

TECAL 1200S

OPERATOR'S MANUAL



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INTRODUCTION

The Tecal 1200S is designed to provide an exceptionally stable and accurate heat source from between 150 and 1200°C 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 1200S accepts interchangeable insert blocks allowing many sizes of probes to be calibrated. The unit uses an R-type Thermocouple control sensor and a special heater design for optimum temperature uniformity and rapid heating rates. Heaters are semi-embedded in a vacuum formed light-weight refractory ceramic-fibre material which form a two-part heating assembly to achieve stable and uniform temperatures throughout the block.

A ceramic tube covers the entire test area of the furnace which insulates the isothermal block and test probes from the high-power heater windings. The ceramic tube supports the isothermal block and assists with homogeneity of temperature distribution.

The isothermal block assembly is machined from a special alloy giving excellent thermal conductivity and also resists high-temperature oxidation. This block is designed to optimize performance between sufficient mass for good stability and uniformity and to have a low enough mass to have rapid heating and cooling rates and good stabilisation periods.

The standard insert block has 4 test holes which accept Ø8mm probes x 80mm deep for use with a reference probe typically an R type thermocouple or an SPRT. We also offer a range of other interchangeable inserts blocks as detailed later in this manual.

This product offers a wide temperature range and enables high-temperature calibration routines to be carried out easily and affordably.

Typical applications are in the glass manufacturing, electrical power, automotive and material processing industries.

The Eurotherm 3216CC Controller features a dual LED display allowing operating parameters including the block temperature, 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.

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

The Tecal 1200S calibrator is designed to give the same as the actual display temperature as the test sensor in the block. If the unit is set to 1200°C and the display reads 1200°C and the calibration well is at 1200°C.

Before using the Tecal 1200S 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

Operator Safety

Please read this manual carefully before using the Tecal 1200S 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. 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.
- The ceramic materials used in furnace manufacture become electrically conductive to some extent at high temperatures. Also, there are partially exposed heating coils in the chamber. DO NOT use any conductive tools within the working area of the unit without isolating first.

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 1200S 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 by the handle in the upright position to prevent the insert blocks or ceramic insulators from being dropped and damaged.

Test probes and the Tecal 1200S insert 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 1200S 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 1200S Calibrator
- Calibration certificate
- Mains cable
- TechneWorks software on CD
- Guarantee card
- Allen key
- Insertion extraction tool

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 with the carrying handle 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.

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. For 230V units an RCD can be used to provide additional safety protection against fault conditions.

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

2. UK ONLY: The fused plug supplied with the mains cable is fitted with a 10 Amp fuse to protect the instrument and the user.
3. 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.
4. Plug the mains cable into the socket on the side of the instrument.
5. Place the unit on a suitable flat bench ensuring that the air inlet vents on the underside are free from obstruction.
6. Switch on the instrument next to the mains supply cable entry :

☒ mains switch On

☐ mains switch Off



Power Supply switch: when the Tecal 1200S is connected to the electrical supply and the switch made the neon illuminates



Heat Supply Neon: the neon illuminates when power is being supplied to the elements

Replacement cable

Should the mains lead need replacement, a cable of 1.5mm² of harmonized code H05VV-F should be used. **IF IN DOUBT CONSULT A QUALIFIED ELECTRICIAN.**

Working Conditions

The Tecal 1200S 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%
- 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's controller 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 paille 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 1.5 mm² au code harmonisé H05VV-F. 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:

- ☒ Netzschalter Ein
- ☐ Netzschalter Aus

Ersatzkabel

Bei einem eventuellen Austausch des Netzkabels wird ein Kabel vom Typ H05VV-F mit 1.5 mm². **IM ZWEIFELSFALL EINEN ELEKTRO-FACHMANN 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 keinster 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
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 sfiiati 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:

☒ Interruttore di rete Acceso

☐ Interruttore di rete Spento

Qualora occorra sostituire il cavo di rete, si dovrà utilizzare un cavo di 1.5 mm² codice armonizzato H05VV-F. **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 sobretensión. 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 1.5 mm² de código armonizado H05VV. **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.

