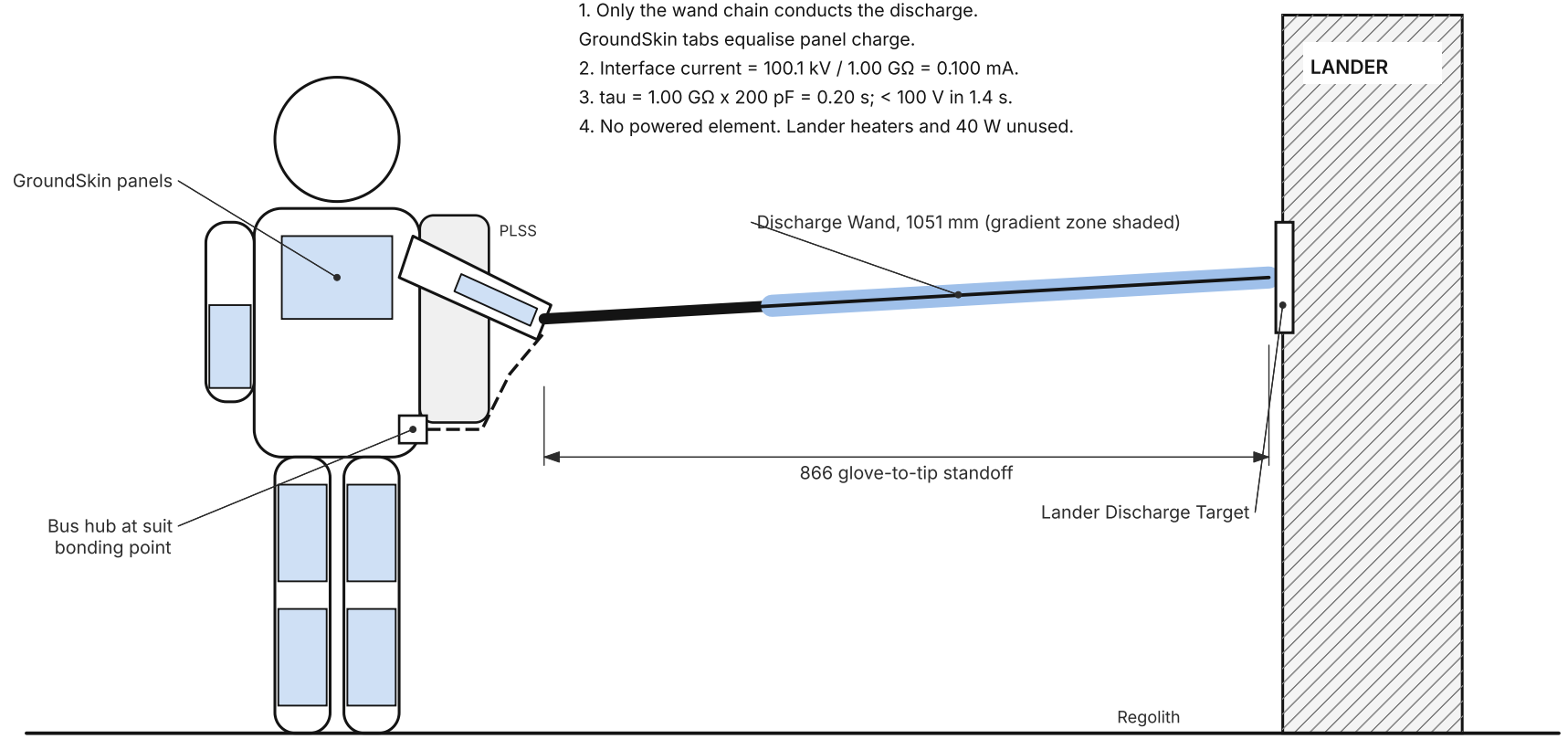
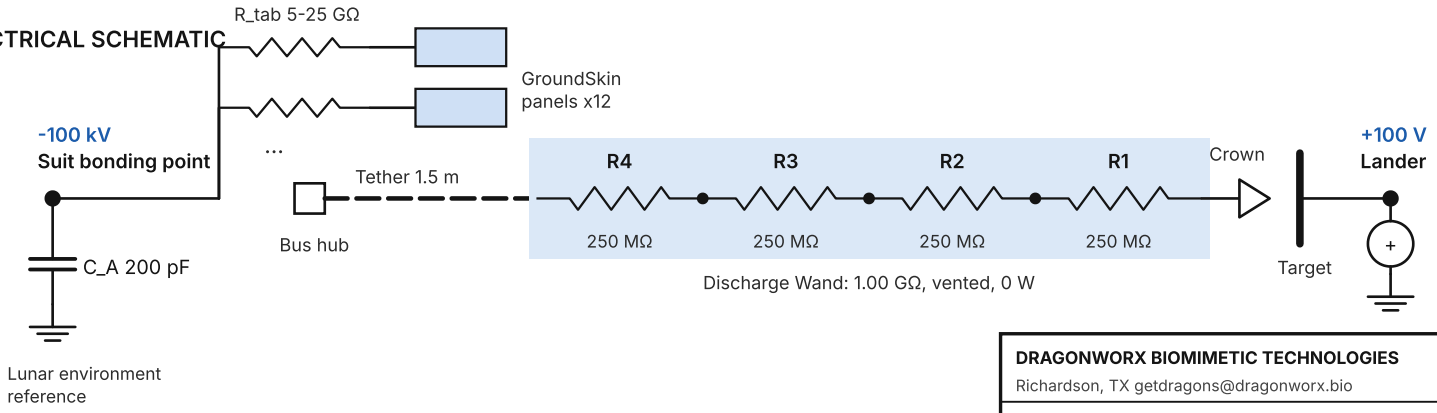
SYSTEM ARRANGEMENT AT LANDER RETURN (not to scale)

NOTES

1. Only the wand chain conducts the discharge. GroundSkin tabs equalise panel charge.
2. Interface current = 100.1 kV / 1.00 GΩ = 0.100 mA.
3. tau = 1.00 GΩ x 200 pF = 0.20 s; < 100 V in 1.4 s.
4. No powered element. Lander heaters and 40 W unused.



