Metris
ANDRITZ Digital Solutions

FEED & BIOFUEL

FLOW COATING CONTROL

EFFICIENT POST-PELLET LIQUID APPLICATION

EFFORTLESS AUTOMATION.
TOTAL PEACE OF MIND

ANDRITZ
ENGINEERED SUCCESS

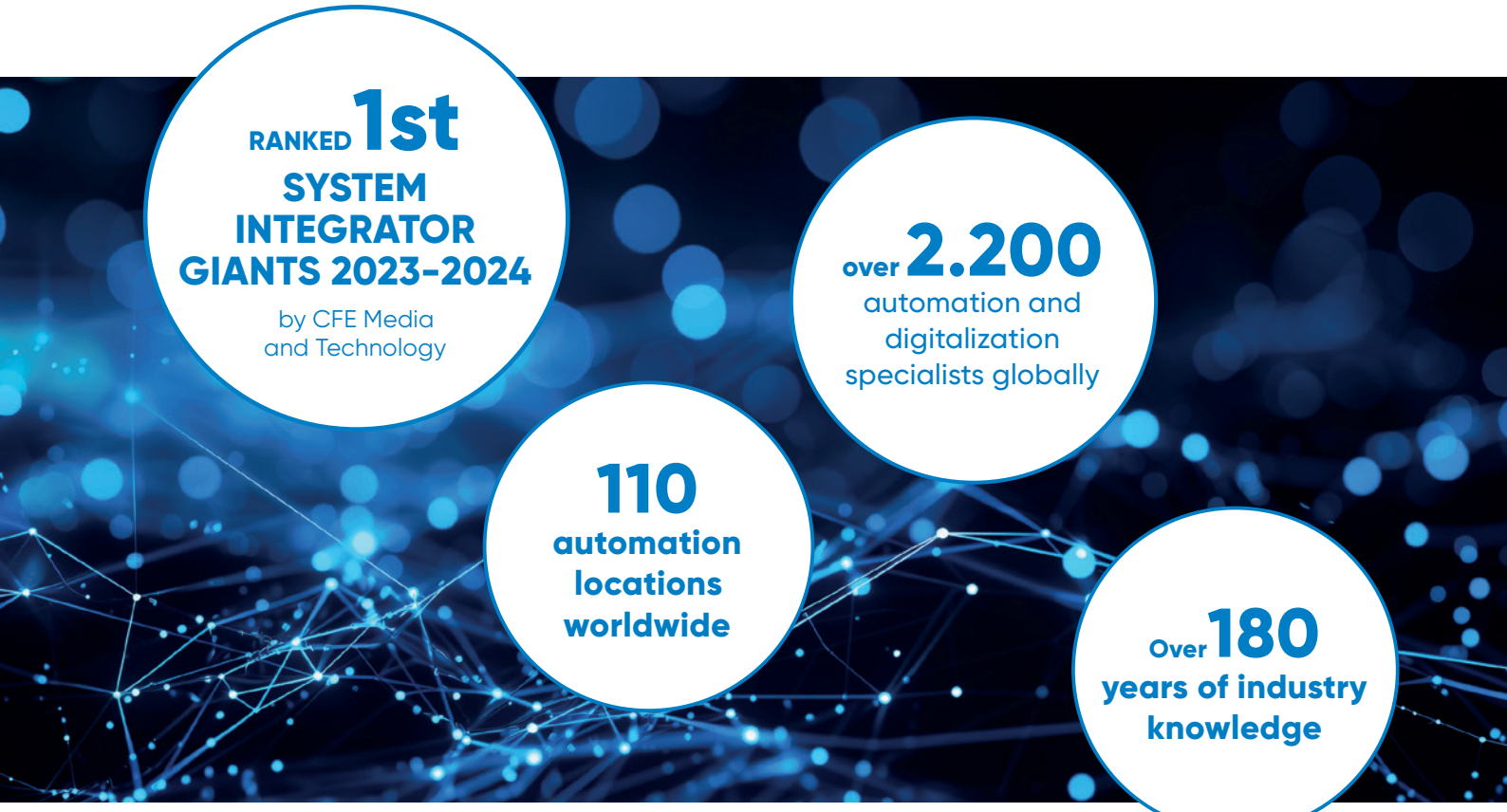
NEVER STAND STILL

At ANDRITZ, we understand the challenges the feed and biofuel industry faces today. With volatile raw material prices, emerging outbreaks, and a competitive marketplace, the need for innovative solutions has never been greater. Our Automation & Digitalization solutions, powered by the Metris Digital Platform, are designed to upgrade your operations, ensuring profitability, reducing total cost of ownership, and enhancing operational excellence.

Leveraging our 40 years of cross-sector success, our platform blends human and digital intelligence to enhance processing efficiency and support growth, while delivering 7 - 16% throughput increases.

Our solutions encompass an evolving, vendor-neutral solution supported by state-of-the-art automation and digitalization technology.

ANDRITZ will be with you every step of the way in your digitalization journey, ensuring your plant and your business **NEVER STAND STILL.**



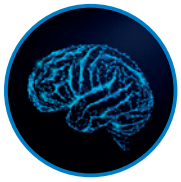
FOUR PILLARS OF SUCCESS

Through our global industry-specific expertise and deep understanding of the challenges our customers face, we deliver automation and digitalization solutions based on four key pillars.

AUTOMATION
The 'Muscle'

Achieve peak performance over the entire lifetime of your lines

The automation suite encompasses a broad spectrum of control solutions ranging from basic to fully automated systems, including production management, real-time plant simulation, condition monitoring, process optimization, and life cycle management.
These components maximize plant throughput, simplify maintenance, and optimize resource use.



DIGITALIZATION
The 'Brain'

Maximize your plant's potential while minimizing investment risk

The digitalization suite offers a holistic digital infrastructure for process optimization, asset management, operator training and knowledge management, ensuring a turnkey approach to feed and biofuel processing operations.
Our digitalization platform transforms operational data into robust, actionable analytics, maximizing your plant's potential while minimizing investment risk.

