

LANSO®



TOT / TWT Digital Transformer Top-oil / Winding Temperature Controller

TOT / TWT



Product Overview

Digital Transformer Top-oil / Winding Temperature Controller consists primarily of a mechanical component and a digital sensing unit. A sealed system consisting of an elastic element, a sensing tube, and a temperature-sensing component is filled with a temperature-sensing medium. When the measured temperature changes, the volume of the temperature-sensing medium inside the temperature-sensing component changes accordingly. This increase in volume is transmitted through the sensing tube to the elastic element inside the instrument, causing it to undergo a corresponding displacement. After this displacement is amplified by the mechanical mechanism, it indicates the measured temperature and actuates a micro-switch, which outputs a switching control signal to drive the cooling system, thereby achieving the goal of controlling the transformer's temperature.

Scope of Application

- Ultra-High Voltage Oil-Immersed Transformers
- Extra-High Voltage Oil-Immersed Transformers
- High-Voltage Oil-Filled Transformers

Product Features

- The product utilizes dual-diaphragm compensation technology, with an all-weather accuracy of 1.5% FS, meeting the requirements of State Grid standard DL/T1400.3-2023;
- The product complies with State Grid's standards for digital meters;
- The product is manufactured using high-frequency welding and self-flow filling technology, ensuring a reliable temperature sensor with no leakage;
- The product offers a variety of output signal options (Pt100, 4–20 mA, RS485);
- The product is equipped with six sets of temperature control switches, featuring graduated cooling capacity; switch points can be freely set across the entire range;
- The product housing features an integrated die-cast alloy design, which is easy to disassemble and offers greater strength;
- Protection rating: IP67.

Chapter 1

—Digital Transformer Top-oil / Winding Temperature Controller —Standard Specifications

Specifications and Parameters

Mechanical Properties	Indicator Accuracy	±1.5% of full scale
	Standard Measurement Range ※	0°C to 150°C
	Winding Temperature Simulation	Internal options: CT ≤ 2.2A, CT ≤ 2.65A, or CT ≤ 5 A
	Installation Methods	Stainless Steel Vibration-Resistant Mount (Standard) 80 x 100 or 144 x 210
	Cover Plate	500 VAC to ground, sustained for 60 seconds
Electrical Performance	Number of Switches ※	2, 4, or 6 independent, adjustable switches
	Switch Type	Standard
	Switch Return Difference	5°C ± 3°C - Standard Full range adjustable with all switches closed.
	Switch Accuracy	±1.5% of full scale
	Remote Output	Passive Output: Pt100 Output: 4-20 mA, 2 × 4-20 mA, 4-20 mA & 0-5 VDC
	Communications	RS-485 MODBUS (Complies with the State Grid's digital meter standards; certification available)
	Dielectric Isolation Switch	2,000 VAC to ground, for 60 seconds
	Dielectric Isolated Remote Output	500 VAC to ground, for 60 seconds
Materials	Housing	Die-cast aluminum, powder-coated in RAL 7035
	Capillary Tube	Copper-nickel element with stainless steel protective cover
	Window	UV-Protective Tempered Glass
Environment	Corrosion Resistance Rating ※	C4-CX (optional)
	Protection Rating	Ingress Protection 67
	Operating Temperature	-40°C to 70°C - Standard -60°C to 70°C - Polar regions
	Storage Temperature	-50° to 80°C
	Humidity	95% relative humidity, non-condensing @ 95°C
	General Requirements	Complies with IEC 60076-22-1
	Overvoltage Category, Pollution Level, Insulation Class	Class III, Level 2, Insulation Class 1

