

Innovative Metrology PRESYS®



PRESYS Instruments, since 1989 is specialized in manufacturing Process Control and Calibration Products. Located in Sao Paulo, Brazil with a branch in Miami, USA, **PRESYS** also has worldwide distributors network.

Full solutions for Temperature, Pressure and Electrical Signals are available, **PRESYS** manufactures all the Calibrators, Softwares and the Calibration Cell®.

PRYMELAB is the **PRESYS** Metrology Laboratory accredited by CGCRE according to ISO/IEC 17025 standard. CGCRE is Signatory of the ILAC Mutual Recognition Arrangement.



www.presyscorp.com

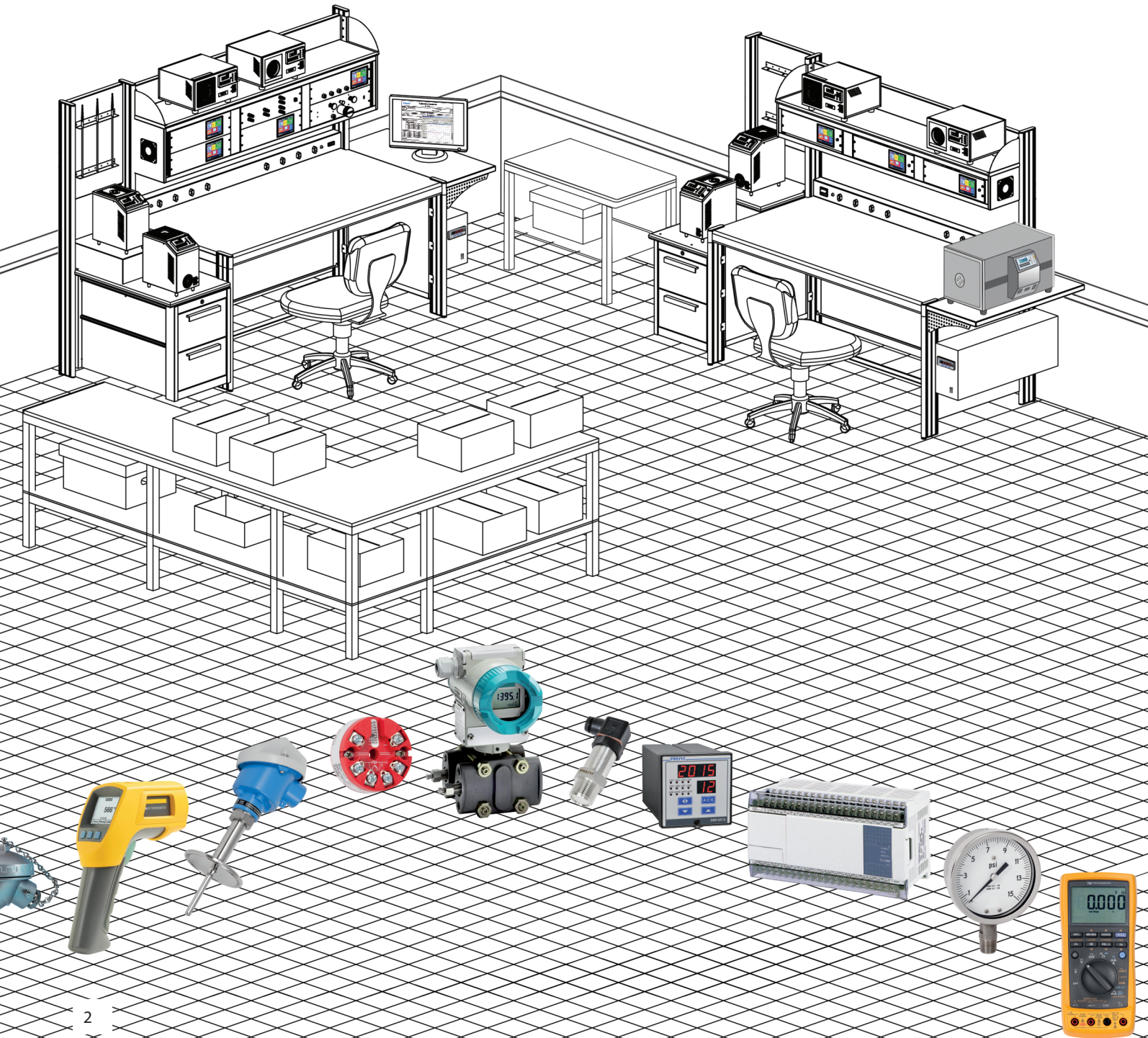
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Calibration Cell

"The ability to calibrate better at lower costs"



"An Open Platform for Innovative Metrology"

Presys **Calibration Cell**[®] is an Integrated Modular with Calibrators that communicate with each other, with Isoplan[®] Software and applications that can be made using ".NET" tools. It also offers several "smart / web" technology features as remote software upgrade of the calibrators and technical support via teleconference. It helps companies to organize better the calibration services, producing, in a user friendly way, compliant certificates, at lower costs.



★ Process Signals Module



Integrated Modular Calibrators:

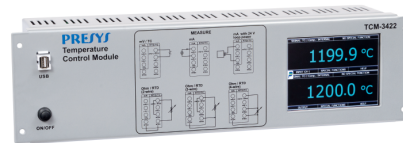
Pressure, temperature, electric signals, or tailored to specific customer needs.

All the Calibrators have portable versions, for field use.

★ Precision Thermometer Module



★ Temperature Control Module



★ Communication Protocol Module



★ Pressure Meter Module



★ Pressure Control Module



■ Multi Level Information System, covering all the aspects of managing and automating the calibration process.

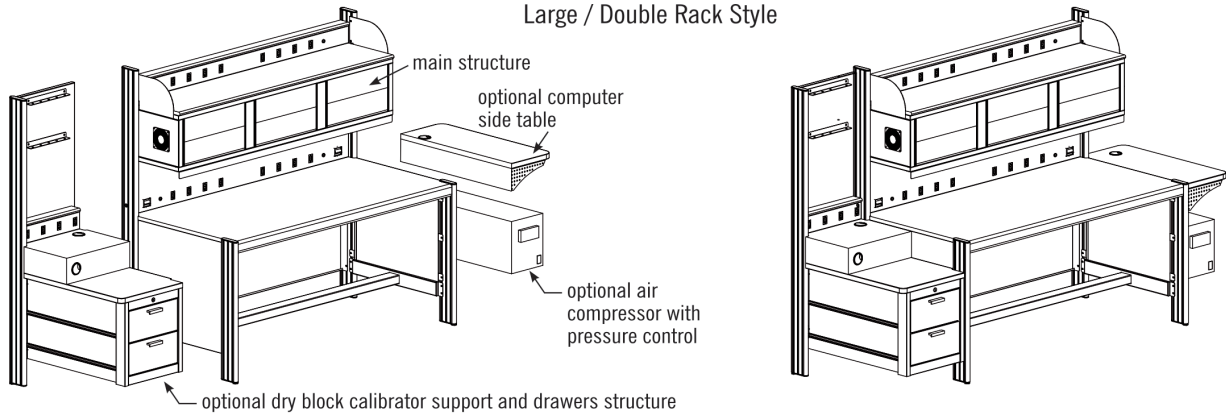
■ .Net user or factory made plugins.

```
namespace Presys.Calibrators.MasterCal.UI
{
    internal class PressureGenerator
    {
        private Thread _listenerThread;
        private Presys.Calibrator.Network.NetworkConnect.Listener _listener;
        private String _ip;
        private String _inputValue;
        /*Comm events*/
        internal event EventHandler<EventArgs> ValueChanged;
        internal event EventHandler<EventArgs> Connlost;
        internal String SetInput
    }
}
```

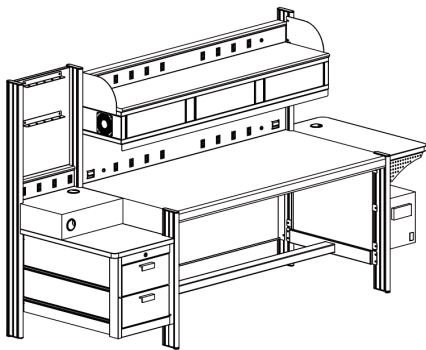
■ Common Information Infrastructure: Ethernet, Wireless, USB, TCP/IP
 Built-in Web Server, Modbus, Hart®, Profibus®, Foundation™ Fieldbus.

Calibration Cell, Styles:

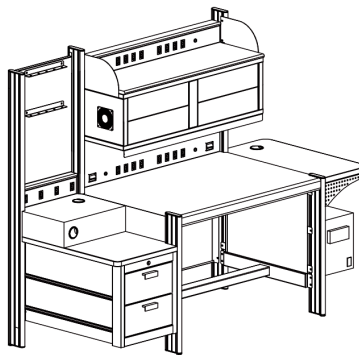
Large / Double Rack Style



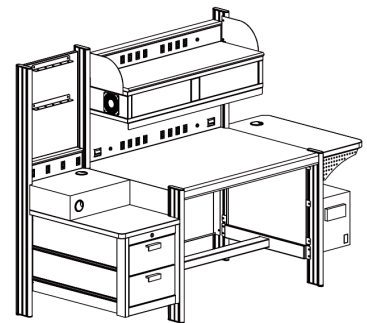
Large / Single Rack Style



Small / Double Rack Style



Small / Single Rack Style



Visit: www.calibrationcell.com

PSV STATION

Calibration and Test Workstation for Pressure Safety/Relief Valves and Pilot Operated Valves

The **PRESYS** PSV Workstations are a family of transportable, compact, digital, and easy to operate stations for the testing and calibration of all sorts of Pressure Safety/Relief Valves in the range of ½" – 10" and up to 5,000 psig (350 bar).

PRESYS PSV Workstations feature a unique digital registration system that allows the automatic detection of the set pressure and the reseating pressure.

The Workstations communicate with the Isoplan® Calibration software to produce complete documented calibration and test reports.

Visit: www.psvstation.com



STANDARD FEATURES

- Three models with maximum pressures up to 5000 psig.
- Low pressure system for pilot operated valves.
- Polycarbonate safety shield for operator protection.
- Accept threaded and flanged valves up to 10".
- Accurate digital pressure recorder.
- Bubble counter and adapter for leak detection and measuring.
- Easy-to-use control panel.
- Reduced pressure lost.
- Manual clamping system.
- Communicate with ISOPLAN® to produce calibration and test reports.
- Compact Dimension: 1.12 (h) x 0.70(w) x 1 (l) meter, 220 kg, total height with protection: 1.90 m.
- Skid-mounted for easy transportation or installation in containers.

PRESYS		Calibration Certificate								
		N°002/2014								
COMPANY: Presys Instruments		REG N: 12898	PSV1							
INSTRUMENT: SAFETY VALVE		TAG:	12 Months							
FUNCTION: BOILER PROTECTION		CALIBRATION PERIOD:								
SECTOR: PLANT/BOILER		PROC.: 001								
CRITICALITY: A										
O.S.: SAP003										
TECHNICAL INFORMATION										
Manufacturer: CROSBY		Diameter: 10"								
Model: OMNI TRIM										
CALIBRATION AND ADJUSTMENT										
STRATEGY: 1										
INPUT RANGE: Pressure PSV 0,0 to 6,0 (kgf/cm2)		OUTPUT RANGE: Pressure PSV 0,0 to 6,0 kgf/cm2								
INITIAL CALIBRATION										
	Reference (kgf/cm2)	Reading 1 (kgf/cm2)	Average (kgf/cm2)	Error (kgf/cm2)	Blowdown (%)	U (kgf/cm2)	k	Accep crit. (kgf/cm2)		
RESEATING PRESSURE	4,9	4,2	4,2	-0,7	14,29	0,1	2,000	0,5		
SET PRESSURE	5,0	4,9	4,9	-0,1		0,1	2,000	0,2		
SEAT TIGHTNESS:		BELLOW INTEGRITY:								
FINAL CALIBRATION										
	Reference (kgf/cm2)	Reading 1 (kgf/cm2)	Reading 2 (kgf/cm2)	Reading 3 (kgf/cm2)	Average (kgf/cm2)	Error (kgf/cm2)	Blowdown (%)	U (kgf/cm2)	k	Accep crit. (kgf/cm2)
RESEATING PRESSURE	4,9	4,3	4,3	4,2	4,3	-0,8	16,34	0,1	2,121	0,5
SET PRESSURE	5,0	5,0	5,1	5,1	5,1	0,1		0,1	2,121	0,2
COMMENTS:										
- Used Norm : ASME Section VIII (Gas)										
- Used Fluid : Air										
CALIBRATION CONDITIONS										
LOCATION : LABORATORY										
USED STANDARDS										
Model: PSV-350BAR N.S.: PSV350 N. Cert.: R4286.103 Next. Calib.: 07/10/2014 Scale: Pressure PSV bar/ E/S:(E)										
MAINTENANCE TYPE AND FAILURE CODE										
007- Valve cleaning and adjust										
CALIBRATION DATE : 11/12/2013					NEXT CALIBRATION : 11/12/2014					
COMMENTS										
SAFETY VALVE - Final Calibration 1			SAFETY VALVE - Final Calibration 2			SAFETY VALVE - Final Calibration 3				

The set pressure and reseating pressure are automatically registered and display on the digital pressure registration system and can be send in real-time to the ISOPLAN® Software.

ISOPLAN® calibration software allows you to record all your safety valves technical information and calibration operations in a strong database in order to meet your safety regulations.

It will generate the full calibration report that will include the calibration graphics, calculation of blowdown, photos of the valve before and after maintenance as well as any technical relevant information.

PRESYS PSV workstation is delivered in a seaworthy packing and we provide installation and training on-site on request.

PRESYS products are developed in a technology context combining high quality and reliability, using a continuous improvement process. With a global presence in most regions of the world, directly or with specialized and trained distributors, **PRESYS** provides you with the right solution for you application or calibration needs, always benefiting of our entire technical support.



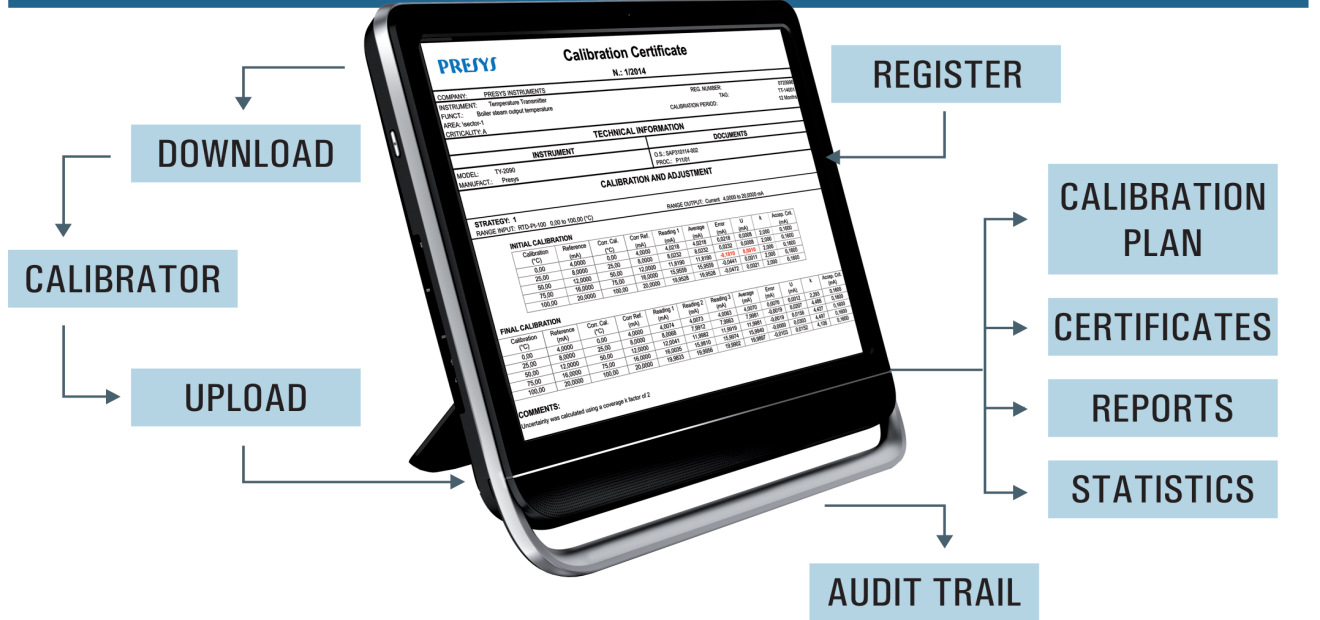
Calibration Software

ISOPLAN-5 ISOPLAN Calibration and Management System.

The Calibration Automation and Management System, comprised by ISOPLAN software, Calibration Station and Presys Calibrators, is designed to meet the requirements of execution and management of instruments calibrations. It offers: Reliability, Security, Compliance, Productivity and Flexibility.

- Meets ISO/IEC 17025 requirements.
- Allows instruments registration, tags, calibration standards, factory areas.
- Calibration management with calibration frequency monitoring.
- Retrieval of calibration history.
- Statistical control of calibrations and hours of work, through reports and charts.
- Issues of Calibration Certificates as well as calibration scheduling plan and worksheets.
- Automatic and manual downloads / uploads.
- Due date calibration alarms of instruments and standards.
- Enables calibration datasheets export in Excel spreadsheets.
- Database format: Access, SQL Server or Oracle.
- Company Logo and certificate customization.
- Error versus time chart.
- Chart of the calibrations distribution through the year.
- Calibration plan, annual / biannual / monthly and also by factory area option.
- Flagging for inactive instruments and standards.
- Calibration certificate and failures numbering.
- Automatic calculation of the expanded uncertainty for two or more standards.
- Registration and management of failures and occurrences.
- User level to control access profile.
- Calibration control for external laboratories.
- Calibration of pressure switch, thermostitch etc.
- Possibility of adding instrument and the tag photos to the register.
- Filters for advanced search with different criteria of selection for the records and calibrations results.
- Several optional modules available.

Isoplan-5 General Diagram

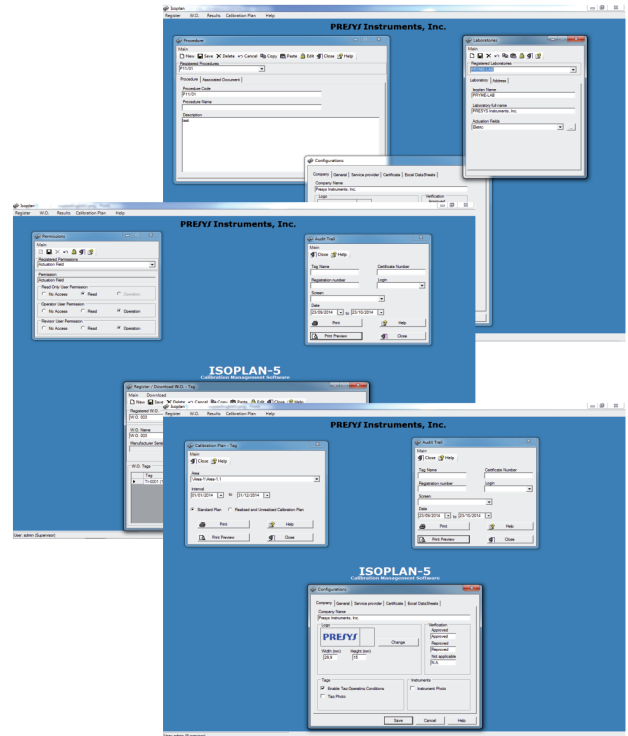


Order Code

- Isoplan - 5A + Optional Modules ("Access" Database)
- Isoplan - 5S + Optional Modules ("SQL Server" Database)
- Isoplan - 5O + Optional Modules ("Oracle" Database)

PRESYS Calibration Certificate		N.: 1/2014								
COMPANY: PRESYS INSTRUMENTS		REG. NUMBER: 072009								
INSTRUMENT: Temperature Transmitter		TAG: TT14001								
FUNCTION: Boiler steam output temperature		CALIBRATION PERIOD: 12 Months								
AREA: Sector-1		CERTIFICATA: A								
TECHNICAL INFORMATION										
MODEL: TY-2000		O.S.: SAP10114-002								
MANUFACT.: Presys		PRECIS.: P1101								
CALIBRATION AND ADJUSTMENT										
STRATEGY: 1										
RANGE OUTPUT: RTD-Pt-100 0.00 to 100.00 (°C)										
RANGE OUTPUT: Current: 4.0000 to 20.0000 mA										
INITIAL CALIBRATION										
Calibration (°C)	Reference (mA)	Corr. Cal. (mA)	Corr. Ref. (mA)	Reading 1 (mA)	Reading 2 (mA)	Average (mA)	Error (mA)	U (mA)	k	Accept. Crt.
0.00	4.0000	0.00	4.0000	4.0218	4.0218	4.0218	0.0008	2.000	0.1600	Pass
25.00	8.0000	25.00	8.0000	8.0252	8.0252	8.0252	0.0008	2.000	0.1600	Pass
50.00	12.0000	50.00	12.0000	11.9190	11.9190	-0.1110	0.0111	2.000	0.1600	Pass
75.00	16.0000	75.00	16.0000	15.9559	15.9559	-0.0441	0.0011	2.000	0.1600	Pass
100.00	20.0000	100.00	20.0000	19.9528	19.9528	-0.0472	0.0021	2.000	0.1600	Pass
FINAL CALIBRATION										
Calibration (°C)	Reference (mA)	Corr. Cal. (mA)	Corr. Ref. (mA)	Reading 1 (mA)	Reading 2 (mA)	Average (mA)	Error (mA)	U (mA)	k	Accept. Crt.
0.00	4.0000	0.00	4.0000	4.0218	4.0218	4.0218	0.0008	2.000	0.1600	Pass
25.00	8.0000	25.00	8.0000	8.0252	8.0252	8.0252	0.0008	2.000	0.1600	Pass
50.00	12.0000	50.00	12.0000	12.0044	11.9962	11.9961	-0.0019	0.0207	4.485	0.1600
75.00	16.0000	75.00	16.0000	15.9510	15.9490	-0.0060	0.0063	4.487	0.1600	Pass
100.00	20.0000	100.00	20.0000	19.9833	19.9892	19.9897	-0.0103	0.0152	4.158	0.1600
COMMENTS: Uncertainty was calculated using a coverage k factor of 2										
CALIBRATION CONDITIONS										
LOCATION: Calibration Laboratory										
HUMIDITY: 50-75% PRESS.: 1 atm TEMPERATURE: 23 °C										
USED STANDARDS										
Model: MCS-XV4 S.N.: MCSRV. Cert. N.: R002.01.14. Next Calib.: 15/01/2015. Sub-Model: PH-100 (°C) (V.O.)										
Model: MCS-XV4 S.N.: MCSRV. Cert. N.: L000.03.12. Next Calib.: 15/03/2015. Sub-Model: CHA-100 (V.O.)										

Calibration Plan - Tags		Page: 1/2	
Area: Area-5	Features	Month: 03-2013	Model
TT-14002	Auxiliary Temperature 2	Last Calibration: 11/03/2013	Reg. No.: 072009
Area: Area-2	Features	Month: 05-2013	Model
SI-001	Temperature Indicators	Last Calibration: 24/11/2012	Reg. No.: 05256
Area: Area-00000	Features	Month: 07-2013	Model
SI-004	Validation	Last Calibration: 30/07/2013	Reg. No.: M033293
Area: Area-1	Features	Month: 09-2013	Model
TT-14002	Auxiliary Temperature 2	Last Calibration: 11/03/2013	Reg. No.: 072009
Area: Area-2	Features	Month: 11-2013	Model
TT-14002	Auxiliary Temperature 2	Last Calibration: 24/11/2012	Reg. No.: 072009
Area: Area-00000	Features	Month: 11-2013	Model
SI-001	Validation	Last Calibration: 24/11/2012	Reg. No.: 05256



ISOPLAN-5 - Optional Modules

"Dsh" MODULE

Datasheet

- Recommended to create instruments datasheet.
- Configurable table format datasheet, where the user enters data in order to store technical information for registered instrument.

- Recommended for users who perform several collections of calibration data and prefer not to use paper.
- Ideal to eliminate transcription errors, improve performance and volume of calibration data.
- Also indicated for data collection with Netbooks, Palms, Tablets and other devices aimed at calibration data quickly and safely.

"ESS" MODULE

Data Acquisition Handheld Devices

"UL" MODULE

User level

- Recommended for companies that have many Isoplan Software users. with different access profiles.
- Ideal for labs with 03 or more technicals.
- Has user profile registration and allows safer use to Isoplan.

- Recommended for execution of Loop Calibrations.
- Enables the registration of various components of the loop, performing the summation of the uncertainties involved.
- Ideal for optimizing calibrations of different frequency calibrations of the instruments.

"LM" MODULE

Loop Calibrations

"ES" MODULE

Electronic Signature

- Recommended for companies that want to reduce the flow of paper and printing.
- Enables the signing of certificates and documents through login and password.
- Allows configuration of the number of signatures on a certificate.
- Ideal to optimize the flow of documents between the technical and supervision.

- Recommended for Calibration areas that want to include in Isoplan the number of the procedure and the entire description of the task.
 - Indicated to prevent use incorrect procedures, and the use of outdated procedures.
- Ideal for companies that want to control procedures as well as basic procedural descriptions of important quantities.

"PDC" MODULE

Procedures

"AT" MODULE
Audit Trail

- Recommended for companies which have audits of their computerized systems and electronic records.
- Issue of a complete report with all keystrokes involving a TAG and / or related to an instrument calibration made by the user.
- Enables verification and provides a complete audit trail of Isoplan use.

"SP" MODULE
Service Provider

- Recommended for service companies.
- Enables the registration of clients with total separation of the database.
 - Ideal for customers managing calibrations of provided services.
 - Allows you to create individual calibration plans.

"PSV" MODULE
Security Valves Calibration

- Recommended for companies that perform PSV - Safety Valves calibrations. It records the "POP" and calculates the blowdown.
- Creates PSV calibration chart and allows inclusion of pictures of the security valves during calibration and adjustment steps.
- Ideal to meet NR13 requirements.

"FDA" MODULE
**Meets FDA - 21 CFR - Part 11 requirements;
 Electronic Signature;
 Audit Trail;
 Loops;
 Datasheet.**

- Recommended for Pharmaceutical companies and companies which have audits and inspections of national and international bodies.
 - This module has Electronic Signature - "ASE" "AT" - Audit Trail, "ML" - Loop Calibration and "DSH" - Datasheet Modules.
 - Ideal to meet standards requirements and make the software ready for a full validation in accordance with FDA requirements.

MVP - Master Validation Plan
Requirements Documentation of users, tests of Installation Qualification, Operation Qualification and Performance Qualification.

- Set of documents composed of:
 - User Requirements
 - Installation Qualification (IQ)
 - Operation Qualification (OQ)
 - Performance Qualification (PQ)
- Ideal for companies which need to "validate" their computerized systems and meet standard requirements.
- Can be supplied in accordance with the modules acquired.



Universal Process Calibrator MCS-XV

- 5.7" Touchscreen Display.
- Up to four pressure sensors.
- e-Connected: Ethernet, Wi-Fi, Pen-drive, Hart, Profibus*, Fieldbus Foundation*, Modbus and USB Host/Device.
- Operates all the signals of Instrumentation / Control Process.
- Data Logger function for acquisition and registration of the measurements and visualization in chart.
- Hart Full Configurator (optional).
- Online update of new software versions.
- Friendly user interface with help menu which shows the wiring diagram, technical videos storage and language setting.