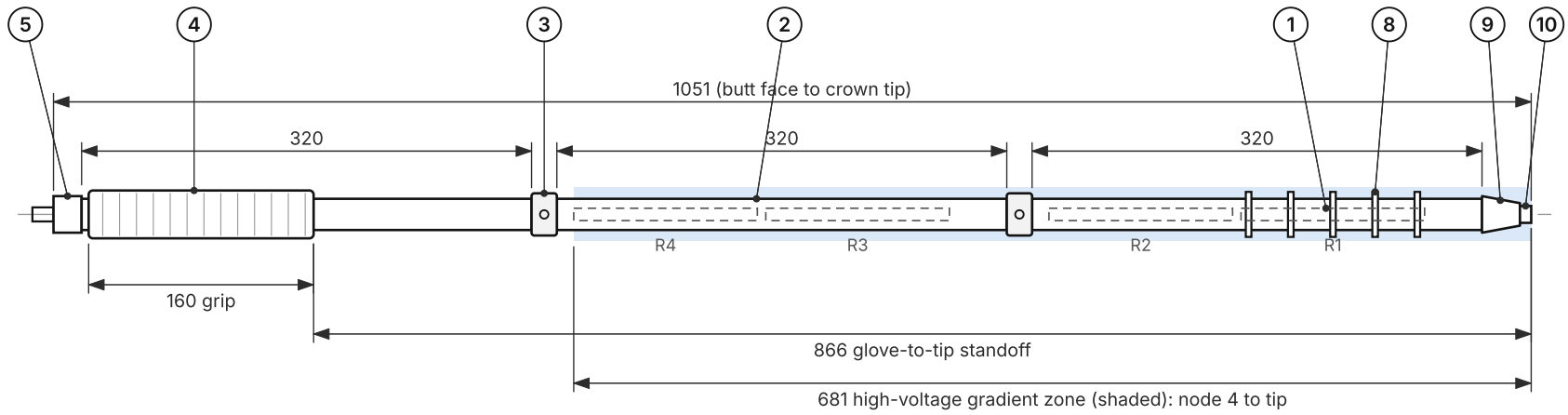
ELECTRICAL SCHEMATIC



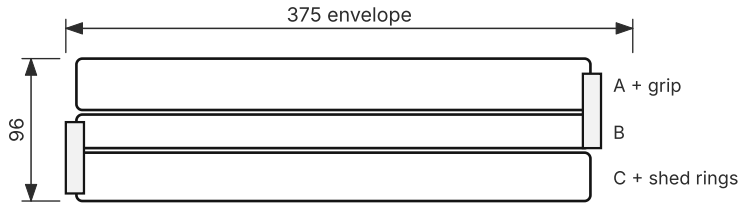
DRAGONWORX BIOMIMETIC TECHNOLOGIES Richardson, TX getdragons@dragonworx.bio			
GroundSkin system and schematic			
DWG NO. **DWX-GS-001**	SCALE NTS	REV A	SHEET 1 of 9

Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.

DEPLOYED, SIDE ELEVATION (1:5)

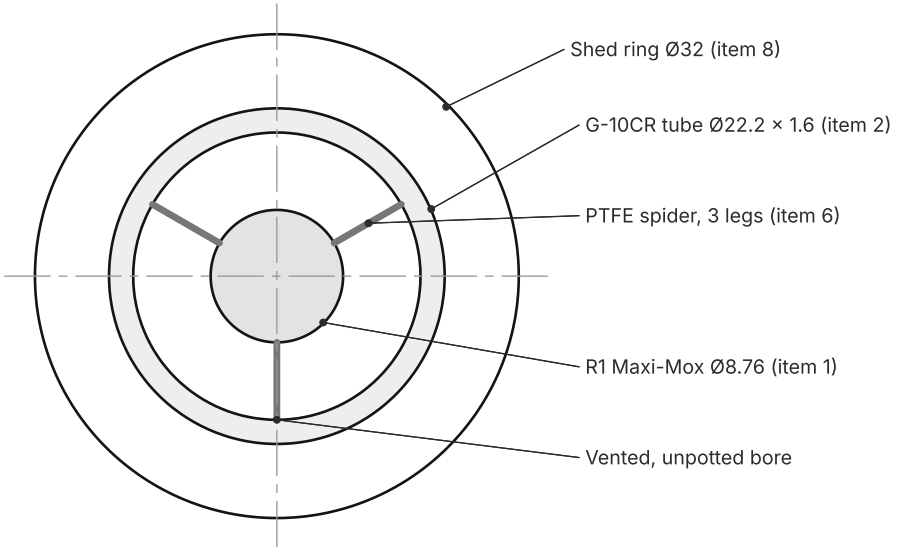


STOWED (Z-FOLD), PLAN VIEW (1:5)



Envelope 375 × 96 × 36 mm in an MLI-wrapped holster on the LMAL thigh rail (item 15). Hinge 1 at the grip end, hinge 2 at the far end; both over-centre and glove-operable.

