LuxMed®
Healthcare Redefined
A Brand of
LUXLIGHTING TECHNOLOGY PRIVATE LIMITED

COMPLETE RANGE OF

Co_2 Incubator, Tri-Gas Incubator, Hypoxia Incubator

Advanced Cell Culture Solutions

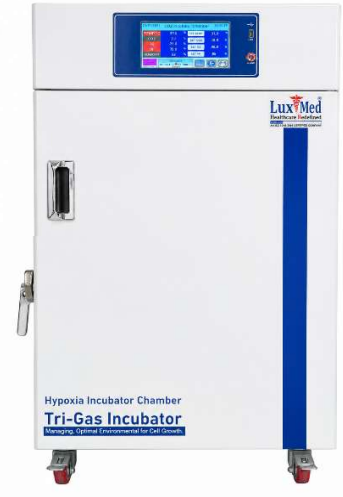
CO_2 Incubator
Heating & Cooling **(LMX-HC)**

Pre-Order Selection Options For Research and cell growth

- UV lamp for air jacket
- Heat Sterilization - 120°C to 180°C
- CO_2 & O_2 Gas Sensor
- Water Jacket
- LCD, Touch Screen Display
- Fan less design to reduce chance of contamination, reduce noise.
- Fan with in chamber HEPA for better recovery and ISO Class Clean air Or Higher

CO_2 Incubator
Touch Screen **(LMX-TC)**

CO_2 Incubator
LCD Display **(LMX-LCD)**



Hypoxia Incubator
(Tri-Gas Incubator) **(LMX-HI)**

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CO_2 Incubator

Managing, Optimal Environmental for Cell Growth

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CO_2 Incubator (Heating + Cooling + Humidity + CO_2 + O_2 Control)

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CO_2 Incubator

Managing, Optimal Environmental for Cell Growth

LuxMed® CO2 incubator with heating, cooling, and humidity control relies on integrated electronic systems, compressor modules, and water reservoirs to maintain stable cell growth environments. These units typically target 37°C, 5% CO2, and 90–95% relative humidity.

Heating Systems

• **Direct Heat**: Uses foil heaters or wire elements wrapped around the outer chamber walls for fast, uniform warmth.

• **Water Jacket:** Surrounds the inner chamber with a heated water volume to provide maximum thermal stability during power cuts.

Cooling Systems

• **Compressor**: Cool the air and circulate the air for working well for ambient temperatures below or near setpoints.

• **Compressor Refrigeration:** Standard mechanical refrigeration handles aggressive cooling for sub-ambient applications or precise operation in warm room conditions.

• **Compressor-Based:** Standard refrigeration cycles used in larger units for wide-range or sub-ambient temperature control.

LuxMed® CO2 incubators combining heating, cooling, and humidity control represent highly specialized equipment often powered by advanced Compressor modules or specialized compressor units to cultivate temperature-sensitive, non-mammalian, or marine cells. Standard biological units only heat above ambient conditions, but full-range climate models allow incubation at, below, or significantly above room temperature alongside regulated moisture and carbon dioxide levels.

Core Technological Components

• **Compressor:** Cool the air and circulate the air for working well for ambient temperatures below or near setpoints.

• **Active vs. Passive Humidity:** Standard passive water pans generate ~95% relative humidity (RH) through natural evaporation. Active control systems use precise internal steam generators or vaporizers to forcefully maintain moisture levels even through frequent door disruptions.

• **Carbon Dioxide Regulation:** Microprocessor-controlled infrared (IR) or thermal conductivity sensors dynamically inject CO2 gas to keep a strict buffer range (typically 5%) to regulate media pH.

LuxMed® CO_2 incubator with heating, cooling, and humidity controls maintains precise biological environments using integrated thermal layers, Peltier or compressor refrigeration, and passive pans or active steam generators.

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Heating Systems

• **Direct Heat:** Foil heaters or wire elements wrapped around the outer chamber walls provide fast, uniform warmth and enable high-temperature decontamination cycles (e.g., 180°C).

• **Water Jacket:** An insulated water-filled cavity surrounding the inner chamber acts as a thermal buffer, maintaining stable heat during power failures.

Cooling Systems

• **Compressor:** Cool the air and circulate the air for working well for ambient temperatures below or near setpoints.

• **Compressor Refrigeration**: Standard mechanical refrigeration handles aggressive cooling for sub-ambient applications or precise operation in warm room conditions.
Humidity Control

• **Passive Control**: A bottom water pan filled with sterile distilled water relies on natural evaporation to maintain 90%–95% relative humidity (RH).

• **Active Control:** Microprocessor-regulated steam injection or external reservoirs actively monitor and rapidly recover humidity levels after door openings.

