

User Manual

Calibration Bath
With Black Body Cavity

OB-15/2 BB

SAMPLE



Kambič

WARRANTY

Kambic d.o.o. guarantees that the product delivered has been thoroughly tested to ensure that it meets its published specifications. The warranty is valid only if the product has been installed and used in accordance to the instructions supplied by Kambic d.o.o.

Kambic d.o.o. shall in no event be liable for incidental or consequential damages, including without limitations, lost profits, loss of income, loss of business opportunities, loss of use, and other related exposures, caused by incorrect use of product.

Warranty is valid for **13 months** from date of shipping and includes spare parts and labor.

Type: OB-15/2 BB

Serial number:

Date of shipping:

Signature/stamp:

Manufacturer:

Kambic d.o.o.

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Thank you for your trust and for buying this device. We hope it will successfully serve the purpose for many years.

**CAREFULLY READ THESE INSTRUCTIONS
BEFORE USING THE DEVICE**



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EN

1. WARNINGS AND SAFETY PRECAUTIONS

Always keep this manual in close reach for reference. This product should only be used and operated by skilled and trained personnel familiar with technical capabilities and potential safety hazards.

Always follow and obey the national regulations related to technology and labor laws.

To avoid injuries and equipment damage study and follow the safety instructions and warnings.

Legal:

The content of the manual is subject to change without notice.

Understanding and following this operating manual is first step to hazard-free and safe use of the equipment.

This user manual can not reach out to all application that might even develop in the future. If you find information unclear or you are not sure about safe use of the product in your specific case, do not hesitate to contact your dealer or us via info@kambic.com for further information or opinions.

In no event shall Kambic d.o.o. be held liable for any damages, direct or incidental related to the use of this product and manual.

Product can be equipped with variety of accessories and options. This warning list might include elements that are applicable only with certain models and accessories.



READ ALL INSTRUCTIONS BEFORE USE!

Reduce the possibility of injury and failure.



WARNING

Before you perform any kind of maintenance, disconnect all electrical power to the unit! DO NOT operate this unite without a properly grounded, properly polarized power cord. DO NOT connect this unite to a non-grounded, non-polarized outlet.



DANGER

Appliance must not be installed in a room where the possibility of explosive atmosphere is present!



DANGER OF BREAKDOWN

Service only allowed to authorized personnel!

**DANGER OF FIRE**

Heating of flammable materials is not allowed!

**WARNING**

Use only distilled or demineralized water for humidity maintenance system!
Close the doors tightly before start! Do not open doors during the cycle!

**DANGER OF BURNS**

Use safety gloves when operating with high/low temperatures!

**EXPLOSION HAZARD**

Do not process any materials that could generate explosive hazardous Atmosphere!

**EXPLOSION HAZARD**

Do not operate the equipment in explosive hazardous atmosphere!

**ELECTRIC HAZARD**

Do not operate the equipment in wet and condensing environment!

**STABILITY HAZARD**

Do not load or affect product stability with heavy loads or climbing the product!

**TRANSPORT HAZARD**

Transport the chamber only in original packing!
Always secure the chamber stability during reposition!
Never use doors or handles or accessories for holding point during reposition!

**FREEZING HAZARD**

Do not store or transport product if charged with water!
All water needs to be drained and dried from system elements prior to exposing to freezing conditions!

**OVERHEATING HAZARD**

Do not install the equipment in non ventilated environments!
Ensure appropriate space and volume around the chamber!
Ensure sufficient heat dissipation for product cooling!

DE

WARNUNGEN UND SICHERHEITSVORKEHRUNGEN

Halten Sie dieses Handbuch zum Nachschlagen stets griffbereit. Dieses Produkt darf nur durch befähigtes und trainiertes Personal verwendet werden, dass mit den technischen Eigenschaften und potentiellen Sicherheitsrisiken vertraut ist.

Befolgen Sie stets die nationalen technischen und Arbeitsrechtsvorschriften.

Um Verletzungen sowie Schäden am Gerät zu vermeiden, lesen und befolgen Sie die Sicherheitsanweisungen und Warnungen.

Rechtliche Hinweise:

Der Inhalt dieses Handbuchs kann ohne vorherige Benachrichtigung geändert werden.

Das Benutzerhandbuch zu verstehen und zu befolgen, ist der erste Schritt zur gefahrenfreien und sicheren Verwendung dieses Geräts.

Dieses Benutzerhandbuch kann nicht alle Geräte, einschließlich zukünftiger Entwicklungen abdecken. Wenn Sie Informationen als unklar empfinden oder sich über die sichere Verwendung des Gerätes in Ihrem spezifischen Fall unsicher sind, zögern Sie nicht, Ihren Händler oder uns über info@kambic.com zu weiteren Informationen oder Stellungnahmen zu kontaktieren.

Keinesfalls kann Kambic d.o.o. für Schäden jeglicher Art durch Verwendung dieses Produktes oder Handbuchs, direkt oder indirekt, verantwortlich gemacht werden.

Das Produkt kann mit verschiedenen Zubehörteilen und Optionen ausgestattet sein. Die Warnungsliste kann Punkte enthalten, die nur auf bestimmte Modelle und Zubehörteile zutreffend sind.



LESEN SIE VOR DER VERWENDUNG ALLE ANWEISUNGEN!

Reduzieren Sie die Verletzungs- und Schadensmöglichkeiten.



WARNUNG

Vor jeglichen Wartungsarbeiten alle Netzversorgungsanschlüsse zum Gerät trennen! Das Gerät NICHT ohne ordnungsgemäß geerdetes und gepoltes Netzanschlusskabel verwenden. Das Gerät NICHT an eine Steckdose ohne Erdung oder mit falscher Polung anschließen.



GEFAHR

Das Gerät darf nicht in Räumen mit möglicherweise auftretender explosionsfähiger Atmosphäre betrieben werden!



GEFAHR DES GERÄTEAUSFALLS

Wartung nur durch autorisiertes Personal zulässig!



BRANDGEFAHR

Beheizung von entzündlichen Materialien ist nicht zulässig!



WARNUNG

Nur destilliertes oder entionisiertes Wasser für die Luftfeuchtigkeitsregelung verwenden! Türen vor dem Start dicht schließen und im Betrieb nicht öffnen!



GEFAHR VON VERBRENNUNGEN

Verwenden Sie bei hohen/niedrigen Temperaturen Sicherheitshandschuhe!