SECTION A-A THROUGH R1 AT A SHED RING (2:1)



NOTES

1. R1-R4: Ohmite Maxi-Mox MOX-5N, 250 MΩ ±1%, 50 kV each; series total 1.00 GΩ.
2. Steady stage voltage 25.0 kV (50% of rating) at 100.1 kV differential.
3. R1 is the designated hold-off stage: up to 94 kV for <1 ms at tip contact (DWG-003).
4. Gradient zone starts at node 4 (hinge 1). Grip, butt cap and tether stay at suit potential.
5. Vented, unpotted bore: no voids to discharge at the Paschen minimum during depressurisation.
6. Assembly mass 541 g. Power 0 W. Item numbers refer to the Bill of Materials.

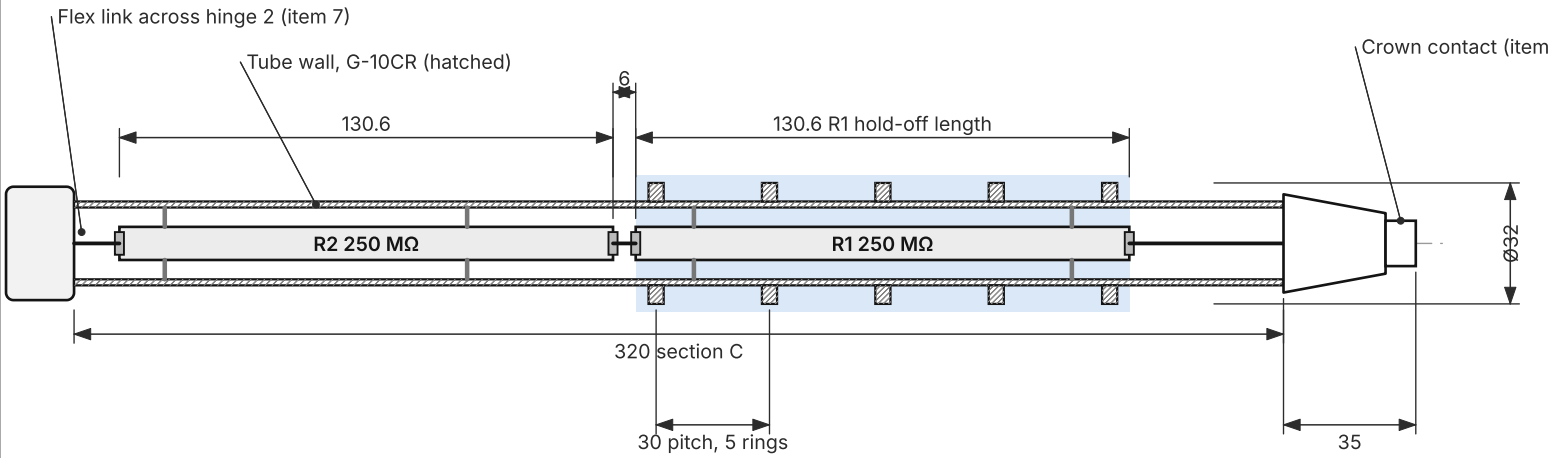
Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.

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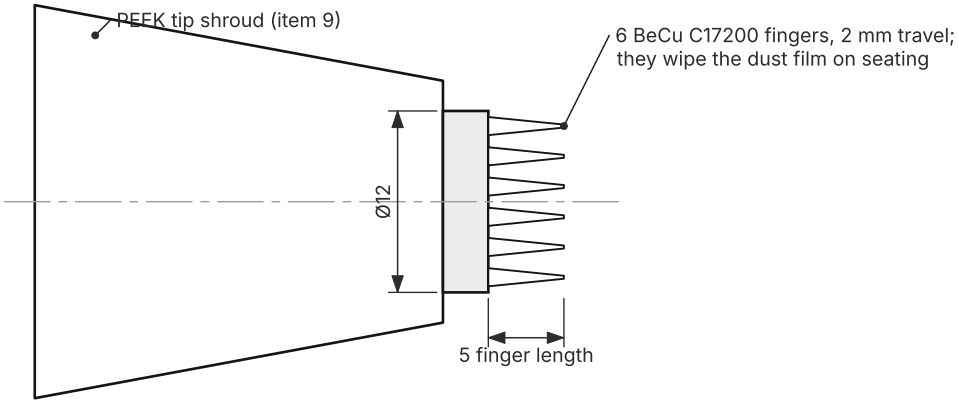
Discharge Wand assembly

DWG NO.	SCALE	REV	SHEET
DWX-GS-002	1:5 (as noted)	A	2 of 9

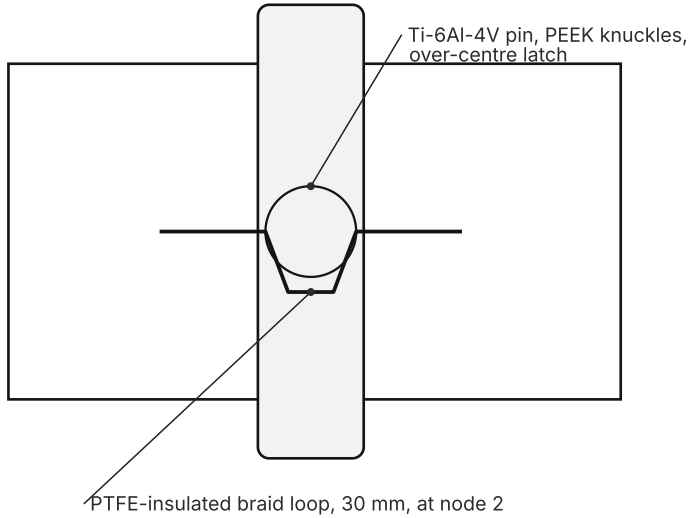
SECTION C, LONGITUDINAL SECTION (1:2)



DETAIL T: CROWN CONTACT (4:1)



DETAIL H: HINE 2 WITH FLEX LINK (2:1, schematic)



NOTES

1. R1 sits at the tip so it, not the suit, absorbs the contact transient. Ladder-network simulation (EPA, section 3): 94 kV across R1 for 0.76 ms, about 7.2 kV/cm along the 130.6 mm body in vacuum.
2. Five PEEK shed rings over R1 lengthen the outer creepage path and interrupt surface-flashover tracks on the dust-exposed tube.
3. Crown tip node capacitance <= 1 pF: contact spark <= 5 mJ, at the lander target, 866 mm from the glove.
4. Phase II: 150 kV impulse test of the R1 stage in vacuum with JSC-1A simulant contamination.