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CO_2 Incubator LCD Display

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CO_2 Incubator

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LuxMed® Tri-Gas Incubator is synonymous with a Hypoxia Incubator Chamber and an advanced CO_2 Incubator, functioning as a single multi-gas system that controls carbon dioxide (CO_2), oxygen (O_2), nitrogen (N_2), temperature, and humidity. While a standard CO_2 incubator only regulates temperature and CO_2 at ambient (21%) oxygen, a Tri-Gas/hypoxia system uses nitrogen injection to actively reduce oxygen down to physiological levels (1% to 20%) to mimic in vivo tissue environments.

Key Functional Differences

• **Standard CO_2 Incubator:** Controls only temperature and CO_2 levels; oxygen remains at room air levels (~21%).

• **Tri-Gas / Hypoxia Incubator:** Controls temperature, CO_2, and precisely lowers or raises O_2 using an N_2 supply and advanced sensors (like Zirconia or IR).

Technical Features

• **Gas Regulation**: Manages CO_2 (typically 0–20%), O_2 (hypoxic range 0.1–20%, or hypertoxic up to 90%), and uses N_2 displacement.

• **Sensors:** Uses Infrared (IR) dual-beam sensors for stable CO_2 tracking and solid-state Zirconia or electrochemical cells for precise O_2 control.

• **Contamination Control:** Often features high-temperature disinfection cycles (e.g., 125°C dry heat) and HEPA/ULPA air filtration.

Primary Applications

• **Stem Cell & Cancer Research:** Studies tumor microenvironments and stem cell maintenance under real physiological oxygen tensions.

• **In Vitro Fertilization (IVF):** Culturing embryos at reduced oxygen concentrations (approx. 5% O_2) matching the oviduct environment.

• **Explore Devices**: Review system specifications and multi-gas configurations

Key Technical Parameters & Performance

• **Oxygen Control (O_2):** Typically, adjustable from ultra-low hypoxia levels up to standard atmospheric conditions (commonly ranging from 0.1% to 25% or up to 85% for specialized systems). Precision is maintained using high-end zirconium dioxide or electrochemical sensors.

• **Carbon Dioxide Control (CO_2):** Usually ranges from 0% to 20% with an accuracy of ±0.1%, monitored using dual-beam Infrared (IR) sensors that resist performance drift from humidity or temperature fluctuations.

• **Nitrogen Displacement (N_2):** Microprocessor-based PID control loops automatically regulate N_2 injection rates (often 6–12 liters per minute during recovery phases) to achieve the desired balance.

• **Temperature & Humidity:** Maintains temperature uniformity within ±0.1°C to ±0.5°C using 6-sided direct heating or air/water jackets. Humidity levels are kept high (~95% RH) via natural or active humidification pans to prevent evaporation of cultures.

CO_2 Incubator

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Core Applications

• **In Vitro Fertilization (IVF):** Crucial for mammalian embryo and oocyte cultivation. Lowering O_2 levels mimics human oviduct/uterine environments, reducing harmful oxidative stress.

• **Stem Cell and Oncology Research:** Stem cells and cancer tumors naturally grow in deep tissue environments with oxygen concentrations far below atmospheric levels (hypoxia).

• **Microbiology & Immunology:** Used to propagate anaerobic microorganisms, study cellular dynamics, and harvest mammalian cell secretions under optimal biological limits hypoxia incubator is a specialized lab device used to control oxygen, carbon dioxide, and temperature to mimic low-oxygen body or tissue environments for cell growth. It helps researchers study cancer, stem cells, and metabolism under exact physiological conditions.

Key Features

• **Oxygen Control:** Adjusts O_2 levels precisely from 0.1% up to 25.0% using nitrogen gas.

• **Carbon Dioxide (CO_2):** Regulates CO_2 (usually around 5%) to maintain proper media pH balance.

• **Temperature & Humidity:** Keeps stable internal heat (up to 45°C) and moisture to stop cell drying.

• **Data Logging**: Records real-time gas and temperature levels for experiment tracking.

Common Uses

• **Cancer Research:** Simulating solid tumor microenvironments where oxygen is very low.

• **Stem Cell Culture:** Improving cell growth and preventing early differentiation or stress.•

Tissue Engineering: Testing how sensitive primary cells or neural tissues react to lack of oxygen

Crucial Equipment Specifications		
Parameter	**Operational Specification Range**	**Primary Benefit / Purpose**
Temperature Control	4 °C to 60 °C (or higher)	Supports plant, insect, marine, and traditional mammalian cultures.
Relative Humidity (RH)	85% to 98%	Minimizes sample evaporation and blocks dry spots from cultivating mold.
CO2 Concentration	0% to 20% V/V	Stabilizes complex carbon-based cell buffers to regulate critical fluid pH.
Sterilization Cycles	90°C to 180°C (Dry or Humid)	Broad-spectrum elimination of interior viral, fungal, and bacterial contaminants.

