TOTAL DUST COLLECTOR CONTROL SYSTEMS
200 OUTPUT DEMAND CONTROLLER

PENTAIR ENVIRONMENTAL SYSTEMS
GOYEN PRECISION P2
TOTAL DUST COLLECTOR CONTROL SYSTEMS

The Goyen Precision series dust collector cleaning systems controller has a unique modular format that allows a simple Sequential Mode controller to be easily upgraded to Enhanced Differential Pressure Mode control, analog and digital I/O, and full SCADA and DCS integration.

Goyen’s Precision controller grows with the demands of yours and your customer’s business.

PRODUCT DESCRIPTION
This new generation cleaning system controller is presented as an easily configurable master plus expansion card platform. The master controller has 10 on-board outputs, which may be expanded to 200 outputs total through the connection of up to nineteen 10 output expansion cards. All outputs feature individual push-button manual triggers and LED lights.

The expansion cards are available with compact push-in terminals or large screw-terminal types.

The Continuous Mode interface gives dependable and familiar reverse pulse cleaning control on a timed basis. The electrical on time ranges from 30 to 500 ms, with a pause between pulses of 1 to 999 seconds.

The Enhanced Demand Mode interface provides easy cleaning systems control flexibility.

The P-2 interface provides:

- Minimum pulse rates while in demand mode.
- A selection of pre-programmed cleaning patterns to minimise dust re-entrainment, while eliminating spaghetti wiring.
- Configurable filter pre-coating settings.
- Blowdown cycles on automatic basis or hardwired to the fan circuit.
- A tube cleaner can be optionally specified to ensure pressure lines to the integrated pressure transducer remain clear within dusty environments.

- Demand cleaning on the basis of high and low pressure limits.
- Demand cleaning on the basis of a high point and a selectable % pressure drop.
- Selection of displayed pressure units (kPa, Pa, mm H₂O, inches H₂O, mm Hg).
• A clear back-lit LCD display, viewable from a wide range of angles.
• Audible button press confirmation.
• 5 languages; English, German, Italian, French, Spanish.
• Power out memory retention.
• Scrolling display during operation showing all parameter settings.
• Automatic detection of connected slaves, solenoids, and communications modules on start-up.
• Hour and cycle counts.
• Factory defaults restore.

**ALARMS**
Alarms include:
• Open circuit and closed circuit solenoid failure detection and identification
• Service alarms at 100K, 500K and 950K cycles
• Watchdog alarm
• Insufficient power
• Circuit over temperature
• High dP alarm
• Auxiliary alarm
• Low tank pressure (when connected to a pressure transmitter).

An alarm delay of up to 255 seconds can be applied, and the alarm may be reset either at the controller interface or remotely via the P-CTX or P-MOD communications cards.

**MODBUS INTERCONNECT MODULE**

Protocol – MODBUS two wire RS485 half duplex

Comms rate – 9600 baud, 1 stop bit, 8 data bits, no parity

Terminating resistor – DIP switch selectable terminating resistor if the Master is on the end of a MODBUS network.

<table>
<thead>
<tr>
<th>READ ONLY DATA</th>
<th>WRITE ONLY DATA</th>
<th>READ/WRITE DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instantaneous dP Cycling status</td>
<td>Restore factory defaults Hour counter reset</td>
<td>Language Electrical on-time Blowdown mode</td>
</tr>
<tr>
<td>Power status Watchdog alarm</td>
<td>Reset cycles Reset service alarm</td>
<td>Electrical off-time Tube cleaner on time</td>
</tr>
<tr>
<td>Coil failure Service alarm</td>
<td>Reset general alarm</td>
<td>Pressure units Tube cleaner off time</td>
</tr>
<tr>
<td>Low header pressure alarm Auxiliary alarm</td>
<td></td>
<td>Demand cleaning mode Enhanced Demand Mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High dP limit Hour counter value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low dP limit Number of expansion cards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DP range Number of outputs on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alarm delay expansion cards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High dP alarm Cycle count</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Filter pre-coating mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pattern cleaning mode Skip outputs (0–10)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of blowdown cycles Activate output address ##–##</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Automatic blowdown cycle setting Run</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Basic Configuration

I/O Configuration

COMMUNICATIONS
The Precision controller may be expanded with an I/O card (P-CTX) or a two wire half-duplex RS485 card programmed with the Modbus protocol (P-MOD).

