



SEPARATION

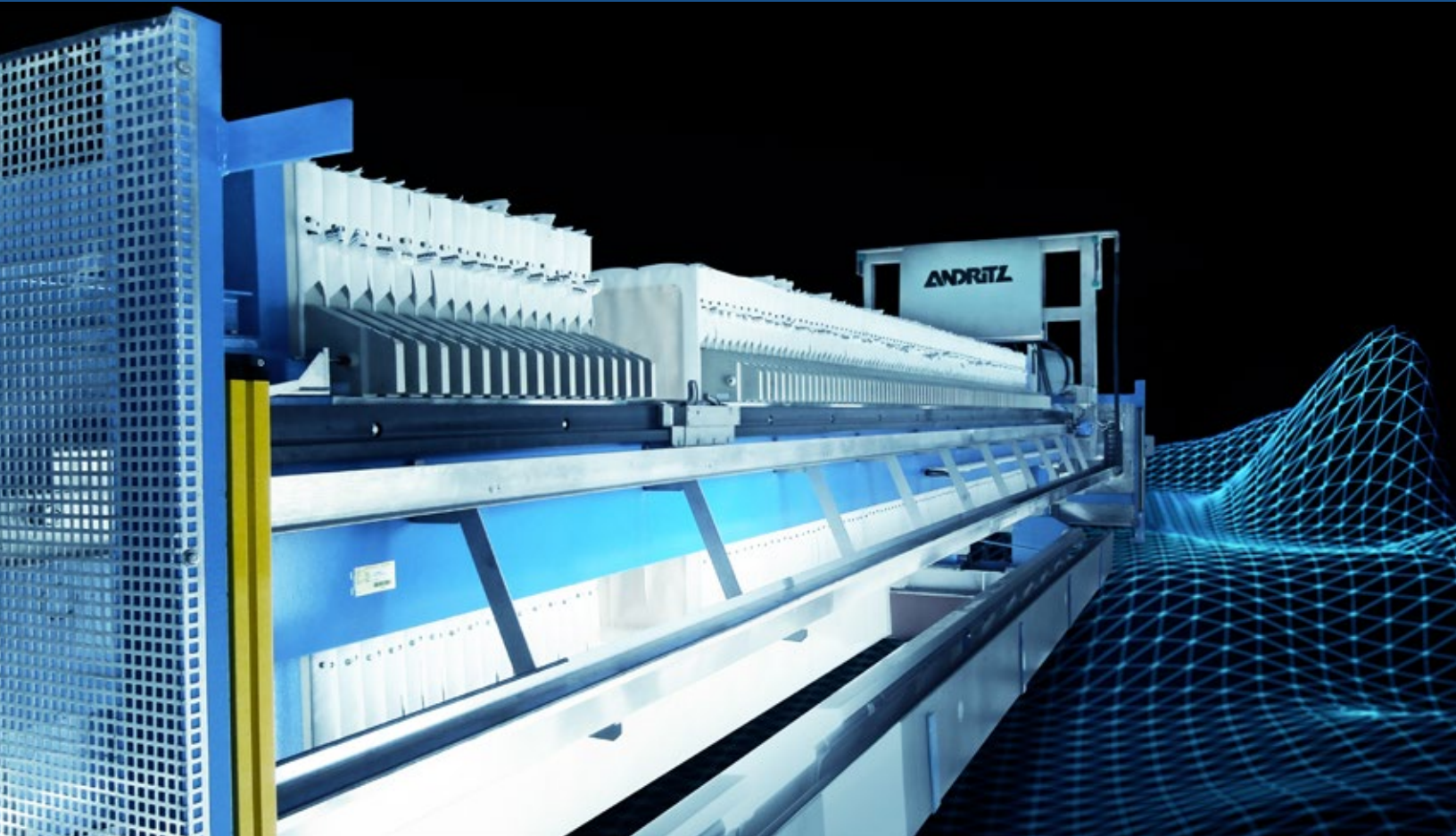
OPTIMIZE EFFICIENCY AND MAXIMIZE PROFIT

ANDRITZ INTELLIGENT FILTER PRESS

ANDRITZ

ENGINEERED SUCCESS

In many industries, efficient filtration is the key to achieving consistently high product quality. One of the most common technologies used for filtration is the filter press. ANDRITZ has combined its proven filter press automation solutions with Industrial Internet of Things (IIoT)-technologies to create new mechanisms and features that promise an increase in product quality and a decrease in operating costs. This process optimization scheme is called Intelligent Filter Press. With extensive experience paired with innovation and digitalization to deliver improvements precisely where they are needed, ANDRITZ is your partner helping you to profit from the opportunities that come with Industry 4.0.



Get ready for the future of filtration

Several steps closer to autonomous operation.

With ANDRITZ filter press technology, you are prepared for the opportunities that come with digitalization and IIoT – all to the degree that fits your individual needs.

With a broad portfolio of automation solutions: From Smart Sensors to collect all the relevant operational data of your filter press, to sophisticated data analytics to turn data into relevant information, to Augmented Reality that visualizes the information for the operator.

For different degrees of automation: From manual operations to fully automated filter presses.

For a wide range of purposes: From predictive maintenance solutions, to process monitoring and troubleshooting, to long-term trending.

Four building blocks form an intelligent filter press.

PROCESS OPTIMIZATION

- Filter press operation is driven by process parameters, such as
 - Pressure
 - Temperature
 - pH level
 - Dry substance
 - Throughput

MECHANICAL INNOVATIONS

- Tilt sensors for shifting plates
- FEM-proven (finite element method) and optimized frames

INTELLIGENT FILTER PRESS

PREDICTIVE MAINTENANCE

- Additional sensors to support predictive maintenance
 - Oil quality
 - Filtrate quality
 - Pressure monitoring

INDUSTRIAL DIGITALIZATION

- Metris addIQ control system
- Metris SmartFILTERCLOTH
- Intelligent cloth washing
- Artificial intelligence applications

Benefits

- Increased capacity by optimizing cycle time
- Optimized process parameters
- Just-in-time detection of batch faults
- Ensuring ideal process conditions for downstream equipment
- Increased process reliability thanks to quality monitoring features
- Optimized productivity for filter press plants

Intelligent packages to improve your filter press and process

Freely configurable according to your needs.