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CO_2 Incubator – Touch Screen Display

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CO_2 Incubator

Managing, Optimal Environmental for Cell Growth

LuxMed® incubators are essential laboratory equipment used to maintain optimal conditions for cell and tissue cultures. They provide a controlled environment with specific temperature, humidity, and CO2 levels to promote cell growth and survival. These incubators are crucial in various applications, including cell-based research, drug discovery, and even in-vitro fertilization

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Uses of CO_2 Incubators:

• **Cell Culture**: CO2 incubators provide a stable and sterile environment for growing cells, ensuring optimal conditions for cell growth and differentiation.
• **In-Vitro Fertilization (IVF):** They are used to cultivate and maintain embryos during IVF, providing the right environment for embryo development.
• **Drug Discovery and Development:** CO2 incubators are used in drug testing and the development of new medications, as they allow for controlled cell culture conditions for drug screening.
• **Tissue Engineering:** They are utilized in the development of tissue-engineered products, such as 3D cell structures for grafting or tissue repair.
• **Research and Development:** CO2 incubators are widely used in various research fields, including immunology, oncology, and cell dynamics.
• **Vaccine and Antibody Production:** They play a role in the production of cell-based products like vaccines and antibodies, which are crucial in the pharmaceutical industry.
• **Diagnostics**: CO2 incubators are used for diagnostics, such as cell-based assays and monitoring cell growth in various applications.

How CO_2 Incubators Work:

CO_2 incubators control several key parameters to maintain optimal conditions for cell culture:
• **Temperature:** They maintain a specific temperature, typically 37°C, which is optimal for many mammalian cell types.
• **Humidity:** High humidity levels (around 95%) are maintained to prevent the cells from drying out.
• **CO2 Levels:** The CO2 concentration is carefully regulated, usually around 5%, to maintain the pH of the culture medium. CO2 interacts with sodium bicarbonate in the culture medium to buffer the pH within the physiological range.
• **Sterility:** They are designed to prevent contamination by filtering the air and water used in the incubator, as well as providing a sterile environment for the cells to grow.

CO2 incubators are designed to create and maintain controlled environments for cell culture, primarily focusing on temperature, humidity, and CO2 levels. These incubators use a closed system to regulate the atmosphere inside the chamber, ensuring optimal conditions for cell growth.

Here's a more detailed breakdown of the key design principles:1.

Temperature Control

• **Heating Systems:** CO2 incubators typically use either a water or oil jacket, or electrical heating elements to maintain a constant temperature, usually around 37°C.

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• **Precision and Uniformity:** The design aims for precise temperature control and uniformity throughout the chamber to avoid thermal gradients that could affect cell growth.

2. Humidity Control

• **Evaporation and Condensation:** Humidity is maintained through a combination of evaporation from a water reservoir or atomizer system and condensation control.

• **Constant Levels:** The goal is to maintain a high humidity level, typically around 95%, to prevent media from drying out and to ensure proper cell hydration.

3. CO2 Level Regulation

• **Sealed System:** The incubator's design features a sealed chamber to isolate the internal environment from external CO2 fluctuations.

• **CO2 Supply and Control:** A CO2 gas supply, often with a built-in control system, ensures that the CO2 concentration within the chamber is maintained at the desired level, usually around 5% for many cell cultures.

• **CO2 Sensors:** Infrared (IR) sensors are commonly used to continuously monitor CO2 levels and automatically adjust the gas flow to maintain the set point.

4. Minimizing Contamination

• **Sterile Design:** CO2 incubators are designed with a focus on minimizing contamination risks, using materials like stainless steel for the interior and ensuring smooth surfaces to prevent microbial growth.

• **Air Filtration:** Air is often filtered to remove particulate matter and prevent the introduction of contaminants.

Technical Specification

Feature	Specification					
Model	LMX-C50	LMX-C85	LMX-C150	LMX-C175	LMX-200	LMX-C500
Capacity	50 Ltr	85 Ltr	150 Ltr	175 Ltr	200 Ltr	500 Ltr
Temperature Control	PID Microprocessor					
Chamber Material	SS-304 Stainless Steel					
CO_2 Sensor	Dual Beam Infrared (IR)					
Display Options	LCD / Touch Screen					
Cooling Option	Available (Heating & Cooling Model)					
Humidity	Natural Water Reservoir					
Data Logging	USB					
Alarm System	Audio & Visual					
Power Supply	220–240V, 50Hz					
Heating	Air jacket / Water jacket					
CO2 Range	Infrared sensor, range 0~20%					
Inner Chamber (WxDxH)MM	500*360*310	538*395*405	510*460*460	657*495*539	690*540*540	1069*820*719
Outer Chamber (WxDxH)MM	955*520*490	880*572*583	965*620*640	996*672*718	1025*700*720	1380*820*920

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Hypoxia Incubator Chamber

(Tri-Gas Incubator)

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Core Applications

In Vitro Fertilization (IVF): Crucial for mammalian embryo and oocyte cultivation. Lowering O_2 levels mimics human oviduct/uterine environments, reducing harmful oxidative stress.

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Hypoxia incubator is a specialized lab device used to control oxygen, carbon dioxide, and temperature to mimic low-oxygen body or tissue environments for cell growth. It helps researchers study cancer, stem cells, and metabolism under exact physiological conditions.

