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Clinical & Embryology Academy of ART

RESONANCE

Benchttop Incubators - An Enigma



*“Action is the foundational
key to all success”
- Pablo Picasso*

Preface

i-Ceat RESONANCE, the monthly bulletin, is the trailblazing academic initiative by the Clinical and Embryology Academy of ART. It aims to mentor the budding fertility specialists and embryologists from the very basics to the highest level of clinical expertise.

We present before you the fourth volume of this monthly bulletin. Here we discuss the first stepping stone in Assisted Reproductive Technology laboratory, "Benchtop Incubators - An Enigma". The incubators have a profound impact on ART procedures. Understanding regulatory pathways of early mammalian embryo development, preimplantation embryo cellular differentiation and pluripotency of the embryonic inner cell mass has been pivotal to advances in embryo culture.

While significant advances in embryo culture have occurred over the last few decades, there is still room for improvements and add on.

Benchtop incubators, without any doubt, offers good embryo culture conditions, which results in a euploid embryos.

These very insights about benchtop incubators resonance are targeted to provide you with all the technical and physical parameters of most benchtop incubators in the Indian market. As a clinical embryologist, I Hope this information would help you choose the suitable machine according to your patient's volume.

We sincerely wish that our fraternity is benefitted academically and that the knowledge enhances their results.

Guest Editor

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Arise, Awake & Stop not till the
Goal is Reached

- Swami Vivekanand



HUMIDIFIED BENCHTOP INCUBATORS

Manufacturer	Planar	Origio	Cook
Brand	CT-37	BT-37 Mark I & Mark II	K-Minc 1000 incubator
Country	UK	Denmark	Australia
PHYSICAL SPECIFICATION			
Size (dimensions)	440 Wx270 Dx210 H (mm)	420 Wx270 Dx210 H (mm)	405 Wx195 Hx385 D (mm)
Weight	14 kg (3.5 kg / cassette)	15.5 kg	12 kg
Energy consumption	Dual External Power Supplies	100-230 V, 50/60 Hz	100-240 V, 50/60 Hz
Chambers Provided	6 individual cassette style chambers	02	02
No of Dishes (60 mm/35MM/4 well) / chamber	06/12/04 (per chamber)	04/08-10/04	04/08/04
TECHNICAL SPECIFICATION			
Gas	Pre-mix gas concentration required	Pre-mix gas concentration required	Pre-mix gas concentration required
Incubator Chamber volume(in lit)	-----	0.43l	0.43l
Recovery time	-----	<2 min CO ₂ , <8min O ₂	+--/-5 temp, +/- 3min CO ₂
Rate of gas flow	230 mL/minute per incubation chamber	31ml/min	15ml/min
Heated Lid	Present	Present	Present (top & bottom)
Controlled parameters display	Only temp Controller (sensors for temp)	Only temp Controller (7 sensors for temp)+ Gas Consumption display	Temp + Gas Consumption display
Air Filter	HEPA Filter present	Millipore filter (HEPA)	0.2 HEPA filter+ hydrophobic pre filter
Media warming /gassing Compartment	Not present	Not present	Not present
Humidification	Present (can be used as dry as well)	Present (disposable flask)	Present (disposable flask)
PH monitoring	Not inbuilt but can be achieved by adding a device called petri-sense.	Optional/ pH of culture media via pH online	Not inbuilt but can be achieved by adding a device called Safe-sense
Inbuilt PH Meter	Not present / In-built Battery	Not present / In-built Battery	Not present
Temperature validation	No Built in Device	No Built in Device	No Built in Device
Gas Sensor	Flow sensor present	IR Type	Not present
Heating system	Inbuilt platinum heater PT-100	Direct heat transfer (PT-1000) & cooling fan	Direct heat transfer (Thermistor Thermometer Resistance)
Alarm system/ sms	Present	Present(for both temperature +gas flow)	Present (time-stamped alarm notification)
In built data logging facility (standalone)	Yes via PIMS software	Not present	Present (by using DATA logger system software)
Price (Approximate in INR)	15-30 Lacs	7 Lacs	7 Lacs
Indian dealer	SHINE LIFE (Origio Scientific Pvt. Ltd)	Origio IndiaPvt. Ltd.	Inter Medics