Metris addIQ control system

FILTER PRESS PACKAGES

Intelligent cloth washing

*

PO

Hydraulic closure monitoring

PO

Hydraulic oil quality monitoring

QM

PROCESS PACKAGES

Lenser filter element

*

CTO

Metris addIQ piston stroke control

*

CTO

Metris addIQ load cells

CTO

FREELY
CONFIGURABLE
ACCORDING TO
YOUR NEEDS

FURTHER OPTIONS (READ MORE ON PAGE 16 AND 17)

**Metris
addIQ
Connect**

**Metris
addIQ
Monitoring**

**Metris
addIQ
Optimizing**



**Metris
SmartFILTERCLOTH**

FCM

CTO

**Cycle time
optimization**

QM

**Quality
monitoring**

PO

**Process
optimization**

ACE

**AI
tool**

FCM

**Filter cloth
management**

*** Metris addIQ
Optimizing**



**Filtrate
quality
monitoring**

QM

**Metris addIQ
ACE for
filter presses**

ACE

Feed monitoring

**Mandatory for
process optimization**

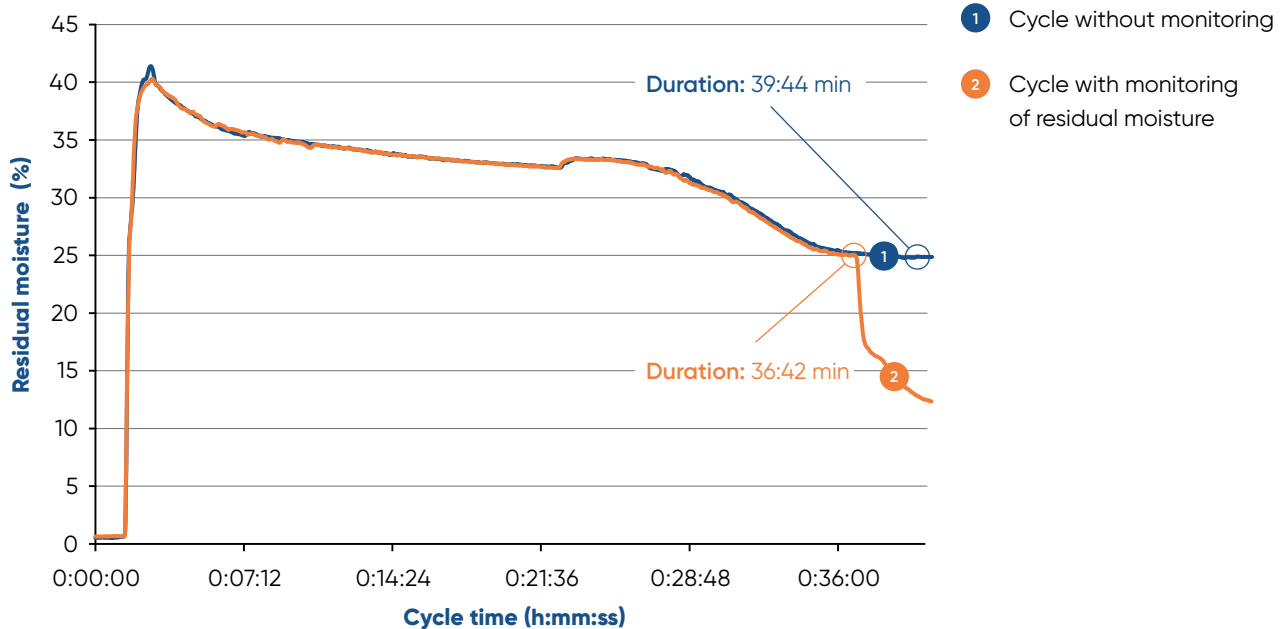
PO

Efficient cycle time management

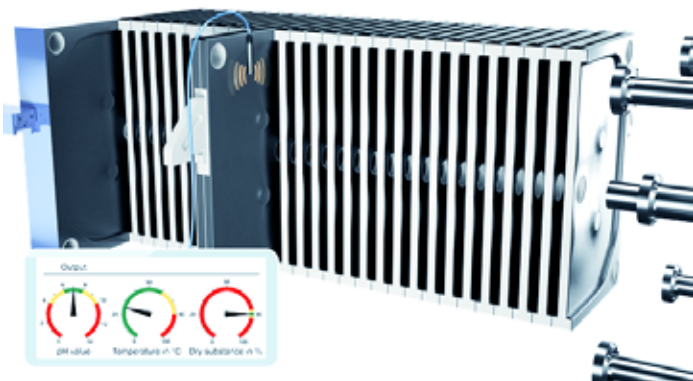
LENSER FILTER ELEMENT

Process operation is optimized by means of sensors integrated into the filter element. Consequently, the cycle time is optimized because appropriate measures are triggered automatically when nominal target values are reached.

ANDRITZ has created a logical link between material feed, filtration pressure, and residual moisture target value. Filtration is stopped automatically when target values are reached. This system guarantees that the filtration process always runs under optimum conditions.



Cycle time comparison (example of a filtration process within a mining and minerals application)



Intelligent Lenser filter element

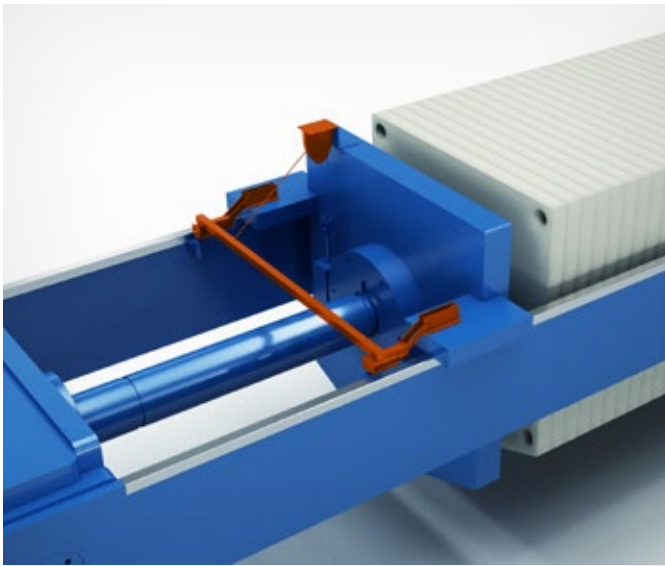
Benefits

- Filtration time reduced by up to 20% due to optimized cycle time
- Maximized production capacity and productivity
- Reproducible process results
- The filtration process always runs under optimum conditions
- Flexible adjustment of target values possible
- Optimized energy consumption



METRIS addIQ PISTON STROKE CONTROL

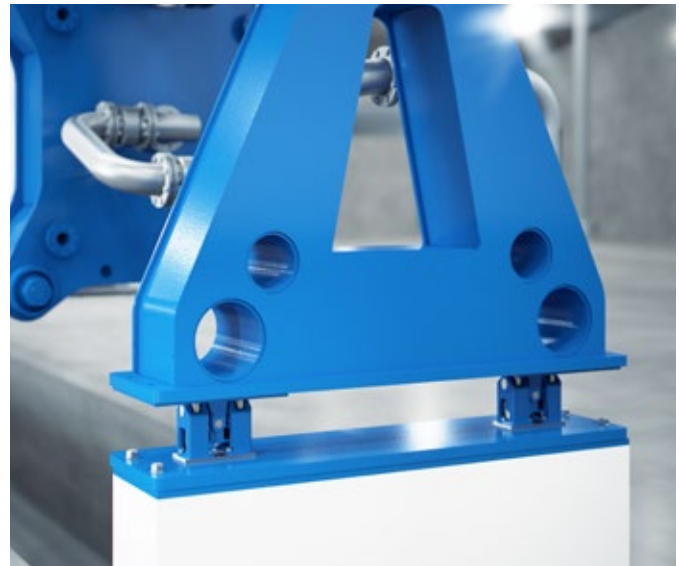
A cycle time reduction of up to 40% can be realized with the Metris addIQ piston stroke control system. The system is available for sidebar and overhead filter presses. Overhead filter presses use an electronic system, while sidebar filter presses have a mechanical piston stroke shortening device.