The MCS-XV Calibrator operates all signals used in Instrumentation and Process Control, in addition it can be provided with up to four positions for pressure measurement. RTD inputs have internal algorithms that calculate temperatures using Callendar-Van Dusen and ITS-90 coefficients, among other international temperature tables. The MCS-XV also works as a Hart Full configurator (optional), which configures all available Hart® devices. It has an integrated DD file interpreter (Device Description).

The Data-Logger option allows data acquisition/ storage function to the calibrator, generating charts and reports from the records. The task function allows the user to create and save calibration procedures that can be performed whenever necessary. MCS-XV incorporates concepts of automatic calibration with management software, especially the Isoplan® Software, such as issuing reports and certificates, task management, calibration data organization and archiving.

* Check availability.

Specifications - Inputs

Input Ranges	Resolution	Accuracy	Remarks	
milivolt	-150 to 150 mV	0.001 mV	$\pm 0.01\%$ FS ***	$R_{input} > 10\text{ M}\Omega$
	-500 to -150 mV	0.01m V	$\pm 0.02\%$ FS	auto-range
	150 to 2450 mV	0.01m V	$\pm 0.02\%$ FS	
volt	-10 to 45 V	0.0001 V	$\pm 0.02\%$ FS	$R_{input} > 1\text{ M}\Omega$
mA	-5 to 24.5 mA	0.0001 mA	$\pm 0.02\%$ FS	$R_{input} < 120\ \Omega$
resistance	0 to 400 Ω	0.01 Ω	$\pm 0.01\%$ FS	Excitation current 0.85 mA
	400 to 2500 Ω	0.01 Ω	$\pm 0.03\%$ FS	auto-range
frequency*	0 to 600 Hz	0.01 Hz	$\pm 0.04\text{ Hz}$	$R_{input} > 50\text{ k}\Omega$
	600 to 1300 Hz	0.1 Hz	$\pm 0.2\text{ Hz}$	Voltage DC _{maximum} = 30 V
	1300 to 5000 Hz	1 Hz	$\pm 2\text{ Hz}$	AC Signal from 0.3 to 30 V auto-range
counter*	0 to 10 ⁸ – 1 count	1 count	—	Same remark as frequency Pulse frequency < 3000 Hz
Pt-100	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.1\text{ °C} / \pm 0.2\text{ °F}$	IEC-60751
Pt-1000	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	$\pm 0.1\text{ °C} / \pm 0.2\text{ °F}$	IEC-60751
Cu-10	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	$\pm 2.0\text{ °C} / \pm 4.0\text{ °F}$	Minco 16-9
Ni-100	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	$\pm 0.2\text{ °C} / \pm 0.4\text{ °F}$	DIN-43760
Probe**	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.1\text{ °C} / \pm 0.2\text{ °F}$	IEC-60751
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	$\pm 0.2\text{ °C} / \pm 0.4\text{ °F}$	IEC-60584
TC-K	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	$\pm 0.5\text{ °C} / \pm 1.0\text{ °F}$	IEC-60584
	-150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	$\pm 0.2\text{ °C} / \pm 0.4\text{ °F}$	
TC-T	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	$\pm 0.6\text{ °C} / \pm 1.2\text{ °F}$	IEC-60584
	-200 to -75 °C / -328 to -103 °F	0.1 °C / 0.1 °F	$\pm 0.4\text{ °C} / \pm 0.8\text{ °F}$	
	-75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	$\pm 0.2\text{ °C} / \pm 0.4\text{ °F}$	
TC-B	50 to 250 °C / 122 to 482 °F	0.1 °C / 0.1 °F	$\pm 2.5\text{ °C} / \pm 5.0\text{ °F}$	IEC-60584
	250 to 500 °C / 482 to 932 °F	0.1 °C / 0.1 °F	$\pm 1.5\text{ °C} / \pm 3.0\text{ °F}$	
	500 to 1200 °C / 932 to 2192 °F	0.1 °C / 0.1 °F	$\pm 1.0\text{ °C} / \pm 2.0\text{ °F}$	
	1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F	$\pm 0.7\text{ °C} / \pm 1.4\text{ °F}$	
TC-R	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	$\pm 1.0\text{ °C} / \pm 2.0\text{ °F}$	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	$\pm 0.7\text{ °C} / \pm 1.4\text{ °F}$	
TC-S	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	$\pm 1.0\text{ °C} / \pm 2.0\text{ °F}$	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	$\pm 0.7\text{ °C} / \pm 1.4\text{ °F}$	
TC-E	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	$\pm 0.3\text{ °C} / \pm 0.6\text{ °F}$	IEC-60584
	-150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	$\pm 0.1\text{ °C} / \pm 0.2\text{ °F}$	
TC-N	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	$\pm 1.0\text{ °C} / \pm 2.0\text{ °F}$	IEC-60584
	-200 to -20 °C / -328 to -4 °F	0.1 °C / 0.1 °F	$\pm 0.4\text{ °C} / \pm 0.8\text{ °F}$	
	-20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	$\pm 0.2\text{ °C} / \pm 0.4\text{ °F}$	
TC-L	-200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	$\pm 0.2\text{ °C} / \pm 0.4\text{ °F}$	DIN-43710
TC-C	0 to 1500 °C / 32 to 2732 °F	0.1 °C / 0.1 °F	$\pm 0.5\text{ °C} / \pm 1.0\text{ °F}$	W5Re / W26Re
	1500 to 2320 °C / 2732 to 4208 °F	0.1 °C / 0.1 °F	$\pm 0.7\text{ °C} / \pm 1.4\text{ °F}$	

(*) Function only available when the frequency output is not configured.

(**) Probe is a separate input for reference RTD in order to be used as a thermometer. The mentioned accuracy is related only to MCS-XV input.

(***) FS = Full Scale.

Specifications - Outputs

Output Ranges		Resolution	Accuracy	Remarks
millivolt	-10 to 110 mV	0.001 mV	± 0.02 % FS	$R_{\text{output}} < 0.3 \Omega$
volt	-0.5 to 12 V	0.0001 V	± 0.02 % FS	$R_{\text{output}} < 0.3 \Omega$
mA	0 to 24 mA	0.0001 mA	± 0.02 % FS	$R_{\text{maximum}} = 700 \Omega$
Two wires transmitter (XTR)	4 to 24 mA	0.0001 mA	± 0.02 % FS	$V_{\text{maximum}} = 60 \text{ V}$
resistance	0 to 400 Ω	0.01 Ω	± 0.02 % FS	External excitation current: 1 mA
	0 to 2500 Ω	0.1 Ω	± 0.03 % FS	
frequency*	0 to 100 Hz	0.01 Hz	± 0.02 Hz	Amplitude:
	0 to 10000 Hz	1 Hz	± 2 Hz	22 V / 25 mA max.
pulse*	0 to 10 ⁸ – 1 pulse	1 pulse	—	Peak Value: 22 V / 25 mA max. Pulse frequency up to 10000 Hz
Pt-100	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.2 °C / ± 0.4 °F	IEC-60751
Pt-1000	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	Minco 16-9
Ni-100	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	IEC-60584
TC-K	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F	IEC-60584
	-150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
TC-T	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 1.2 °C / ± 2.4 °F	IEC-60584
	-200 to -75 °C / -328 to -103 °F	0.1 °C / 0.1 °F	± 0.8 °C / ± 1.6 °F	
	-75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
TC-B	50 to 250 °C / 122 to 482 °F	0.1 °C / 0.1 °F	± 5.0 °C / ± 10.0 °F	IEC-60584
	250 to 500 °C / 482 to 932 °F	0.1 °C / 0.1 °F	± 3.0 °C / ± 6.0 °F	
	500 to 1200 °C / 932 to 2192 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	
	1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F	± 1.4 °C / ± 2.8 °F	
TC-R	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	± 1.4 °C / ± 2.8 °F	
TC-S	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	± 1.4 °C / ± 2.8 °F	
TC-E	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F	IEC-60584
	-150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
TC-N	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	IEC-60584
	-200 to -20 °C / -328 to -4 °F	0.1 °C / 0.1 °F	± 0.8 °C / ± 1.6 °F	
	-20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
TC-L	-200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	DIN-43710
TC-C	0 to 1500 °C / 32 to 2732 °F	0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F	W5Re / W26Re
	1500 to 2320 °C / 2732 to 4208 °F	0.1 °C / 0.1 °F	± 0.7 °C / ± 1.4 °F	

(*) Function only available when the frequency input is not configured.

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code

MCS-XV - [] - [] - [] - [] - [] - [] - [] - [] - [] - []

Hart Communication

- NH - No Hart Communication
- CH - Hart Calibrator (basic commands: zero, span, trim mA)
- FH - Full-Hart Configurator, with DD library from Hart Communication Foundation and one-year upgrade.

Number of Pressure Inputs

- 0 - no pressure sensors
- 1 - one sensor
- 2 - two sensors
- 3 - three sensors
- 4 - four sensors

RANGE	Input 1	RESOLUTION	ACCURACY	REMARKS
(0)	0 – 250 mmH ₂ O	0.001	± 0.05 % FS*	Gage pressure.
(1)	0 – 1 psi	0.0001	± 0.05 % FS	Used with air or inert gases
(2)	0 – 5 psi	0.0001	± 0.025 % FS	
(3)	0 – 15 psi	0.0001	± 0.025 % FS	Gage or absolute pressure.
(4)	0 – 30 psi	0.0001	± 0.025 % FS	Used with fluids (gases or liquids) compatible with 316 L stainless steel
(5)	0 – 100 psi	0.001	± 0.025 % FS	
(6)	0 – 250 psi	0.001	± 0.025 % FS	
(7)	0 – 500 psi	0.01	± 0.025 % FS	
(8)	0 – 1,000 psi	0.01	± 0.025 % FS	
(9)	0 – 3,000 psi	0.01	± 0.025 % FS	
(10)	0 – 5,000 psi	0.1	± 0.025 % FS	
(11)	0 – 10,000 psi	0.1	± 0.05 % FS	
(12)	Others, upon request			

Pressure Type Input 1 (Only for version with one sensor or more)

- A - Absolute** (Only for ranges 3 to 8)
- G - Gage**
- V - Vacuum** (Only for range 3)
- C - Compound***** (Only for ranges 3 to 8)
- D - Differential** (Only for ranges 0 to 2)

RANGE Input 2** (Only for version with two sensors or more)

Pressure Type Input 2**

RANGE Input 3** (Only for version with three sensors or more)

Pressure Type Input 3**

RANGE Input 4** (Only for version with four sensors)

Pressure Type Input 4**

(*) FS = Full Scale (**) Same code of input 1

(***) From -15 psi to the full scale of range

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.005 % FS / °C, taking 23 °C as the reference temperature.

Engineering Units: psi, atm, kgf/cm², inH₂O, mH₂O, cmH₂O, mmH₂O, inHg, cmHg, mmHg, bar, mbar, Pa, kPa and torr.

Pneumatic Connection: 1/4" NPTF (1/8" NPTF only for the range 0 - 10,000 psi).

Overpressure: up to twice the value of full scale pressure (to sensors up to 5,000 psi).

Information Infrastructure: Ethernet, Wireless, USB, TCP/IP - Integrated Web Server

Operating Ambient: 0 to 50 °C ambient temperature and 90 % maximum relative humidity.

Dimensions: 80 mm x 140 mm x 250 mm (HxWxD).

Weight: 1.5 kg approx.

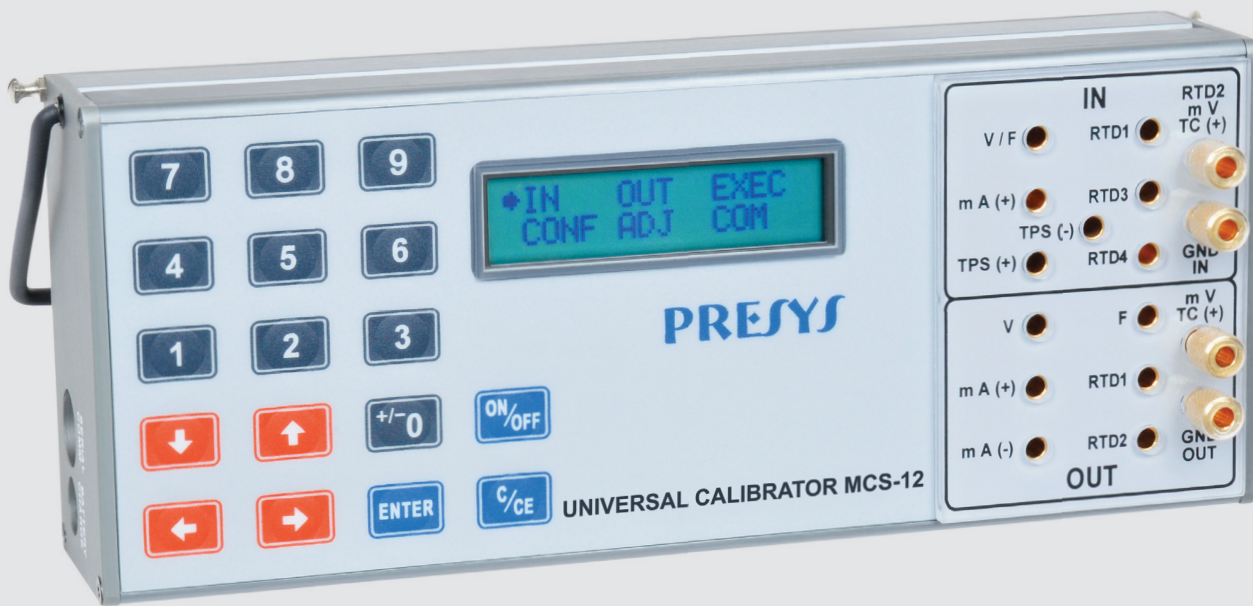
Warranty: 1 year, except for rechargeable battery.

Included items:

- Technical Manual;
- Carrying case;
- Test leads;
- Battery charger (100 to 240 Vac - 50/60Hz).

Optional Accessories:

- Cold Junction Compensation Block - Order Code: 06.22.0002-00;
- Temperature Sensors: 1/5 DIN-R Probe - Order Code: 04.06.0001-21;
- 1/5 DIN-A Probe - Order Code: 04.06.0007-21;
- 1/5 DIN-A-L Probe - Order Code: 04.06.0002-21.



Universal Calibrator for Instrumentation MCS-12

- Measures and generates mA, mV, volts, ohms, RTD, TC and Hz.
- Simultaneous input and output operation.
- Isolated input and output.
- Pressure module optional.
- Interface with a Windows-based Calibration Software to provide a true Computer-Aided Calibration System with documenting capability.
- Real-time data acquisition capability when connected to a computer.
- Callendar-Van Dunsen coefficients for Probe input.

MCS-12 Universal Calibrator enables measurement and generation of signals used in instrumentation and Process Control. It is a high-accuracy instrument, having high stability features in temperature changes and long-term aging conditions. The Probe input calculates the temperature based on international standard tables, in IPTS-68 and ITS-90 scales, and also has algorithms that calculate temperatures using Callendar-Van Dusen coefficients from a calibrated sensor. It contains useful items allowing its on field and workbench use. The calibrator also incorporates concepts of automatic checking and calibration via computer, such as report and certificate issues, automatic work management, data archiving for an overall coverage of quality procedure requirements. Additionally, various optional modules are available, intended to perform pressure and temperature measurements.

Specifications - Inputs

Input Ranges	Resolution	Accuracy	Remarks
millivolt -150 mV to 150 mV -500 mV to -150 mV 150 mV to 2450 mV	0.001 mV 0.01 mV 0.01 mV	± 0.01 % FS *** ± 0.02 % FS ± 0.02 % FS	R _{input} > 10 MΩ auto-range
volt -10 V to 11 V 11 V to 45 V	0.0001 V 0.0001 V	± 0.02 % FS ± 0.02 % FS	R _{input} > 1 MΩ
mA -5 mA to 24.5 mA	0.0001 mA	± 0.02 % FS	R _{input} < 160 Ω
frequency * 0 to 600 Hz 600 to 1300 Hz 1300 to 10000 Hz	0.01 Hz 0.1 Hz 1 Hz	± 0.02 Hz ± 0.2 Hz ± 2 Hz	R _{input} > 50 kΩ Voltage DC _{maximum} = 30 V AC Signal from 0.3 to 30 V auto-range
counter * 0 to 10 ⁸ -1 count	1 count	—	Same remark as frequency Pulse Frequency < 3000 Hz
resistance 0 to 400 Ω 400 to 2500 Ω	0.01 Ω 0.01 Ω	± 0.01 % FS ± 0.03 % FS	Excitation current 0.85 mA, auto-range
Pt-100 -200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Pt-1000 -200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10 -200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	MINCO 16-9
Ni-100 -60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
Probe ** -200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
TC-J -210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	IEC-60584
TC-K -270 to -150 °C / -454 to -238 °F -150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F ± 0.2 °C / ± 0.4 °F	IEC-60584
TC-T -260 to -200 °C / -436 to -328 °F -200 to -75 °C / -328 to -103 °F -75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F ± 0.4 °C / ± 0.8 °F ± 0.2 °C / ± 0.4 °F	IEC-60584
TC-B 50 to 250 °C / 122 to 482 °F 250 to 500 °C / 482 to 932 °F 500 to 1200 °C / 932 to 2192 °F 1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 2.5 °C / ± 5.0 °F ± 1.5 °C / ± 3.0 °F ± 1.0 °C / ± 2.0 °F ± 0.7 °C / ± 1.4 °F	IEC-60584
TC-R -50 to 300 °C / -58 to 572 °F 300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 0.7 °C / ± 1.4 °F	IEC-60584
TC-S -50 to 300 °C / -58 to 572 °F 300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 0.7 °C / ± 1.4 °F	IEC-60584
TC-E -270 to -150 °C / -454 to -238 °F -150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.3 °C / ± 0.6 °F ± 0.1 °C / ± 0.2 °F	IEC-60584
TC-N -260 to -200 °C / -436 to -328 °F -200 to -20 °C / -328 to -4 °F -20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 0.4 °C / ± 0.8 °F ± 0.2 °C / ± 0.4 °F	IEC-60584
TC-L -200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43710
TC-C 0 to 1500 °C / 32 to 2732 °F 1500 to 2320 °C / 2732 to 4208 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F ± 0.7 °C / ± 1.4 °F	W5Re / W26Re W5Re / W26Re

(*) Accuracy since frequency output is not configured. (**) Probe is a spare input for a reference RTD in order to use as standard thermometer. The accuracy is related to calibrator only. (***) FS = Full Scale.

Specifications - Output

Output Ranges	Resolution	Accuracy	Remarks
millivolt -10 mV to 110 mV	0.001 mV	± 0.02 % FS	R _{output} < 0.3 Ω
volt -0.5 V to 12 V	0.0001 V	± 0.02 % FS	R _{output} < 0.3 Ω
mA 0 to 24 mA	0.0001 mA	± 0.02 % FS	R _{maximum} = 700 Ω
Two-wire transmitter (XTR) 4 to 24 mA	0.0001 mA	± 0.02 % FS	V _{maximum} = 60 V
frequency 0 to 100 Hz 0 to 10000 Hz	0.01 Hz 1 Hz	± 0.02 Hz ± 2 Hz	Peak Value: 22 V / 25 mA max.
pulse 0 to 10 ⁸ -1 pulse	1 pulse	—	Peak Value: 22 V / 25 mA max. Pulse Frequency up to 10000 Hz
resistance 0 to 400 Ω 0 to 2500 Ω	0.01 Ω 0.1 Ω	± 0.02 % FS ± 0.03 % FS	For external excitation current of 1 mA
Pt-100 -200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.2 °C / ± 0.4 °F	IEC-60751
Pt-1000 -200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10 -200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	MINCO 16-9
Ni-100 -60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
TC-J -210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	IEC-60584
TC-K -270 to -150 °C / -454 to -238 °F -150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 0.4 °C / ± 0.8 °F	IEC-60584
TC-T -260 to -200 °C / -436 to -328 °F -200 to -75 °C / -328 to -103 °F -75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.2 °C / ± 2.4 °F ± 0.8 °C / ± 1.6 °F ± 0.4 °C / ± 0.8 °F	IEC-60584
TC-B 50 to 250 °C / 122 to 482 °F 250 to 500 °C / 482 to 932 °F 500 to 1200 °C / 932 to 2192 °F 1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 5.0 °C / ± 10.0 °F ± 3.0 °C / ± 6.0 °F ± 2.0 °C / ± 4.0 °F ± 1.4 °C / ± 2.8 °F	IEC-60584
TC-R -50 to 300 °C / -58 to 572 °F 300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F ± 1.4 °C / ± 2.8 °F	IEC-60584
TC-S -50 to 300 °C / -58 to 572 °F 300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F ± 1.4 °C / ± 2.8 °F	IEC-60584
TC-E -270 to -150 °C / -454 to -238 °F -150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F ± 0.2 °C / ± 0.4 °F	IEC-60584
TC-N -260 to -200 °C / -436 to -328 °F -200 to -20 °C / -328 to -4 °F -20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F ± 0.8 °C / ± 1.6 °F ± 0.4 °C / ± 0.8 °F	IEC-60584
TC-L -200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	DIN-43710
TC-C 0 to 1500 °C / 32 to 2732 °F 1500 to 2320 °C / 2732 to 4208 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 1.4 °C / ± 2.8 °F	W5Re / W26Re W5Re / W26Re

Accuracy values are valid within one year and temperature range of 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples using the internal cold junction compensation add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485).
Dimensions: 91 mm x 233 mm x 64 mm (HxWxD).
Weight: 1 kg approx.
Warranty: 1 year, except for rechargeable battery.
Included Items: carrying case, test leads, manual and battery charger.

Optional Accessories:
 Cold Junction Compensation Block - Order Code: 06.22.0002-00;
 Temperature Sensors: 1/5 DIN-R Probe - Order Code: 04.06.0001-21;
 1/5 DIN-A Probe - Order Code: 04.06.0007-21;
 1/5 DIN-A-L Probe - Order Code: 04.06.0002-21;
 Communication Interface - Order Code: 06.02.0007-00.



Multicalibrator for Instrumentation MCS-8

- Measures and generates mA, mV, volts, ohms, RTD, TC.
- Simultaneous input and output operation.
- Isolated input and output.
- Interface with a Windows-based Calibration Software to provide a true Computer-Aided Calibration System with documenting capability.
- Real-time data acquisition capability when connected to a computer.

MCS-8 Multicalibrator enables measurement and generation of signals used in instrumentation and Process Control. It is a high-accuracy instrument, having high stability features in temperature changes and long-term aging conditions. It contains useful items allowing its on field and workbench use.

The calibrator also incorporates concepts of automatic checking and calibration via computer, such as report and certificate issues, automatic work management, data archiving for an overall coverage of quality procedure requirements. When connected to computer can be used as an online data logger.

Specifications - Input

Input Ranges	Resolution	Accuracy	Remarks
millivolt -150 mV to 150 mV -500 mV to -150 mV 150 mV to 2450 mV	0.001 mV 0.01 mV 0.01 mV	± 0.01 % FS * ± 0.02 % FS ± 0.02 % FS	R _{input} > 10 MΩ auto-range
volt -10 V to 11 V 11 V to 45 V	0.0001 V 0.0001 V	± 0.02 % FS ± 0.02 % FS	R _{input} > 1 MΩ
mA -5 mA to 24.5 mA	0.0001 mA	± 0.02 % FS	R _{input} < 160 Ω
resistance 0 to 400 Ω 400 to 2500 Ω	0.01 Ω 0.01 Ω	± 0.01 % FS ± 0.03 % FS	Excitation Current 0.85 mA, auto-range
Pt-100 -200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Pt-1000 -200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10 -200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	MINCO 16-9
Ni-100 -60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
TC-J -210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	IEC-60584
TC-K -270 to -150 °C / -454 to -238 °F -150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F ± 0.2 °C / ± 0.4 °F	IEC-60584
TC-T -260 to -200 °C / -436 to -328 °F -200 to -75 °C / -328 to -103 °F -75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F ± 0.4 °C / ± 0.8 °F ± 0.2 °C / ± 0.4 °F	IEC-60584
TC-B 50 to 250 °C / 122 to 482 °F 250 to 500 °C / 482 to 932 °F 500 to 1200 °C / 932 to 2192 °F 1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 2.5 °C / ± 5.0 °F ± 1.5 °C / ± 3.0 °F ± 1.0 °C / ± 2.0 °F ± 0.7 °C / ± 1.4 °F	IEC-60584
TC-R -50 to 300 °C / -58 to 572 °F 300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 0.7 °C / ± 1.4 °F	IEC-60584
TC-S -50 to 300 °C / -58 to 572 °F 300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 0.7 °C / ± 1.4 °F	IEC-60584
TC-E -270 to -150 °C / -454 to -238 °F -150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.3 °C / ± 0.6 °F ± 0.1 °C / ± 0.2 °F	IEC-60584
TC-N -260 to -200 °C / -436 to -328 °F -200 to -20 °C / -328 to -4 °F -20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 0.4 °C / ± 0.8 °F ± 0.2 °C / ± 0.4 °F	IEC-60584
TC-L -200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43710
TC-C 0 to 1500 °C / 32 to 2732 °F 1500 to 2320 °C / 2732 to 4208 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F ± 0.7 °C / ± 1.4 °F	W5Re / W26Re W5Re / W26Re

(*) FS = Full Scale

Specifications - Output

Output Ranges	Resolution	Accuracy	Remarks
millivolt -10 mV to 110 mV	0.001 mV	± 0.02 % FS	R _{output} < 0.3 Ω
volt -0.5 V to 12 V	0.0001 V	± 0.02 % FS	R _{output} < 0.3 Ω
mA 0 to 24 mA	0.0001 mA	± 0.02 % FS	R _{maximum} = 700 Ω
Two-wire transmitter (XTR) 4 to 24 mA	0.0001 mA	± 0.02 % FS	V _{maximum} = 60 V
resistance 0 to 400 Ω 0 to 2500 Ω	0.01 Ω 0.1 Ω	± 0.02 % FS ± 0.03 % FS	External excitation current of 1 mA
Pt-100 -200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.2 °C / ± 0.4 °F	IEC-60751
Pt-1000 -200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10 -200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	MINCO 16-9
Ni-100 -60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
TC-J -210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	IEC-60584
TC-K -270 to -150 °C / -454 to -238 °F -150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 0.4 °C / ± 0.8 °F	IEC-60584
TC-T -260 to -200 °C / -436 to -328 °F -200 to -75 °C / -328 to -103 °F -75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.2 °C / ± 2.4 °F ± 0.8 °C / ± 1.6 °F ± 0.4 °C / ± 0.8 °F	IEC-60584
TC-B 50 to 250 °C / 122 to 482 °F 250 to 500 °C / 482 to 932 °F 500 to 1200 °C / 932 to 2192 °F 1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 5.0 °C / ± 10.0 °F ± 3.0 °C / ± 6.0 °F ± 2.0 °C / ± 4.0 °F ± 1.4 °C / ± 2.8 °F	IEC-60584
TC-R -50 to 300 °C / -58 to 572 °F 300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F ± 1.4 °C / ± 2.8 °F	IEC-60584
TC-S -50 to 300 °C / -58 to 572 °F 300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F ± 1.4 °C / ± 2.8 °F	IEC-60584
TC-E -270 to -150 °C / -454 to -238 °F -150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F ± 0.2 °C / ± 0.4 °F	IEC-60584
TC-N -260 to -200 °C / -436 to -328 °F -200 to -20 °C / -328 to -4 °F -20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F ± 0.8 °C / ± 1.6 °F ± 0.4 °C / ± 0.8 °F	IEC-60584
TC-L -200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	DIN-43710
TC-C 0 to 1500 °C / 32 to 2732 °F 1500 to 2320 °C / 2732 to 4208 °F	0.1 °C / 0.1 °F 0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F ± 1.4 °C / ± 2.8 °F	W5Re / W26Re W5Re / W26Re

Accuracy values are valid within one year and temperature range of 20 to 26 °C. For thermocouples, using the internal cold junction compensation add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485).

