المركز الوطني للبحوث الزراعية
National Agricultural Research Center

نموذج استدراج اسعار

الرقم المتسلسل لطلب الشراء:..... التاريخ : .....

مديرية اللوازم والعطاءات

الرقم	قائمة اللوازم	المطلوب		المواصفات	السعر الافرادي	السعر الاجمالي
		الوحدة	الكمية			
1	Thermocycler	Sys.	1	Attached		
2	Lab. Incubator	Sys.	1	Attached		
3	Glass-Door Laboratory Refrigerator	Sys.	1	Attached		
4	Gel documentation System	Sys.	1	Attached		
5	NanoDrop	Sys.		Attached		
6	Ultra-Low Temperature Laboratory Freezer (Deep Freezer)	Sys.	1	Attached		
7	Biological Safety Cabinet - Class II	Sys.	1	Attached		
8	Non-touch ultrasonic homogenizer	Sys.	1	Attached		
9	Analytical balance	Sys.	2	Attached		

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المجموع :- النهائي رقما ( ) كتابة ( ).

اسم و توقيع المورد: ... .

ختم المورد :.....

التاريخ:..... .

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مواصفات الفنية للاجهزة

1. Thermal Cycler

Specification	Requirement for procurement
Type	Conventional PCR, 96 x 0.2 ml tubes, 0.2 ml tube strips, or 1 x 96-well plate
Temperature range	0–100°C or 4- 100°C
Gradient	30-100 °C
Maximum block ramp rate	4 -6 °C/sec.
Sample ramp rate	2.0 - 2.5°C/sec.
Temperature uniformity	±0.5°C well-to-well within 30 sec of arrival at target temperature.
Temperature accuracy:	±0.3- 0.5°C of programmed target
Temperature differential range	1–25°C
Dimensions (H x W x D)	25-26 x 45-48 x 22-24 cm
PCR volume range	10–100 µL.
Data connectivity	Yes: USB + Wi-Fi + Ethernet:
Compatible with	standard 0.2 mL PCR tubes and/or 96-well PCR plates.
Display	VGA colored touch screen or color TFT touchscreen.
Power	100–240 V, 50–60 Hz. Max. 700 W
Warranty	5 years

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3. Lab. incubator and mini- Growth Chamber

Specification	Requirement for procurement
Type	Programmable Environmental Growth Chamber (Incubator) for Insect Incubation and Rearing
Purposes	Environmental chamber suitable for incubation, growth, and rearing of insects and other biological samples.
Chamber capacity	≥120 L.
Programmable	temperature, relative humidity, and lighting control.
Temperature range	−10°C to +60°C or wider.
Temperature range during controlled-humidity operation	+10°C to +60°C.
Relative humidity control range_RH)	20–95% RH or wider.
Temperature resolution:	0.1°C or better.
Relative humidity resolution	1% RH or better
Integrated humidity- generation/control system	YES
Programmable day/night cycles.	YES
Programmable temperature/humidity/light Cycles	YES
low-heat interior illumination.	LED or equivalent
Programmable lighting timer	Covering a 24-hour cycle.
Programmable timer with continuous/hold operation	YES
Capability to store multiple environmental programs/profiles	YES
corrosion-resistant internal chamber	Stainless-steel or equivalent
Internal observation	Glass door
Shelves	At least two adjustable shelves.
Digital control and display system.	YES
Safety alarms for abnormal temperature and/or humidity conditions. Supplied complete with all accessories necessary for operation	YES
Power supply compatible with	220–240 V, 50 Hz.
Warranty	5 years

