



Typical bioethanol distillation / rectification column

BOOKLET-CATALOG · 2026

Equipment from CSC-AUTOMATION

in bioethanol production

Instrumentation, valves, pumps, drives and control systems for the elevator, mash, fermentation, distillation, ethanol metering and the DDGS line.

Mitsubishi Electric

JUMO

KROHNE

InterApp

Pepperl+Fuchs

4B Braime

CSF Inox

GEMÜ

MOLLET

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Supply-program overview for grain-processing and bioethanol plants in Ukraine

Who is CSC-AUTOMATION

CSC-AUTOMATION LLC is a Ukrainian engineering supplier of process-automation equipment (over 30 years on the market). The company does not build columns or cookers: its program is measurement, valves, pumps, variable-frequency drives, PLCs and sensors that dress a bioethanol plant.

30+**years on the market**

40,000+ SKUs in stock, 7 branches,
service across Ukraine

40+**sugar plants**

Over 16,000 valve units supplied — a
close neighbor of molasses ethanol

35+**brands**

Mitsubishi, JUMO, KROHNE, InterApp,
GEMÜ, P+F, 4B, CSF

Where CSC-AUTOMATION equipment sits in the process

01 Grain intake

Elevators, silos, dryers, aspiration

02 Milling and mash

Temperature, pH, water and enzyme flow

03 Fermentation

Level, temperature, slurry feed

04 Distillation

Steam, reflux, fuel-ethanol metering

05 DDGS / stillage

Solids, moisture, viscous-media pumps

06 Utilities / Ex

CIP, effluent, barriers, Remote I/O

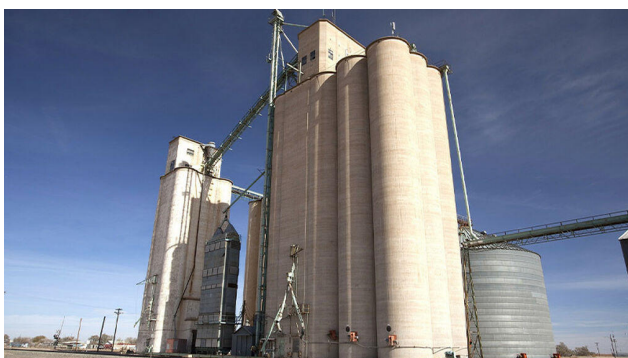
NOTE

CSC-AUTOMATION covers the field package and the control system. Columns, molecular sieves and stillage decanters belong to process contractors. Together they make a controllable plant.

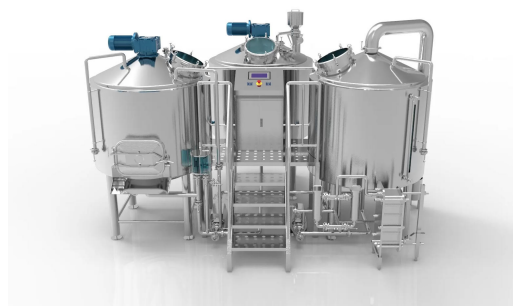
From silo to fuel ethanol

Below — which product groups from the CSC-AUTOMATION program cover each area of a typical corn or molasses plant.

PLANT AREA	CONTROL / MEASUREMENT	VALVES / PUMPS / SOLIDS
Elevator / silos	Mitsubishi FR + 4B Watchdog WDC4	MOLLET, P+F, IMKO, ENVEA
Milling, mash, cooking	JUMO temperature / pH / conductivity	KROHNE OPTIFLUX, GEMÜ, InterApp
Fermentation	JUMO + Tecfluid / KROHNE level	CSF / OMAC pumps, Hafner valves
Distillation and metering	KROHNE OPTIMASS 6400	InterApp RHEA/NEPTUNIA on steam, YTC
Stillage and DDGS	SWR SolidFlow, MOLLET / P+F level	Orbinox knife gates, CSF
Boiler house, CIP, effluent	JUMO effluent pH, KROHNE water	FLUX drum pumps, FR-F fans
Hazardous areas	P+F K-System / H-System barriers	Remote I/O LB (Zone 2), FB (Zone 1)
Plant control system	MELSEC iQ-R / iQ-F, GOT HMI	Cabinets, CC-Link, SCADA



