

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 (TP01)
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 ± 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 ± 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: ≥ 210 kΩ
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: ±0.1% of FSR, where FSR = 22 mA or 5.5 VDC AO: ±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 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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