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5. Laboratory Refrigerator

Specification	Requirement for procurement
Type	Glass-Door Laboratory Refrigerator
Purposes	Laboratory refrigerator suitable for storage of biological samples, reagents, media, and other temperature- sensitive laboratory materials.
Grade	Molecular Biology
Operating temperature range	+2°C to +8°C.
Nominal operating setpoint	+4°C.
Storage capacity	≥600 L.
air circulation	Forced-air circulation cooling system to ensure uniform temperature distribution
Microprocessor	Microprocessor-controlled temperature management system.
Digital temperature display	YES
Temperature adjustment resolution	0.1°C or better.
Rapid temperature recovery	following door opening
Audible and visual alarm system for	High temperature, Low temperature, Power failure, Temperature sensor failure, Door-open condition.
Glass door	Allowing visual inspection of stored materials without opening the refrigerator.
Lockable door	to prevent unauthorized access
shelves	Multiple adjustable shelves suitable for laboratory sample storage
Interior illumination	LED or equivalent low-heat interior illumination
wheels	Caster wheels with leveling/stabilizing feet.
Interior designed for	Easy cleaning and laboratory use
Refrigeration system suitable	For continuous laboratory operation
Supplied complete with	All shelves and accessories required for normal operation
Power supply compatible with	220–240 V, 50 Hz
Warranty	5 years

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6. Gel documentation System

Specification	Requirement for procurement
Type	DNA/Protein Gel Documentation and Imaging System
Purposes	Digital gel documentation and imaging system suitable for imaging and documentation of DNA, RNA, and protein electrophoresis gels.
Suitable for	Commonly used fluorescent, UV-responsive, and/or visible stains.
Camera	**High-resolution digital CMOS or equivalent camera.**
Camera resolution	≥ 6megapixels.
Imaging area suitable for	Imaging area suitable for standard laboratory electrophoresis gels, (≥14 × 20 cm).
UV illumination capability	**yes**
Visible/white-light illumination capability	**yes**
Fluorescence imaging capability	**yes**
Appropriate emission filters compatible with commonly used DNA and protein gel stains	.yes
image	Integrated touchscreen or equivalent user-friendly operating interface. Integrated image acquisition and analysis software. Automatic and manual exposure control. Capability for image capture, annotation, storage, analysis, and export. Automated or software-assisted selection of appropriate illumination/excitation settings. Pre-calibrated and/or automated imaging modes suitable for routine DNA and protein gel applications. High dynamic range suitable for quantitative gel imaging. Image export in standard formats including TIFF and JPEG. Capability for transferring images/data to an external computer or storage device.
Operating temperature	suitable for standard laboratory environments
Supplied with all	trays, filters, cables, software licenses, and accessories necessary for normal operation
Warranty	5 years

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7. NanoDrop

Specification	Requirement for procurement
Type	Microvolume UV-Visible Spectrophotometer
Microvolume UV-Visible spectrophotometer	Suitable for quantitative and qualitative analysis of DNA, RNA, proteins, and other biological samples
Minimum sample volume:	≤1–2 µL.
Wavelength range covering	at least 190–850 nm.
Measurement modes suitable for	DNA, RNA, and protein quantification
Automatic calculation of	A260/A280 and A260/A230 purity ratios
Wide dynamic concentration range suitable for	low- and high-concentration nucleic-acid samples without routine dilution.
dsDNA measurement range extending from	1 ng/µL to ≥20,000 ng/µL or wider.
Protein measurement capability	covering a wide concentration range
. Having	High-sensitivity optical detector suitable for microvolume measurements Integrated touchscreen or equivalent user interface.
Measurement time	≤10 seconds per sample under standard operating conditions.
Measurement repeatability	: ≤3% CV or better
Photometric accuracy	±3% or better under specified calibration conditions.
included	Integrated software for data acquisition, analysis, storage, and export. Software capability for identification and/or correction of common sample contaminants. Automatic nucleic-acid concentration and purity calculations. Integrated dilution/concentration calculation tools suitable for downstream molecular biology applications. Internal storage capable of storing a large number of measurements. Data exports through USB, network connection, or equivalent method. Durable microvolume sample measurement pedestal suitable for aqueous biological samples. Integrated cuvette measurement. Supplied complete with required software, cables, accessories, and calibration/verification materials necessary for normal operation.
Warranty	5 years