Elevator / silos — the first area of any grain ethanol plant

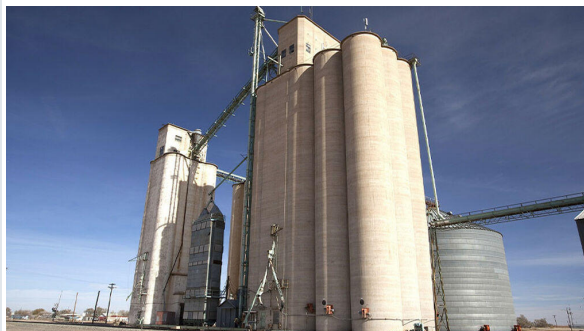


Liquid loop: mash, fermentation, tank piping

01 Grain intake, elevators, silos

The first area of every corn-based plant

At bioethanol plants grain arrives through intake, bucket elevators and silos. CSC-AUTOMATION supplies drives, level instruments and 4B Braime elevator/conveyor monitors (slip, misalignment, bearing temperature, stop) — ATEX for grain dust.



MITSUBISHI ELECTRIC

FR-A / FR-F / FR-D variable-frequency drives

Soft start of a loaded elevator, dryer fans, pumps

4B BRAIME

Watchdog Super Elite WDC4, T500 Elite

Hazard panel: speed, misalignment, vibration, chain integrity, Modbus to MELSEC

4B BRAIME

WDA, Touchswitch, M1003 Stopswitch

Belt slip and 5–15 mm misalignment, shaft stop in 0.3 s, ATEX Zone 20/21

MOLLET

MOLOSbob LF20, DF11

Silo level to 42 m, ATEX approved

Where to install it

- FR-A — heavy elevator start; Watchdog WDC4 — one panel per elevator: B400/T400N bearings, VibMil, WDA, stop relay to the PLC.
- MOLLET MF diaphragm sensors — boot-plug protection at the elevator boot.
- Pepperl+Fuchs CBN/NBB — extra discharge-plug and bucket presence if a full 4B kit is not fitted.
- IMKO TRIME / SWR M-Sens2 — in-line moisture; ENVEA ProSens — dust in aspiration.

02 Milling, mash, cooking, saccharification

This is where ethanol yield per tonne of corn is set

Starch gelatinization temperature, pH and water/enzyme flow — a typical JUMO + KROHNE + control-valve package.



JUMO

Temperature / pressure sensors and controllers

Cooker, heat exchangers, steam

JUMO

pH, redox, conductivity tecLine / AQUIS

Mash, enzyme solutions, CIP

KROHNE

OPTIFLUX electromagnetic flowmeter

Water, mash, solutions without gas phase

GEMÜ / INTERAPP

Diaphragm valves, butterfly valves

Dosing and isolation on vessel piping

Where to install it

- InterApp Desponia / Bianca — the main shut-off on water, mash and CIP; EPDM HT seats for higher temperature.
- YTC YT-1000 / YT-1200 positioners — steam and liquid flow control.
- Hafner and GSR solenoid valves — fast isolation.
- CSF Inox / OMAC pumps — viscous mash with solids.

03 Fermentation

Close to CSC-AUTOMATION practice in brewing and sugar

On molasses sites (Uzyn, Hnidava, Haisyn, Teofipol) the liquid loop is almost the same as at a sugar plant, where CSC-AUTOMATION already has thousands of deliveries.



JUMO

Beer / mash temperature

Stable fermentation and yeast protection

KROHNE / TECFLUID

Fermenter level

OPTISOUND ultrasonic, guided-wave level

KROHNE + CSF

Slurry and nutrient feed

Flow plus hygienic pumps

INTERAPP / HAFNER

Pneumatic valve actuators

Automatic tank isolation

Where to install it

- For molasses add Harrer & Kassen HK6/HK2 microwave density meters (CSC-AUTOMATION fits them on sugar-plant evaporators).
- CSF Inox CS / AS hygienic pumps — milk, wort, beer, syrups.
- Pepperl+Fuchs ATEX sensors — where ethanol vapor is present around the tanks.

