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# Nagman's Calibration Test Bench Systems



## AN OVERVIEW...

Nagman's wide range of **Calibration Systems - Test Benches, Workstations, Bench-tops & Mobile Units** - are designed & executed to serve as

Powerful tools for

- Total Quality Management & ISO Conformance with Accuracies Traceable to International Standards
- Total Solution to all Calibration requirements

Thus these serve as an Essential / Integral part of Centralised / Distributed (Site) Calibration / Testing / Q.C. Laboratory Setups in all types of Industries.

Nagman's **Calibration Systems - Test Benches, Workstations, Bench-tops & Mobile Units** offer

- ultimate **Flexibility** thro' **Custom Configuration / Preferences** enabling Incorporation/Integration of World's best - Furniture / Utility Modules / Calibration Standards and Test & Measuring Instruments

Nagman also offer Cost Effective / Economy / Budget Solution Calibration Test Benches / Workstations / Mobile Units / Bench-tops - a Complete & Comprehensive range, integrating / interfacing Nagman's own time tested, proven Temperature / Pressure / Multifunction Calibrator modules, Power Supplies & other Utilities etc.

With the wide choice & combination of Modules offered by Nagman, complete Calibration Systems for **Dedicated / Single Parameter** (Temperature / Pressure / Electrical & Electronics) or for **Multiparameter - any combination** of parameters can be Designed, Configured & "Built-up" to suit Customer's requirement.

Test Bench Designs include **Elevated / Table-top Device Panels (Single / Dual Deck)** with **Movable Under-Bench Cabinets / Cupboards / Trolleys** etc.

Hi-tech Next Generation "**Multi-Flex**" Range of Test Benches offer **space saving / multi-purpose "Push-Pull"** (Electrically operated) **Pop-in/Pop-out** Device panels & Mounted Under-bench Trolleys.

Nagman also can offer only Bench-tops for Mounting on Customer Table / Furniture.

Nagman offer - for Remote / Distributed Field / Site Calibration work **Compact Mobile Units** - combination of Modules & Utilities mounted in a sturdy Trolley case.

Nagman can offer these Test Benches / Bench-tops - one or more - mounted in a **Van** or **Container** to serve as "**Mobile Calibration Lab**" for Site / Field Calibration assignments.

Calibration Accuracies (of Instrument Modules) are Traceable to International Standards & duly verified (where possible) (before integration) & Certified by Nagman's **NABL** (equivalent to UKAS) Accredited - per **ISO 17025:2005** - "**Centre for Calibration**".

Nagman offer these Systems - optionally - with their powerful & unique **Calibration Management Software** - **Calman Plus** - interfacing / integrating the various Modules & enabling perform Calibration Routines Semi-automatically / Automatically. Advanced Version of CMS for uplinking to customer SAP System also available.

More than **500 Systems** are proving their mettle in industries & Projects **Worldwide**, thro' continued good performance.



## GENERAL DESIGN / SPECIFICATIONS OF FURNITURE

### Basic Design & Dimension

Work Table-tops are constructed from high density wood particle board of thickness 25 mm and covered / finished with non-reflective, dissipative antistatic (optional) matt finish plastic laminate, to meet the requirements for applications within the electronic Industry. The surface of the worktop is resistive to impacts / discolouring / soldering marks & most of Chemical reagents.

### Eco-Frame

### Economic Heavy Duty

Basic / Economy Version - High quality / Heavy Duty (& Powder coated) 40 mm square tube fabricated 4 or 5 legged Frame construction



### 'C' Frame

Trendy, Ergonomic / 'C' Frame Design

Metallic constructions, such as frames and angles are from degreased & phosphate treated Sheet Steel, protected with oven backed enamel paint, for better conductivity & dissipation of static charges, to ensure zero potential throughout the working surface.



Test Benches / Workstations are available in various dimensions, custom configurable (Lengths from 1000 upto 2400 mm x Depth 1000 mm x Height 800 mm), depending on modules fitted in Bench-top / Device Panel Units & to suit customers choice - possible to design & configure as per available space (area) of Customers' Lab.