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8. Deep Freezer

Specification	Requirement for procurement
Type	Ultra-Low (deep) Temperature Laboratory Freezer. Ultra-low temperature laboratory freezer suitable for long-term storage of biological samples, DNA/RNA materials, microorganisms, tissues, and other temperature-sensitive research materials.
Capable of maintaining a nominal storage temperature	between −80°C and −86°C. • Storage capacity: ≥500 L. • Microprocessor-controlled temperature management system.
Adjustable temperature	setting range covering at least −40°C to −86°C
Included	• Digital LCD, LED, or equivalent temperature display. • High-accuracy temperature monitoring sensor suitable for ultra-low-temperature operation. • High-efficiency refrigeration system capable of maintaining the specified temperature continuously. • High-performance thermal insulation designed for ultra-low-temperature laboratory storage. • Durable, corrosion-resistant exterior construction. • Durable, easy-to-clean interior suitable for long-term sample storage. • Insulated external door with secure locking mechanism. • Multiple insulated internal compartments/doors to reduce cold-air loss during sample access. • Minimum three adjustable or removable storage shelves. • Shelf load capacity: ≥45 kg per shelf. • Heavy-duty casters with leveling/stabilizing feet. • At least one access port for external temperature-monitoring probes or validation equipment.
Audible and visual alarm system for:	High temperature. Low temperature. Power failure. Sensor malfunction. Door-open condition
Alarm and temperature-monitoring functions	Shall remain active during abnormal operating conditions
Noise level suitable for	Laboratory operation, preferably ≤55 dB(A).
Included	• Automatic recovery/restart following power interruption. • Battery-backed alarm or equivalent emergency alarm capability • Supplied complete with shelves, access keys, manuals, and all accessories required for normal operation.
Power supply compatible with	220–240 V, 50 Hz.
Warranty	5 years

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9. Biological Safety Cabinet

Specification	Requirement for procurement
Style	**Class II**
Width:	. 1.2–1.3 m
Working width	1.2–1.3 m
Voltage	230 V, 50/60 Hz
Interior, working surface, side and front	Stainless Steel
HEPA	H14, 99.995% at MPPS
Airflow	Smart Flow Plus
Blowers	Dual blower + pressure sensor system
included	SmartPort
Display	Touchscreen
Sash	7-8 inch opening
Included	UV
Stand	Adjustable-height stand
Energy saving	Night Standby mode
Noise	60- 63 dBA
Warranty	5 years

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10 - Non-touch ultrasonic homogenizer

1. Frequency 20-40KHz (±0.5KHz).
2. Power 1500-1800W.
3. Power Adjust 1% - 99%.
4. Timing 1 - 999min.
5. Capacity 5 µL to 500 mL per batch.
6. Temp. Display.
7. Holder 0.5ml 12 wells, 2ml 12 wells, 0.2ml 12 wells, support 5ml - 50ml.
8. Power Supply 220V±0.5 50Hz.
9. Multiple tube rack options can accommodate sample volumes using a variety of standard sample tubes.
10. The Cup Tip design ensures a contact-free homogenization process for small-scale samples.
11. The system displays real-time process parameters (time, amplitude, and delivered energy/power).
12. Provide pulse mode with user-adjustable ON/OFF times.
13. Touchscreen control panel, digital type, programmable.

11 - Analytical balance

1. Maximum Capacity 220 g
2. Readability 1 mg
3. Repeatability 1 mg
4. Linearity ± 2 mg
5. Pan Size (120 mm x 120 mm) minimum for rectangular and 90-100 mm Ø. For round shape
6. Internal Calibration Automatic
7. Draft shield include a draft shield
8. Working Environment (10°C – 30°C, 80%RH, non-condensing)
9. Communication USB device; USB host x 2; RS232
10. Display minimum 5" LED OR LCD screen
11. Pan Construction Stainless Steel
12. Stabilization Time minimum 5s
13. Compliance ISO/IEC 17025.
14. Warranty min 1 year.

