Health, Safety & R290 Refrigerant Handling Policy

Karnot's commitment to a zero-harm workplace, with specific operational standards for the safe design, transport, installation, commissioning, maintenance and decommissioning of R290 (propane) heat pump systems.

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Approved by	Stuart Edmund Cox, Managing Director
Applies to	All Karnot directors, officers, employees, consultants, contractors and sub-contractors performing any work for or on behalf of Karnot — on Karnot premises, on customer premises, in transit, or remotely. R290-specific provisions also bind every party in possession of a Karnot R290 product.

1. Zero-harm commitment

Karnot Energy Solutions Inc. ("Karnot") is committed to a workplace free from preventable injury, illness and refrigerant-related incident. Health and safety is the first priority on every Karnot project, ahead of cost, schedule and any other operational consideration. No commercial pressure justifies cutting a safety corner.

Every person involved in a Karnot project — Karnot personnel, sub-contractors, customer staff working alongside our equipment, and visitors — has both the right and the duty to stop work where they believe an unsafe condition exists. No one will be penalised for exercising that right in good faith.

2. Legal and standards framework

This Policy is designed to comply with, at minimum, the following Philippine laws and international standards:

- Republic Act No. 11058 — Occupational Safety and Health Standards Act (2018).
- DOLE Department Order No. 198-18 — Implementing Rules and Regulations of RA 11058.
- Republic Act No. 9514 — Fire Code of the Philippines (2008), and BFP IRR.
- Philippine Electrical Code, 2017 Edition (PEC).
- Republic Act No. 6541, as amended by RA 6541 / National Building Code IRR.
- Republic Act No. 8749 — Clean Air Act (refrigerant containment and venting).
- IEC 60335-2-40 — Particular requirements for electric heat pumps, including A3 flammable refrigerant provisions (the controlling international standard for R290 heat pumps).
- ISO 5149-1:2014 — Refrigerating systems and heat pumps: safety and environmental requirements.
- ISO 45001:2018 — Occupational Health and Safety Management Systems (the framework Karnot operates to).
- ASHRAE Standard 15 — Safety Standard for Refrigeration Systems.
- EN 378 — Refrigerating systems and heat pumps: safety and environmental requirements (used by Karnot for design and risk assessment alignment).

3. Karnot OSH management system

Karnot operates a health-and-safety management system aligned with ISO 45001. Its core elements are:

- **OSH Committee** — chaired by the Managing Director with representation from field service, where required by RA 11058 §13 once staff thresholds are reached.
- **Designated Safety Officer (DSO)** — RA 11058-qualified, responsible for training, incident investigation, drills and reporting.

- **Site-specific Job Hazard Analyses (JHA)** — completed for every installation, commissioning or service visit and signed off by the on-site supervisor before work commences.
- **Hierarchy of controls** — Eliminate → Substitute → Engineer → Administer → PPE, applied in that order for every identified hazard.
- **Incident reporting** — every accident, near-miss and dangerous occurrence is reported within 24 hours via the channel set out in section 9.
- **Annual review** — the OSH programme, the policy, the registers, and the training matrix are reviewed at least annually by the Managing Director.

4. R290 (propane) refrigerant — design and product

R290 is propane (C_3H_8). It is a natural refrigerant with very low Global Warming Potential (GWP = 3) and zero Ozone Depletion Potential, but it is classified as **A3 — higher flammability** by ISO 817 and ASHRAE 34. Karnot's R290 products are designed and built to control this flammability risk in accordance with IEC 60335-2-40 and ISO 5149.

- **Charge limits.** Each Karnot iHEAT R290 unit is charged within the maximum permissible refrigerant charge for its room volume and installation class under IEC 60335-2-40 Annex GG, with safety margins as required by the standard. Unit nameplates record the as-built charge.
- **Hermetic refrigerant circuit.** Charge resides entirely within a factory-sealed hermetic circuit. Field charging is not performed by Karnot field service except in expressly-permitted top-up scenarios with the correct equipment and qualified personnel.
- **Outdoor / well-ventilated installation by default.** Karnot's standard installation guidance places units outdoors or in mechanically-ventilated plant rooms with the air-side condenser exhausting away from ignition sources. Installations falling outside this guidance require a written derogation from the Karnot engineering team after a refrigerant leak risk assessment.
- **Ignition source control.** No naked flame, smoking, hot work, electrical switching outside the unit's certified protected zones, or other ignition source is permitted within the refrigerant-restriction zone defined for each installation.
- **Leak detection.** Permanent installations in indoor/enclosed plant rooms are equipped with a fixed LEL gas detector wired to alarm and ventilation override. Karnot field service uses portable propane sniffers calibrated annually on every service visit.
- **Marking and documentation.** All Karnot R290 products carry the IEC 60335-2-40 warning label, the refrigerant charge nameplate, and a refrigerant-handling card describing emergency procedures.