DEEP INDUSTRY EXPERTISE
The 'Heart'

Over 180 years of industry expertise and a global footprint ensure our solutions are adaptable and regionally attuned.
We preconfigure solutions based on our deep process knowledge, giving you immediate access to our know-how, our portfolio, and our service infrastructure all in one place.

AUTONOMOUS OPERATIONS
The 'Vision'

We strongly believe that the journey to autonomous operations is paved with bold steps by those who embrace every facet of automation and digitalization, turning challenges into opportunities for growth.
By taking that initial leap, you can unlock a world of possibilities. We can help you achieve a fully autonomous feed plant by 2027.

FLOW COATING CONTROL

This document is intended as a comprehensive introduction to Andritz's automation and control solutions for flow coating control and micro fluid spray systems. It provides essential insights into production control and automation and the extensive capabilities of Andritz's solutions. The emphasis is on the practical features of these solutions in various scenarios.

Flow Coating Control System

User-friendly solution designed to monitor and control all the parts and processes for micro-fluid spray systems and post-pellet liquid application. It seamlessly integrates state-of-the-art machinery and complex processes with an intuitive, easy-to-use interface, simplifying operations and enhancing planning and decision-making capabilities.

Market-proven automated control solutions trusted worldwide

OVER 75 FLOW COATING CONTROL SYSTEMS INSTALLED GLOBALLY

CUSTOMERS IN OVER 20 COUNTRIES, enhancing their operational efficiency and reliability with us

- **Unmatched Expertise:** In-depth knowledge of process automation.
- **Tested Excellence:** High-quality, industry proven solutions.
- **Plug & Play Preconfigured Solutions:** Delivering adaptable solutions for your exact needs.
- **Global Support Structure:** Prompt and effective assistance for any challenges.
- **Secure Compliance:** Upholding industry cybersecurity standards.

Effortlessly integrates into existing systems

Easy-to-use, intuitive interface

Simplifies operations

Enhances planning and decision-making capabilities

5

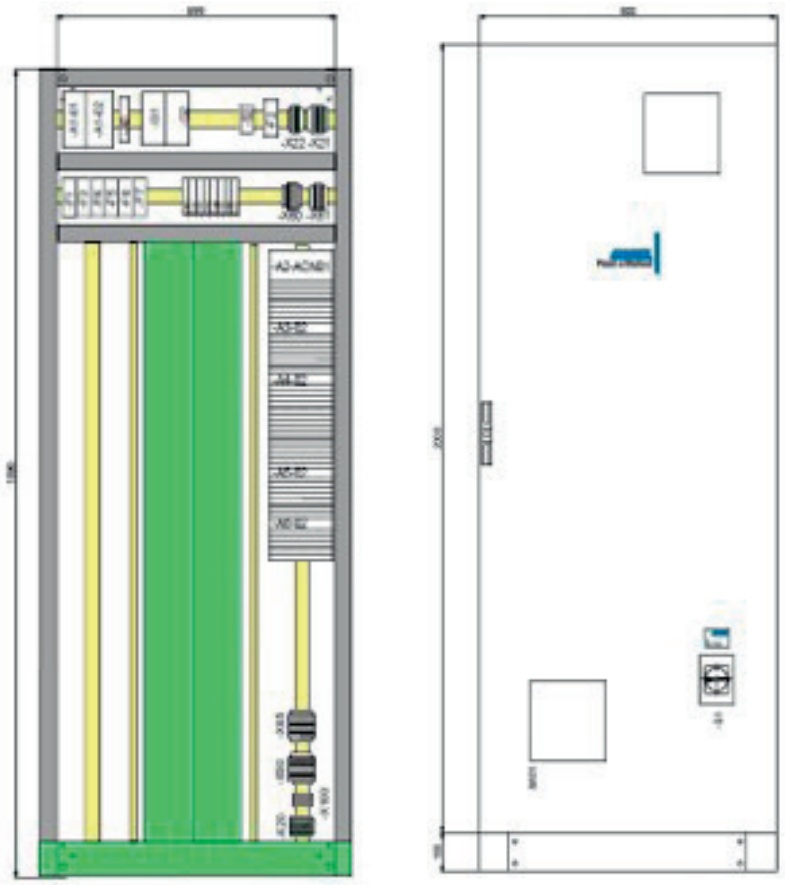
Control Options

Two distinct control systems are available to meet diverse needs: Management System and Panel System.

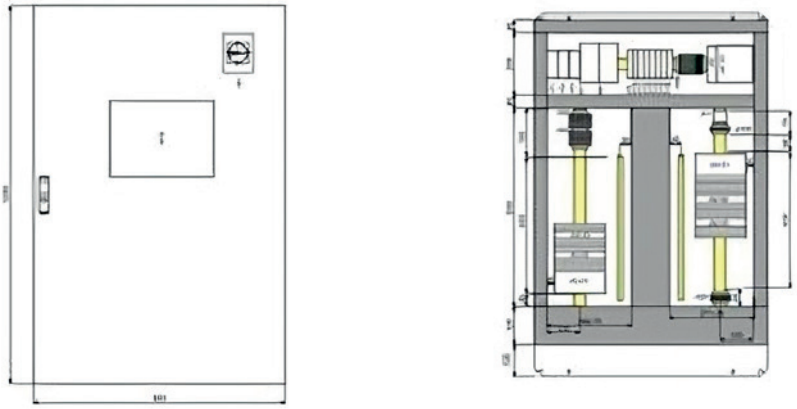
Management System is a network-based, modular solution capable of controlling up to four processes.
It supports multiple control stations, offering enhanced operational flexibility, and is designed with future scalability in mind.

Alternatively, **Panel System** is a cost-effective choice that provides an optimal balance between performance and expenditure. It includes an ergonomic user interface that displays relevant information, enabling direct monitoring and control of manufacturing operations. It also supports add-ons, offering flexibility to adapt to evolving needs.

Both systems are designed with a focus on operational success, offering control, flexibility, and growth potential.