Dimension: 91 mm x 233 mm x 64 mm (HxWxD).

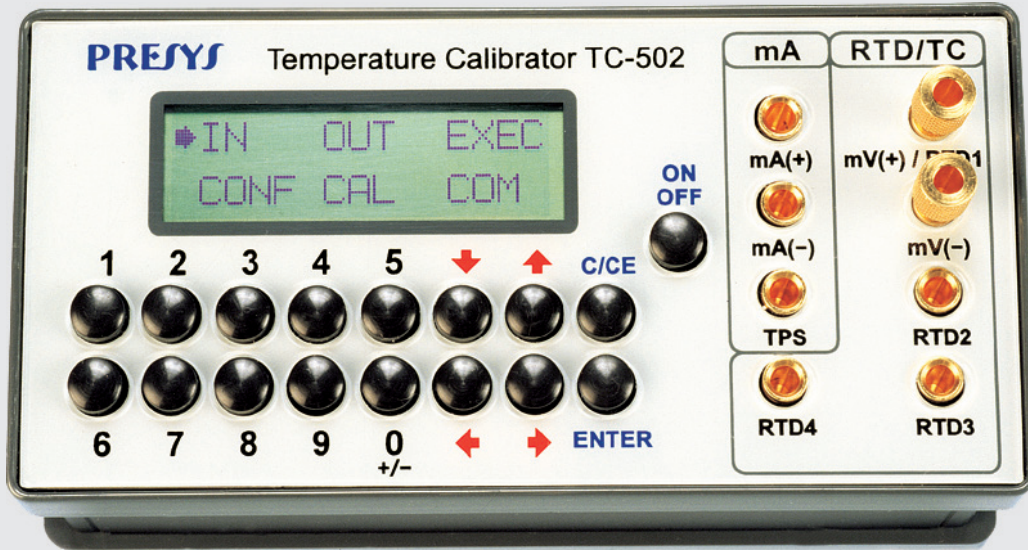
Weight: 1 kg approx.

Warranty: 1 year, except for rechargeable battery.

Included Items: carrying case, test leads, manual and battery charger.

Optional Accessories:

Communication Interface - Order Code: 06.02.0007-00.



Temperature Calibrator TC-502

- Designed for field use, it offers all advantages of a documenting calibrator
- Measures and generates mV, TC, ohms and RTD signals, besides measuring mA.
- Output operation simultaneous with mA input.
- Internal regulated 24 Vdc power supply for 2-wire transmitters.
- Special function for transmitter calibration converts mA into the transmitter input range.
- Square root function for mA input.
- Automatic power-off configuration to save battery.
- Interface with Windows-based Calibration Software ISOPLAN® to provide a true Computer-Aided Calibration System.
- Real-time data acquisition capability when connected to a computer.

TC-502 temperature calibrator allows the measurement of mA, mV, TC, ohms and RTD and the generation of mV, TC, ohms and RTD. The generation of any of these signals can be carried out simultaneously with mA measurement, if isolated from each other, making it easy to calibrate and adjust temperature transmitters. Distinguished from regular calibrators due to its high-accuracy. RTD or ohms generation (simulation) is possible for continuous or intermittent excitation current. Allows either ITS-90 or IPTS-68 temperature scale for measuring or generating TC or RTD. Incorporates the most modern concepts of calibration and adjustment via computer, where data are shared between instrument and computer, improving efficiency in handling information through report and certificate issues, automatic work management, data organization and storage, for an overall coverage of quality procedure requirements, specially those related to ISO-9000.

Specifications - Input

Input Ranges	Resolution	Accuracy	Remarks	
millivolt				
-150 to 150 mV	0.001 mV	± 0.01 % FS	R _{input} > 10 MΩ	
-500 to -150 mV	0.01 mV	± 0.02 % FS	auto-range	
150 to 2450 mV	0.01 mV	± 0.02 % FS		
mA				
-5 to 24.5 mA	0.0001 mA	± 0.02 % FS	R _{input} < 160 Ω	
resistance				
0 to 400 Ω	0.01 Ω	± 0.01 % FS	Excitation current 0.9 mA	
400 to 2500 Ω	0.01 Ω	± 0.03 % FS	auto-range	
Pt-100	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Pt-1000	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	MINCO 16-9
Ni-100	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	IEC-60584
TC-K	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F	IEC-60584
	-150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
TC-T	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F	IEC-60584
	-200 to -75 °C / -328 to -103 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
	-75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
TC-B	50 to 250 °C / 122 to 482 °F	0.1 °C / 0.1 °F	± 2.5 °C / ± 5.0 °F	IEC-60584
	250 to 500 °C / 482 to 932 °F	0.1 °C / 0.1 °F	± 1.5 °C / ± 3.0 °F	
	500 to 1200 °C / 932 to 2192 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F	
	1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F	± 0.7 °C / ± 1.4 °F	
TC-R	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	± 0.7 °C / ± 1.4 °F	
TC-S	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	± 0.7 °C / ± 1.4 °F	
TC-E	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 0.3 °C / ± 0.6 °F	IEC-60584
	-150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	
TC-N	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F	IEC-60584
	-200 to -20 °C / -328 to -4 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
	-20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
TC-L	-200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43710

Specifications - Output

Output Ranges	Resolution	Accuracy	Remarks	
millivolt				
-15 to 75 mV	0.001 mV	± 0.02 % FS	R _{output} < 0.3 Ω	
resistance				
0 to 2500 Ω	0.01 Ω	± 0.008 % FS	For external excitation current of 1.0 mA	
Pt-100	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Pt-1000	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	MINCO 16-9
Ni-100	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	IEC-60584
TC-K	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F	IEC-60584
	-150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
TC-T	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 1.2 °C / ± 2.4 °F	IEC-60584
	-200 to -75 °C / -328 to -103 °F	0.1 °C / 0.1 °F	± 0.8 °C / ± 1.6 °F	
	-75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
TC-B	50 to 250 °C / 122 to 482 °F	0.1 °C / 0.1 °F	± 5.0 °C / ± 10.0 °F	IEC-60584
	250 to 500 °C / 482 to 932 °F	0.1 °C / 0.1 °F	± 3.0 °C / ± 6.0 °F	
	500 to 1200 °C / 932 to 2192 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	
	1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F	± 1.4 °C / ± 2.8 °F	
TC-R	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	± 1.4 °C / ± 2.8 °F	
TC-S	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	± 1.4 °C / ± 2.8 °F	
TC-E	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F	IEC-60584
	-150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
TC-N	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	IEC-60584
	-200 to -20 °C / -328 to -4 °F	0.1 °C / 0.1 °F	± 0.8 °C / ± 1.6 °F	
	-20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
TC-L	-200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	DIN-43710

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485)

Dimensions: 56 mm x 144 mm x 72 mm (HxWxD).

Weight: 0.6 kg approx.

Warranty: 1 year, except for rechargeable battery.

Included Items: carrying case, test leads, manual and battery charger.

Optional Accessories:

Temperature Sensors :

1/5 DIN-R Probe - Order Code: 04.06.0001-21;

1/5 DIN-A Probe - Order Code: 04.06.0007-21;

1/5 DIN-A-L Probe - Order Code: 04.06.0002-21;

Communication Interface - Order Code: 06.02.0001-00.



Loop Calibrator LC-505

- Measures and generates standard linear signals for current and voltage loops (mA and volt).
- Simultaneous input and output operation.
- Internal regulated 24 Vdc power supply for 2-wire transmitters.
- Special function for transmitter calibration converts any input signal into any output signal.
- Square root function for mA input or output.
- Automatic power off configuration to save battery.
- Small, battery-operated, portable (rechargeable battery, charger and carrying case included).
- Interface with Windows-based Calibration Software ISOPLAN® to provide a true Computer-Aided Calibration System.
- Real-time data acquisition capability when connected to a computer.

LC-505 loop calibrator allows the measurement and generation of signals used in current (4- 20 mA) and voltage (1-5 V, 0-10 V) loops. Distinguished from regular loop calibrators due to its high-accuracy, possibility of simultaneous measurement and generation of isolated signals, on-line communication with computer, working as a data acquisition point, and full computer-aid for instrument calibration and adjustment tasks. Incorporates the most modern concepts of calibration and adjustment via computer, where data are shared between instrument and computer, improving efficiency in handling information through report and certificate issues, automatic work management, data organization and storage for an overall coverage of quality procedure requirements, specially those related to ISO-9000. When connected to a computer it can be used for real-time data acquisition.

Specifications - Input

Input Ranges	Resolution	Accuracy	Remarks
volt -10 to 11 V	0.0001 V	± 0.02 % FS*	R _{input} > 1 MΩ
11 to 45 V	0.0001 V	± 0.02 % FS	
mA -5 to 24.5 mA	0.0001 mA	± 0.02 % FS	R _{input} < 160 Ω

Specifications - Output

Output Ranges	Resolution	Accuracy	Remarks
volt -1 to 11 V	0.0001 V	± 0.02 % FS	R _{output} < 0.3 Ω
mA 0 to 22 mA	0.0001 mA	± 0.02 % FS	R _{maximum} = 700 Ω
Two-wire transmitter (XTR) 4 to 22 mA	0.0001 mA	± 0.02 % FS	V _{maximum} = 60 V

*FS = Full Scale

Accuracy values are valid within one year and temperature range of 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature.

Serial Communication: Modbus® RTU Protocol (RS-232/ RS-485)

Dimensions: 56 mm x 144 mm x 72 mm (HxWxD)

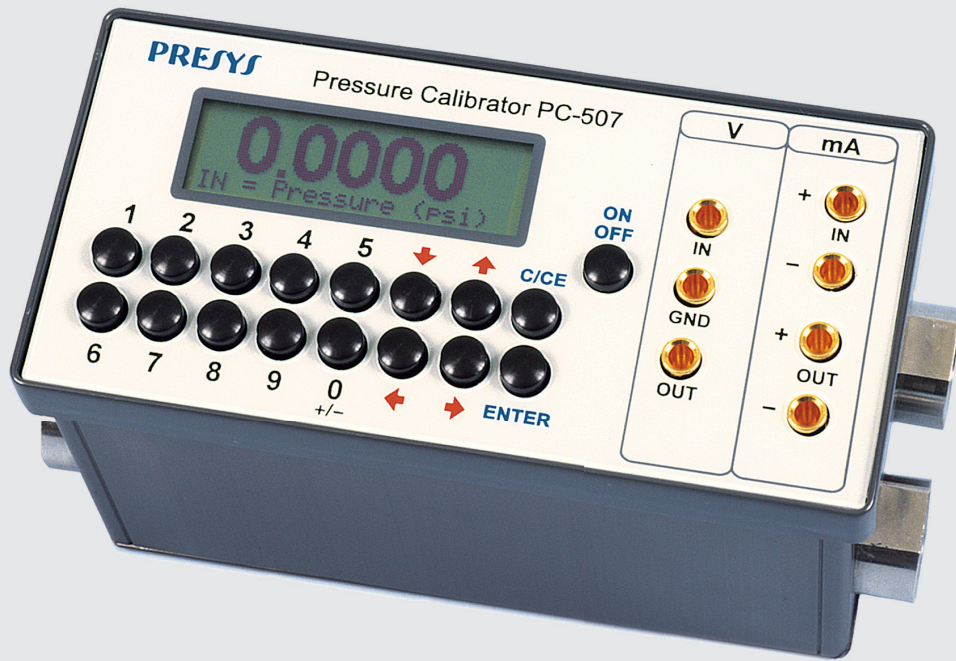
Weight: 0.6 kg approx.

Warranty: 1 year, except for rechargeable battery.

Included Items: carrying case, test leads, manual battery charger.

Optional Accessories:

Communication Interface - Order Code: 06.02.0001-00.



Pressure Calibrator PC-507

- Small and portable, ideal for field use, presents performance levels comparable only to laboratory standards.
- Available and upgradeable with up to four pressure input sensors.
- Ranges from 250 mmH₂O to 10,000 psi gage or absolute pressure, including vacuum and differential between any pair of sensors.
- Accuracy of 0.025 % of full scale.
- Measures pressure, mA and volts and generates mA and volts. Provides a 24 Vdc power supply for 2-wire transmitters, and contact input for pressure switch verification.
- Includes input for optional temperature probe.
- The user can increase the number of sensors of the PC-507 by installing new ones in the calibrator.
- Interface with Windows-based Calibration Software ISOPLAN[®] to provide a true Computer-Aided Calibration System with documenting capability.
- Real-time data acquisition capability when connected to a computer.

PC-507 pressure calibrator is an instrument of reduced dimensions, compact, operates with rechargeable battery, including a practical carrying case to make easier its field use. Its technical features indicate performance levels comparable only to laboratory standards, it presents accuracy of 0.025 % of full scale. It can be provided with up to four pressure sensors, i.e., one calibrator may contain different ranges, for example, vacuum, 0 to 100 psi, 0 to 1,000 psi and 0 to 3,000 psi, or any other possible combination among the available ranges. The calibrator may be purchased with a certain number of sensors, which may be later increased. Communication with the computer is established via RS-232/485 serial communication port. When used together with ISOPLAN[®] calibration software, it takes advantage of the documenting calibration concept which automatizes the calibration process, allowing data storage and sharing between calibrator and computer, improving efficiency in handling information, preparing reports, issuing certificates, storage and registration of process instruments and sensors for an overall coverage of the quality procedure requirements, specially those related to ISO 9000.

Order Code

PC - 507 - - - - - - - - - -

Number of Inputs

- 1 - one sensor
- 2 - two sensors
- 3 - three sensors
- 4 - four sensors

RANGE	Input 1	RESOLUTION	ACCURACY	REMARKS
0 - 0	- 250 mmH ₂ O	0.001	± 0.05 % FS*	Gage pressure
1 - 0	- 1 psi	0.0001	± 0.05 % FS	Used with air or inert gases
2 - 0	- 5 psi	0.0001	± 0.025 % FS	
3 - 0	- 15 psi	0.0001	± 0.025 % FS	Gage or absolute pressure.
4 - 0	- 30 psi	0.0001	± 0.025 % FS	Used with fluids (gases or liquids) compatible with 316L stainless steel
5 - 0	- 100 psi	0.001	± 0.025 % FS	
6 - 0	- 250 psi	0.001	± 0.025 % FS	
7 - 0	- 500 psi	0.01	± 0.025 % FS	
8 - 0	- 1,000 psi	0.01	± 0.025 % FS	
9 - 0	- 3,000 psi	0.01	± 0.025 % FS	
10 - 0	- 5,000 psi	0.1	± 0.025 % FS	
11 - 0	- 10,000 psi	0.1	± 0.05 % FS	
12 - Others,	upon request			

Pressure Type Input 1

- A - Absolute (Only for ranges 3 to 8)
- G - Gage
- V - Vacuum (Only for range 3)
- C - Compound*** (Only for ranges 3 to 8)
- D - Differential (Only for ranges 0 to 2)

RANGE Input 2** (Only for version with two sensors or more) _____

Pressure Type Input 2** _____

RANGE Input 3** (Only for version with three sensors or more) _____

Pressure Type Input 3** _____

RANGE Input 4** (Only for version with four sensors) _____

Pressure Type Input 4** _____

(*) FS=Full Scale (**) Same code as Input 1 (***) From -15 psi to the full scale of range

Code example: PC-507-4-2-G-3-V-5-G-8-A, defines a four sensors calibrator, which input 1 range from 0 to 5 psi (gage pressure), input 2 from 0 to 15 psi (vacuum), input 3 from 0 to 100 psi (gage pressure) and input 4 from 0 to 1,000 psi (absolute pressure). Input 1 used with air or inert gases and inputs 2, 3 and 4 are used with fluids compatible with 316 L stainless steel.

Electrical Specifications

Input Ranges	Resolution	Accuracy	Remarks
volt -10 to 11 V	0.0001 V	± 0.02 % FS	R _{input} > 1MΩ
11 to 45 V	0.0001 V	± 0.02 % FS	
mA -5 to 24.5 mA	0.0001 mA	± 0.02 % FS	R _{input} < 160 Ω
Output Ranges	Resolution	Accuracy	Remarks
volt -1 to 11 V	0.0001 V	± 0.02 % FS	R _{output} < 0.3 Ω
mA 0 to 22 mA	0.0001 mA	± 0.02 % FS	R _{maximum} = 700 Ω
Two-wire transmitter (XTR) 4 to 22 mA	0.0001 mA	± 0.02 % FS	V _{maximum} = 60 V
Probe Range	Resolution	Accuracy	Remarks
Pt-100 -200 °C to 850 °C / -328 °F to 562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.1 °F	IEC-60751

FS = Full Scale

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.005 % FS / °C, taking 23 °C as the reference temperature.

Engineering Units: psi, atm, kgf/cm², inH₂O, mH₂O, cmH₂O, mmH₂O, inHg, cmHg, mmHg, bar, mbar, Pa, kPa and torr.

Operating Ambient: 0 to 50 °C ambient temperature and 90 % maximum relative humidity

Pneumatic Connection: 1/4" NPTF (1/8" NPTF only for the range 0 - 10,000 psi).

Overpressure: up to twice the value of full scale pressure (to sensors up to 5,000 psi).

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485)

Dimensions: 80 mm x 144 mm x 72 mm (HxWxD).

Weight: 1.0 kg approx.

Warranty: 1 year, except for rechargeable battery.

Included items: carrying case, test leads, manual and battery charger.

Optional Accessories:

Temperature Sensor: 1/5 DIN-R Probe - Order Code: 04.06.0001-21; 1/5 DIN-A Probe - Order Code: 04.06.0007-21;

1/5 DIN-A-L Probe - Order Code: 04.06.0002-21;

Communication Interface - Order Code: 06.02.0001-00.



Group IIC, Zone 0 / Ex ia IIC T4 Ga

Pressure Calibrator PC-507-IS - Intrinsically Safe

- The PC-507-IS is a pressure gauge for usage in hazardous areas. It is Intrinsically Safe. Certified for Group IIC, Zone 0 / Ex ia IIC T4 Ga (hydrogen and acetylene group).
- Up to four pressure sensors.
- Ranges from 250 mmH₂O to 10,000 psi gage or absolute pressure, including vacuum and differential between any pair of sensors.
- Accuracy of 0.025 % of full scale reading.
- Measures pressure, mA and volts and generates mA and volts. Provides a 24 Vdc power supply for 2-wire transmitters, and contact input for pressure switch verification.
- Includes input for optional temperature probe.
- Real-time data acquisition capability when connected to a computer.

The Pressure Calibrator PC-507 now has version approved for use in hazardous areas. The PC-507-IS is intrinsically safe. Can be operated in Group IIC Zone 0 which is the most demanding about the need for protection against electric sparks, it is the group of hydrogen and acetylene. Layout of the front membrane is notably different from the PC-507, in order to characterize unequivocally the Intrinsically Safe version.

Communication with computer is established via RS-232/485 serial communication port. When used together with ISOPLAN[®] calibration software, it takes advantage of the documenting calibration concept which automatizes the calibration process, allowing data storage and sharing between calibrator and computer, improving efficiency in handling information, preparing report, issuing certificates, storage and registration of process instruments and sensors for an overall coverage of the quality procedure requirements, specially those related to ISO 9000.

Order Code

PC - 507 - IS - [] - [] - [] - [] - [] - [] - [] - [] - []

Number of Inputs

- 1 - one sensor
- 2 - two sensors
- 3 - three sensors
- 4 - four sensors

RANGE	Input 1	RESOLUTION	ACCURACY	REMARKS
0 - 0	250 mmH ₂ O	0.001	± 0.05 % FS*	Gage pressure
1 - 0	1 psi	0.0001	± 0.05 % FS	Used with air or inert gases
2 - 0	5 psi	0.0001	± 0.025 % FS	
3 - 0	15 psi	0.0001	± 0.025 % FS	Gage or absolute pressure.
4 - 0	30 psi	0.0001	± 0.025 % FS	Used with fluids (gases or liquids)
5 - 0	100 psi	0.001	± 0.025 % FS	compatible with 316L stainless steel
6 - 0	250 psi	0.001	± 0.025 % FS	
7 - 0	500 psi	0.01	± 0.025 % FS	
8 - 0	1,000 psi	0.01	± 0.025 % FS	
9 - 0	3,000 psi	0.01	± 0.025 % FS	
10 - 0	5,000 psi	0.1	± 0.025 % FS	
11 - 0	10,000 psi	0.1	± 0.05 % FS	
12 -	others, upon request			

Pressure Type Input 1

- A - Absolute (Only for ranges 3 to 8)
- G - Gage
- V - Vacuum (Only for range 3)
- C - Compound** (Only for ranges 3 to 8)
- D - Differential (Only for ranges 0 to 2)

RANGE Input 2*** (Only for version with two sensors or more)

Pressure Type Input 2***

RANGE Input 3*** (Only for version with three sensors or more)

Pressure Type Input 3***

RANGE Input 4*** (Only for version with four sensors)

Pressure Type Input 4***

(*) FS=Full Scale (**) From -15 psi to the full scale of range (***) Same code as Input 1

Code example: PC-507-IS-4-2-G-3-V-5-G-8-A, defines a four sensors calibrator, which input 1 range from 0 to 5 psi (gage pressure), input 2 from 0 to 15 psi (vacuum), input 3 from 0 to 100 psi (gage pressure) and input 4 from 0 to 1,000 psi (absolute pressure). Input 1 used with air or inert gases and inputs 2, 3 and 4 are used with fluids compatible with 316 L stainless steel.

Electrical Specifications

Input ranges	Resolution	Accuracy	Remarks
volt 0 to 11 V	0.0001 V	± 0.02 % FS	R _{input} > 1MΩ
11 to 30 V	0.0001 V	± 0.02 % FS	
mA 0 to 24.5 mA	0.0001 mA	± 0.02 % FS	R _{input} < 65Ω
Output ranges	Resolution	Accuracy	Remarks
volt 0 to 11 V	0.0001 V	± 0.02 % FS	R _{output} < 0.3 Ω
mA 0 to 22 mA	0.0001 mA	± 0.02 % FS	R _{maximum} = 450 Ω
Two-wire transmitter (XTR) 4 to 22 mA	0.0001 mA	± 0.02 % FS	V _{maximum} = 30 V
Probe range	Resolution	Accuracy	Remarks
Pt-100 -200 °C to 850 °C / -328 °F to 562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751

FS = Full Scale

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.005 % FS / °C, taking 23 °C as the reference temperature.

Engineering Units: psi, atm, kgf/cm², inH₂O, mH₂O, cmH₂O, mmH₂O, inHg, cmHg, mmHg, bar, mbar, Pa, kPa and torr.

Operating Ambient: 0 to 40 °C ambient temperature and 90 % maximum relative humidity

Pneumatic Connection: 1/4" NPTF (1/8" NPTF only for the range 0 - 10,000 psi)

Overpressure: up to twice the value of full scale pressure (to sensors up to 5,000 psi).

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485)

Dimensions: 115 mm x 144 mm x 72 mm (HxWxD).

Weight: 1.5 kg approx.

Warranty: 1 year, except for rechargeable battery.

Included Items: leather carrying case, test leads, manual and battery charger.

Optional Accessories:

Temperature Sensor: 1/5 DIN-R Probe - Order Code: 04.06.0001-21; 1/5 DIN-A Probe - Order Code: 04.06.0007-21;

1/5 DIN-A-L Probe - Order Code: 04.06.0002-21;

Communication Interface - Order Code: 06.02.0001-00.



Pressure Mini Station PMS-517

- Ideal for laboratory use.
- Available and upgradeable with up to eight pressure sensors.
- Ranges from 250 mmH₂O to 10,000 psi gage or absolute pressure, including vacuum and differential between any pair of sensors.
- Accuracy of 0.025 % of full scale reading.
- Measures pressure, mA and volts and generates mA and volts. Provides a 24 Vdc power supply for 2-wire transmitters, and contact input for pressure switch verification.

The Pressure Mini Station PMS-517 provides the user with practically any type or range of pressure in a single instrument. Its technical features indicate performance levels comparable only to laboratory standards, it presents accuracy of 0.025 % full scale. Measures pressure, mA and volts and generates mA and volts. Provides a 24 Vdc power supply for 2-wire transmitters, and contact input for pressure switch verification. Can be provided in single model with up to four pressure sensors or double model with up to eight sensors. Thus, only one mini station can have the most varied ranges of pressure. Can also be purchased with a number of pressure sensors and subsequently be added others.

Order Code

PMS - 517 - [] - [] - [] - [] - [] - [] - [] - [] - [] - []

MODEL

S - single
D - double

RANGE	Input 1	RESOLUTION	ACCURACY	REMARKS
0 - 0	250 mmH ₂ O	0.001	± 0.05 % FS*	Gage pressure Used with air or inert gases
1 - 0	1 psi	0.0001	± 0.05 % FS	
2 - 0	5 psi	0.0001	± 0.025 % FS	
3 - 0	15 psi	0.0001	± 0.025 % FS	Gage or absolute pressure. Used with fluids (gases or liquids) compatible with 316L stainless steel
4 - 0	30 psi	0.0001	± 0.025 % FS	
5 - 0	100 psi	0.001	± 0.025 % FS	
6 - 0	250 psi	0.001	± 0.025 % FS	
7 - 0	500 psi	0.01	± 0.025 % FS	
8 - 0	1,000 psi	0.01	± 0.025 % FS	
9 - 0	3,000 psi	0.01	± 0.025 % FS	
10 - 0	5,000 psi	0.1	± 0.025 % FS	
11 - 0	10,000 psi	0.1	± 0.05 % FS	
12	others, upon request			
X	no sensor (for expansion)			

Pressure Type Input 1

A - Absolute (Only for ranges 3 to 8)
G - Gage
V - Vacuum (Only for range 3)
C - Compound*** (Only for ranges 3 to 8)
D - Differential (Only for ranges 0 to 2)

RANGE and Pressure Type Input 2**

RANGE and Pressure Type Input 3**

RANGE and Pressure Type Input 4**

RANGE and Pressure Type Input 5**
(Only for double version)

RANGE and Pressure Type Input 6**
(Only for double version)

RANGE and Pressure Type Input 7**
(Only for double version)

RANGE and Pressure Type Input 8**
(Only for double version)

(*) Full Scale

(**) Same code as input 1

(***) From -15 psi to the full scale of range

Code example: PMS-517-D-0G-3V-5G-6G-8A-9G-X-X, defines a 6 sensors Pressure Mini Station, which input 1 range from 0 to 250 mmH₂O gage pressure, input 2 from 0 to 15 psi vacuum, input 3 from 0 to 100 psi gage pressure, input 4 from 0 to 250 psi gage pressure, input 5 for 1,000 psi absolute pressure, input 6 from 0 to 3,000 psi gage pressure. Input 1 used with air or inert gases and the others used with fluids compatible with 316L stainless steel.