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2. **Stem Cell Culture:** Improving cell growth and preventing early differentiation or stress.
3. **Tissue Engineering:** Testing how sensitive primary cells or neural tissues react to lack of oxygen.

How They Compare: The LuxMed® Technology Spectrum

Equipment Type	Gas Controls	Target Environment	Primary Use Cases
Standard CO_2 Incubator	Temperature + CO_2 (typically 5%)	Nonmonic (~20-21% atmospheric O_2)	Standard mammalian cell lines, general tissue culture.
Tri-Gas Incubator	Temperature + CO_2 + O_2 (via N_2 injection)	Hypertoxic (0.1% to 20% O_2) or Hypertoxic	Stem cells, IVF embryos, primary tissue, tumour microenvironments.
Hypoxia Chamber Incubator	Temperature + CO_2 + O_2 (often modular or self-contained)	Strict Hypoxic / Anaerobic (Down to 0% O_2)	Deep hypoxia modeling, cardiovascular research, anaerobic microbiology

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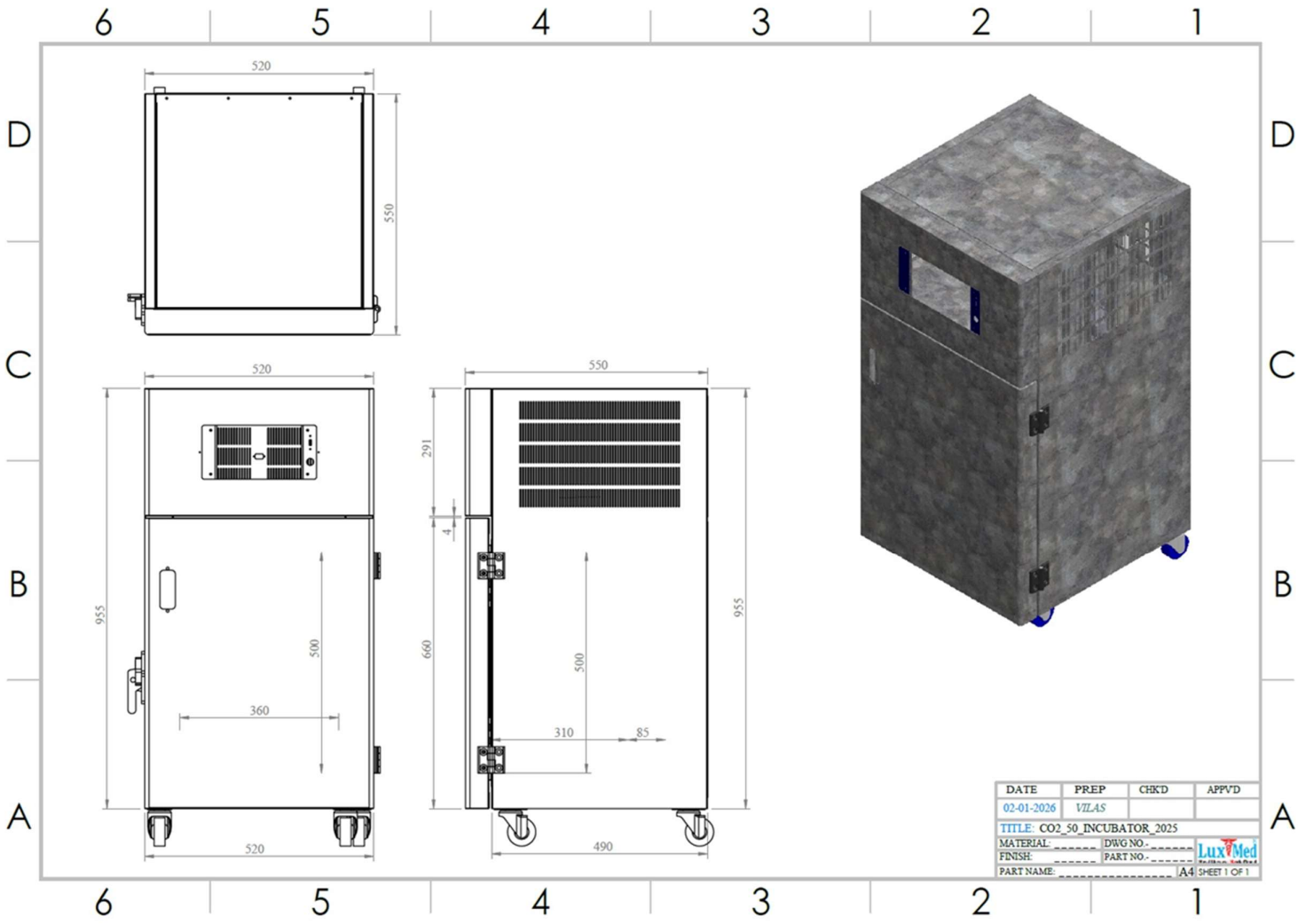
CO_2 Incubator – 50 Ltr



