TECHMIZE by TONGHUI

OM

OPERATION MANUAL

TH2883 Series

Impulse Winding Tester — TH2883-1 / TH2883-5 / TH2883-10. Covers front-panel operation, comparison-method setup, system configuration and file management; see Chapter 7 for the remote-control interfaces and Chapter 8 for the HANDLER interface.

Techmize Electronic GmbH · Ismaning, Germany · an international subsidiary of Changzhou Tonghui Electronic Co., Ltd.

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TH2883 Series Operation Manual

Impulse Winding Tester — TH2883-1 / TH2883-5 / TH2883-10

This is the English-language edition of the TH2883 Series Operation Manual, prepared by Techmize for the European market. It covers the three single-channel models **TH2883-1**, **TH2883-5** and **TH2883-10**, which share one platform and differ only in impulse-voltage range and a small number of related step sizes — see §6.1–6.2. The 8-channel and 4-channel variants (**TH2883S8-5**, **TH2883S4-5**) are covered by a separate datasheet and operation manual.

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The full SCPI command reference is issued as a separate companion document, TH2883 Series SCPI Command Reference, in line with Techmize's standard practice for command sets of this size. Chapter 7 of this manual covers the remote interfaces and command-subsystem structure only.

CHAPTER 1

Safety & Compliance

1.1 About this manual

This is the original-language (English) edition of the operation manual for the Techmize TH2883 series impulse winding tester, covering models **TH2883-1**, **TH2883-5** and **TH2883-10**. Where this manual and the instrument itself appear to disagree, or where a described function is not present on your particular model or configuration, contact Techmize or your authorized distributor using the details in §1.9 before relying on the instrument for measurement or sorting decisions.

Techmize continually improves the performance, features and construction of its instruments; content, specifications and accessories described here are subject to change without notice.

> **WARNING — HIGH IMPULSE VOLTAGE**
>
> The TH2883 series applies a high-voltage impulse to the device under test — up to 1.2 kV on the TH2883-1, 5 kV on the TH2883-5, and **10 kV** on the TH2883-10 — at the front-panel HI test terminal. This is a serious shock hazard. Never touch the test terminals, the test cable, the test fixture, or the device under test while the front-panel **HV** indicator is lit. Disconnect the AC power cord before opening the instrument or changing internal settings; there are no operator-serviceable parts inside.

1.2 Safety symbols used in this manual

The following symbols and signal words appear in this manual and on the instrument itself:

WARNING — a hazard that, if not avoided, could result in personal injury or death.

CAUTION — a hazard that, if not avoided, could damage the instrument or the device under test, or invalidate a measurement.

NOTE — supplementary information that helps with correct or efficient use, but is not itself a hazard.

Protective ground — this terminal must be connected to protective earth. Also printed next to the instrument's rear-panel ground terminal.

1.3 General safety requirements

Protective earthing of the chassis, via the three-wire AC power cord, is essential to safety and must not be defeated. Do not place heavy objects on top of the instrument, and keep the rear-panel cooling-fan intake clear at all times.

> **WARNING — ELECTRIC SHOCK**
>
> Always use a supply outlet with a protective earth contact. Never connect the AC supply, or operate the instrument, with the protective ground disconnected or with a two-wire (ungrounded) adapter. Disconnect the power cord before replacing the fuse.

Power	
Supply voltage	220 V AC ±10% (198–242 V) or 110 V AC ±10% (99–121 V)
Supply frequency	50 Hz or 60 Hz, ±5% (47.5–63 Hz)
Power consumption	≤ 200 VA
Fuse (220 V / 50 Hz, as shipped for the European market)	T1AL (time-lag, low breaking capacity); replace only with the same rating and type

The instrument's fuse holder also accepts a T2AL fuse for 110 V / 60 Hz operation. Units supplied to the European market are fitted with the T1AL fuse for 220 V / 50 Hz operation.

High-voltage stability depends on a stable AC supply; use a properly rated, regulated AC source. The AC power-inlet line L, neutral N and earth E conductors must match the instrument's power-inlet wiring.

WARNING — TEST TERMINALS AND TEST CABLE

The front-panel HI/LO test terminals, and the HV-rated test cable (TH2883-01) and test fixtures connected to them, carry the impulse test voltage while the **HV** indicator is lit. Always use the test cable and fixture supplied or specified by Techmize/Tonghui, matching the connector to the panel socket. Disconnect the device under test before changing wiring, and never touch the test terminals, cable, fixture or device under test while a test is in progress.

Test fixtures and cables. Use only the test cable and fixture supplied or specified by Techmize/Tonghui; a user-made or third-party cable or fixture can produce incorrect measurement results or create a shock hazard at this instrument's test voltages. Keep the fixture, cable and the device-under-test leads clean to ensure good contact.

Environment

Item	Requirement
Operating temperature	0–40 °C
Operating humidity	≤ 75% RH
Transport / storage temperature	0–50 °C
Transport / storage humidity	≤ 93% RH, non-condensing

Do not use the instrument in a dusty, vibrating, direct-sunlight or corrosive-gas environment. Keep the rear-panel ventilation openings clear, and avoid operating in a high-humidity location, since the instrument itself generates high voltage internally. If the instrument will not be used for an extended period, store it in its original packaging, or a similar box, in a well-ventilated room within the storage conditions above.

CAUTION — WARM-UP

Allow at least **15 minutes** of warm-up after switch-on before relying on the instrument for measurement or sorting decisions.

