
TECHNE

TECAL 700XS

OPERATOR'S MANUAL

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INTRODUCTION

The Tecal 700XS is designed to provide an exceptionally stable and accurate heat source that can be used in a calibration laboratory or a field environment. These units enable precise temperature calibration of a wide range of temperature sensors and thermostats to be carried out. They offer fast heat up times, with unrivalled accuracy and repeatability.

The Tecal 700XS accepts interchangeable insert probe sleeves allowing many sizes of probes to be calibrated. The unit uses a PRT sensor and 4 specially manufactured heaters to achieve stable and uniform temperatures throughout the block. The unit has a large fixed block with multiple bores accepting 5 different probe sizes as well as a separate bore for slim insert blocks to allow virtually any probe sizes to be calibrated. The fixed aluminium bronze block offers improved thermal conduction across the block and gives the flexibility of many probe sizes being catered for. Large removable insert blocks can give errors due to the thermal breaks between the bore of the block and the clearance required to allow the insert blocks' insertion and removal. This new design reduces these errors.

The all new control PCB features a large LED display allowing operating parameters including the block temperature, block stability, heating status, and current set-point to be reviewed. The temperature can be easily set using the control buttons to any desired temperature within the calibrator's specified range. The 4 push buttons can also be easily used to perform switch test functions.

If the unit is used correctly this instrument will provide continued accurate calibration of temperature sensors and devices in many applications.

The Tecal 700XS calibrator is designed to display the same temperature as the test sensor in the block. If the unit is set to 700°C and the display reads 700°C and the calibration well is at 700°C.

Before using the Tecal 700XS make sure you have read this manual carefully. If there is any doubt relating to the proper use of this equipment, the staff at Techne or your supplier will be happy to assist.



SAFETY AND INSTALLATION

Operator Safety

Please read this manual carefully before using the Tecal 700XS Calibrator. If the equipment is not used in the manner described in this manual the protection provided by the equipment might be impaired.

All Techne instruments are designed to conform to international safety requirements and are fitted with an over-temperature cut-out. If a safety problem should be encountered then switch off the unit at the mains socket and remove the plug from the electricity supply.

The following definitions apply to the terms **Warning** and **Caution**:-

Warning identifies conditions and actions that may pose hazards to the user.

Caution identifies conditions and actions that may damage the instrument being used.

Warnings

HIGH TEMPERATURES ARE DANGEROUS as they can cause serious burns to operators and ignite combustible material. Users should be aware of the following to avoid personal injury:



- USE CARE AND WEAR PROTECTIVE GLOVES TO PROTECT HANDS
- DO NOT use combustible substances near hot objects
- DO NOT operate the instrument in the vicinity of inflammable liquids or gases
- DO NOT operate the instrument under any structure or in a cabinet – clearance of 20cm on all sides and 1m above the calibrator is recommended
- NEVER use any liquids or heat transfer fluids such as silicone oil paste as dangerous fumes may be given off
- After heating test samples, remember that parts of the instrument, namely the block and any associated accessories may be very hot.

Cautions

Users should be aware of the following to avoid damage to the instrument:



- DO NOT use if the cooling fan in the instrument is not working correctly
- DO NOT operate if the instrument appears damaged or operates abnormally
- DO NOT place any liquids or heat transfer fluids such as silicone oil paste etc onto the instrument
- DO NOT use this instrument if it is excessively wet, dirty or dusty
- DO NOT interchange slim metric inserts with slim Imperial inserts as they will become jammed. Slim Inserts are available to suit both models
- Note that the lifetime of some components can be shortened by continuous high temperature operation

Additional Notes.

The Tecal 700XS is a precision calibration instrument designed for optimum durability and trouble free operation but it must be handled with care.

The unit should always be carried in the upright position to prevent the insert blocks from being dropped out and damaged.

Test probes and the Tecal 700XS block may have differing thermal expansion rates. The precision bores are manufactured to a very close tolerance to allow for probe expansion inside the well as the block heats up. Otherwise, the probe may become stuck in the well.

Some test probes have temperature limits so it is advisable not to exceed this temperature. Ensure that the air temperature above the Tecal 700XS does not exceed the probe handle's temperature limit.

The air above the block may be over 200°C and if the probe handle limits are exceeded, the probe may be permanently damaged.

Unpacking

When unpacking please ensure that the following have been removed from the packaging:

- Tecal 700XS Calibrator
- Calibration certificate
- Mains cable
- TechneWorks software on CD
- Guarantee card

The user is advised to keep the original packaging in case the instrument ever needs to be returned for service or repair. Techne accepts no responsibility for damage incurred unless the unit is correctly packed and transported in its original packaging.

INSTALLATION

The instrument should be carried either holding the front and the rear of the instrument or using the carry strap provided. Never move or carry the instrument when in use or connected to the mains electricity supply.

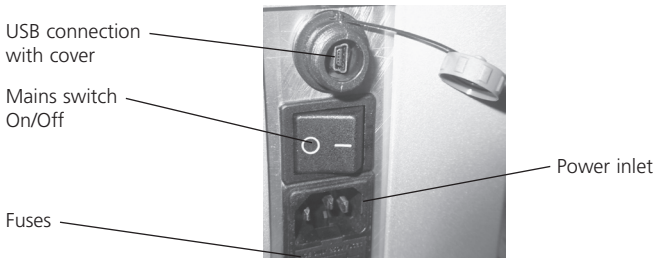
1. All Techne instruments are supplied with a mains power cable.
2. Before connecting the instrument to the mains electricity supply, check the voltage against the rating plate (located on the side of the unit). Please note that the unit must be earthed to ensure proper electrical safety. Connect the mains cable to a suitable plug according to the table below.

