Better technology, better user experience

PIACS® DC4 delivers

- User experience like never before
- More efficient control strategies to meet environmental regulations
- Improved ESP voltage and current measurements
- Faster voltage recovery after sparks, improve emissions
- Modular, flexible system with up to 10 high voltage units, 90 rapping gears, 90 heaters and 2 purge-air units
- Built-in ESP manager for remote service
- Common parts for single and 3-phase high voltage systems
- Robust controller construction, increased reliability of components.

The PIACS® control unit is well known as a powerful electrostatic precipitator (ESP) controller in industries where reducing emissions is a key goal. The microprocessor-based controller is programmed to optimise the corona power delivered to a precipitator bus section, react efficiently to process variations, and ensure outlet dust emissions remain low, even under challenging conditions.

With more than 4,000 ESP installations worldwide, FLSmidth provides high-quality, efficient air pollution control systems to help plants meet stringent environmental regulations in the most cost-efficient way.

By evolving the PIACS technology and improving user experience, FLSmidth has developed an enhanced ESP control unit for the future: PIACS DC4.

User experience now more intuitive

From the operator main menu, you can easily see the precipitator status and adjust all the high-voltage (HV), rapping gears, heating and purge-air systems, simply by tapping on the relevant icons. This provides you with detailed information and useful overviews to manage the system.

The screens you can access include:
- Troubleshooting
- ESP Controller panel
- Trend screen
- Alarm overview
- Current voltage curves
- Oscilloscope screen
- Communication status of the modules.

Unique internal measurement

Improved ESP voltage and current measurements are achieved via an internal measuring board in the terminal box of the high voltage rectifier. This improves the spark detection (detecting sparks that otherwise might not have been detected) and provides the ability to react to real sparks, improving the ESP efficiency.

The benefits are faster, more efficient utilisation of installed power and, ultimately, even lower dust emission.

The PIACS DC4 screen provides you with a simple visual overview of the system’s performance. It is easy to adjust fields and extract alarm information and event logs.
What’s new?

User experience like never before

**Clarity**
Greater focus on functionality has motivated our design of the new PIACS DC4 HMI. Throughout the system, texts and figures are legible and appropriate at every size, and icons are precise and lucid.

**Simplicity**
A professional interface, distinct visual layers and seamless motion help the user understand and interact with system intuitively. Content is arranged perfectly across the entire screen.

**Intuitive**
Touch and discoverability heighten the user experience and enable access to functionality and additional content without losing context. Transitions provide a sense of depth as you navigate through content.

Best ESP control strategies

**Improve performance**
- Fast recovery after spark
- Adaptive spark rate control and relative setback at sparks
- New patent voltage recovery after spark method ‘Residual Voltage Recovery’.

**Save energy**
- Built-in EMCS (energy management control system) for energy saving.

Avoid process fluctuations and back corona
- New stability monitor for ESP and process optimisation
- Automatic optimisation, including patent method for back corona detection
- Intermittent energisation, alternative resistivity mode
- Rapping control strategies, power off rapping, blocking, delay and queue between units.

Unique service facilities

**Maintain the HV system**
- Built-in help, with troubleshooting tips
- Oscilloscope with 4 channels for service tasks
- Firmware update via USB port
- Communication link status, internal modules and to central control system (CCS) interface
- Self-diagnose tool for panel and I/O controller
- Manual control of firing angle/ESP current for testing
- Backup/restore system configuration.

**Detect failures inside the ESP**
- Current voltage curves (CVC), automatic or manual
- 4-channel trend log of all essential operating values
- Alarm log, and history log
- Eventlog, parameter and configuration
- Export CVC, Trend, Eventlog and scope data to ftp or USB memory
- Backup/restore rated and operation parameters
- Built-in ESP manager for remote support.

**User experience like never before**
- Help and troubleshooting menu
- Current voltage curves
- Oscilloscope
- Trend log

**Unique service facilities**
- Maintain the HV system
- Detect failures inside the ESP
- User experience like never before

**Best ESP control strategies**
- Improve performance
- Save energy
- Avoid process fluctuations and back corona

**Unique service facilities**
- HV field detail
- ESP HV supplies
Custom-made systems

Modular system features
- One common interface to control the complete ESP system
- Optionally, a Local Control Panel can be provided for each field
- Modular, flexible system with up to:
  - 1 chamber
  - 1 to 5 fields
  - 1 to 2 bus-sections per field
  - 10 DC rectifiers
  - 90 rapping gears
  - 90 heating units
  - 2 purge-air units with optional heaters
  - Sub temperature monitors for heat group, PT100 sensor or thermostat
- Cost-efficient spare parts, common parts for one and three phase systems
- Increased electrical separation between SCR driver board and control board, using fiber optical separation.