CONTACT INFORMATION

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www.ippn.de

When contacting a Service Center for support, please have the following information available:

- Model Number
- Serial Number
- Voltage
- Description of the problem

TECAL 1200S SPECIFICATION

Temperature

Temperature range (min set point 10°C)	150°C to 1200°C
Temperature set point precision	0.1°C, °F, K (1° above 1000)
Display Accuracy	±3°C

Stability (in amb of 20°C) after 10-20 mins at temperature over 30 minute period

960 - 1200°C	±0.012°C
660 - 960°C	±0.017°C
420 - 660°C	±0.015°C
150 - 420°C	±0.035°C

Radial Uniformity (well to well in - standard insert A)

960 - 1200°C	±0.25°C
660 - 960°C	±0.2°C
420 - 660°C	±0.1°C
150 - 420°C	±0.03°C

Heating/Cooling Rate

Heating rate between 50°C and 1200°C	25 minutes
Cooling rate between 1200°C and 100°C	130 minutes

Well dimensions

Diameter x length	Ø34 x155mm
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Insert dimensions (80mm immersion depth)

Insert A (standard - supplied with unit)	Ø8 x 4 off
Insert B	Ø3, 4, 6 mm x 2 off each.
Insert C	Ø1/8", 1/4", 3/16", 5/16", 3/8"
Insert D	Ø3/16", 1/4", 3/8" x 2 off each
Insert E	Ø1/4" x 6 off

System

Fan cooling	Automatic
Communication	RS-232

Dimensions

Dimensions H x W x D	350 x 200 x 297 mm
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Weight

12kg / 24lbs

Power

Main Supply 230v ($\pm 10\%$) 50/60Hz	1625W
Main Supply 120v ($\pm 10\%$) 50/60Hz	1625W
The performance will vary and will not necessarily meet the above typical specification at the extremes of voltage.	

Fuse Rating

230v	10A
120v	16A

Standard NIST traceable cert

150, 420, 660, 960, 1200°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.

Carefully lower the insert block into the well and use the threaded tool to screw it lightly into place.

Then gently lower the insulation plug onto the relevant insert block.

Test Probes should be of the closest diameter possible to the selected insert while still allowing the probe to slide in and out easily. Insert to suit various probe sizes are available from Techne.

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

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

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

The power neon is ON whenever the furnace is connected to the supply.

Then turn ON the power switch on the front panel which supplies the control circuit. The display on the controller should illuminate and the fan start running. The controller initially goes through a short test cycle.

The display on the unit will show the current block temperature and heat or cool to the current set point.

The heater neon will illuminate when power is applied to the heater.

When the set point is entered the block may take 25 minutes to reach the set-point temperature depending on the set point value.

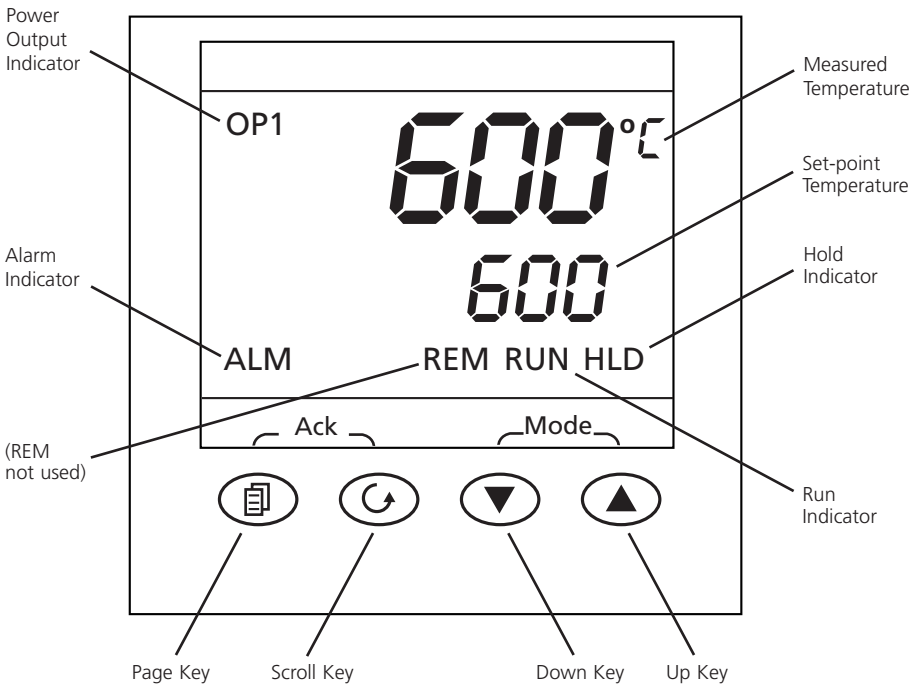
It may take a further 10 to 20 minutes to stabilise to within $\pm 0.5^{\circ}\text{C}$ of the set-point.