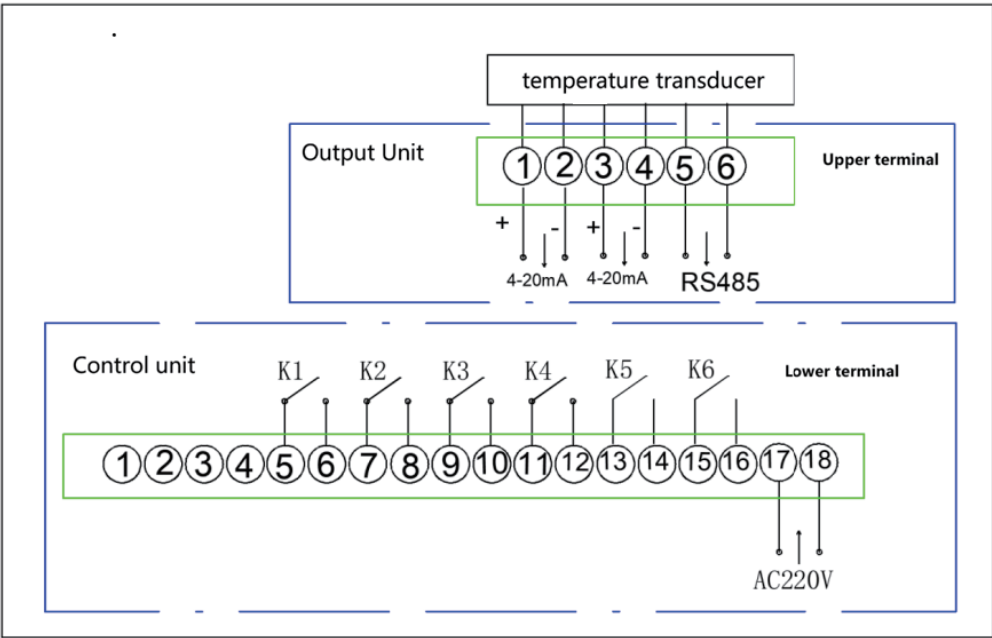
Chapter 2

—Digital Transformer Top-oil / Winding Temperature Controller —Optional Configurations

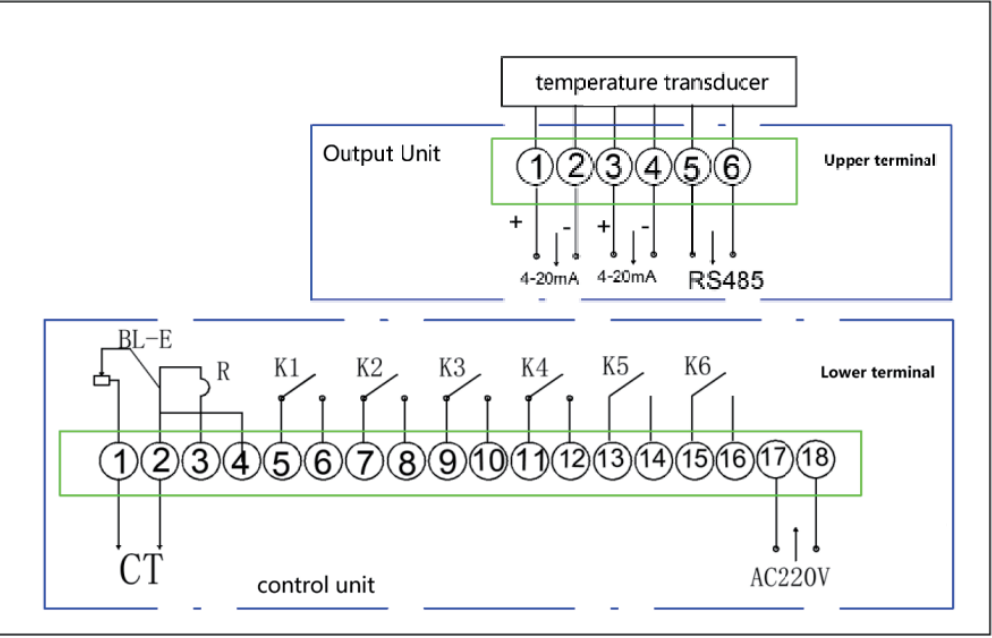
※1) Basic Functions	Option 1	Digital Transformer Top-oil Temperature Controller
	Option 2	Digital Transformer Winding Temperature Controller
	Option 3	Fiber Optic Digital Transformer Top-oil Temperature Controller
	Option 4	Fiber Optic Digital Transformer Winding Temperature Controller
	Option 5	Other thermostat requirements can be customized
※2) Operating temperature	Option 1	-40°C~+55°C
	Option 2	-25°C~+70°C
	Option 3	-60°C~+70°C
	Option 4	Other temperature requirements can be customized
※3) Measuring Range	Option 1	0~150°C
	Option 2	0~160°C
	Option 3	-20~140°C
	Option 4	-40~120°C
	Option 5	Other temperature requirements can be customized
※4) Number of switches	Option 1	2 sets of normally open contacts
	Option 2	3 sets of normally open contacts
	Option 3	4 setsof normally open contacts
	Option 4	6 sets of normally open contacts
	Option 5	Other contact requirements are available upon request
※5) Mounting Dimensions	Option 1	144 × 210
	Option 2	80 × 100
	Option 3	Other directions are available upon request