EXPLOSIONSGEFAHR

Verwenden Sie keine Materialien, die eine explosionsfähige Atmosphäre erzeugen könnten!



EXPLOSIONSGEFAHR

Das Gerät nicht in explosionsfähiger Atmosphäre betreiben!



GEFAHR ELEKTRISCHER SCHLÄGE

Das Gerät nicht in feuchter oder kondensierender Umgebung betreiben!



GEFAHR DER SCHWERPUNKTVERLAGERUNG

Keine schweren Lasten laden oder Stabilität durch Zuladung oder Besteigen des Produktes beeinflussen!



GEFAHR DURCH TRANSPORT

Transportieren Sie die Kammer nur in der Originalverpackung!
Bei Positionsveränderung stets die Kammerstabilität absichern!
Niemals Türen, Griffe oder Zubehörteile zum Tragen des Gerätes nutzen!



FROSTGEFAHR

Nicht einlagern oder transportieren, wenn Wasser im Produkt ist!
Vor Exposition gegenüber Temperaturen unter dem Gefrierpunkt muss das gesamte Wasser abgelassen und das ganze System trocken sein!



GEFAHR DER ÜBERHITZUNG

Das Gerät nicht in unbelüfteter Umgebung installieren!
Stellen Sie genug Abstand und Raumvolumen um die Kammer sicher!
Stellen Sie ausreichend Wärmeabfuhr zur Kühlung des Produktes sicher!

FR

MISES EN GARDE ET MESURES DE SÉCURITÉ

Veillez toujours garder ce manuel à proximité en cas de besoin. Ce produit ne doit être utilisé et manié que par du personnel formé et compétent étant au fait des capacités techniques et des risques potentiels d'accident.

Veillez toujours suivre et respecter les réglementations nationales en matière de technologie et de code du travail.

Afin d'éviter tout dommage corporel et matériel, veuillez étudier et suivre ces consignes de sécurité et mises en garde.

Clause légale:

Le contenu de ce manuel est sujet à modifications sans préavis.

La compréhension et le respect de ce manuel d'utilisation est le premier pas vers une utilisation sûre et sans danger de l'équipement.

Ce manuel d'utilisation ne peut s'étendre à l'ensemble des applications susceptibles de se développer à l'avenir. Si vous trouvez certaines informations peu claires ou si vous avez des doutes concernant une utilisation sûre dans votre cas précis, n'hésitez pas à contacter votre vendeur ou nous-mêmes via info@kambic.com pour plus d'informations ou de conseils.

En aucun cas Kambic d.o.o. ne pourra être tenu responsable pour quelques dommages directs ou accidentels que ce soient liés à l'utilisation de ce produit ou de ce manuel.

Le produit peut être équipé de nombreux accessoires et options. Cette liste de mises en garde est susceptible de contenir des éléments n'étant applicables qu'à certains modèles et accessoires.



LISEZ TOUTES LES CONSIGNES AVANT UTILISATION!

Limitez le risque d'accidents et de pannes.



ATTENTION

Déconnectez toute alimentation électrique de l'appareil avant de réaliser quelque type de maintenance que ce soit!

N'utilisez PAS cet appareil sans câble électrique correctement relié à la terre et correctement polarisé. Ne connectez PAS cet appareil à une prise non reliée à la terre ou non polarisée.



DANGER

L'appareil ne doit pas être installé dans une pièce présentant un risque d'atmosphère explosive!



RISQUE DE PANNE

Utilisation uniquement autorisée au personnel habilité!

**RISQUE D'INCENDIE**

Interdiction de chauffer des matériaux inflammables!

**ATTENTION**

N'utiliser que de l'eau distillée ou déminéralisée pour le système de maintien d'humidité ! Fermez les portes fermement avant de démarrer ! N'ouvrez pas les portes pendant le cycle!

**RISQUE DE BRÛLURES**

Portez des gants de sécurité lors d'une utilisation à hautes/basses températures!

**RISQUE D'EXPLOSION**

N'utilisez aucuns matériaux pouvant générer une atmosphère présentant des risques d'explosion!

**RISQUE D'EXPLOSION**

N'utilisez pas l'équipement dans une atmosphère présentant des risques d'explosion!

**RISQUE D'ÉLECTROCUTION**

N'utilisez pas l'équipement dans un environnement humide et présentant de la condensation!

**RISQUE D'INSTABILITÉ**

N'affectez pas la stabilité du produit avec de lourdes charges ou en montant sur celui-ci!

**RISQUES LIÉS AU TRANSPORT**

Ne transportez la chambre que dans son emballage d'origine!
Assurez toujours la stabilité de la chambre pendant son déplacement!
N'utilisez jamais de portes, de poignées ou d'accessoires comme point d'appui pendant un déplacement!

**RISQUE DE GEL**

N'entreposez ou ne transportez pas le produit si celui-ci est chargé d'eau!
Toute eau doit être évacuée des composants du système et ces derniers séchés avant d'être exposés à des conditions de gel!

**RISQUE DE SURCHAUFFE**

N'installez pas l'équipement dans un environnement non ventilé!
Assurez suffisamment d'espace et de volume autour de la chambre!
Assurez suffisamment de dissipation thermique pour le refroidissement du produit!

ES

ADVERTENCIAS Y PRECAUCIONES DE SEGURIDAD

Mantenga siempre este manual al alcance de la mano para su posterior consulta. Sólo el personal cualificado y capacitado que conoce capacidades técnicas y posibles riesgos de seguridad debe usar y manipular este producto.

Observe y cumpla siempre con las reglamentaciones nacionales relativas a la tecnología, igual que con la legislación laboral.

Para evitar heridas y daños en el equipo, revise y siga las instrucciones y advertencias de seguridad.

Aviso legal:

El contenido de este manual está sujeto a cambio sin previo aviso.

Entender y seguir las instrucciones de este manual de funcionamiento es el primer paso para el uso del equipo sin riesgos y de una manera segura.

Este manual de usuario no puede cubrir todas las aplicaciones que puedan desarrollarse en el futuro. Si considera que alguna información no está clara o tiene dudas en cuanto al uso seguro del producto en su caso particular, contacte con su distribuidor o escríbanos a info@kambic.com para obtener información adicional u opinión.

Sociedad limitada Kambic d.o.o. en ningún caso será responsable de ningún tipo de daños directos o incidentales resultantes de la utilización de este producto y manual.