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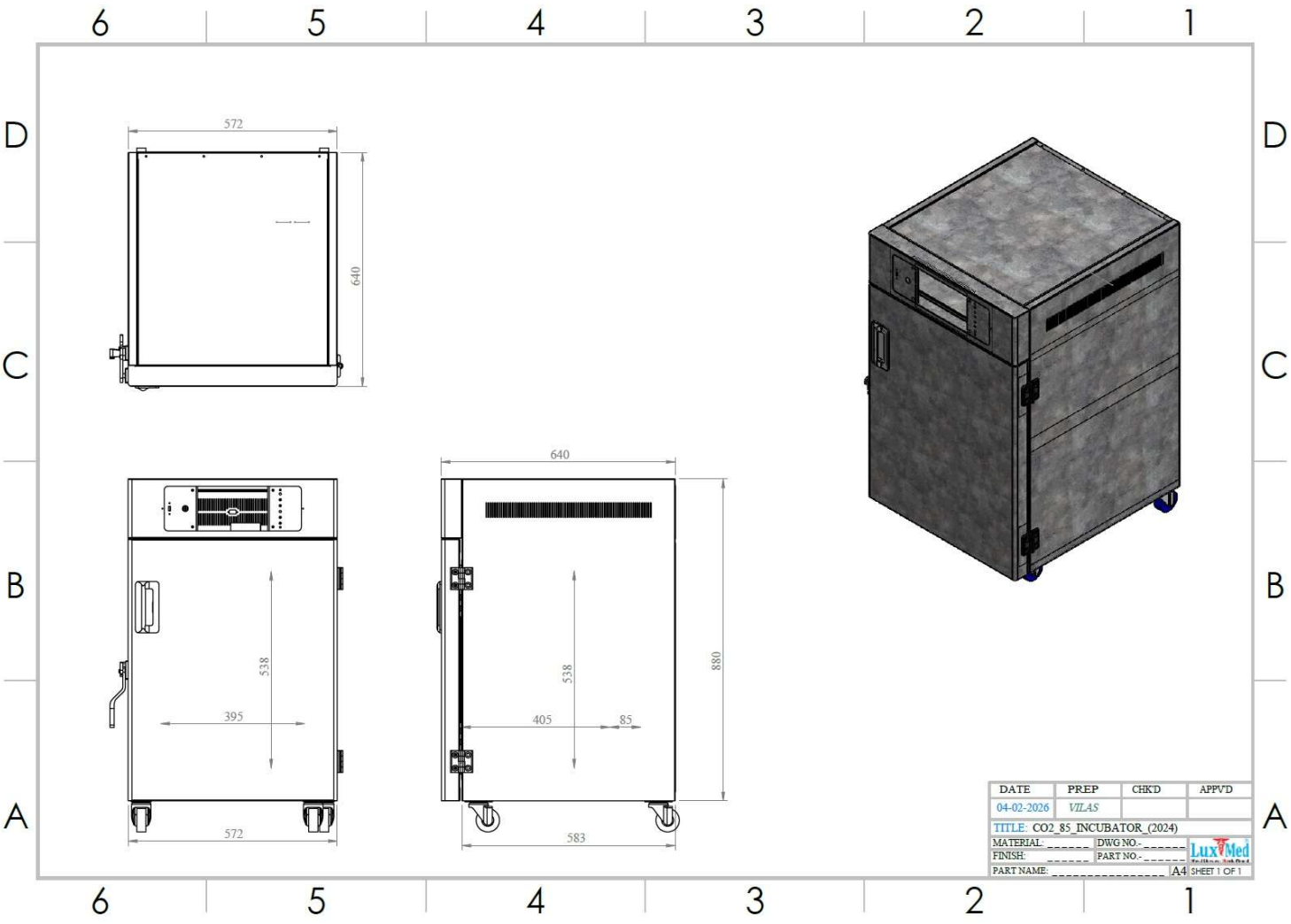
CO_2 Incubator – 85 Ltr



