrast to competitors from Asia or the USA.

As a medium-sized company based in the heart of Europe we are forced to move within this framework and constantly improve our infrastructure. That costs us additional energy and money. In Europe we are right at the forefront of research and development, but implementation under the existing framework is difficult, and yes I would say even impossible. We cannot keep up in the race to industrial digitisation in this way.

That's why today, in an election year in Germany, I appeal to the parties to please consider where directives can be streamlined and made less bureaucratic. Nevertheless, the Corona virus should be the urgently needed wake-up call to finally accept the challenge of digitising education. Because for digitisation to succeed we need a joint effort between companies, society and politicians. Companies are ready and waiting.

Pilz Group

The Pilz Group is a global supplier of products, systems and services for automation technology. The family business is based in Ostfildern and employs around 2,500 staff. With 42 subsidiaries and branches around the world, Pilz supplies safe solutions for human, machine and the environment.

The technology leader offers complete automation solutions comprising sensor, control and drive technology – including systems for industrial communication, diagnostics and visualisation. Consulting, engineering and training round off its international range of services. Pilz solutions are used in many industries beyond mechanical engineering, such as intralogistics, railway technology or the robotics sector for example.

www.pilz.com

Pilz on social networks:

On our social media channels we provide background information about the company as well as the people at Pilz and report on the latest news from automation technology.

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