Management system



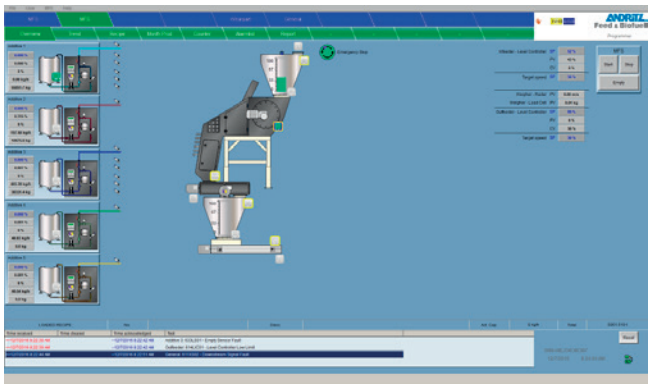
Panel system

Management system

Management System is a modular system specifically designed to manage ANDRITZ Feed & Biofuel production machines or parts of a production line. It can also be configured to interface with third-party machines. This system enables remote monitoring and control of the entire process from a control room. Furthermore, it provides additional control options and configurable parameters directly from the interface. This makes it an excellent choice for comprehensive operation and maintenance insights.

SYSTEM DESCRIPTION

Management system, centered around a PLC based system, manages all machine electrical signals, and communicates with a computer running the Scada system via Ethernet. Scada allows process monitoring, management, and data storage for future access. It's network-based, allowing multiple clients to connect to the same server, enabling multiple control stations.



FEATURES

- **Extensive Human-Machine Interface:** Management System's Overview tab offers an intuitive, comprehensive graphical interface. It provides a color-coded visual representation of the entire installation and all its components, allowing for real-time status monitoring. The interface is designed for direct control, with fields for adjusting Recipe parameters and displaying current values.
- **Efficient Control:** Auto Start and Auto Stop execute preprogrammed steps to make sure the machines start in the correct order. Step Start and Step Stop offer granular control, initiating or halting individual steps as needed.
- **Flexible Management Options:** The system provides three user levels - Operator, Maintenance, and Programmer, each with unique access for efficient operation, configuration, and testing.
- **Real-Time Connection Monitoring:** The system provides instant visual feedback on the PLC connection, ensuring seamless operation and immediate fault detection.
- **Detailed Component Insights:** Clickable objects on the overview screen open pop-up windows, providing in-depth information about motors, valves, and controllers. This feature allows for manual control of the individual components.
- **Dynamic Trend Analysis:** Management System provides trend curves for numerous variables, offering insights like temperature, speed, and retention time. This feature aids in monitoring system performance and making informed decisions.
- **Event logger:** The system logs its events, enabling backtracking and comparison of current process parameters with past ones for comprehensive process review and analysis.

Panel System

Panel System is a standalone, cost-effective solution that is installed in the field near the machines. The system includes a PLC, a panel PC and this approach reduces costs and complexity. It doesn't offer remote control, but instead prioritizes direct, localized control. The system is adaptable, allowing for future additions. It's designed for smaller operations, providing real-time control and data collection from process functions.

SYSTEM DESCRIPTION

Panel System consists of a wall mounted panel with a 12" touchscreen computer and a PLC with input and outputs. It is Ethernet-based and has a 5-port switch where all network units are connected.

FEATURES

- **Interactive Display:** This feature offers a graphical representation of your setup. It includes a control section for line operation and an alarm bar. It allows access to pop-ups for adjustments via touchscreen inputs. The display aligns with your system configuration, mirroring the actual installation managed by Panel System.
- **Function-Based Control System:** The system utilizes a function block-based approach, enhancing process visibility and allowing more granular control. It supports various functions and allows simulations, for testing the functionality of the program.
- **Interactive Function Pop-ups:** Clickable functions open configurable pop-ups, providing detailed information and allowing parameter adjustments. Color coding offers immediate visual feedback, enhancing user control and system understanding.
- **Trend Displays:** The system features trend displays, showing parameter development over time. This powerful tool aids in tuning PID controllers and analyzing process issues, enabling efficient problem-solving and system optimization.
- **Historic Alarm List:** Tracks all past alarms, aiding in process analysis and understanding system behavior.
- **Analytics indicator:** Showcases key metrics such as work hours, production quantity, and software version.

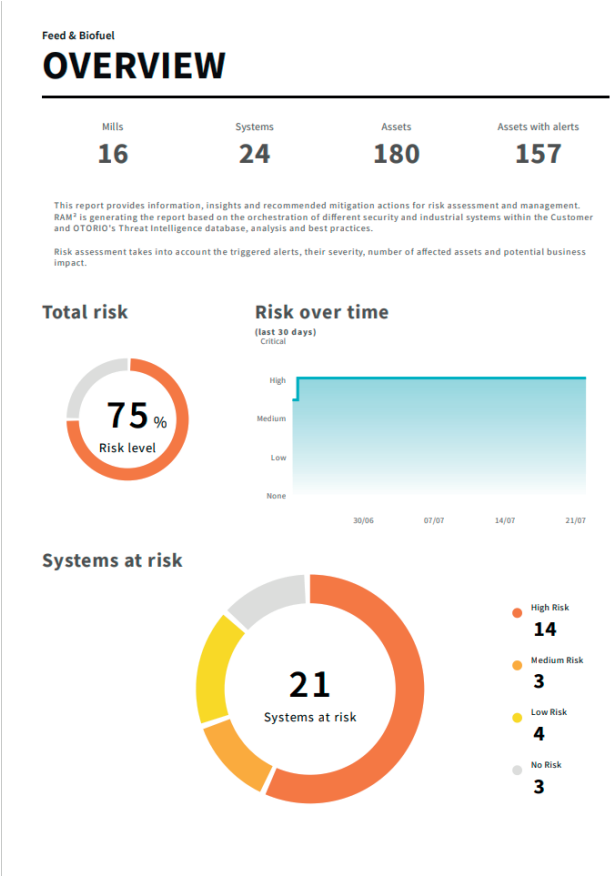
Cybersecurity Offerings

THE CYBERSECURITY PROBLEM

The digital revolution has boosted operational efficiency but also heightened cyber-attack risks. Such attacks, now common across sectors including feed and biofuel, pose significant threats.