5. Personnel competence and training

Every person who installs, services or decommissions a Karnot R290 product must hold valid certification appropriate to the work:

- **Refrigeration competence.** TESDA Refrigeration and Air-Conditioning Servicing NC II or NC III, or international equivalent (City & Guilds 2079, F-Gas Cat I-IV for those returning from overseas).
- **R290 specific competence.** Documented training on A3 refrigerant handling, either through a Karnot in-house course or an accredited third-party programme.
- **Electrical competence.** PRC-licensed Master Electrician or Registered Electrical Engineer for any work involving installation or modification of fixed wiring.
- **Working at height.** Where work is performed above 1.8 m, TESDA Working at Heights competency or equivalent.
- **First-aid and CPR.** At least one currently certified first-aider on every Karnot install or service team deployed to site.
- **Annual refresher.** Every Karnot field-service person undertakes an annual OSH refresher covering: emergency response, refrigerant leak protocols, fire extinguisher use, electrical lockout/tagout, manual handling, and incident reporting.

6. Personal Protective Equipment (PPE)

Karnot provides, and requires its personnel and sub-contractors to use, PPE appropriate to each task. As a minimum, every site team deploys with:

- Safety boots conforming to PNS ISO 20345 (or equivalent EN ISO 20345 S3).
- Cut-resistant gloves for sheet-metal and copper-tube work.
- Safety glasses or face shield for brazing, cutting and chemical handling.
- Hard hat for work under any overhead operation.
- Hi-vis vest for work in any trafficked area.
- For R290 leak response: anti-static, non-spark hand tools and ATEX-rated leak detectors as defined in the leak-response procedure.

7. Hot work, electrical work and lockout/tagout

Hot work (brazing, welding, grinding) on or within 3 m of any R290 system or its associated piping is permitted only with a written Hot Work Permit signed by the Karnot site supervisor, with the system isolated, depressurised, purged with inert gas (typically OFN), and confirmed gas-free with a calibrated detector.

Electrical work on Karnot equipment requires lockout/tagout of the unit's supply isolator. Live-line work is not permitted under any circumstance.

8. Customer-site and PEZA-zone safety

Most Karnot deployments are inside PEZA-registered industrial estates or other controlled-access facilities. Karnot personnel and sub-contractors must:

- Hold valid PEZA work permits and gate passes prior to arrival on site.
- Comply fully with the customer's site-specific safety induction, PPE rules, permit-to-work systems, traffic rules and emergency procedures — without exception.
- Conduct a site-specific Take 5 / pre-task hazard review at the start of each shift, signed by the on-site supervisor.
- Stop work and consult the customer's site safety officer immediately upon any unsafe condition or any near-miss event.

9. Incident reporting and emergency response

Every accident, near-miss and dangerous occurrence — irrespective of severity — must be reported to the Karnot Compliance Officer within 24 hours, by email to info@karnot.com and by phone to the on-call number. Serious incidents (fatality, lost-time injury, fire, refrigerant release > 100 g) trigger DOLE-RA-11058 and BFP reporting obligations and must be reported the same day.

Emergency response procedures for each Karnot product are documented in the product handover pack. The default for a suspected propane release is: **(1) isolate ignition sources; (2) ventilate; (3) evacuate the affected area to a safe distance; (4) call the customer's emergency response team; (5) notify the Karnot 24-hour service number.**

10. Sub-contractor health and safety

Karnot's installation sub-contractors must be PEZA-accredited service enterprises where the work is performed in a PEZA zone, must hold valid DOLE OSH compliance certificates, must employ DSOs as required by RA 11058, and must sign the Karnot Compliance Acknowledgement (KES-ACK-001) before any work commences. Karnot retains the right to audit sub-contractor safety performance and to terminate the engagement for material safety breach.

11. Records and review

Karnot maintains the following records, retained for the period required by Philippine law and not less than five (5) years:

- Training records — every certificate, every refresher, every site induction.
- Site JHAs and Hot Work Permits.
- Incident register and investigation reports.
- Refrigerant register — charges, top-ups, reclaims, decommissions.
- PPE issue register.
- Sub-contractor accreditation file.

APPROVAL

This policy is approved by the undersigned for and on behalf of Karnot Energy Solutions Inc., with effect from 11 May 2026, and will be reviewed not later than 11 May 2027.

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Stuart Edmund Cox
Managing Director
Karnot Energy Solutions Inc.
Date: 11 May 2026