Ultimate stability may take 15 to 20 minutes more of stabilisation time.

General Operating Advice

The Heating element life is shortened by use at temperatures close to maximum. Do not leave the furnace at high temperature when not required.

CONTROLLER LAYOUT (HOME DISPLAY)



Keys

Page Key



The *Page* key is used to access level 2 when held down for 3 seconds.

Scroll Key



The *Scroll* key is used to scroll through the parameters.

ACK

Page + Scroll



When pressed simultaneously the ACK function is used to:

- Return to the Home Menu.
- Acknowledge timer end.
- Acknowledge an alarm if activated.

Arrow Keys



The arrow keys are used individually to adjust the selected parameters and in combination to run a program.

CONTROLLER TEST INSTRUCTIONS

When switched on, the controller goes through a short test routine and then shows the measured temperature (PV = Process Value) in the upper part of the display, and below it, the set temperature (Set Point).

Note: If a parameter is selected and no further action is taken, the display will time out and revert back to the home display in its working level after approximately 1 minute.

The Tecal 1200S has been set for Operation as a Simple Controller

When switched on, the controller goes through a short test routine and then shows the measured temperature (PV = Process Value) in the upper part of the display, and below it, the set temperature (Set Point).

Changing the Set Point

Press Up (▲) or Down (▼) to select the required SP. If the SP is higher than the measured temperature, the OP1 indicator will illuminate in the top left corner of the display, indicating that the controller is calling for power (giving an output).

The controller will immediately attempt to reach the set temperature and then maintain it.

The temperature range has 5 setting levels.

To enter the correct control RECIPE NO set in LEVEL 2 see **Understanding User Levels** section below.

Scroll to RECNO and set to which temperature range in operation.

RECNO 1 = 150°C

RECNO 2 = 450°C

RECNO 3 = 660°C

RECNO 4 = 960°C

RECNO 5 = 1200°C

Using the Controller

The parameters in the controller are first shown by a short code (mnemonic). After 5 Seconds a description of the parameter will scroll once along the display and then revert back to the mnemonic. The scrolling text can be interrupted at any time by a single press of any of the buttons, but will not scroll again until the parameter is returned to. In this manual the mnemonic will be shown first followed by the scrolling text in brackets;

e.g. WRK.OP <WORKING OUTPUT>

Understanding User Levels

There are two user levels in the controller; Level 1 (Operator) and Level 2 (Supervisor).

Level 1 (Operator) is for the day to day operation of the controller. These parameters are not protected by a security code.

Level 2 (Supervisor) provides access to additional parameters. Access to these is protected by a security code

To Enter Level 2

- 1 Press and hold the page key  for 3 seconds.
- 2 The display will show Leu 1 GOTO
- 3 Release the page Key 
- 4 Press the Up  or Down  to choose LEu 2 (level 2)
- 5 Press the Up  or Down  to enter the code (Level 2 Code = 9).

If the correct code is entered, the display show the level 2 home display.

If an incorrect code is entered the display reverts back to Level 1 home display

When level 2 operations have been completed, the supervisor must return to Level 1 either manually or by 'power cycling', there is no time out function.

To Return to Level 1

- 1 Press and hold the page Key 
- 2 Press Down  to select LEu 1

It is not necessary to enter a code when going from a higher level to a lower level when level 1 is selected; the display reverts to the home display at the start of the user operation section.