P-CTX allows control of the Precision controller from devices such as programmable logic controllers and remote control panels. P-CTX also provides a 4–20 mA output to allow remote monitoring or logging of the instantaneous system differential pressure. An auxiliary input allows the connection and monitoring of additional diagnostic sensors such as hopper levels.

P-MOD allows full integration of Precision into SCADA/HMI systems. With each output individually addressable and all controller events accessible, total DCS integration with particulate, gas monitoring devices and process controls is possible.

ENCLOSURE CHOICES
The Precision controller is available as either standard DIN-mounted boards or for incorporation into your own control cabinets, in painted steel IP65 enclosures, or stainless steel IP65 enclosures.
**ELECTRICAL SPECIFICATION**

Supply power (input)/Terminal output voltage (output)

For AC in DC out boards (with maximum load): Input: 110–240 V AC 50/60 Hz ±10%, fuse protected to 260 V AC. Output: 24 V DC at 60 W (2.5 A) for master and expansion cards.

For AC in AC out boards (with maximum load): Input: 100–130 V AC and 210–260 V AC 50/60 Hz, fuse protected to 260 V AC. Output: Max rating at 120 V AC +10%, 310 W (2.36 A), Max rating at 240 V AC +10%, 350 W (1.34 A).

For DC in DC out boards (with maximum load): Input: 24–48 V DC ±10%, fuse protected transient suppression to 60 V DC spikes. Output: 24 V DC at 60 W (2.5 A) for master and expansion cards.

**MECHANICAL/ENVIRONMENTAL SPECIFICATION**

Enclosure type (optional) – Painted steel or stainless steel.

Operating/Storage temperature range – 0–70°C (32–158°F)

Vibration – Reliable operation up to 55 Hz, 1.5 mm double amplitude

Mechanical shock – Shock up to 100 m/s²
## PRODUCT SPECIFICATION

### Master and Expansion Cards

<table>
<thead>
<tr>
<th>INTERFACE</th>
<th>PRECISION P-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 line back-lit LCD display</td>
<td>✓</td>
</tr>
<tr>
<td>Tactile input buttons</td>
<td>✓</td>
</tr>
<tr>
<td>Individual output LEDs</td>
<td>✓</td>
</tr>
<tr>
<td>Manual output trigger for each terminal (100ms duration) [for AC/DC, DC/DC only]</td>
<td>✓</td>
</tr>
<tr>
<td>Manual cleaning cycle trigger</td>
<td>✓</td>
</tr>
<tr>
<td>Scrolling display showing system settings during operation</td>
<td>✓</td>
</tr>
<tr>
<td>English, German, Italian, Spanish, French language support</td>
<td>✓</td>
</tr>
<tr>
<td>Pressure units [kPa, Pa, inWG, mmWG, mmHG]</td>
<td>✓</td>
</tr>
<tr>
<td>Menu lockout (security code)</td>
<td>✓</td>
</tr>
<tr>
<td>Slave Communications LED</td>
<td>✓</td>
</tr>
<tr>
<td>Power LED &amp; power switch</td>
<td>✓</td>
</tr>
</tbody>
</table>

### START-UP

- Automatic detect connected terminals | ✓ |
- Automatic detect connected expansion cards | ✓ |
- System self diagnostic on start up | ✓ |
- Automatic power supply detection | ✓ |
- 12 month memory retention without power | ✓ |
- Factory defaults reset | ✓ |

### OPERATION

- Hour count | ✓ |
- Cycle count with service alarms | ✓ |
- Electrical on-time selection (30 ms to 500 ms) | ✓ |
- Electrical off time selection (1s to 999s) | ✓ |
- Fan Contact Blowdown Cycles | ✓ |
- Automatic Blowdown Cycles | ✓ |
- Sequential Mode Cleaning | ✓ |
- Demand Mode Cleaning (set high and low dP limits) | ✓ |
- Demand Mode Cleaning (set high limit and dP range) | ✓ |
- Enhanced Demand Mode Cleaning (minimum pulse rate) | ✓ |
- Pre-programmed Pattern Mode Cleaning | ✓ |
- Filter precoating function | ✓ |

### TERMINALS AND CONTACTS

- 10 x AC/DC solenoid outputs on Master suits wires from 12–22 AWG (0.5 to 2.5 mm²) | ✓ |
- Fan contacts | ✓ |
- Auxiliary pressure gauge contacts | ✓ |
- Auxiliary alarm contact (example to siren or light) | ✓ |
- Tube cleaner contacts | ✓ |

