

HV-D150 High-Voltage Differential Probe

User Manual

Document ID: ISO-HVD150-UM

Revision: v1.0

Date: 2026-01-29

isosentry.com

Document control

Document ID	ISO-HVD150-UM
Model	HV-D150
Revision	v1.0
Date	2026-01-29
Applies to	All units unless otherwise noted.

Change summary (fill in each release):

- Initial release.

Support: support@isosentry.com

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1 Important safety information

! High voltage can cause injury or death. Follow your lab safety procedures and work with a qualified person when necessary.

1.1 Safety summary

- Inspect insulation, leads, and accessories before each use. Do not use damaged cables, connectors, or housings.
- Keep the probe and accessories clean and dry. Do not use in wet environments.
- De-energize the DUT before connecting or disconnecting the probe whenever possible.

1.2 Alarm note

! The over-voltage alarm is an indicator only. Do not treat it as a safe operating limit.

1.3 Terms and symbols (fill)

- **DUT:** Device under test.
- **Differential voltage:** Voltage between the two probe inputs.
- **Each input to ground:** The voltage of either input referenced to earth/ground.
- **TODO:** Add symbols used on the product and in documentation.

2 Overview

HV-D150 is a differential probe intended for measuring high-voltage differential waveforms in power electronics.

2.1 What this manual covers

- Safe operation and basic measurement procedure
- Range selection and over-voltage alarm behavior
- Best practices for low-noise measurements
- Specifications, maintenance, and troubleshooting

2.2 Key specifications

Attenuation	50X / 500X
Bandwidth	150 MHz (-3 dB)
Max differential input (measurement range, V _{peak})	50X: up to ± 180 V _{peak} (50X, differential input) 500X: up to ± 1600 V _{peak} (500X, differential input) Measurement-range limit only; not a CAT safety category.
Over-voltage alarm	1800 V _{peak} nominal (tolerance: 1750–1850 V _{peak})
CAT (per marking)	CAT II 1000 V / CAT III 600 V (each input to earth; supplier-declared) CAT rating is independent of 50X/500X selection.
Input impedance	Each input to ground: 8 M Ω — 3 pF Differential: 16 M Ω — 1.5 pF

! Audible/visual alert only; do not treat as a working limit.

3 What's in the box

3.1 Standard items

- HV-D150probe body
- BNC output cable
- USB-C power cable
- Test clip accessories (red/black pairs):
 - IS-CLP-01 Insulated Wide-Jaw Alligator Clip (16.2 g/pair)
 - IS-CLP-02 Quick Test Hook Clip (23.0 g/pair)
 - IS-CLP-03 Needle Test Probe Tip (47.2 g/pair)
 - IS-CLP-04 Insulation-Piercing Hook Clip (12.7 g/pair)
 - IS-CLP-05 Safety Hook Clip (4mm) (29.8 g/pair)
- Quick Start (this document set)

3.2 Optional accessories

No optional accessories are listed in this revision; all supported clips are already included in the standard kit.

3.3 Inspect before use

- Inspect insulation and connectors for cracks, loose fit, or exposed conductor.
- Replace any suspect clip before energizing the DUT.

3.4 Supplier declaration note

Accessory ratings are supplier-declared; IsoSentry has not independently verified them.

4 Getting started

4.1 Basic connection

1. De-energize the DUT if possible.
2. Connect the probe output to the oscilloscope input.
3. Select the attenuation range (50X or 500X).
4. Connect the probe inputs to the DUT (minimize loop area).
5. Energize the DUT and verify scaling/polarity.

4.2 Range selection

- Use **50X** for smaller signals. Measurement range limit: up to $\pm 180 \text{ V}_{\text{peak}}$ (50X, differential input).
- Use **500X** for higher differential signals. Measurement range limit: up to $\pm 1600 \text{ V}_{\text{peak}}$ (500X, differential input).

Measurement-range limit only; not a CAT safety category. CAT rating is independent of 50X/500X selection.

4.3 Scaling on the oscilloscope (fill)

TODO: Describe how scaling should be set for 50X and 500X ranges (scope probe factor / vertical scale).

4.4 Over-voltage alarm

Alarm behavior:

- Threshold: $1800 \text{ V}_{\text{peak}}$ nominal (tolerance: $1750\text{--}1850 \text{ V}_{\text{peak}}$)
- Note: Audible/visual alert only; do not treat as a working limit.

5 Operating the probe

5.1 Controls and indicators (fill)

TODO: Insert a figure and describe any buttons, switches, LEDs, and alarm indicators.

5.2 Measurement concepts

- Differential measurement measures the voltage between the two inputs.
- Input impedance affects the DUT. For reference:
 - Each input to ground: $8 \text{ M}\Omega$ — 3 pF
 - Differential: $16 \text{ M}\Omega$ — 1.5 pF

5.3 Overrange and alarm

- ! Over-voltage alarm: 1800 V_{peak} nominal (tolerance: 1750–1850 V_{peak}). Audible/visual alert only; do not treat as a working limit.

6 Best practices

6.1 Low-noise wiring

- Minimize loop area between probe inputs and DUT nodes.
- Keep leads short; avoid large ground loops.
- Twist input wires when possible.