Electrical Specifications

Input Ranges	Resolution	Accuracy	Remarks
volt -10 to 11 V	0.0001 V	± 0.02% FS	R _{input} > 1 MΩ
11 to 45 V	0.0001 V	± 0.02% FS	
mA -5 to 24.5 mA	0.0001 mA	± 0.02% FS	R _{input} < 160 Ω
Output Ranges	Resolution	Accuracy	Remarks
volt -1 to 11 V	0.0001 V	± 0.02% FS	R _{output} < 0.3Ω
mA 0 to 22 mA	0.0001 mA	± 0.02% FS	R _{maximum} = 700 Ω
Two-wire transmitter (XTR) 4 to 22 mA	0.0001 mA	± 0.02% FS	V _{maximum} = 60 V

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.005 % FS / °C, taking 23 °C as the reference temperature.

Engineering units: psi, atm, kgf/cm², inH₂O, mH₂O, cmH₂O, mmH₂O, inHg, cmHg, mmHg, bar, mbar, Pa, kPa and torr.

Operating Ambient: 0 to 50 °C ambient temperature and 90 % maximum relative humidity

Pneumatic Connection: 1/4" NPTF (1/8" NPTF only for the range 0 - 10,000 psi).

Overpressure: up to twice the value of full scale pressure (to sensors up to 5,000 psi).

Dimensions (HxWxD): Single Model: 185 X 175 X 200 mm. Double Model: 185 X 338 X 200 mm.

Weight: 1.8 kg (single) and 3.0 kg (double) approx.

Warranty: 1 year, except for rechargeable battery.

Included Items: test leads, manual and power cord.



Pressure Calibration Station PCS-5070

- Complete calibration set pressure including pressure calibrator, control valves, multiway valves connections block, mounted in a practical plastic case of high resistance.
- Small and portable, ideal for field use, presents performance levels comparable only to laboratory standards.
- Accuracy of 0.025 % of full scale.
- Measures pressure, mA and volts and generates mA and volts. Provides a 24 Vdc power supply for 2-wire transmitters, and contact input for pressure switch verification.
- Includes input for optional temperature probe.

The Pressure Calibration Station PCS-5070 operates with rechargeable battery. Provided with a default pressure sensor from 0 to 30 psig and up to three direct pressure sensors for ranges from 250 mm H₂O to 10,000 psi gage or absolute pressure including vacuum, and differential between any pair of sensors. It has two control valves for 30 psi pressure, sensitive to variations of up to 6.3 mmH₂O and 5 way valve for maximum pressure of 1,000 psi and a maximum leak 0.1 Ncm³ / min. Communication with the computer is established via RS-232/485 serial communication port. When used together with ISOPLAN[®] calibration software, it takes advantage of the documenting calibration concept which automatizes the calibration process, allowing data storage and sharing between calibrator and computer, improving efficiency in handling information, preparing reports, issuing certificates, storage and registration of process instruments and sensors for an overall coverage of the quality procedure requirements, specially those related to ISO 9000.

Order Code

PCS - 5070 - - - **4** - **G** - - - - - - - -

Number of Inputs

- 1 - one default sensor, 0 to 30 psi gage pressure
- 2 - two sensors
- 3 - three sensors
- 4 - four sensors

RANGES	Input 1	RESOLUTION	ACCURACY	REMARKS
0 - 0 - 250	mmH ₂ O	0.001	± 0.05 % FS*	Gage pressure
1 - 0 - 1	psi	0.0001	± 0.05 % FS	Used with air or inert gases
2 - 0 - 5	psi	0.0001	± 0.025 % FS	
3 - 0 - 15	psi	0.0001	± 0.025 % FS	Gage or absolute pressure.
4 - 0 - 30	psi	0.0001	± 0.025 % FS	Used with fluids (gases or liquids)
5 - 0 - 100	psi	0.001	± 0.025 % FS	compatible with 316L stainless steel
6 - 0 - 250	psi	0.001	± 0.025 % FS	
7 - 0 - 500	psi	0.01	± 0.025 % FS	
8 - 0 - 1,000	psi	0.01	± 0.025 % FS	
9 - 0 - 3,000	psi	0.01	± 0.025 % FS	
10 - 0 - 5,000	psi	0.1	± 0.025 % FS	
11 - 0 - 10,000	psi	0.1	± 0.05 % FS	
12 - Others,	upon request			

Pressure Type

- A - Absolute (Only for ranges 3 to 8)
- G - Gage
- V - Vacuum (Only for range 3)
- C - Compound*** (Only for ranges 3 to 8)
- D - Differential (Only for ranges 0 to 2)

RANGE Input 2** (Only for version with two sensors or more)

Pressure Type Input 2**

RANGE Input 3** (Only for version with three sensors or more)

Pressure Type Input 3**

RANGE Input 4** (Only for version with four sensors)

Pressure Type Input 4**

(*) FS=Full Scale (**) Same code as Input 1 (***) From -15 psi to the full scale of range

Code Example: PCS-5070-4-4-G-3-V-5-G-8-A, defines a four sensors calibrator, which input 1 range from 0 to 30 psi (gage pressure), input 2 from 0 to 15 psi (vacuum), input 3 from 0 to 100 psi (gage pressure) and input 4 from 0 to 1,000 psi (absolute pressure). All inputs are used with fluids compatible with 316 L stainless steel.

Electrical Specifications

Input Ranges		Resolution	Accuracy	Remarks
volt	-10 to 11 V	0.0001 V	± 0.02 % FS	R _{input} > 1MΩ
	11 to 45 V	0.0001 V	± 0.02 % FS	
mA	-5 to 24.5 mA	0.0001 mA	± 0.02 % FS	R _{input} < 160Ω
Output Ranges		Resolution	Accuracy	Remarks
volt	-1 to 11 V	0.0001 V	± 0.02 % FS	R _{input} < 0.3 Ω
mA	0 to 22 mA	0.0001 mA	± 0.02 % FS	R _{maximum} = 700 Ω
Two-wire transmitter (XTR)		0.0001 mA	± 0.02 % FS	V _{maximum} = 60 V
4 to 22 mA				
Probe Range		Resolution	Accuracy	Remarks
Pt-100	-200 °C to 850 °C / -328 °C to 562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751

FS = Full Scale

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.005 % FS / °C, taking 23 °C as the reference temperature.

Engineering Units: psi, atm, kgf/cm², inH₂O, mH₂O, cmH₂O, mmH₂O, inHg, cmHg, mmHg, bar, mbar, Pa, kPa and torr.

Operating Ambient: 0 to 50 °C ambient temperature and 90 % maximum relative humidity.

Pneumatic Connection: 1/4" NPTF (1/8" NPTF only for the range 0 - 10,000 psi).

Overpressure: up to twice the value of full scale pressure (to sensors up to 5,000 psi).

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485).

Dimensions: 180 mm x 420 mm x 340 mm (HxWxD).

Weight: 7.5 kg approx.

Warranty: 1 year, except for rechargeable battery.

Included items: Test leads, manual and power cord.

Optional Accessories:

Temperature Sensor: 1/5 DIN Probe-R - Order Code: 04.06.0001-21; 1/5 DIN Probe-A - Order Code: 04.06.0007-21;

1/5 DIN Probe-A-L - Order Code: 04.06.0002-21;

Communication Interface - Order Code: 06.02.0002-00.

PMY Pressure Module

For use with MCS-12 Universal Calibrator



Through PMY pressure module, the MCS-12 Universal Calibrator can measure pressure with high accuracy. Ideal to calibrate and adjust pressure instruments, such as: pressure and vacuum gages, pressure transmitters, strain gages, I/P converters, pressure switches, etc. PMY Pressure Module uses piezoresistive pressure sensors which constitute the state-of-the-art in pressure measurement. The sensors construction in the solid state technology provide high reliability in the measurements. Nonlinearity effects, hysteresis, thermal variations etc., are minimized by use of temperature compensation algorithms in pressure measurements. The module has also a mV input proper to calibrate strain gages.

- For use with the MCS-12 Universal Calibrator.
- One or two pressure ranges per module, simple or double pressure version.
- Gage, absolute, compound, differential pressure and vacuum.
- Ranges between 0 – 250 mmH₂O and 0 – 10,000 psi.
- High accuracy (0.05 % FS) and high thermal stability (0.005% FS/ °C).

Order Code

PMY - [] - [] - [] - [] - [] - [] - []

Number of Inputs

- S - Single
- D - Double

RANGE	Input 1	RESOLUTION	ACCURACY	REMARKS
00 - 0 - 250 mmH ₂ O		0.001	± 0.1 % FS*	Gage pressure.
01 - 0 - 1 psi		0.0001	± 0.1 % FS	Used with air or inert gases
02 - 0 - 5 psi		0.0001	± 0.05 % FS	
03 - 0 - 15 psi		0.0001	± 0.05 % FS	Gage or absolute pressure.
04 - 0 - 30 psi		0.0001	± 0.05 % FS	Used with fluids
05 - 0 - 100 psi		0.001	± 0.05 % FS	(Gases or liquids) compatible with
06 - 0 - 250 psi		0.001	± 0.05 % FS	316L stainless steel
07 - 0 - 500 psi		0.01	± 0.05 % FS	
08 - 0 - 1000 psi		0.01	± 0.05 % FS	
09 - 0 - 3000 psi		0.01	± 0.05 % FS	Gage pressure
10 - 0 - 5000 psi		0.01	± 0.05 % FS	Used with fluids
11 - 0 - 10000 psi		0.01	± 0.1 % FS	
12 - Others, upon request				

- Pressure Type** Input 1
- A - Absolute (only for ranges 3 to 8)
 - G - Gage
 - D - Differential (only for ranges 0 to 2)
 - C - Compound** (only for ranges 3 to 8)
 - V - Vacuum (only for range 03)
- (*) FS = Full Scale.
(**) From -15 psi to the full scale of range.

- RANGE** Input 2 (Only for double version)
- 00 - Not used, or follows the same encoding of input 1

- Pressure Type** Input 2 (Only for double version)
- 0 - Not used, or follows the same encoding of input 1

- Operating ambient:** 0 to 50 °C temperature and 90 % maximum relative humidity.
Pneumatic connection: 1/4" NPTF (Note: 1/8" NPTF only for range 0 - 10,000 psi).
Overpressure: up to twice the value of full scale pressure (to sensors up to 5,000 psi).

Code Example:

PMY-D-03-G-05-A

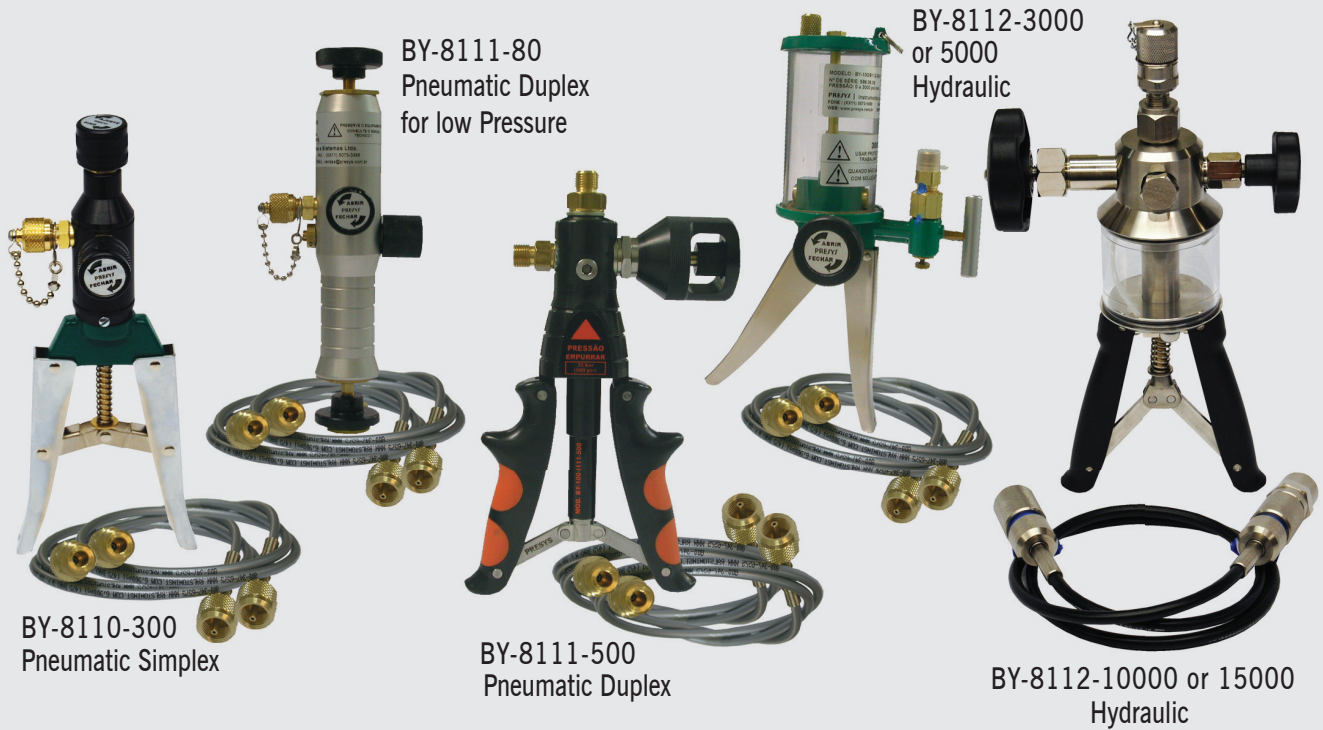
Defines a double module: input 1 for 0 to 15 psi gage pressure and input 2 for 0 to 100 psi absolute pressure. Both for use with fluids compatible with 316L stainless steel

Dimensions: 144 x 72 x 69 mm (HxWxD)

Weight: 0.5 kg approx.

Warranty: 1 year.

Included Items: carrying case, manual and terminals.



Pressure Calibration Pumps 8100 Series (manually operated)

- **Versatile:** Pressure pump for calibration of transmitters, gauges etc.;
- **Safe:** Does not use electricity or high pressure bottle;
- **Adjustable:** Provided with fine adjustment for the entire pressure range;
- **Robust:** Heavy duty construction;
- **Portable:** Compact size and lightweight;
- **Easy to use:** Low effort;
- **Flexible in use:** Compatible with PMY, PC-507 and others.

SPECIFICATIONS	8110-300	8111-80	8111-500	8112-3000 or 5000	8112-10000 or 15000
Pressure Range	300 psi	80 psi or 24" Hg vacuum	500 psi or 28" Hg vacuum	3,000 psi or 5,000 psi	10,000 psi or 15,000 psi
Weight (kg)	0.550	0.590	0.800	1.0	1.6
Dimensions (HxWxD)	245 x 96 x 60	200 x 73 x 90	220 x 105 x 63	236 x 159 x 70	240 x 185 x 95
Body Material	anodized aluminum brass, stainless steel	anodized aluminum brass, stainless steel	anodized aluminum brass, stainless steel	brass, stainless steel	stainless steel
Hoses Material	Nylon / Kevlar Brass	Nylon / Kevlar Brass	Nylon / Kevlar Brass	Nylon / Kevlar Brass	nylon, stainless steel mesh, PTFE and nitrile rubber
Seals Material	Nitrile Rubber (NBR)	Nitrile Rubber (NBR)	Nitrile Rubber (NBR)	Nitrile Rubber (NBR)	Nitrile Rubber / PTFE / Viton rubber
Connection	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT

- Included 2 hoses and 2 adapters each.

Accessories for Pressure Instruments



1/4" MALE NPT TEE ADAPTER FOR HIGH PRESSURE HOSES:

- Order Code: 02.09.0077-21
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/4" Male NPT* x 2 Adapters with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).
- * Also available with other threads.



1/8" MALE BSP ADAPTER FOR HIGH PRESSURE HOSES:

- Order Code: 06.08.0032-00
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/8" Male BSP x Adapter with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).

1/8" MALE NPT ADAPTER FOR HIGH PRESSURE HOSES:

- Order Code: 06.08.0013-00
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/8" Male NPT x Adapter with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).



1/4" MALE NPT ADAPTER FOR HIGH PRESSURE HOSES:

- Order Code: 06.08.0006-00
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/4" Male NPT x Adapter with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).



1/4" FEMALE NPT ADAPTER FOR HIGH PRESSURE HOSES:

- Order Code: 06.08.0012-00
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/4" Female NPT x Adapter with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).

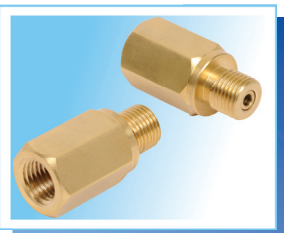


1/4" MALE BSP ADAPTER FOR HIGH PRESSURE HOSES:

- Order Code: 06.08.0037-00
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/4" Male BSP x Adapter with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).

1/2" MALE NPT ADAPTER FOR HIGH PRESSURE HOSES:

- Order Code: 06.08.0030-00
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/2" Male NPT x Adapter with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).





1/2" FEMALE NPT ADAPTER FOR HIGH PRESSURE HOSES:

- Order Code: 06.08.0015-00
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/2" Female NPT x Adapter with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).



1/8" MALE NPT QUICK CONNECTOR x 1/8" MALE NPT Mod. CR-1/8:

- Order Code: 06.08.0002-00
- Material: Carbon steel with antioxidant treatment, Polyurethane O-rings, Nitrile Rubber and PTFE.
- Ends: 1/8" Male NPT with quick sealing system x 1/8" Female NPT.
- Maximum Pressure: 5,000 psi (310 bar).

1/4" MALE NPT SWIVEL QUICK CONNECTOR:

- Order Code: 06.08.0003-00
- Material: Carbon steel with antioxidant treatment, Polyurethane O-rings, Nitrile Rubber and PTFE.
- Ends: 1/4" Male NPT with quick sealing system x 1/4" Female NPT with swivel system.
- Maximum Pressure: 5,000 psi (310 bar).



1/4" MALE NPT QUICK CONNECTOR x HOSE ADAPTER Mod. CR-1/4:

- Order Code: 06.08.0008-00
- Material: Stainless Steel and Brass, Nitrile Rubber O-rings.
- Ends: 1/4" Male NPT with quick sealing system x Adapter with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).



1/4" FEMALE NPT QUICK CONNECTOR:

- Order Code: 06.08.0004-00
- Material: Carbon steel with antioxidant treatment, Polyurethane O-rings, Nitrile Rubber and PTFE.
- Ends: 1/4" Male NPT x 1/4" Female NPT with quick sealing system.
- Maximum Pressure: 5,000 psi (310 bar).



1/2" MALE NPT QUICK CONNECTOR x 1/2" NPT Mod. - CR-1/2:

- Order Code: 06.08.0005-00
- Material: Carbon steel with antioxidant treatment, Polyurethane O-rings, Nitrile Rubber and PTFE.
- Ends: 1/2" Male NPT with quick sealing system x 1/4" Female NPT
- Maximum Pressure: 5,000 psi (310 bar).

1/2" FEMALE NPT QUICK CONNECTOR:

- Order Code: 06.08.0017-00
- Material: Carbon steel with antioxidant treatment, Polyurethane O-rings, Nitrile Rubber and PTFE.
- Ends: 1/2" Male NPT x 1/2" Female NPT with quick sealing system.
- Maximum Pressure: 5,000 psi (310 bar).



HOSES:

- Order Code: 06.08.0018-00 (900 mm)
06.08.0028-00 (1500 mm)
- Material: Kevlar Mesh with Nylon coating.
- Ends: Brass with female sealing system connection.
- Maximum Pressure: 5,000 psi (310 bar).



1/4" NPT QUICK PLUG:

- Order Code: 06.08.0010-00
- Material: Carbon steel with antioxidant treatment, Polyurethane O-rings, Nitrile Rubber and PTFE.
- Ends: 1/4" Male NPT with quick sealing system
- Maximum Pressure: 5,000 psi (310 bar).



CHAINED PLUG:

- For use with adapter for high pressure hose.
- Order Code: 04.04.0039-10
- Material: Brass, stainless steel chain.

**HOSES AND ADAPTERS KIT
Mod. MC-KIT:**

- Order Code: MC-KIT
- Material: Kevlar Mesh with Nylon coating.
- Ends: Brass with Female connection for sealing system adapter.
- Length: 1500 mm
- Maximum Pressure: 5,000 psi - Adapters
- Material: Brass, Nitrile Rubber O-rings.
- Ends: 1/4" Male NPT x Adapters with sealing system for high pressure hoses.
- Maximum Pressure: 5,000 psi (310 bar).

The Kit is made of two hoses (1500 mm each) and four adapters.

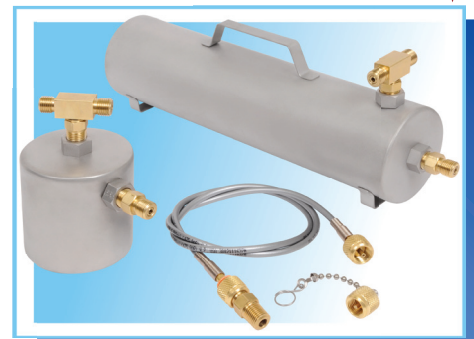
**LOW PRESSURE STABILIZER KIT
Mod.: KIT-RS-P-BP-AC
Mod.: KIT-RS-P-BP-BC**

- Low Pressure Stabilizer with low or high capacity, for pressure stabilization. Use with pneumatic manual pumps.
- Order Code: KIT-RS-P-BP-AC - High Capacity - 06.08.0039-00
KIT-RS-P-BP-BC - Low Capacity - 06.08.0040-00
- Material: Stainless Steel, Brass Connections and Nitrile Rubber O-rings sealing
 - Dimensions: 3" diameter. length: 80 and 300 mm.
 - Connections: 1 x TEE Adapter and 1 x brass adapter with sealing system for high pressure hoses.
 - Maximum Pressure: 100 psi (7 bar).

Included a chained plug and a 1/4" NPT adapter.

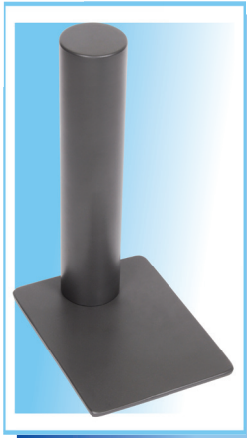
**IMPURITIES SEPARATOR
Mod.: BY100/SI**

- Use in pneumatic pumps for calibration. Prevents pump contamination by liquids from process instruments during their calibrations.
- Order Code: 06.08.0038-00
- Material: Stainless Steel, Polycarbonate and Nitrile Rubber O-rings.
- Connections: 1 x 1/4" Female BSP + 1 x 1/4" Male BSP.
- Maximum Pressure: 600 psi (40 bar).



MANIFOLD KIT WITH 1/4" AND 1/2" FEMALE NPT CONNECTORS:

- *Order Code:* 06.08.0050-00
- *Material:* Anodized Aluminum Block, steel support with epoxy painting and "U" clip for attaching into 2 " dichromated steel pipe .
- *Connections:* 1 x 1/2" Female NPT and 1 x 1/4" Female NPT with quick sealing system and carbon steel with anti-oxidant treatment , Polyurethane O-rings, Nitrile Rubber and PTFE; 1 x 1/4" Male NPT and 1 x 1/8" Male NPT brass adapter with sealing system for high pressure hoses, Polyurethane O-rings, Nitrile Rubber; 1 x chained plug.
- *Support:* Steel, 2" diameter, 300 mm height and epoxy painting
 - *Maximum Pressure:* 3,000 psi (207 bar).

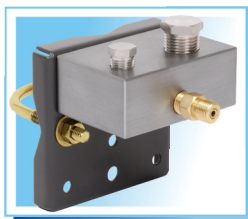


SUPPORT FOR TRANSMITTERS (2" TUBE):

- *Order Code:* 06.08.0001-00
- *Material:* Steel with epoxy painting.
- *Dimensions:* □ 2", 300 mm height.

MANIFOLD KIT WITH SANITARY CONNECTIONS:

- *Order Code:* MANIFOLD KIT- E
 - For Gauge or Transmitter calibration, using Manifold Kit with 1/2" female NPT.
 - *Material:* Stainless Steel.
 - *Support:* Steel, 2" diameter, 300 mm height and epoxy painting.
 - *Sanitary Connection Types:* SMS, RJT, IDF, TC etc.
- Note: Specify the types and dimensions.



MANIFOLD BLOCK:

- *Order Code:* 06.08.0009-00
- *Material:* Anodized Aluminum Block, steel support with epoxy painting and "U" clip for attaching into 2 " dichromated steel pipe.
- *Holes:* 1 x 1/8"Female NPT, 2 x 1/4" Female NPT and 1 x 1/2" Female NPT.
- *Included:* 2 x 1/4" hex plugs, 1 x 1/2" NPT hex plug 1 x 1/8" NPT allen plug.
- *Maximum Pressure:* 3,000 psi (207 bar).



1/2" UNF x 1/2" BSP Adapter:

- *Order Code:* 06.08.0078-00
- *Material:* Brass
- *Ends:* 1/2" UNF x 1/2" BSP.

1/4" FEMALE NPT x 1/8" MALE NPT:

- *Order Code:* 02.22.0136-21
- *Material:* 304 Stainless Steel.
- *Ends:* 1/4" Female NPT x 1/8" Male NPT.
- *Maximum Pressure:* 15,000 psi (1,000 bar).

Note: Other connections upor request.



Dry Block Calibrators (low temperatures) T-25N / T-35N / T-50N

The T-25N, T-35N and T-50N Dry Block Calibrators perform functions that would require three different types of instruments: dry block calibrator, standard thermometer and calibrator for TCs, RTDs, mA, mV, ohms and thermostats.

- Model T-50N generates the coolest temperature available for a **PRESYS** dry block. It reaches $-50\text{ }^{\circ}\text{C}$ in an ambient temperature of $23\text{ }^{\circ}\text{C}$, with no need of well insulator.
- Optional temperature measurement and control by external probe with Callendar-Van Dusen coefficients.
- Resolution of $0.01\text{ }^{\circ}\text{C}$.
- Stability of $\pm 0.02\text{ }^{\circ}\text{C}$ for all range of temperature.
- Input for RTD, thermocouples and thermostats.
- Internal regulated 24 Vdc power supply and mA input for 2-wire transmitters.
- Completely automatic calibration with or without the use of a computer.
- Documenting capabilities: connection with computer and ISOPLAN[®] calibration software.

The T-25N, T-35N and T-50N models control temperature over an insert in order to calibrate thermocouples, thermoresistances, glass thermometers, thermostats etc. Besides providing high accuracy temperature values, they also allow the measurement of signals generated by the thermocouples, thermoresistances and thermostats, which are being calibrated. This is possible due to an embedded calibrator specific for these types of signal, including 4-20 mA. They incorporate the function of dry block, standard thermometer and calibrator for RTD and TC sensors, besides mA reading. They present a wide range of programming resources, allowing them to perform automatic calibration of the sensors. In this case, the sensor is placed in the insert and its electrical terminals are connected to the embedded calibrator, the operator defines the calibration points and the number of repetitions, then the process is started so that all the sequence is automatically accomplished. Another way of performing automatic documented calibrations is by means of ISOPLAN[®] calibration software for PC/Windows[™] which uses the RS-232 serial port to connect PC to the dry block. With ISOPLAN[®] it is possible to register sensors and instruments of the factory, generate work orders, create and print calibration certificates and reports, i.e., it brings all the advantages of computer data management to the calibration environment.