Wiring Diagram

1) Digital Transformer Top-oil Temperature Controller



1) Digital Transformer Winding Temperature Controller



Note :Other requirements customizable upon customer request.

※6) Mounting Thread	Option 1	M27*2
	Option 2	M33*2
	Option 3	M22*1.5
	Option 4	M30*2
	Option 5	First Grade
	Option 6	G1/2
	Option 7	Other threaded connections are available upon request
※7) Meter Head Rain Cover	Option 1	C3
	Option 2	C4
	Option 3	C5
	Option 4	CX
※8) Output Parameters	Option 1	Output signal:Pt100
	Option 2	Output signal:4-20mA
	Option 3	Output signal:RS485
	Option 4	Output signal:Pt100x2
	Option 5	Output signal:4-20mAx2
	Option 6	Output signal:No output
※9) Toggle Switch Specifications	Contact Rating	AC220V 10A/DC220V3A
	Electrical Life	Operating life ≥ 10,000 cycles
	Contact Resistance	≤50 mΩ
	Insulation Resistance	≥100 MΩ (test voltage: 500 VDC)
※10) Electrical Connection	Option 1	5 x M20*1.5
	Option 2	3 x M25*1.5
※11) Sealing Material	Option 1	NBR (Nitrile)
	Option 2	FPM (Fluororubber)
	Option 3	Acrylate

Chapter 3

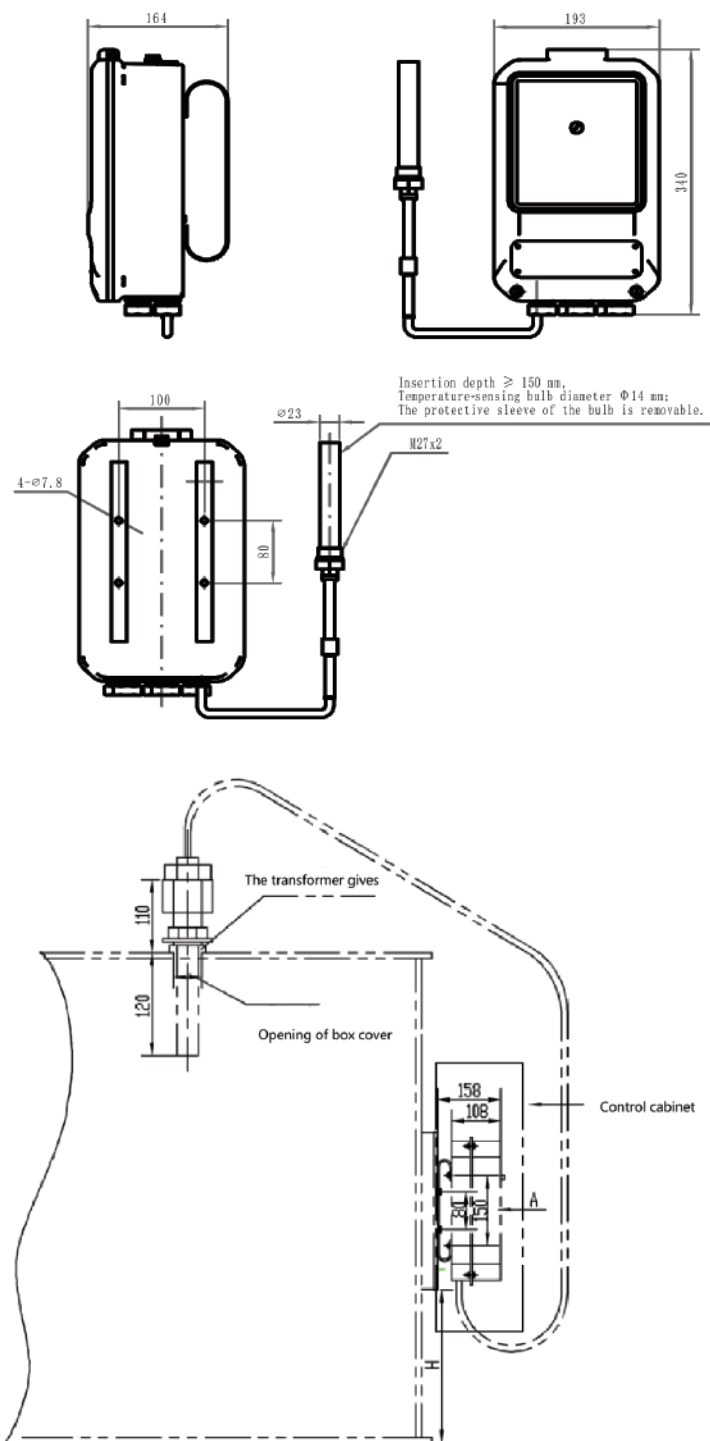
—Digital Transformer Top-oil / Winding Temperature Controller