1.4 Electrical safety test data

Dielectric-withstand, insulation-resistance and leakage-current test figures for the instrument itself (as opposed to the device-under-test measurements the instrument performs) are not included in this manual. Contact Techmize/Tonghui engineering if a formal electrical safety test report for the instrument is required.

1.5 CE marking

The TH2883 series carries the CE mark, as shown on the instrument's rear-panel nameplate. Compliance is supported by the harmonized standards listed in §6.6; the specific EU certificate of conformity references for this series were not available at the time of writing — contact Techmize for the current certificates if required for your import documentation.

1.6 WEEE — disposal of electrical and electronic equipment



This symbol indicates that the instrument must not be disposed of as unsorted municipal waste at the end of its service life. Within the European Union, return the instrument to Techmize, your distributor, or a designated collection point for electrical and electronic equipment, in accordance with the WEEE Directive (2012/19/EU) and its national transposition in your country. Correct disposal helps prevent potential harm to the environment and human health from uncontrolled waste handling.

1.7 RoHS compliance

The TH2883 series is covered by Techmize's own RoHS (Directive 2011/65/EU, as amended) self-declaration. No independent third-party RoHS certificate is currently available for this series.

1.8 Warranty

Techmize warrants this instrument to be free from defects in material and workmanship for a period of **two (2) years** from the date of delivery to the original purchaser. During the warranty period, Techmize will repair or replace, at its discretion, a product that proves defective, provided it has been used within the specified operating conditions. A warranty card is required to claim warranty service.

This warranty does not cover damage from misuse, accident, unauthorized modification or repair, consumable/wear items such as the fuse and the high-voltage test cable, or damage from operation outside the environmental limits given in §1.3. Repair must be carried out by qualified technical personnel; do not replace internal components without authorization. After any repair, the instrument must be recalibrated before further use.

1.9 Manufacturer & EU contact

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Registration

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Register Court: Amtsgericht München
HRB 312530 · VAT ID DE463170824

CHAPTER 2

Out of the Box

2.1 Unpacking

Inspect the shipping container for damage after unpacking. It is not recommended to power on the instrument if the container shows signs of damage — contact your carrier and your Techmize distributor before proceeding. Check the contents against your order; if anything does not conform, notify Techmize or your distributor promptly.

Item	Qty
TH2883-1, TH2883-5 or TH2883-10 instrument (model as ordered)	1
TH2883-01 high-voltage test cable	1
TH2881-001 foot switch	1
EU power cable (Schuko, CEE 7/7)	1
Fuse, T1AL (220 V / 50 Hz)	2
Warranty card	1
Test report	1

This operation manual is issued in PDF only; no printed edition is included in the standard packing. TH26052 and TH26053 test fixtures for the TH2883-1 are optional accessories and must be ordered separately.

Keep the original packaging — it is the recommended way to store or return the instrument. Store the instrument in a dry, well-ventilated room at 0–50 °C and ≤93% RH when not in use for an extended period, away from corrosive gases.

2.2 Connecting the power supply

Item	TH2883-1 / TH2883-5 / TH2883-10
Supply	220 V AC ±10% or 110 V AC ±10%, 50/60 Hz ±5%
Power consumption	≤ 200 VA
Power switch	Front-panel push-push power switch

Match the L (line), N (neutral) and E (earth) conductors of the supply cable to the instrument's rear-panel power inlet, and confirm reliable grounding before switching on.

> **WARNING**
>
> Make sure the protective-earth conductor is reliably grounded before connecting the power cable, to prevent electric shock. Disconnect the power cable before replacing the fuse. The fuse holder is rated T2AL for 110 V/60 Hz operation and T1AL for 220 V/50 Hz operation — fit only the fuse type matching the supply voltage in use.

2.3 Connecting the device under test

Connect the TH2883-01 high-voltage test cable (or an equivalent Techmize-specified fixture, such as the optional TH26052/TH26053 for the TH2883-1) to the front-panel test port: **HI** sources the impulse test voltage, and **LO** is the return/ground terminal, together forming the circuit through which the coil's damped-oscillation waveform is acquired.

WARNING — NEVER TOUCH LIVE TERMINALS

Never touch the test terminals, test cable, fixture or device under test while the front-panel **HV** indicator is lit. The HI terminal can be at up to 1.2 kV (TH2883-1), 5 kV (TH2883-5) or 10 kV (TH2883-10).

CAUTION

A user-made or third-party test fixture or cable can produce incorrect measurement results. Keep the fixture/cable and the device-under-test leads clean for good contact.

2.4 Acquiring a standard waveform

Before sorting production units, the instrument needs a reference ("standard") waveform to compare against. Connect a known-good sample coil and use the Standard Sampling function (<Measurement Display> → Standard Sampling, §4.1.1) to capture it — manually, automatically across sample rates, or in a repeating cycle. Up to 20 standard-waveform/setup combinations can be stored internally (§5.3). Techmize recommends acquiring a fresh standard waveform whenever the test fixture, cable or sample batch changes.