### Perfect Space Saving Solutions

#### Corner Profile



- Solutions for Space Saving "Corner Benches" - "L" shaped straight angle or with "Corner Working Area" - available as option to house
  - LCD Monitor in Bench-top
  - Tools in perforated back panel
  - CPU & Document Shelf under the Work Bench Cabinet to effectively use the Corner Space



#### Multi-Flex

Electrically actuated 'Pop-up' Bench-tops & Space Saving Device Panels & 'Push-Pull' Under Bench Trolleys.

## Bench-tops & Device Panels

Bench-tops are designed to be mounted either on top of the Workbench, or in an Elevated position, with perforated sheet panel at the bottom (to accommodate tools, components storage boxes etc.). One additional (laminated board top) is provided (optionally) over the Device Panels, to place Portable Standards etc.



Device Panels (Modular designs) are made up of high quality Aluminium metal sheet of 3 mm thick, specially crafted (according to the Modules) and surface finished with Aluminium foil that gives an aesthetic look. The 19" chassis techniques permit changing the devices / Modules without any problems.

Single/Dual Deck Configuration (Based on number of Modules).  
30° viewing angle adjustable (Single) Decks.

## Under Bench Cabinets

Under Bench Cabinets (with 3 or 4 drawers of various heights), constructed in wood / steel, are provided with drawer guides and runners for smooth opening & closing. Cabinets are provided with central locking facility & castor wheels.



## Cupboards / Cutouts

Cupboards (with/without Drawers) made up of Laminated Chip Board can be designed in the Device Panel to accommodate Primary Standards viz. Dead Weight Testers etc. Separate Cupboard provision for accommodating Manometers / Micro-Manometers is also possible.

For accommodating Portable Calibrators / Reference Standards in the Bench-top, suitable 'Cutouts' can be designed & provided.



## Trolleys

Specially designed movable Trolleys, to mount Portable / Semi-portable Reference Standards like Temperature Calibrators, Dead Weight Testers etc. - that can be hidden under the Test Bench while not in use & can be easily moved to a convenient location for operations.

Electrically actuated / motorized (fixed under bench)  
Pop-up Trolleys also available (Multi-Flex).



## Other Accessories

Varieties of Workstation Accessories & Utilities including Articulated arm (for Lamp / Soldering Iron & Base, Telephone, PC Monitor etc.), Fluorescent Lamp, Shelves / Racks for PC, Keyboard Tray, Tool Stand attachment, Pick-up Boxes, Adjustable Auxiliary Tops (to accommodate loose Instruments, Tools, Circuit Diagrams etc.) to attach to the perforated panel. Chairs are available to complete the Workstation as fully equipped Ergonomic System.

## Ultimate Flexibility

In the pages to follow, Salient Features & Brief Specifications of the Standard / Optional Modules - Common/Utility Modules, Temperature/Pressure/ Electrical & Electronics Calibrator Modules, Test & Measuring Instrument Modules etc. are made available for Customer's Choice / Selection, Design & Configuration of Dedicated Temperature/Pressure/Electrical & Electronics or Multifunction/Multiparameter Calibration Systems - Test Benches, Workstations, Bench-tops & Mobile Units. For complete Specifications, kindly contact us.

We also offer Test Benches / Field Test / Calibration Systems for Flow (Water/Gas), Level, Mass, Mechanical, Dimensional and other Applications incorporating Appropriate Calibration Masters / Standards.

100s of our Calibration Test Benches are being used in Centralized Test Facilities & ISO/IEC 17025 Accredited Calibration Labs across a Wide Spectrum of Industries around the world, providing these customers with high performance systems for the necessary applications.