—Dial Display

Dial Display Content	Unit of Indication	°C
	Temperature Measurement	Temperature sensed by temperature bulb; each scale division is 2°C, marked with maximum and minimum measuring range
	Communication Indication	Green LED, flashes during communication
	Err	Red LED, stays steady-on when fault occurs
	Accuracy Class	Class 1.5
	Company Logo	Mark of "LANSO"
	Maximum Temperature Memory	Red pointer records the maximum temperature value of the temperature controller

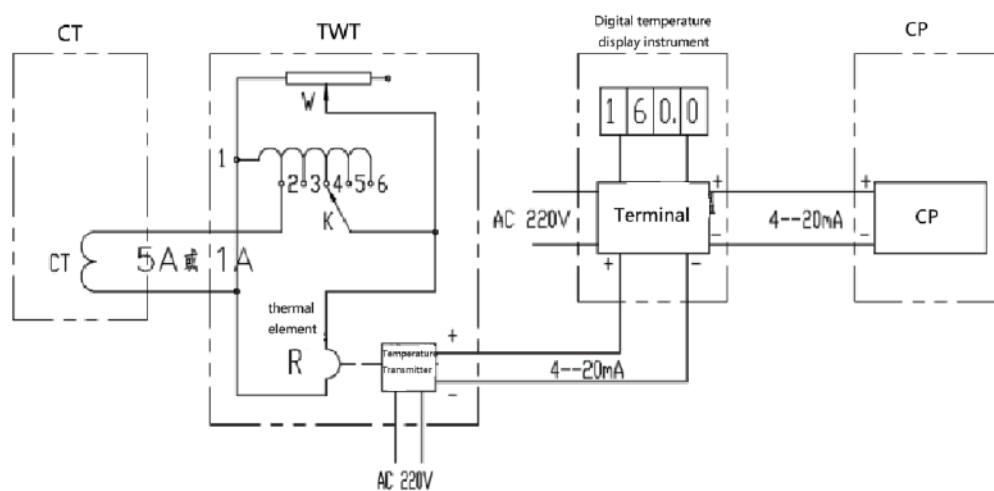
Chapter 4

—Digital Transformer Top-oil / Winding Temperature Controller —Installation Diagrams



After installation, be sure to tighten the screws on the meter cover to prevent water leaks.