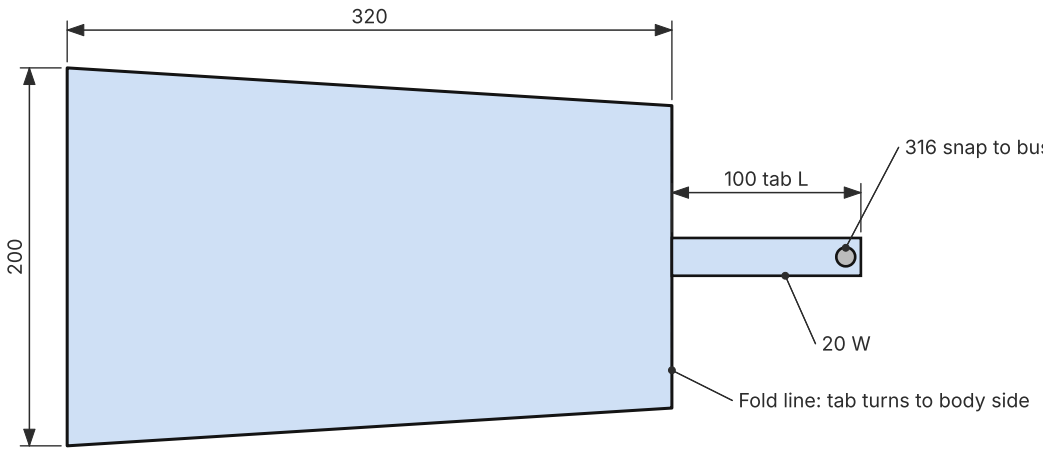
Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.

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Wand distal section and tip

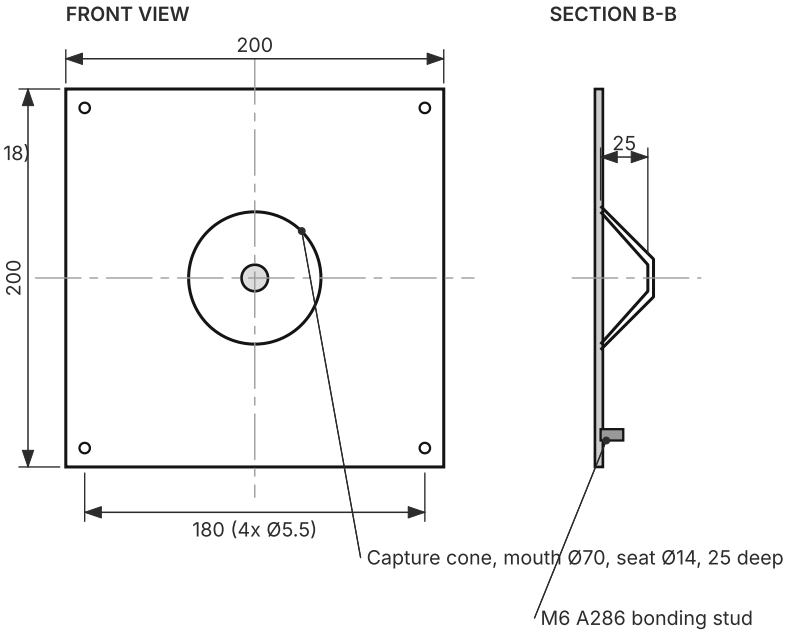
DWG NO.	SCALE	REV	SHEET
DWX-GS-003	1:2 (as noted)	A	3 of 9

GROUNDSKIN FOREARM PANEL, FLAT PATTERN (1:4)



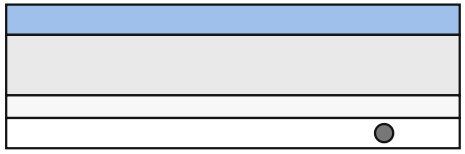
R_tab = Rs x L / W = 5 Rs = 5 to 25 GΩ over the acceptance band
Inadvertent touch anywhere on the panel: I <= 100.1 kV / 5 GΩ = 0.020 mA

LANDER DISCHARGE TARGET (1:4)



6061-T6 plate, 3 mm; spun 6061 cone shell, 3 mm wall, welded.
Bonding stud to the lander bonding attachment point (lander ICD).
Mount vertical, centre 1150 ± 100 above regolith, beside the ladder.
Vertical face and horizontal cone axis shed settling dust; the crown fingers wipe any residual film on seating.
Mass 0.43 kg with strap and fasteners. Power 0 W.