**Temperature Calibration  
Test Bench**

**Pressure Calibration (Primary /  
Secondary) Test Bench**



**Electrical & Electronics  
Calibration Test Bench**

**Multifunction / Multiparameter  
Calibration Test Bench**



## TYPICAL TEST BENCH INSTALLATIONS WORLDWIDE





# CALIBRATION SYSTEMS

TEST BENCHES • WORKSTATIONS • BENCH-TOPS • MOBILE UNITS

## CHOICE OF COMMON MODULES & UTILITIES

MOUNTED IN DEVICE PANEL

### Mains Power Supply - Single / Three Phase

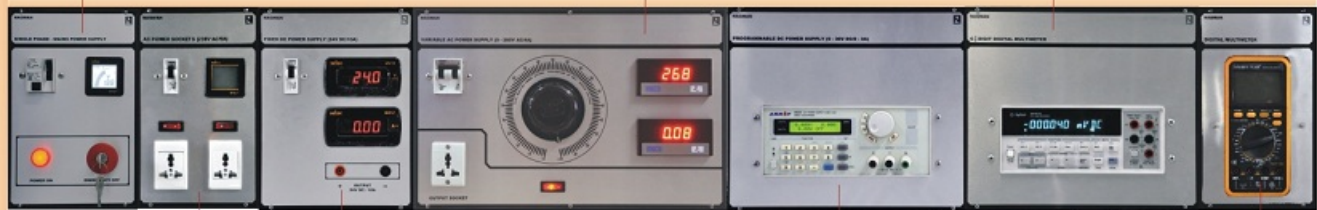
Universal AC Power Supply - 230V ( 25A / 40A )  
50 Hz / 60 Hz  
Emergency ON/OFF Switch  
Lamp Indication; Voltmeter  
115V Single Phase Power Supply (optional)  
415V Three Phase Power Supply (optional)

### Variable AC Power Supply

Input Voltage : 230V AC  
Output Voltage : 0 to 260V AC  
Current Rating : 4A / 8A / 15A  
Analog/Digital Voltmeter & Ammeter  
One number of standard Power Socket with  
Lamp Indication Switch

### Precision Digital Multimeter

5½ / 6½ digit Resolution  
3 Hz ... 300 Hz AC Bandwidth  
Null feature allows to remove Lead  
Resistance / Fixed Offsets  
Min. / Max. / Avg. Readouts  
Continuity & Diode Test



### 230V / 110V AC Socket Panel

Universal AC Sockets  
Outputs :  
a) 230V AC, 5A / 15A  
b) 110V AC, 5A  
Voltmeter  
Lamp Indication

### Fixed DC Power Supply

Supply Voltage : 230V AC  
Output : 5V / 12V / 24V / 48V  
2A / 5A / 10A  
Banana Socket  
Lamp Indication  
Digital Volt / Ammeter

### Programmable DC Power Supply (Variable)

Programmable Voltage / Current :  
a) 0 to 36V DC / 3A  
b) 0 to 72V DC / 1.5A  
Constant Voltage & Constant Current Mode  
Single Output

### True RMS Multimeter

3999 Counts Auto / Manual Ranging  
3½ Digits  
Capacitance / Frequency  
Measurement  
Diode Test  
True RMS

For other Module Types / Ratings / Specifications etc. consult us.



### Multifunction Calibrator

Simultaneous Measurement &  
Simulation of  
- mV, V & mA  
- Ohms, Frequency & Pulse  
- Thermocouples & RTDs  
- Basic DC Accuracy : 0.02% / 0.01%

### Air Supply Modules - Pressure Panel \*

Air Filter / Pressure Regulator  
Ranges : 0 to 2.5 / 0 to 6 / 0 to 10 Bar/Kg/Cm<sup>2</sup>  
Dial Size : 63 mm  
Accuracy : 1.6%  
Pressure Output Ports : Quick Fit Type

### Air Supply Modules - Vacuum Panel \*

Vacuum Regulator  
Vacuum Gauge Range : -1 to 0 Bar  
Dial Size : 63 mm / 100 mm  
Accuracy : ±1.6%  
Vacuum Output Ports : Quick Fit Type

\* External Dry Compressed Air / Vacuum supply required

## TEMPERATURE CALIBRATION TEST BENCH



### Application

For work shop Calibration of varieties of Temperature Measurement & secondary devices including Sensors, Indicators, Thermocouple and RTDs Probes / Assemblies / Transmitters, Calibrators, Pyrometers (Infrared), Thermistors, Recorders, Switches and Controllers etc. in quick time. As this Work station is built-in with varieties of Modules, both Sourcing (simulation of Temperature through Dry-Blocks / Oil Baths / Black Body Sources) & Precise Measurement modules and offered with dedicated software, 'CALTEMP' Temperature Calibration became easy & fully Automatic, & hence the operator need not stand near by the system, to set each & every Measurement Points.