### INTERFACE

<table>
<thead>
<tr>
<th>INTERFACE</th>
<th>PRECISION P-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 wire, half duplex RS485 Master/Slave communication</td>
<td>✓</td>
</tr>
<tr>
<td>Up to 19 expansion cards connected</td>
<td>✓</td>
</tr>
<tr>
<td>Large format expansion card support</td>
<td>✓</td>
</tr>
<tr>
<td>Compact format expansion card support</td>
<td>✓</td>
</tr>
</tbody>
</table>

### ALARMS

- Coil failure (open circuit) | ✓ |
- Coil failure (closed circuit) | ✓ |
- Service alarm [100K, 500K, 950K cycles] | ✓ |
- Watchdog alarm | ✓ |
- Insufficient power pre-warning | ✓ |
- Low tank pressure [when connected to pressure transducer] With PLC Interconnect | ✓ |
- High dP alarm With PLC Interconnect | ✓ |
- Auxiliary alarm With PLC Interconnect | ✓ |
- Alarm delay (0 to 255s) | ✓ |

### STANDARD ENCLOSURE DETAILS [DIMENSIONS IN MM]

[Diagram of enclosure details]
### I/O MODULE (P-CTX)

**DIGITAL IN**
- **Demand/Continuous mode contact**: Allows remote switching between demand and sequential cleaning modes when Combined with Precision P-2
- **Auxiliary contact**: Allows monitoring of other devices in the installation, for example tribo-electric probes
- **Manual cycle contact**: Allows remote activation of the manual cleaning cycle feature
- **Low header pressure contact**: Allows the installation of a low pressure switch on the cleaning system pressure vessel
- **Service alarm reset contact**: Allows remote resetting of the service alarm
- **General alarm reset contact**: Allows remote resetting of coil failure, low header pressure, high dP, and auxiliary alarms

**DIGITAL OUT**
- **Tube cleaner contact**: Allows the installation of Goyen’s tube cleaning device. Useful to clear lines running to remote pressure switches or dP gauges mounted to the dust collector.
- **Power contacts**: Allows remote monitoring of the power status of the controller.
- **Cycling contacts**: Allows remote monitoring of the controller status with regards to cycling or paused.
- **Watchdog contacts**: Allows remote monitoring of the pulse controller’s heartbeat.
- **Coil failure alarm contacts**: Allows remote notification that a coil failure has occurred.
- **Service alarm contacts**: Allows remote monitoring of service alarm condition.
- **High dP alarm contact**: Allows remote monitoring of a high dP alarm condition.

**ANALOGUE OUT**
- **4–20 mA Instantaneous dP contacts**: Allows remote monitoring of the instantaneous dP of the system. These are powered contacts.

### HOW TO ORDER

**Examples**
- **P-2DCT-CTX-SS**: 24 to 48 VDC input power demand master, with tube cleaner and I/O card in a stainless steel enclosure.
- **Interfaces, communications cards, and expansion cards may be separately ordered as:**
  - **PS-L**: Large 10 station expansion card – DC output
  - **PS-LA**: Large 10 station expansion card – AC output (use with AA interface only)
  - **PS-C**: Compact 10 station expansion card – AC output (use with AA interface only)
  - **PS-CA**: Compact 10 station expansion card – AC output (use with AA interface only)
  - **P-MOD**: Modbus RS485 communications card
  - **P-CTX**: Digital/Analog I/O card
  - **P-2**: Enhanced Demand Mode interface only (for in-field upgrades)

### P-CTX Terminal Layout

Control mode interface
- **2AC**: Enhanced demand mode, AC in DC out
- **2DC**: Enhanced demand mode, DC in DC out
- **2AA**: Enhanced demand mode, AC in AC out

Tube cleaner
- **Blank**: no tube cleaner
- **T**: Tube cleaner fitted (only with enclosure)
- **T1 - 110v AC (AC only)**
- **T2 - 240v AC (AC only)**

I/O module
- **Blank**: no I/O module
- **CTX - I/O module fitted**

Network module
- **Blank**: no network module

Enclosure types
- **Blank**: no enclosure
- **M**: Painted mild steel
- **SS**: Stainless steel

Imperial tube fitting
- **A**: Imperial tube cleaning fitting (metric standard)