Technical Specifications

	T-25N	T-35N	T-50N
Operating Range: ambient temperature: 23 °C	-25 °C to +125 °C	-35 °C to +125 °C	-50 °C to +125 °C
Accuracy: internal reference with external probe with external thermometer	± 0.1 °C		
	± 0.07 °C		
	± 0.05 °C		
Resolution:	0.01 °C		
Stability:	± 0.02 °C		
Heating Time:	5 min (25 °C to 125 °C)	5 min (20 °C to 100 °C)	5 min (20 °C to 100 °C)
Cooling Time:	10 min (125 °C to 0 °C)	9 min (100 °C to 0 °C)	9 min (100 °C to 0 °C)
Temperature Uniformity:	0.05 °C		
Weight:	9.0 kg	10.0 kg	10.0 kg
Power Supply:	110 or 220 Vac, 50/60 Hz		
Electric Power:	200 W	400 W	400 W
Units / Temperature Scales	°C or °F / IPTS-68 or ITS-90, user selectable		
Display:	Graphic vacuum fluorescent with contrast adjustment		
Well Diameter / Depht:	Ø 25.4 mm (1") / 124 mm		
Dimension (HxWxD)	250 x 180 x 270 mm		
Warranty:	1 year, except for rechargeable battery and elements of Peltier effect		

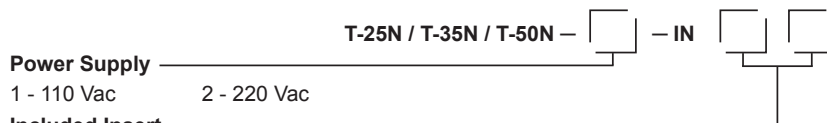
Electrical Input Ranges Specifications

Input Ranges	Resolution	Accuracy	Remarks
milivolt	-150 to 150 mV	0.001 mV	± 0.01 % FS
	-500 to -150 mV	0.01 mV	± 0.02 % FS
	150 to 2450 mV	0.01 mV	± 0.02 % FS
mA	-5 to 24.5 mA	0.0001 mA	± 0.02 % FS
	0 to 400 Ω	0.01 Ω	± 0.01 % FS
resistance	400 to 2500 Ω	0.01 Ω	± 0.03 % FS
	Pt-100	-200 to 850 °C / -328 to 1562 °F	0.1 °C / 0.1 °F
Pt-1000	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F
Cu-10	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F
Ni-100	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-K	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F
	-150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-T	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F
	-200 to -75 °C / -328 to -103 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F
	-75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-E	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 0.3 °C / ± 0.6 °F
	-150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F
TC-N	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F
	-200 to -20 °C / -328 to -4 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F
	-20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-L	-200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F

FS = Full Scale

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Included Insert

Choose between the inserts listed below. Unless specified, the accompanying insert is IN06.

Accessories

Inserts:	Holes	Order Code
IN01	1x 3/4"	06.04.0011-00
IN02	1x 1/2"	06.04.0012-00
IN03	1x 6.0 mm and 3x 1/4"	06.04.0013-00
IN04	3x 6.0 mm and 1x 1/4"	06.04.0014-00
IN05	4x 6.0 mm	06.04.0015-00
IN06	2x 6.0 mm and 2x 1/4"	06.04.0016-00
IN07	1x 6.0 mm 1x 8.0 mm and 1x 3/8"	06.04.0017-00
IN08	1x 6.0 mm 1x 3.0 mm and 2x 1/4"	06.04.0018-00
IN09	Without hole, to be drilled by the client	06.04.0019-00
IN10	Others, under ordering	06.04.0020-00

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485).

Included Items: carrying case, strap, insert (selectable), container for steel balls, tiny steel balls, insert extractor tool, test leads, manual and power cord.

Optional Accessories:

Temperature Sensors: 1/5 DIN Probe-R - Order Code: 04.06.0001-21;

1/5 DIN Probe-A - Order Code: 04.06.0007-21;

Communication Interface - Order Code: 06.02.0002-00



Dry Block Calibrators for Large Calibration Volume T-25NL / T-45NL / T-660PL

- The T-25NL, T-45NL and T-660PL part of a family of calibrators designed for large calibration volume. This Calibrator family is ideal to calibrate sensors that require deep immersion.
- Model T-25NL and T-45NL are 3 in 1 temperature calibrators: dry block, stirred liquid bath for glass thermometers and any shape of temperature sensors and a Black Body source for infrared pyrometers. The T-660PL comes with a dry block and, optionally, a Black Body source.
- Optional temperature measurement and control by external probe with *Callendar-Van Dusen* coefficients.
- The T-660PL generates temperatures from ambient to 650 °C. The T-25NL and T-45NL generate temperatures from -25 °C to 140 °C and -45 °C to 140 °C, respectively, in ambient temperature of 23 °C.
- Stability of ± 0.02 °C for the T-25NL and T-45NL and ± 0.05 °C for the T-660PL model.

The T-25NL, T-45NL and T-660NL models control temperature over the bath or insert with high accuracy in order to calibrate thermocouples, thermoresistances, glass thermometers, thermostats etc. Besides that, the T-25NL and T-45NL may work as a stirred liquid bath and black body source and the T-660PL may work as a black body source. Besides providing high accuracy temperature values, they also allow the measurement of signals generated by the thermocouples, thermoresistances and thermostats, which are being calibrated. With the optional purchase of a probe to be connected to the external input, the calibrator controls the temperature using as reference a sensor inserted in the same measurement zone of the sensors under calibration increasing the accuracy and decreasing set point errors and loading effects. They present a wide range of programming resources, allowing them to perform automatic calibration of the sensors, with or without the use of a computer. With ISOPLAN® it is possible to register sensors and instruments of the factory, generating work orders, creating and printing calibration certificates and reports, i.e., it brings all the advantages of computer data management to the calibration environment.

Technical Specifications

	T-25NL	T-45NL	T-660PL
Operating Range: ambient temperature: 23°C	-25 °C to 140 °C	-45 °C to 140 °C	from ambient temperature to 660 °C
Accuracy: Internal reference with external probe with external thermometer	± 0.1 °C	± 0.1 °C	± (0.1 °C + 0.1% of reading)
	± 0.07 °C	± 0.07 °C	± 0.10 °C
	± 0.05 °C	± 0.05 °C	± 0.05 °C
Resolution:	0.01 °C	0.01 °C	0.01 °C
Stability:	± 0.02 °C	± 0.02 °C	± 0.05 °C
Heating Time:	23 min (25 °C to 140 °C)	14 min (25 °C to 140 °C)	30 min (50 °C to 660 °C)
Cooling Time:	20 min (25 °C to -25 °C)	35 min (25 °C to -45 °C)	1h15 (660 °C to 200 °C)
Temperature Uniformity:	± 0.05 °C		
Weight:	12.0 kg		10.0 kg
Power Supply:	110 or 220 Vac, 50/60Hz		
Electric Power:	300 W	450 W	1000 W
Units / Temperature Scales:	°C or °F / IPTS-68 or ITS-90, user selectable		
Display:	Graphic vacuum fluorescent with contrast adjustment		
Well Diameter / Depth:	35 x 160 mm		36 x 155 mm
Dimension (HxWxD)	315 x 180 x 270 mm		
Warranty:	1 year, except for rechargeable battery and elements of Peltier effect		

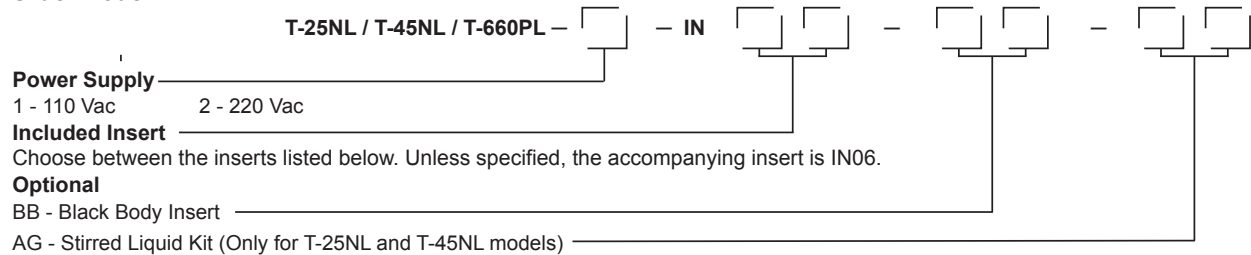
Electrical Input Ranges Specifications

Input Ranges	Resolution	Accuracy	Remarks
millivolt -150 to 150 mV -500 to -150 mV 150 to 2450 mV	0.001 mV	± 0.01 % FS	Rinput > 10 MΩ
	0.01 mV	± 0.02 % FS	auto-range
	0.01 mV	± 0.02 % FS	
mA -5 to 24.5 mA	0.0001 mA	± 0.02 % FS	Rinput < 160 Ω
	0.01 Ω	± 0.01 % FS	excitation current 0.9 mA
resistance 0 to 400 Ω 400 to 2500 Ω	0.01 Ω	± 0.03 % FS	auto-range
	0.01 Ω	± 0.03 % FS	
Pt-100 -200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Pt-1000 -200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10 -200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	MINCO 16-9
Ni-100 -60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
TC-J -210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	IEC-60584
	0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F	IEC-60584
TC-K -150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
	0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F	IEC-60584
TC-T -260 to -200 °C / -436 to -328 °F -200 to -75 °C / -328 to -103 °F -75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
	0.1 °C / 0.1 °F	± 0.3 °C / ± 0.6 °F	IEC-60584
TC-E -150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	
	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F	IEC-60584
TC-N -260 to -200 °C / -436 to -328 °F -200 to -20 °C / -328 to -4 °F -20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43710
TC-L -200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	

FS= Full Scale

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Accessories

Inserts:	Holes	T-25NL / T-45NL	T-660PL
IN01	1x 3/4"	06.04.0041-00	06.04.0062-00
IN02	1x 1/2"	06.04.0042-00	06.04.0063-00
IN03	1x 6.0 mm and 3x 1/4"	06.04.0043-00	06.04.0064-00
IN04	3x 6.0 mm and 1x 1/4"	06.04.0044-00	06.04.0065-00
IN05	4x 6.0 mm	06.04.0045-00	06.04.0066-00
IN06	2x 6.0 mm and 2x 1/4"	06.04.0046-00	06.04.0067-00
IN07	1x 6.0 mm 1x 8.0 mm and 1x 3/8"	06.04.0047-00	06.04.0068-00
IN08	1x 6.0 mm 1x 3.0 mm and 2x 1/4"	06.04.0048-00	06.04.0069-00
IN09	Without hole, to be drilled by the client	06.04.0049-00	06.04.0070-00
IN10	Others, under ordering	06.04.0050-00	06.04.0071-00

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485).
Included Items: carrying case, strap, insert (selectable), insert extractor tool, test leads, manual and power cord.

Optional Accessories:
Temperature Sensors:
1/5 DIN A-L Probe - Order Code: 04.06.0002-21.
Angular Probe (up to 660 °C) - Order Code: 04.06.0009-21.
Communication Interface - Order Code: 06.02.0002-00.



Dry Block Calibrators (high temperatures) T-350P / T-650P / T-1200P

- The T-350P, T-650P and T-1200P Dry Block Calibrators perform functions that would require three different types: a dry block, standard thermometer and a calibrator for RTDs, TCs, mA, mV, ohms and thermostats.
- Model T-1200P generates temperature from 50 °C up to 1200 °C. The T-350P and T-650P models generate from ambient temperature to 350 °C and 650 °C respectively.
- Stability of ± 0.05 °C for the T-350P and T-650P and ± 0.1 °C for the T-1200P model.
- Internal regulated 24 Vdc power supply and mA input for 2-wire transmitters.
- Optional temperature measurement and control by external probe with Callendar-Van Dusen coefficients for the models T-350P and T-650P.
- Completely automatic calibration with or without the use of a computer.
- Documenting capabilities: connection with computer and ISOPLAN® calibration software.
- The T-1200P allows the use as a black body target for infrared thermometers.

The T-350P, T-650P and T-1200P models control temperature over an insert in order to calibrate thermocouples, thermoresistances, glass thermometers, thermostats etc. Besides that, the T-1200P model may work as a black body source. Besides providing high accuracy temperature values, they also allow the measurement of signals generated by the thermocouples, thermoresistances and thermostats, which are being calibrated. This is possible due to an embedded calibrator specific for these types of signals, including 4-20 mA. They incorporate the function of dry block, standard thermometer and calibrator for RTD and TC sensors, besides mA reading.

With the optional purchase of a probe (only for T-350P and T-650P) to be connected to the external input, the calibrator controls the temperature using as reference a sensor inserted in the same measurement zone of the sensors under calibration increasing the accuracy and decreasing set point errors and loading effects.

They present a wide range of programming resources, allowing them to perform automatic calibration of the sensors, with or without the use of a computer.

With ISOPLAN® it is possible to register sensors and instruments of the factory, generate work orders, create and print calibration certificates and reports, i.e., it brings all the advantages of computer data management to the calibration environment.

Technical Specifications

	T-350P	T-650P	T-1200P
Operating Range: ambient temperature: 23 °C	from ambient temperature to 350 °C	from ambient temperature to 650 °C	50 °C to 1200 °C
Accuracy: Internal reference with external probe with external thermometer	± (0.1 °C + 0.1% of reading)	± (0.1 °C + 0.1% of reading)	± 3 °C
	± 0.07 °C	± 0.10 °C	---
	± 0.05 °C	± 0.05 °C	± 0.75 °C
Resolution:	0.01 °C	0.01 °C	0.1 °C
Stability:	± 0.05 °C	± 0.05 °C	± 0.1 °C
Heating Time:	10 min (50 °C to 350 °C)	15 min (50 °C to 650 °C)	45 min (100 °C to 1200 °C)
Cooling Time:	12 min (350 °C to 100 °C)	22 min (650 °C to 200 °C)	5h (1200 °C to 200 °C)
Temperature Uniformity:	± 0.05 °C		± 0.2 °C
Weight:	7.0 kg	8.0 kg	8.7 kg
Power Supply:	110 or 220 Vac, 50/60 Hz		220 Vac, 50/60 Hz
Electric Power:	500 W	1000 W	2300 W
Unit / Temperature Scales:	°C or °F / IPTS-68 or ITS-90, user selectable		
Display:	Graphic vacuum fluorescent with contrast adjustment		
Well Diameter / Depth:	Ø 25.4 mm (1") / 124 mm		Ø 34 mm / 130 mm
Dimension (HxWxD)	250 x 180 x 270 mm		300 x 180 x 270 mm
Warranty:	1 year, except for rechargeable battery		

Electrical Input Ranges Specifications

Input Ranges	Resolution	Accuracy	Remarks
millivolt	-150 to 150 mV	0.001 mV	± 0.01 % FS
	-500 to -150 mV	0.01 mV	± 0.02 % FS
	150 to 2450 mV	0.01 mV	± 0.02 % FS
mA	-5 to 24.5 mA	0.0001 mA	± 0.02 % FS
			± 0.01 % FS
resistance	0 to 400 Ω	0.01 Ω	± 0.01 % FS
	400 to 2500 Ω	0.01 Ω	± 0.03 % FS
Pt-100	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F
Pt-1000	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F
Cu-10	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F
Ni-100	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-K	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F
	-150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-T	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F
	-200 to -75 °C / -328 to -103 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F
	-75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-B**	50 to 250 °C / 122 to 482 °F	0.1 °C / 0.1 °F	± 2.5 °C / ± 5.0 °F
	250 to 500 °C / 482 to 932 °F	0.1 °C / 0.1 °F	± 1.5 °C / ± 3.0 °F
	500 to 1200 °C / 932 to 2192 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F
	1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F	± 0.7 °C / ± 1.4 °F
TC-R**	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	± 0.7 °C / ± 1.4 °F
TC-S**	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	± 0.7 °C / ± 1.4 °F
TC-E*	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	± 0.3 °C / ± 0.6 °F
	-150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F
TC-N	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F
	-200 to -20 °C / -328 to -4 °F	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F
	-20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F
TC-L*	-200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F

FS= Full Scale

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Power Supply

1 - 110 Vac*** 2 - 220 Vac (***) for T-1200P upon request

(*) Not applicable to T-1200P.

(**) Not applicable to T-350P and T-650P.

Included Insert

Choose between the inserts listed below. Unless specified, the accompanying insert is IN06.

Optional: BB - Black Body Insert (only for T-1200P)

Accessories

Inserts:	Holes	Order Code		
		T-350P	T-650P	T-1200P
IN01	1x 3/4"	06.04.0011-00	06.04.0021-00	06.04.0031-00
IN02	1x 1/2"	06.04.0012-00	06.04.0022-00	06.04.0032-00
IN03	1x 6.0 mm and 3x 1/4"	06.04.0013-00	06.04.0023-00	06.04.0033-00
IN04	3x 6.0 mm and 1x 1/4"	06.04.0014-00	06.04.0024-00	06.04.0034-00
IN05	4x 6.0 mm	06.04.0015-00	06.04.0025-00	06.04.0035-00
IN06	2x 6.0 mm and 2x 1/4"	06.04.0016-00	06.04.0026-00	06.04.0036-00
IN07	1x 6.0 mm 1x 8.0 mm and 1x 3/8"	06.04.0017-00	06.04.0027-00	06.04.0037-00
IN08	1x 6.0 mm 1x 3.0 mm and 2x 1/4"	06.04.0018-00	06.04.0028-00	06.04.0038-00
IN09	Without hole, to be drilled by the client	06.04.0019-00	06.04.0029-00	06.04.0039-00
IN10	Others, under ordering	06.04.0020-00	06.04.0030-00	06.04.0040-00

Serial communication: Modbus® RTU Protocol (RS-232/RS-485).

Included Items: carrying case, strap, insert (selectable), container for steel balls*, tiny steel balls*, insert extractor tool, test leads, insulation**, manual and power cord.

Optional Accessories:

Temperature Sensors: 1/5 DIN A Probe - Order Code: 04.06.0007-21.
Angular Probe (up to 660 °C) - Order Code: 04.06.0009-21
Communication Interface - Order Code: 06.02.0002-00



CALIBRATION BATH for Stirred Liquid and Dry Block of Extra Large Calibration Volume

T-35NLL / T-300PLL

- The T-35NLL generates temperatures from -35 °C to 140 °C, and the T-300PLL from ambient temperature to 300 °C.
- Stirred Liquid or Dry Block.
- Extra large calibration volume: 59 mm diameter x 200 mm height.
- High Stability, Uniformity and Accuracy. Easily performs 1/5 and 1/10 DIN Pt-100 calibrations.
- Optional temperature measurement and control by external probe with Callendar-Van Dusen coefficients.
- Resolution of 0.01 °C.
- Stability of ± 0.02 °C for T-35NLL and ± 0.05 °C for T-300PLL.
- Have input for thermocouples, resistance thermometers and thermostats.
- Internal regulated 24 Vdc power supply and mA input for 2-wire transmitters.
- Completely automatic calibration with or without the use of a computer.
- Documenting capabilities: connection with computer and ISOPLAN[®] calibration software.

The T-35NLL and T-300PLL baths were developed for applications which require an extra large calibration volume. Thus, the dimensions of 59 mm diameter by 200 mm height of the inserts enable the calibration of many different shapes and sizes sensors or the calibration of multiple temperature sensors at the same time. When using the container insert (Stirred Liquid Insert) filled with fluid, T-35NLL/ T-300PLL become true liquid baths of high homogeneity since they have an uniform mechanical stirrer magnetically coupled, maintaining constant turbulence of the fluid. It can also be purchased an external probe so that the control can be done from a sensor inserted in the block, together with the sensors to be calibrated. Have all the common features of the Presys calibrators: automatic calibrations, auxiliary calibrator, communication with computer and Isoplan[®] software etc.

Low Viscosity Silicone Oil Type 200-10 (-30 to 160 °C) Type 710 (80 to 300 °C)

- *Order Code* 200-10: 03.03.0206-21
- *Order Code* 710: 03.03.0225-21
- *Operating Temperature*: -30 °C to 160 °C / 80 °C to 300 °C.
- *Flash Point*: 163 °C / 302 °C.
- 1 kg package.
- Emits no vapors.

Technical Specifications

T-35NLL

T-300PLL

Operating Range: ambient temperature: 23 °C	-35 °C to 140 °C	from ambient temperature to 300 °C
Accuracy: internal reference with external probe with external thermometer	± 0.1 °C	
	± 0.07 °C	
	± 0.05 °C	
Resolution:	0.01 °C	
Stability:	± 0.02 °C	± 0.05 °C
Heating Time:	50 min (25 °C to 140 °C)	60 min (25 °C to 300 °C)
Cooling Time:	120 min (25 °C to -35 °C)	100 min (300 °C to 100 °C)
Temperature Uniformity:	± 0.05 °C	
Weight:	14.8 kg	13 kg
Power Supply:	110 or 220 Vac, 50/60Hz	
Electric Power:	450 W	1000 W
Units / Temperature Scales:	°C or °F / IPTS-68 or ITS-90 user selectable	
Display:	Graphic vacuum fluorescent with contrast adjustment	
Well diameter / Depth:	Ø59 x 200 mm	
Dimensions: (HxWxD)	380 x 200 x 270 mm	
Warranty:	1 year, except for rechargeable battery and elements of Peltier effect	

Electrical Input Specifications

Input Ranges	Resolution	Accuracy	Remarks
millivolt -150 to 150 mV -500 to -150 mV 150 to 2450 mV	0.001 mV	± 0.01 % FS	Rinput > 10 MΩ
	0.01 mV	± 0.02 % FS	auto-range
	0.01 mV	± 0.02 % FS	
mA -5 to 24.5 mA	0.0001 mA	± 0.02 % FS	Rinput < 160 Ω
	0.01 Ω	± 0.01 % FS	Excitation current 0.9 mA
resistance 0 to 400 Ω 400 to 2500 Ω	0.01 Ω	± 0.03 % FS	auto-range
	0.01 Ω	± 0.03 % FS	
Pt-100 -200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Pt-1000 -200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	IEC-60751
Cu-10 -200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	± 2.0 °C / ± 4.0 °F	MINCO 16-9
Ni-100 -60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43760
TC-J -210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	IEC-60584
TC-K -270 to -150 °C / -454 to -238 °F -150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	± 0.5 °C / ± 1.0 °F	IEC-60584
	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
TC-T -260 to -200 °C / -436 to -328 °F -200 to -75 °C / -328 to -103 °F -75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	± 0.6 °C / ± 1.2 °F	IEC-60584
	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
TC-E -270 to -150 °C / -454 to -238 °F -150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	± 0.3 °C / ± 0.6 °F	IEC-60584
	0.1 °C / 0.1 °F	± 0.1 °C / ± 0.2 °F	
TC-N -260 to -200 °C / -436 to -328 °F -200 to -20 °C / -328 to -4 °F -20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	± 1.0 °C / ± 2.0 °F	IEC-60584
	0.1 °C / 0.1 °F	± 0.4 °C / ± 0.8 °F	
	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	
TC-L -200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	± 0.2 °C / ± 0.4 °F	DIN-43710

FS = Full Scale

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Power Supply

1 - 110 Vac 2 - 220 Vac

Included Insert

Choose between the inserts listed below. Unless specified, the accompanying insert is IN03.

Optional

BB - Black Body Insert

AG - Stirred Liquid Kit

Accessories

Inserts:	Holes	Order Code
IN01	7x 6 mm and 1x 1/4"	T-35NLL / T-300PLL 06.04.0107-00
IN02	8x 1/4"	06.04.0108-00
IN03	2x 3.0 mm, 2x 6.0 mm, 2x 1/4" and 2x 8 mm	06.04.0109-00
IN04	2x 6.0 mm, 2x 8.0 mm, 2x 3/8" and 1x 1/4"	06.04.0110-00
IN10	Others, under ordering	06.04.0111-00

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485).

Included Items: carrying case, strap, insert (selectable), insert extractor tool, test leads, manual and power cord.

Optional Accessories:

Temperature Sensors:

1/5 DIN R Probe - Order Code: 04.06.0001-21.

Communication Interface - Order Code: 06.02.0002-00.



Reference Grade Temperature Calibrator TS-1200PLAB

- 5.7" Touchscreen Display
- Operating Range: 50 to 1200 °C.
- Control by an external reference thermocouple (optional)
- Resolution: 0.01 °C.
- Stability: 0.10 °C @ 1100 °C.
- Homogeneity: 0.35 °C @ 1100 °C.
- Measurement Zone: 100 mm.
- Immersion: 300 mm.
- Deviation Function for TC test sensors.
- Available in Horizontal and Vertical versions.
- Information Infrastructure:
 - Ethernet, Wireless, USB, TCP/IP - Built-in Web Server.

The TS-1200PLAB Calibrator generates temperature values in the block or insert from 50 to 1200 °C. Its high accuracy and homogeneity is due to the fact that TS-1200PLAB has three control zones, allowing better distribution of temperature throughout the block and ensuring low radial and axial uniformity through the extension of the 100 mm of measurement zone. It has two inputs for mV and for various thermocouples types, including Au-Pt, with deviation function configurable. It is available in two mounting versions: horizontal and vertical. TS-1200PLAB incorporates concepts of automatic calibration with calibration management softwares, especially with the Isoplan® Software, such as issuing reports and certificates, task management, calibration data organization and archiving etc.

Technical Specification	TS-1200PLAB
Operating Range (ambient temperature 23 °C)	50 to 1200 °C
Accuracy: internal reference with external probe with external thermometer	± 1 °C ± 0.75 °C ± 0.3 °C
Resolution	0.01 °C
Stability:	± 0.1 °C
Axial Uniformity (100 mm)	± 0.30 @ 300 °C ± 0.35 @ 600 °C ± 0.35 @ 1100 °C
Radial Uniformity (between opposite holes)	± 0.02 @ 300 °C ± 0.07 @ 600 °C ± 0.09 @ 1100 °C
Loading effect (4 probes x 1 probe)	± 0.10 @ 200 °C ± 0.20 @ 600 °C ± 0.20 @ 1100 °C
Hysteresis	0.2 °C
Heating Time	4 h (25 to 1100 °C)
Cooling Time	10 h (1100 to 200 °C)
Well diameter / depth	Ø 34 x 300 mm
Display	5.7" Resistive Touchscreen
Units / Temperature Scales	°C, °F, K, °R / ITS-90 or IPTS-68, user selectable
Dimensions (HxWxD)	Vertical Model: 670 x 310 x 410 mm Horizontal Model: 360 x 635 x 401 mm
Weight	30 kg
Power supply	220 Vac, 50/60 Hz
Electric power	6000 W
Warranty	1 year

Electrical Input Specifications

Input Ranges	Resolution	Accuracy	Remarks
millivolt	0 to 70 mV	0.0001 mV	± 0.005 % FS R _{input} > 10 MΩ
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F IEC-60584
TC-K	-270 to 1370 °C / -454 to 2498 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 1370 °C IEC-60584
TC-T	-260 to 400 °C / -436 to 752 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 400 °C IEC-60584
TC-B	50 to 1820 °C / 122 to 3308 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1820 °C IEC-60584
TC-R	-50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1760 °C IEC-60584
TC-S	-50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1760 °C IEC-60584
TC-E	-270 to 1000 °C / -454 to 1832 °F	0.01 °C / 0.01 °F	± 0.05 °C / 0.10 °F @ 1000 °C IEC-60584
TC-N	-260 to 1300 °C / -436 to 2372 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 1300 °C IEC-60584
TC-L	-200 to 900 °C / -328 to 1652 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 900 °C DIN-43710
TC-C	0 to 2320 °C / 32 to 4208 °F	0.01 °C / 0.01 °F	± 0.25 °C / 0.50 °F @ 1500 °C W5Re / W26Re
TC-Au-Pt	0 to 1000 °C / 32 to 1832 °F	0.01 °C / 0.01 °F	± 0.06 °C / 0.12 °F @ 1000 °C ASTM E1751

FS = Full Scale

All specifications are valid for one year.