### Industries / Sectors Served

Chemical, Petrochemical, Refineries, Power Generation (Thermal, Gas, Nuclear & Hydro), Oil & Gas, Manufacturing, Automation, Automotive, Aeronautics, Cement, Steel, Glass, Sugar & other Process Industries.



**Sub-Zero Temperature Calibrator**

**Model : MTC40** (Micro-Controller based)  
Range : -40 from Ambient to 123°C  
Resolution :  $\pm 0.1^\circ\text{C}$   
Accuracy :  $\pm 0.3^\circ\text{C}$ ; Stability :  $\pm 0.05^\circ\text{C}$   
Immersion Dia / Depth : 19 mm / 100 mm

**Micro Oil Bath**

**Model : MOB 250**  
Range : 20°C above Ambient to 250°C  
Resolution :  $0.1^\circ\text{C}$   
Accuracy :  $\pm 0.6^\circ\text{C}$ ; Stability :  $0.2^\circ\text{C}$

**Low Temperature Dry Block Calibrator**

**Models : 350H / 350H2**  
Range : 20°C above Ambient to 350°C  
Resolution :  $0.1^\circ\text{C}$   
Accuracy :  $\pm 1^\circ\text{C}$ ; Stability :  $0.3^\circ\text{C}$  /  $\pm 0.4^\circ\text{C}$   
Immersion Dia // Depth : 25 mm // 110mm/190 mm

**Universal Low Temperature Calibrator**

**Models : MTC 350**  
With Measurement Capability  
Range : 50 to 350°C; Resolution :  $0.1^\circ\text{C}$   
Accuracy :  $\pm 0.4^\circ\text{C}$ ; Stability :  $\pm 0.05^\circ\text{C}$   
Immersion Dia / Depth 25 mm / 110 mm

**Low Temperature****Model : BBSL**

Range : 10°C above Ambient to 350°C  
Stability :  $\pm 0.5^\circ\text{C}$ ; Resolution :  $0.1^\circ\text{C}$   
Accuracy : Within 0.5% of indicated temperature (Min.  $1^\circ\text{C}$ )  
Aperture Size : 25 mm  $\varnothing$

**Medium Temperature****Model : BBSM**

Range : 20°C above Ambient to 600°C  
Stability :  $\pm 0.5^\circ\text{C}$ ; Resolution :  $0.1^\circ\text{C}$   
Accuracy : Within 0.5% of indicated temperature (Min.  $2^\circ\text{C}$ )  
Aperture Size : 25 mm  $\varnothing$

**Low & Medium Temperature (Dual Chamber)**

**Model : BBSD** enables simultaneous measurement of 2 Pyrometers / Quick Measurement in 2 Points over the range  
Dual Ranges : 50 to 300°C & 250 to 600°C  
Accuracy : Within 0.5% of indicated temperature (Min.  $1^\circ\text{C}$  in Chamber 1 &  $2^\circ\text{C}$  in Chamber 2)  
Stability :  $\pm 0.5^\circ\text{C}$ ; Resolution :  $0.1^\circ\text{C}$   
Auto-tune PID Temperature Controller  
Aperture Size : 25 mm  $\varnothing$

**Medium Temperature Dry Block Calibrator****Models : 650H / 650H2**

Range : 20°C above Ambient to 650°C  
Resolution :  $0.1^\circ\text{C}$   
Accuracy :  $\pm 1.5^\circ\text{C}$ ; Stability :  $0.5^\circ\text{C}$  /  $\pm 0.6^\circ\text{C}$   
Immersion Dia // Depth : 25 mm // 110 mm/190 mm

**Universal Medium Temperature Calibrator****Model : MTC 650**

With Measurement Capability  
Range : 50 to 650°C; Resolution :  $0.1^\circ\text{C}$   
Accuracy :  $\pm 0.6^\circ\text{C}$ ; Stability :  $\pm 0.05^\circ\text{C}$   
Immersion Dia 25 mm & Depth 150 mm