6.2 High dv/dt environments

- Route cables away from switching nodes.
- Consider shielding and physical separation.
- Validate results by repeating measurements with slightly different routing.

6.3 Common-mode considerations (fill)

- TODO: Add guidance on interpreting common-mode voltage and CMRR limits.
- Include typical high dv/dt failure symptoms and mitigation steps.

7 Specifications

This chapter lists the canonical specifications used in IsoSentry documentation. The Datasheet provides a concise view; the Test Methods document explains how key specs are measured.

7.1 Key specifications

Attenuation	50X / 500X
Bandwidth	150 MHz (-3 dB)
Max differential input (measurement range, V _{peak})	50X: up to ±180 V _{peak} (50X, differential input) 500X: up to ±1600 V _{peak} (500X, differential input) Measurement-range limit only; not a CAT safety category.
Over-voltage alarm	1800 V _{peak} nominal (tolerance: 1750–1850 V _{peak}) Audible/visual alert only; do not treat as a working limit.
CAT (per marking)	CAT II 1000 V / CAT III 600 V (each input to earth; supplier-declared) CAT rating is independent of 50X/500X selection.
Input impedance	Each input to ground: 8 MΩ — 3 pF Differential: 16 MΩ — 1.5 pF

7.2 Accessory interface and dimensions

Model (g/pair)	Accessory Rating	Dimensions (mm)	Weight	
IS-CLP-01	Insulated Wide-Jaw Alligator Clip	L84; H36; opening 27; interface 4	16.2	1000 V / 32 A
IS-CLP-02	Quick Test Hook Clip	L153; tip dia 0.5; interface 4	23.0	1000 V / 10 A
IS-CLP-03	Needle Test Probe Tip	Overall 96.8; tip 2; exposed tip 3.5; interface 4	47.2	CAT II 1000 V; CAT IV 600 V; 10 A
IS-CLP-04	Insulation-Piercing Hook Clip	L159; opening 4; interface 4	12.7	CAT II 1000 V; MAX 10 A
IS-CLP-05	Safety Hook Clip (4 mm)	122.5±2; 114.5±1; 43.5±0.5; tip 4±0.5; dia 4±0.1; 6±1	29.8	1000 V CAT III; 600 V CAT IV; 10 A

Accessory ratings are supplier-declared; IsoSentry has not independently verified them.

7.3 Accessory wireframe gallery

7.4 Additional specs

Additional probe-level parameters (for example gain accuracy, offset, CMRR, and uncertainty) are defined in Datasheet and Test Methods revisions where corresponding data is published.

8 Maintenance

8.1 Cleaning

- Disconnect from the DUT and oscilloscope.
- Wipe with a soft, dry cloth.
- Do not use solvents that can damage insulation.

8.2 Storage

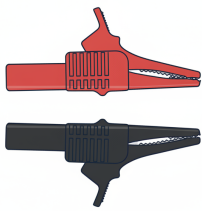
Store in a clean, dry environment. Avoid sharp bends in cables.

8.3 Recommended verification interval (fill)

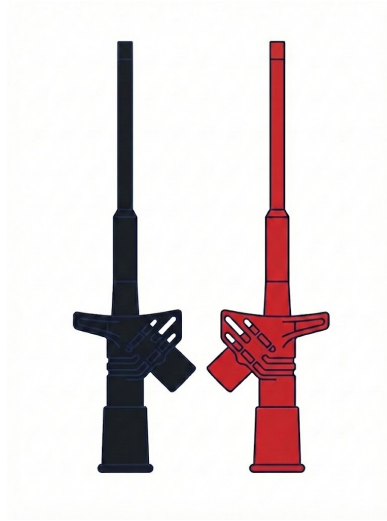
TODO: Provide recommended verification/calibration interval and procedure reference.

9 Troubleshooting

Symptom	What to check
No signal	Connections, scope channel enabled, probe range, probe factor settings.
Noise too high	Lead length, routing, loop area, nearby switching nodes.
Alarm triggers	Reduce voltage, switch to 500X, verify limits, review Safety Guide.



IS-CLP-01
Insulated Wide-Jaw Alligator
Clip



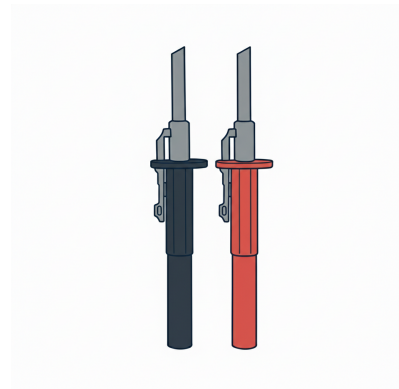
IS-CLP-02
Quick Test Hook Clip



IS-CLP-03
Needle Test Probe Tip



IS-CLP-04
Insulation-Piercing Hook Clip



IS-CLP-05
Safety Hook Clip (4mm)

Figure 1: Accessory line-style wireframes (supplier visual reference).

9.1 Support

If you cannot resolve the issue, contact support@isosentry.com.

A Appendix

A.1 Glossary (fill)

TODO

A.2 Document history (fill)

Maintain a short release history table here (revision/date/summary).

A.3 Contact

support@isosentry.com

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