El producto puede ser provisto de una variedad de accesorios y opciones. Esta lista de advertencias puede incluir elementos aplicables sólo a algunos modelos y accesorios.



¡LEA TODAS LAS INSTRUCCIONES ANTES DE USAR EL PRODUCTO!

Reduzca la posibilidad de heridas y averías.



ADVERTENCIA

Antes de cualquier mantenimiento, idesconecta todo el suministro eléctrico de la unidad! NO manipule esta unidad sin un cable de alimentación debidamente polarizado y puesto a tierra. NO conecte esta unidad con un enchufe no polarizado y sin puesta a tierra!



PELIGRO!

¡El Aparato no se debe instalar en el lugar en el que existe la posibilidad de presencia de atmósfera explosiva!



PELIGRO DE FALLO

Uso permitido sólo para el personal autorizado!

**PELIGRO DE INCENDIO**

Mantener alejado de fuentes de calor, chispas, llama abierta o superficies calientes!
No fumar!

**ADVERTENCIA**

¡Utilice sólo agua destilada o desmineralizada para el sistema de mantenimiento de la humedad!
¡Cierre la puerta ajustadamente antes de comenzar! ¡Durante el ciclo no abra la puerta!

**PELIGRO DE QUEMADURAS**

¡Al manipular el producto en temperaturas altas o bajas, utilice los guantes protectores!

**RIESGO DE EXPLOSIÓN**

¡No procese ningún material que pueda generar una atmósfera explosiva peligrosa!

**RIESGO DE EXPLOSIÓN**

¡No manipule el equipo en una atmósfera explosiva peligrosa!

**RIESGOS ELÉCTRICOS**

¡No manipule el equipo en un ambiente húmedo y de condensación!

**RIESGO DE INESTABILIDAD**

¡No aplique carga ni desestabilice el producto con cargas pesadas!
¡No subir al producto!

**RIESGOS AL TRANSPORTAR**

¡Transporte la cámara sólo en su empaque original!
¡Proporcione siempre estabilidad a la cámara al reposicionarla!
¡Nunca la agarre por las puertas, asideros o accesorios durante el reposicionamiento!

**RIESGO DE CONGELAMIENTO**

¡No almacene ni transporte el producto si está lleno de agua!
¡Antes de exponer el producto a las condiciones de congelamiento hay que eliminar y secar el agua por completo de los elementos del sistema!

**RIESGO DE SOBRECALENTAMIENTO**

¡No instale al equipo en los ambientes sin ventilación!
¡Proporcione suficiente espacio y volumen alrededor de la cámara!
¡Proporcione la disipación del calor suficiente para enfriar el producto!

RU

ПРЕДУПРЕЖДЕНИЯ И МЕРЫ ПРЕДОСТОРОЖНОСТИ

Всегда держите данное руководство в непосредственной близости для справки. Данное изделие должно использоваться и эксплуатироваться только квалифицированным и подготовленным персоналом, ознакомленным с техническими возможностями и потенциальными угрозами безопасности.

Всегда последовательно соблюдайте национальные правила, касающиеся технологий и трудового законодательства. Во избежание травм и повреждений оборудования изучите и следуйте инструкциям по технике безопасности и предупреждениям.

Правовая информация:

Содержание данного руководства может быть изменено без предварительного уведомления.

Понимание и следование данной инструкции по эксплуатации является первым шагом на пути к безопасности и безопасному использованию оборудования.

Данная инструкция по эксплуатации не может охватить все приложения, которые могут развиваться в будущем.

Если информация для вас является неясной или вы не уверены в безопасном использовании изделия в вашем конкретном случае, рекомендуем обращаться к вашему дилеру или к нам через info@kambic.com за дополнительной информацией или мнением.

Ни при каких обстоятельствах Kambic d.o.o. не несет ответственности за любые повреждения, прямо или косвенно связанные с использованием данного изделия и руководства.

Изделие может быть оснащено разнообразными аксессуарами и опциями. Этот список предупреждений может включать элементы, которые применимы только к определенным моделям и аксессуарам.



ПРОЧИТАЙТЕ ВСЕ ИНСТРУКЦИИ ПЕРЕД ИСПОЛЬЗОВАНИЕМ!

Уменьшите вероятность травм и сбоев.



ПРЕДУПРЕЖДЕНИЕ!

Прежде чем выполнять какое-либо обслуживание, отключите все электропитание к устройству! НЕ используйте это устройство это устройство без правильно заземленного, правильно поляризованного шнура питания. НЕ подключайте это устройство к незаземленной, неполяризованной розетке.



ОПАСНОСТЬ

Прибор не должен устанавливаться в помещении, где присутствует взрывоопасная атмосфера!



ОПАСНОСТЬ ПОВРЕЖДЕНИЯ

Обслуживание разрешается только уполномоченному персоналу!

**ОПАСНОСТЬ ВОСПЛАМЕНЕНИЯ**

Нагревание воспламеняющихся материалов запрещено!

**ПРЕДУПРЕЖДЕНИЕ**

Используйте только дистиллированную или деминерализованную воду для системы поддержания влажности! Плотно закройте двери перед запуском! Не открывайте двери во время цикла!

**ОПАСНОСТЬ ОЖОГОВ**

При работе с высокими / низкими температурами используйте защитные перчатки!

**ОПАСНОСТЬ ВЗРЫВА!**

Не обрабатывайте любые материалы, которые могут создавать взрывоопасную атмосферу!

**ОПАСНОСТЬ ВЗРЫВА!**

Не используйте оборудование во взрывоопасной среде!

**ЭЛЕКТРИЧЕСКАЯ ОПАСНОСТЬ**

Не используйте оборудование во влажной и конденсационной среде!

**ОПАСНОСТЬ НЕСТАБИЛЬНОСТИ**

Не перегружайте и не влияйте на стабильность изделия тяжелыми нагрузками или подъемом на изделие!

**ТРАНСПОРТНАЯ БЕЗОПАСНОСТЬ**

Транспортируйте камеру только в оригинальной упаковке!
Всегда сохраняйте стабильность камеры во время перемещения!
Никогда не используйте двери или ручки или аксессуары для удерживания во время перемещения!

**ОПАСНОСТЬ ЗАМЕРЗАНИЯ**

Не храните и не перевозите изделие, если оно заполнено водой!
Вся вода должна быть слита и высушена из элементов системы до воздействия условий замерзания!