IMPACT OF CYBERATTACKS

Cyberattacks are highly destructive. These attacks disrupt supply chains, halt production, and affect operations, leading to significant losses. On average, a cyber-attack causes a 5-day production halt, costing approximately $4.47 million.



OUR SOLUTION

ANDRITZ helps its global customers minimize digital and cyber risks through its partnership with leading OT security provider OTORIO. ANDRITZ provides combined, advanced cybersecurity and automation options integrated into its systems, safeguarding operations against cyber threats and disruptions, ensuring smooth, uninterrupted production.

STANDARD PLATFORM - OTORIO spOT™

ANDRITZ utilizes spOT™, a unique technology developed by its OT security partner OTORIO. spOT™ is an integral part of the machine delivery and quality procedures, supporting system hardening. By checking the full machine against the relevant IEC62443 / NIST / NERC standards or additional standards required by customers, spOT creates a cyber security "machine fingerprint" and automatically generates machine-specific IEC compliance letters.

FEATURES

Andritz conducts factory acceptance tests for all equipment. With Otorio spOT integration, these processes become less time-consuming and more cost-effective, ensuring that products meet all required standards before shipment.

- All equipment delivered by Andritz, including Windows PCs and servers, is IEC62443 compliant helping organizations understand and mitigate system risks.
- Comprehensive complaint reports are provided for all Windows PCs and servers, keeping you informed about your system's security state.

OPTIONAL FEATURES:

- **Updating the equipment with new patches:** Regular updates are crucial for maintaining the security and functionality of your equipment. They help to fix vulnerabilities, improve performance, and add new features.
- **Implementing additional hardening, per spOT's security overview and compliance reports:** Hardening your systems can significantly enhance your security posture. It helps to reduce system vulnerabilities and protect against potential threats.

ADDITIONAL OPTION - OTORIO RAM²

Otorio RAM² is a distinct, advanced OT cybersecurity platform for organizations looking to further invest in their cybersecurity governance. It integrates seamlessly with existing systems, serving as an overlay or standalone solution for industrial control systems (ICS) and cyber-physical systems (CPS). Please note that the platform would be a separate acquisition on the part of the customer.

FEATURES

Unparalleled Visibility: RAM² orchestrates data from cross-domain sources, providing a consolidated view of your entire operational network. This feature makes monitoring and risk management more efficient and proactive.

- **Correlated insights:** RAM² correlates data from various sources, reducing noise and providing actionable "insights". This enhances focus and effectiveness in threat response.
- **Non-intrusive attack simulations:** With the help of cyber digital twin technology, RAM² forms a virtual duplicate of your OT network. This allows security teams to simulate potential breaches and attacks, helping to foresee and prepare for possible threat paths.
- **Integrated overlay:** RAM² can be used as an overlay or a standalone OT security solution, maximizing ROI from your existing operational security stack. This feature prevents downtime and financial losses.
- **Powerful noise reduction:** RAM² reduces unimportant and irrelevant alerts by up to 80%, eliminating alert fatigue and making sure that genuine threats are not obscured.

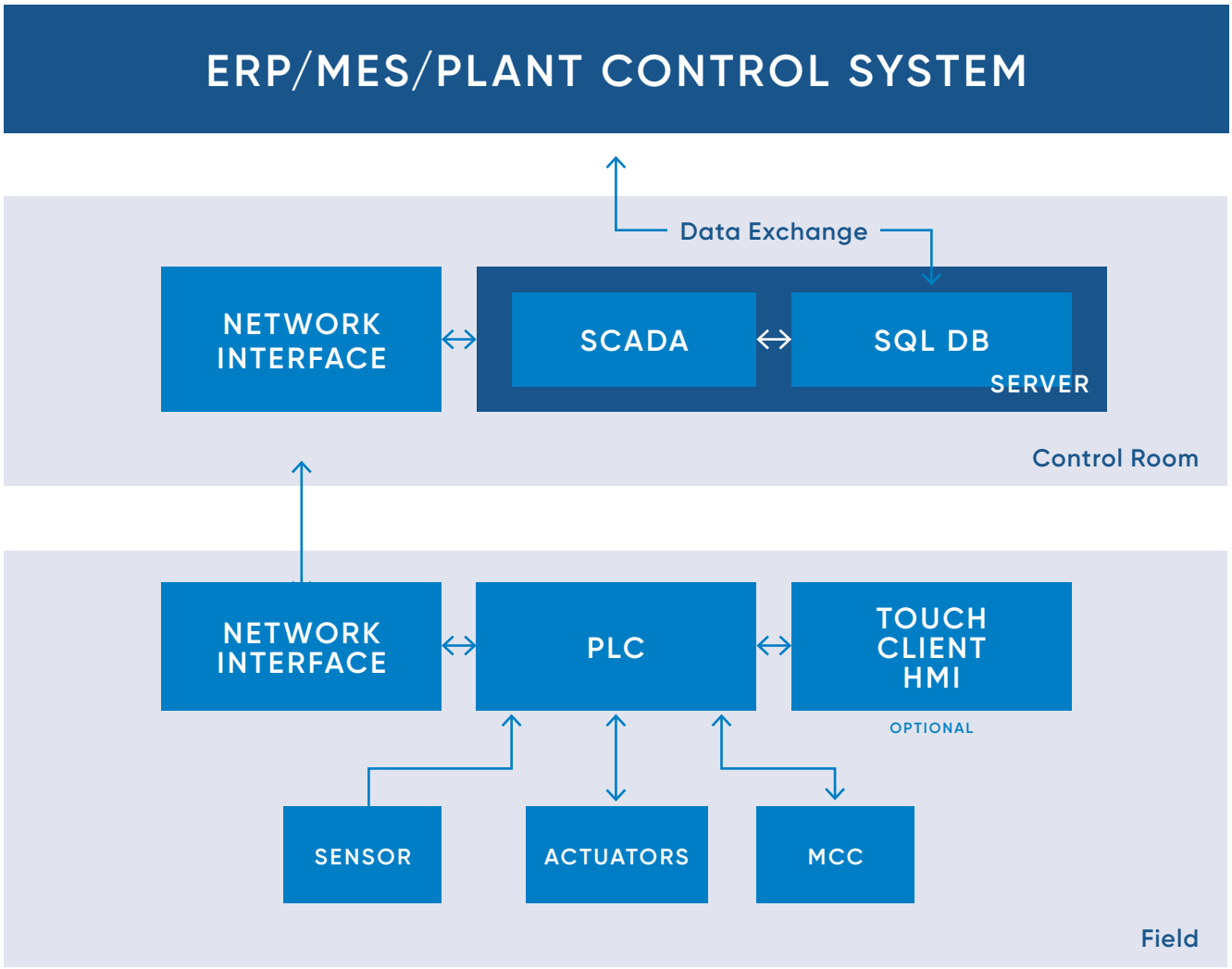
WHAT IS THE RIGHT CHOICE FOR YOU?