Modular flexibility
Our previous generations of PIACS controllers were built for each section of the ESP. But by using the PIACS DC4, which has an expandable I/O system, you are no longer bound to only three rapping and heating feeders. You can expand by up to 90 rapping gears and 90 heaters and two purge-air units – offering an almost limitless modular system.

Shared parts
In the PIACS DC4, almost all parts can be used in both single and three-phase T/R systems. This means you save on spare parts, keep track of fewer parts, and only require one order number. And, if necessary, it is easy to transition between single and three-phase T/R systems.
Key components

**ECP Touch Panel**
- 15.6” touch panel capacitive touch screen
- Common controller for one chamber
- Modular system supporting
- Built-in ESP manager for remote support
- High-speed data communication with slave nodes using Ethernet Powerlink.

**FB – Firing Board**
- Single-phase firing board (3 phase systems use three 1-phase units)
- Mains voltage up to 690V, 50/60Hz
- No active power supply for driver circuits
- One fibre optical firing for both half-cycles of the line frequency
- Status fibre for line synchronisation and status of firing.

**iCU – intelligent Control Unit**
- iCU supports both single and 3-phase systems
- Power controller for firing board up to 690V - 50/60Hz
- Fiber optical firing of the SCR unit(s) – electrical separation between iCU and firing board
- High voltage control & alarms (Analog or CANbus to rMU unit)
- For unit status and maintenance (7-segment LED for status and Udc/Idc indication, 7-segment dot for spark indication)
- Include control for automatic grounding switch
- Service interface via serial USB port
- Electrical separation between T/R set and iCU/ECP.

**rMU – remote Measuring Unit**
- High voltage control & alarms signals (CANbus to iCU unit)
- For unit status and maintenance (7-segment LED for status and Udc/Idc indication, 7-segment dot for spark indication)
- Include control for automatic grounding switch
- Service interface via serial USB port
Retrofitting existing control panels

Did you know?

- FLSmidth has upgraded existing ESP control systems from all different manufacturers for the last 25 years, starting with the first generation of PIACS controller.

Over more than 40 years, the PIACS ESP control family has been installed in more than 4,000 APC installations worldwide.

Want to renovate your old controller?
- Limited spare parts availability?
- Supplier no longer present in the local market?
- Lack of technical support in your area?
- Old controllers with little or no optimisation or service features?
- Need an improvement of the ESP performance?

Upgrade or retrofit
The PIACS DC4 is available for a new ESP, or you can easily upgrade your existing controller. The system can be tailored according to your needs.
Alternatives

New control panel
Complete new panels delivered pre-cabled, pre-tested and CE certified; based on single-phase or three-phase HV systems.

PIACS DC4 control panels are completely customisable to match specific requirements:
- Single or individual incomers
- Mains breaker with door handle
- Up to 690V mains voltage
- Up to 100kA short circuit current
- Bottom or top cables entries
- Optional EMC filter, power socket, light and key interlocking system
- Parallel or serial interface with CCS (Profibus, Profinet, Modbus, Ethernet, DeviceNet, etc).

As an option, pre-cabled and pre-tested back panels can be delivered and installed in the existing cubicles.

Built-in retrofit
Delivery of retrofit kit parts with all required components for upgrading an existing panel with one-phase or three-phase thyristor control.

Existing electrical apparel in the panels are maintained, including T/R, rapping motors and heating systems feeders. Only key parts for new PIACS DC4 and I/Os installation are required.

Our electrical specialists will ensure that the new control system is properly installed in your existing ESP control panels. Built-in retrofits can be performed during maintenance stoppages or during operation, field by field.
Built-in ESP manager

There is no need for an external computer or special software. With the new PIACS DC4, it is now possible to access the ESP control interface through a built-in ethernet connection. This allows plant maintenance staff and FLSmidth specialists to service the equipment remotely, increasing ESP reliability.

With the new PIACS DC4, FLSmidth offers various service packages, including 24/7 support via remote access from our Copenhagen central or our local customer service office.