Mechanical piston stroke shortening device for sidebar filter presses – down position to reduce cycle time and keep shifting plate aligned

METRIS addIQ LOAD CELLS

Metris addIQ load cells for filter presses measure the initial weight of the filter press and monitor it throughout the entire filtration process. By applying the Metris addIQ control system, the cycle time is optimized for every batch, keeping the overall cycle time to an absolute minimum.



Metris addIQ load cells optimize the cycle time for your filter press – for every batch

Benefits

- Shorter cycle time
- Increased capacity
- Easy to retrofit

Benefits

- Reduces cycle time
- Extends the lifetime of wear parts in the feed system
- Better results can be replicated time after time

Guaranteed asset management

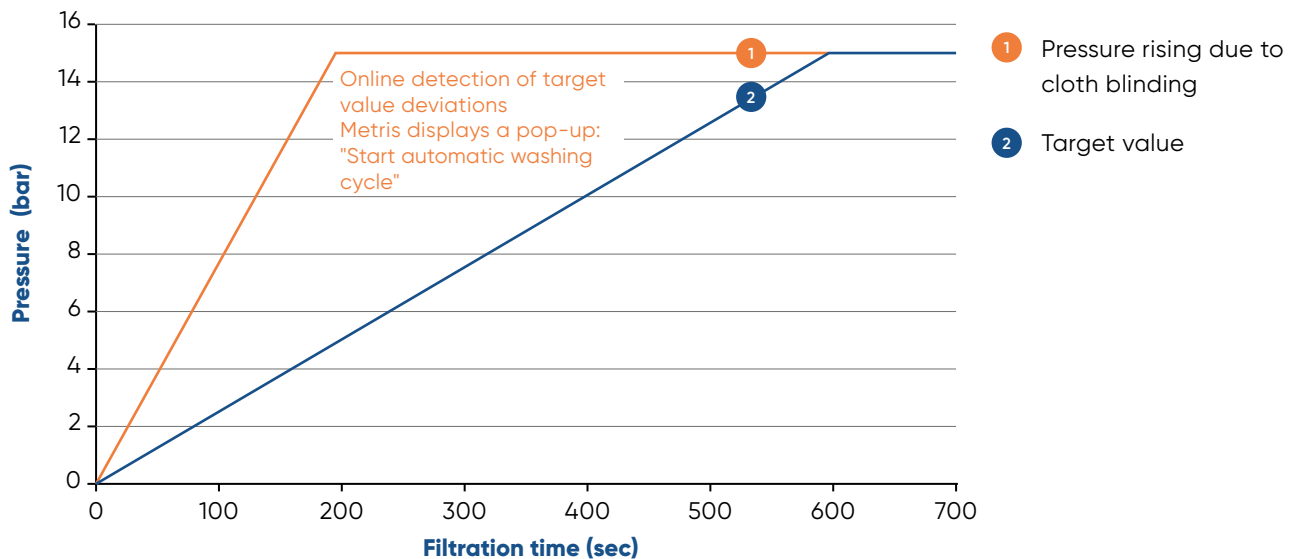
INTELLIGENT CLOTH WASHING

The intelligent filter press features a sensor that has two functions performed by the deviation of shifting plate angle from nominal values and the pressure rise during the filtration process:

Online safety monitoring of movable parts: If the system detects deviations from nominal values, the filter press is stopped automatically. This action ensures operating safety.

Online monitoring of the plate package: If the measurements taken deviate from nominal values, the system provides a recommendation to the operator to conduct an automatic washing cycle. In addition, the intelligent filter press detects any deviations from nominal pressure at the beginning of the filtration process and proposes an automatic washing cycle:

- Monitoring of filter cloth performance
- Keep capacity/throughput at highest level
- Cloth washing on real demand



Online pressure monitoring

Benefits

- Up to 20% longer lifetime of your filter cloth
- Filter press operates under optimum mechanical conditions
- OPEX optimization due to cloth washing on real demand
- Greater operating safety because sealing areas are cleaned
- Less operator supervision needed

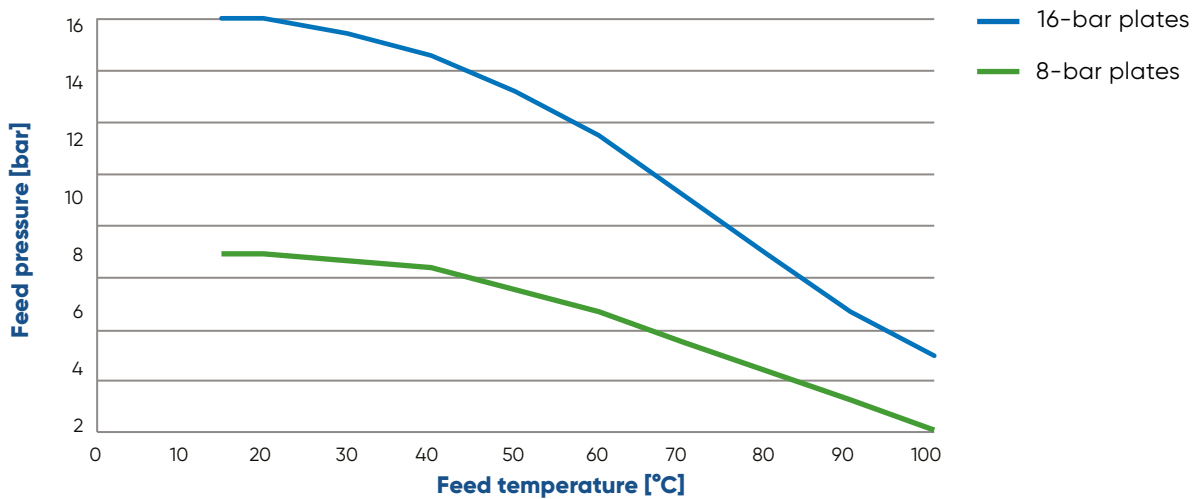
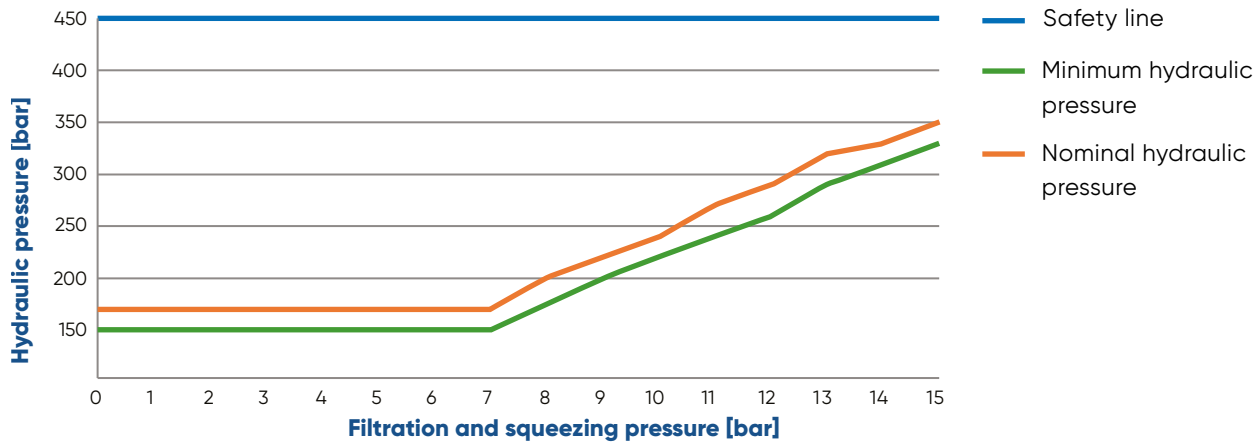