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مديرية اللوازم والعطاءات

الرقم	قائمة اللوازم	المطلوب		المواصفات	السعر الافرادي	السعر الإجمالي
		الوحدة	الكمية			
.1	Autoclave	Sys.	1	Attached		
.2	Multiparameter ION analyzer	Sys.	1	Attached		
.3	Industrial Stainless-steel Pulverizer	Uni.	1	Attached		
	Halogen moisture analyzer	Sys.	1	Attached		
.4	DNA Plant/Seed Extraction Kit	Kit	1	Attached		
.5	Plant Pro Kit	Kit	2	Attached		
.6	DNA Tissue/Insect Extraction Kit	Kit	1	Attached		
.7	DNA Tissue/Insect Extraction Kit	Kit	1	Attached		
.9	Microbiome DNA Enrichment Kit	Kit	1	Attached		
10	Master Mix	Kit	3	Attached		
.11	Master Mix	Kit	3	Attached		
.12	Filter Tips	PK	10	Attached		
13	Gloves	PK	10	Attached		
14	Polypropylene Floating Microtube Racks	Rack	4	Attached		
15	Benchtop Coolers	Cooler	2	Attached		
16	Portable/mobile compressor refrigerator	ICE BOX	1	Attached		
17	ICE BOX	ICE BOX	1	Attached		
18	Mortar and pestle	Uni.	20	Attached		

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Vertical laboratory autoclave

Parameter	Required specification
Type	Vertical laboratory autoclave / automatic vertical sterilizer
Chamber capacity	≥50 L
Chamber material	High-grade stainless steel
Sterilization temperature	Programmable, **121–134°C**
Operating pressure	Appropriate pressure automatically controlled according to selected sterilization temperature/cycle
Controller	Microprocessor-controlled programmable digital system
Display	**Color touchscreen**
Programs	Dedicated and customizable programs for **liquids/media, solids, glassware, wrapped instruments, pipette tips and laboratory waste**
Liquid/media cycle	Dedicated cycle with controlled heating, sterilization and cooling
Waste cycle	Program suitable for microbiological/biological laboratory waste
Drying	**Integrated drying/vacuum-drying function**, where applicable
Cooling	**Rapid/forced cooling system** with appropriate temperature and pressure control
Lid/door sealing	Automatic **compressed-air/pneumatic sealing** preferred
Safety	Door/lid interlock; door cannot open while chamber is pressurized or at unsafe temperature
Protection	Independent over-temperature and over-pressure protection
Process monitoring	Continuous monitoring of temperature and pressure
Data recording	USB/Ethernet or equivalent electronic data logging; printer preferably included
Heat recovery	**Heat-recovery/energy-saving system preferred**
Water	Compatible with treated/demineralized/distilled water as specified by manufacturer
Accessories	Stainless-steel baskets/racks; liquid containers; drain system; loading accessories
Validation	Manufacturer documentation supporting **IQ/OQ/PQ or equivalent validation**
Calibration	Factory calibration certificate for temperature and pressure sensors
Service	Installation, commissioning, operator training and preventive maintenance
Warranty	**Minimum 5 years**, including parts and labor, excluding consumables
Electrical	220–240 V, 50 Hz, suitable for Jordanian electrical supply
Standards	CE and applicable international laboratory sterilizer/autoclave safety standards