*Specifications valid for standard curve.

Thermocouple with internal cold junction compensation, one must consider the error of this cold junction compensation of up to ± 0.2 °C or ± 0.4 °F. Configurable parameters of thermoresistance coefficients using ITS-90 and Callendar-Van Dusen (αδβ and abc curves).

Order Code

TS-1200PLAB - [] - [] - IN [] []

Model
H - Horizontal V - Vertical

Power Supply
2 - 220 Vac

Included Insert
Choose between the inserts listed below

Accessories	Order Code
Inserts:	
Holes	
IN01 1 x 3/4"	TS-1200PLAB-V 06.04.0051-00 TS-1200PLAB-H 06.04.0075-00
IN02 1 x 1/2"	06.04.0052-00 06.04.0076-00
IN03 1 x 6.0 mm and 3 x 1/4"	06.04.0053-00 06.04.0077-00
IN04 3 x 6.0 mm and 1 x 1/4"	06.04.0054-00 06.04.0078-00
IN05 4 x 6.0 mm	06.04.0055-00 06.04.0079-00
IN06 2 x 6.0 mm and 2 x 1/4"	06.04.0056-00 06.04.0080-00
IN07 1 x 6.0 mm, 1 x 8.0 mm and 1 x 3/8"	06.04.0057-00 06.04.0081-00
IN08 1 x 6.0 mm, 1x 3.0 mm and 2 x 1/4"	06.04.0058-00 06.04.0082-00
IN09 Without hole, to be drilled by the client	06.04.0059-00 06.04.0083-00
IN10 Others, under ordering	06.04.0060-00 06.04.0084-00
IN11 2 x 1/4" 2 x 7 mm	06.04.0061-00 06.04.0085-00

Included Items: Insert (selectable), insulation, insert extractor tool, manual and power cord.

Information Infrastructure: Ethernet, Wireless, USB, TCP/IP - Built-In Web Server.

Optional Accessories: "R" type Reference Thermocouple - Order Code: 04.06.0010-21.



Multifunctional Temperature Calibrator T-35NH

- Generates temperatures from -35 °C to 140 °C.
- Dry Block and Black Body Inserts.
- Horizontal mounting, facilitates infrared thermometer calibration.

Technical Specification		T-35NH
Operating Range ambient temperature: 23°C		-35 °C to 140 °C
Accuracy	internal reference	± 0.1 °C
	with external thermometer	± 0.05 °C
Resolution:		± 0.01 °C
Stability:		± 0.02 °C
Heating Time:		24 min (25 °C to 140 °C)
Cooling Time:		23 min (25 °C to -35 °C)
Temperature Uniformity:		± 0.05 °C

Weight:	12.7 kg
Power Supply:	110 or 220 Vac, 50/60Hz
Electric Power:	400 W
Units / Temperature Scales:	°C or °F / IPTS-68 or ITS-90, user selectable
Display:	Graphic vacuum fluorescent with contrast adjustment
Well Diameter / Depth:	35 mm x 160 mm
Dimensions: (HxWxD)	215 x 390 x 310 mm
Warranty:	1 year, except for rechargeable battery and elements of Peltier effect.

Electrical Input Specifications							
Input Ranges		Resolution	Accuracy	Input Ranges		Resolution	Accuracy
millivolt	-150 to 150 mV	0.001 mV	± 0.01 % FS	TC-K	-270 to -150 °C	0.1 °C	± 0.5 °C
	-500 to -150 mV	0.01 mV	± 0.02 % FS		-150 to 1370 °C	0.1 °C	± 0.2 °C
	150 to 2450 mV	0.01 mV	± 0.02 % FS	TC-T	-260 to -200 °C	0.1 °C	± 0.6 °C
mA	-5 to 24.5 mA	0.0001 mA	± 0.02 % FS		-200 to -75 °C	0.1 °C	± 0.4 °C
					-75 to 400 °C	0.1 °C	± 0.2 °C
resistance	0 to 400 Ω	0.01 Ω	± 0.01 % FS	TC-E	-270 to -150 °C	0.1 °C	± 0.3 °C
	400 to 2500 Ω	0.01 Ω	± 0.03 % FS		-150 to 1000 °C	0.1 °C	± 0.1 °C
Pt-100	-200 to 850 °C	0.01 °C	± 0.1 °C	TC-N	-260 to -200 °C	0.1 °C	± 1.0 °C
Pt-1000	-200 to 400 °C	0.1 °C	± 0.1 °C		-200 to -20 °C	0.1 °C	± 0.4 °C
Cu-10	-200 to 260 °C	0.1 °C	± 2.0 °C		-20 to 1300 °C	0.1 °C	± 0.2 °C
Ni-100	-60 to 250 °C	0.1 °C	± 0.2 °C	TC-L	-200 to 900 °C	0.1 °C	± 0.2 °C
TC-J	-210 to 1200 °C	0.1 °C	± 0.2 °C				

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Power Supply

1 - 110 Vac - 2 - 220 Vac

Included Insert

Choose between the inserts listed below. Unless specified, the accompanying insert is IN06.

Black Body Insert

BB - Black Body Insert

Accessories

Inserts:	Holes
IN01	1x 3/4"
IN02	1x 1/2"
IN03	1x 6.0 mm and 3x 1/4"
IN04	3x 6.0 mm and 1x 1/4"
IN05	4x 6.0 mm
IN06	2x 6.0 mm and 2x 1/4"
IN07	1x 6.0 mm, 1x 8.0 mm and 1x 3/8"
IN08	1x 6.0 mm, 1x 3.0 mm and 2x 1/4"
IN09	Without hole, to be drilled by the client
IN10	Others, under ordering

Order Code

T-35NH
06.04.0041-00
06.04.0042-00
06.04.0043-00
06.04.0044-00
06.04.0045-00
06.04.0046-00
06.04.0047-00
06.04.0048-00
06.04.0049-00
06.04.0050-00

Serial Communication: Modbus® RTU Protocol (RS-232/ RS-485).

Included Items: carrying case, straps, insert (selectable), insert extractor tool, test leads, manual and power cord.

Optional Accessories:

Black Body Insert - Order Code: 06.04.0072-00.

1/5 DIN-A Probe - Order Code: 04.06.0002-00.

Communication Interface - Order Code: 06.02.0002-00.



Multifunctional Temperature Calibrator T-650PH

- Generates temperatures from ambient to 650 °C.
- Dry Block and Black Body Inserts.
- Horizontal mounting, facilitates infrared thermometer calibration.

Technical Specification T-650PH

Operating Range ambient temperature: 23°C	from ambient to 650 °C
Accuracy Internal reference with external thermometer	± (0.1 °C + 0.1% of reading) ± 0.05 °C
Resolution:	± 0.01 °C
Stability:	± 0.05 °C
Heating Time:	20 min (50 °C to 650 °C)
Cooling Time:	21 min (650 °C to 200 °C)
Temperature Uniformity:	± 0.05 °C

Weight:	9.2 kg
Power Supply:	110 or 220 Vac, 50/60Hz
Electric Power:	1000 W
Units / Temperature Scales:	°C or °F / IPTS-68 or ITS-90, user selectable
Display:	Graphic vacuum fluorescent with contrast adjustment
Well Diameter / Depth:	Ø 32 mm x 125 mm
Dimensions: (HxWxD)	215 x 390 x 310 mm
Warranty:	1 year, except for rechargeable battery

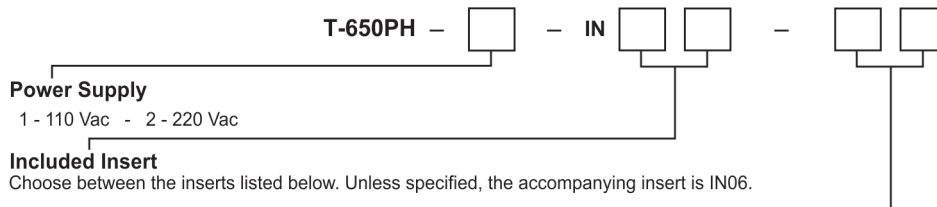
Electrical Input Specifications

Input Ranges	Resolution	Accuracy
millivolt -150 to 150 mV -500 to -150 mV 150 to 2450 mV	0.001 mV 0.01 mV 0.01 mV	± 0.01 % FS ± 0.02 % FS ± 0.02 % FS
mA -5 to 24.5 mA	0.0001 mA	± 0.02 % FS
resistance 0 to 400 Ω 400 to 2500 Ω	0.01 Ω 0.01 Ω	± 0.01 % FS ± 0.03 % FS
Pt-100 -200 to 850 °C	0.01 °C	± 0.1 °C
Pt-1000 -200 to 400 °C	0.1 °C	± 0.1 °C
Cu-10 -200 to 260 °C	0.1 °C	± 2.0 °C
Ni-100 -60 to 250 °C	0.1 °C	± 0.2 °C
TC-J -210 to 1200 °C	0.1 °C	± 0.2 °C

Input Ranges	Resolution	Accuracy
TC-K -270 to -150 °C -150 to 1370 °C	0.1 °C 0.1 °C	± 0.5 °C ± 0.2 °C
TC-T -260 to -200 °C -200 to -75 °C -75 to 400 °C	0.1 °C 0.1 °C 0.1 °C	± 0.6 °C ± 0.4 °C ± 0.2 °C
TC-E -270 to -150 °C -150 to 1000 °C	0.1 °C 0.1 °C	± 0.3 °C ± 0.1 °C
TC-N -260 to -200 °C -200 to -20 °C -20 to 1300 °C	0.1 °C 0.1 °C 0.1 °C	± 1.0 °C ± 0.4 °C ± 0.2 °C
TC-L -200 to 900 °C	0.1 °C	± 0.2 °C

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Black Body Insert
BB - Black Body Insert

Accessories:

Inserts:	Holes
IN01	1x 3/4"
IN02	1x 1/2"
IN03	1x 6.0 mm and 3x 1/4"
IN04	3x 6.0 mm and 1x 1/4"
IN05	4x 6.0 mm
IN06	2x 6.0 mm and 2x 1/4"
IN07	1x 6.0 mm, 1x 8.0 mm and 1x 3/8"
IN08	1x 6.0 mm, 1x 3.0 mm and 2x 1/4"
IN09	Without hole, to be drilled by the client
IN10	Others, under ordering

Order Code

T-650PH
06.04.0096-00
06.04.0097-00
06.04.0098-00
06.04.0099-00
06.04.0100-00
06.04.0101-00
06.04.0102-00
06.04.0103-00
06.04.0104-00
06.04.0105-00

Serial Communication: Modbus® RTU Protocol (RS-232/ RS-485).

Included Items: carrying case, straps, insert (selectable), insert extractor tool, test leads, manual and power cord.

Optional Accessories:

Black Body Insert - Order Code: 06.09.0031-00.
Type «N» Thermocouple for black body- Order Code: 01.22.0062-21.
Communication Interface - Order Code: 06.02.0002-00.



Multifunctional Temperature Calibrator T-1200PH

- Generates temperatures from 50 °C to 1200 °C.
- Dry Block and Black Body Inserts.
- Horizontal mounting, facilitates infrared thermometer calibration.

Technical Specifications **T-1200PH**

Operating Range ambient temperature: 23°C	50 °C to 1200 °C
Accuracy internal reference	± 3 °C
with external thermometer	± 0.75 °C
Resolution:	± 0.1 °C
Stability:	± 0.2 °C
Heating Time:	45 min (100 °C to 1200 °C)
Cooling Time:	5h (1200 °C to 200 °C)
Temperature Uniformity:	± 0.2 °C

Weight:	10.3 kg
Power Supply:	220 Vac, 50/60Hz
Electric Power:	2300 W
Units / Temperature Scales:	°C or °F / IPTS-68 or ITS-90, user selectable
Display:	Graphic vacuum fluorescent with contrast adjustment
Well Diameter / Depth	Ø 34 mm x 130 mm
Dimensions: (HxWxD)	215 x 390 x 310 mm
Warranty:	1 year, except for rechargeable battery

Electrical Input Specifications

Input Ranges	Resolution	Accuracy
millivolt		
-150 to 150 mV	0.001 mV	± 0.01 % FS
-500 to -150 mV	0.01 mV	± 0.02 % FS
150 to 2450 mV	0.01 mV	± 0.02 % FS
mA		
-5 to 24.5 mA	0.0001 mA	± 0.02 % FS
resistance		
0 to 400 Ω	0.01 Ω	± 0.01 % FS
400 to 2500 Ω	0.01 Ω	± 0.03 % FS
Pt-100		
-200 to 850 °C	0.01 °C	± 0.1 °C
Pt-1000		
-200 to 400 °C	0.1 °C	± 0.1 °C
TC-B		
50 to -250 °C	0.1 °C	± 2.5 °C
250 to 500 °C	0.1 °C	± 1.5 °C
500 to 1200 °C	0.1 °C	± 1.0 °C
1200 to 1820 °C	0.1 °C	± 0.7 °C
TC-J		
-210 to 1200 °C	0.1 °C	± 0.2 °C

Input Ranges	Resolution	Accuracy
TC-K		
-270 to -150 °C	0.1 °C	± 0.5 °C
-150 to 1370 °C	0.1 °C	± 0.2 °C
TC-T		
-260 to -200 °C	0.1 °C	± 0.6 °C
-200 to -75 °C	0.1 °C	± 0.4 °C
-75 to 400 °C	0.1 °C	± 0.2 °C
TC-N		
-260 to -200 °C	0.1 °C	± 1.0 °C
-200 to -20 °C	0.1 °C	± 0.4 °C
-20 to 1300 °C	0.1 °C	± 0.2 °C
TC-R		
-50 to 300°C	0.1 °C	± 1.0 °C
300 to 1760 °C	0.1 °C	± 0.7 °C
TC-S		
-50 to 300 °C	0.1 °C	± 1.0 °C
300 to 1760 °C	0.1 °C	± 0.7 °C

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code

T-1200PH – – **IN** –

Power Supply

1 - 110 Vac* - 2 - 220 Vac *upon request

Included Insert

Choose between the inserts listed below. Unless specified, the accompanying insert is IN06.

Black Body Insert

BB - Black Body Insert

Accessories

Inserts:	Holes
IN01	1x 3/4"
IN02	1x 1/2"
IN03	1x 6.0 mm and 3x 1/4"
IN04	3x 6.0 mm and 1x 1/4"
IN05	4x 6.0 mm
IN06	2x 6.0 mm and 2x 1/4"
IN07	1x 6.0 mm, 1x 8.0 mm and 1x 3/8"
IN08	1x 6.0 mm, 1x 3.0 mm and 2x 1/4"
IN09	Without hole, to be drilled by the client
IN10	Others, under ordering

Order Code

T-1200PH

06.04.0031-00
06.04.0032-00
06.04.0033-00
06.04.0034-00
06.04.0035-00
06.04.0036-00
06.04.0037-00
06.04.0038-00
06.04.0039-00
06.04.0040-00

Serial Communication: Modbus® RTU Protocol (RS-232/ RS-485).

Included Items: carrying case, straps, insert (selectable), insert extractor tool, test leads, insulation, manual and power cord.

Optional Accessories:

Black Body kit with thermocouple - Order Code: 06.04.0074-00.
Communication Interface - Order Code: 06.02.0002-00.

especially for
infrared



Infrared Thermometer Calibrator T-30NIR

- Generates temperatures from -30 °C to 150 °C.
- Very practical to use, facilitates calibration.
- It can be used with external reference thermometer.
- Includes a front cover and a connection for dry air blowing on the target edges which prevents the ice formation.

Technical Specification

T-30NIR

Operating Range ambient temperature: 23 °C	-30 °C to 150 °C
Accuracy internal reference with external thermometer	± 0.4 °C ± 0.1 °C
Resolution:	± 0.01 °C
Stability:	± 0.1 °C
Target Size:	80 mm 60 mm with gas inflator device
Target Emissivity (ε):	0.95
Heating Time:	18 min (25 °C to 150 °C)

Cooling Time:	25 min (25 °C to -30 °C)
Weight:	10 kg
Power Supply:	110 or 220 Vac, 50/60Hz
Electric Power:	400 W
Units / Temperature Scales:	°C or °F / IPTS-68 or ITS-90, user selectable
Display:	Graphic vacuum fluorescent with contrast adjustment
Dimensions: (HxWxD)	215 x 390 x 310 mm
Warranty:	1 year, except for rechargeable battery and elements of Peltier effect

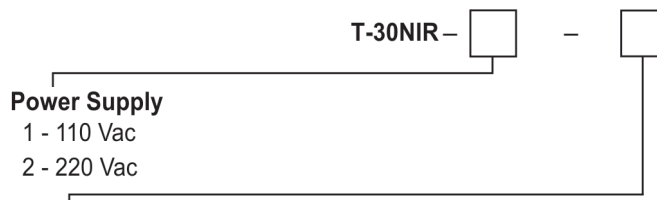
Electrical Input Specification

Input Ranges	Resolution	Accuracy
millivolt		
-150 to 150 mV	0.001 mV	± 0.01 % FS
-500 to -150 mV	0.01 mV	± 0.02 % FS
150 to 2450 mV	0.01 mV	± 0.02 % FS
mA		
-5 to 24.5 mA	0.0001 mA	± 0.02 % FS
resistance		
0 to 400 Ω	0.01 Ω	± 0.01 % FS
400 to 2500 Ω	0.01 Ω	± 0.03 % FS
Pt-100		
-200 to 850 °C	0.01 °C	± 0.1 °C
Pt-1000		
-200 to 400 °C	0.1 °C	± 0.1 °C
Cu-10		
-200 to 260 °C	0.1 °C	± 2.0 °C
Ni-100		
-60 to 250 °C	0.1 °C	± 0.2 °C
TC-J		
-210 to 1200 °C	0.1 °C	± 0.2 °C

Input Ranges	Resolution	Accuracy
TC-K		
-270 to -150 °C	0.1 °C	± 0.5 °C
-150 to 1370 °C	0.1 °C	± 0.2 °C
TC-T		
-260 to -200 °C	0.1 °C	± 0.6 °C
-200 to -75 °C	0.1 °C	± 0.4 °C
-75 to 400 °C	0.1 °C	± 0.2 °C
TC-E		
-270 to -150 °C	0.1 °C	± 0.3 °C
-150 to 1000 °C	0.1 °C	± 0.1 °C
TC-N		
-260 to -200 °C	0.1 °C	± 1.0 °C
-200 to -20 °C	0.1 °C	± 0.4 °C
-20 to 1300 °C	0.1 °C	± 0.2 °C
TC-L		
-200 to 900 °C	0.1 °C	± 0.2 °C

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Reference Thermometer

- 0 - No Reference Thermometer
- 1 - 1/5 DIN Pt-100 Sensor
- 2 - Secondary Pt-100 Sensor

Serial Communication: Modbus® RTU Protocol (RS-232/ RS-485)

Included Items: carrying case, straps, test leads, cover, gas inflator device, brush to remove ice, manual and power cord.

Optional Accessories:

Communication Interface - Order Code: 06.02.0002-00.

especially for
infrared



Infrared Thermometer Calibrator T-500PIR

- Generates temperatures from ambient to 500 °C.
- Quickly changes and stabilizes the temperature setpoints..
- Target with high homogeneity surface.

Technical Specification T-500PIR

Operating Range ambient temperature: 23 °C	ambient to 500 °C
Accuracy internal reference with external thermometer	± (0.4 °C + 0.1% of reading) ± 0.2 °C
Resolution:	± 0.01 °C
Stability:	± 0.2 °C
Target Size:	80 mm
Target Emissivity (ε):	0.95
Heating Time:	30 min (50 °C to 500 °C)

Cooling Time:	30 min (500 °C to 200 °C)
Weight:	9 kg
Power Supply:	110 or 220 Vac, 50/60Hz
Electric Power:	1000 W
Units / temperature Scales:	°C or °F / IPTS-68 or ITS-90, user selectable
Display:	Graphic vacuum fluorescent with contrast adjustment
Dimensions: (HxWxD)	215 x 390 x 310 mm
Warranty:	1 year, except for rechargeable battery

Electrical Input Specifications

Input Ranges	Resolution	Accuracy
millivolt -150 to 150 mV -500 to -150 mV 150 to 2450 mV	0.001 mV 0.01 mV 0.01 mV	± 0.01 % FS ± 0.02 % FS ± 0.02 % FS
mA -5 to 24.5 mA	0.0001 mA	± 0.02 % FS
resistance 0 to 400 Ω 400 to 2500 Ω	0.01 Ω 0.01 Ω	± 0.01 % FS ± 0.03 % FS
Pt-100 -200 to 850 °C	0.01 °C	± 0.1 °C
Pt-1000 -200 to 400 °C	0.1 °C	± 0.1 °C
Cu-10 -200 to 260 °C	0.1 °C	± 2.0 °C
Ni-100 -60 to 250 °C	0.1 °C	± 0.2 °C
TC-J -210 to 1200 °C	0.1 °C	± 0.2 °C

Input Ranges	Resolution	Accuracy
TC-K -270 to -150 °C -150 to 1370 °C	0.1 °C 0.1 °C	± 0.5 °C ± 0.2 °C
TC-T -260 to -200 °C -200 to -75 °C -75 to 400 °C	0.1 °C 0.1 °C 0.1 °C	± 0.6 °C ± 0.4 °C ± 0.2 °C
TC-E -270 to -150 °C -150 to 1000 °C	0.1 °C 0.1 °C	± 0.3 °C ± 0.1 °C
TC-N -260 to -200 °C -200 to -20 °C -20 to 1300 °C	0.1 °C 0.1 °C 0.1 °C	± 1.0 °C ± 0.4 °C ± 0.2 °C
TC-L -200 to 900 °C	0.1 °C	± 0.2 °C

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Power Supply

- 1 - 110 Vac
- 2 - 220 Vac

Reference Thermometer

- 0 - No Reference Thermometer
- 1 - N Type Thermocouple sensor
- 2 - Secondary Pt-100 Sensor

Serial Communication: Modbus® RTU Protocol (RS-232/ RS-485).

Included Items: carrying case, straps, test leads, manual and power cord.

Optional Accessories:

Communication Interface - Order Code: 06.02.0002-00.

especially for
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Infrared Thermometer Calibrator T-1200PIR

- Generates temperatures from 50 °C to 1200 °C.
- High temperature uniformity of the calibrator provides high homogeneity of the black body cavity.
- Accompanies a “N” type thermocouple for cavity reference temperature.

Technical Specification		T-1200PIR	
Operating Range ambient temperature: 23 °C		50 °C to 1200 °C	
Accuracy	internal reference	± 3 °C	
	with external thermometer	± 0.75 °C	
Resolution:		± 0.1 °C	
Stability:		± 0.2 °C	
Target Size:		20 mm	
Target Emissivity (ε):		0.95	
Heating Time:		45 min (100 °C to 1200 °C)	
		Cooling Time:	5h (1200 °C to 200 °C)
		Weight:	10.4 kg
		Power Supply:	220 Vac, 50/60Hz
		Electrical Power:	2300 W
		Units / Temperature Scales:	°C or °F / IPTS-68 or ITS-90, user selectable
		Display:	Graphic vacuum fluorescent with contrast adjustment
		Dimensions: (HxWxD)	215 x 390 x 310 mm
		Warranty:	1 year, except for rechargeable battery

Electrical Input Specifications			
Input Ranges	Resolution	Accuracy	
millivolt	-150 to 150 mV	0.001 mV	± 0.01 % FS
	-500 to -150 mV	0.01 mV	± 0.02 % FS
	150 to 2450 mV	0.01 mV	± 0.02 % FS
mA	-5 to 24.5 mA	0.0001 mA	± 0.02 % FS
resistance	0 to 400 Ω	0.01 Ω	± 0.01 % FS
	400 to 2500 Ω	0.01 Ω	± 0.03 % FS
Pt-100	-200 to 850 °C	0.01 °C	± 0.1 °C
Pt-1000	-200 to 400 °C	0.1 °C	± 0.1 °C
TC-B	50 to -250 °C	0.1 °C	± 2.5 °C
	250 to 500 °C	0.1 °C	± 1.5 °C
	500 to 1200 °C	0.1 °C	± 1.0 °C
	1200 to 1820 °C	0.1 °C	± 0.7 °C
TC-J	-210 to 1200 °C	0.1 °C	± 0.2 °C

Input Ranges	Resolution	Accuracy	
TC-K	-270 to -150 °C	0.1 °C	± 0.5 °C
	-150 to 1370 °C	0.1 °C	± 0.2 °C
TC-T	-260 to -200 °C	0.1 °C	± 0.6 °C
	-200 to -75 °C	0.1 °C	± 0.4 °C
	-75 to 400 °C	0.1 °C	± 0.2 °C
TC-N	-260 to -200 °C	0.1 °C	± 1.0 °C
	-200 to -20 °C	0.1 °C	± 0.4 °C
	-20 to 1300 °C	0.1 °C	± 0.2 °C
TC-R	-50 to 300°C	0.1 °C	± 1.0 °C
	300 to 1760 °C	0.1 °C	± 0.7 °C
TC-S	-50 to 300 °C	0.1 °C	± 1.0 °C
	300 to 1760 °C	0.1 °C	± 0.7 °C

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code

T-1200PIR-

Power Supply

- 1 - 110 Vac * (*upon request)
- 2 - 220 Vac

Serial Communication: Modbus® RTU Protocol (RS-232/ RS-485).

Included Items: carrying case, straps, black body insert, test leads, insulation, manual and power cord.

Optional Accessories:

Communication Interface - Order Code: 06.02.0002-00.



Surface Sensors Temperature Calibrator **T-500PS**

- Especially designed for surface sensors calibration such as: RTD, thermocouples and thermistors with maximum metrological reliability.
- Its flat aluminum surface ensures high thermal conductivity and perfect physical contact between the sensor and the measuring area.
- 80 mm diameter circular surface area.
- It has strategically placed heaters under the measurement area to ensure the best temperature stability and uniformity.
- Includes entrance to accommodate a reference probe.
- Documenting capability: Communication with computer and Isoplan® Software .

The T-500PS Calibrator generates temperature from ambient up to 500 °C in a large surface and high accuracy area for calibration of surface sensors.

The circular 80 mm diameter area distributes uniformly the temperature which allows the calibration of more than one sensor simultaneously. The calibrator has also input for various types of thermocouples and resistance thermometers. The surface has a lateral hole, where one high accuracy sensor can be used as standard for calibration.

It also has all the common features of the **PRESYS** calibrators family: automatic calibration, auxiliary calibrator, communication with the computer and Isoplan® Software etc.