- **Otorio spOT:** for a strong security foundation in your operation. Otorio spOT ensures essential protection, provides on-demand reports, and is a cost-effective solution offered by Andritz.

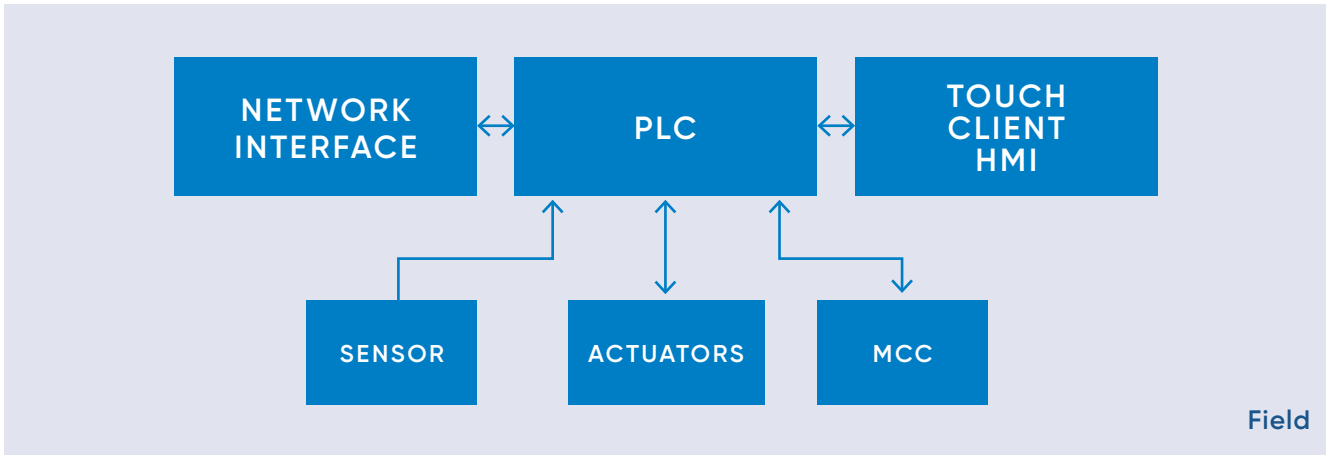
- **Otorio RAM²:** if you wish to create an enterprise-wide security strategy, have preexisting cybersecurity options that can be integrated, and desire total and comprehensive control and monitoring of your cybersecurity., Otorio RAM² is ideal. It integrates with existing systems, maximizing return on investment.

Remember, the right choice is the one that best fits your specific needs and objectives, and we're here to help you make that choice.

Control System Architecture



Management System Architecture



Panel System Architecture

Flow Coating Control

SAFETY FEATURES

At ANDRITZ, we plan, engineer, and develop our products with a commitment to meeting the highest safety and environmental standards. Our control systems are designed with an extensive array of safety features, including comprehensive safety systems, absolute and limited interlocks, and operational monitoring. These ensure that every aspect of the operation runs smoothly and safely, protecting both people and processes.

GENERAL OVERVIEW

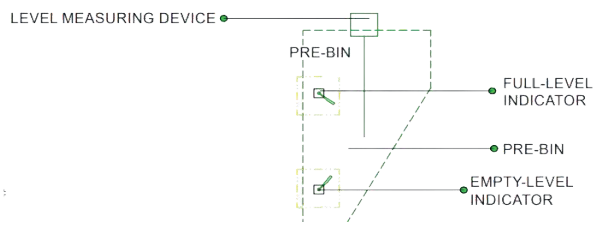
The Flow Coating Control System addresses the common challenges of Microfluid Spray Systems. It ensures a precise, automated, and consistent liquid spray, regardless of variations in pellet flow from the cooler, discharge surges, and deviations in pellet capacity. Additionally, the post-pellet liquid addition aids in minimizing dust and crumbling, enhances pellet quality and appearance, and helps avoid enzyme overdosing costs.

PROCESS DESCRIPTION

The pre-bin feeds the spraying system for smooth and consistent operation. The retention bin retains the pellets until complete absorption (micro) or hardening (macro oil) has occurred. The pellet speed over the weighting plate and the signal from the load cells are combined to calculate the gravimetric pellet flow. The signal is sent to the liquid pumps to spray the desired fraction of liquid onto the pellets.