Connection	220/240V, 50/60Hz Supply	110V/120V Supply, 50/60Hz
Live	Brown	Black
Neutral	Blue	White
Earth	Green/yellow	Green

3. UK ONLY: The fused plug supplied with the mains cable is fitted with a 10 Amp fuse to protect the instrument and the user.
4. Units showing 230V, 50/60Hz on the rating plate also operate between 210 and 260V; units with 120V, 50/60Hz also operate between 100 and 130V and units marked with 100V will operate between 90 and 110V. In all cases the heating rate will degrade by approximately 8% at the extremes of the voltage range.
5. Plug the mains cable into the socket on the side of the instrument.
6. Place the unit on a suitable flat bench ensuring that the air inlet vents on the underside are free from obstruction.
7. Switch on the instrument:

I mains switch On

O mains switch Off



Replacement cable

Should the mains lead need replacement, a cable of 1mm² of harmonized code H05VV-F connected to an IEC320 plug should be used. **IF IN DOUBT CONSULT A QUALIFIED ELECTRICIAN.**

Working Conditions

The Tecal 700XS calibrator is designed to operate under the following conditions:

- Indoor use
- Ambient temperature range +5°C to +40°C
- Altitude to 2000m
- Relative humidity not exceeding 95%
- Mains supply fluctuations not exceeding 10%
- Over voltage category II IEC 60364-4-443
- Pollution degree 2
- Environmental conditions should not be excessively dusty or dirty

Note: The control specifications are quoted at an ambient temperature of 20°C. The specification may deteriorate outside an ambient temperature of 10°C to 30°C.

The instrument has been tested for radio frequency interference and is certified under EN61326.

GUARANTEE

The instrument is guaranteed against any defect in material or workmanship for the period specified on the enclosed guarantee card. This period is effective from the date of purchase; within this period all defective parts will be replaced free of charge provided that the defect is not the result of an accident, misuse or negligence. The screen of the calibrator can be damaged by sharp objects such as pens, pencils and fingernails. Damage of this sort will be considered misuse and will invalidate the guarantee for this component.

Servicing under this guarantee should be obtained from the supplier of the instrument.

This manual has been prepared for the convenience of Techne customers and nothing in this manual shall be taken as a warranty, condition or representation concerning the description, merchantability, fitness for purpose or otherwise of the unit or components.

Notwithstanding the description and specification(s) of the instruments contained in the operator's manual, Techne reserves the right to make such changes as it sees fit to the instruments or to any of the components.

SÉCURITÉ ET CONSIGNES D'INSTALLATION

Sécurité de l'opérateur

Lire attentivement le présent manuel avant d'utiliser le Calibrateur de température. Si ce matériel n'est pas utilisé de la manière décrite dans le présent manuel, la protection fournie risque d'être compromise.

Tous les appareils Techne sont conçus pour être conformes aux exigences internationales de sécurité et sont dotés d'une coupure en cas de surchauffe. Si un problème de sécurité survient, mettre l'appareil hors tension au niveau de la prise secteur et débrancher la fiche de l'alimentation électrique.

Avertissement

Les TEMPÉRATURES ÉLEVÉES SONT DANGEREUSES car elles peuvent provoquer de graves brûlures chez l'opérateur et enflammer les matériaux combustibles. Les utilisateurs devront être conscients des dangers potentiels suivants :



- AGIR AVEC PRUDENCE ET PORTER DES GANTS DE PROTECTION POUR LES MAINS
- NE PAS utiliser de substances combustibles à proximité d'objets chauds
- NE PAS utiliser l'appareil au voisinage de liquides ou de gaz inflammables
- NE PAS placer un quelconque liquide directement sur l'appareil

Rappel : après le chauffage d'échantillons, certaines parties de l'appareil, notamment le couvercle et le bloc, ainsi que les accessoires associés, peuvent être brûlants.

Déballage

Au moment du déballage, vérifier que l'emballage contenait les articles suivants :

- Calibrateur de température
- Câble d'alimentation
- Certificat de traçabilité
- Logiciel TechneWorks sur CD
- Carte de garantie

Il est conseillé à l'utilisateur de conserver l'emballage d'origine s'il devait s'avérer nécessaire de renvoyer l'appareil pour une intervention d'entretien ou de réparation. Techne n'accepte aucune responsabilité pour les dégâts survenus si l'appareil n'est pas correctement emballé et transporté dans son emballage d'origine.

Noter que des objets pointus tels que crayons, stylos et ongles peuvent facilement endommager l'écran du Calibrateur de température. Ce type de dégâts sera considéré comme une mauvaise utilisation et annulera la garantie de l'appareil.

INSTALLATION

Porter l'appareil à deux mains. Ne jamais déplacer ou transporter l'appareil lorsqu'il est en service ou branché à l'alimentation électrique.

1. Tous les appareils Techne sont livrés avec un câble d'alimentation, qui peut être intégré à l'appareil ou muni d'une fiche.
2. Avant de raccorder l'appareil à l'alimentation électrique, vérifier la tension par rapport à la plaque signalétique (située au dos de l'appareil). Vérifier que le sélecteur de tension (situé au-dessus de l'interrupteur Marche/Arrêt) est réglé sur la tension correspondant au réseau local. Noter que l'appareil doit être relié à la terre pour assurer une bonne sécurité électrique. Brancher le câble secteur sur une fiche adéquate d'après le tableau suivant.

Connexion	Alimentation 220/240V, 50/60Hz	Alimentation 110V/120V, 50/60Hz
Phase	Marron	Noir
Neutre	Bleu	Blanc
Terre	Vert/jaune	Vert

3. ROYAUME-UNI SEULEMENT : La prise à fusible fournie avec le câble secteur est munie d'un fusible 10 A destiné à protéger l'appareil et l'utilisateur.
4. Les appareils portant l'indication 230 V, 50/60 Hz sur la plaque signalétique fonctionnent également entre 210 et 260 V ; les appareils portant l'indication 120 V, 50/60 Hz fonctionnent également entre 100 et 130 V et les appareils portant l'indication 100 V fonctionneront entre 90 et 110 V. Dans tous les cas, la puissance de chauffage se dégrade d'environ 8% aux extrêmes de la plage de tension.
5. Brancher le câble d'alimentation dans la prise au dos de l'appareil.
6. Disposer l'appareil sur une paillasse ou sous une hotte aspirante si nécessaire, en veillant à ce que les prises d'air situées au-dessous ne soient pas obstruées. Positionner l'appareil avec tout autour un écartement minimum de 200 mm par rapport aux murs ou autres éléments, ainsi qu'entre chaque appareil en cas d'utilisation d'appareils multiples, afin de permettre une circulation d'air efficace pour chaque appareil.
7. Allumer l'appareil.