Electrical Schematic of Digital Transformer Winding Temperature Controller



Chapter 5

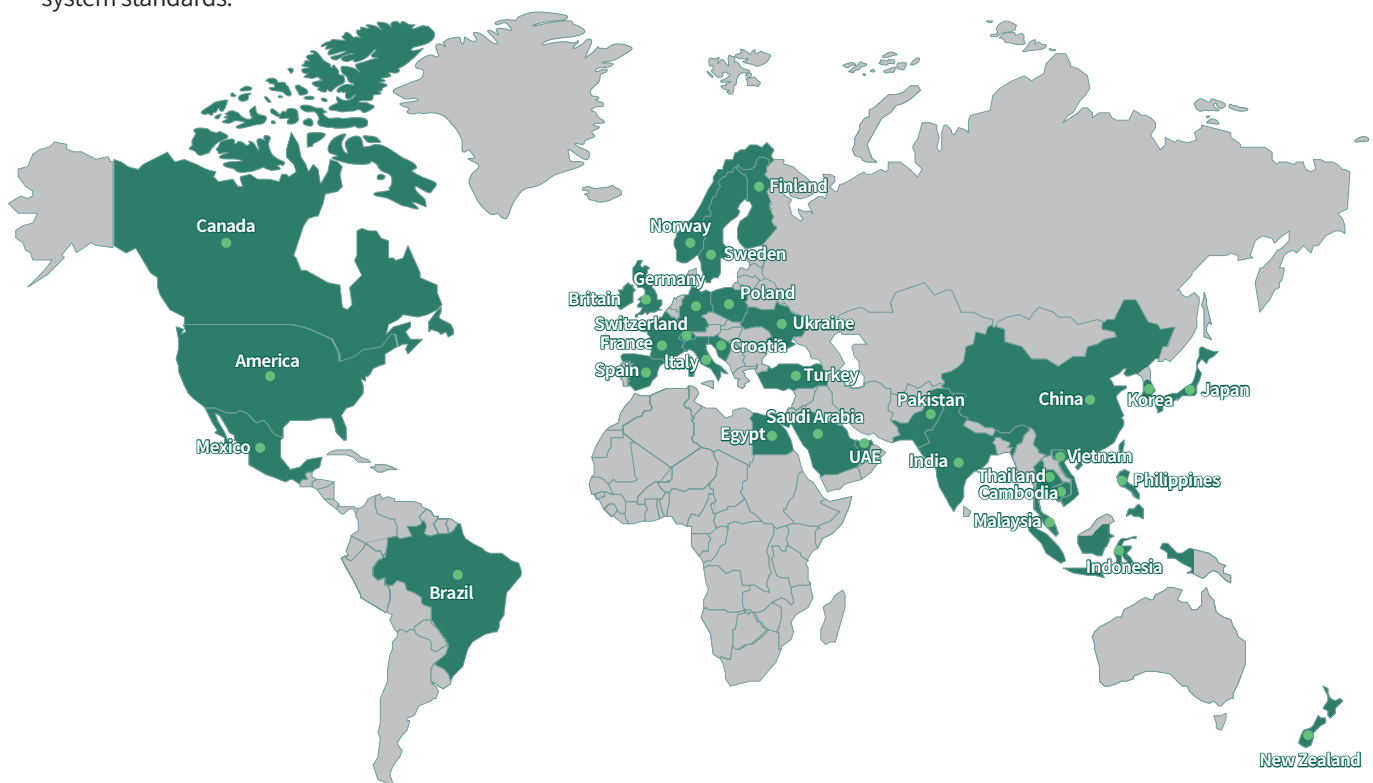
—Digital Transformer Top-oil / Winding Temperature Controller
—List of Optional Accessories

List of Optional Accessories	Rain Protection Measures	Option 1	Rain Cover
	Backend Display	Option 2	Digital Temperature Display
	Installation Accessories	Option 3	Mounting Screws
		Option 4	Install the backplate

Lanso Konly (Shanghai) Instruments Co., Ltd. is an innovation-driven high-tech enterprise, focusing on globally leading SF₆ and alternative insulating gas monitoring solutions, as well as a series of digital transformer accessories. The company has established a full industry-chain ecosystem covering R&D, production, marketing, and service, empowering the safe operation of power equipment worldwide.

Relying on independent research and development, the company has obtained more than 50 patents and received authoritative certifications such as National High-Tech Enterprise, Little Giant Enterprise, and 2024 Shanghai Manufacturing Individual Category Champion. Its products are exported to more than 20 countries and regions globally. The company has established deep cooperation with international giants such as ABB, Schneider, and Siemens, as well as leading domestic enterprises including Taikai Group, Sieyuan Electric, and Pinggao Group etc.

The company strictly controls product quality management, establishing a full-process quality traceability system from raw material procurement to finished product delivery. Through a series of scientific and rigorous measures, it ensures product stability and reliability, and has been certified under the ISO9001 and ISO14001 quality management system standards.



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