2.5 Starting the instrument for the first time

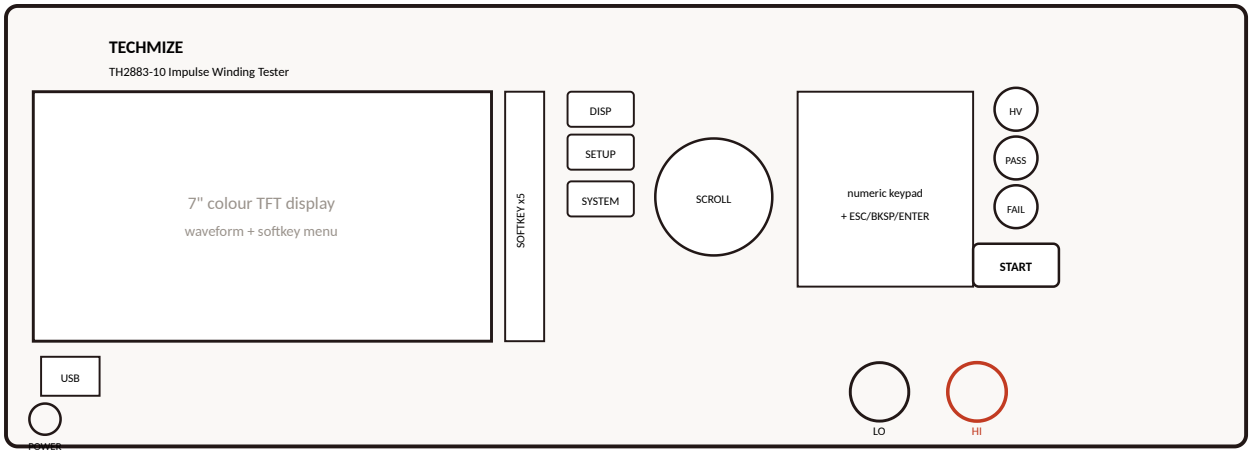
1. Connect the EU power cable to the rear-panel inlet, confirming reliable earth-ground connection.
2. Press the front-panel power switch.
3. The instrument displays a startup screen showing the Tonghui trademark, model and firmware version.
4. If password protection is enabled, the instrument prompts for the startup password before continuing (§6.1.7).
5. The display opens on the default <Measurement Display> page.

Allow at least 15 minutes of warm-up before relying on the instrument for measurement or sorting decisions (§1.3). For an overview of the front panel, rear panel and screen layout, continue to Chapter 3.

CHAPTER 3

Getting to Know the Instrument

3.1 Front panel



Simplified front-panel layout (schematic, not to scale) — see the legend below for the full item list

1 **Trademark & model** label.

2 **LCD display** — 800×480-dot colour TFT; shows the measured waveform, settings and system parameters.

3 **SOFTKEY** — 5 keys beside the display; function changes with the active page/menu (§3.3).

4 **DISP** — opens the <Measurement Display> page (§4.1).

5 **SETUP** — opens (cycles through) <Measurement Setup>, <Internal File> and <External File> (§4.2, §5.2).

6 **Scroll wheel** — moves the cursor and confirms/modifies a selected value.

7 **SYSTEM** — opens (cycles through) <System>, <Interface> and <About> (§5.1).

8 **Numeric keypad**, with **ESC**, **BACKSPACE** and **ENTER**.

12 **HV indicator** — lit while high voltage is present at the test port; never touch the test terminals or device under test while lit.

13 **PASS / FAIL indicators** — light when the comparator function (§4.1.2) is enabled and a sort result is available.

14 **START** — triggers a measurement, or aborts one in progress.

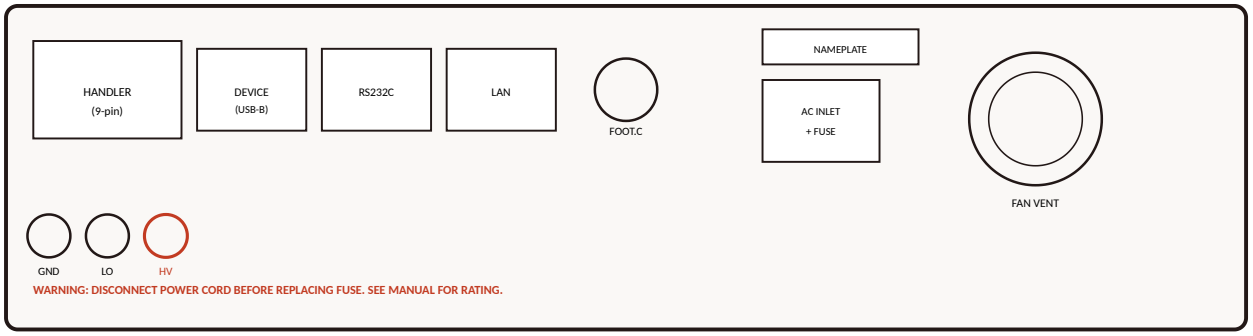
15–16 **HI / LO test terminals** — impulse voltage output (HI) and return (LO); connect the test cable/fixture here.

17 **COPY** — screen-capture (hard-copy) key.

18 **POWER switch.**

19 **USB Host port** — reads/writes a connected USB flash drive.

3.2 Rear panel



Simplified rear-panel layout (schematic, not to scale) — see the legend below for the full item list

1 **HANDLER port** — 9-pin connector; outputs the comparator result and end-of-measurement signal, and accepts an external start/stop trigger (Chapter 8).

2 **USB DEVICE** — rear-panel USB-B port for PC control over USBCDC or USBTMC (§7.3).

3 **RS232C port** — 3-wire serial communication with a host PC (§7.1).

4 **LAN port** — LXI-compliant network interface; browser and remote-control access (§7.2).

5 **FOOT.C** — footswitch input (TH2881-001, included as standard); triggers a measurement when Trigger mode = Manual.

6 **Nameplate** — manufacturer, model, serial number, fuse rating and CE mark.

7 **Fan vent** — cooling-fan exhaust; keep clear.

8 **Ground terminal** — chassis protective ground.