## TEMPERATURE CALIBRATION TEST BENCH

### CHOICE OF MODULES & UTILITIES

**Mobile Trolley****High Temperature Dry Block Calibrator****Model : 1200 HN**

Stable high temperature source for calibration of multiple (upto 6) Sensors at high temperature  
Range : 300 to 1200°C; Resolution :  $1^\circ\text{C}$   
Accuracy : Better than  $\pm 3^\circ\text{C}$   
Stability : Better than  $\pm 0.5^\circ\text{C}$   
Immersion Dia / Depth : 45 mm / 150 mm

**High Temperature Dry Block Calibrator****Model : MTC 1200**

Portable Model with Measurement Capability  
Range : 300 to 1200°C  
Resolution :  $1^\circ\text{C}$ ;  
Accuracy :  $\pm 2^\circ\text{C}$   
Stability :  $\pm 0.5^\circ\text{C}$   
Immersion Dia / Depth : 26 mm / 150 mm

**Metrological Dry Block Calibrator****Model : Metcal 650**

With Measurement Capability  
Range : 50 to 650°C; Resolution :  $0.01^\circ\text{C}$   
Accuracy :  $\pm 0.4^\circ\text{C}$ ; Stability :  $\pm 0.04^\circ\text{C}$   
Immersion Dia 30 mm & Depth 150 mm  
Axial Uniformity :  $\pm 0.4^\circ\text{C}$   
Radial Uniformity :  $\pm 0.04^\circ\text{C}$

**Temperature Scanner****6 Point Calibration**

Simultaneous Calibration of upto 6 Thermocouples or RTDs  
Reduces Calibration Time by 1/6<sup>th</sup>.  
Serves as an Interface Module for Multi-hole Dry Block Temperature Calibrators

**Working Standard RTD / TC Probes****RTD**

Type Pt100 : Range -45 to 650°C

**Thermocouple Probes**

Type K : Range : 300 to 1200°C

Type S : Range : 650 to 1500°C

Supplied loose in wooden case

## PRESSURE CALIBRATION TEST BENCH

### PRIMARY & SECONDARY STANDARDS



#### Application

Primary Standard & Secondary Standard Pressure Calibration Test Benches - specially designed for Primary Level / Precision Calibration & Testing of Pneumatic, Electro-Pneumatic & Hydraulic Pressure Instruments.

These Test Benches Calibrate Gauges, Calibrators, Transducers, Transmitters, Indicators, Switches, Valves I/P, P/I Converters, etc. -- both Hydraulic & Pneumatic.

#### Industries / Sectors Served

Chemical, Petrochemical, Refineries, Power Generation (Thermal, Gas, Nuclear & Hydro), Oil & Gas, Manufacturing, Automation, Automotive, Aeronautics, Cement, Steel, Glass, Sugar & other Process Industries.



# PRESSURE CALIBRATION TEST BENCH

## PRIMARY STANDARDS

### DEAD WEIGHT TESTERS (HYDRAULIC)

RAM Screw Pump Design (Oil operated)  
Built-in Priming Pump  
Ranges : Upto 1200 Bar  
Single / Dual Piston  
Accuracies (Reading) :  
±0.1% (H3000 Series)  
±0.05% (H6000 Series)  
±0.025% (H6600 Series)  
±0.015% (H6900 Series)  
Units : Bar or PSI or Kg/cm<sup>2</sup>  
Mounted on table-top or on a Trolley (under bench)



### MANOMETERS

Single Limb Manometers used as Primary Standard for Low Pressure Vacuum & Medium Pressure Measurement (Water/Mercury filling)  
Ranges : 0 to 1000 mmWC;  
0 to 800 mmHg (1050 mBar);  
0 to 23 psi (0 to 1580 mBar)  
Resolution : 1 mm  
Typical Accuracy : ±0.1% F.S. / ±1 mmWC  
Mounted in 'Trolley' cupboard