Table showing parameters accessible in level 1 and Level 2

Operator LEVEL 1	Supervisor LEVEL 2
Home display	Home Display
	Timer
	Timer Status
	Alarms (if configured)
	Current Transformer Input (if configured)
	Comms (if configured)
	Controller setup (if configured)
	Customer Calibration (if configured)

Tip

If while navigating the controller a parameter has been passed or you need to access parameters which would be at the end of a scroll list, press and hold Scroll  and use Up  to return to a previous parameter.

Setting up the controller

Before using the controller (or during its lifetime) certain parameters may have to be set, depending on specific requirements. To do this the controller must be set to supervisor level (Level 2).

Set Point Ramp Rate

To control the rate at which the temperature rises to setpoint, the SP.RATE function is used.

Before setting the ramp rate, it is advisable to set the setpoint to a low value, preferably 0°C. Once the ramp rate has been set the required setpoint can be entered from the home menu. Doing so will activate the ramp rate, which can be identified with the run indicator showing on the bottom of the display. While the ramp rate is active the working setpoint will be shown on the lower temperature display (This is the setpoint controlled by the ramp rate).

When the process temperature has reached the setpoint value at the given ramp rate, the run indicator will turn off and the instrument will control at the required Setpoint temperature.

Any further modifications to set point will cause the ramp rate to be activated and the instrument to control as described above.

NOTE: Ensure timer configuration is set to 'none' (Section 0) to use the setpoint ramp rate feature without any timer functions.

Press scroll  until the display shows SP.Rate <setpoint rate limit>.

Using Up  and Down  select the ramp rate required, in °C/Min.

To check the Setpoint during ramping press the Up  and Down  once.

To cancel the ramp rate, the SP.Rate <setpoint rate limit> must be set to OFF.

Units

Press scroll  until the display shows units <Display Units>. Using the Up  and Down  select the required units.

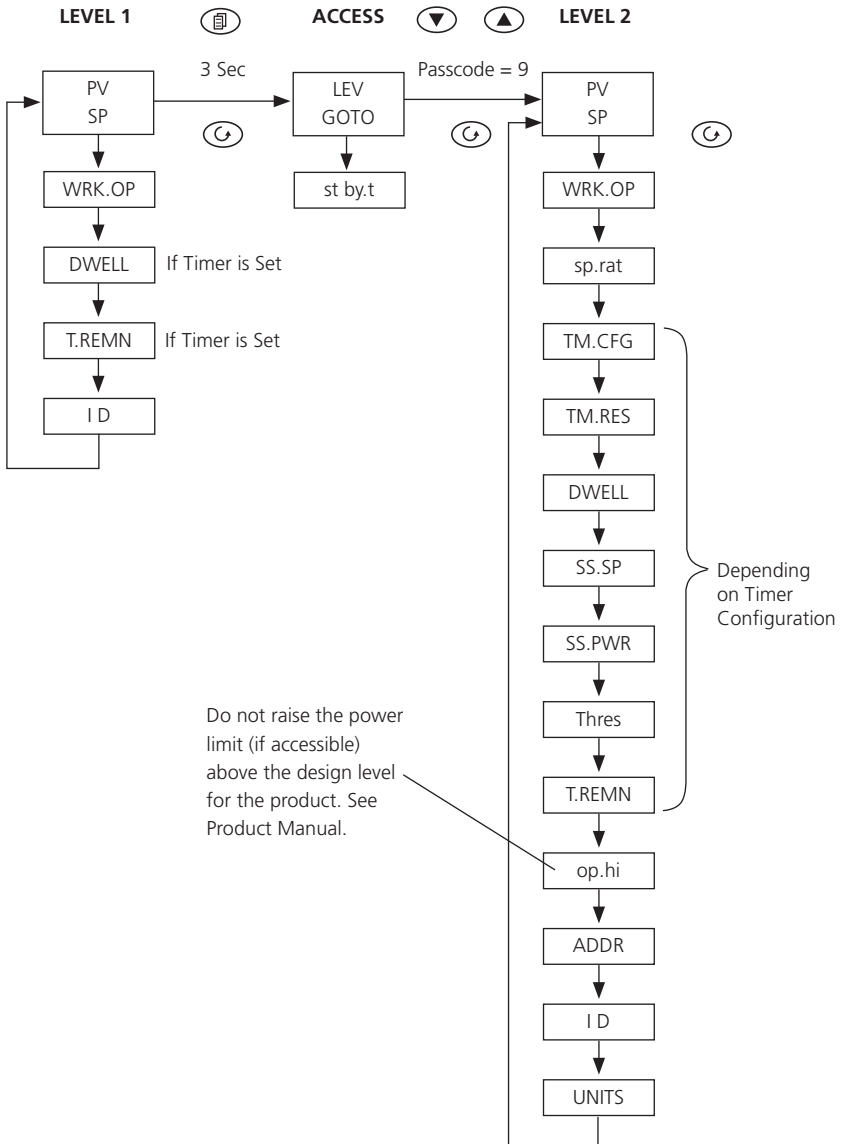
Mnemonic	Description
NonE	No units (Default °C)
°C	Celsius
°F	Fahrenheit
°K	Kelvin
PErc	%