9 **AC inlet & fuse holder** — fuse rated T2AL (110 V/60 Hz) or T1AL (220 V/50 Hz, as shipped for Europe); see §1.3, §2.2.

10 **3-pin power inlet.**

11–12 **Rear test terminals** — HV and GND/LO, duplicating the front-panel HI/LO test port (§3.1).

3.3 Screen display regions

The <Measurement Display> page is the instrument's working view: the main waveform area shows the measured coil's damped-oscillation waveform (and, when enabled, the stored standard waveform for comparison), with a voltage-scale ruler on the left, the test/run status (RUN/STOP), the current impulse-voltage setting, the overall OK/NG result, and the individual results of each enabled comparison method (A = Area, Z = Area-diff, C = Corona, P = Phase-diff) in the upper-right corner. A softkey menu occupies the right edge, and a status strip across the bottom shows the timebase, the active file name, the sampling rate and the time of day.

3.4 Main pages

Page	Reached with	Description
<Measurement Display>	DISP	Live waveform, OK/NG result, standard sampling, comparator setup, measure function, utility, statistics (§4.1)
<Measurement Setup>	SETUP	Impulse voltage, sample rate, test/erase pulses, voltage adjust, wave display, trigger mode, delay, BDV (destructive) test (§4.2)
<Internal File> / <External File>	SETUP (cycles)	Save/load/delete instrument configurations, internally or on a USB drive (§5.3)
<System> / <Interface> / <About>	SYSTEM (cycles)	Display, alarms, password, language, date/time, HANDLER valid time; RS232C/USB/LAN configuration; model/serial/firmware info (§5.1–5.2)

3.5 Basic operation

1. Press DISP, SETUP or SYSTEM to reach the page group you want; SETUP and SYSTEM cycle through their sub-pages on repeated presses.
2. Move the cursor to the field to be changed, using the scroll wheel or the numeric-direction-key cluster (when lit, §5.1).
3. Use the softkeys shown for that field (coarse/fine increase-decrease, or an on/off toggle), or type a value directly on the numeric keypad and confirm with ENTER.

3.6 Starting the instrument

Confirm reliable earth-ground connection, then press the front-panel power switch (§2.5). The instrument shows a startup screen (trademark, model, firmware version), then opens on the default <Measurement Display> page. If password protection is enabled, enter the startup password when prompted (§5.1.7). Allow at least 15 minutes of warm-up before relying on the instrument for measurement or sorting decisions (§1.3).

CHAPTER 4

Basic Operation

The TH2883 series tests a coil by applying a high-voltage impulse and capturing the resulting damped-oscillation waveform, then comparing it against a stored standard waveform using up to four independent comparison methods. This chapter covers the <Measurement Display> page's softkey menu and the <Measurement Setup> page, then walks through starting a test.

4.1 <Measurement Display> page (DISP)

Pressing DISP opens the default power-on page: the live/standard waveform display, with a softkey main menu of six functions.

4.1.1 Standard Sampling

Captures the reference waveform the instrument compares each test against. Three modes are available:

Mode	Behaviour
Manual	Start / Sample Complete / Sample Average (count) / Undo / Undo All — a single capture, optionally averaged over several pulses
Auto	Start — captures at each sample rate in turn, then Select (or Select & Detect, which also runs a verification test) to choose the best-fitting rate as standard
Cyclic	Start — repeatedly re-samples at the current rate; Select (or Select & Detect) to adopt the current capture as standard

A Modify softkey (also used elsewhere, §4.1.6) lets the scroll wheel change the waveform display colour, the impulse voltage, and the sample rate directly from this menu.

4.1.2 Compare Setup (comparator)

Configures the instrument's four comparison methods — Area, Area-diff, Corona and Phase-diff (§6.3). Each method has its own Method-select, Status (on/off), Position (the 0–6000-point comparison window, or the zero-crossing index for Phase-diff) and Limit (pass/fail threshold) softkeys; selecting a region lights two yellow vertical cursor lines in the waveform area (Position only; not for Phase-diff).

Method	Position range	Limit range
Area	0–6000 (start/end window, 10-pt step)	0.1%–99.9%, 0.1% step
Area-diff	0–6000 (start/end window, 10-pt step)	0.1%–99.9%, 0.1% step
Corona	0–6000 (start/end window, 10-pt step)	0–255, unitless, 1-count step
Phase-diff	Zero-crossing index 2–99	0.1%–99.9%, 0.1% step

A Phase-diff comparison can return FAIL1 (the configured zero-crossing point is not found on the test waveform) or FAIL2 (a complete oscillation period is not found on the standard waveform), in addition to PASS/FAIL — see §6.3 for how each method works.

4.1.3 Measure Function

Reads the peak voltage, time and frequency of the displayed waveform. Selecting one of Voltage / Time / Frequency lights two selection lines on the waveform; the scroll wheel steps each cursor between the upper limit, lower limit and mid-point positions, and the softkey's second line shows the resulting difference (ΔV, Δs or ΔHz) between the two cursors.

4.1.4 Utility

Field	Function
File	Opens the internal file system (§5.3)
Amplitude	Waveform display zoom, 1×–3×
Grid	On/off — waveform-area grid lines
Sub-display	On: shows the extracted corona-discharge signal in the auxiliary display area. Off: shows the basic measurement parameters and comparison-method judgement values instead
Keyboard lock / unlock	Locks/unlocks the front-panel keys; a lock icon appears in the status strip while locked

4.1.5 Statistics

Shows, per comparison method, the number of tests run, the number that passed, and the pass rate. Status turns the statistics page on/off; Clear Data resets the counters; Save Data writes the current statistics to a connected USB drive as a CSV file.

