

QUALITROL® 505 ITM

Intelligent transformer monitor



Advanced, accurate and intelligent monitoring for your transformer

- The power to know your transformer health immediately with TransLife™
- Advanced thermal modeling of winding temperatures
- Superior temperature control for increased transformer loading

Product Summary

Description Advanced transformer monitor, easy to configure, control and track accurately all aspects of your power transformer. Dynamic loading analysis to optimize loading and maximize asset life.

Application Industry leader in remote and local monitoring of oil-filled transformer and load tap changer parameters. Advanced control of cooling systems and alarms through intuitive ITM manager interface.



QUALITROL® 505 ITM intelligent transformer monitor

Improve asset protection and utilization

- In addition to traditional mechanical monitoring and protection, electronic transformer monitoring improves reliability, safety, and the availability of key decision making information.
- Expanded capabilities and features are now available in one single device.
- Avoid installation, maintenance and capital cost on additional devices.

Immediately know your transformer health with TransLife™

- TransLife™ feature provides a dashboard of required critical information.
- Computes loss of asset life rate, life consumption and remaining asset life
- Critical Forecast feature determines the time remaining until a critical temperature is reached based on current conditions
- Monitor your windings with TransLife™
- Temperature Profiler feature provides the history of the transformer's temperature

Optimize loading and equipment life

- Improved accuracy gained by use of advanced calculated winding temperature measurement permit safe operation at higher loads
- Automatic cooling bank switching normalizes fan and pump usage for maximum life
- Pre-cooling functionality reduces damaging high temperatures produced by overloads.
- Adaptive setback improves cooling system efficiency by measuring ambient temperature and then adapting cooling and alarm set points based on temperature trends
- Low temperature lock-out insures oil pumps remain off at cold temperatures, this prevents static electrification and arcing
- Seasonal setback allows for customized cooling schemes depending on the time of the year

Simplify root cause analysis for condition-based maintenance

- Continuous information of all important transformer operating parameters aids in "drilling down" to the root, fundamental cause of the problem
- Relay control contacts and "go/no-go" alarms serve as economical method for remotely determining status of a transformer

Flexibility

- Flexible modular inputs (compatible with RTDs, CTs, voltages, current loops & switch contacts) enable all parameters of transformers to be monitored in one integrated device.
- New matrix relays can be set to alarm based on set points, a matrix of set points and difference calculations. Improves identification of transformer issues and reduces false trips
- 0-1mA or 4-20mA outputs provide information to SCADA systems
- Multiple mounting options: control panel configurations; self-contained corrosion/weatherproof enclosure configurations; 19 inch mount rack configurations
- Utilizes digital protocols over RS-232 or RS-485
- Field upgradeable for future monitoring inputs



505 ITM intelligent transformer monitor capabilities

Monitor and measure



Oil level



Pressure



Load tap changer



Load current



Cooling system



Third party devices



Temperature

Analyze and communicate



Control

- Cooling system optimization
- Local and remote alarms
- Programmable relays
- Cooling system exerciser
- Seasonal set points
- Ambient forecast



Information

- TransLife™
- Predictive loading
- SCADA outputs (0-1mA or 4-20mA)
- Digital communication (RS 485, RS 232)
- Protocols (DNP 3.0, MODBUS)



QUALITROL® 505 ITM intelligent transformer monitor

TransLife™, the report card for transformers

General Description

- TransLife™ feature provides a dashboard of critical information needed to effectively manage transformer operation
- ITM manager is an intuitive helpful tool to manage transformers, to provide data for condition-based maintenance and to plan capital expenditures effectively
- Critical forecast feature estimates the time to reach critical temperature based on the present transformer load
- Temperature profiler records the time at various temperatures that relate to asset life, this information is displayed graphically for quick identification of time spent at peak temperatures
- Monitoring a winding, the QUALITROL 505 ITM receives inputs from oil, winding and ambient temperature to report loss of life rates, life consumption (daily and hourly), total loss of life and remaining asset life

TransLife™
Monitoring a winding

TransLife™ Control
Contains all the selections of input measurements for TransLife™

Critical Forecast
Determines the time remaining until a critical temperature is reached based on current conditions

Temperature Profiler
Logs the duration that the transformer is at each temperature range

Consumed Life
Computes loss of asset life rate, life consumed, remaining asset life and hours in operation