GROUNDSKIN LAYER STACK (not to scale)



Dissipative topcoat (CNT-PU), 25 µm, Rs 1-5 × 10^9 Ω/sq

LMAL outer panel: UHMWPE ripstop, 150 µm (existing)

PTFE isolation film, 50 µm, body side at tab and bus runs
Bus wire M22759/11-26 in seam channel, suit potential

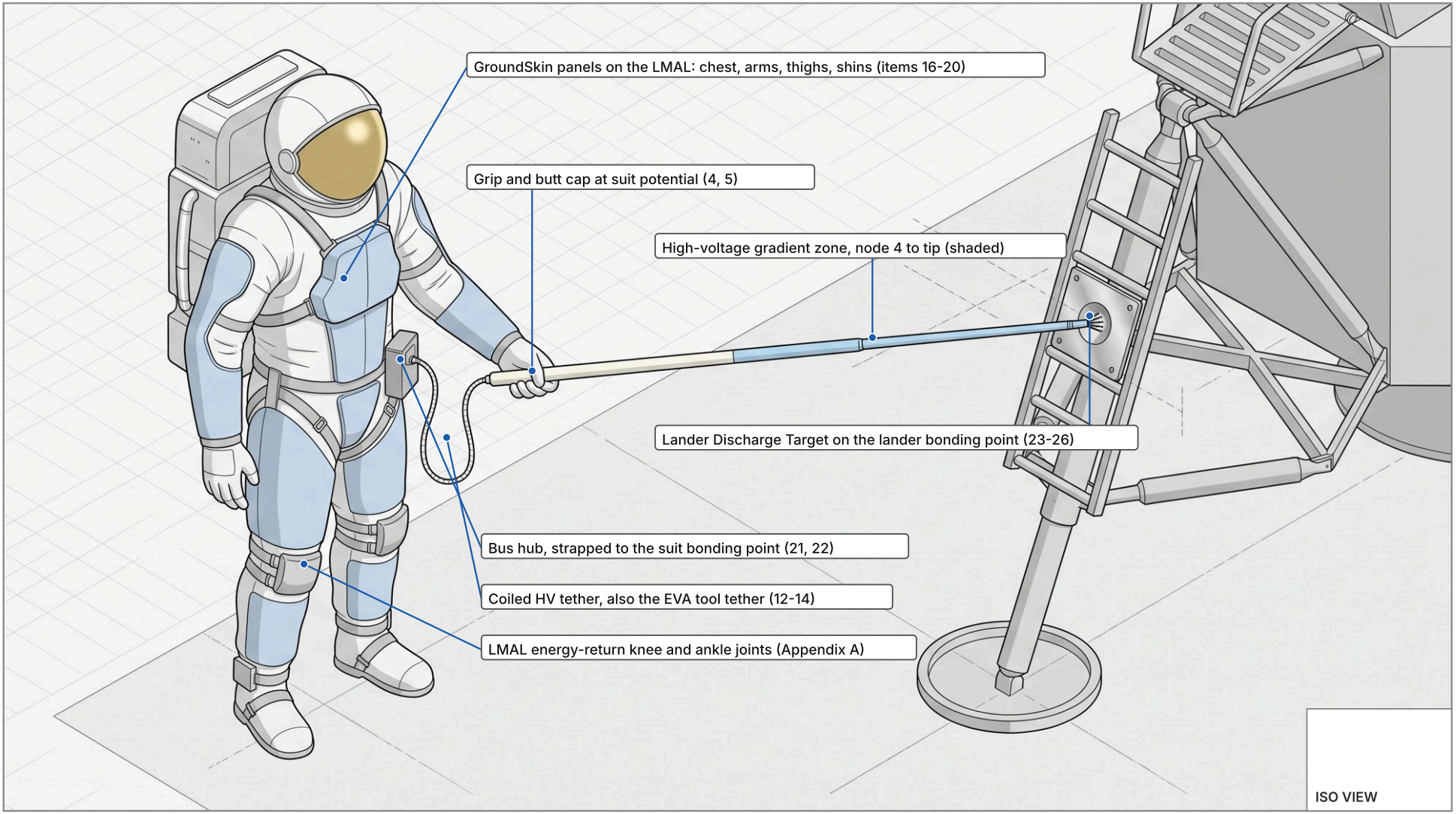
Outside (regolith side) at top. AxEMU outer TMG is not modified.

Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.

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GroundSkin panel and lander target

DWG NO.	SCALE	REV	SHEET
DWX-GS-004	1:4	A	4 of 9



NOTES

1. The crew member seats the wand crown in the target before any other contact with the lander.
2. Only the wand chain carries the discharge; GroundSkin panels join the suit node through bleed tabs.
3. Illustrative rendering, not to scale. Dimensions govern from DWX-GS-001 to 004.