4.1.6 Modify

As described under Standard Sampling (§4.1.1): with the scroll-wheel icon lit, use the wheel to change the waveform colour, the impulse voltage, or the sample rate.

4.2 <Measurement Setup> page (SETUP)

Field	Options / range
Impulse voltage (Imp Volt)	TH2883-1: 30–1200 V, 5 V step · TH2883-5: 100–5000 V, 10 V step · TH2883-10: 500–10000 V, 20 V step
Sample rate (Samp)	200 · 100 · 50 · 25 · 12.5 · 6.25 · 3.12 · 1.56 MSa/s (8 levels)
Test pulses (Test Imp)	1–32 pulses, 1-pulse step (sample averaging)
Erase pulses (Erase Imp)	0–16 demagnetizing pulses, 1-pulse step
Voltage adjust (Volt ADJ)	On · Off — compensates the output so the actual voltage on the DUT matches the setting, regardless of DUT loading
Wave display (Wave Disp)	All on (standard + test) · Standard only · Test only · All off
Trigger mode (Trig Mode)	Manual (START key or foot switch) · External (HANDLER input) · Internal (free-running) · Bus (remote command)
Delay time (Delay Time)	0.1–99.9 s, 0.1 s step (Internal trigger mode only)
BDV test	On · Off — enables the step-voltage destructive test (§4.3)
Start / End voltage, Volt Step	Available only when BDV test is On; see §4.3

4.3 BDV (step-voltage destructive) test

An alternative to interturn comparison testing at a single fixed voltage: the instrument runs a series of tests starting at Start Volt, stepping up by Volt Step × Start Volt at each stage, ending at End Volt, applying the four comparison methods at each step. This helps establish a safe test-voltage margin for a given coil design, or locate the voltage at which insulation breakdown first appears.

Field	Range
Start voltage	Same span as Imp Volt per model (§4.2); must not exceed End voltage
End voltage	Same span as Imp Volt per model (§4.2); must not be less than Start voltage
Volt step	1%–50%; step voltage = Start voltage × Volt Step

> **CAUTION**
> A BDV test is destructive if it reaches the coil's actual breakdown voltage. Use it only on sacrificial samples, not on production units intended for shipment.

4.4 Comparator master enable

The Comparator field on <Measurement Setup> (see also §4.1.2) turns comparison on or off as a whole, independent of the four individual methods' own Status fields. With Comparator off, the instrument still displays the measured and standard waveforms, but performs no PASS/FAIL judgement.

4.5 Starting a test

Connect the device under test to the HI/LO test port via the TH2883-01 cable or fixture (§2.3), with a valid standard waveform already acquired (§2.4). Trigger a measurement by pressing the front-panel [START] key or the foot switch (Manual trigger), an external signal at the HANDLER input (External trigger), automatically (Internal trigger, §4.2), or a remote command (Bus trigger, Chapter 7) — selected via Trig Mode on <Measurement Setup>. Press [START] again at any time to abort a measurement in progress.

> **WARNING**
> Do not touch the test terminals or device under test while the **HV** indicator is lit.

4.6 Worked example

Testing a small switch-mode transformer winding on a TH2883-5, with an expected insulation margin well above the normal operating voltage: acquire a standard waveform from a known-good sample (§2.4) at, e.g., 2000 V impulse voltage, 50 MSa/s sample rate, test pulses = 1; enable the Area and Corona comparison methods with a 0–6000 window and a 2.0% / 10-count limit respectively; set Trigger mode to Manual; connect each production unit in turn and press [START], reading the PASS/FAIL result from the front-panel indicators or the HANDLER output.

4.7 How the comparison methods work

The TH2883 series applies the same impulse voltage to the unit under test and to a reference coil, and compares the resulting damped-oscillation transient waveforms. The oscillation's decay reflects the coil's inductance, Q factor, turn count and, for wound components on a magnetic core, the core material — so a shorted turn, an interturn or interlayer short, a turn-count error, or a core-material deviation all show up as a waveform difference from the standard. Four independent comparison methods interpret that difference differently:

4.7.1 Area comparison

Integrates (computes the area under) the test waveform over a user-defined A–B window, and compares it with the standard waveform's area over the same window; the percentage difference is judged against the configured limit. Waveform area correlates with energy loss in the winding, making this method effective for detecting interlayer and interturn short circuits.

4.7.2 Area-difference comparison

Integrates the point-by-point (Y-axis) difference between the test and standard waveforms over the A–B window, and compares that difference area with the standard waveform's own area over the same window. This method is primarily sensitive to differences in inductance (L) and energy loss between the standard and test coils.

4.7.3 Corona-discharge comparison

Independent of the overall waveform shape, this method extracts the high-frequency content from any corona-discharge spikes present on the test waveform within the A–B window and compares the extracted value against a configured (unitless, integer) limit. It can reveal interlayer or inter-winding insulation weaknesses that area-based comparison alone would miss.

4.7.4 Phase-difference comparison

The user designates a zero-crossing point to compare (index 2–99 — the 1st zero-crossing is excluded as unrepresentative of actual winding performance). The instrument measures the test waveform's offset from the standard waveform at that zero-crossing, and the standard waveform's own oscillation period, and judges the ratio of these two quantities against the configured percentage limit. A valid Phase-diff comparison requires the designated zero-crossing to exist on both waveforms (otherwise it returns FAIL1 or FAIL2 — §4.1.2).