PRE-BIN AND LEVEL INDICATORS

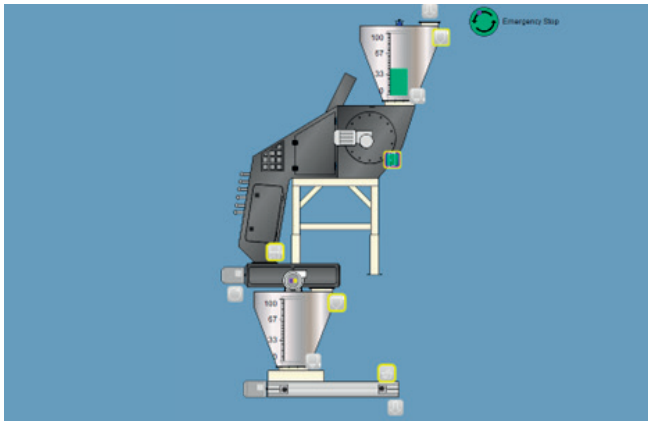
The pre-bin in the micro fluid system is used to level capacity fluctuations at a pellet mill start/stop, at varying cooler discharge speeds, and at sudden cooler emptying processes. These capacity fluctuations have to be leveled to make the weigher system work correctly and to avoid fluctuations in the dosing pump speed, which may cause inaccurate dosing quantities per ton of feed. In a normal production the pre-bin level should amount to approx. 50% to prevent fluctuations.



THE FLOW COATING CONTROL SYSTEM CONSISTS OF THE FOLLOWING PROCESS UNITS:

- **Prebin**
- **Cellular feeder**
- **Weighting plate**
- **Spraying chamber**
- **Retention Bin**

Additionally, a bypass system and an additional spraying chamber can be installed.



PRE-BIN UNIT COMPONENTS

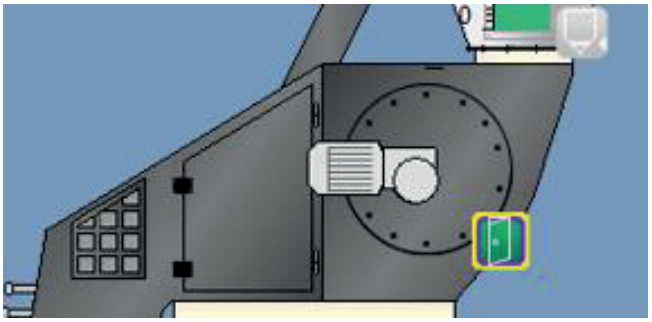
- **Level measuring device:** Placed at the top of the pre-bin, ensures continuous level metering. The signal from the level measuring device is used in the control to maintain the pre-bin level to approximately 50%.
- **Slide gate:** A slide gate in the transition between the pre-bin and the cellular feeders regulates capacity and prevents overfilling and consequent pellet crushing.
- **Full-level indicator:** A full-level indicator is placed at the top of the pre-bin, signaling to stop the operation if the pre-bin is full.
- **Empty-level indicator:** An empty level indicator is placed at the bottom of the pre-bin, signaling that the pre-bin is empty, in case the level measuring device fails due to dust. It is also used to signal to the control if some of the product from the last production is still left in the pre-bin.

CELLULAR FEEDER

The cellular feeder is designed to ensure an even flow of products of the same thickness and width over the weighting plate in the weighter housing placed directly after the feeder.

WEIGHTING CHAMBER

The weighting chamber and the spraying chamber are built together as a unit. The weighting chamber part consists of a sloped weighting plate mounted above a load cell and a radar which are used together to calculate the pellet flow and thus ensure the correct liquid dosing.



SPRAYING CHAMBER

The spray chamber receives the material flow from the weighting chamber. The control system supports up to 5 liquid additive units, and up to 10 nozzles in the spray chamber, and multiple nozzle types, such as 2 substance or flat nozzles, depending on the required flow rate. The nozzles are adjusted so they operate withing the designated flow rate range. This ensures that no surplus liquid or build-up is left in the spraying chamber after processing.

RETENTION BIN

Below the spraying chamber pellets should be retained for a specific period of time to complete pellet liquid absorption and hardening.

RETENTION BIN UNIT COMPONENTS

- **Discharge screw:** A frequency driven dosing screw removes the material from the retention bin after sufficient retention time.
- **Low level sensor:** Placed at the bottom of the retention bin, signals the completion of the processing.

CELLULAR-FEEDER UNIT COMPONENTS

- **Cellular wheel:** Provides the desired quantity of materials at the outlet on the basis of the rotational speed of the wheel. The feeder speed is PID regulated, and the minimum and maximum RPM limits are set from the control interface.

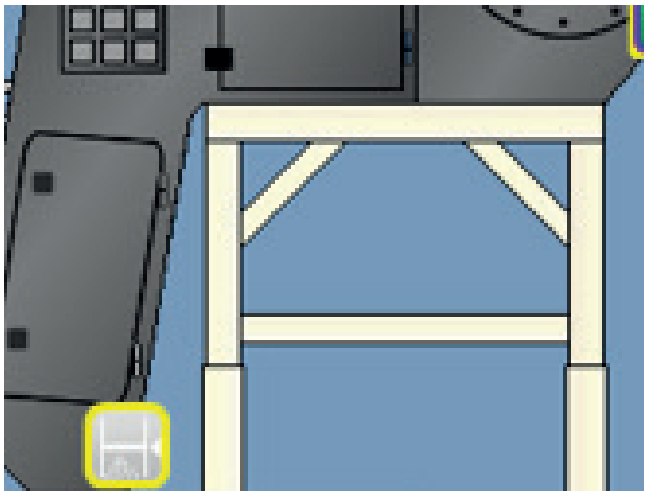
WEIGHTING CHAMBER UNIT COMPONENTS

- **Load Cell and Radar:** The pellet flow calculation is realized by taking the speed of the pellets over the weighting plate, the signal from the load cell, and weighting plate length.