Washing device

HYDRAULIC CLOSURE MONITORING

Usually, the pressure is always set to the highest level, which means greater mechanical stress on the filter plates and cloths. Besides that, the hydraulic power pack needs more

energy and is less reliable. Hydraulic closure monitoring sets the hydraulic oil pressure to optimal values according to feed temperature and feed pressure for increased process safety and optimal operating conditions.

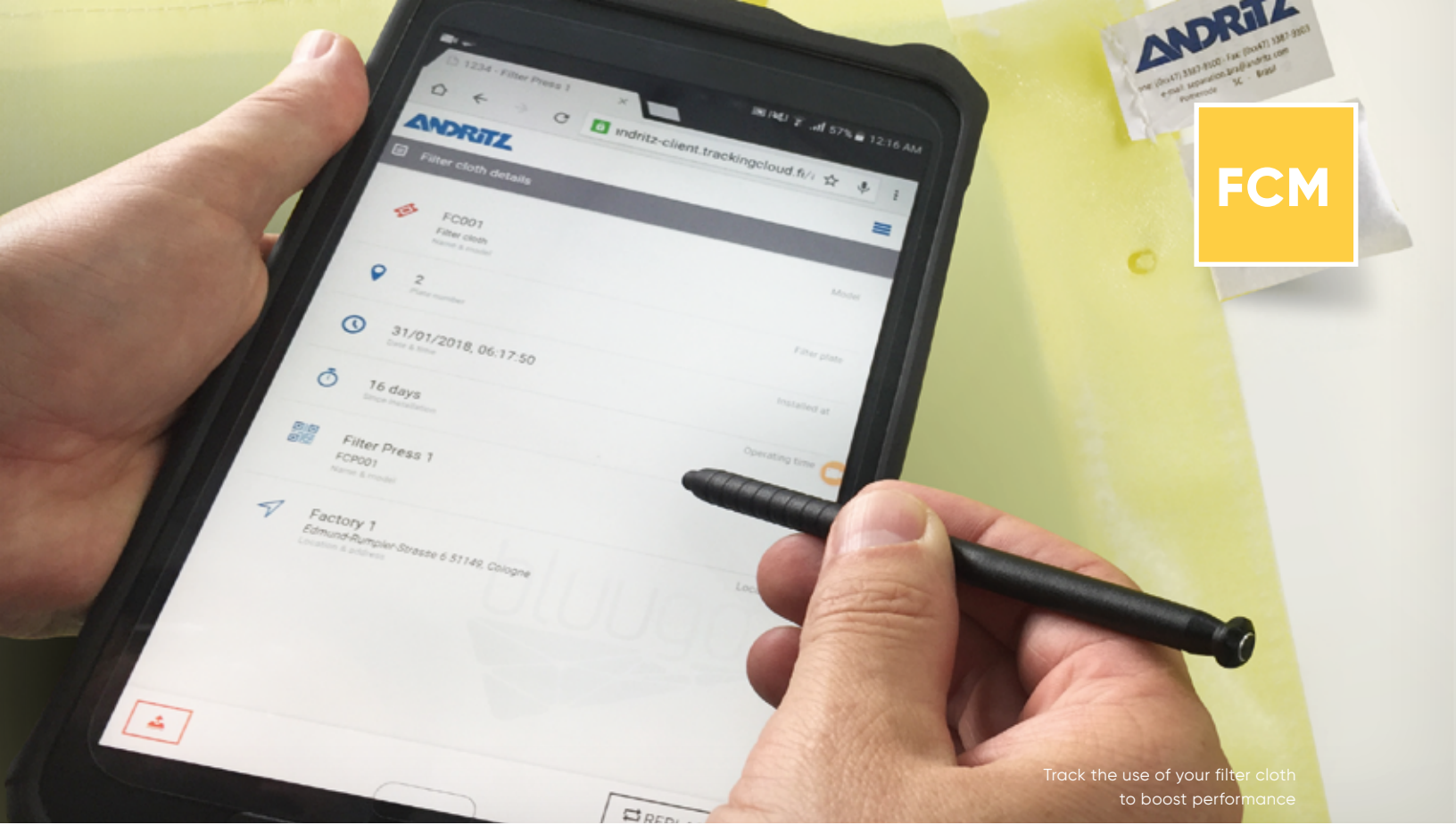


Depending on process temperature, the feed pressure is controlled by a high-fidelity control algorithm

Benefits

- Prevents inadmissible operating conditions for polypropylene (PP) filter plates
- Increased lifetime of filter plates and cloth
- Minimized risk in hazardous environments because there is no contamination





Track the use of your filter cloth to boost performance

Boost performance with filter cloth management

METRIS SmartFILTERCLOTH

Metris SmartFILTERCLOTH is a tracking system that helps you to monitor the use of your filter cloths. This increased transparency of filter cloth use helps to optimize the process and your equipment's availability. Metris SmartFILTERCLOTH is a system consisting of an RFID chip that is tagged to each cloth and a user-friendly software package. The machine operator can track the use of and document any damage to the cloths on a tablet PC. The data collected by the system and your operator will allow your ANDRITZ specialist to develop solutions and recommendations to make your machine and process perform better.