- I** Interrupteur secteur en position Marche
O Interrupteur secteur en position Arrêt

Câble de rechange

S'il s'avère nécessaire de remplacer le cordon secteur, utiliser un câble de 1 mm² au code harmonisé H05VV-F raccordé à une fiche IEC320. EN CAS DE DOUTE, CONSULTER UN ÉLECTRICIEN QUALIFIÉ.

Conditions de travail

Le calibrateur de température est conçu pour fonctionner dans les conditions suivantes :

- Utilisation en intérieur
- Plage de température ambiante : +5 à +40°C
- Altitude jusqu'à 2000m
- Humidité relative ne dépassant pas 95%
- Fluctuations de l'alimentation sur secteur ne dépassant pas 10%
- Surtensions de catégorie II selon la norme IEC 60364-4-443
- Degré de pollution 2

Remarque : Les caractéristiques de régulation sont indiquées pour une température ambiante de 20°C. Ces caractéristiques peuvent se détériorer au dessus d'une température ambiante de 10 à 30°C.

L'appareil a été testé en matière de perturbations radioélectriques et est certifié selon la norme EN61326.

GARANTIE

L'appareil est garanti contre tout défaut de matériaux ou vice de fabrication pendant la période précisée sur la carte de garantie jointe. Cette période s'applique à compter de la date d'achat ; pendant cette période, toutes les pièces défectueuses seront remplacées gratuitement à condition que le défaut ne soit pas le résultat d'un accident, d'une mauvaise utilisation ou d'une négligence. Des objets pointus tels que crayons, stylos et ongles peuvent endommager l'écran du Calibrateur de température. Les dégâts de cette sorte seront considérés comme une mauvaise utilisation et annuleront la garantie de l'appareil.

Dans le cadre de cette garantie, le service après-vente est à effectuer auprès du fournisseur de l'appareil.

Le présent manuel a été préparé pour le confort des clients de Techne et rien dans son contenu ne doit être pris comme une garantie, une condition ou une affirmation concernant la description, la qualité marchande, l'adéquation à un usage particulier ou autre de l'appareil ou de ses composants.

Nonobstant la description et les caractéristiques techniques des appareils figurant dans le manuel de l'utilisateur, Techne se réserve le droit d'apporter aux appareils ou à n'importe quel composant les changements jugés utiles.

SICHERHEITS- UND INSTALLATIONSINFORMATIONEN

Sicherheit des Bedienpersonals

Lesen Sie diese Anleitung vor Verwendung des Temperatur Kalibratoren bitte sorgfältig durch. Wenn das Gerät nicht entsprechend der Bedienungsanleitung eingesetzt wird, können die Schutzfunktionen des Gerätes beeinträchtigt werden.

Alle Geräte von Techne entsprechen den internationalen Sicherheitsanforderungen und sind mit einer Übertemperatur-Schutzvorrichtung ausgestattet. Bei einer Sicherheitsstörung bitte das Gerät an der Steckdose ausschalten und den Netzstecker ziehen.

Achtung

HOHE TEMPERATUREN STELLEN EINE GEFAHRENQUELLE DAR. Sie können schwere Brandverletzung verursachen und brennbare Stoffe entzünden. Der Benutzer sollt sich mit den möglichen Gefahren vertraut machen:



- UMSICHTIG VORGEHEN UND SCHUTZHANDSCHUHE TRAGEN
- KEINE brennbaren Stoffe in der Nähe heißer Gegenstände verwenden
- Das Gerät NICHT in der Nähe entzündlicher Flüssigkeiten oder Gase betreiben
- Flüssigkeiten NICHT direkt auf das Gerät auftragen

Nach der Erhitzung von Proben daran denken, dass bestimmte Geräteteile wie Deckel, Thermoblock und Zubehörteile sehr heiß sein können.

Auspacken

Beim Auspacken darauf achten, dass der folgende Lieferumfang vorhanden ist:

- Kalibrator
- Netzkabel
- Garantiekarte

Wir empfehlen die Originalverpackung aufzubewahren, falls das Gerät zwecks Wartung oder Reparatur zurückgeschickt werden muss. Techne übernimmt keine Verantwortung für Transportschäden, wenn das Gerät nicht ordnungsgemäß verpackt in der Originalpackung verschickt wird.

Achten Sie bitte darauf, dass die Anzeige des Temperatur Kalibratoren durch spitze bzw. scharfe Gegenstände wie Stifte, Bleistifte und Fingernägel leicht zerkratzt wird. Diese Art von Beschädigung gilt als Missbrauch des Geräts und führt zur Ungültigkeit der Garantie für dieses Gerät.

INBETRIEBNAHME

Das Gerät mit beiden Händen tragen. Das Gerät unter keinen Umständen transportieren, wenn es in Betrieb ist, oder während das Gerät noch am Netz angeschlossen ist.

1. Alle Geräte von Techne werden mit einem Netzkabel geliefert, das entweder eingesteckt wird oder fest mit dem Gerät verbunden ist.
2. Vor dem Anschluss bitte kontrollieren, ob die Stromversorgung den Angaben auf dem Typenschild (auf der Geräterückseite) entspricht. Darauf achten, dass der Spannungswähler (über dem Ein/Aus-Schalter) auf die entsprechende örtliche Spannung eingestellt ist. Um die elektrische Sicherheit zu gewährleisten, muss dieses Gerät geerdet werden. Schließen Sie das Netzkabel entsprechend der folgenden Tabelle an einen geeigneten Stecker an.