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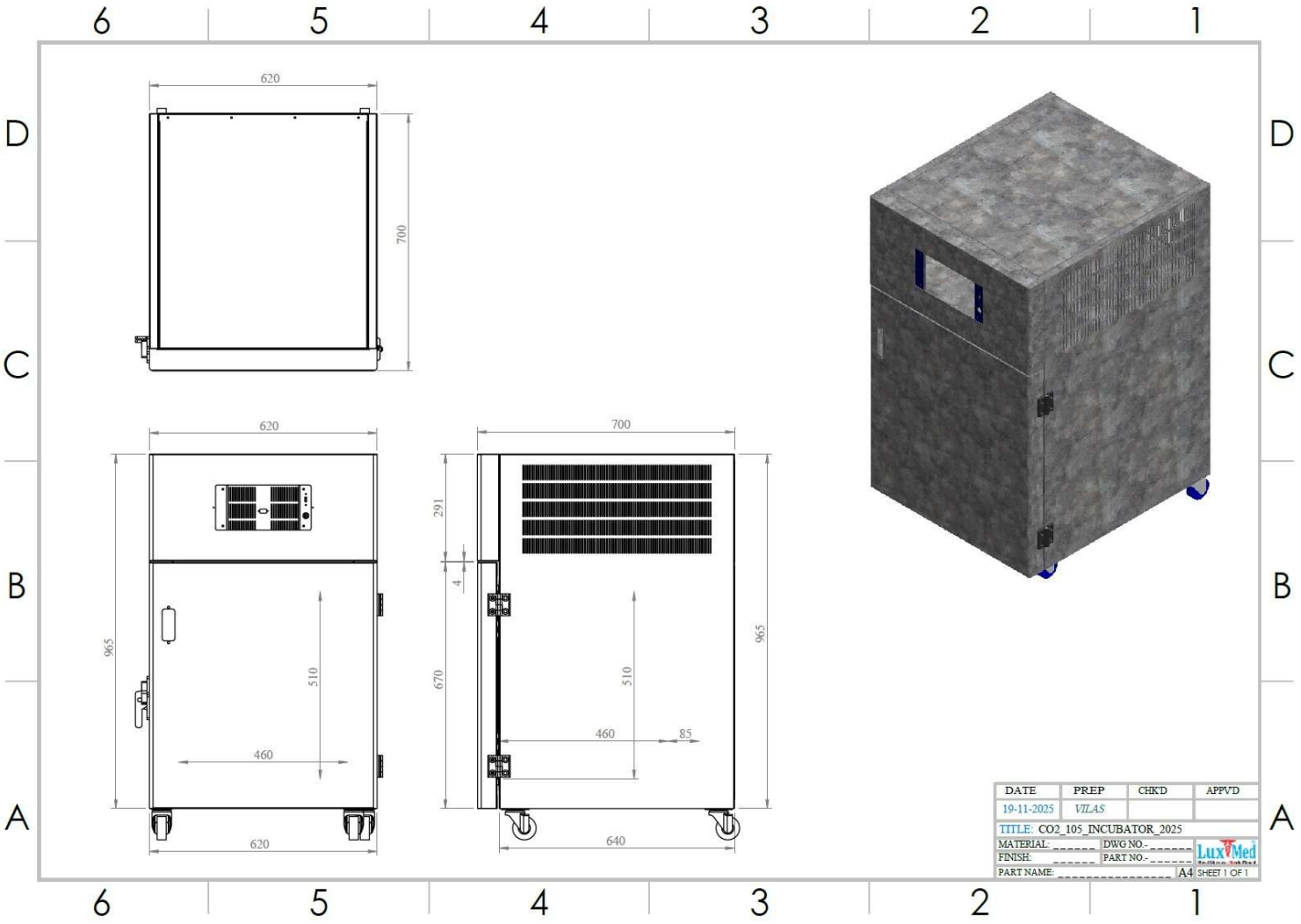
CO_2 Incubator – 105 Ltr