Benefits

- Precise monitoring of filter cloth lifetime
- Recording of filter cloth damage for troubleshooting purposes
- Predictive maintenance for optimized planning and maximized uptime

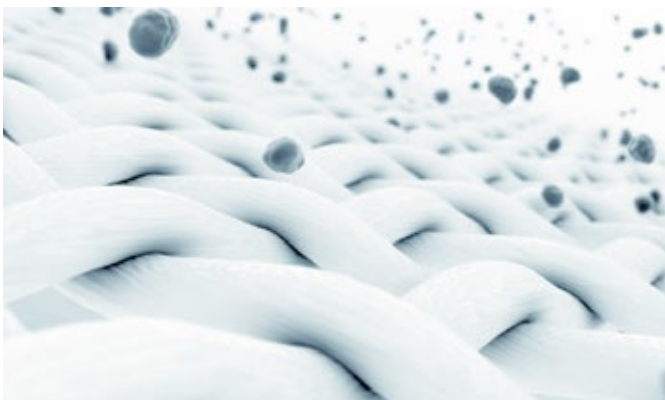
High-level supervision with quality monitoring

QM

The system is able to detect quality losses in hydraulic oil and filtrate in real time and informs the operator accordingly. Hence, there is no damage to cylinders and hydraulic components, and filtrate contamination is prevented.

FILTRATE QUALITY MONITORING

Filter cloth damage is the main cause of filtrate contamination. When filter cloths are damaged, particles may enter the filtrate. A sensor monitors particles as a source of contamination in the filtrate. Damage can be detected by automatic filtrate analysis. The quality of filtrate is displayed online via an HMI with intuitive design. Particles in filtrate flow are measured to increase process safety by detecting cloth damage and overfilling of the filter press.



Real-time online monitoring of filtrate quality

HYDRAULIC OIL QUALITY MONITORING

The intelligent filter press measures any deviations in oil quality (water content, particles, and temperature) to prevent water in oil (generating corrosion) and contaminant particles in oil (causing damage to valves and cylinders).



Guarantee sustainable oil quality

Benefits

- Avoid further damage to cloths, plates, and peripheral equipment
- Additional warning in case of overfilling
- Ensure good filtrate quality

Benefits

- Longer lifetime of hydraulic power pack
- Self-supervising filter press for predictive maintenance
- Oil changes on demand
- Greater operating safety (less wear)
- Corrosion protection for the oil system thanks to moisture sensor

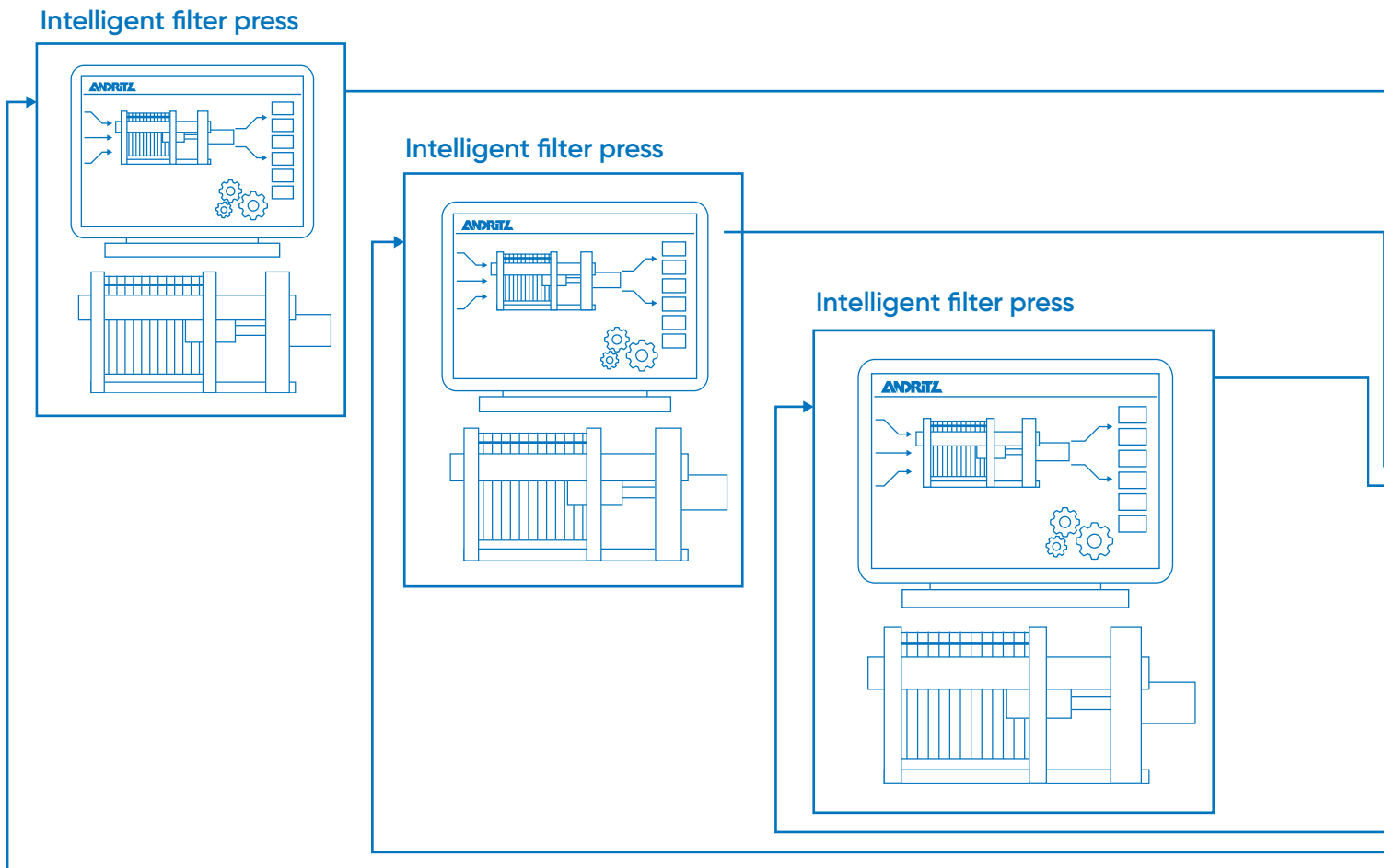
Highest performance with optimized, multiple filter press lines

METRIS addIQ ACE FOR FILTER PRESSES

In operations with multiple filter presses, operators make decisions on when is the best time to take one of the machines out of operation for washing or cloth change. This decision affects overall production and water consumption. At this level, operators need to consider the efficiency of filtration operations as a whole. When there are more than four filter presses in the plant, it can be very complex to maintain an overview of the entire operation. Operators

have to consider many aspects of the operation constantly, such as bottlenecks in throughput, availability of water, and the operating status in upstream and downstream equipment. Metris addIQ ACE for filter presses, part of Metris addIQ Optimizing*, considers all the aspects mentioned, automates the decision-making process, and optimizes the entire filter press operation – uniformly and holistically. ANDRITZ has equipped Metris addIQ ACE for filter presses

