Process Solutions

Honeywell

Technical Information

Experion Series C Turbomachinery I/O Specification

EP03-540-511

Release 511

October 2019, Version 1.0

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"
Servo Output			
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		
LVDT Interface			
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%		
Analog Inputs	* 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)		

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)
Analog Outputs	* 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^{o}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.
Digital Inputs	
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