**ОПАСНОСТЬ ПЕРЕГРЕВА**

Не устанавливайте оборудование в невентилируемых помещениях!
Обеспечьте необходимое расстояние и пространство вокруг камеры!
Обеспечьте достаточную теплоотдачу для охлаждения изделия!

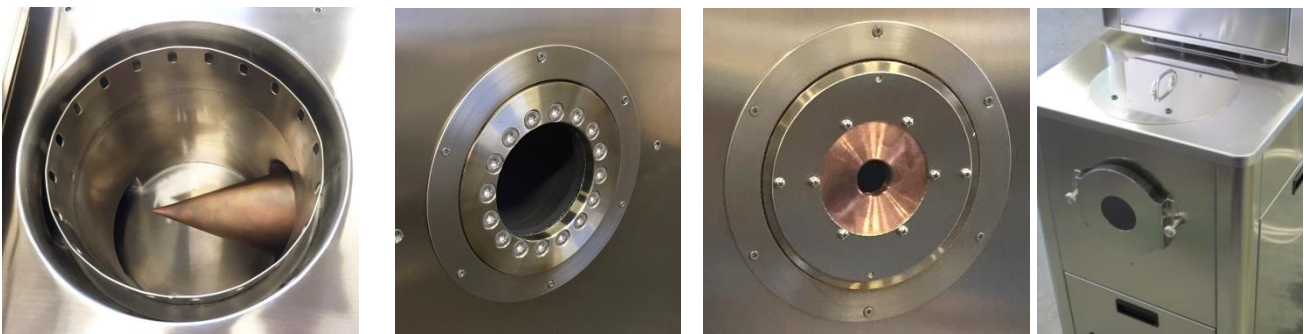
2. INTRODUCTIONS

Calibration bath OB-15/2 BB was developed and manufactured specifically for the calibration of temperature instruments, probes and liquid thermometers at temperatures from +40°C to 300°C. Fluid calibration baths ensure high temperature stability and uniformity across working volume. To ensure such specifications all calibration baths of our brand are designed with a special double cylinder construction with uniform vertical flow in the working volume. Of course the construction is not enough that is why we are using high capacity microprocessor controllers and different levels of heating.

A touch-screen display is used to set the individual temperatures. All controllers are also equipped with communication modules, so the appliance can be operated and controlled via a PC.

The appliance is completely made of stainless steel AISI 304, which guarantees easy maintenance and long life time.

Special attention is also given to the installed Black Body Cavity that can be easily replaced or maintained. The cavity is made of copper and interior covered with Pyromark 1200.

**WARNING**

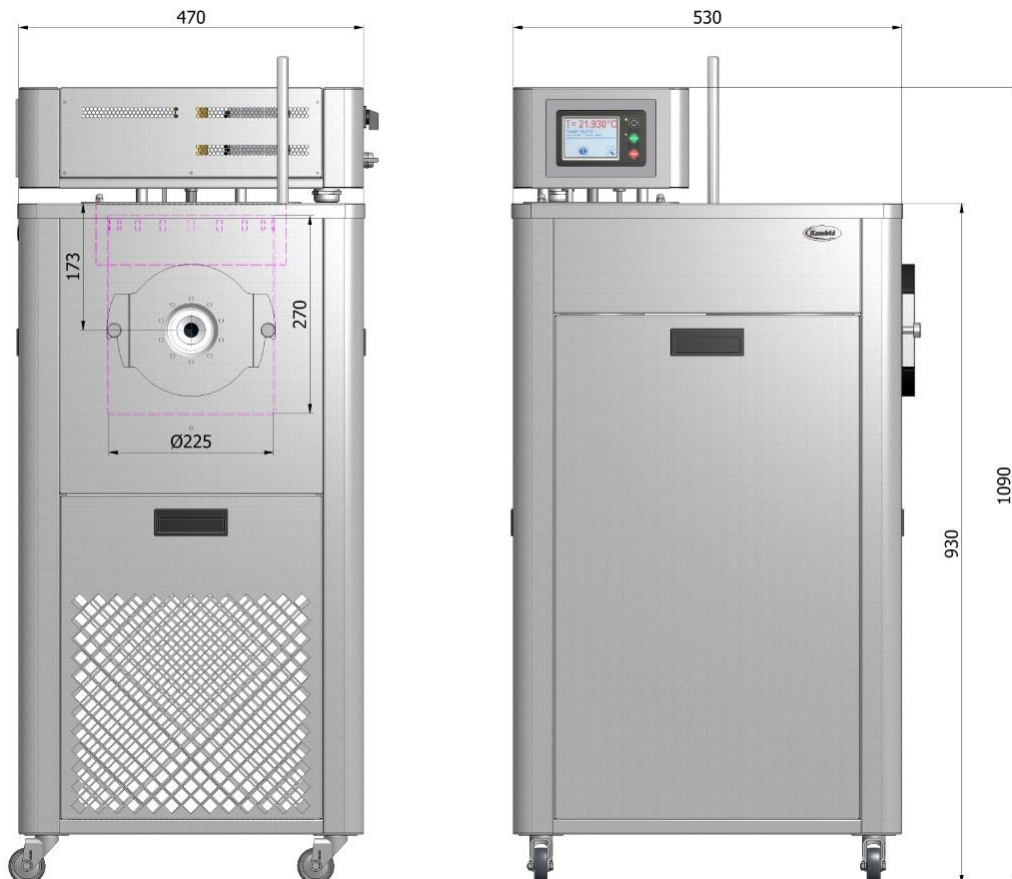
To prevent leakage make sure that all screws that hold up the black body are firmly tightened! Inspect the seal with every change of the black body!

**WARNING**

Temperature range is limited to the properties of the selected fluid!