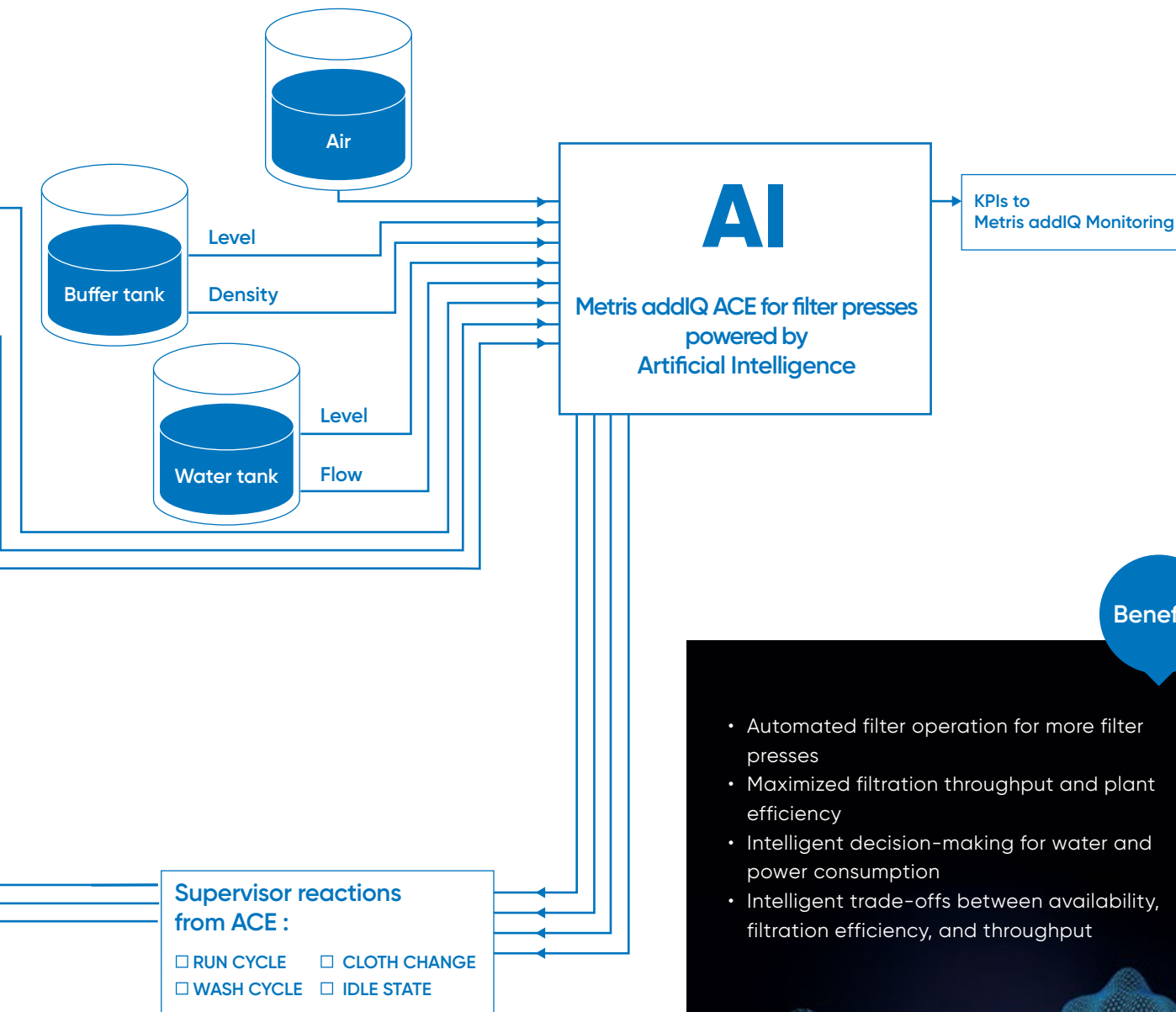
Metris addIQ control system



* More information on Metris addIQ Optimizing can be found on page 17

with Artificial Intelligence technology for the needs of each filter press so that each machine is aware of what is happening throughout the operation. This system takes the efficiency of each filter press into account, collects information from upstream and downstream operations, and makes intelligent decisions to maximize production throughput, minimize water consumption, and increase

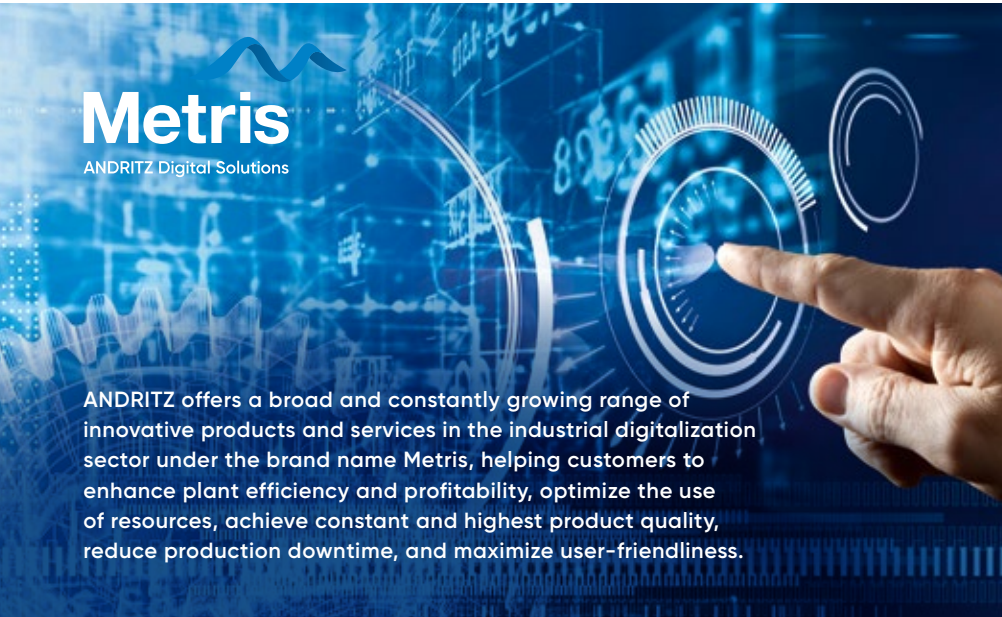
overall filtration efficiency. Metris addIQ ACE for filter presses looks at the operational management of the filter presses as a complete system, thereby also optimizing the ancillary equipment, such as feed pumps, to ensure such conditions as excess power consumption are avoided.



Benefits

- Automated filter operation for more filter presses
- Maximized filtration throughput and plant efficiency
- Intelligent decision-making for water and power consumption
- Intelligent trade-offs between availability, filtration efficiency, and throughput

Intelligence for machine and process control



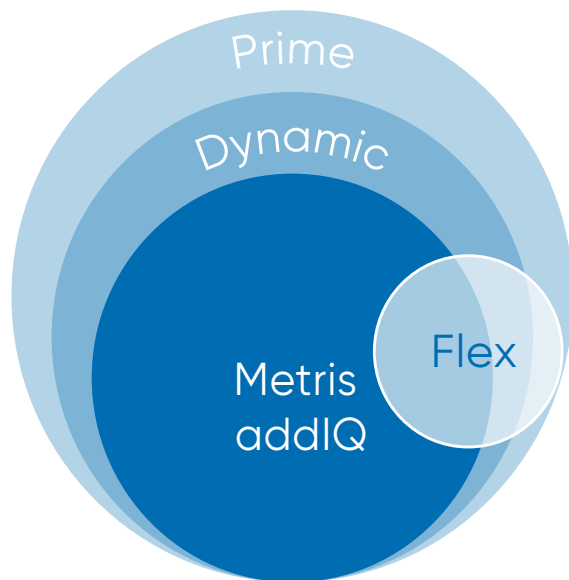
Metris addIQ control systems

With Metris addIQ, you have a well-proven, intelligent control solution for industrial processes and machines. Our solid/liquid separation specialists use their in-depth expertise to provide scalable solutions that are individually tailored to regional and application requirements. Whether you're automating new equipment or upgrading to extend the lifecycle of existing systems, we find the ideal solution for you.

