

TP01

ABB Ability™ Symphony® Plus Hardware Selector



The TP01 Turbine Protection module is a SIL3 rated turbine protection module that offers a complete set of built-in protection functions for all types of gas, steam and hydro turbines. These functions include: Overspeed Trip, Overspeed Protection, Acceleration Protection, Anti-Surge Protection, Trip Anticipation, Load Drop Anticipation, and three different variations of Power Load Unbalance.

The TP01 module can be configured to interface to all types of speed probes, transducers, switches and trip solenoids. It will detect an overspeed condition and generate a turbine trip output in under 5 milliseconds

Features and benefits

- The TP01 Turbine Protection module provides:
- 5 Analog Input channels
- 2 A/D converters, 16-Bit unipolar resolution
- 2 Analog Output channels
- 5 Group isolated 24-48VDC Digital Input channels
- 2 CH-2-CH isolated, high load, Form A contact Digital Outputs
- 6 additional Form C contact Digital Outputs provided by ROM810

| General info | |
|-----------------------------|---|
| Article number | 2VAA008173R01 |
| Type | Turbine Protection |
| Signal specification | AI: 5 group isolated 4...20 mA or 1...+5 VDCAO: 2 group isolated 0... 24mADI: 5 CH-2-CH isolated 24/48/125VDC 120 VACDO: 2 Form A contact 120 VAC / 149 VDC |
| Life cycle status | ACTIVE |
| Number of channels | 14 |
| Signal type | 5x AI + 2x AO + 5x DI + 2x DO |
| HART | No |
| SOE | Yes |
| Redundancy | Yes |
| Form factor | Standard (190 mm) |
| Mounting | Horizontal Row or Vertical Column |
| MTBF (per MIL-HDBK-217-FN2) | PR E: 234,052 Hours |
| MTTR (Hours) | 1 Hours |

| Detailed data | |
|---------------------------------|---|
| Module power requirements | 24 VDC \pm 10%, 100 mA typical, 125 mA max |
| Module power connection | POWER TB on cHBX01L or VBX01T |
| Field IO power | Analog I/O: 85 mA @ 24 VDC \pm 10% = external system powered loads |
| Overvoltage category | Category I for power, inputs or outputs. Tested according to EN 61010-1 |
| Max field cable length | 600 meters (1968 feet) |
| Number of Channels | 14 Total (5x AI, 2x AO, 5x DI, 2x DO) Channels |
| Signal ranges and types | Analog Inputs: AI1-AI2: 4...20 mA (System Powered) AI3-AI5: 4...20 mA or 1...5 VDC (System or Field Powered) Analog Outputs: 4...20 mA (System Powered) Digital Inputs: DI1-DI2: 24/48 VDC (System Powered) DI3-DI5 24/48 VDC (System Powered) 24/48/125 VDC, 120 VAC (Field Powered) Digital Outputs: DO1-DO2: Form A Contact, 120 VAC / 150 VDC DO3-DO8 (via ROM810): Form C Contact 3A @ 150 VDC, 5A @ 120 VAC |
| SOE timestamp accuracy | 1 msec resolution for 24 & 48 VDC |
| Output response time | Max 1 msec |
| Input Impedance | Current mode: 250 Ω , Voltage mode: \geq 210 k Ω |
| A/D Conversion | 2 A/D converters, each with 4 input channels |
| A/D Resolution | 16-Bits Unipolar |
| A/D Update rate | 1 msec for all 8 channels |
| D/A Conversion | 2 D/A converters, each channel has a dedicated D/A converter |
| D/A Resolution | 16-Bits |
| Accuracy, FSR | AI: \pm 0.1% of FSR, where FSR = 22 mA or 5.5 VDC AO: \pm 0.08% of FSR, FSR = 24 mA |
| Field signal to Logic isolation | UL1577 1000 VRMS for 1 minute |
| Channel isolation | UL1577 1000 VRMS for 1 minute |
| Short circuit protection | AO: 24 mA nominal output current limit DI: 2.7mA on Channels 3-5 |

| Diagnostics | |
|---------------------|--|
| Front plate LED's | STATUS LEDs: R (Run) and F (Fault) + I/O CH Status |
| Local availability | Mini USB connection on module front plate |
| Remote availability | HN800 device diagnostics via SPE |

| Environment and certification | |
|--|--|
| Temperature, Operating | -20 to +55 °C Tested according to IEC/EN 60068-2-1, IEC/EN 60068-2-2 |
| Temperature, Storage | -40 to +85 °C Tested according to MIL-STD-810G |
| Relative humidity | 20% to 95% @ 40°C non-condensing. Tested according to IEC/EN 60068-2-78, IEC/EN 61298-3 |
| Vibration (operational sinusoidal) | 5 to 60 Hz 0.137 mm (0.0054 in.), 60 to 150 Hz 1.0 G. Tested according to IEC/EN 60068-2-6 |
| Vibration (transportation) | 10 to 500 Hz. Tested according to MIL-STD-810G |
| Shock (storage) | 15 G, 11 msec. Tested according to IEC/EN 60068-2-27 |
| Drop | 100 mm. Tested according to IEC/EN 60068-2-31 |
| Protection class | IP20 according to EN 60529, IEC 529 |
| Altitude (operational) | Sea level to 3,048 meters (10,000 ft.) Tested according to MIL-STD-810G |
| Altitude (storage) | Sea level to 12,192 meters (40,000 ft.) Tested according to MIL-STD-810G |
| Air quality | ISA S71.04 G1, ISA S71.04 G3 compliant versions SPCxxxA are also available |
| ESD immunity | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-2, Severity level 3 |
| Surge immunity | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-5, Severity level 3 |
| Electrical fast transient immunity | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-4, Severity level 3 |
| Radiated RFI immunity | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-3, Severity level 3 |
| Conducted Immunity | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-6, Severity level 3 |
| Magnetic field immunity | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-8, Severity level 4 |
| Radiated emission | Tested according to IEC/EN 61000-6-4, CISPR 11 + A1, CISPR 16-1-1, Group 1, Class A, ISM equipment Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-6, Severity level 3 |
| Conducted emission | Tested according to IEC/EN 61000-6-4, CISPR 11 + A1, CISPR 16-1-1, Group 1, Class A, ISM equipment |
| Voltage dips and interruption immunity | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-11 |
| CSA non-hazardous locations | Certified for use as process control equipment in an ordinary (non-hazardous) location |
| CSA hazardous, nonincendive locations | Class I, Division 2, Groups A, B, C, D |
| CE Mark | CE Mark EMC directive 2004/108/EC & Low Voltage Directive 2006/95/EC |
| RoHS compliance | RoHS Directive 2015/863 |
| WEEE compliance | DIRECTIVE/2012/19/EU |

| Compatibility | |
|-----------------------------|----------------------------|
| Use with MTU | HBS01-TCM, VBS01-TCM |
| Module keying code for base | slot #1 = 12, slot #2 = 24 |

| Dimensions | |
|------------|--------|
| Width | 27 mm |
| Depth | 106 mm |
| Height | 190 mm |
| Weight | 294 g |

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