4.8 Choosing and applying comparison methods

Which comparison method(s) best suit a given coil depend on the construction and the fault modes of concern:

Test object	Recommended approach
Air-core coils (no magnetic core)	Area or Area-diff comparison; inductance and energy-loss differences dominate
Wound components on a magnetic core	Area, Area-diff and/or Corona comparison; core-material variation and interlayer insulation weakness both matter
Multi-winding / multi-tap coils	Phase-diff comparison, with the zero-crossing chosen to fall within the winding section of interest
High-reliability / safety-critical windings	Combine two or more methods (e.g. Area + Corona) for layered coverage

Techmize recommends starting from a generous limit (a wider percentage or count) on a batch of known-good samples, observing the natural spread of results, and then tightening the limit to a value that separates good units from intentionally-faulted reference samples with margin. A dedicated area-difference chart view (available from the comparison-method softkey menu) overlays the test and standard waveforms with the Y-axis difference shaded, which can help visualize where in the winding a difference is concentrated when setting up a new test program.

4.9 Key usage

Control	Function
Scroll wheel	Rotate to move the cursor / change a selected value; press to confirm or toggle. Also used wherever the wheel icon is lit in the status strip.
Numeric direction keys	With the icon lit, keys `8` / `2` / `4` / `6` move the cursor up/down/left/right in a cycle; lighting this icon disables direct numeric entry on those keys until it is turned off again.
Display-page switching	**DISP**, **SETUP**, **SYSTEM** — see §3.3–3.4

CHAPTER 5

System Setup & File Management

5.1 <System> page (SYSTEM)

Pressing SYSTEM cycles through <System>, <Interface> (§5.2) and <About> (§5.2.4).

Field	Options / range
Brightness	Adjustable, soft-key increase/decrease
Pass/Fail display	On · Off — master display of the OK/NG result
Pass alarm	Volume, adjustable; minimum = silent
Fail alarm	Volume, adjustable; minimum = silent
Key sound	On · Off
Hard copy (screen-capture) area	Full screen · Waveform area only (waveform-only option applies on <Measurement Display> only; elsewhere the full screen is always captured)
Password	On · Off · Modify — startup password; numeric only; disabling it still requires the current password
Language	中文 (Chinese) · **English** — European-market units ship set to English
Theme	Royal blue (fixed)
Date / Time	Format YYYY/MM/DD, HH:MM:SS; adjustable via softkeys or direct numeric entry
HDL (HANDLER) valid time	1–255 ms, or Hold (output stays at its last state); sets how long the HANDLER PASS/FAIL outputs remain valid

> **NOTE**
> Record any password you set — a lost password requires Techmize/Tonghui support to clear. Units shipped for the European market are configured to the English operator interface.

5.2 <Interface> page

Selects which remote interface (RS232C, USB or LAN) is active, and configures its parameters. Only one interface is active for remote control at a time; the cursor can only move within the parameter block of the currently selected interface.

Field	Options / range
I/O	RS232C · USB · LAN
RS232C — Baud rate	4800 · 9600 (default) · 19200 · 38400 · 115200 bit/s
RS232C — Data bits	6 · 7 · 8 (default)
RS232C — Stop bits	1 (default) · 1.5 · 2 bit
RS232C — Parity	None (default) · Odd · Even
RS232C — Terminator	LF (default) · CR · LFCR
USB — mode	USBTMC (default) · USBCDC (virtual COM port)
LAN — DHCP	On · Off (default)
LAN — Auto IP	On · Off (default)
LAN — IP address / subnet / gateway / DNS	Manually configurable when DHCP and Auto IP are both off

5.3 <About> page

Displays the instrument's model, serial number, and firmware/system version; also provides Reset and Default-Settings softkeys.

5.4 File management

Reached by cycling the SETUP key to <Internal File> or <External File>. Configuration settings — the measurement/setup parameters and comparison-method limits — can be saved to and recalled from a file, so a complete test program does not need to be re-entered manually.

Location	Capacity	Formats	Loadable
Internal (non-volatile memory)	100 files	.STA	Yes
External (USB drive, drive E:)	Limited by media	.STA (loadable) · .TXT · .CSV (export only)	.STA only

5.4.1 Internal file operations

Operation	Effect
Load	Recalls the selected file's saved settings into the active configuration (confirm Yes/No)
Unload	Clears the "loaded" state of a currently-loaded file (confirm Yes/No)
Copy to E:	Copies the selected internal file to a connected USB drive
Delete	Deletes the selected file (confirm Yes/No); deleting a currently-loaded file also clears its loaded state
Save	Saves the current configuration to the selected (empty) slot; confirm, then enter a file name (A–Z, 0–9, underscore) and press **ENTER**. An empty name defaults to `UNNAME.STA`

5.4.2 External (USB) file operations

Operation	Effect
Subfolder navigation	Enter/return a level with the cursor on a folder entry and the corresponding softkey, or press the scroll wheel to enter a folder
Create folder	Default name `FOLDERxx` (xx = 01–99) if none is entered
Save	Default name `FILExxx` (xxx = 001–999); pressing `.` while entering a name offers the .STA, .TXT or .CSV extension explicitly
Load	Only .STA files can be loaded into the instrument's active RAM configuration; .TXT and .CSV are export-only formats
Delete / Copy to I:	As for internal files (§5.4.1), in the opposite direction for Copy

> **NOTE**
>
> Use a USB2.0 drive formatted as FAT16 or FAT32. Back up data on the USB drive before connecting it to the instrument — Techmize/Tonghui is not responsible for USB-drive data loss.