Anschluss	220/240V, 50/60Hz	110V/120V, 50/60Hz
Phase	Braun	Schwarz
Neutral	Blau	Weiß
Erde	Grün/Gelb	Grün

3. NUR FÜR GROSSBRITANNIEN: der mit dem Netzkabel gelieferte Sicherungsstecker enthält eine 10 Amp. Sicherung zum Schutz des Geräts und des Anwenders.
4. Geräte mit der Bezeichnung 230V, 50/60Hz auf dem Typenschild können mit Spannungen zwischen 210 und 260V betrieben werden; Geräte für 120V, 50/60Hz können mit Spannungen zwischen 100 und 130V betrieben werden. Bei Geräten für 100V gilt der Bereich 90 bis 110V. In allen Fällen reduziert sich die Erhitzungsrate um etwa 8% in den äußeren Spannungsbereichen.
5. Stecken Sie das Netzkabel in die Buchse auf der Geräterückseite ein.
6. Stellen Sie das Gerät auf einen geeigneten ebenen Tisch oder in einem Abzugsschrank auf und sorgen Sie dafür, dass die Lufteinlassschlitze auf der Geräteunterseite nicht blockiert sind. Das Gerät muss einen Mindestabstand von 200mm zu Wänden und anderen Gegenständen bzw. zu anderen Geräten dieser Art aufweisen, um einen ausreichenden Luftstrom zu gewährleisten.
7. Schalten Sie das Gerät ein:

- I** Netzschalter Ein
- O** Netzschalter Aus

Ersatzkabel

Bei einem eventuellen Austausch des Netzkabels wird ein Kabel vom Typ H05VV-F mit 1mm² Adernquerschnitt und Europastecker (IEC 320) benötigt. IM ZWEIFELSFALL EINEN ELEKTROFACHMANN HINZUZIEHEN.

Einsatzbedingungen

Der Temperatur-Kalibratoren ist für den Einsatz unter folgenden Bedingungen ausgelegt:

- Gebrauch in Innenräumen
- Umgebungstemperatur zwischen +5°C to +40°C
- Höhe: bis zu 2000m
- Relative Feuchte nicht über 95%
- Netzspannungsschwankungen nicht über 10%
- Überspannungsklasse 2 IEC 60364-4-443
- Verschmutzungsgrad 2

Hinweis: Die Gerätespezifikationen beziehen sich auf eine Umgebungstemperatur von 20°C und können sich außerhalb des Bereichs 10°C bis 30°C verschlechtern.

Das Gerät wurde auf HF-Störeinflüsse geprüft und entspricht den EMV-Bedingungen nach EN61326.

GARANTIE

Techne gewährleistet, dass dieses Gerät für den auf der Garantiekarte angegebenen Zeitraum keine Herstellungs- und Materialmängel aufweist. Dieser Zeitraum tritt ab dem Verkaufsdatum in Kraft. Innerhalb dieses Zeitraums werden alle defekten Teile kostenlos ausgetauscht, soweit der Defekt nicht auf einen Unfall, Missbrauch oder Nachlässigkeit zurückzuführen ist. Die Anzeige des Temperatur Kalibratoren kan durch spitze/scharfe Gegenstände wie Stifte, Bleistifte und Fingernägel beschädigt werden. Diese Art von Beschädigung gilt als Missbrauch des Geräts und führt zur Ungültigkeit der Garantie für dieses Gerät.

Wartungsarbeiten, die unter diese Garantie fallen, müssen von der Verkaufsstelle für dieses Gerät gehandhabt werden.

Diese Anleitung wurde zur Information der Kunden von Techne erstellt und stellt in keinsten Weise eine Gewährleistung, Bedingung oder Darstellung bezüglich der Beschreibung, Marktgängigkeit oder Zweckdienlichkeit dieser Geräte oder Bauteile dar.

Unabhängig von Beschreibung und Spezifikation(en) des hier beschriebenen Geräts behält sich Techne das Recht vor, Änderungen an diesem Gerät oder dessen Bauteilen vorzunehmen.

INFORMAZIONI SULLA SICUREZZA E L'INSTALLAZIONE

Sicurezza dell'operatore

Leggere attentamente il presente manuale prima di usare il calibratore. Se non si usa l'apparecchiatura nel modo descritto nel presente manuale, la protezione fornita dall'unità potrebbe risultarne diminuita.

Tutti gli strumenti Techne sono progettati per rispettare i requisiti di sicurezza internazionali e sono previsti con un dispositivo di sovratemperatura. In caso di problemi di sicurezza, spegnere l'unità dalla presa di rete centrale e togliere la spina dall'alimentazione elettrica.

Avvertenza

Le ALTE TEMPERATURE SONO PERICOLOSE in quanto possono provocare serie ustioni agli operatori e dare fuoco al materiale combustibile. Gli utenti devono conoscere i seguenti pericoli potenziali:



- PRESTARE ATTENZIONE ED INDOSSARE GUANTI PROTETTIVI PER LE MANI
- NON usare sostanze combustibili vicino ad oggetti caldi
- NON mettere in funzione lo strumento nei pressi di liquidi o gas infiammabili
- NON collocare alcun tipo di liquido direttamente nello strumento

Dopo aver riscaldato i campioni, ricordare che le parti dello strumento, cioè il coperchio ed il blocco ed eventuali accessori associati potrebbero essere molto caldi.

Disimballaggio

Durante il disimballaggio, assicurarsi di aver tolto quanto segue dall'imballo:

- Calibratore
- Certificato di tracciabilità
- Cavo di alimentazione di rete
- Scheda di garanzia

Si consiglia all'utente di conservare l'imballaggio originale nel caso in cui occorresse restituire lo strumento per assistenza o riparazioni. Se l'unità non è correttamente imballata e trasportata nel suo imballo originale, Techne non accetta alcuna responsabilità per eventuali danni che dovessero verificarsi.

Notare come lo schermo del Calibratore termico si possa danneggiare facilmente con oggetti appuntiti come penne, matite ed unghie. Questo tipo di danni sarà considerato come uso improprio e renderà nulla la garanzia per questo componente.

INSTALLAZIONE

Occorre trasportare lo strumento usando entrambe le mani. Non spostare né trasportare lo strumento quando è in funzione o collegato all'alimentazione elettrica di rete.

1. Tutti gli strumenti Techne sono forniti con un cavo di alimentazione; può essere integrale o plugin.
2. Prima di collegare lo strumento all'alimentazione elettrica di rete, controllare la tensione confrontandola con la targhetta riportante i valori nominali (si trova sul retro dell'unità). Assicurarsi che il selettore di tensione (posto sopra l'interruttore On/Off) sia impostato sulla tensione corretta per l'alimentazione locale. Notare che al fine di garantire la corretta sicurezza elettrica, occorre che l'unità sia messa a terra. Collegare il cavo di rete ad una presa idonea secondo la tabella riportata alla pagina successiva.