3. TECHNICAL DATA

	OB-15/2 BB
Width	530 mm
Height	1090 mm
Depth	470 mm
Working chamber dimensions	φ225 x 270 mm
Volume	~ 15 L
Temperature range	+40°C...+250 °C
Temperature Stability	Better than ± 0.005°C
Temperature homogeneity	Better than ± 0.007°C
Display resolution	0.001 °C
Set-up resolution	0,001 °C
Control	MPC – PID
Power supply (±10%)	230V / 50-60 Hz
Wattage	2500 W
Communication port RS 232	Built-in
Cooling	Air cooled compressor refrigeration system
Construction materials	SS vessel, exterior housing & cover
Temperature probe	PT 100

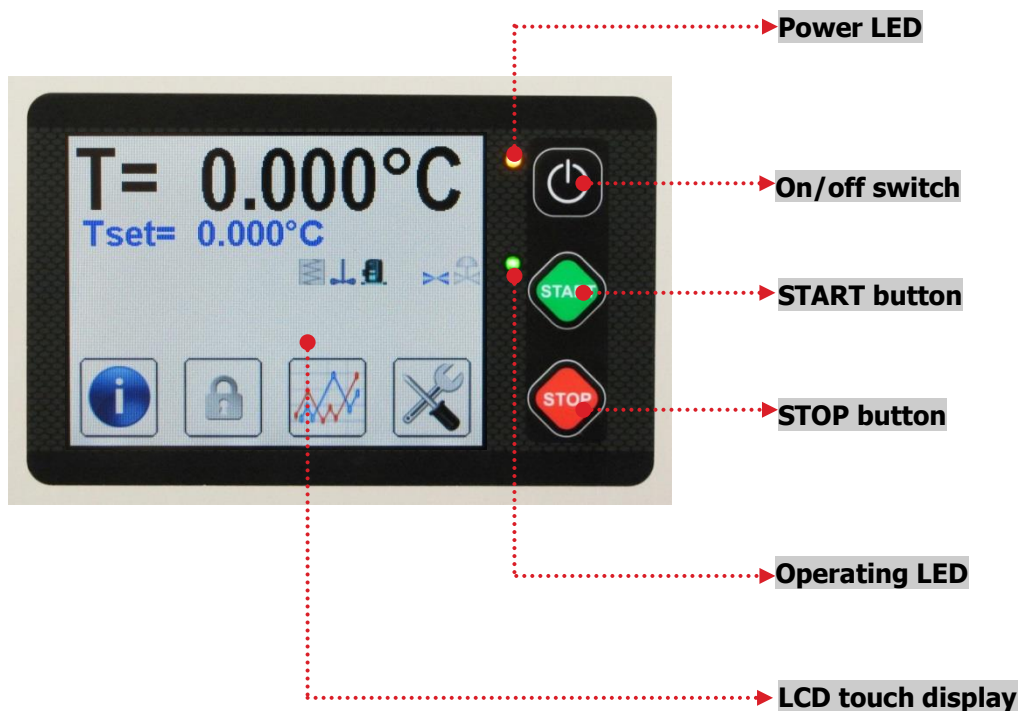


4. INSTRUCTIONS FOR USE

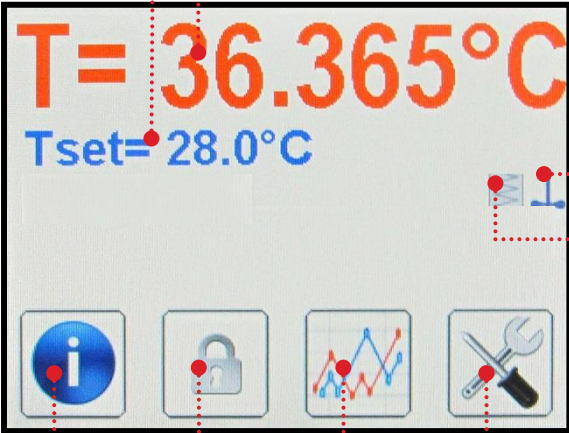
4.1 Basic setup

- Step 1:** Fill the bath with appropriate fluid (up to 80%)
- Step 2:** Connect the power cord into the power supply 230V±10%; 50/60Hz
- Step 3:** Put the main switch in position 1 (on the back of the device)
- Step 4:** Press On/off switch
- Step 5:** Select the desired temperature and press "**START button**"
- Step 6:** Check the fluid level and add if necessary
- Step 7:** Press "**STOP**" to stop the cycle

4.2 Control panel with touch display



4.2.1 Main screen



The main screen displays the following information and controls:

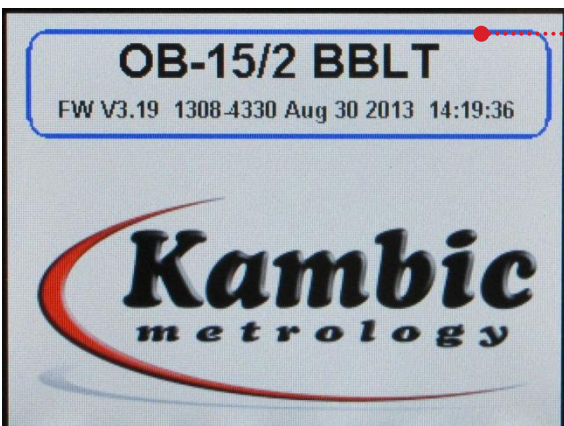
- Temperature Readings:**
 - T = 36.365°C** (Current bath temperature)
 - Tset = 28.0°C** (Setpoint temperature)
- Operational Indicators:**
 - Fluid stirrer in operation (indicated by a small stirrer icon)
 - Heating in operation (flashing) (indicated by a small heating element icon)
- Control Buttons:**
 - INFO button:** Represented by an 'i' icon.
 - Unlock button:** Represented by a padlock icon.
 - Graph button:** Represented by a line graph icon.
 - Settings button:** Represented by a wrench and screwdriver icon.

Temperature Legend:

- Black:** temperature in tolerances (set value $\pm 0.05^\circ\text{C}$)
- Red:** temperature too high
- Blue:** temperature too low

4.2.2 INFO screen

Press INFO button to see this screen:

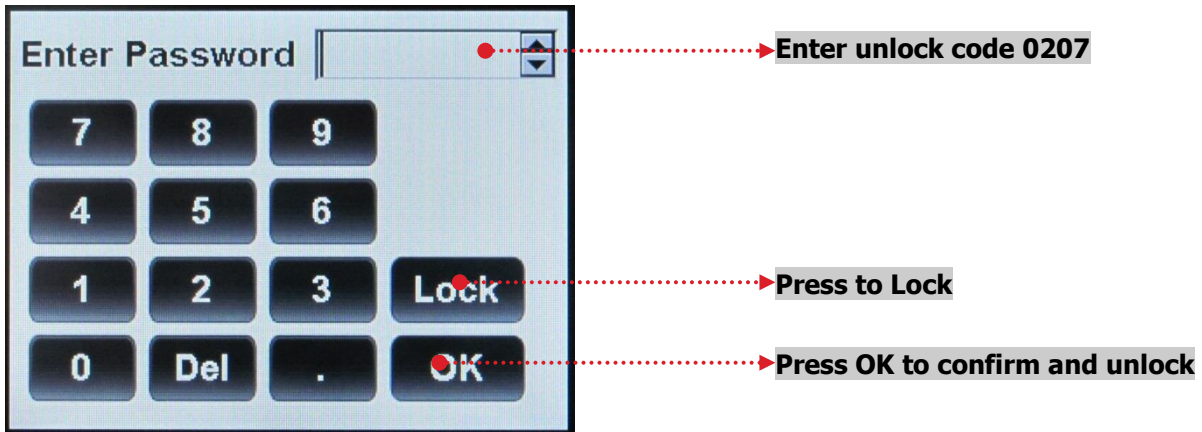


The INFO screen displays the following information:

- OB-15/2 BBLT** (Device model)
- FW V3.19 1308-4330 Aug 30 2013 14:19:36** (Firmware version, date, and time)
- Kambic metrology** (Company logo)

4.2.3 Unlock screen

Press Unlock button to see this screen:

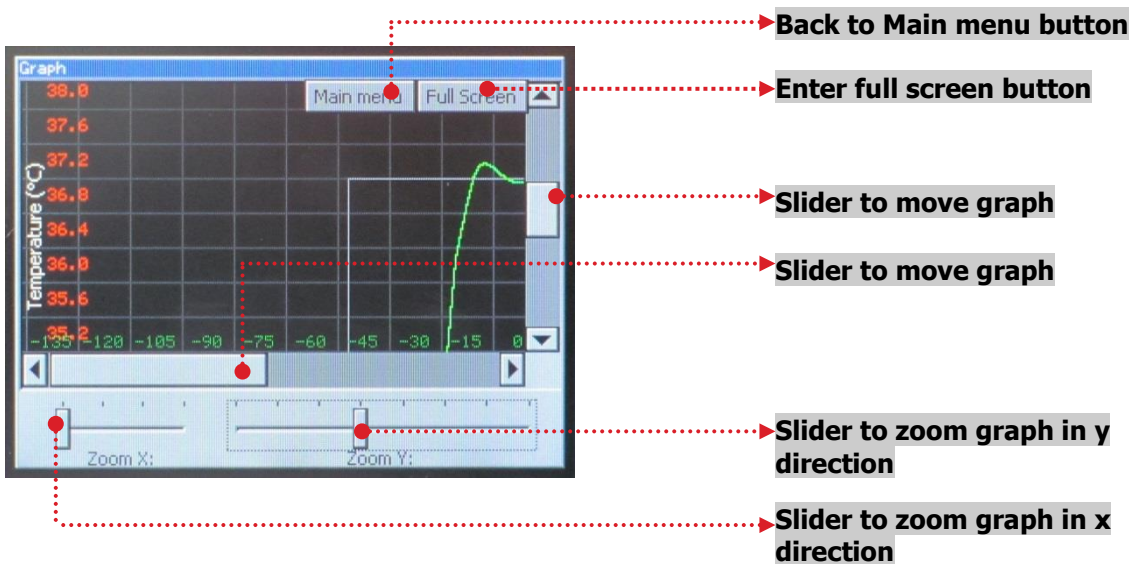


Enter unlock code 0207 and confirm with OK button to enable edit PID settings and temperature corrections.

To disable edit PID setting and temperature corrections press Lock button.
If you forget to press Lock button after 2 minutes it locks automatic.

4.2.4 Graph screen

Press Graph button to see this screen:



4.2.5 Main settings

Touch value to select
 You can set each decimal place separately!

Set temperature

Set LCD brightness

Decrease value

Increase value

Next screen

Previous (main) screen

4.2.6 PID parameter settings

Touch value to select

Previous screen

Decrease value

Increase value

Next screen

Default values	
Pb-Prop.Band	1.25°C
Ti-Integral time	150.0s
Td-Derivat. const.	0.0



WARNING

Changing the PID parameters can seriously affect temperature control, stability! stability, stabilization time,...

This should only be done by skilled professional staff!!!

4.2.7 Special settings

The screenshot shows the 'SPECIAL SETTINGS' screen with the following parameters and controls:

- Stirring Speed : 100%** - Callout: Touch value to select
- Temp.Averaging : 5** - Callout: Fluid mixing speed. After changing this parameter wait for a few minutes for the system to stabilize!!! Never change for more than a few % at a time!
- Heat.PowerLimit: 100%** - Callout: Set the frequency for the temp. Averaging
- Decrease value** - Callout: Set the heater power limit
- Increase value** - Callout: Decrease value
- Next screen** - Callout: Increase value
- Previous screen** - Callout: Next screen

Default values	
Stirring speed	100%
Temp. Averaging	5
Heat.PowerLimit	100%

4.2.8 Temperature corrections

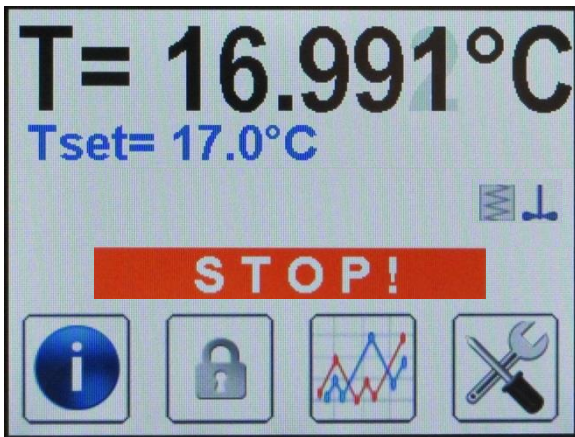
The screenshot shows the 'Temp.Corr. T= 36.414°C' screen with the following parameters and controls:

- Corr. at 0.0°C = 0.000** - Callout: Touch value to select
- Corr. at 100.0°C 100.000** - Callout: Decrease value
- Corr. at 200.0°C 200.000** - Callout: Increase value
- Corr. at 250.0°C 250.000** - Callout: Next screen
- Previous screen** - Callout: Previous screen

Default values	
Corr. At 40.0 °C	40.000
Corr. At 100.0 °C	100.000
Corr. At 200.0°C	200.000
Corr. At 300.0°C	300.000

4.2.9 STOP screen

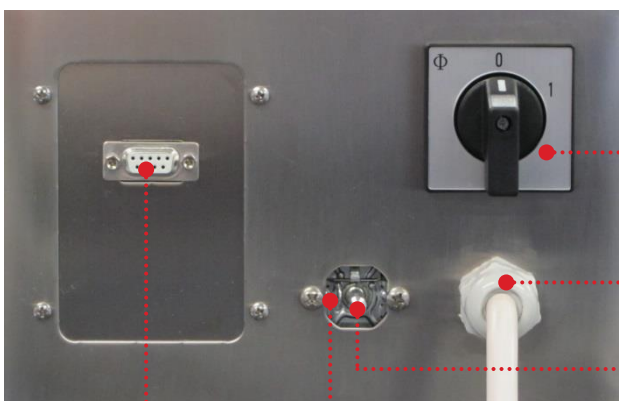
If you press stop button (1 second or more) to stop the cycle you will see this screen:



- This will immediately stop temperature control!