DRY BENCHTOP INCUBATORS

Manufacturer	Esco	K Systems	K Systems	Astec	Cook
Brand	Miri® Multi-room Incubator for IVF	G210	G185	EC-6	IVFtech freyGen ALF
Country	Denmark	Denmark	Denmark	Japan	Denmark
PHYSICAL SPECIFICATION					
Size (dimensions)	700*580*150 mm	850*550*170 mm	850*558*152.5 mm	W108*D180*H19/ Chamber	560Wx660Dx137H (mm) for 4 chambers 830Wx660Dx137H (mm)for 6 chambers
Weight	35 Kg	45kg	38 kg	26kg	36.5 kg / 57.2 kg
Energy consumption	280watt	270watt	270watt		110-240/ 50-60 Hz
Chambers Provided	06	10	10	06	04 & 06
No of Dishes (60 mm/35MM/ 4 well) / chamber	4/8/4	4/8/4	4/8/4	03/06/02	04/08/04
PHYSICAL SPECIFICATION					
Gas CO ₂ / N ₂	Gas Mixture inbuilt / pre-mixed	Gas Mixture inbuilt	Gas Mixture inbuilt	Gas Mixture inbuilt	Gas Mixture inbuilt
Heated Lid	Present	Present	Present	Present	Present
Incubator chamber volume	0.886l	0.299l/chamber	0.299l/chamber	0.310l	
Rate of gas flow (co ₂)	<32 ml/min	11ml/min	25ml/min		Co ₂ 1.02 ,16.66 ml/min N ₂ 66.66 ml/min
Recovery Time	Temp <1min / Gas <3 min	CO ₂ <2 min , O ₂ <4 Min	CO ₂ <2 min , O ₂ <4 Min	----	4 Chamber --3.5 min, 6 chamber -4 min
Controlled parameters display	Independent 06 Chamber control of temp with gas concentration display	Independent 10 Chamber control of temp with gas concentration display	Independent 10 Chamber control of temp with gas concentration display	Independent 10 Chamber control of temp with gas concentration display	Temp- 12 Sensors , Gas 2- sensors
Filter	Present (HEPA/ VOC/UV)	Present	Present (HEPA/VOC and UV light)	Present	HEPA
Media warming / gassing Compartment	Not present	Present	Present	Not Present	Not Present
Humidification	Not present	Not present	Not present	Not present	Not Present

PH monitoring	Inbuilt for on-line for all 06 chambers (safe sense)	Present online for reference chambers (with fibre optic non-contact pH measurement)	Optional, Online (based on infra-red monitoring)	Not present	Not Present
Inbuilt PH Meter	Present	Present	Present	Not present	Present, (Safe sense)
Temperature validation	PT1000 Validation Port	No Built in Device	PT1000 Validation Port		Present
Gas Sensor	Present (IR type)	Not present (external CO ₂ measurements)	Present (CO ₂ sensor IR type)	Present (CO ₂ sensor IR type)	Present
Heating system	12 PID controllers for Individual heating of Bottom as well as LID for all 6 chambers.	Non elective EM Nutra technology for zero electromagnetic fields	Non elective EM Nutra technology for zero electromagnetic fields	Digital PID control	
Alarm/sms	Present	SMS-enabled alerts (K-linked)	Integrated Alarm system present	Present	Present
In built data logging facility (stand alone)	Present, external alarm facility	Present	Present	Datalogging software EZC Logger	Present via software
Price (Approximate in INR)	13 Lacs	17 Lacs	15 Lacs	14 lacs	12 lacs
Indian dealer	ESCO India	S tech Associates	Sandeep Tawte	Mr Rajeev Ganguly (Shivani Scientific)	Inter Medics

***All prices mentioned above are without GST**

Note *Information provided is sourced either from manufacturer's website, product literature or via communication with company's technical personnel.

Scientific Committee

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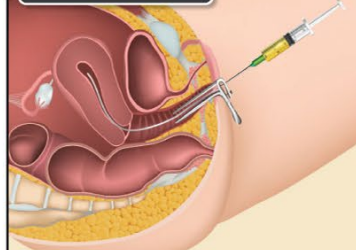
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A tribute to covid warriors and their quest to learn IVF