

6. Specifications

Specifications for the various Series C Turbomachinery I/O modules are given below.

For information on environmental specifications, please refer to the Series C Turbomachinery IO Platform Specification and Technical Data Sheet EP03-540-400.

7. Servo Valve Positioner Module (SVPM) – CC-PSV201

7.1. Function

This Series C I/O module provides an onboard PID positioning loop for positioning a servo valve typically used in a turbomachinery control application. It can accept LVDT/RVDT/4-20 mA position feed back signals from the control valve, receive a control valve demand remote set point from a C300-20msCEE controller and execute onboard PID positioning loop to issue current output to servo valve coil to control the control valve position.

7.2. Notable Features

- Onboard PID positioning loop execution with overall loop latency within 10 mS
- Onboard excitation supply for LVDT and support for various configurations of LVDT connections
- LVDT input channel can be optionally configured to accept 4-20 mA analog input signal
- Supports wide range of unidirectional/bidirectional current output to servo valve coil
- Servo valve output channel can optionally be configured for 4-20 mA analog output signal
- Accepts two digital inputs, which can be configured to drive servo valve output to safe value
- PID execution using the position measurement and remote set point received from the C300 20 ms controller
- Extensive module level diagnostics (PV qualification for AI & AO, LVDT excitation frequency drift check, internal reference check, power supply diagnostic, memory diagnostics, etc.)
- Extensive field level diagnostics (open wire detection for Servo, LVDT, AI [4-20 mA] and DI; LVDT core fallout; read back current diagnostics for Servo and AO [4-20 mA])
- Drive Servo output to safe value on detecting abnormal condition of control components
- Point processing at 2.5 mS period for "LVDT/RVDT signal" and PID execution
- Provides digital dither (current modulation) to compensate stiction in the controlled device (servo valve)
- Supports servo valve position calibration
- Supports redundant solution
- Supplies non-incendive field power

7.3. SVPM supports the following I/O interfaces

- LVDT/RVDT/analog input – 2 channels
- Digital input – 2 channels
- Servo/analog output – 2 channels
- 2 PID blocks

7.4. Detail Specifications – SVPM

| Parameter | Specification |
|--|---|
| Input/Output Model | CC-PSV201 - Servo Valve Positioner Module |
| | CC-TSV211 Redundant 18" |
| <u>Servo Output</u> | |
| Output Type | Bipolar current (Ranges: 10, 20, 40, 80, 160, 320 mA) Unipolar current (Ranges: 50, 300 mA) |
| Output Channels | 2 |
| Dither | 0-10% of FS, 25-60 Hz |
| Output Temperature Drift | 300 ppm per deg C |
| Output Current Linearity | 0.325% |
| Resolution | 16-bit DAC |
| Maximum Resistive Load (24 V supply = 22 VDC through 28 VDC) | Maximum coil resistances allowed for different current ranges with this interface are available in Honeywell DFS document |
| Maximum Open Circuit Voltage | ±14 V |
| Gap (0 mA) of Output to Field on Switchover | 15 mS maximum |
| <u>LVDT Interface</u> | |
| Input/Feedback | 3/4/5/6 wires LVDT feedback signals, 8 V RMS max., 2.5-3.2 KHz |
| Excitation | 8 V RMS max, 2.5-3.2 KHz (max. internal excitation is 50 mA) |
| Frequency Stability | 2.5-3.2 KHz ±5 Hz from set value |
| Channels | 2 |
| Galvanic Isolation (any input terminal voltage referenced to common) | ±500 VDC |
| Isolation Technique | Isolation transformer |
| A/D Converter Resolution | 16-bits |
| Input/Output Range ⁽¹⁾ | 8 V RMS max., 2.5-3.2 KHz |
| Input Impedance (voltage inputs) | Impedance > 25 Kohm (2.5 KHz to 3.2 KHz) |
| Input Scan Rate | 2.5 mS |
| Hardware Accuracy (@ CMV = 0 V) | < 1% |
| <u>Analog Inputs</u> | |
| | * AI & LVDT signals are mutually exclusive |
| Input Type | Voltage, current (2-wire or self-powered transmitters) |
| Input Channels | 2 |
| Common Mode Voltage, DC to 60 Hz | -6 to +5 V peak |
| A/D Converter Resolution | 16-bits |
| Input Range ⁽¹⁾ | 0 to 5 V, 1 to 5 V, 0.4 to 2 V, 4-20 mA (through 250 Ω) |

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|---|--|
| Maximum Normal Mode Input (differential inputs, no damage) | ±30 V |
| Input Impedance (voltage inputs) | > 10 M Ω powered |
| Maximum Input Voltage (any input referenced to common, no damage) | ±30 V |
| Input Scan Rate | 5 ms |
| Hardware Accuracy (@ CMV = 0 V) | ± 0.075% of full scale (23.5°± 2°C) ± 0.15% of full scale (0 to 60°C) |
| <u>Analog Outputs</u> | * AO & Servo signals are mutually exclusive |
| Output Type | 4-20 mA |
| Output Channels | 2 |
| Output Ripple | < 100 mV across 250 Ω load |
| Output Temperature Drift | 0.005% of full scale/°C |
| Output Readback Accuracy | ±4% of full scale |
| Output Current Linearity | ±0.05% of full scale nominal |
| Resolution | ±0.05% of full scale |
| Calibrated Accuracy | ±0.35% of full scale (25°C) including linearity |
| Directly Settable Output Current Range | 0 mA, 2.9 mA to 21.1 mA |
| Maximum Resistive Load (24 V supply = 22 VDC through 28 VDC) | 760 ohms |
| Maximum Output Compliant Voltage (24 V supply = 22 VDC through 28 VDC) | 16 V |
| Maximum Open Circuit Voltage | 18 V |
| Response Time (DAC input code to output) | 1 mS |
| Gap (0 mA) of Output to Field on Switchover | 15 mS max. |
| <u>Digital Inputs</u> | |
| Input Channels | 2 |
| DI Power Voltage Range | 22 to 28 VDC |
| ON Sense Voltage/Current | 13 VDC (min.) or 6.12 mA (min.) |
| OFF Sense Voltage/Current | 5 VDC (max.) or 2.1 mA (max.) |
| Input Impedance | 4.6K |
| Absolute Delay Across Input Filter and Isolation | 1.78 mS |
| Field Resistance for Guaranteed ON Condition | 300 Ω max. @ 15 VDC |
| Field Resistance for Guaranteed OFF Condition | 30 KΩ min. @ 30 VDC |