4.2.10 Back panel



▶ Main switch

▶ Power supply cable

▶ Over temperature safety device shaft

▶ Over temp. safety device reset spring

▶ RS-232 communication port

5. SERVICE AND MAINTENANCE

**WARNING**

Before any service or cleaning be sure to disconnect the power supply cable from the power supply!

Maintenance and service within the warranty period may only be performed by the authorized service person.

Please advise Kambic in before alternation & modification. It is not allowed to change or rebuild any part of the construction without producer's written permit.

All spare parts are in stock in the producer's magazine. It is only allowed to use the original spare parts.

Maintenance and service within the warranty period may only be done by the producer's service department or authorized service.

With proper care the instrument should require very little maintenance. Keep the interior and the exterior clean. The bath should be cleaned regularly to prevent a buildup of oil or dust. For cleaning use some soft cleaning detergents and soft cloth.

Periodically check the fluid level in the bath to ensure that the level has not dropped. A drop in the fluid level affects the stability and dramatically the uniformity of the bath. Changes in fluid level are dependent upon several factors most often it is the volumetric expansion of the fluid!

Heat transfer medium lifetime is dependent upon the type of medium and the environment. The fluid should be checked at least every month. Once some fluids have become compromised, the break down can occur rapidly. Particular attention should be paid to the viscosity of the fluid. A significant change in the viscosity can indicate that the fluid is contaminated, being used outside of its temperature limits, contains ice particles, or is close to a chemical breakdown.

In the event of failure, call the service;

Please find contacts on page 1 or on our web site: www.kambicmetrology.com

5.1 Draining the Bath

All our calibration baths are designed and equipped with drain valve for safe and quick draining of bath fluid.

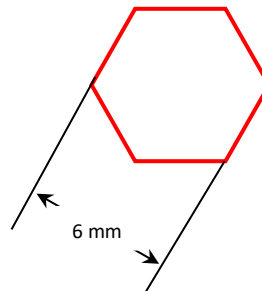
Do to extremely high and low temperatures special metal seal valve is selected, assuring leakage free operation even at extreme temperatures and large valve flow section at the same time. Large flow section is extremely important when replacing damaged fluid with high viscosity.

Needed tools to operate:

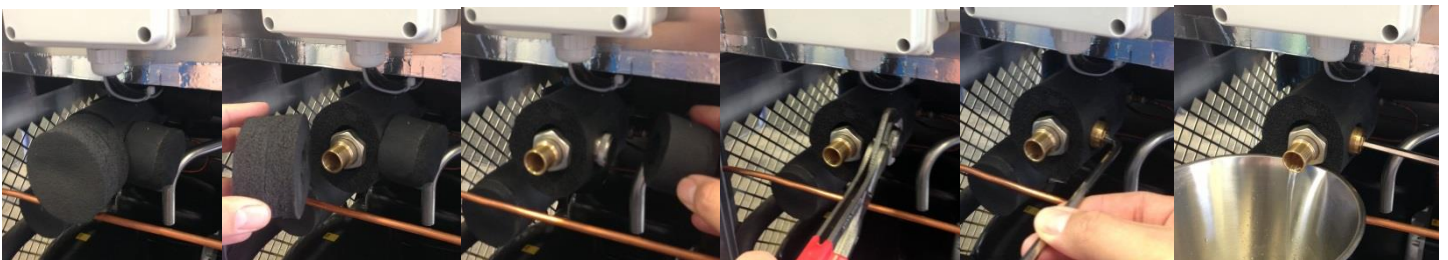
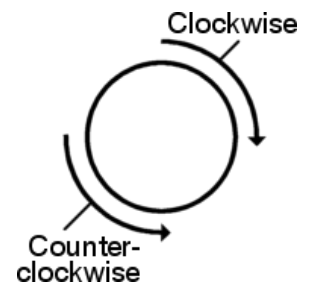
- Pip grips such as:



- Hexagon key 6mm such as:



- 1) Allocate valve behind front removable deck
- 2) Remove isolation caps (only for ULT models)
- 3) Use hand or pipe grips to unscrew (counterclockwise) valve cap
- 4) Insert hexagon key 6mm and unscrew to open valve (counterclockwise)
(Make sure to have fluid vessel ready!)
- 5) Always close screw clockwise after draining!
- 6) Always replace valve caps and isolation caps for ULT models



6. REQUIRED SPACE AND CONNECTIONS

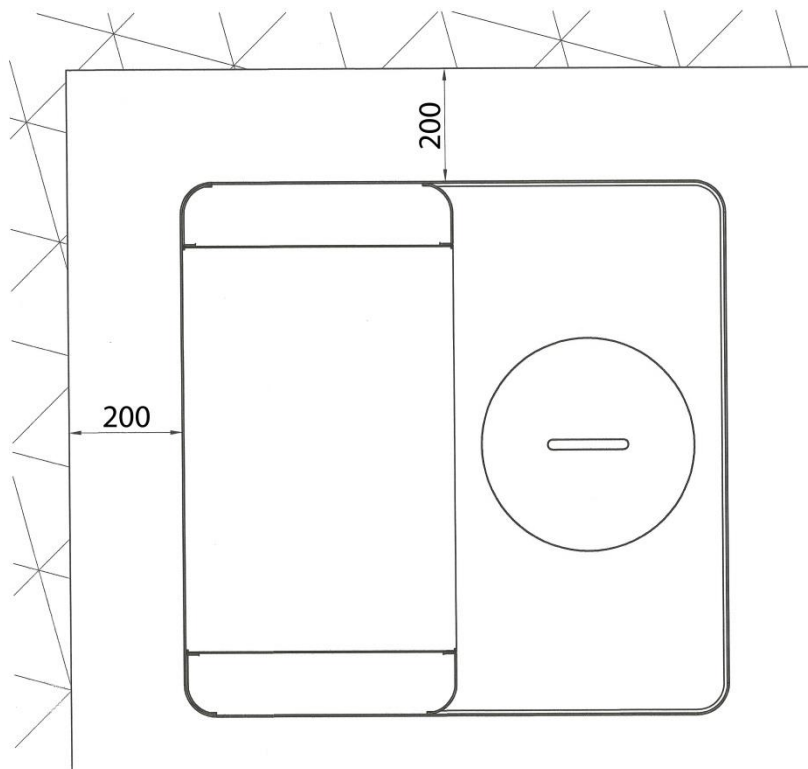
The appliance must be installed at least 200 mm away from the nearest wall. It must also be in a dry and well ventilated room.