Connessione	220/240V, Alimentazione 50/60Hz	Alimentazione 110V/120V, 50/60Hz
Phase	Sotto tensione	Marrone Nero
Neutro	Blu	Bianco
Terra	Verde/giallo	Verde

3. SOLO REGNO UNITO: la spina con fusibile fornita con il cavo di rete è dotata di un fusibile da 10Amp per proteggere lo strumento e l'utente.
4. Le unità la cui targhetta dei valori nominali indica 230V, 50/60Hz funzionano anche tra 210 e 260V; quelle con 120V, 50/60Hz funzionano anche tra 100 e 130V e quelle contrassegnate da 100V funzionano tra 90 e 110V. In tutti i casi, il tasso di riscaldamento diminuirà di circa l'8% agli estremi dell'intervallo di tensione.
5. Inserire il cavo di rete nella presa che si trova sul retro dello strumento.
6. Collocare l'unità su un banco piano idoneo o in una cappa aspirante se necessario, assicurandosi che gli sfiati delle prese d'aria nella parte inferiore non siano ostruiti. Posizionare lo strumento con una distanza minima attorno di 200 mm. dalle pareti o da altri oggetti e tra ciascuna unità, nel caso in cui si usino unità multiple, in modo da consentire un flusso d'aria efficace per ciascuno strumento.
7. Accendere lo strumento:

- I Interruttore di rete Acceso
- O Interruttore di rete Spento

Cavo di ricambio

Qualora occorra sostituire il cavo di rete, si dovrà utilizzare un cavo di 1mm² codice armonizzato H05VV-F collegato ad una spina IEC 320. IN CASO DI DUBBIO, RIVOLGERSI A UN ELETTRICISTA QUALIFICATO.

Condizioni di esercizio

Il calibratore è stato progettato per funzionare nelle seguenti condizioni:

- uso interno
- campo di temperatura ambiente da +5°C a +40°C
- altitudine massima 2000m.
- umidità relativa non superiore all'95%
- oscillazione dell'alimentazione di rete non superiore al 10%
- categoria di sovratensione II IEC 60364-4-443
- grado di inquinamento 2

Nota: le specifiche di controllo sono indicate ad una temperatura ambiente di 20°C. Le specifiche potrebbero peggiorare fuori da una temperatura ambiente compresa tra 10°C e 30°C.

Lo strumento è stato collaudato per interferenze da radiofrequenze ed è certificato secondo la norma EN61326.

GARANZIA

Lo strumento è garantito da qualsiasi difetto nei materiali o nella lavorazione per il periodo specificato nella scheda di garanzia allegata. Questo periodo è valido dalla data di acquisto; entro tale periodo, tutte le parti difettose saranno sostituite gratuitamente, a condizione che il difetto non sia la conseguenza di un incidente, un uso improprio o negligenza. Lo schermo del calibratore può essere danneggiato da oggetti appuntiti come penne, matite ed unghia. Tale tipo di danno sarà considerato uso improprio e renderà nulla la garanzia per questo componente.

L'assistenza secondo quanto stabilito dalla presente garanzia deve essere fornita dal fornitore dello strumento.

Il presente manuale è stato preparato ad uso dei clienti di Techne e niente di quanto in esso contenuto costituisce garanzia, condizione o rappresentanza riguardo la descrizione, la commerciabilità, l'idoneità allo scopo o altrimenti dell'unità o dei componenti.

Nonostante la descrizione e le specifiche dello strumento contenuti nel manuale dell'operatore, Techne si riserva il diritto di apportare le modifiche ritenute opportune agli strumenti o a qualsiasi loro componente.

INFORMACIÓN DE SEGURIDAD E INSTALACIÓN

Seguridad del operario

Lea atentamente este manual antes de utilizar el calibrador. Si el equipo no se utiliza de la forma descrita en este manual, se reducirá la protección ofrecida por el equipo.

Todos los instrumentos Techne están diseñados para cumplir los requisitos internacionales de seguridad, e incluyen un dispositivo de corte de sobret temperatura. Si se produce un problema de seguridad, apague la unidad en la toma de alimentación y retire el enchufe del suministro eléctrico.

Advertencia

LAS ALTAS TEMPERATURAS SON PELIGROSAS, ya que pueden ocasionar quemaduras graves a los operarios y prender el material combustible. Los usuarios deben conocer los posibles riesgos:



- TENGA CUIDADO Y LLEVE GUANTES DE PROTECCIÓN PARA PROTEGERSE LAS MANOS
- NO utilice sustancias combustibles cerca de objetos calientes
- NO utilice el instrumento cerca de líquidos o gases inflamables
- NO coloque un líquido directamente en el instrumento. Después de calentar las muestras, recuerde que hay componentes del instrumento que pueden calentarse mucho, concretamente la tapa y el cuerpo y todos los accesorios asociados

Desembalaje

Durante el desembalaje, asegúrese de sacar los siguientes componentes del embalaje:

- Calibrador
- Cable de alimentación
- Tarjeta de garantía

Se recomienda guardar el embalaje original en caso de que tenga que enviar el instrumento para un trabajo de mantenimiento o reparación. Techne no se responsabiliza de los daños producidos si la unidad no está debidamente embalada y no se envía en su embalaje original.

Tenga en cuenta que los objetos punzantes, p.ej.: bolígrafos, lápices y uñas, pueden dañar fácilmente la pantalla del calibrador. Este tipo de daño se considerará como un uso incorrecto, e invalidará la garantía de este componente.

INSTALACIÓN

El instrumento se debe transportar con las dos manos. No mueva ni lleve el instrumento cuando se utilice o esté conectado al suministro eléctrico principal.

