

Nu-Armour R1 1500



Endorsed by UNICEF &
the National Department of Health (NDoH), PNG



Off-grid Vaccine Fridge, Freezer and LED Lights for Vaccine Storage Room Powered by Solar and Wind Turbine System – Nu-Armour R1 1500

Introduction:

Nu-Armour R1 1500 is a self-driven equipment package system (a vaccine fridge, a freezer and LED lights) for vaccine storage room that runs on direct-current electricity provided by solar and wind energy. Batteries are used to store energy. In this off-grid system, energy stored in batteries are used to provide power during periods of low or no sunlight/wind.

Nu-Armour R1 is used primarily in areas without any electricity or where there is no reliable electricity supply. The system is designed to match the fridge/freezer/lights power consumption and Papua New Guinea (PNG)'s local culture and climate conditions.

Autonomy (number of hours that the system can maintain vaccine load within the acceptable temperature range under extreme low solar radiation and low wind conditions): minimum 96 hours.

Purpose:

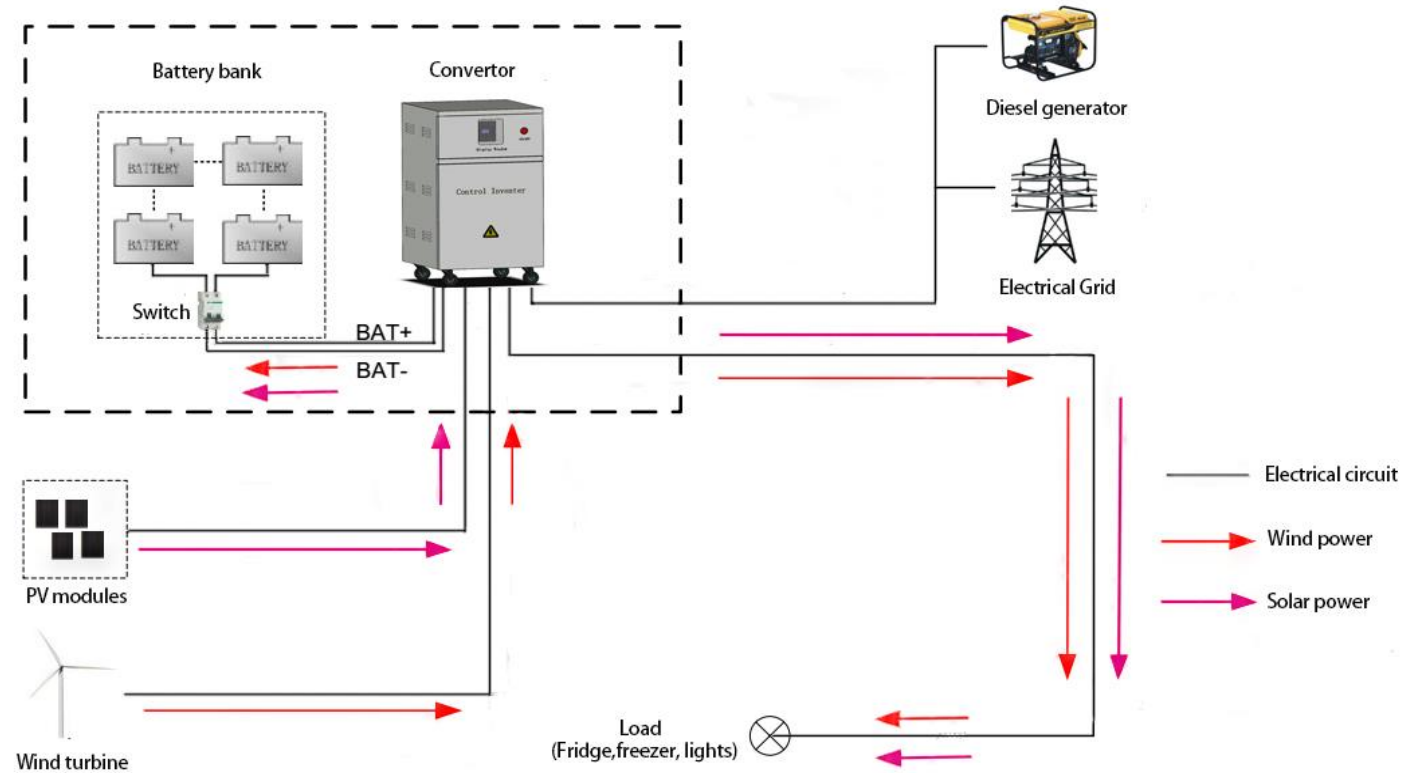
Papua New Guinea's immunization coverage has fallen way below the expected level of 80 per cent. Our findings suggest that ill-equipped and weak cold chain infrastructure contributes significantly to the low coverage. Low immunization coverage contributes to disease outbreaks, high mortality and morbidity rates, and the economic costs of low immunization coverage are high. Our innovative off-grid system, Nu-Armour R1 1500, is aimed to increase vaccination coverage throughout Papua New Guinea to achieve herd immunity. It ensures uninterrupted power supply, via multiple renewable energy sources, to critical cold chain infrastructure that would have otherwise been compromised by unreliable power supply. It also ensures that the vaccines can be reached to off-grid areas safely and effectively. This cost-effective system will bring significant health improvements to PNG and cost (economic costs of low immunization rate) savings to the government.