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Multiparameter ion analyzer

Feature	Specification
Instrument type	Multiparameter ion analyzer
Measurement principle	Ion-selective electrode (ISE) potentiometry
Ion capacity	**7 ions simultaneously**
pH	Included
Maximum parameters	**10**
Typical ions	NH_4^+, NO_3^-, K^+, Ca^{2+}, Mg^{2+}, Na^+ and Cl^-
Additional parameters	pH; conductivity and hardness depending on configuration
Measurement time	Approximately **60 seconds**
Measurement range	Approximately **1 to >10,000 mg/L**, depending on ion
Minimum sample volume	Approximately **10 mL**
Units	mg/L, ppm or mmol/L
Calibration	Multi-point calibration; customizable standards
Measurement method	Potentiometric
Probe	Multi-ion probe accommodating up to 7 ISE sensors
Data processing	Computer software
Data export	Results can be exported to Excel/CSV
Power	USB-powered, 5 V
Operating temperature	**4–50°C**
Portability	Portable system with carrying case
Applications	Irrigation water, fertilizers, soil extracts, plant sap, hydroponics, wastewater, groundwater and environmental samples

Industrial Stainless-steel Pulverizer	200 g high-speed laboratory pulverizer: stainless-steel grinding chamber, around 25-28,000 rpm, designed for laboratory sample preparation.
Halogen moisture analyzer	Readability: 0.001 g Maximum weighing capacity: 120–200 g. Moisture readability: ≥ 0.01%
Gloves	Disposable Nitrile gloves, black or blue, (3) small, (4) large and (5) X-large, not made with natural rubber lates, single use, powder free, for molecular biology lab and general use.
Mortar and pestle	high-quality porcelain/ceramic, rated for cryogenic use, Autoclavable. Chemically resistant. Glazed exterior, unglazed/rough grinding interior Heavy-duty pestle with a rounded grinding end Suitable for grinding different tissue in liquid nitrogen Easy to clean and decontaminate SIZE: (10) 50– (10)100 mL for individual samples.

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Floating microtube rack

Feature	Required specification
Product type	**Floating microtube rack with supporting stands/legs, 2 sequare and 2 circular shape.**
Material	Laboratory-grade polypropylene (PP)
Capacity	Minimum 16 microtube positions
Tube compatibility	1.0, 1.5 and 2.0 mL microcentrifuge tubes
Supporting structure	**integrated stands/legs**
Floating function	Rack must float stably in water or ice baths when loaded
Stand function	Four stands shall provide stable support when the rack is placed on a laboratory bench
Handle	Integrated handle for easy removal from water/ice
Tube identification	Numbered/marked tube positions preferred
Temperature range	Approximately −70°C to +100°C
Construction	Durable molded polypropylene
Application	PCR, DNA/RNA extraction, molecular biology and sample incubation/cooling

DNA Tissue/Insect Extraction Kit

Feature	Required specification
Product type	Genomic DNA extraction kit for insect and animal tissue
Sample type	Insects, arthropods and small animal tissue
Sample input	**10 mg** tissue/sample
Extraction method	Mechanical and chemical tissue disruption
Purification	Silica membrane spin-column or equivalent
DNA type	Genomic DNA, including mitochondrial DNA
DNA binding capacity	**≥ 5 µg**
Elution volume	**≥10 µL**, with low-volume elution capability preferred
DNA quality	High-quality DNA suitable for molecular analysis
Sample condition	Fresh, frozen or preserved specimens
Downstream applications	PCR, qPCR, DNA barcoding, genotyping and sequencing
Processing	Rapid extraction with minimal hands-on steps
Equipment required	Standard microcentrifuge and pipettes
Hazardous chemicals	free of phenol and chloroform
Kit size	**50 extractions**
Accessories	All required extraction buffers, columns, tubes and reagents included

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DNA Tissue/Insect Extraction Kit

Feature	Required specification
Product type	Genomic DNA extraction kit for insect and animal tissue
Sample type	Insects, arthropods and animal tissue
Sample input	**50 mg** tissue/sample
Extraction method	Mechanical and chemical tissue disruption
Purification	Silica membrane spin-column or equivalent
DNA type	High-quality genomic and mitochondrial DNA
DNA binding capacity	**≥ 25 µg**
Elution volume	**≥35 µL**, with flexible elution capability
DNA quality	High-molecular-weight DNA suitable for molecular analysis
Sample condition	Fresh, frozen or preserved specimens
Downstream applications	PCR, qPCR, DNA barcoding, population genetics and sequencing
Processing	Rapid extraction with minimal hands-on steps
Equipment required	Standard microcentrifuge and pipettes
Hazardous chemicals	Preferably free of phenol and chloroform
Kit size	**50 extractions**
Accessories	All required extraction buffers, columns, tubes and reagents included