1. Todos los instrumentos Techne se suministran con un cable de alimentación, que puede ser integrado o 'enchufable'.
2. Antes de conectar el instrumento al suministro eléctrico, compruebe que el voltaje coincida con el indicado en la placa de régimen (situada en la parte trasera de la unidad). Asegúrese de que el interruptor de selección de voltaje (situado encima del interruptor de encendido/apagado) está ajustado al voltaje correcto del suministro eléctrico. El instrumento debe disponer de una toma de tierra para garantizar la seguridad eléctrica adecuada. Conecte el cable de alimentación a un enchufe adecuado según la siguiente tabla.

Conexión	220/240V, 50/60Hz Supply	110V/120V Supply, 50/60Hz
Con corriente	Marrón	Negro
Neutro	Azul	Blanco
Toma de tierra	Verde/amarillo	Verde

3. SÓLO PARA EL REINO UNIDO: El enchufe suministrado con el cable de alimentación incluye un fusible de 10 amperios para ofrecer protección al instrumento y al usuario.
4. Las unidades cuya placa de régimen indique 230V, 50/60Hz también pueden funcionar entre 210 y 260V; las unidades con 120V, 50/60Hz también funcionan entre 100 y 130V, y las unidades con 100V funcionan entre 90 y 110V. En todos los casos, el porcentaje de calentamiento disminuirá un 8% aproximadamente en los dos extremos del intervalo de voltaje.
5. Conecte el cable de alimentación en el enchufe situado en la parte trasera del instrumento.
6. Sitúe la unidad sobre una mesa plana o en una campana de laboratorio si es necesario, y asegúrese de que los orificios de ventilación situados en la parte inferior no tienen ninguna obstrucción. Coloque el instrumento a una distancia mínima de 200 mm alrededor de paredes u otros elementos, y entre cada unidad (en caso de que se utilicen varias) para que haya una circulación de aire adecuada para cada instrumento.
7. Encienda el instrumento:
 - I Interruptor de alimentación encendido
 - O Interruptor de alimentación apagado

Cable de repuesto

Si es necesario sustituir el cable de alimentación, se debe utilizar un cable de 1mm² de código armonizado H05VV, conectado a un enchufe IEC320. **EN CASO DE DUDA, PÓNGASE EN CONTACTO CON UN ELECTRICISTA.**

Condiciones de trabajo

El ciclador térmico está diseñado para utilizarse en las condiciones siguientes:

- Uso en interior
- Intervalo de temperatura ambiente +5°C a +40°C
- Altitud: hasta 2.000 m
- Humedad relativa no superior al 95%
- Fluctuaciones del suministro eléctrico no superiores al 10%
- Categoría de sobrevoltaje II IEC 60364-4-443
- Nivel de contaminación 2

Nota: Las especificaciones de control corresponden a una temperatura ambiental de 20°C. Las especificaciones pueden empeorar si se utiliza el instrumento fuera del intervalo de temperatura comprendido entre 10°C y 30°C

Se han realizado pruebas para comprobar la interferencia de radiofrecuencia del instrumento, el cual cumple la normativa EN61326.

GARANTÍA

El instrumento está garantizado contra cualquier defecto en el material o la fabricación durante el período especificado en la tarjeta de garantía que se adjunta. Este período entra en vigor a partir de la fecha de compra. Durante este período, se reemplazarán sin cargo alguno todas las piezas defectuosas, a condición que el defecto sea resultado de un accidente, uso incorrecto o negligencia. Tenga en cuenta que los objetos punzantes, p.ej.: bolígrafos, lápices y uñas, pueden dañar fácilmente la pantalla del calibrador. Este tipo de daño se considerará como un uso incorrecto, e invalidará la garantía de este componente.

El distribuidor del instrumento proporcionará información sobre las reparaciones realizadas bajo esta garantía.

Este manual se ha preparado con una finalidad informativa para los clientes de Techne, y ninguna parte del manual se deberá considerar como una garantía, condición o reflejo con respecto a la descripción, comerciabilidad, idoneidad para un fin determinado o de otro tipo de la unidad o sus componentes.

Con independencia de la descripción y las especificaciones del instrumento que se indican en el manual del operario, Techne se reserva el derecho de realizar cambios en el instrumento o en cualquiera de sus componentes cuando lo estime oportuno.

cool the unit down. The calibrator should be returned to your supplier for repair.

TECAL 700XS SPECIFICATION

Temperature

Temperature range (min set point 10°C or 50°F)	Amb.+25°C to 700°C (or 1292°F)
Temperature set point precision	0.01
Display Accuracy at 660°C	±0.25°C
Display Accuracy at 425°C	±0.2°C
Display Accuracy at 100°C	±0.1°C
Set point Display	°C or °F
Switch test ramp rate	0.1 to 10.0°C or 0.1 to 18.0°F

Stability (in amb of 25°C) after 10 mins at temperature over 30 minute period

425 - 700°C	±0.10°C
100 - 425°C	±0.04°C
50 - 100°C	±0.02°C

Axial Uniformity (between 0-40mm from base of well)

425 - 700°C	±1.5°C
100 - 425°C	±1.5°C
50 - 100°C	±0.5°C

Radial Uniformity

425 - 700°C	±0.5°C
100 - 425°C	±0.1°C
50 - 100°C	±0.02°C

Loading effect

425 - 700°C	±0.04°C
50 - 425°C	±0.02°C

Hysteresis

±0.07°C

Heating/Cooling Rate

Heating rate between 50°C and 700°C	25 minutes
Cooling rate between 700°C and 100°C	30 minutes
Cooling rate between 700°C and 50°C	30 minutes

TECAL 700XS SPECIFICATION (CONTINUED)**Well dimensions (6 bores)**

Well depth	152 mm
Well diameters (Metric version)	15,10,8, 6, 4.5, 3 mm
Well diameters (Imperial version)	5/8, 3/8, 5/16, 1/4, 3/16, 1/8"

Insert dimensions

Slim insert dimensions (Metric version)	15mm o/d
Slim insert dimensions (Imperial version)	3/8" o/d

System

Fan cooling	Automatic (when cooling)
Switch test	Yes (display and buzzer)
Communication	USB 1.1

Dimensions

Dimensions H x W x D	297x190x426 mm
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Weight

10kg / 22lbs

Power

Main Supply 230v ($\pm 10\%$) 50/60Hz	1100W
Main Supply 120v ($\pm 10\%$) 50/60Hz	1100W

The performance will vary and will not necessarily meet the above typical specification at the extremes of voltage.