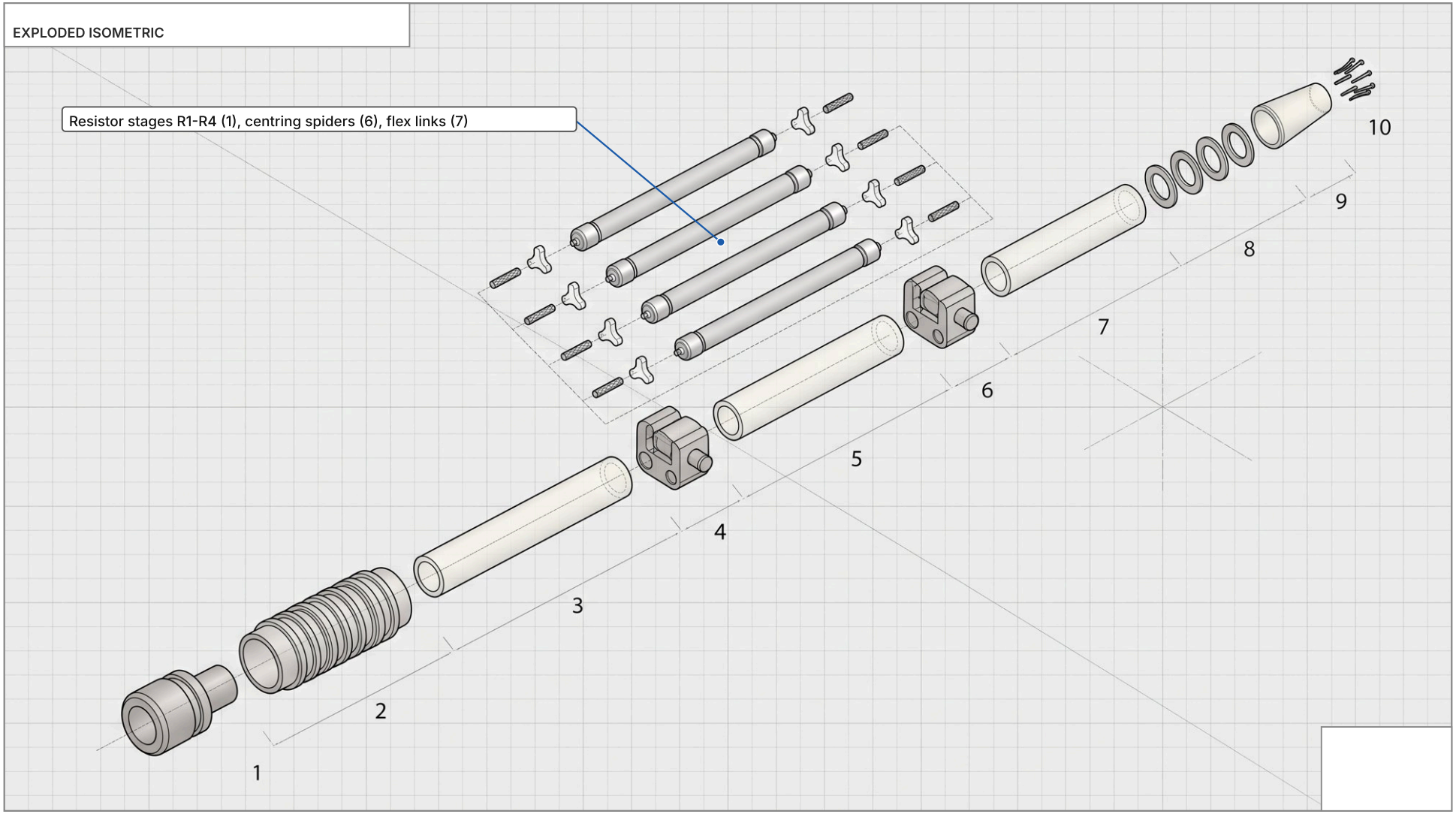
Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.

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System isometric, illustrative

DWG NO.	SCALE	REV	SHEET
DWX-GS-005	NTS	A	5 of 9

EXPLODED ISOMETRIC



VIEW KEY: numbers printed in the view, mapped to Bill of Materials items

1 Butt cap with tether ferrule (BOM 5)
2 Grip sleeve (BOM 4)
3 Tube section A (BOM 2)
4 Hinge 1 (BOM 3)
5 Tube section B (BOM 2)
6 Hinge 2 (BOM 3)
7 Tube section C (BOM 2)
8 Shed rings (BOM 8; five in assembly)
9 Tip shroud (BOM 9)
10 Crown contact (BOM 10)

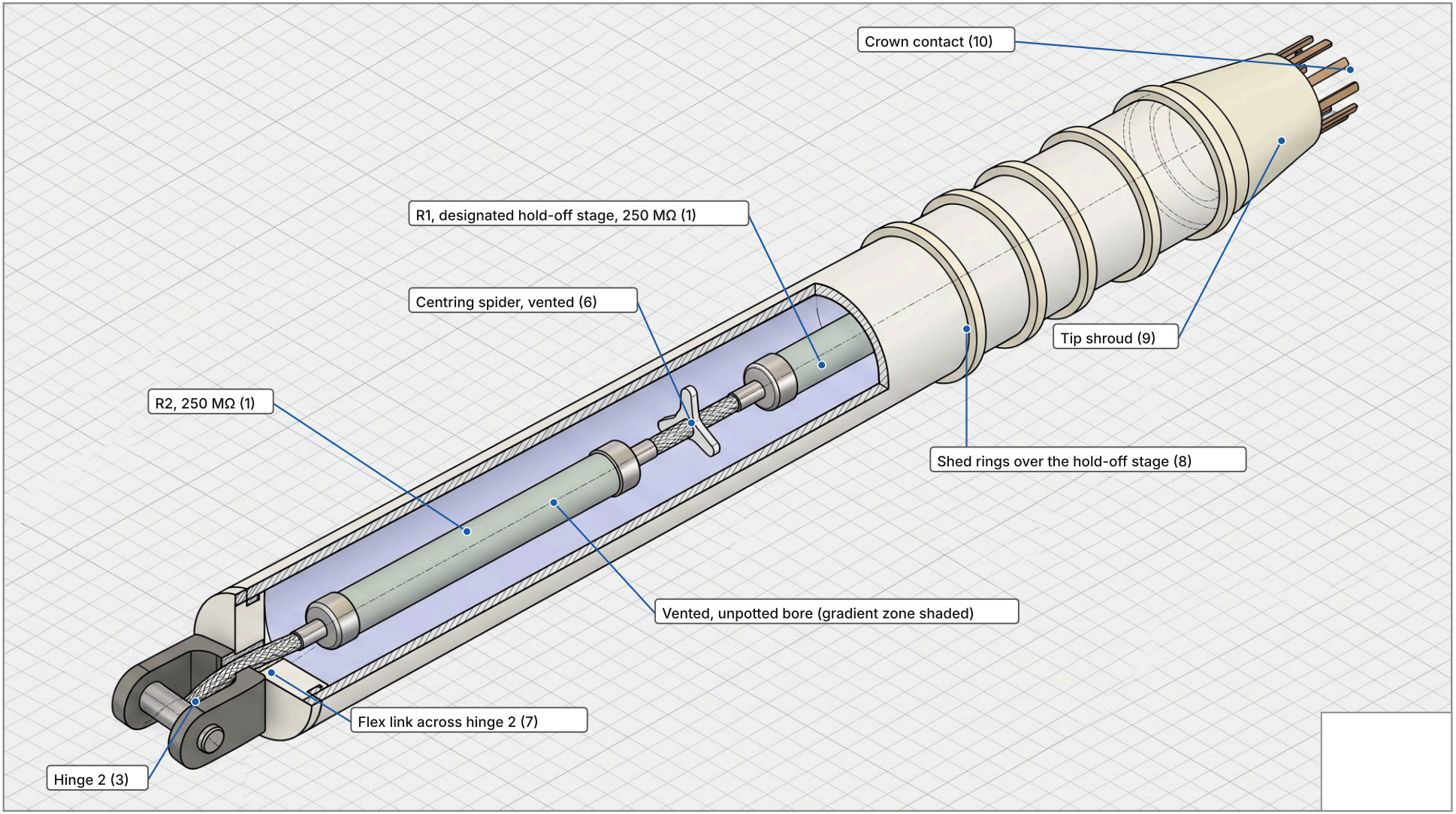
Illustrative rendering, not to scale. Dimensions govern from DWX-GS-001 to 004.