04 Distillation, rectification, ethanol metering

A critical area for the licence and for export

Tray temperatures, beer and reflux flow, custody transfer of fuel ethanol. CSC-AUTOMATION has already used KROHNE OPTIMASS 6400 for spirit metering at a brewery in Ukraine.



KROHNE

OPTIMASS 6400 C

Ethanol mass flow, ~0.1% accuracy, Ex, -50...+150 °C

JUMO

Column temperature / pressure

Reboiler, trays, condenser

INTERAPP

RHEA / NEPTUNIA check valves

Steam, condensate, water, neutral liquids

YTC

YT-1000 / YT-1200 positioners

Reflux and steam control

Where to install it

- OPTIMASS — the lead candidate for custody transfer (domestic 7% blend and EU export).
- InterApp RHEA — full-bore check on steam; NEPTUNIA — compact wafer check.
- Explosion-protected KROHNE / JUMO / Pepperl+Fuchs versions for spirit storage.
- Photo — KROHNE OPTIMASS Coriolis mass flowmeter.

05 Stillage, DDGS, corn oil

Co-products that absorb surplus grain

Modern plants differ from old distilleries by a dry-stillage line. This area needs solids, moisture and abrasive-liquid instruments.



ORBINOX

EX / EB knife-gate valves

Wet stillage, fibre, abrasive slurry

SWR / ENVEA

SolidFlow, M-Sens2

Solids flow and DDGS moisture

MOLLET / P+F

DDGS bin level

Dust, ATEX, vibrating point level

CSF / OMAC / BOYSER

Viscous-media pumps

Stillage, oil, thick fractions

Where to install it

- CSF Inox sanitary centrifugal pump — technical corn oil and clean fractions.
- For biogas from stillage the CSC-AUTOMATION program includes InterApp Desponia valves with an SS disc and NBR liner.
- Moisture before the DDGS dryer drives gas and power use — measure it directly, not by temperature alone.

06 Power and piping

What turns the elevators and shuts the lines



Mitsubishi FR-A800 — heavy-duty drive for elevators and mills



Mitsubishi E800 — compact drives for pumps and dosers



InterApp Desponia — butterfly valve on water, CIP, mash



CSF Inox — hygienic pump for the liquid loop

07 Plant control system

CSC-AUTOMATION designs cabinets, programs Mitsubishi Electric controllers and builds SCADA/HMI. On the elevator that is grain routing; on the spirit side — temperature, flow and column interlocks.

GOT3000 Series Smart, Seamless, Smooth



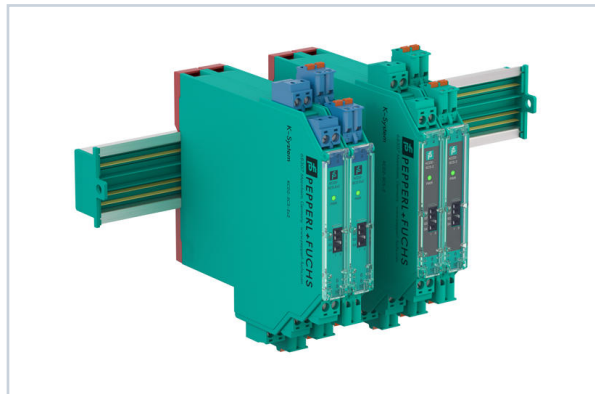
Mitsubishi GOT operator panels — typical HMI for a bioethanol or elevator control room

- MELSEC iQ-R PLC (medium/large plant) or iQ-F FX5U (a single area, elevator, dryer).
- Discrete and analog I/O modules, CC-Link network, GOT Simple / GOT2000 / GOT3000 panels.
- FR-A/FR-F drives are run from the PLC: elevator rate tracks the separator.
- KROHNE flowmeters and JUMO sensors integrate over 4–20 mA or digital buses.
- Zone 0/1/2 signals go through K-System intrinsic-safety barriers or Remote I/O LB/FB.
- Ready cabinets + commissioning + operator training — the stated CSC-AUTOMATION delivery model.