Options

The full Eurotherm manual may be required to determine customer parameter settings. To reveal or hide parameters in the controller it is necessary to go into configuration modes and enter security codes.

Navigation Diagram

3216CC



Controller Fault

Fault Code Diagnostic Table

Error Code	Explanation	Actions
S.br	Temperature sensor failure	Replace the Temperature Sensor

Glossary of Terms

Process Value (PV)	The actual temperature of the Tecal 1200.	°C
Setpoint (SP)	The target temperature the Tecal 1200 is trying to reach.	°C
SP Ramp Rate	The speed at which the furnace or oven is allowed to heat up or cool down.	°C/Min
Control Setpoint	The temperature that can be directly set into the controller using the Up and Down keys	
Element	The heating device used in the unit.	
Thermocouple	The temperature-measuring device used in the unit	
PID	Proportional Integral Derivative: the control system used by the controller.	
Overtemperature (O/T)	The condition which a furnace or oven may enter if part of the main control circuit fails.	
Overtemperature Protection	A system to prevent the product or process being damaged if it has gone into an overtemperature condition.	
Ramp/Dwell Pairs	A Program is split up into segments, each segment. Contains a Ramp and a dwell.	
Program	A sequence of stored Parameters set by the operator, which will run automatically when started.	
Latched Alarm	Will hold the alarm condition once it has been detected.	
Non-Latching Alarm	Will reset itself when the alarm condition is removed.	
Power Cycling	The Power to the controller is turned off and then back on.	

RUNNING THE TECAL 1200S FROM A PC

The Tecal 1200S can be run from a PC using our TechneWorks software. This software is available free of charge to download from the Techne web-sites at www.techne.com or www.techneusa.com.

Connecting the unit to the computer using an RS-232 cable

When connecting The Tecal 1200S to a PC for the first time using the RS-232 connection Technetworks includes a help file giving full instructions for use with the Tecal.

If the RS232 option is supplied, then the Tecal 1200 is fitted with 9 way D-socket connected to the controller communications (comms) module. The Tecal 1200 is suitable for direct connection to a personal computer, using a "straight through" cable as follows (the linked pins at the computer end are recommended but may not be necessary). The cable is usually 9-pin at the furnace end and 9-pin at the computer, but other alternatives are shown in parentheses.

Tecal 1200S end of cable female 9-pin (25-pin)			RS232 Cable: Tecal 1200S to PC	Computer end of cable 9-pin (25-pin) male		
Rx	3	(2)	_____	3	(2)	Tx
Tx	2	(3)	_____	2	(3)	Rx
Com	5	(7)	_____	5	(7)	Com
				7,8	(4,5)	Link together
				1,4,6	(6,8,20)	Link together

Comms Address

Typically the comms address is set to 1, but this can be changed.

To change the address value access the level 2 list. In level 2 press the scroll key  until the ADDR (ADDRESS) parameter is displayed. Use the Up  Down  to select the address value.