Fuse Rating

230v	6.3A
120v	10A

Standard NIST traceable cert

100, 200, 350, 500, 650°C

USER OPERATION SET UP

Place the unit on an even horizontal surface with clearance around the unit of 20cm on all sides and 1m above. The area around the calibrator should be free of draught, dirt, flammable substances, etc.

Plug the mains cable with the correct supply into the unit.

Carefully lower the slim metric inserts or slim Imperial inserts into the relevant unit.

Note that Tecal 700XSS has Slim Insert blocks to suit metric or imperial models.

Generally if the Tecal 700XS has metric bores a metric insert should be used.

Similarly if the Tecal 700XS has imperial bores then imperial inserts should be used.

The well should be clear of any dirt, foreign objects, grit or grease before the insert is fitted.

The Slim insert block sits proud of the block and has 2 removal holes for use with the insert extraction tool.

Turn on the power to the unit with the switch above the mains cable inlet.

The unit will display the current temperature and heat or cool to the current set point. When the unit has reached the set point temperature the display will stabilise and will be stable after 10 minutes at temperature.

Detailed instruction on programming the Tecal 700XS is given below.

USER OPERATION – DISPLAY INTERFACE FUNCTIONS



Set Point



Switching On

When you first switch on, the display will show the edition of the software which your unit uses. For example software issue "F 1.00" would be shown.

This will display for 1 second then the actual block temperature will be indicated.

Set Point

When the **SET** button is pressed the set point LED illuminates.

The front panel controls consist of four push buttons and a five digit LED display.



Adjust Set Point

If the SET button is pressed and held for a few seconds the Adjust Set point LED illuminates. Then using just the UP or DOWN ARROW adjust the Set temperature.

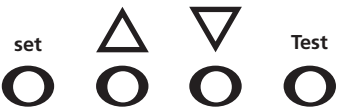
Speed of Change of Set Temperature

Each press of the UP ARROW or DOWN ARROW buttons will increase or decrease the set temperature by 0.1°C. If the buttons are held down the temperature change will accelerate to 5°C per second. Once adjustment has been made and following approximately 3 seconds the Adjust Set Point LED goes out and the unit returns to display the current block temperature. The unit will then heat to the Set point.



Display Units setting °C or °F

Press the set button 5 times and hold for a few seconds which will display U C or U F. Then use either the UP ARROW or DOWN ARROW buttons to select either °C or °F. The unit will return to the current block temperature display after a few seconds in the selected units.

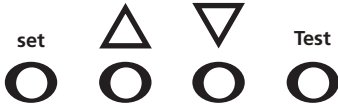


Heater LED

When the set temperature is higher than the block temperature this indicator will light. If the light is on continuously the block is getting constant power. The only exception is described in the section on the over-temperature cut-out operation. As the block temperature approaches the set point temperature the heater indicator will flash. When set temperature is reached the indicator will stay on for shorter periods.

SWITCH TEST INSTRUCTIONS

↓ Plateau



↓ Adjust (Plateau)



↓ Ramp rate C/min or F/min



↓ Adjust (Ramp rate)

**Switch test - Plateau Set Point**

To check the starting point (Plateau) for the initial temperature of the switch test. Press the Set button twice. The P set point temperature will be displayed. Values between 10 and 700°C can be set. Thermostats must not be connected to any other voltage sources during test.

SWITCH TEST - Adjust Plateau Set Point

To Adjust the Plateau temperature press the Set button twice and continue to hold until the LED shown illuminates. Then using just the UP or DOWN ARROW adjust the Plateau temperature value. Press the Set button once more to move on to the ramp rate.

SWITCH TEST - Ramp rate °C/minute or °F/minute

To check the Ramp rate for the switch test press the Set button three times. (If checking after adjusting the Plateau press the Set button once). The r value will be shown as here. Values can be set between 0.1 and 10.0°C/minute (or 0.1 and 18.0°F/minute).

SWITCH TEST - Adjust Ramp rate

To Adjust the Ramp rate press the Set button three times and continue to hold until the LED shown illuminates. Then using just the UP or DOWN ARROW adjust the ramp rate value. Press the Set button once more to move on to the Switch Test End point.

End point

**SWITCH TEST -End point**

To check the End point for the final set temperature of the switch test. Press the Set button four times. (If checking after adjusting the ramp rate press the Set button once). End point values must be higher than the Plateau set point values and can be set to 700°C.

Adjust (End point)

**Switch Test - Adjust End Point**

To Adjust the End point temperature press the Set button four times and continue to hold until the LED shown illuminates.

Then using just the **UP** or **DOWN ARROW** adjust the End point value. The End point value must be higher than the Plateau set point.

Note

Values set for all of the above will be retained after the unit is powered off.

RUN SWITCH TEST**Start Switch Test Program**

Once the P, r, E values have been set the Switch test can be started by pressing and holding the Test button for a few seconds. The display will show a flashing P and the current block temperature which will flash until the Plateau temperature is reached. When the Plateau temperature has stabilised the P will display continuously.

Then use the **UP ARROW** button to proceed to the next temperature with the controlled heating ramp rate.



Start Switch Test Ramping

The display will show a flashing r and the current block temperature which will increase in temperature at the selected ramp rate until either the switch contacts change state or the end temperature is reached. The heater LED will illuminate for differing periods depending on the value of ramp rate set.



Switch Test - valid test results

When the contacts close or open the current block temperature will be stored. The unit will also beep 3 times to signify the successful end of the test. The E illuminates to show the temperature at the change of Switch state. If the contacts are in the closed state to start the test the LED will go out at the change temperature and vice versa.



Switch Test - invalid test results

If the contacts do not change state during the Ramp period the End temperature will be reached and this display will be shown. The test can be re-run by pressing the Down Arrow.



Repeat Switch Test Program

Once the test has finished the test can be re-run by pressing the Down Arrow. The test will be repeated as above.

A digital display showing the letter 'P' followed by the number '1500'. The digits are in a seven-segment style.