CHAPTER 6

Performance & Specifications

6.1 Technical specifications

Parameter	TH2883-1	TH2883-5	TH2883-10
Channels	1	1	1
Impulse voltage	30–1200 V, 5 V step, ±5%±5 V	100–5000 V, 10 V step, ±5%±15 V	500–10000 V, 20 V step, ±5%±25 V
Inductance test range	≥ 1 µH	≥ 10 µH	≥ 20 µH
Impulse energy	≤ 0.02 J	≤ 0.25 J	≤ 0.5 J
Measurement speed	6 meas/s	6 meas/s	3 meas/s at 10 kV output
Applied pulses	Up to 32 per measurement (sample averaging, §4.2)		
Input impedance	5 MΩ		

TH2883-1's 1200 V ceiling applies to sufficiently high winding inductance; maximum output voltage falls at very low inductance values near the 1 µH minimum — consult Techmize for the voltage-vs-inductance curve.

6.2 Display & waveform acquisition

Item	Specification
Display	800×480-dot, 65k-colour TFT; waveform display area 600×256
Sampling rate	Up to 200 MSa/s, 8 adjustable levels (§4.2)
Resolution / memory depth	8-bit · 6k-byte memory depth
Sample averaging	1–32 pulses
Waveform measurement	Voltage, time, frequency (§4.1.3)

6.3 Comparison methods

Method	What it detects	Limit type
Area comparison	Energy-loss differences; interlayer/interturn shorts	% of standard-waveform window area
Area-difference comparison	Inductance (L) and energy-loss differences	% of standard-waveform window area
Corona-discharge comparison	Interlayer/inter-winding insulation weakness (high-frequency content)	Unitless count, 0–255
Phase-difference comparison	Timing offset at a chosen zero-crossing; multi-winding/tap differences	% of standard oscillation period

See §4.7 for how each method is computed and §4.8 for selection guidance.

6.4 Trigger, output & memory

Item	Specification
Trigger mode	Manual (incl. foot switch) · External · Internal · Bus (§4.2)
Detection output	OK/NG display, LED indicators, buzzer alarm, HANDLER output
Measurement statistics	Pass/fail count and pass rate per comparison method (§4.1.5)
Memory	20 internal standard-waveform/setup slots (§2.4); 100 internal configuration files (§5.4); USB drive for external storage
Interfaces	HANDLER, RS232C, USB Device, USB Host, LAN — standard on all models

6.5 General specifications

Item	Specification
Power	110/220 V AC ±10%, 50/60 Hz ±5%, ≤200 VA
Warm-up time	≥ 15 minutes
Operating environment	0–40 °C, ≤75% RH
Dimensions / weight	400(W) × 132(H) × 420(D) mm, ≈ 15 kg
Safety & EMC (referenced standards)	IEC 61010-1:2001 · IEC 61326-2-1:2005

All other specifications (display, waveform acquisition, comparison methods, interfaces) are identical across TH2883-1/-5/-10 — only impulse-voltage range/step, inductance range, impulse energy and measurement speed differ by model.

PART II

Remote Control & Handler

Covers the RS232C, USB and LAN remote interfaces and the HANDLER interface for automated test integration. The full SCPI command tables are issued separately as the *TH2883 Series SCPI Command Reference*.

CHAPTER 7

Remote Control

The TH2883 series can be controlled remotely over RS232C, USB (USBTMC or USBCDC) or LAN, using the SCPI command set. Only one interface is active at a time, selected on the <Interface> page (§5.2). For the complete command syntax and parameter ranges, see the companion *TH2883 Series SCPI Command Reference*.

7.1 RS232C

Item	Specification
Pin assignment (9-pin)	TXD = pin 2, RXD = pin 3, GND = pin 5
Baud rate	4800 · 9600 · 19200 · 38400 · 115200 bit/s (§5.2)
Data format	6/7/8 data bits · none/odd/even parity · 1/1.5/2 stop bits (all configurable)
Command termination	LF, CR or LFCR (configurable, §5.2)
Max. command length	2 KB per SCPI command string

Note that the instrument's RS232C implementation provides only a minimal subset of the full RS-232 standard (TXD, RXD, GND) rather than the complete 9-pin signal set — a deliberate simplification common to this class of instrument.

7.2 LAN

LXI-compliant network interface. IP configuration can be obtained via DHCP, via link-local Auto IP, or set manually (IP address, subnet mask, gateway, preferred/alternate DNS) when both are disabled (§5.2). The LAN interface also supports browser-based access to the instrument's embedded web page for status and basic remote control.

7.3 USB

USBTMC (default): USBTMC-USB488 compliant, over the rear-panel USB DEVICE (USB-B) port. Requires a VISA/USBTMC driver on the host PC; once installed, the instrument is addressable with LabVIEW or any USBTMC-capable client.

USBCDC: presents a virtual COM port over the same connector, selected via USB mode = USBCDC (§5.2). Requires the Tonghui-supplied `TH2883-vcom.inf` driver; once installed, the instrument appears as "TH2883 USB Vcom Port" in the host OS's device manager and can be addressed as an ordinary serial port.

7.4 Command-set overview

The instrument uses the SCPI command set over all interfaces. Commands are organized into 12 subsystems — display (`DISPlay`), impulse voltage (`IVOLTage`), sample rate (`SRATE`), comparator (`COMParator`), trigger (`TRIGger`), statistics (`STATistic`), demagnetizing/wave-adjust (`WADJust`), standard wave (`SWAVE`), fetch (`FETCh?`), measure (`MEASure`), abort (`ABORt`) and mass memory (`MMEMory`) — plus the common commands `*RST` , `*TRG?` and `*IDN?` .