Additional space or relocation of the apparatus may be necessary when carrying out any maintenance or servicing.

The user must provide electrical connection: 230V±10% / 50Hz, 60Hz.

Environmental and operational conditions

Temperature	+15°C ... +25°C
Relative humidity	from 15 % to 75 %

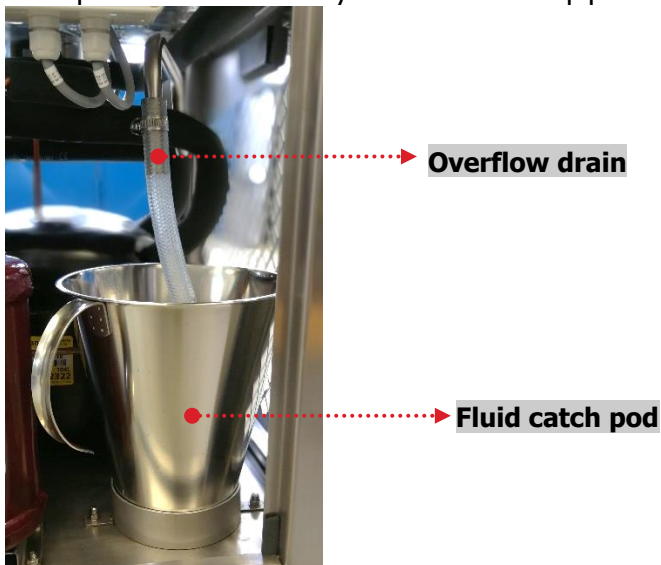


7. SAFE USE AND SAFETY ELEMENTS

It is not allowed to heat-up any material which could form explosive atmosphere.
Cycle may only be started when the cover is closed. Do not store any fluids on top of the housing!

Microprocessor controller has a special safety system which turns heaters off if temperature rises for more than 5 °C above set temperature. In case of an error on this system, a mechanical over temperature shut-off will disable heating. If this happens the cause must be found and the over temperature shut-off must be manually reset. The over temperature shut-off device is located on the rear side of the electro box. In case when this over temperature shut-off is activated a red indication light above it is ON and there is a message on the display "ERROR safety thermostat!!" Reset the over temperature safety device by pressing a small spring next to the over temperature safety devices shaft.

Do to the large temperature range and possibilities of usage of different fluids, there is a chance of fluid volume expansion at higher temperatures. To avoid unlikable leakage the bath is equipped with overflow drain opening which leads to the lower part of the housing. The operator must make sure that the catch pod is located directly below this drain pipe to catch and overflowed fluid.



The operator should also make sure that the bath contains enough fluid at all times. The minimum fluid level is when all round openings on the working vessel are fully flooded during the operation.

The appliance may only be used by trained personnel with enough practical experience regarding heating – cooling and temperature controlled appliances.

Each user is responsible for correct and safe use.

When indicating an error, press "STOP" and switch the main switch in the OFF position immediately. Then contact the producer or service.

8. DISMANTLING AND DISPOSAL



This symbol means do not dispose of your product with your other household waste. Instead, you should protect human health and the environment by handing over your waste equipment to a designated collection point for the recycling of waste electrical and electronic equipment. For more information please contact your local waste disposal service.

9. TROUBLESHOOTING

Fluid drip from bath

- ➔ check fluid level
- ➔ check catch pod

Temperature stability & uniformity

- ➔ check fluid level and fluid flow
- ➔ check stirring operating
- ➔ check fluid viscosity
- ➔ check temperature sensor

Increased noise

- ➔ check stirring
- ➔ check fluid

Not able to reach high temperature

- ➔ check the max. power on heater limit setting

Probe error

- ➔ check probe connections and cable
- ➔ replace probe

Controller malfunction

- ➔ call service

10. RS-232 COMMUNICATION PROTOCOL

COM port settings:

- 9600 Baud
- No parity
- 8 Data bit
- 1 Stop bit

Connector pins info:

- 3 = TXD RS232 output from controller
- 7 = GND
- 11 = RXD RS232 input to controller

All commands must be written in capital letters and identical as written in this description!

After the receipt of the command (START, STOP, SETTEMP) the data is immediately written in the eeprom. This way the controller will always return to the last settings in case of a power failure.

No.	Command:	Action:
1.	STOP <LF>	Operation of the bath stopped. Equal to STOP on the controller.
2.	START<LF>	Operation of the bath activated. Equal to the START on the controller.
3.	SETTEMP= 37.0<LF>	Set temperature with single decimal
4.	SETTEMP?<LF>	Request of set temperature. Will return current set temperature. SETTEMP=37.000<CF><LF>
5.	TXD<LF>	Request of set and current temperature. Will return current set temperature and current measured temperature. Tm=37.001 Ts=37.0<CR><LF>
6.	KP=120<LF>	Set P component in PID controller
7.	KP?<LF>	Request of current P component. Will return KP=120<CR><LF>
8.	TI=600<LF>	Set I component in PID controller
9.	TI?<LF>	Request of current I component. Will return TI=600<CR><LF>
10.	TD=0<LF>	Set D component in PID controller
11.	TD?<LF>	Request of current D component. Will return TD=0<CF><LF>
12.	TRIG=10<LF>	Automatic RS232 output period 10 seconds. 0 seconds automatic output disabled. Will output: 10.06.3 Tm=37.001 Ts=37.0 P=75WD=0<CR><LF> Usable with combination to dot printer EPSON LX-300
13.	TRIG?<LF>	Request of current output period. Will return TRIG=10<CR><LF>

11. Attachments

11.1 Declarations

11.2 Electrical Drawings