Technical Specifications		T-500PS
Operating Range ambient temperature: 23 °C	ambient to 500 °C	
Accuracy internal reference with external thermometer	± (0.4 °C + 0.1% of reading) ± 0.2 °C	
Resolution:	± 0.01 °C	
Stability:	± 0.2 °C	
Surface Diameter:	80 mm	
Heating Time:	30 min (50 °C to 500 °C)	

Cooling Time:	30 min (500 °C to 200 °C)
Weight:	9 kg
Power Supply:	110 or 220 Vac, 50/60Hz
Electric Power:	1000 W
Units / Temperature Scales:	°C or °F / IPTS-68 or ITS-90 user selectable
Display:	Graphic vacuum fluorescent with contrast adjustment
Dimensions: (HxWxD)	250 x 180 x 270 mm
Warranty:	1 year, except for rechargeable battery

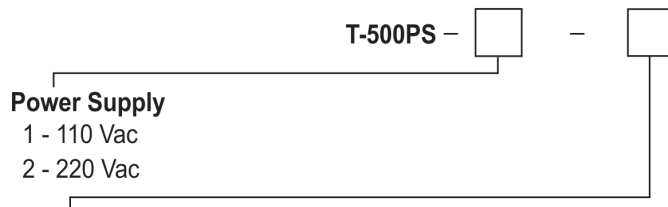
Electrical Input Specifications

Input Ranges	Resolution	Accuracy
millivolt	-150 to 150 mV	0.001 mV ± 0.01 % FS
	-500 to -150 mV	0.01 mV ± 0.02 % FS
	150 to 2450 mV	0.01 mV ± 0.02 % FS
mA	-5 to 24.5 mA	0.0001 mA ± 0.02 % FS
resistance	0 to 400 Ω	0.01 Ω ± 0.01 % FS
	400 to 2500 Ω	0.01 Ω ± 0.03 % FS
Pt-100	-200 to 850 °C	0.01 °C ± 0.1 °C
Pt-1000	-200 to 400 °C	0.1 °C ± 0.1 °C
Cu-10	-200 to 260 °C	0.1 °C ± 2.0 °C
Ni-100	-60 to 250 °C	0.1 °C ± 0.2 °C
TC-J	-210 to 1200 °C	0.1 °C ± 0.2 °C

Input Ranges	Resolution	Accuracy
TC-K	-270 to -150 °C	0.1 °C ± 0.5 °C
	-150 to 1370 °C	0.1 °C ± 0.2 °C
TC-T	-260 to -200 °C	0.1 °C ± 0.6 °C
	-200 to -75 °C	0.1 °C ± 0.4 °C
	-75 to 400 °C	0.1 °C ± 0.2 °C
TC-E	-270 to -150 °C	0.1 °C ± 0.3 °C
	-150 to 1000 °C	0.1 °C ± 0.1 °C
TC-N	-260 to -200 °C	0.1 °C ± 1.0 °C
	-200 to -20 °C	0.1 °C ± 0.4 °C
	-20 to 1300 °C	0.1 °C ± 0.2 °C
TC-L	-200 to 900 °C	0.1 °C ± 0.2 °C

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

Order Code



Power Supply

- 1 - 110 Vac
- 2 - 220 Vac

Reference Thermometer

- 0 - No Reference Thermometer
- 1 - Secondary Pt-100 Sensor
- 2 - "N" type Thermocouple Sensor

Serial Communication: Modbus® RTU Protocol (RS-232/ RS-485).

Included Items: carrying case, strap, test leads, manual and power cord.

Optional Accessories: Communication Interface - Order Code: 06.02.0002-00.



Reference Grade Temperature Calibrator TS-35NM

- 5.7" Touchscreen Display.
- Operating Range: -35 °C to 140 °C.
- Resolution: 0.001 °C.
- Optional temperature measurement and control by external probe, cancels the set-point error and loading effect.
- Extensive Funcionalities:
 - Dry-Block (large volume);
 - Stirred Liquid;
 - Black Body;
 - Ice Point Reference;
 - Fixed Point Cell Maintenance.
- ITS-90 Coefficients for reference and test sensors.
- Information Infrastructure:
 - Ethernet, Wireless, USB, TCP/IP - Built-in Web Server.

The TS-35NM Calibrator generates temperature values in the block or insert from -35 to 140 °C. The high homogeneity over its block is due to the fact that TS-35NM has two temperature control zones compensating losses due to heat exchange with the ambient even in negative temperatures. Its large volume insert enables the calibration of many different shapes and sizes sensors or multiple temperature sensors at the same time. Using the stirred liquid insert, the calibrator becomes a true liquid bath of high homogeneity since it has an uniform mechanical stirrer magnetically coupled, maintaining constant turbulence of the fluid. Among its features it also has the possibility of use as a black body source for infrared thermometers calibration, ice point reference and fixed-point cells maintainer. TS-35NM incorporates concepts of automatic calibration with calibration management softwares, especially with the Isoplan® Software, such as issuing reports and certificates, task management, calibration data organization and archiving etc.

Technical Specification	Dry Block	Stirred Liquid
Operating Range (ambient temperature 23 °C)	-35 to 140 °C (-31 to 284 °F)	
Accuracy: internal reference with external probe with external thermometer	± 0.10 °C ± 0.07 °C ± 0.05 °C	
Resolution	± 0.001 °C	
Stability:	± 0.01 °C	± 0.03 °C
Axial Uniformity (60 mm)	± 0.05 @ -35 °C ± 0.01 @ 0 °C ± 0.04 @ 140 °C	± 0.008 @ -35 °C ± 0.005 @ 0 °C ± 0.008 @ 140 °C
Radial Uniformity	± 0.007 @ -35 °C ± 0.020 @ 0 °C ± 0.007 @ 140 °C (between opposite holes)	± 0.006 @ -35 °C ± 0.006 @ 0 °C ± 0.007 @ 140 °C (distance: 40 mm)
Loading effect (8 probes x 1 probe)	0.20 °C full range	
Hysteresis	0.010 °C	
Heating Time	60 min (25 to 140 °C)	
Cooling Time	120 min (25 to -35 °C)	
Well diameter / depth	Ø 59 mm / 200 mm	
Display	5.7" Resistive Touchscreen	
Operational System	Windows CE ®	
Units / Temperature Scales	°C, °F, K, °R / ITS-90 or IPTS-68, user selectable	
Dimensions (HxWxD)	380 x 200 x 320 mm	
Weight	17 kg	
Power supply	110 or 220 Vac, 50/60 Hz	
Electric power	500 W	
Warranty	1 year	

Electrical Input Specification

Input Ranges	Resolution	Accuracy	Remarks
millivolt 0 to 70 mV	0.0001 mV	± 0.005 % FS	R _{input} > 10 MΩ
resistance 0 to 100 Ω	0.0001 Ω	± 0.001 Ω	Excitation current 1.0 mA
100 to 500 Ω	0.001 Ω	± 0.004 Ω	
*Pt-100 -200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / 0.02 °F	Excitation current 1.0 mA
*Pt-25 -200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / 0.02 °F	Excitation current 1.0 mA
TC-J -210 to 1200 °C / -346 to 2192 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F	IEC-60584
TC-K -270 to 1370 °C / -454 to 2498 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 1370 °C	IEC-60584
TC-T -260 to 400 °C / -436 to 752 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 400 °C	IEC-60584
TC-B 50 to 1820 °C / 122 to 3308 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1820 °C	IEC-60584
TC-R -50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1760 °C	IEC-60584
TC-S -50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1760 °C	IEC-60584
TC-E -270 to 1000 °C / -454 to 1832 °F	0.01 °C / 0.01 °F	± 0.05 °C / 0.10 °F @ 1000 °C	IEC-60584
TC-N -260 to 1300 °C / -436 to 2372 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 1300 °C	IEC-60584
TC-L -200 to 900 °C / -328 to 1652 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 900 °C	DIN-43710
TC-C 0 to 2320 °C / 32 to 4208 °F	0.01 °C / 0.01 °F	± 0.25 °C / 0.50 °F @ 1500 °C	W5Re / W26Re
TC-Au-Pt 0 to 1000 °C / 32 to 1832 °F	0.01 °C / 0.01 °F	± 0.06 °C / 0.12 °F @ 1000 °C	ASTM E1751

FS = Full Scale

All specifications are valid for one year.

*Specifications valid for standard curve.

Thermocouple with internal cold junction compensation, one must consider the error of this cold junction compensation of up to ± 0.2 °C or ± 0.4 °F. Configurable parameters of thermoresistance coefficients using ITS-90 and Callendar-Van Dusen (αδβ and abc curves).

Order Code



Power Supply

1 - 110 Vac - 2 - 220 Vac

Included Insert

Choose between the inserts listed below. Unless specified, the accompanying insert is IN03.

Optional

BB - Black Body Insert
AG - Stirred Liquid Kit

Accessories

Inserts:	Holes	Order Code
IN01	7 x 6 mm and 1 1/4"	06.04.0107-00
IN02	8 x 1/4"	06.04.0108-00
IN03	2 x 3.0 mm, 2 x 6.0 mm, 2 x 1/4" and 2 x 8 mm	06.04.0109-00
IN04	2 x 6.0 mm, 2 x 8.0 mm, 2 x 3/8" and 1 x 1/4"	06.04.0110-00
IN10	Others, under ordering	06.04.0111-00

Information Infrastructure: Ethernet, Wireless, USB, TCP/IP - Built-In Web Server.

Included Items: carrying case, strap, insert (selectable), insert extractor tool, test leads, manual and power cord.

Optional Accessories: Industrial Standard Probe (straight) - Order Code: 04.06.0001-21.



Reference Grade Temperature Calibrator TS-360PM

- 5.7" Touchscreen Display.
- Operating Range: from ambient temperature to 360 °C.
- Resolution: 0.001 °C.
- Optional temperature measurement and control by external probe, cancels the set-point error and loading effect.
- Extensive Funcionalities:
 - Dry-Block (large volume);
 - Stirred Liquid (up to 300 °C);
 - Black Body;
- ITS-90 Coefficients for reference and test sensors.
- Information Infrastructure:
 - Ethernet, Wireless, USB, TCP/IP - Built-in Web Server.

The TS-360PM Calibrator generates temperature values in the block or insert from ambient to 360 °C. The two control zones provide a high temperature uniformity throughout the measurement zone.

Its large volume insert enables the calibration of many different shapes and sizes sensors or multiple temperature sensors at the same time. Using the stirred liquid insert, the calibrator becomes a true liquid bath of high homogeneity since it has an uniform mechanical stirrer magnetically coupled, maintaining constant turbulence of the fluid. Among its features it also has the possibility of use as a black body source for infrared thermometers calibration. TS-360PM incorporates concepts of automatic calibration with calibration management softwares, especially with the Isoplan® Software, such as issuing reports and certificates, task management, calibration data organization and archiving etc.

Technical Specification	Dry Block	Stirred Liquid
Operating Range (ambient temperature 23 °C)	ambient to 360 °C	
Accuracy: internal reference with external probe with external thermometer	± (0.1 °C + 0.05% of reading) ± 0.07 °C ± 0.05 °C	
Resolution	0.001 °C	
Stability:	± 0.02 °C	± 0.03 °C
Axial Uniformity (60 mm)	± 0.07 @ 30 °C ± 0.10 @ 200 °C ± 0.20 @ 360 °C	± 0.015 @ 30 °C ± 0.020 @ 200 °C ± 0.022 @ 300 °C
Radial Uniformity	± 0.010 @ 30 °C ± 0.020 @ 200 °C ± 0.020 @ 360 °C (between opposite holes)	± 0.007 @ 30 °C ± 0.009 @ 200 °C ± 0.010 @ 300 °C (distance: 40 mm)
Loading effect (8 probes x 1 probe)	0.20 °C full range	
Hysteresis	0.020 °C	
Heating Time	150 min (25 to 360 °C)	
Cooling Time	200 min (360 to 25 °C)	
Well diameter / depth	Ø 59 mm / 200 mm	
Display	5.7" Resistive Touchscreen	
Operational System	Windows CE ®	
Units / Temperature Scales	°C, °F, K, °R / ITS-90 or IPTS-68, user selectable	
Dimensions (HxWxD)	380 x 200 x 320 mm	
Weight	21 kg	
Power Supply	110 or 220 Vac, 50/60 Hz	
Electric Power	1000 W	
Warranty	1 year	

Electrical Input Specification

Input Ranges	Resolution	Accuracy	Remarks
millivolt 0 to 70 mV	0.0001 mV	± 0.005 % FS	R _{input} > 10 MΩ
resistance 0 to 100 Ω	0.0001 Ω	± 0.001 Ω	Excitation current 1.0 mA
100 to 500 Ω	0.001 Ω	± 0.004 Ω	
*Pt-100 -200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / 0.02 °F	Excitation current 1.0 mA
*Pt-25 -200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / 0.02 °F	Excitation current 1.0 mA
TC-J -210 to 1200 °C / -346 to 2192 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F	IEC-60584
TC-K -270 to 1370 °C / -454 to 2498 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 1370 °C	IEC-60584
TC-T -260 to 400 °C / -436 to 752 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 400 °C	IEC-60584
TC-B 50 to 1820 °C / 122 to 3308 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1820 °C	IEC-60584
TC-R -50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1760 °C	IEC-60584
TC-S -50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1760 °C	IEC-60584
TC-E -270 to 1000 °C / -454 to 1832 °F	0.01 °C / 0.01 °F	± 0.05 °C / 0.10 °F @ 1000 °C	IEC-60584
TC-N -260 to 1300 °C / -436 to 2372 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 1300 °C	IEC-60584
TC-L -200 to 900 °C / -328 to 1652 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 900 °C	DIN-43710
TC-C 0 to 2320 °C / 32 to 4208 °F	0.01 °C / 0.01 °F	± 0.25 °C / 0.50 °F @ 1500 °C	W5Re / W26Re
TC-Au-Pt 0 to 1000 °C / 32 to 1832 °F	0.01 °C / 0.01 °F	± 0.06 °C / 0.12 °F @ 1000 °C	ASTM E1751

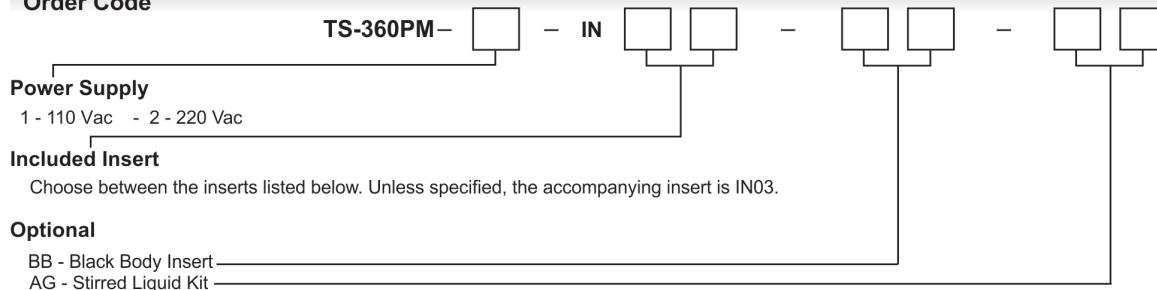
FS = Full Scale

All specifications are valid for one year.

* Specifications valid for standard curve.

Thermocouple with internal cold junction compensation, one must consider the error of this cold junction compensation of up to ± 0.2 °C or ± 0.4 °F. Configurable parameters of thermoresistance coefficients using ITS-90 and Callendar-Van Dusen ($\alpha\beta$ and abc curves).

Order Code



Accessories

Inserts:	Holes
IN01	7 x 6 mm and 1 1/4"
IN02	8 x 1/4"
IN03	2 x 3.0 mm, 2 x 6.0 mm, 2 x 1/4" and 2 x 8 mm
IN04	2 x 6.0 mm, 2 x 8.0 mm, 2 x 3/8" and 1 x 1/4"
IN10	Others, under ordering

Order Code

TS-360PM
06.04.0107-00
06.04.0108-00
06.04.0109-00
06.04.0110-00
06.04.0111-00

Information Infrastructure: Ethernet, Wireless, USB, TCP/IP - Built-In Web Server.

Included Items: carrying case, strap, insert (selectable), insert extractor tool, test leads, manual and power cord.

Optional Accessories: Industrial Standard Probe (straight) - Order Code: 04.06.0001-21.



Reference Grade Temperature Calibrator

TS-660PM

- 5.7" Touchscreen Display.
- Operating Range: from ambient temperature to 660 °C.
- Resolution: 0.01 °C.
- Optional temperature measurement and control by external probe, cancels the set-point error and loading effect.
- Extensive Functionalities:
 - Dry-Block (large volume);
 - Stirred Liquid (up to 300 °C);
 - Black Body;
- ITS-90 Coefficients for reference and test sensors.
- Information Infrastructure:
 - Ethernet, Wireless, USB, TCP/IP - Built-in Web Server.

The TS-660PM Calibrator generates temperature values in the block or insert from ambient to 660 °C. The two control zones provide a high temperature uniformity throughout the measurement zone.

Its large volume insert enables the calibration of many different shapes and sizes sensors or multiple temperature sensors at the same time. Using the stirred liquid insert, the calibrator becomes a true liquid bath of high homogeneity since it has a uniform mechanical stirrer magnetically coupled, maintaining constant turbulence of the fluid. Among its features it also has the possibility of use as a black body source for infrared thermometers calibration. TS-660PM incorporates concepts of automatic calibration with calibration management softwares, especially with the Isoplan® Software, such as issuing reports and certificates, task management, calibration data organization and archiving etc.

Technical Specification	Dry Block	Stirred Liquid
Operating Range (ambient temperature 23 °C)	ambient to 660 °C	
Accuracy: internal reference with external probe with external thermometer	± (0.1 °C + 0.05% of reading) ± 0.10 °C ± 0.05 °C	
Resolution	0.01 °C	
Stability:	± 0.02 °C	± 0.03 °C
Axial Uniformity (60 mm)	± 0.10 @ 30 °C ± 0.25 @ 350 °C ± 0.40 @ 660 °C	± 0.030 @ 30 °C ± 0.040 @ 200 °C ± 0.044 @ 300 °C
Radial Uniformity	± 0.010 em 30 °C ± 0.022 em 350 °C ± 0.025 em 660 °C (between opposite holes)	± 0.007 @ 30 °C ± 0.009 @ 200 °C ± 0.010 @ 300 °C (distance: 40 mm)
Loading effect (8 probes x 1 probe)	0.25 °C full range	
Hysteresis	0.025 °C	
Heating Time	200 min (25 to 660 °C)	
Cooling Time	250 min (660 to 25 °C)	
Well diameter / depth	Ø 59 mm / 200 mm	
Display	5.7" Resistive Touchscreen	
Operational System	Windows CE ®	
Units / Temperature Scales	°C, °F, K, °R / ITS-90 or IPTS-68, user selectable	
Dimensions (HxWxD)	380 x 200 x 320 mm	
Weight	25 kg	
Power supply	110 or 220 Vac, 50/60 Hz	
Electric power	1000 W	
Warranty	1 year	

Electrical Input Specification

Input Ranges	Resolution	Accuracy	Remarks
millivolt 0 to 70 mV	0.0001 mV	± 0.005 % FS	R _{input} > 10 MΩ
resistance 0 to 100 Ω	0.0001 Ω	± 0.001 Ω	Excitation current 1.0 mA
100 to 500 Ω	0.001 Ω	± 0.004 Ω	
*Pt-100 -200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / 0.02 °F	Excitation current 1.0 mA
*Pt-25 -200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / 0.02 °F	Excitation current 1.0 mA
TC-J -210 to 1200 °C / -346 to 2192 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F	IEC-60584
TC-K -270 to 1370 °C / -454 to 2498 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 1370 °C	IEC-60584
TC-T -260 to 400 °C / -436 to 752 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 400 °C	IEC-60584
TC-B 50 to 1820 °C / 122 to 3308 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1820 °C	IEC-60584
TC-R -50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1760 °C	IEC-60584
TC-S -50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / 0.70 °F @ 1760 °C	IEC-60584
TC-E -270 to 1000 °C / -454 to 1832 °F	0.01 °C / 0.01 °F	± 0.05 °C / 0.10 °F @ 1000 °C	IEC-60584
TC-N -260 to 1300 °C / -436 to 2372 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 1300 °C	IEC-60584
TC-L -200 to 900 °C / -328 to 1652 °F	0.01 °C / 0.01 °F	± 0.10 °C / 0.20 °F @ 900 °C	DIN-43710
TC-C 0 to 2320 °C / 32 to 4208 °F	0.01 °C / 0.01 °F	± 0.25 °C / 0.50 °F @ 1500 °C	W5Re / W26Re
TC-Au-Pt 0 to 1000 °C / 32 to 1832 °F	0.01 °C / 0.01 °F	± 0.06 °C / 0.12 °F @ 1000 °C	ASTM E1751

FS = Full Scale

All specifications are valid for one year.

*Specifications valid for standard curve.

Thermocouple with internal cold junction compensation, one must consider the error of this cold junction compensation of up to ± 0.2 °C or ± 0.4 °F. Configurable parameters of thermoresistance coefficients using ITS-90 and Callendar-Van Dusen (αΔβ and abc curves).

Order Code

TS-660PM – [] – IN [] [] – [] [] – [] []

Power Supply

1 - 110 Vac - 2 - 220 Vac

Included Insert

Choose between the inserts listed below. Unless specified, the accompanying insert is IN03.

Optional

BB - Black Body Insert
AG - Stirred Liquid Kit

Accessories

Inserts:	Holes	Order Code
IN01	7 x 6 mm and 1 1/4"	06.04.0112-00
IN02	8 x 1/4"	06.04.0113-00
IN03	2 x 3.0 mm, 2 x 6.0 mm, 2 x 1/4" and 2 x 8 mm	06.04.0114-00
IN04	2 x 6.0 mm, 2 x 8.0 mm, 2 x 3/8" and 1 x 1/4"	06.04.0115-00
IN10	Others, under ordering	06.04.0116-00

Information Infrastructure: Ethernet, Wireless, USB, TCP/IP - Built-In Web Server.

Included Items: carrying case, strap, insert (selectable), insert extractor tool, test leads, manual and power cord.

Optional Accessories: Industrial Standard Probe (straight - up to 660 °C) - Order Code: 04.06.0008-21.

Accessories for Dry Block Calibrators

Insert - for "NL" family



- Order Code: See Accessories on page 31.
- Ideal for thermocouple and RTD sensors calibration.
- Possibility of customization to meet the customer needs.
- External dimensions (mm): Ø 35 x 160.

Black Body Insert - "NL" family



- Order Code: 06.04.0072-00
- Includes an anodized container insert.
- Special black bottom and walls, resulting in a high emissivity black body cavity.
- Suitable for infrared thermometers calibration.
- External dimensions (mm): Ø 35 x 168.

Stirred Liquid Kit - "NL" family



- Order Code: 06.09.0029-00
- Ideal for calibration of glass thermometers.
- Includes a magnetic stirrer, a sensor guide, steel container with lid.

Sensor Guide for Glass Thermometers "NL" family



- Order Code: 06.09.0030-00
- Proper for glass thermometer support.

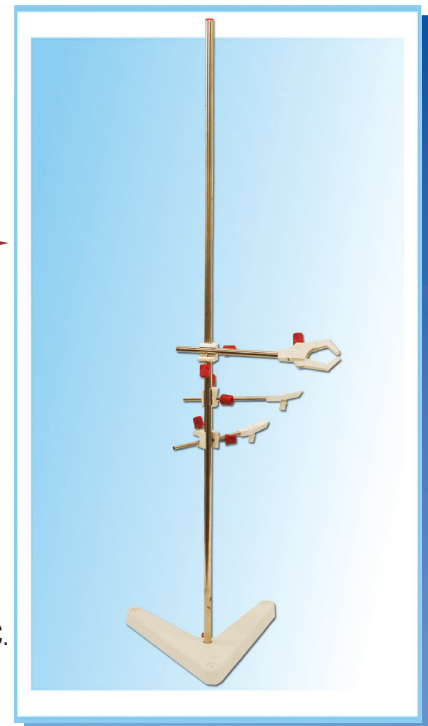
Sensor Guide - "NL" family



- Order Code: 02.22.0082-21
- Proper for TC and RTD support during calibration.

Support for Sensors / Thermometers

- Order Code: 02.22.0128-21
- Proper for TC and RTD support during calibration.
- Adjustable height aiming to achieve sensors of various stem lengths.



Low Viscosity Silicon Oil Type 200-10 - "NL/NLL" / Type 710 - "PL/PLL"



- Order Code "NL/NLL": 03.03.0206-21
- Order Code "PL/PLL": 03.03.0225-21
- Operating Temperature: -30 °C to 160 °C / 80 °C to 300 °C.
- Flash Point: 163 °C / 302 °C.
- 1 kg package.
- Emits no vapors.

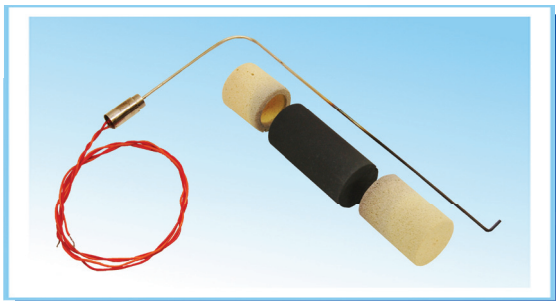
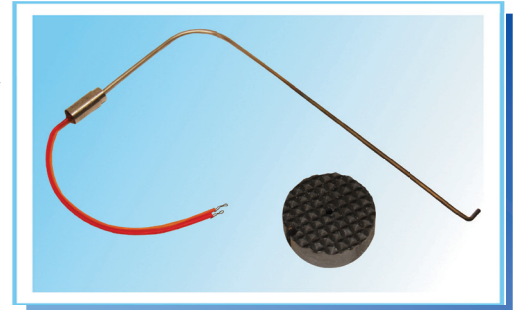


Thermal Shield

- Order Code: 02.22.0125-21
- Ideal for use with High Temperature dry block (e.g. T-650P and T-1200P), in order to reduce the effects of high temperature in the sensor sheaths and especially in the thermocouples junctions.

Black Body Insert for T-660PL + Thermocouple

- Order Code: 06.04.0097-00
- Effective target of 35 mm diameter with a special geometry.
 - Consists of a high emissivity black body cavity.
 - Supplied with thermocouple.
 - Suitable for infrared thermometers calibration.
 - External dimensions (mm): Ø 35 x 13.



Black Body Insert for T-1200P + Thermocouple

- Order Code: 06.04.0074-00
- Insert of special geometry and 20 mm effective target diameter, made in refractory material.
- Consists of a high emissivity black body cavity.
- Supplied with thermocouple.
- Suitable for infrared thermometers calibration.
- External dimensions (mm): Ø 31.5 x 70.

Superior Thermal Insulation for T-1200P

- Order Code: 02.22.0126-21
- Cylindrical shape insulation.
 - Mounted at the top of the insert.
- Must be supplied with holes diameters similar to the insert used.



Probe Carrying Case

- Order Code: 06.01.0017-00
- Ideal for transport and storage of temperature probes for use with the calibrators.



Inferior Thermal Insulation for T-1200P

- Order Code: 02.22.0127-21
- Cylindrical shape Insulation.
- Mounted at the bottom of the insert.
- Supplied with grounding pin.



Super Thermometer ST-501

- PRT reference thermometer, resolution of 0.001 °C.
- Replace precision glass thermometers.
- Fully electronic, without mechanical parts.
- Accepts PRT sensors or standard thermocouples.
- Portable and compact (rechargeable battery, charger and carrying case included).
- It has internal memory and serial communication port.
- Accepts CVD, IPTS-68 and ITS-90 coefficients.

The super thermometer ST-501 main purpose is to measure temperature with high accuracy. It uses platinum resistance thermometers sensors and it also accepts standard thermocouples. The digital electronic indicator can be offered complete including the temperature sensor and calibration certificate of the pair. The ST-501 has internal algorithms to calculate the temperature value according to Callendar-Van Dusen (CVD) and ITS-90 among other international temperature tables. For customers that already have one or several RTD's or PRT's sensors with quality enough for being used as standards, it is only necessary to enter its respective coefficients. And for those uncalibrated probes, it is possible to use the standard linearization curves for RTDs and thermocouples.