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Discharge Wand, exploded view

DWG NO.	SCALE	REV	SHEET
DWX-GS-006	NTS	A	6 of 9

Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.



NOTES

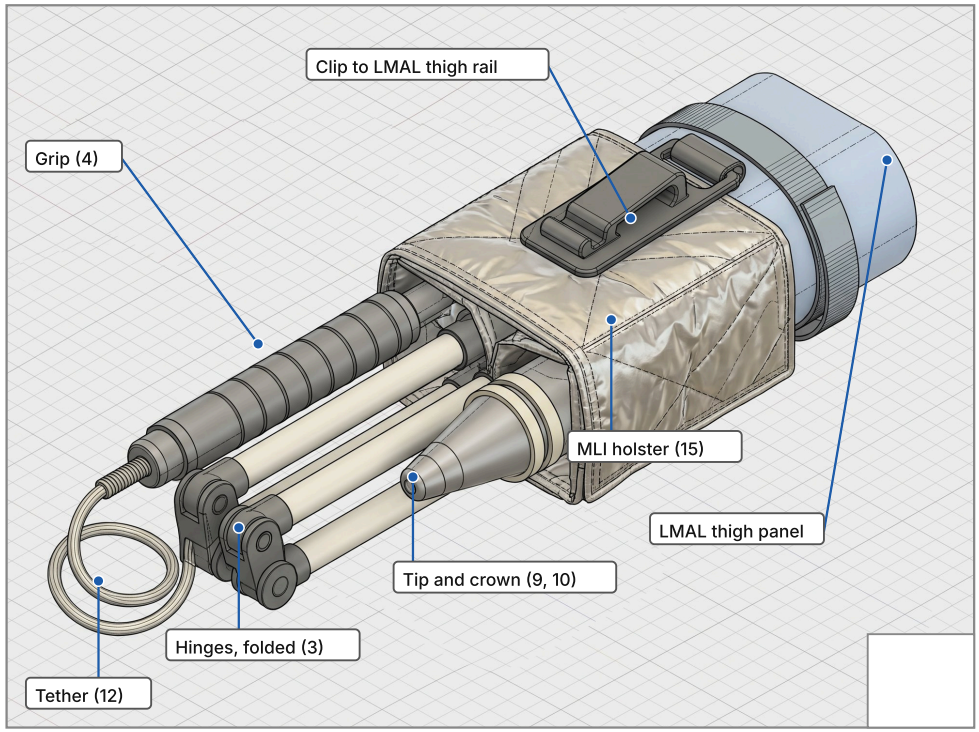
1. R1 carries up to 94 kV for under 1 ms at tip contact; its 130.6 mm body gives about 7.2 kV/cm.
2. Stage lengths and shed-ring positions follow DWX-GS-003; the rendering compresses them.
3. Illustrative rendering, not to scale. Dimensions govern from DWX-GS-001 to 004.

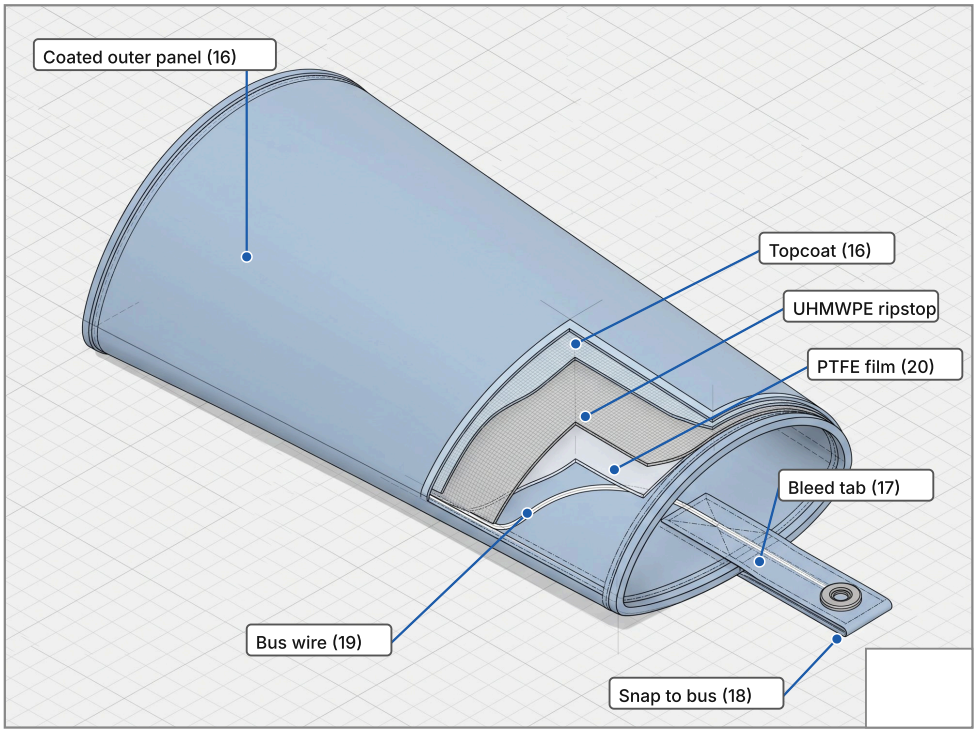
Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.