Metris addIQ for filter presses, a reliable and innovative control system

Metris addIQ combines all our extensive operation, troubleshooting, and start-up experience in one tailored automation solution. The Metris addIQ control system is a unique automation product. Its nucleus is a modular, PLC-based control system that supports you in making best

use of your filter press. In combination with add-ons and upgrades, the Metris addIQ control system maximizes your machine performance regardless of whether you are using ANDRITZ filter presses or other makes.



Stages of expansion to meet your needs

The Metris addIQ control system is available in different packages according to individual needs. The packages available include addIQ Dynamic, addIQ Prime, and addIQ Flex.

METRIS addIQ DYNAMIC

- Monitoring and control of machine and machine auxiliaries
- 10" panel PC touchscreen as standard, upscaling possible
- Advanced control and optimization functions

METRIS addIQ PRIME

- Full-line control system
- Remote access (Metris addIQ Connect)
- 15" panel PC touchscreen as standard
- Metris addIQ Monitoring
- Metris addIQ Optimizing (optional)
- High-end trending and diagnostic functions

METRIS addIQ FLEX

The most flexible solution is Metris addIQ Flex. Scope of control and technical specification can be customized to a large extent. Each package has individual specifics that are directly connected to the type of filter press with which it is to be used.

EX

The Metris addIQ control system is also available in an EX version. The EX automation system is the ideal option for processes meeting hazardous area classification requirements.

Benefits

- Easy integration into existing or new lines/plants, ensuring a short start-up time
- High availability and good performance in operation for all filter press-related functionalities
- Avoids downtime by using preventive maintenance alarms and intuitive machine interface – peace of mind due to machine automation
- Ready for remote support to guarantee short response times (Metris addIQ Connect)
- Process improvements where applicable
- Metris addIQ control systems open the door to all future IIoT solutions

Metris addIQ Monitoring to keep your machine "healthy"

Among all Metris addIQ control system options available for your filter press, Metris addIQ Monitoring can monitor the health status of your machine 24/7 from anywhere in the world.

FEATURES

- Present the most important KPIs for process values on the dashboard
- Store trend data for 24 months
- Logbook functionality for the maintenance and operations team

BENEFITS

- Highest transparency of your assets

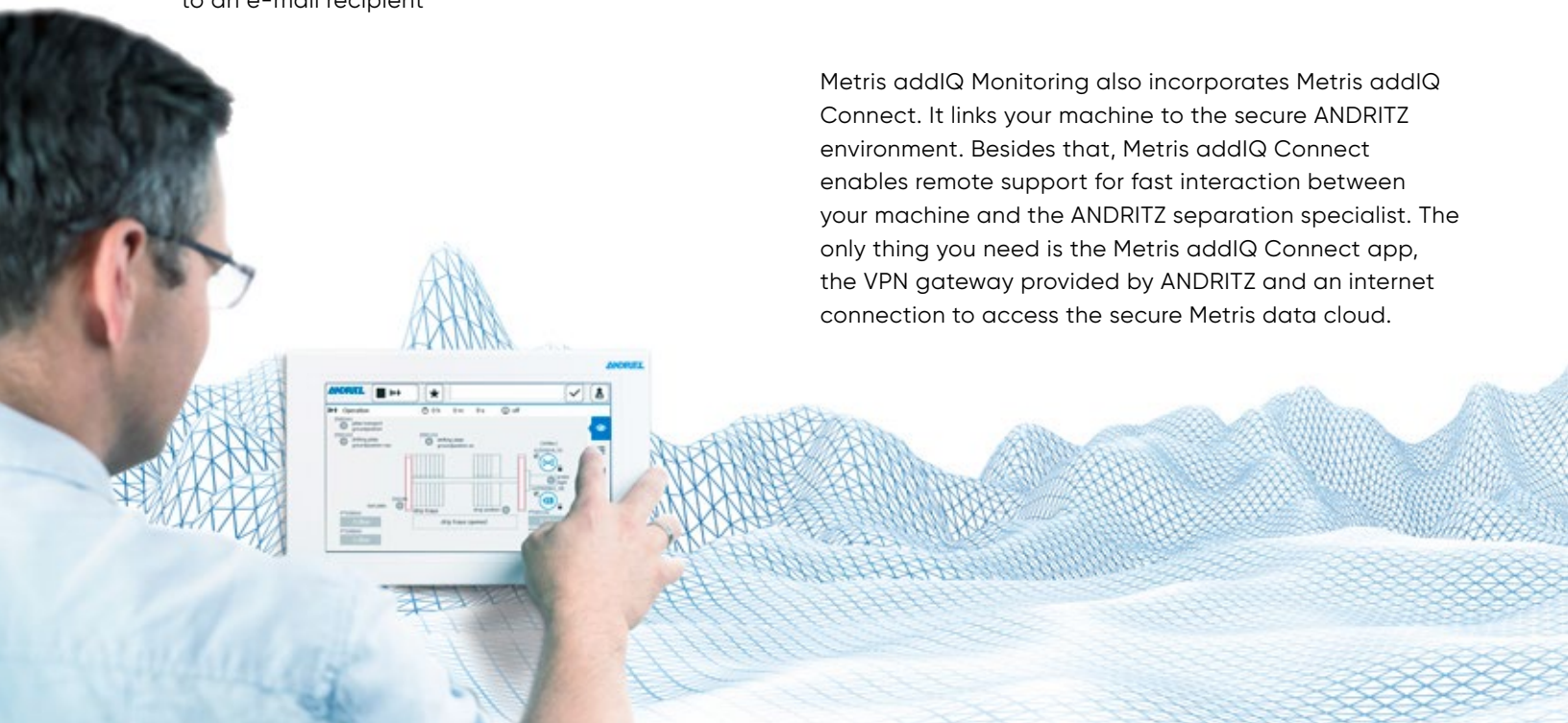
- Direct access to process live data and to machine-related documentation with the mobile app, either via the secure Metris data cloud or on local servers
- Automatic e-mail notifier for the most critical process alarms

- Information provided where useful

- Generate automatic reports (every shift, every day, every month) with process values and corresponding trend curves to an e-mail recipient

- Personalized reports

Metris addIQ Monitoring also incorporates Metris addIQ Connect. It links your machine to the secure ANDRITZ environment. Besides that, Metris addIQ Connect enables remote support for fast interaction between your machine and the ANDRITZ separation specialist. The only thing you need is the Metris addIQ Connect app, the VPN gateway provided by ANDRITZ and an internet connection to access the secure Metris data cloud.