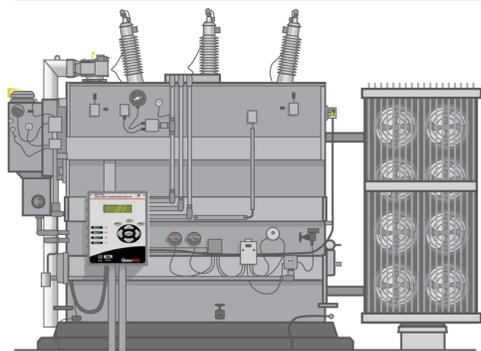
Temperature Profiler Graph
Graphical representation of the transformer's historical temperature
Red bars provide quick indication of time spent at accelerated life consumption

Temperature Profiler Data:

Temperature Range (C)	Hours
< 80 C	42
80 < 86 C	89
86 < 92 C	337
92 < 98 C	3190
98 < 104 C	2268
104 < 110 C	650
110 < 116 C	38
116 < 122 C	4
122 < 128 C	0
128 < 134 C	0
134 < 140 C	0
> 140 C	0



QUALITROL® 505 ITM intelligent transformer monitor series



505 intelligent transformer monitor For general transformer control

- Monitors and reports on important parameters such as liquid temperature, winding temperature, load current, oil level, and mechanical alarms.
- The 505 ITM uses the same accessories and software as the bigger and very successful brother, the 509 ITM. This minimizes any retraining to operate the 505 ITM.



QUALITROL® 505 ITM intelligent transformer monitor

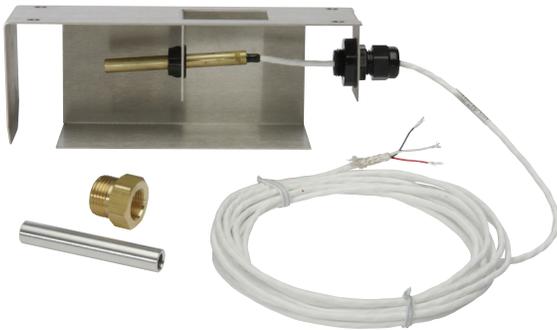
Components and accessories

Pt and Cu resistant temperature devices (RTDs)



- Provides transformer temperature measurements
- Many varieties available to custom fit hundreds of transformer applications with easy upgrade to different types of equipment
- Magnetic RTDs available for easy retrofit when wells are not available

Ambient RTD (103-047)



- For ambient temperature measurement within sub station (close to transformer)
- Includes sun shield to prevent false readings

Current transformers (CTs)



- Measures current flow needed to calculate winding temperature, monitor cooling systems and support advanced functions
- Clip-on design simplifies installation

Pressure transducers (TRN-603-1)



- Monitors static tank pressure and can provide sudden pressure protection (requires QUALITROL 930)