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Wand distal section, cutaway

DWG NO.	SCALE	REV	SHEET
DWX-GS-007	NTS	A	7 of 9





NOTES

1. Left: wand folded into its holster; the warm start and MLI keep it above -55 °C for 8 h in shadow.
2. Right: forearm panel. The bleed tab (R = 5 Rs) is the panel's only path to the bus.
3. Illustrative rendering, not to scale. Dimensions govern from DWX-GS-001 to 004.

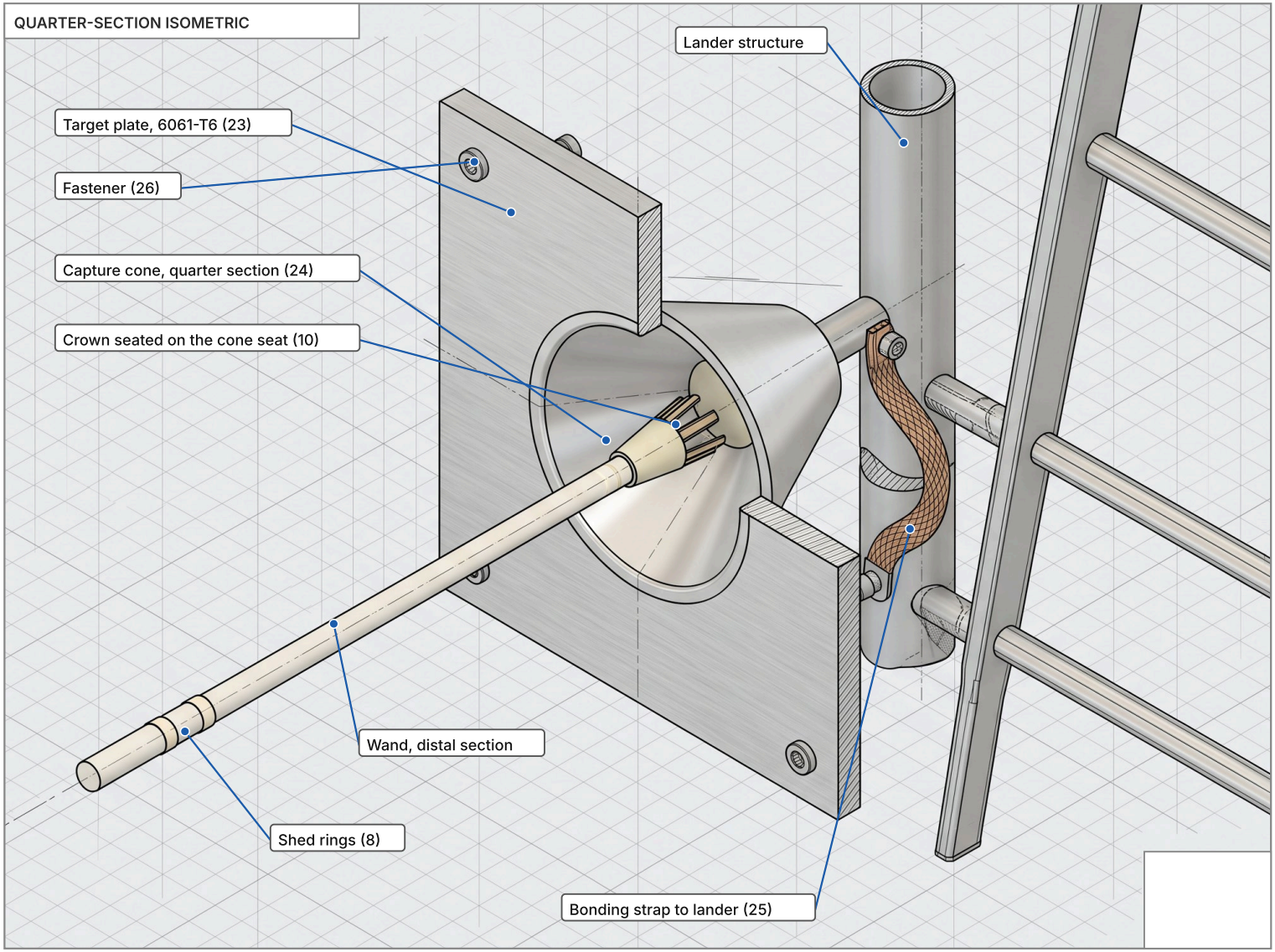
Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.

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Stowage and GroundSkin panel

DWG NO.	SCALE	REV	SHEET
DWX-GS-008	NTS	A	8 of 9

QUARTER-SECTION ISOMETRIC



NOTES

1. Mount the plate vertically beside the ladder, centre 1150 ± 100 above regolith.
2. Illustrative rendering, not to scale. Dimensions govern from DWX-GS-001 to 004.

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Lander Discharge Target, seated wand

DWG NO.	SCALE	REV	SHEET
DWX-GS-009	NTS	A	9 of 9

Dimensions in millimetres. Third-angle projection. Phase 1 concept drawing: NASA Lunar Grounding Challenge.