A digital display showing the letter 'E' followed by the number '1800'. The digits are in a seven-segment style.



↓ Contacts Closed

A digital display showing the letter 'P' followed by the number '1800'. The digits are in a seven-segment style.

↓ Contacts Open

A digital display showing the letter 'P' followed by the number '2000'. The digits are in a seven-segment style.

Exit Switch Test Program

When in the Switch Test mode the test run may be stopped at any point by pressing the Set button. The unit will then return to the normal set point temperature.

RETRIEVE SWITCH TEST RESULTS

Switch Test Results

Once the test results have been taken they can be retrieved by pressing the Test button which will show the last result. This data is stored until the next Switch Test run has been completed.

Switch Contact Status

When in the Switch Test mode the Set LED shows the switch contact status. If the switch contacts are normally closed the LED will be on. If the contacts are normally open the LED will be off.

AFTER USE

When you have finished heating samples, remember that parts of the unit, inserts and associated accessories may be very hot. Take the precautions listed earlier. We recommend that the inserts should be allowed to cool to 70°C before being removed from the Tecal 700XS unit. They will still have to be handled with care.

If you need to remove an insert while it is hot, fit the extractor tool into the locating holes and lift the insert out carefully. Never leave the extractor tool in the insert while it is being used in the Tecal unit.

ADDITIONAL INFORMATION

Brief fault finding notes and lists of replacement parts, accessories and inserts for the Tecal are given in this section.

NOTE THAT THIS EQUIPMENT SHOULD ONLY BE DISMANTLED BY PROPERLY TRAINED PERSONNEL.

REMOVING THE OUTER COVERS EXPOSES POTENTIALLY LETHAL MAINS VOLTAGES.

THERE ARE NO OPERATOR SERVICEABLE PARTS WITHIN THE EQUIPMENT.

GENERAL ADVICE

In the unlikely event that you experience any problems with your Tecal which cannot be easily remedied, you should contact your supplier and return the unit if necessary.

Please include any details of the fault observed and remember to return the unit in its original packing. The slim insert block must be removed from the unit and packed separately within the case. Techne accept no responsibility for damage to units which are not properly packed for shipping: if in doubt, contact your supplier.

FAULT FINDING

HELP display

If HELP is displayed there is a problem with the internal sensing device. The cooling will come on and cool the unit down. The calibrator should be returned to your supplier for repair.

Over-temperature cut-out

The unit is fitted with an over-temperature cut-out. It will operate if a fault develops and the unit exceeds its maximum operating temperature. The cut-out will remove power to the heaters and return the unit to ambient temperature. The heater LED will still be illuminated continuously but the temperature displayed will decrease. If the cut-out has tripped it can be reset by switching the unit off, waiting a few seconds and then switching it on again to reset it.

If the unit is switched off and then switched on again quickly this may also cause the over-temperature cut-out to trip. If this occurs, turn the unit off, wait 5 seconds or more then switch it on again. Repeated tripping of the cut-out may indicate a fault and you should contact your supplier for more information.

Cleaning your Tecal unit

Before cleaning your unit, disconnect from the power supply and allow to cool to ambient temperature. You can clean the case of the Tecal with a cloth dipped in water or ethanol (methanol can also be used). No part of the case or cover should be immersed in the solvents.

Do not use acetone or abrasive cleaners.

Before using any cleaning or decontamination method except those recommended in this manual, the responsible body should check with Techne that the proposed method will not damage the equipment.

Fuses

If neither the power light nor display (on the front panel) is lit, one of the two fuses may have blown. Make sure there is no external cause (such as a faulty plug or lead).

Check both fuses and replace the faulty fuse with a new one of the correct value (fuse values are given on the label next to the power inlet). Fuses should only be changed by suitably qualified personnel. The holder for the two fuses is built into the mains input socket. First remove the power cable and then gently prise the fuse drawer open with a flat-bladed screwdriver or similar tool. Each fuse can be removed by using the screwdriver as a lever.

Exchange the faulty fuse in the fuse holder for a working fuse of the correct value. Finally, replace the fuse drawer in the fuse compartment and push the drawer shut.

If the fuses blow persistently, a serious fault is indicated and you should return the calibrator to your supplier for repair.

Never fit a fuse rated higher than the value indicated on the unit, serious damage or personal injury may result.

Insulation testing

This equipment is fitted with RFI suppression circuitry. Any check of the electrical insulation by means of high voltage dielectric testing (for example as in BS EN 61010-1) must be carried out using only a DC voltage.

This unit contains semiconductor components which may be damaged by electric field effects.

ACCESSORIES

The following parts may be purchased:-

Part N°	Description
FSC700X	Soft carrying case
FCAL700	Hard Carrying case
FDB00CP	Cooling probe for use in 10mm diameter or larger hole or 3/8"
FCALUSB	USB cable IP68 mini B to std A type

SLIM INSERT BLOCKS

Inserts are made from aluminium-bronze and must be ordered separately from the calibrator.
Each insert is stamped for identification.

A blank insert is available which may be drilled to suit your application.

Immersion Depth 152.4 mm or 6"

Number

Probe diameter

METRIC

FINS7100

Insert Block probe 10.0mm

FINS7080

Insert Block probe 8.0mm

FINS7060

Insert Block probe 6.0mm

FINS7045

Insert Block probe 4.5mm

FINS7030

Insert Block probe 3.0mm

BLANK

FINS7BLM

Metric blank

IMPERIAL

FINS7375

Insert Block probe 3/8"

FINS7312

Insert Block probe 5/16"

FINS7250

Insert Block probe 1/4"

FINS7220

Insert Block probe 7/32"

FINS7187

Insert Block probe 3/16"

FINS7125

Insert Block probe 1/8"

BLANK

FINS7BLI

Imperial Blank



Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.



UK Office

Keison Products,

P.O. Box 2124, Chelmsford, Essex, CM1 3UP, England.

Tel: +44 (0)1245 600560

Fax: +44 (0)1245 600030

Email: sales@keison.co.uk

Please note - Product designs and specifications are subject to change without notice. The user is responsible for determining the suitability of this product.