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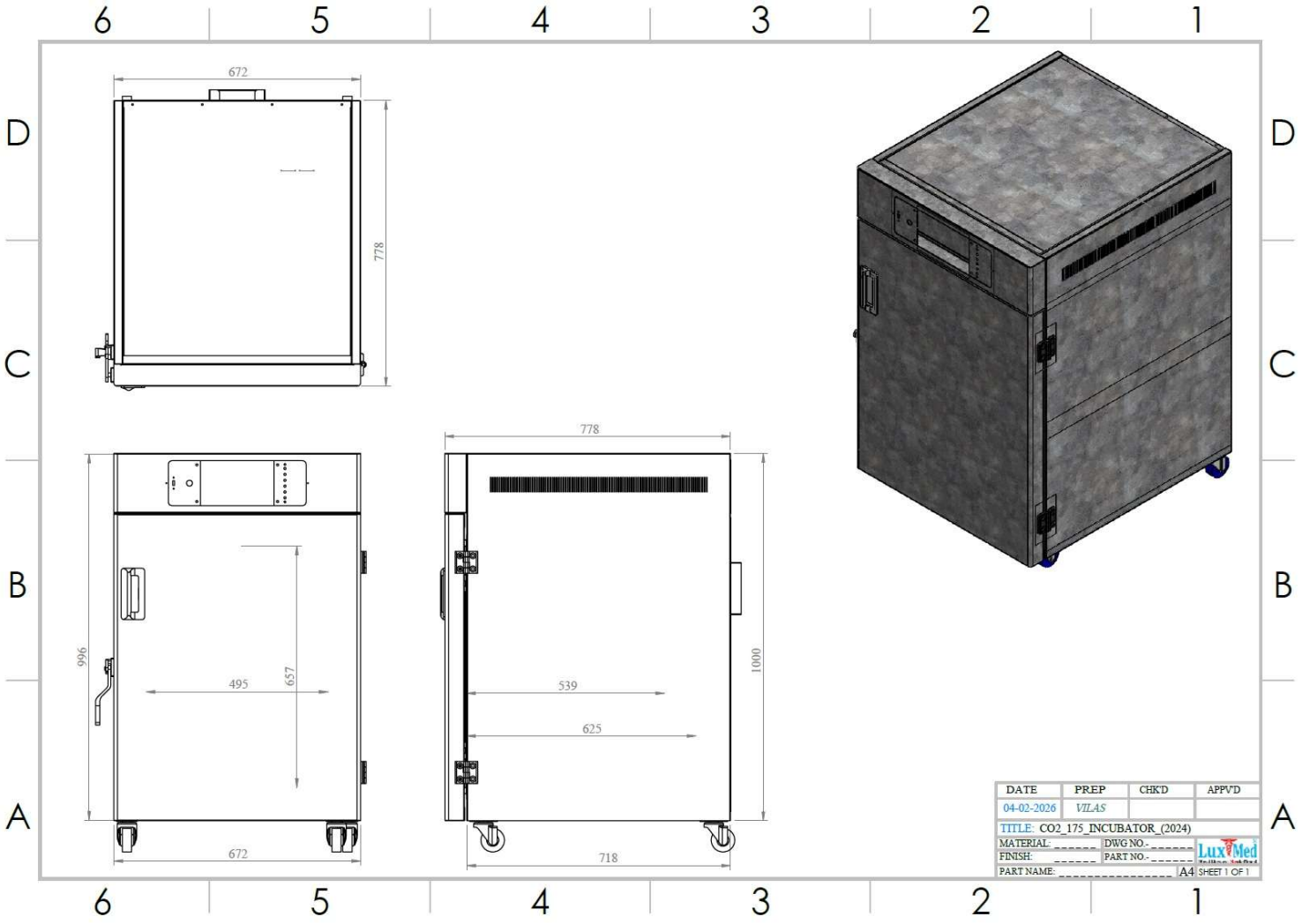
CO_2 Incubator – 175 Ltr



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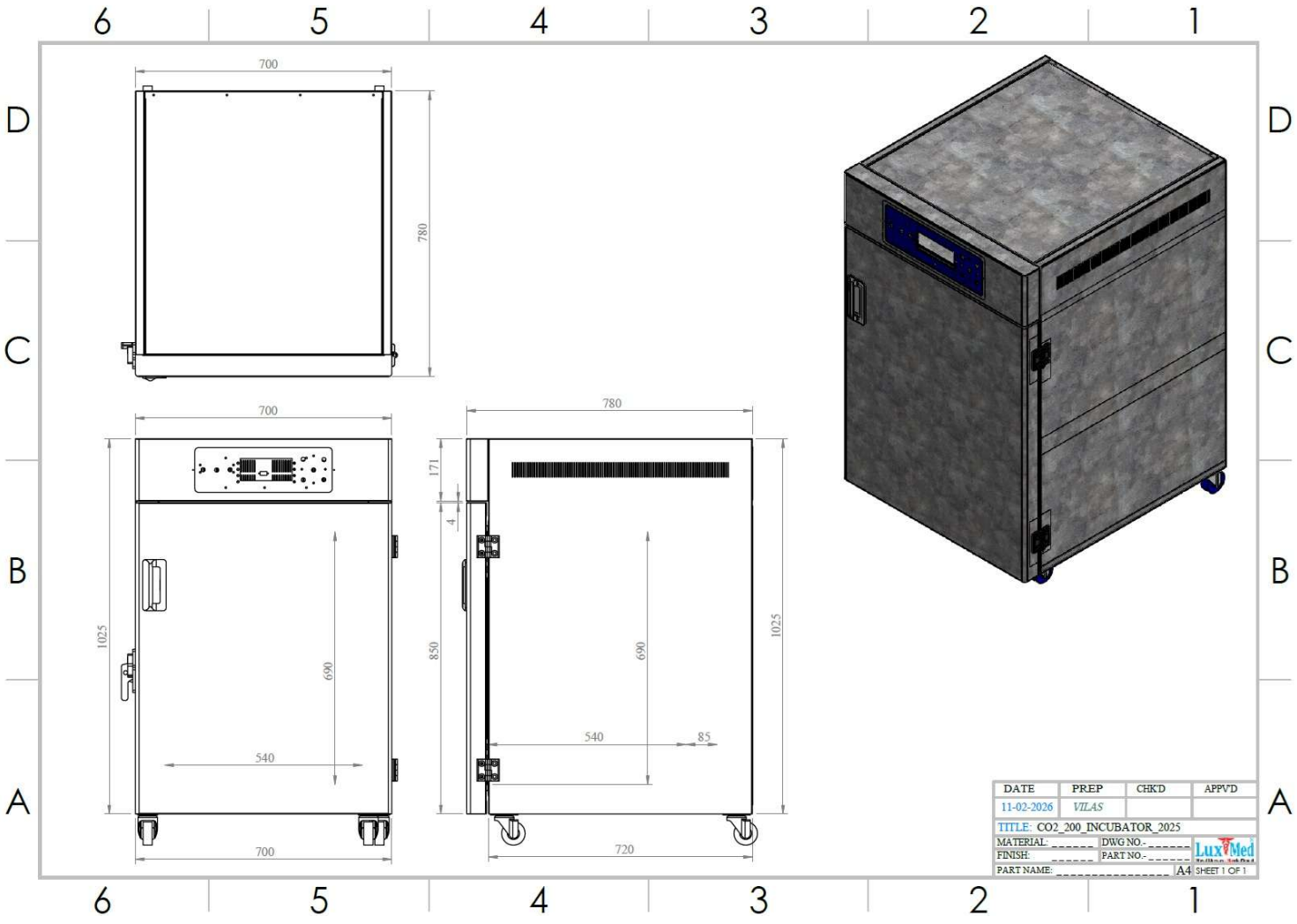
CO_2 Incubator – 200 Ltr