08 Intrinsic-safety barriers and Remote I/O

Pepperl+Fuchs — Zone 0 / 1 / 2 signals into the Mitsubishi cabinet

Ethanol vapor at distillation, dehydration and spirit storage is a classic hazardous area. Sensors and positioners in the zone must not run as a raw 4–20 mA loop into the PLC. CSC-AUTOMATION installs Pepperl+Fuchs K-System / H-System isolated barriers and modular Remote I/O LB / FB.



K-System — isolated barriers on a DIN rail

EX I BARRIERS

K-System (KCD2 / KFD2)

DIN 12.5 / 20 mm. NAMUR, AI/AO 4–20 mA, HART, solenoid and positioner driver. SIL 2. Safe-area cabinet.

HIGH DENSITY

H-System (HiC)

Termination board for DCS/PLC cabinets. The same Ex i loop when metering and valve channels are many.

ZONE 2

Remote I/O LB

Modules in a cabinet at the column / pump house. PROFINET, PROFIBUS, Modbus. Less cable to the control room.

ZONE 1

Remote I/O FB

The same idea for Zone 1: distillation, molecular sieves, ethanol loading. Hot-swap modules.

AI / AO / DI / DO

Typical modules

KCD2-STC-Ex1 — 2-wire transmitter supply; KCD2-SCD-Ex1 — YTC positioner; KCD2-SR-Ex1 — NAMUR; KCD2-SLD-Ex — solenoid.

Where it belongs in a bioethanol plant

- Distillation / rectification: temperature, pressure, level, reflux positioners — via K-System into the MELSEC cabinet.
- Spirit storage and loading: NAMUR limit switches, level gauges, solenoid valves — barrier plus Ex-rated field device.
- Grain silos (dust Zones 20/21/22): MOLLET / P+F via a matching barrier or Remote I/O.
- New-build plant: Remote I/O LB/FB at the columns cuts kilometres of 4–20 mA cable.

Which plants this package fits best

New-type corn plants

OKKO (83 kt ethanol, start-up 2027), Westnol / TBF Group (Horodok), VITAGRO Energy (Marylivskyi plant). Full package: elevator + liquids + metering + DDGS.

Molasses sites

Uzyn and Hnidava sugar plants, Haisyn and Trostianets distilleries, Teofipol (including tenants such as PPEK). This is where CSC-AUTOMATION sugar-plant experience applies: InterApp, YTC, Hafner, KROHNE, JUMO.

The elevator part of any project

Even if another contractor supplies the columns, elevators, dryers and silos are standardised with Mitsubishi + MOLLET + Pepperl+Fuchs.

Minimum starter modernization kit

- VFDs on elevators and dryer fans — a fast power-saving effect.
- Silo level + 4B Watchdog on the elevator (slip, misalignment, bearings) — fewer fires and less downtime in season.
- Mass flowmeter on fuel ethanol — metering for excise, export and domestic E7 blending.
- pH and temperature on mash/beer — more stable ethanol yield.

How to request a specification for your site

For a bioethanol project a per-area specification is enough: elevator, beer house, rectification, DDGS, custody transfer of spirit. CSC-AUTOMATION builds the bill of materials from stock and designs the cabinets and PLC.

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Applications section

What to include so the selection is accurate

- Feedstock: corn, molasses, grain residues; nameplate capacity, t ethanol / year.
- Areas being upgraded now (often elevators, spirit metering and VFDs come first).
- Hazardous areas (ATEX) on silos, spirit storage and dehydration.
- Existing control system: which PLC is already there, and whether a new Mitsubishi loop is needed.
- Whether custody-transfer ethanol metering is required (certified KROHNE OPTIMASS).

DISCLAIMER

This booklet is an industry overview of the public CSC-AUTOMATION supply program for bioethanol and grain-processing plants. Plant capacities, models and stock must be confirmed with a CSC-AUTOMATION manager. Product photos are manufacturer images (KROHNE, Mitsubishi Electric, InterApp, CSF Inox and others) and typical industrial views. This is not an official price list or an offer.