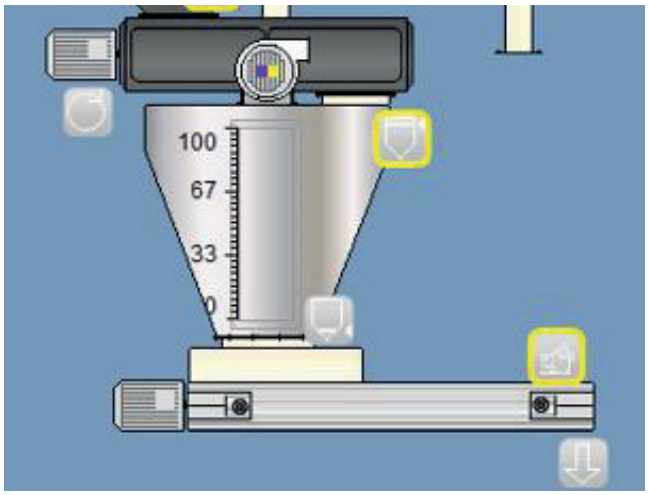
SPRAYING CHAMBER UNIT COMPONENTS

- **Pump nozzle:** When a formula has been selected, supplies the correct liquid quantity based on the previously computed pellet flow. The liquid quantity supplied is tracked by a flowmeter.
- **Counter pressure valve:** An adjustable counter pressure valve is installed to account for the increased static pressure caused by the micro fluid storage tank when it is installed above the spray point. This eliminates the uncontrolled minor flow of micro fluids and prevents liquid overdosing.
- **Recirculation valve:** The recirculation valve will open while product has not yet reached the spraying chamber. The recirculation pressure equals the pressure of the on/off valve. Closes when the weighting plate signals product is coming.
- **Controllable nozzles:** The nozzle type will be adjusted based on the required flow rate and the monitored pressure. The nozzles are supplied by an on/off valve.
- **On/Off Valve:** The valve opens when the weighting plate signals product is coming, allowing the liquid to flow to the nozzle and start the coating process.