DNA Plant/Seed Kit

Feature	Specification
Product	Plant/seed genomic DNA extraction kit
Format	Spin-column
Kit size	50 preparations
Sample input	≤150 mg
Sample types	Leaves, stems, buds, flowers, fruits, seeds, etc.
Lysis	Mechanical bead beating + chemical lysis
Beads	High-density bead-based disruption
DNA type	Total DNA, including genomic and potentially organellar/pathogen DNA
Binding capacity	25 µg
Minimum elution volume	50 µL
Typical DNA size	~25–35 kb; capable of recovering DNA ≥40 kb
Purity	A260/A280 ≥1.8
Inhibitor removal	Removes polysaccharides, polyphenols/tannins and other PCR inhibitors
Downstream applications	PCR, qPCR, NGS, genotyping, arrays
Storage of extracted DNA	≤–20°C

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Plant Pro Extraction Kit

Feature	Specification
Application	Genomic DNA extraction from plant tissues and seeds
Sample input	100 mg
Extraction format	Spin-column
Disruption	Bead beating / mechanical + chemical lysis
Bead size	3.8-4 mm ballcone
DNA binding capacity	50 µg
Typical yield	30 µg from 50 mg starting material
Elution volume	50–100 µL
Purification	Silica membrane
Inhibitor removal	Designed to remove polysaccharides, polyphenolics and other plant PCR inhibitors
Difficult samples	Leaves, roots, stems, seeds, grapevine and other tough/woody material
Pathogen DNA	Suitable for DNA from plant-associated bacterial, fungal and viral pathogens
Downstream use	PCR, qPCR, RFLP, NGS and other molecular applications
Organic extraction	Not required
Phenolic separation	Optional step for highly polyphenolic samples
Processing time	45-60 min for 24 samples
Kit size	50 preparations

Microbial DNA enrichment

Feature	Specification
Application	Microbial DNA enrichment / host-DNA depletion
Principle	Selective capture of CpG-methylated DNA
Input DNA	1 µg per reaction
Recommended DNA size	≥15 kb
Kit sizes	6 - 30 reactions
Downstream applications	NGS, qPCR, conventional PCR
Magnetic beads	Protein A
Target removed	Methylated eukaryotic/host DNA
Microbial DNA	Retained in supernatant
Storage	Components at −20°C and 4°C.
Magnetic rack	Required but not included

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Benchtop Cooler

Feature	Specification
Temperature	−20°C
Capacity	20 tubes
Configuration	4 × 5
Tube capacity	0.2–0.5 mL tubes
1.5 mL compatibility	Yes, using the supplied inserts
Material	Impact-resistant polycarbonate
Lid	Clear, keyed lid with printed grid
Dimensions	22-24 × 16-17 × 13-15 mm
Temperature retention	Below −15°C for 1H.
Stackable	Yes
Cooling	Passive; pre-cooled/frozen before use

5× Colored hot-start master mix

Specification	Requirement
Product Type	PCR amplification master mix, **5×, hot-start, ready-to-load.**
Kit Size	**250- 200 reactions per kit**, based on 20-25 µL reaction volume
Amplicon Size	Suitable for amplification of DNA fragments **up to 5 kb**
Reaction Format	Conventional endpoint PCR
Fidelity	Enhanced fidelity compared with conventional Taq; preferably up to ≥5-fold higher fidelity
Enzyme	Hot-start, thermostable DNA polymerase with proofreading polymerase activity.
$MgCl_2$	**1x PCR solution 3.5, mM MgCl2Included**
Template Compatibility	Suitable for genomic DNA templates
Primer Compatibility	Compatible with standard oligonucleotide primers
Application	Phytoplasma detection, **16S rRNA gene (16S rDNA)** amplification/sequencing, ISSR, SSR, genotyping and other PCR-based analyses.
Storage Conditions	Store according to manufacturer's instructions, typically at −20°C
Purity	Free from DNase, RNase, and PCR inhibitors
Documentation	Certificate of analysis and product datasheet must be provided