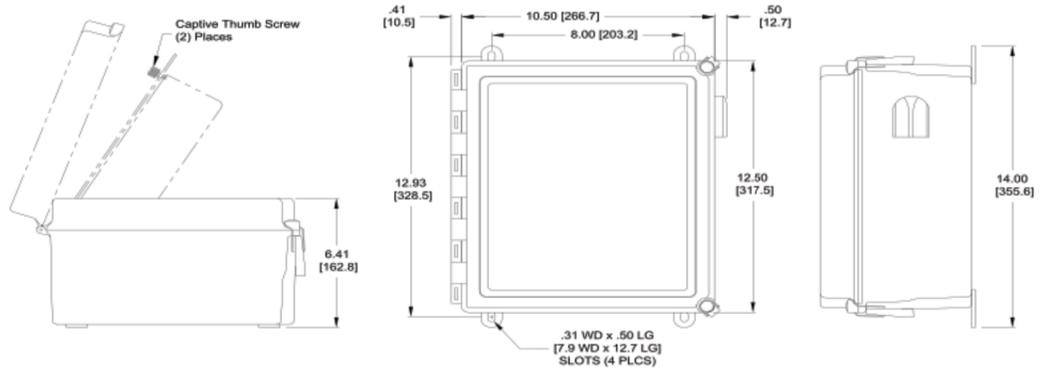


TECHNICAL SPECIFICATIONS

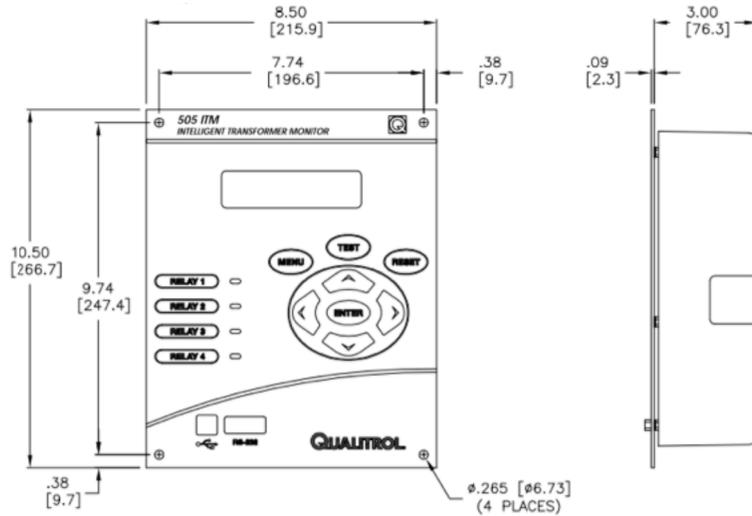
Power supply	Type	Universal; 90 to 264 watts VAC; 47-63 Hz, 40-290 VDC
	Consumption	< 30 watts AC IN; <15 watts DC IN
Input module parameters	Number of inputs	Accepts up to 4 input modules, 2 fixed, 2 configurable
	Accuracy	± 0.5% full-scale input range
	RTD	10 ohm copper & 100 ohm platinum -40°F to 248°F range (-40°C to 120°C)
	CT, winding temperature	Uses clamp-on sensor; range 0 to 5, 10, 20 amps
	AC voltage	0 to 140 and 0 to 360 VAC ranges
	Potentiometer	Accepts potentiometers from 5K to 15K
	Dry switch contact	Measures a dry switch contact as either open or closed
	Powered switch contact	Optically isolated; detects AC or DC from 120 to 250 volts
Output relays	Number of relays	4 programmable, 1 system status, 1 relay for heater control
	Type	Form C, 10 amps @ 120/240 VAC, 10 amps @ 30 VDC
Output current loop	Number of loops	2 magnetically-isolated current loops
	Type	Customer configurable in software to choose between 0-1 mA (max load 10,000Ω) and 4-20 mA (max load 450Ω)
Communications	RS232 port	1 port for set-up communications located on the front panel; varying baud rates
	RS485 port	1 port, 4-wire optically isolated for digital protocols
	USB port	1 type B (slave) for local setup
	Protocols	DNP 3.0 level 3 slave, Modbus RTU, ASCII
User interface	Control	8 pushdown buttons located on front panel
	Local display	2 x 16 character backlit LCD
Environmental	Operating temperature	-40°F to 161.6°F (-40°C to + 72°C)(-60°C when a heater is used)
	Storage temperature	-58°F to 185°F (-50°C to + 85°C)
	Humidity	5% to 90% non-condensing
	Shock	10 G's half-sine, in three orthogonal planes
	Vibration	60/120 Hz @ .004 inch displacement; 10/150 Hz at 1G
Immunity	Dielectric strength	2500 VAC, 60 seconds to ground
	Surge withstand capability	IEEE C37.90.1
	Cond./radiated emissions	IEC 61000-6-1
	Cond./radiated RFI	IEC 61000-6-2
	Safety	IEC 61010-1
	CE approved	Yes



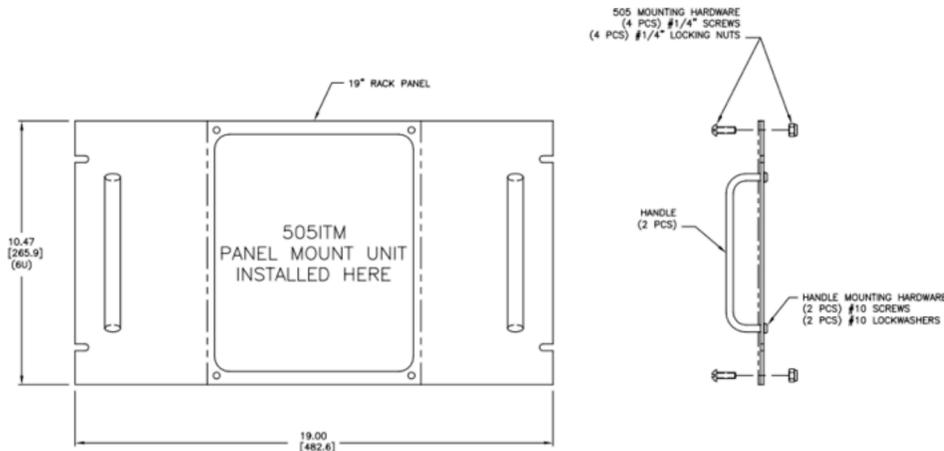
Weatherproof enclosure



Panel mount



19" rack mount



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