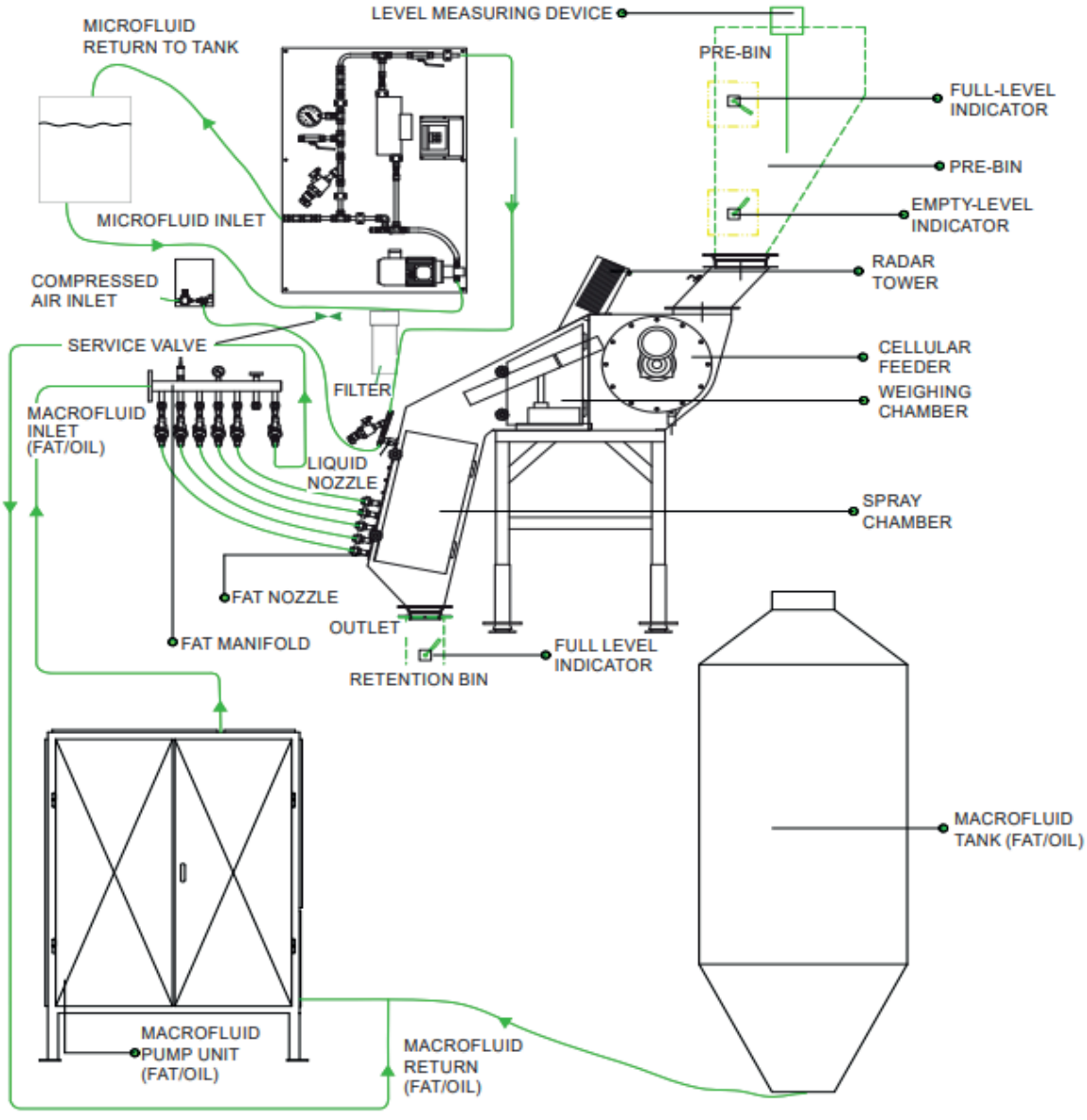
SPRAYING CHAMBER



RETENTION BIN



FULL PROCESS UNIT OVERVIEW



FLOW COATING CONTROL

FUNCTIONAL SCOPE

Functional Unit	Unit Type	Functional description	Panel System	Management System
Dosing	MFS500 or 650	• Pre-bin level control system • Real time flow capacity calculation from flow scale technology • Indication of door switch safety circuit • Overflow monitoring in outlet	●	●
Liquid extra absorption 1	Paddle Mixer	• Indication of door switch safety circuit • Overflow monitoring	●	●
Liquid additive 1	Enzyme Liquid Unit	• Variable speed of pump motor according to liquid flow percentage set point of product flow capacity • 2 on/off valves for spray and re-circulation • 1 on/off valve for compressed air • Level switch indication of supply available • Cooling fan for pump motor	●	●
	Oil or fat Liquid Unit	• Variable speed of pump motor according to liquid flow percentage set point of product flow capacity • 7 on/off valves for 6 different spray capacity nozzles and re-circulation • Nozzle control according to flow or pressure • Level switch indication of supply available • Pressure indication in manifold • Cooling fan for pump motor	●	●
Liquid additive 2	Enzyme Liquid Unit	• Variable speed of pump motor according to liquid flow percentage set point of product flow capacity • 2 on/off valves for spray and re-circulation • 1 on/off valve for compressed air • Level switch indication of supply available • Cooling fan for pump motor	●	●
	Controlled Retention time (CRT)	• Start and stop of cape heating. • Door safety circuit monitoring • Variable speed of the main screw according to set point of time. • Level process value in outlet (1 pr. pelleting process) • Temperature process value in the outlet • Temperature probe cleaner control • Variable speed of equalizer screws according to level and pellet mill main motor (1 pr. pelleting process)	●	●
Conditioning/ Expanding 3	Meal conditio-ning (CM)	• Temperature process value in the outlet • Door safety circuit monitoring • Temperature probe cleaner • Speed monitoring of shaft (V-belt protection)	●	●
	Oil or fat Liquid Unit	• Variable speed of pump motor according to liquid flow percentage set point of product flow capacity • 7 on/off valves for 6 different spray capacity nozzles and re-circulation • Nozzle control according to flow or pressure • Level switch indication of supply available • Pressure indication in manifold • Cooling fan for pump motor	–	●
Liquid additive 3	Enzyme Liquid Uni	• Variable speed of pump motor according to liquid flow percentage set point of product flow capacity • 2 on/off valves for spray and re-circulation • 1 on/off valve for compressed air • Level switch indication of supply available • Cooling fan for pump motor	●	●
Liquid additive 4	Enzyme Liquid Unit	• Variable speed of pump motor according to liquid flow percentage set point of product flow capacity • 2 on/off valves for spray and re-circulation • 1 on/off valve for compressed air • Level switch indication of supply available • Cooling fan for pump motor	●	●
Liquid additive 5	Enzyme Liquid Unit	• Variable speed of pump motor according to liquid flow percentage set point of product flow capacity • 2 on/off valves for spray and re-circulation • 1 on/off valve for compressed air • Level switch indication of supply available • Cooling fan for pump motor	–	●

● included

– not included

GLOBAL SUPPLIER – LOCAL PRESENCE

ANDRITZ Feed & Biofuel is truly a global organization – with local presence. We are represented all over the world. The global market is served from five main locations in Denmark, China, Netherlands, USA, and Slovakia.

In addition, ANDRITZ Feed & Biofuel operates from several strategic regional sales, engineering, and service locations in Australia, Bangladesh, Brazil, Canada, Chile, Dubai, France, Germany, India, Italy, Mexico, Poland, South Africa, Thailand, Turkey, the UK and Vietnam – and is also represented locally by agents and distributors in many other markets.

AUSTRALIA
ANDRITZ Feed & Biofuel
p: +61 3 8773 4888
andritz-fb.au@andritz.com

BANGLADESH
ANDRITZ Feed & Biofuel
p: +880 22 222 64 800
andritz-fb.bd@andritz.com

BRAZIL
ANDRITZ Feed & Biofuel
p: +55 47 3387 9146
andritz-fb.br@andritz.com

CANADA
ANDRITZ Feed & Biofuel
p: +1 519 676 7057
anbosales@andritz.com

CHILE
ANDRITZ Feed & Biofuel
p: +56 2 2246 24 600
andritz-fb.cl@andritz.com

CHINA
ANDRITZ Feed & Biofuel
p: +86 21 5774 5781
andritz-fb.cn@andritz.com

DUBAI
ANDRITZ Feed & Biofuel
p: +971 4 214 6546
andritz-fb.uae@andritz.com

FRANCE
ANDRITZ Feed & Biofuel
p: +33 24 75 06 364
andritz-fb.fr@andritz.com

GERMANY
ANDRITZ Feed & Biofuel
p: +49 2104 91970
andritz-fb.de@andritz.com

INDIA
ANDRITZ Feed & Biofuel
p: +91 87544 15287
andritz-fb.india@andritz.com

ITALY
ANDRITZ Feed & Biofuel
p: +39 025 743 01 30
andritz-fb.it@andritz.com

MEXICO
ANDRITZ Feed & Biofuel
p: +52 229 178 38 45
andritz-fb.mx@andritz.com

NETHERLANDS
ANDRITZ Feed & Biofuel
p: +31 40 262 7777
andritz-fb.nl@andritz.com

POLAND
ANDRITZ Feed & Biofuel
p: +48 60 906 1037
andritz-fb.pl@andritz.com

SOUTH AFRICA
ANDRITZ Feed & Biofuel
p: +27 82 781 0808
andritz-fb.dk@andritz.com

THAILAND
ANDRITZ Feed & Biofuel
p: +66 2258 5528
andritz-fb.dk@andritz.com

TURKEY
ANDRITZ Feed & Biofuel
p: +90 232 570 38 00
andritz-fb.tr@andritz.com

UK
ANDRITZ Feed & Biofuel
p: +44 1482 825 119
andritz-fb.uk@andritz.com

USA
ANDRITZ Feed & Biofuel
p: +1 570 546 1253
andritz-fb.us@andritz.com

VIETNAM
ANDRITZ Feed & Biofuel
p: +84 28 6253 9434
andritz-fb.vi@andritz.com

ANDRITZ.COM/FT

ANDRITZ Feed & Biofuel A/S
Glentevej 5–7
6705 Esbjerg, Denmark
p: +45 72 160 300
andritz-fb.dk@andritz.com

B 0924
1251 GB