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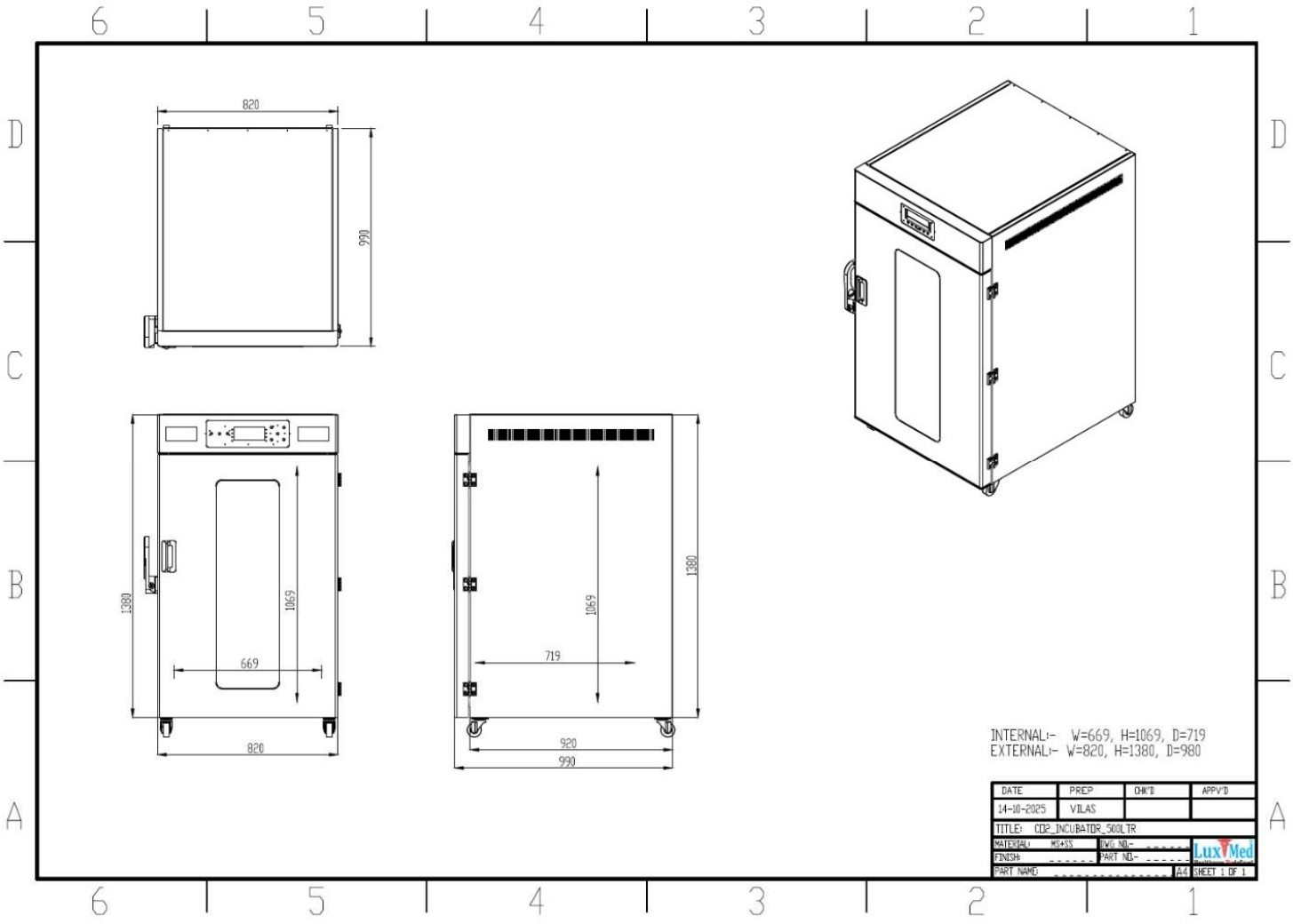
CO_2 Incubator – 500 Ltr



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