Supply, installation and maintenance:

Summit Pharmaceuticals designs, develops and distributes Nu-Armour R1. In collaboration with UNICEF and the Department of Health (NDoH), the very first Nu-Armour R1 1500 unit in PNG was installed at Palimal Health Centre and is currently serving local residents. The residents are enjoying self-driven 1x 100L glass door vaccine fridge, 1x 100L freezer and 10 LED lights. Subsequent units were installed at provinces such as NCD, Central, Western Highlands and Eastern Highlands.



Schematic Diagram Of **Nu-Armour R1**



Nu-Armour R1 6000 Pro

Off-grid solar powered system for complete neonatal & postpartum care

For health facilities/hospitals with no reliable electricity supply

Aim:

Reduce neonatal and post-partum mortality and morbidity rate

Promote and maintain effective immunisation coverage

Prevent, Treat and/or Monitor:

Pre-term complications

Birth asphyxia

Neonatal hypothermia

Post-partum severe bleeding

Post-partum hypovolemic shock

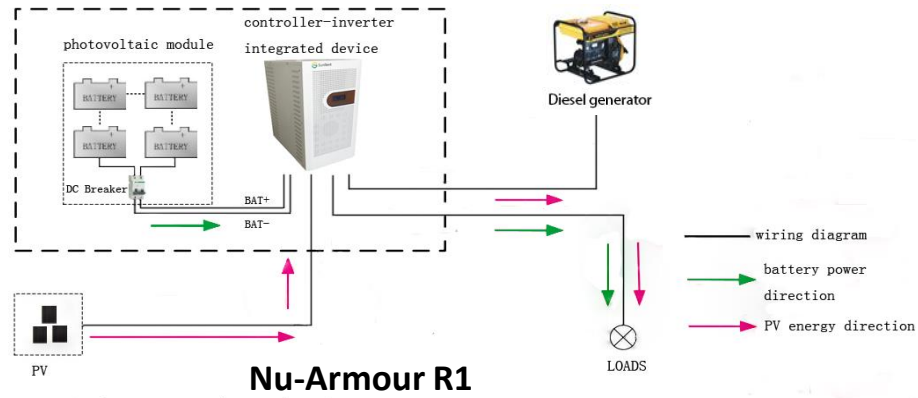
Facilitate:

Induction and augmentation of labour

Maternal and neonatal immunisation

Infection control





System Autonomous:

3 days @ 12kwh per day with a diesel generator backup

Loads:

- 6x LED lights for labour room (1)
 - Medical fridge (2)
 - Oxygen concentrator (3)
 - Baby radiant warmer (4)
 - ECG/NIBP/Spo2/Temp/Pulse Oximeter kit (5)
- Complement accessory: anti-shock garment (6)

1



2



3



4



5



6



Key Facts

Leading causes of infant death: Preterm complications, birth asphyxia, infections and hypothermia (WHO source).

Leading causes of maternal death: severe bleeding and infections (WHO source).

Nu-Armour R1 6000 Pro's

Oxygen concentrator

- Provides oxygen therapy for neonatal pre-term complications, birth asphyxia and respiratory distress.
- Provides oxygen therapy for maternal health (e.g. during maternal hypovolemic shock and asthma attacks).

Baby radiant warmer

- Provides radiant warmth to prevent and treat pre-term complications and hypothermia.

LED lights

- Facilitates infection control. Safe, hygienic and effective delivery of babies by medical professionals can only be done under properly fitted and functioning LED lights in labour room.
- Facilitates effective delivery of babies by providing sufficient lightings in labour room.

Medical fridge

- Maintains vaccine cold chain for maternal and neonatal immunisation. This ensures herd immunity and prevents infection-related infant death.
- Ensures adequate storage of oxytocin for use in post-partum haemorrhage, induction and augmentation of labour.

Vital signs monitoring device

- uninterrupted power supply to vital signs monitoring devices (e.g. ECG/NIBP/Spo2/pulse oximeter) to provide critical information needed for medical professionals to make life-saving decisions and confirm feedback on treatments performed.

Non-pneumatic anti-shock garment

- controls further blood loss during maternal severe bleeding and hypovolemic shock.

Nu-Armour R1 6000 PRO: PREVENT, TREAT & MONITOR neonatal and maternal complications using solar energy!