Metris addIQ Optimizing for stabilized and increased production

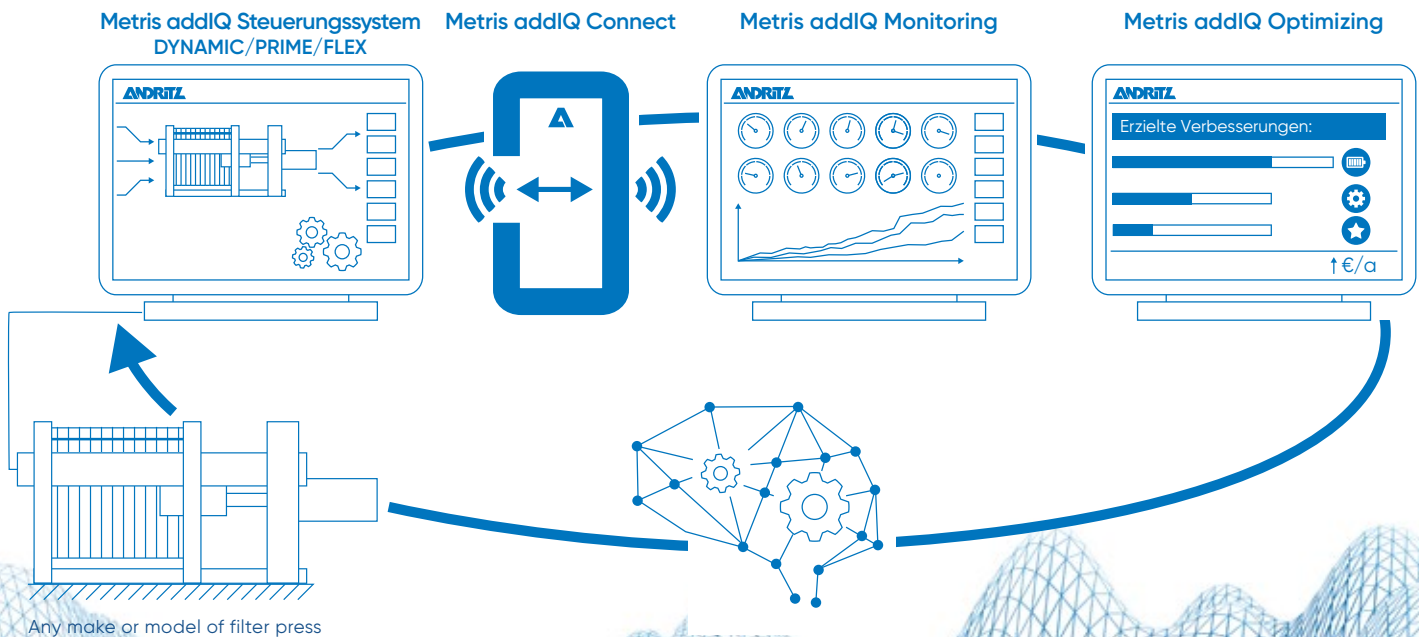
Metris addIQ Optimizing identifies opportunities in your equipment to save money and also to stabilize and increase production.

FEATURES

- Human interpretation by ANDRITZ process specialists (where applicable)
- Identifies improvement and savings opportunities
- Statistical analysis of control effectiveness available at the push of a button
- Prediction of failure in specific equipment

BENEFITS

- Reduced energy and chemical costs
- Increased total production
- Higher plant availability
- Improved process stability





ANDRITZ

Put our 150 years of OEM experience to work for you

Need to optimize your process? Boost availability? Ensure non-stop productivity? When you work with ANDRITZ, you gain access to one of the world's largest OEM manufacturers for solid/liquid separation. Put our in-depth knowledge of separation equipment and processing to work for you.

VAST EXPERIENCE THROUGH LARGE INSTALLED BASE

With an installed global base of more than 55,000 solid/liquid separation machines and systems, you can imagine that we take service seriously. Wherever these customers are located, we work very closely with them to maximize uptime and boost efficiency.

WELL-KNOWN OEM BRANDS

Some customers know us as the people with ANDRITZ on our overalls. Others have come to understand that we are the OEM behind former brand names like 3Sys Technologies, Bird, Delkor Capital Equipment (Pty) Ltd., Escher Wyss dryers, Frautech, Guinard Centrifugation, KHD Humboldt Wedag, Krauss-Maffei centrifuges, dryers, and filters, Lenser, Netzsch Filtration, Rittershaus & Blecher, Royal GMF Gouda, Sprout Bauer, and Vandenbroek – all companies that have been acquired by ANDRITZ. But frankly, we are capable of servicing and supplying spare parts for nearly all brands of solid/liquid separation equipment on the market.

LOCAL SUPPORT BACKED BY GLOBAL EXPERTISE

Our service philosophy is simple: One phone call, one contact person, one dedicated team that speaks your language and knows your equipment and process. This is not an empty promise. It is backed by a network of 550 service specialists for separation equipment and systems as well as service centers all around the world.

A TRUE FULL-SERVICE PROVIDER

Whether you need spare parts, rentals, local service, repairs, upgrades, or modernization of your equipment, ANDRITZ is your service specialist in all aspects of separation. From initial consulting through to service agreements, process optimization, and training programs, we are always looking for ways to minimize downtime and increase predictability in operations while raising your overall production efficiency. In short, we've got you covered.



LOCAL SUPPORT

Responsive local service centers and field service technicians



REPAIRS & UPGRADES

Optimization of machine and process performance, repair work, retrofitting, and modernization



SECOND-HAND & RENTALS

Certified second-hand and rental machines



TRAINING

Operator training and tailored seminars for operating and maintenance personnel



OEM SPARE PARTS

Filter cloths, spare and wear parts from OEMs or with OEM level quality, all readily available



SERVICE AGREEMENTS

Preventive maintenance, contracts for spare parts, maintenance, inspections, repairs, upgrades, operation, and equipment monitoring



PROCESS OPTIMIZATION

Automation tools and process expertise to boost your profit



LAB AND ON-SITE TESTS

Lab and testing capabilities for process optimization and machine upgrades





WHAT'S YOUR SEPARATION CHALLENGE?

ANDRITZ Separation is the world's leading separation specialist with the broadest technology portfolio and more than 2,000 specialists in 40 countries. For more than 150 years, we have been a driving force in the evolution of separation solutions and services for industries ranging from environment to food, chemicals, and mining & minerals. As the OEM for many of the world's leading brands, we have the solutions and services to transform your business to meet tomorrow's changing demands – wherever you are and whatever your separation challenge. **Ask your separation specialist!**

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ANDRITZ

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