Specifications

Input Ranges		Resolution	Accuracy	Remarks
millivolt	0 to 70 mV	0.0001 mV	± 0.005 % FS	R _{input} > 10 MΩ
resistance	0 to 100 Ω	0.0001 Ω	± 0.001 Ω	Excitation
	100 to 500 Ω	0.001 Ω	± 0.004 Ω	current 1.0 mA
Pt-100	-200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / ± 0.02 °F	Excitation current 1.0 mA
Pt-25	-200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / ± 0.02 °F	Excitation current 1.0 mA
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.01 °C / 0.01 °F	± 0.10 °C / ± 0.20 °F	IEC-60584
TC-K	-270 to -150 °C / -454 to -238 °F	0.01 °C / 0.01 °F	± 0.25 °C / ± 0.50 °F	IEC-60584
	-150 to 1370 °C / -238 to 2498 °F	0.01 °C / 0.01 °F	± 0.10 °C / ± 0.20 °F	
TC-T	-260 to -200 °C / -436 to -328 °F	0.01 °C / 0.01 °F	± 0.30 °C / ± 0.60 °F	IEC-60584
	-200 to -75 °C / -328 to -103 °F	0.01 °C / 0.01 °F	± 0.20 °C / ± 0.40 °F	
	-75 to 400 °C / -103 to 752 °F	0.01 °C / 0.01 °F	± 0.10 °C / ± 0.20 °F	
TC-B	50 to 250 °C / 122 to 482 °F	0.01 °C / 0.01 °F	± 1.25 °C / ± 2.50 °F	IEC-60584
	250 to 500 °C / 482 to 932 °F	0.01 °C / 0.01 °F	± 0.75 °C / ± 1.50 °F	
	500 to 1200 °C / 932 to 2192 °F	0.01 °C / 0.01 °F	± 0.50 °C / ± 1.00 °F	
	1200 to 1820 °C / 2192 to 3308 °F	0.01 °C / 0.01 °F	± 0.35 °C / ± 0.70 °F	
TC-R	-50 to 300 °C / -58 to 572 °F	0.01 °C / 0.01 °F	± 0.50 °C / ± 1.00 °F	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / ± 0.70 °F	
TC-S	-50 to 300 °C / -58 to 572 °F	0.01 °C / 0.01 °F	± 0.50 °C / ± 1.00 °F	IEC-60584
	300 to 1760 °C / 572 to 3200 °F	0.01 °C / 0.01 °F	± 0.35 °C / ± 0.70 °F	
TC-E	-270 to -150 °C / -454 to -238 °F	0.01 °C / 0.01 °F	± 0.15 °C / ± 0.30 °F	IEC-60584
	-150 to 1000 °C / -238 to 1832 °F	0.01 °C / 0.01 °F	± 0.05 °C / ± 0.10 °F	
TC-N	-260 to -200 °C / -436 to -328 °F	0.01 °C / 0.01 °F	± 0.50 °C / ± 1.00 °F	IEC-60584
	-200 to -20 °C / -328 to -4 °F	0.01 °C / 0.01 °F	± 0.20 °C / ± 0.40 °F	
	-20 to 1300 °C / -4 to 2372 °F	0.01 °C / 0.01 °F	± 0.10 °C / ± 0.20 °F	
TC-L	-200 to 900 °C / -328 to 1652 °F	0.01 °C / 0.01 °F	± 0.10 °C / ± 0.20 °F	DIN-43710
TC-C	0 to 1500 °C / 32 to 2732 °F	0.01 °C / 0.01 °F	± 0.25 °C / ± 0.50 °F	W5Re / W26Re
	1500 to 2320 °C / 2732 to 4208 °F	0.01 °C / 0.01 °F	± 0.35 °C / ± 0.70 °F	W5Re / W26Re

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.1 °C or ± 0.2 °F.

Dimension: 56 mm x 144 mm x 72 mm (HxWxD).

Weight: 0.6 kg approx.

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485).


Warm-up: 30 minutes.

Operating ambient: 0 to 50 °C.

Relative Humidity: 0 to 90 %.

Warranty: 1 year, except for rechargeable battery.

Included Items: carrying case, support, test leads, manual and battery charger.

Order Code ST-501 - 
Temperature Sensor _____

- 1 - Industrial Standard Probe (-200 to 420 °C)
- 2 - Secondary Standard Probe (-200 to 660 °C)
- 3 - Secondary Standard Probe (-200 to 480 °C)

Optional Accessories:

Temperature Sensors

Description	Order Code	Range	Drift	Accuracy*	Dimensional
Industrial Standard Pt-100 Probe - Straight	04.06.0001-21	-200 to 420 °C	0.035 °C	0.030 °C @ 420 °C	305 mm x Ø 6.35 mm
Industrial Standard Pt-100 Probe - Angular 90°	04.06.0007-21	-200 to 420 °C	0.035 °C	0.030 °C @ 180 °C	140 mm x Ø 6.35 mm
Industrial Standard Pt-100 Probe - Long Angular 90°	04.06.0002-21	-200 to 420 °C	0.035 °C	0.030 °C @ 180 °C	170 mm x Ø 6.35 mm
Secondary Standard Pt-100 Probe	04.06.0004-00	-200 to 480 °C	0.01 °C	0.023 °C @ 420 °C	12" x Ø1/4"
Secondary Standard Pt-100 Probe	04.06.0003-00	-200 to 660 °C	0.03 °C	0.050 °C @ 660 °C	15" x Ø1/4"

Communication Interface - Order Code: 06.02.0001-00

* With ITS-90 coefficients characterization.



Industrial Standard Probe

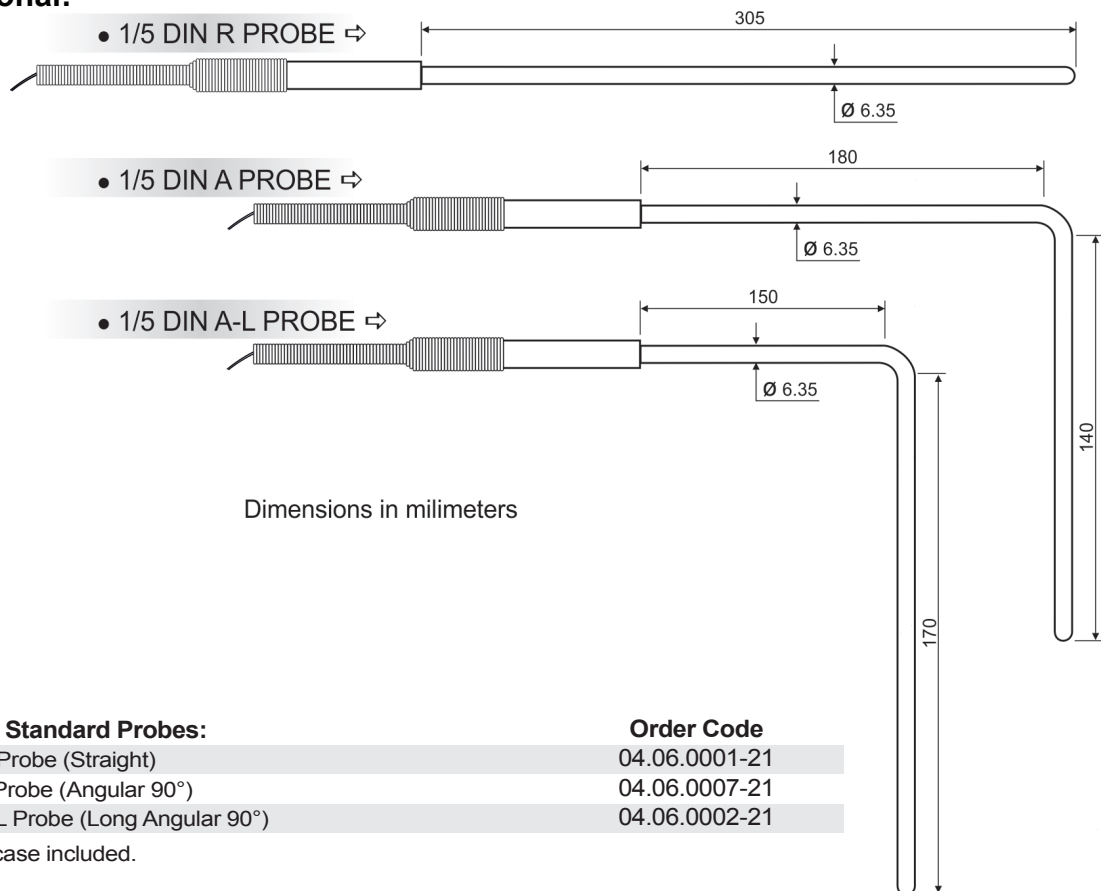
- Range from -200 to 420 °C.
- Long-term drift ± 0.035 °C.
- Accuracy of ± 0.030 °C @ 420 °C using ITS-90 parameters and accuracy of ± 0.48 °C @ 420 °C as 1/5 DIN tolerance.

The Industrial Standard Probes 1/5 DIN-R (straight), 1/5 DIN-A (angular) and 1/5 DIN-A-L (long angular) are built with selected raw materials, have high purity and are handled in a laboratory environment. Use differential bulb of high performance with mineral insulation and sheath, which gives them high vibration resistance and durability at an industrial level, with standard laboratory performing. Due to their high stability they can be used in the non-customized manner as 1/5 DIN standard or custom mode with ITS-90 or Callendar-Van Dusen coefficients, reaching very low uncertainties for long periods of time. In this situation, can be read on a accuracy compatible instrument, such as thermometers ST-501 and PT-511 models or used as reference probe for dry block calibrators.

Technical Specifications

Resistance:	100 Ω @ 0 °C (nominal).	
Temperature Resistance Coefficient:	0.00385 Ω / Ω / °C (nominal).	
Usage Range:	-200 to 420 °C maximum handle temperature of 150 °C.	
Sheath material:	Compacted mineral insulation of high purity sheath in 316 stainless steel.	
Mounting:	4 output wires with 22 AWG nickel plated copper.	
Insulation Resistance:	> 100 MΩ @ 50 Vdc @ 23 °C ambient temperature.	
Long-term drift:	± 0.035 °C @ 0 °C after 100 h of continuous use in 420 °C.	
Self-Heating:	50 mW / °C in an ice bath in 0 °C.	
Minimal Immersion:	At least 100 mm.	
Dimensional:	305 mm x Ø 6.35 mm (1/5 DIN-R) 140 mm from the edge to the bend x Ø 6.35 mm (1/5 DIN-A) 170 mm from the edge to the bend x Ø 6.35 mm (1/5 DIN-A-L)	
Typical Accuracy ITS-90 coefficients:	Straight Model ± 0.030 °C @ -38.0 °C. ± 0.020 °C @ 0.0 °C. ± 0.020 °C @ 232.0 °C. ± 0.030 °C @ 420.0 °C.	Angular Models ± 0.030 °C @ -30.0 °C. ± 0.020 °C @ 0.0 °C. ± 0.020 °C @ 180.0 °C.
1/5 DIN Accuracy:	± 0.02 °C @ -38.0 °C. ± 0.06 °C @ 0.0 °C. ± 0.29 °C @ 232.0 °C. ± 0.48 °C @ 420.0 °C.	

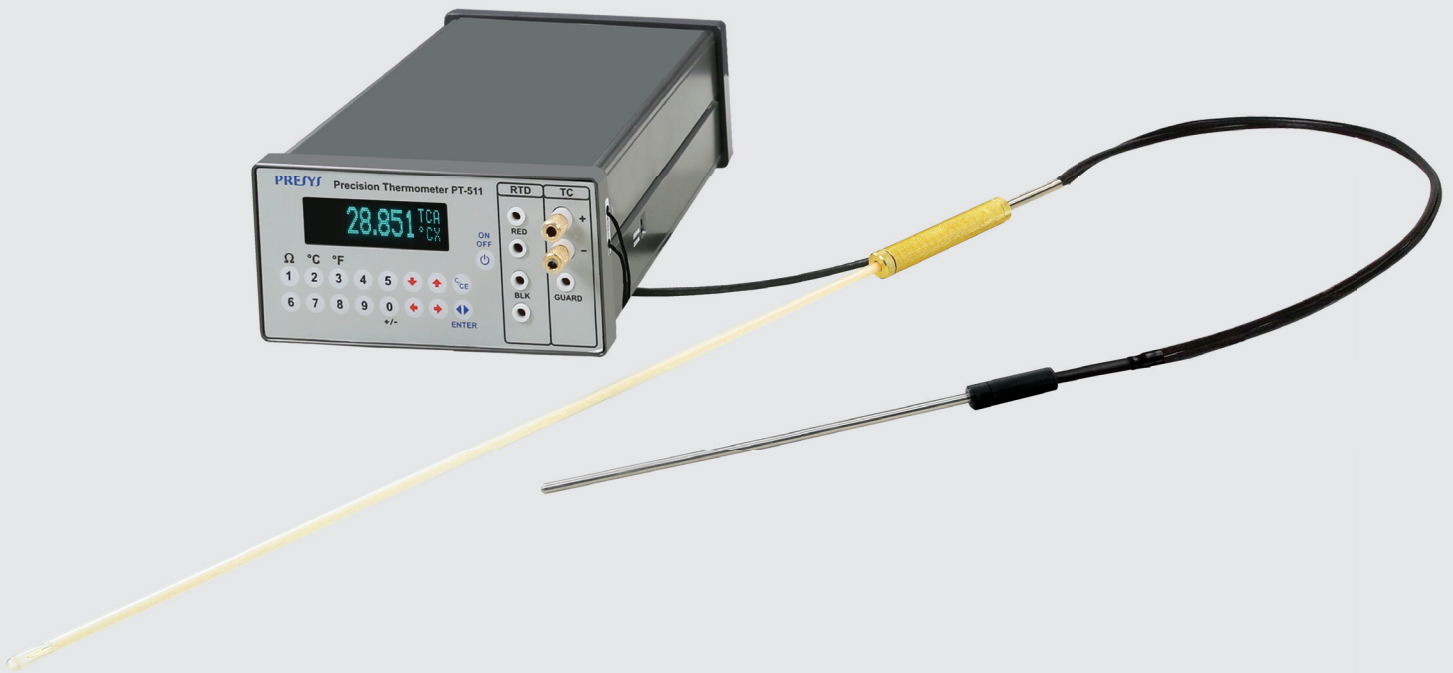
Dimensional:



Industrial Standard Probes:

	Order Code
1/5 DIN R Probe (Straight)	04.06.0001-21
1/5 DIN A Probe (Angular 90°)	04.06.0007-21
1/5 DIN A-L Probe (Long Angular 90°)	04.06.0002-21

*Carrying case included.



Precision Thermometer PT-511

- PRT reference thermometer, resolution up to 0.001 °C.
- Replace precision glass thermometers.
- Fully electronic, without mechanical parts.
- Accepts 25 and 100 ohms sensors or standard thermocouples (including AuPt).
- It has internal memory and serial communication port.
- Accepts CVD, IPTS-68 and ITS-90 coefficients.

The high accuracy thermometer PT-511 main purpose is to measure temperature with high accuracy. It uses platinum resistance thermometers sensors and it also accepts standard thermocouples.

The digital electronic indicator can be offered complete including the temperature sensor and calibration certificate of the pair. The PT-511 has internal algorithms to calculate the temperature value according to Callendar-Van Dusen (CVD) and ITS-90 among other international temperature tables. For customers that already have one or several RTD's or PRT's sensors with quality enough for being used as standards, it is only necessary to enter its respective coefficients. And for those uncalibrated probes, it is possible to use the standard linearization curves for RTDs and thermocouples.

Specifications - Input

Ranges		Resolution	Accuracy	Remarks
millivolt	0 to 70 mV	0.0001 mV	± 0.002 % FS	R _{input} > 10 MΩ
resistance	0 to 100 Ω	0.0001 Ω	± 0.001 Ω	Excitation
	100 to 500 Ω	0.001 Ω	± 0.004 Ω	current 1.0 mA
Pt-100	-200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / ± 0.02 °F	Excitation current 1.0 mA
Pt-25	-200 to 850 °C / -328 to 1562 °F	0.001 °C / 0.001 °F	± 0.01 °C / ± 0.02 °F	Excitation current 1.0 mA
TC-J	-210 to 1200 °C / -346 to 2192 °F	0.01 °C / 0.01 °F	± 0.03 °C @ 0 °C ± 0.03 °C @ 600 °C	IEC-60584
TC-K	-270 to 1370 °C / -454 to 2498 °F	0.01 °C / 0.01 °F	± 0.04 °C @ 0 °C ± 0.04 °C @ 600 °C	IEC-60584
TC-T	-260 to 400 °C / -436 to 752 °F	0.01 °C / 0.01 °F	± 0.04 °C @ 0 °C ± 0.03 °C @ 300 °C	IEC-60584
TC-B	50 to 1820 °C / 122 to 3308 °F	0.01 °C / 0.01 °F	± 0.20 °C @ 800 °C ± 0.15 °C @ 1200 °C	IEC-60584
TC-R	-50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.13 °C @ 800 °C ± 0.11 °C @ 1200 °C	IEC-60584
TC-S	-50 to 1760 °C / -58 to 3200 °F	0.01 °C / 0.01 °F	± 0.14 °C @ 800 °C ± 0.13 °C @ 1200 °C	IEC-60584
TC-E	-270 to 1000 °C / -454 to 1832 °F	0.01 °C / 0.01 °F	± 0.03 °C @ 0 °C ± 0.02 °C @ 600 °C	IEC-60584
TC-N	-260 to 1300 °C / -436 to 2372 °F	0.01 °C / 0.01 °F	± 0.04 °C @ 600 °C ± 0.04 °C @ 1000 °C	IEC-60584
TC-L	-200 to 900 °C / -328 to 1652 °F	0.01 °C / 0.01 °F	± 0.03 °C @ 0 °C ± 0.03 °C @ 600 °C	DIN-43710
TC-C	0 to 2320 °C / 32 to 4208 °F	0.01 °C / 0.01 °F	± 0.08 °C @ 800 °C ± 0.09 °C @ 1200 °C	W5Re / W26Re
TC-Au/Pt	0 to 1000 °C / 32 to 1832 °F	0.01 °C / 0.01 °F	± 0.09 °C @ 500 °C ± 0.06 °C @ 1000 °C	ASTM E1751

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature. For thermocouples with internal cold junction compensation, add a cold junction compensation error of ± 0.1 °C or ± 0.2 °F.

Dimensions: 56 mm x 144 mm x 230 mm (HxWxD).

Weight: 1.0 kg approx.

Serial communication: Modbus® RTU Protocol (RS-232/RS-485).

Warm-up: 30 minutes.

Operating Ambient: 0 to 50 °C.

Relative Humidity: 0 to 90 %.

Warranty: 1 year, except for rechargeable battery.

Included Items: manual, test leads and power cord.

Order Code

PT-511 -

Temperature Sensors

Au/Pt - Primary Standard Au/Pt Thermocouple

- 1 - Industrial Standard Probe (-200 to 420 °C)
- 2 - Secondary Standard Probe (-200 to 660 °C)
- 3 - Secondary Standard Probe (-200 to 480 °C)

Optional Accessories:

Temperature Sensors

Description	Order Code	Range	Drift	Accuracy*	Dimensional
Industrial Standard Pt-100 Probe - Straight	04.06.0101-21	-200 to 420 °C	0.035 °C	0.030 °C @ 420 °C	305 mm x Ø 6.35 mm
Industrial Standard Pt-100 Probe - Angular 90°	04.06.0107-21	-200 to 420 °C	0.035 °C	0.030 °C @ 180 °C	140 mm x Ø 6.35 mm
Industrial Standard Pt-100 Probe - Long Angular 90°	04.06.0102-21	-200 to 420 °C	0.035 °C	0.030 °C @ 180 °C	170 mm x Ø 6.35 mm
Secondary Standard Pt-100 Probe	04.06.0104-00	-200 to 480 °C	0.01 °C	0.023 °C @ 420 °C	12" x Ø 1/4"
Secondary Standard Pt-100 Probe	04.06.0103-00	-200 to 660 °C	0.03 °C	0.050 °C @ 660 °C	15" x Ø 1/4"
Primary Standard Au/Pt Thermocouple	PT-TC-Au/Pt	0 to 1000 °C	0.05 °C	0.030 °C @ 1000 °C	560 mm x Ø 7 mm

Communication Interface - Order Code: 06.02.0001-00.

* With ITS-90 coefficients characterization.



Platinum - Gold Thermocouple TC-Au/Pt Primary Standard

- Calibration uncertainties of $\pm 0.030 \text{ }^\circ\text{C}$ @ $1000 \text{ }^\circ\text{C}$.
- Stability better than $\pm 0.050 \text{ }^\circ\text{C}$ over long periods of use.
- Best alternative for high temperature PRT.
- More robust and less annealing care than PRTs.
- Does not deteriorate the electrical isolation between sensor element and sheathed as PRTs.

Presys Au/Pt thermocouple sensor follows the design, care selection of raw material and handling in accordance with NIST and McLaren guidelines.

It is a high performance sensor, more robust and stable than PRT for high temperature and level of accuracy of secondary or primary temperature standards.

R and S thermocouples use platinum alloys in their composition which causes deterioration in performance and variable behavior depending on their immersion in the heat source (presence of non-homogeneities).

The Au/Pt thermocouple developed by Presys uses Au and Pt wires with 99.999% of purity, and as these metals are very stable from 0 to $1000 \text{ }^\circ\text{C}$, the stability of the thermocouple is excellent for this range. The international literature has extensively described the exceptional qualities of this type of thermocouple.

Can be used with the Presys Precision Thermometer PT-511 which already has the Au/Pt thermocouple curve developed by Burns. The reading is obtained directly in temperature unit. This set calibrated by fixed points results in a digital thermometer with the best uncertainties for such a wide range as 0 to $1000 \text{ }^\circ\text{C}$.

Technical Specifications

Temperature Range:	0 to 1000 °C
Typical stability:	± 0.050 °C
Thermocouple Material:	Gold 99.999 % of purity Platinum 99.999 % of purity
Sheath material:	Measurement junction in quartz Reference junction in stainless steel
Measurement Junction Dimensions:	Ø 7 mm x 560 mm
Reference Junction Dimensions:	Ø 6 mm x 230 mm
Typical Calibration Uncertainties:	0.070 °C @ 231.928 °C (Sn) 0.050 °C @ 419.527 °C (Zn) 0.035 °C @ 660.323 °C (Al) 0.025 °C @ 961.78 °C (Ag)
Weight:	0.5 kg
Order Code:	PROBE – PT – TC – Au/Pt
Warranty:	1 year

Example of an Au/Pt Thermocouple Certificate:

Temperature values measured in the thermometer with deviation function already programmed.

Cell	Temperature /°C	e.m.f. / µV	Indicated Value /°C	Uncertainty / °C	Immersion / mm
Ag 23	961.78	16114.11	961.78	0.025	200
Al 34	660.323	9317.45	660.33	0.035	160
Zn EPC 033	419.527	4944.28	419.54	0.050	160
Sn EPC 047	231.928	2235.25	231.91	0.070	160
In EPC 046	156.5985	1350.62	156.58	0.13	180
Ga ISO 168	29.7646	196.23	29.70	0.13	180
Ice Point 0 °C	0.00	0.14	-0.08	0.13	250

The calibration uncertainty is estimated with a confidence level of 95% (k = 2).

- Carrying case included.

Calibration Laboratory **PRESYS - PRYMELAB**

PRESYS has a calibration laboratory - **PRYMELAB** - where the calibrations of manufactured instruments are held.

PRESYS ISO/IEC 17025 Laboratory provides certification of our calibrators in the following scopes:

◆ Pressure

- **Range up to 16,000 psi (1,100 bar)**
gage, absolute pressure, and vacuum with uncertainties up to **80 ppm**.



◆ Temperature

- **Range from -55 to 650 °C**
for RTD/digital thermometer with RTD system with uncertainties up to **0.01 °C**.
- **Range from -55 to 1100 °C**
for Thermocouple/digital thermometer with Thermocouple sensor with uncertainties up to **0.1 °C**.
- **Range from -200 to 800 °C**
for RTD indicator / controller / simulator with uncertainties up to **0.03 °C**.
- **Range from -250 to 2300 °C**
for Thermocouple indicator / controller / simulator with uncertainties up to **0.02 °C**.



◆ Electrical Signals

- **Range from 1 mV to 100 Vdc** with uncertainties up to **0.8 μV**.
- **Range from 10 μA to 100 mAdc** with uncertainties up to **8 nA**.
- **Range from 1 Ω to 100 kΩ** with uncertainties up to **0.18 mΩ**.



Calibration Certificate

PANY: PRESYS INSTRUMENTS
 INSTRUMENT: Temperature Transmitter
 PROC.: Boiler steam output temperature
 CALIBRATION: A

N.: 1/2014

REG. NUMBER: TAG: O.S.: SAP310114-002
 CALIBRATION PERIOD: PROC.: P11/01

INSTRUMENT TECHNICAL INFORMATION

CALIBRATION AND ADJUSTMENT

RANGE INPUT: RTD-Pt-100 0,00 to 100,00 (°C)
 RANGE OUTPUT: Current 4,0000 to 20,0000 mA

Calibration (°C)	Reference (mA)	Corr. Cal. (°C)	Corr Ref. (mA)	Reading 1 (mA)	Average (mA)	Error (mA)	U (mA)	k	Accep. Crit. (mA)
0,00	4,0000	0,00	4,0000	4,0218	4,0218	0,0218	0,0008	2,000	0,1600
25,00	8,0000	25,00	8,0000	8,0232	8,0232	0,0232	0,0008	2,000	0,1600
50,00	12,0000	50,00	12,0000	11,8190	11,8190	-0,1810	0,0010	2,000	0,1600
75,00	16,0000	75,00	16,0000	15,9559	15,9559	-0,0441	0,0011	2,000	0,1600



Tags

Main Reports

Registered Tags: TT-14001

Area: \Area-2

Tag Name: TT-14001

Instrument: 0720996

Cal./Verif.: Calibration

Criticality: A

Function / Interval: Instrument Calibration Strategy Operation Conditions

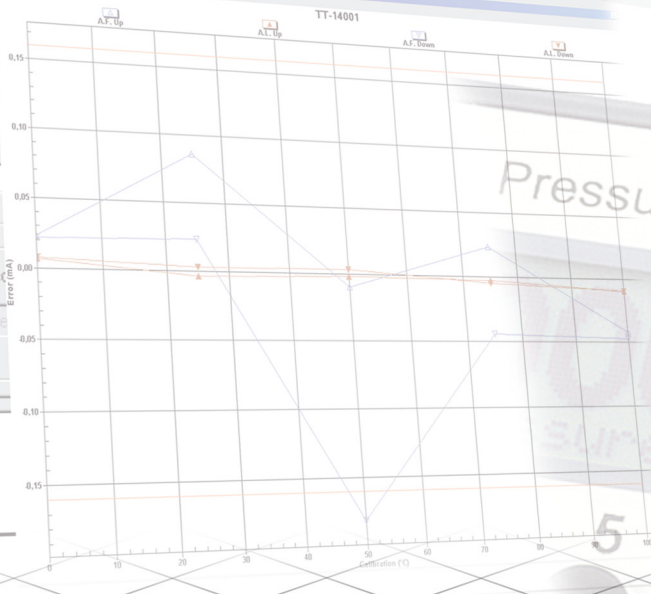
Strategy: 1

Instrument Scale: Temperature

Calibration Generation: Presys Calib.

Scale: RTD-Pt-100-°C

Options Presys Calibrators: Sensor P1



PRESYS
 TS-35NM

Pressure Calibrator PC-507



ON OFF

C/CE

5

Pressure Calibrator PC-507 controls and buttons.