Nu-Armour R1 6000 Pro's medical fridge

Effective and validated temperature control between 2-8°C

Uniform temperature distribution throughout the interior space

Glass door with demister function

Spacious interior (100L) with multiple trays

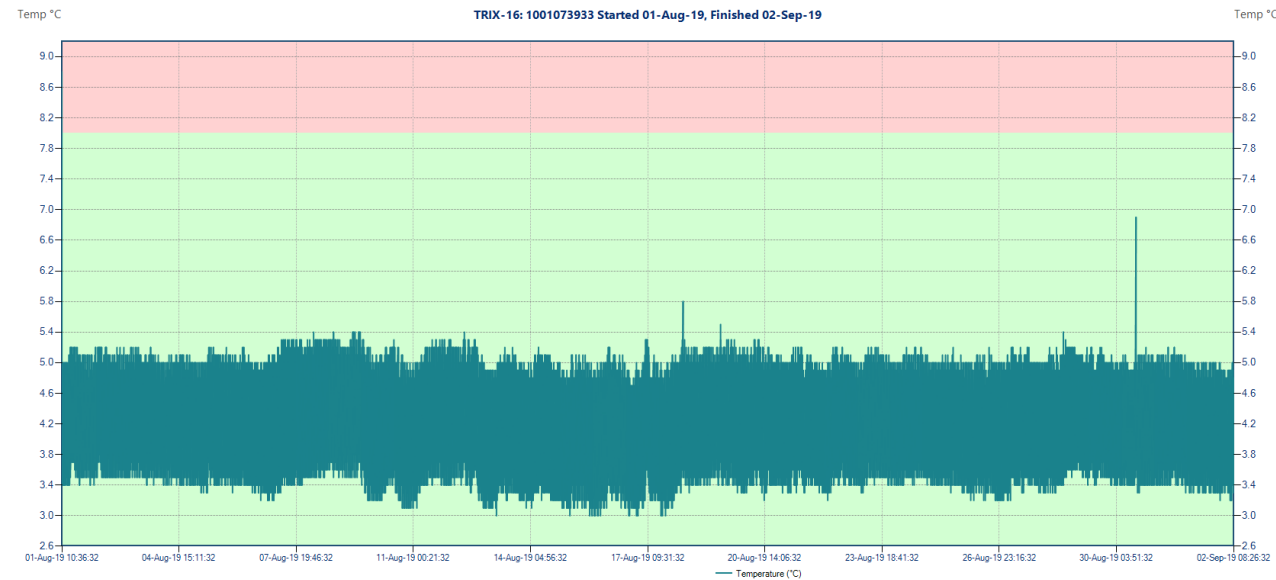
Indicators and alarms: Yes

Inbuilt thermometer and LED lights

Climate-classification: SN – T (all climate)

CE & ISO13485 certified

Comply with WHO's technical specifications



Fridge temperature monitoring data (LogTag Data Logger)





Nu-Armour R1 6000 Pro's oxygen concentrator

Oxygen concentration: >90%
 Flow control: 0.1 LPM
 Minimum flow output: 0.1 LPM
 Maximum flow output: 10 LPM
 Indicators and alarms: Yes
 Support both newborn and mother or
 Support at least 4 newborns
 Comply with WHO's technical specifications



Nu-Armour R1 6000 Pro's LED lights

Emit sufficient lights for labour room
 Long life cycle
 No warm-up time
 Shock resistant



Nu-Armour R1 6000 Pro ensures uninterrupted power supply to vital signs monitoring devices used in neonatal care units



Nu-Armour R1 6000 Pro's baby radiant warmer

Controlled temperature system
 Adjustable humidity
 Self-testing function
 Indicators and alarms: Yes
 Triple protection for over temperature with separate cut off device
 Adjustable bed
 Comply with WHO's technical specifications



Non-pneumatic Anti-shock Garment

Endorsed by WHO & UNICEF



Nu-Armour R1 6000 Pro

Features:

- Built to last and comprehensive life saving system for neonatal and maternal care
- Low maintenance
- Easy installation with minimal training required to run the solar power system
- High quality, fully automated, intelligent and reliable solar power system that requires minimal human input and monitoring
- A cost-effective system:
 - ✓ Improve, transform, and provide quality health services through innovative approaches supporting primary health care and health system development
 - ✓ Reduce financial burdens on healthcare system associated with neonatal and maternal death and complications



Portable Solar Power System

- D40



Features:

- Reusable, light-weight and portable solar power system (a D40 unit includes a high efficient 40W solar panel, a controller with built-in 20AH large-capacity battery, 5W LED light bulbs and USB charging cable).
- The system supports up to 4 LED bulbs. Suitable to use for both indoor & outdoor lightings, areas without electricity, camping and during power failure.
- Two USB ports to charge electronic products such as mobile phones, computers, DC fans, DC TV. And digital cameras.
- Built-in safety protection for over-charge, over-discharge, over-load, short-circuit and false connection.