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 100°C before being removed from the Tecal 1200S unit. They will still have to be handled with care.

INSERT BLOCK REMOVAL

If you need to remove an insert while it is hot, first remove the ceramic top insulator, then use the allen key supplied to loosen the insert block and then screw the extractor tool into the threaded hole and lift the insert out carefully.

Never leave the extractor tool in the insert while it is being used in the Tecal unit.

The ceramic top insulator must be in place when operating the 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 / FAULT FINDING

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 **insert block** and **ceramic insulator 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.

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

The Tecal 1200 should be connected to an HRC Fused and Isolated supply rated at 10A for 230v or 16A for 120v.

If neither the power light nor display (on the front panel) is lit check that there is no external cause (such as a faulty plug or lead).

Should 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.

Safety Warning – Disconnection from Supply

Always ensure that the furnace is disconnected from the supply before repair work is carried out.

Safety Warning - Refractory Fibrous Insulation

This unit contains refractory fibres in its thermal insulation. These materials may be in the form of fibre blanket or felt, vacuum formed board or shapes, mineral wool slab or loose fill fibre.

Normal use of the furnace does not result in any significant level of airborne dust from these materials, but much higher levels may be encountered during maintenance or repair.

Whilst there is no evidence of any long term health hazards, we strongly recommend that safety precautions are taken whenever the materials are handled.

Exposure to dust from fibre which has been used at high temperatures may cause respiratory disease.

When handling fibre always use an approved mask, eye protection, gloves and long sleeved clothing.

Avoid breaking up waste material. Dispose of waste fibre in sealed containers.

After handling rinse exposed skin with water before washing gently with soap (not detergent). Wash work clothing separately.

Before commencing any major repairs we recommend reference to the European Ceramic Fibre Industry Association Bulletin No. 11 and the UK Health and Safety Executive Guidance Note EH46.

We can provide further information on request.

REPLACEMENT PARTS

Each unit is supplied with a mains cable. The following parts may be purchased if replacements or alternatives are required.

FCAB12UK	Tecal 1200S Mains cable, 230V UK units
FCAB12EU	Tecal 1200S Mains cable, 230V European units
FCAB12US	Tecal 1200S Mains cable, 120/100V units

ACCESSORIES

The following parts may be purchased:

Part N°	Description
FCAL1200	Hard Carrying case
FDB00CP	Cooling probe for use in 10mm diameter or larger hole or 3/8"
6104266	RS-232 cable

INSERT BLOCKS Ø34 x 155mm long - Immersion Depth 80 mm

Inserts are made from a specialist alloy and alternatives bores may be ordered separately from the calibrator. Each insert is stamped for identification.

Insert block

NUMBER	PROBE DIAMETER
FINS1200A	Insert Block probe 4x Ø8.0mm (Standard insert) Included with the unit
FINS1200B	Insert Block probe 2xØ3mm, 2 x Ø4mm, 2 x Ø6mm
FINS1200C	Insert Block probe Ø1/8", Ø1/4", Ø3/16", Ø5/16", Ø3/8"
FINS1200D	Insert Block probe 2xØ3/16", 2xØ1/4", 2xØ3/8"
FINS1200E	Insert Block probe 6x Ø1/4"

Ceramic Top insulator

NUMBER	PROBE DIAMETER
FCER1200A	Insulator A for block 4 x Ø8.0mm (Standard insert) Included with the unit
FCER1200B	Insulator B for block 2 x Ø3mm, 2 x Ø4mm, 2 x Ø6mm
FCER1200C	Insulator C for block Ø1/8", Ø1/4", Ø3/16", Ø5/16", Ø3/8"
FCER1200D	Insulator D for block 2 x Ø3/16", 2 x Ø1/4", 2 x Ø3/8"
FCER1200E	Insulator E for block 6 x Ø1/4"

If you require further technical or application assistance please contact Bibby Scientific Ltd at:
technehelp@bibby-scientific.com

For servicing information please contact: **service@bibby-scientific.com**

We are continually striving to improve our Tecal Dri-block calibrators and software.

If you have any comments and suggestions on how we can do things better please send them to us at:
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