Commands follow a tree structure up to 3 levels deep, colon-separated, and are case-insensitive. A keyword's mandatory portion is capitalized in the documentation (e.g. `DISPlay` can be sent in full or abbreviated to `DISP`); the abbreviation rule is: keywords of 4 characters or fewer are never abbreviated; keywords longer than 4 characters are abbreviated to their first 4 characters, or to their first 3 characters when the 4th character is a vowel; a compound-word keyword abbreviates to its first word's initial letter plus its (possibly abbreviated) last word. A semicolon separates multiple commands at the same tree level within one command string; `;:` restarts the next command from the tree root. All commands return the string `"1"` (success) or `"0"` (failure). SCPI numeric formats NR1 (integer), NR2 (fixed point) and NR3 (floating point) are used as appropriate per command; NL (newline, decimal 10) terminates each command line, with `^END` as the IEEE-488 EOI equivalent on a query response.

For the full command syntax, parameter ranges and worked examples, see the *TH2883 Series SCPI Command Reference*.

CHAPTER 8

Handler Interface

The rear-panel 9-pin HANDLER interface lets the TH2883 series integrate into an automatic test or sorting system: it accepts an external start/stop trigger and outputs the PASS/FAIL comparator result, together with a measurement-complete (end-of-conversion, /EOC) signal and a BUSY status line.

8.1 HANDLER connector pin assignment

Pin	Signal	Description
1	EXGND	Reference ground for the external power supply EXV. Tied to the instrument's own reference ground when the internal supply is used.
2	/EOC	End-of-measurement signal, active low, once the A/D conversion completes; the sort result is valid once BUSY also goes low.
3	BUSY	Active while a measurement is in progress; goes low once computation and display are complete.
4	/PASS	Comparator pass result, active low.
5	/FAIL	Comparator fail (NG) result, active low.
6	EXV	External power input for /EOC, BUSY, /PASS, /FAIL and the /START, /STOP inputs, when Handler power is set to external (§8.2).
7	/START	External trigger input, active low pulse, rising-edge triggered, when Trigger mode = External (§4.2).
8	/STOP	External test-abort input, rising-edge active.
9	VCC	Instrument-internal +5 V supply. Current draw should be kept under 0.1 A if used, and signal wiring kept away from noise sources.

"/" denotes an active-low signal. All DC-isolated outputs (/EOC, BUSY, /PASS, /FAIL) are open-collector via optocoupler, pulled up through a 4.7 kΩ resistor to either the internal +5 V (VCC) or an external supply (EXV, +5–24 V) — see §8.2.

8.2 Electrical characteristics

Signal	Low level	High level	Max. current	Reference ground
/EOC, BUSY, /PASS, /FAIL (DC-isolated outputs)	≤0.5 V	+5–24 V	6 mA	Internal: instrument GND · External: EXGND

/START and /STOP (DC-isolated inputs) connect to the cathode of an internal LED optocoupler; the instrument triggers on the rising edge of /START and aborts on the rising edge of /STOP. The LED anode can be driven from the internal +5 V supply or from the external EXV supply (shared with the output signals). A current-limiting resistor on the HANDLER interface board must be matched to the external supply voltage in use: 680 Ω for 5–8 V (factory default, also used with the internal supply), 1.2 kΩ for 8–15 V, 2.2 kΩ for 15–24 V. Using an external supply above 8 V without changing this resistor risks component damage.

Internal vs. external power, for both the output and input signal groups, is selected by two jumpers on the HANDLER interface board (factory default: both jumpers set for external power). Both jumpers must be moved together when switching between internal and external power.

> **WARNING**
> Switch off and disconnect the power cord before opening the instrument to change the HANDLER board jumper settings.

8.3 Using the HANDLER interface

1. Set Trigger mode to External on <Measurement Setup> (§4.2) so the instrument waits for a HANDLER trigger before each measurement.
2. Enable the Comparator and configure the comparison method(s) and limits to be used for sorting (§4.1.2).
3. Apply a trigger pulse to /START (pin 7) from the external handler/sorter.
4. The instrument runs the impulse test and comparison; BUSY stays active until computation and display are complete, then /EOC pulses once the result is ready.
5. Read the sort result from /PASS (pin 4) or /FAIL (pin 5), both active-low, valid for the time set by HDL Valid Time (§5.1) or until the next trigger if set to Hold.

APPENDIX

Packing, Warranty & Related Documents

A.1 Standard accessories

See §2.1 for the standard packing contents (instrument, TH2883-01 high-voltage test cable, TH2881-001 foot switch, EU power cable, fuses, warranty card, test report). This operation manual is issued in PDF only and is not included as a printed item. TH26052 and TH26053 test fixtures for the TH2883-1 are optional accessories, purchased separately.

A.2 Transport & storage

Store the instrument in its original packaging, in a dry, well-ventilated location at 0–50 °C and ≤93% RH, away from corrosive gases, for any extended period of non-use. During transport, protect the instrument from shock, vibration and moisture.

A.3 Nameplate & markings

Each instrument's rear-panel nameplate carries: the manufacturer's name/trademark; product name and model; serial number and date of manufacture; the supply-voltage/fuse rating table; and the CE mark.

A.4 Related documents

- TH2883 Series Datasheet (Techmize)
- TH2883 Series SCPI Command Reference (Techmize, companion to this manual)

A.5 Contacting Techmize

For technical support, accessories, calibration or service, contact Techmize directly or through your authorized Techmize distributor.

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