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2X GOTAG Master Mix

Specification	Requirement
Product Type	PCR amplification master mix, **2×, ready-to-load.**
Kit Size	**100 reactions per kit**, based on 20-25 µL reaction volume
Reaction Format	Suitable for conventional PCR applications
Enzyme	**GoTaq** _ DNA Polymerase,
Buffer	Optimized PCR reaction buffer included
$MgCl_2$	1.5 mM final $MgCl_2$ included
Amplicon Size	3–5kb DNA fragments.
Template Compatibility	Suitable for genomic DNA templates
Primer Compatibility	Compatible with standard oligonucleotide primers
exonuclease activity	Included
Application	Suitable for molecular biology applications, including 16Sr, ISSR, SSR, and related PCR-based marker analysis
Reaction Volume	Compatible with standard 20–50 µL PCR reaction volumes
Storage Conditions	Store according to manufacturer's instructions, typically at −20°C
Purity	Free from DNase, RNase, and PCR inhibitors
Documentation	Certificate of analysis and product datasheet must be provided

Filter Tips

Feature	Required specification
Type	Aerosol-barrier / filter pipette tips
Material	High-quality virgin polypropylene
Filter	Hydrophobic aerosol barrier/filter
Sterility	Sterile
DNase/RNase	Certified DNase- and RNase-free
DNA contamination	DNA-free
PCR inhibitors	PCR-inhibitor-free
Endotoxins	Endotoxin-free preferred
Tip surface	Low-retention / hydrophobic inner surface
Compatibility	Universal fit with standard laboratory micropipettes
Accuracy	Suitable for molecular biology and PCR/qPCR
Packaging	Racked, preferably hinged-lid racks
Graduations	Preferred
Single-use	Yes
Autoclavability	Not required for pre-sterilized tips
Traceability	Lot number and certificate of conformity required
SIZE	**10 boxes of:** **10 µL** — PCR/qPCR reagent preparation **20 µL** — small-volume molecular work **200 µL** — PCR setup, DNA extraction and routine pipetting **1000 µL** — DNA extraction buffers and larger-volume transfers

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Portable/mobile compressor refrigerator

Feature	Required specification
Type	Portable/mobile compressor refrigerator
Capacity	40–50 L
Temperature range	2–8°C minimum; adjustable
Cooling system	DC compressor
Power	12/24 V DC + 220–240 V AC adapter
Power consumption	≤60 W preferred
Temperature display	Digital
Temperature control	Electronic/microprocessor
Battery protection	Required for vehicle operation
Internal basket	Removable
Insulation	High-density PU foam
Construction	Rigid, impact-resistant
Mobility	Wheels + telescopic handle preferred
Temperature monitoring	Built-in thermometer; external data logger preferred
Refrigerant	Environmentally compliant refrigerant
Applications	Plant samples, insect samples, biological specimens, reagents
Vehicle use	Required
AC operation	Required for laboratory/office use

ICE BOX

Feature	Requirement
Capacity	**50 L**
Type	Insulated biological/sample transport box
Temperature	**+2 to +8°C**
Cold retention	**≥48 h**
Insulation	High-density PU + high-performance insulation
Cooling	Reusable PCM/ice packs
Interior	Removable tray/dividers
Temperature monitoring	**Digital thermometer/data logger**
Construction	Rigid, impact-resistant, waterproof
Lid	Tight-fitting insulated lid
Handles	Heavy-duty
Cleaning	Smooth, disinfectable interior
Applications	Plant samples, insect samples, biological specimens, molecular samples

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