### MICRO-MANOMETERS

Primary Standard Micro-Manometer for very Low Pressure / Differential Pressure & Precision Measurement  
Range : -50 to 2500 / 5000 pascal  
Resolution : 1 Pascal  
Typical Accuracy : ±0.4% F.S.  
Mounted in Trolley cupboard

## SECONDARY STANDARDS

### DIGITAL PRESSURE INDICATOR WITH EPM

MPC-B / MPC-B+



Ranges :  
-0.85 upto 40 Bar (Pneumatic)  
0 upto 700/1000 Bar thro' one or more Internal/External Pressure Modules  
Accuracy : ±0.05%/±0.025% FS (Temperature compensated)  
Selectable Pressure Units thro' Keypad  
High Resolution Graphic Display  
DC Current / Voltage Measurement - Upto 50 mA/30V  
Switch Test Facility & Zero Offset Facility  
Pressure Input Ports; Quick Fit Type



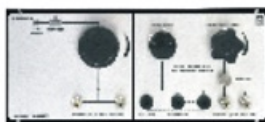
### DIFFERENTIAL / ABSOLUTE / GAUGE PRESSURE INDICATOR

For measurements of Gauge, Vacuum & Differential Pressure or Absolute Pressure  
Ranges :  
0 to 2000 mBar upto 90 Bar

Typical Accuracy :  
±0.05%/0.1%/0.2% F.S.

### MIMIC PANEL

For feeding Micromanometers / Manometers & Low Pressure / Vacuum Gauges / Indicators



- Low Pressure & Vacuum Source
- Integral Pump & Vernier Valve for Fine Adjustment
- Pressure Range :  
0 to 2 Bar/Sensitivity : 0.05 mBar
- Vacuum Range :  
0 to 0.8 Bar/Sensitivity : 0.05 mBar

### SET OF ANALOG PRESSURE / VACUUM GAUGES



Bourdon Type  
Dial Size : 160 mm / 250 mm  
Ranges :  
Pressure Gauge : Upto 700 Bar/Kg/Cm<sup>2</sup>  
Vacuum Gauge : -1 to 0 Bar (Std. DIN Ranges)  
Accuracy : 0.25%/0.5%/0.1% FS  
Panel Mounted  
Pressure Input Ports : Quick Fit type

## CHOICE OF MODULES & UTILITIES

### STAND-ALONE UNITS

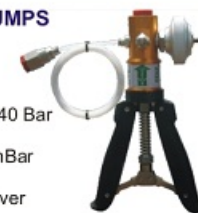
(to complement Indicator / Gauges / Manometers / Mimic Panel / Air Supply Modules)

### PNEUMATIC HAND PUMPS



PHP 2

Ranges : -0.9 to 2 / 10 / 25 / 40 Bar  
Resolution : 0.5 mmWC / 1 mBar  
Pressure / Vacuum Changeover selection



PHP 10 / 25 / 40

### HYDRAULIC HAND PUMPS



HHP 200 / HHP 350

Ranges :  
upto 200 / 350 / 700 / 1000 Bar  
Transparent Reservoir  
Medium : Oil  
Fine Adjustment Vernier



HHP 700 / HHP 1000

All Hand Pumps are supplied with Pneumatic / Hydraulic Hose & Quick Release Coupling Connectors as standard.

### COMPARISON TESTER (Hydraulic)

GCL/GCH Series



Ranges :  
GCL Series : Upto 250 Bar  
GCH Series : Upto 1400 Bar  
Ram Screw Pump Design  
Isolating Valve & Priming Pump  
Mounted on a Trolley (Under Bench)

### MANIFOLDS



For Mounting / Testing of Multiple Gauges / Devices  
2/3/4 Gauge Manifolds (Tabletop)  
Material : Stainless Steel  
Connecting Hoses with End fittings (optional)  
Threaded Unions (to suit)

## ELECTRICAL & ELECTRONICS (SIGNAL) CALIBRATION TEST BENCH



### Application

These Test Benches are useful for Calibration & Testing of Electrical & Electronic Instruments and equipments including V/A Meters, Multimeters, AC/DC Signal Sources, Clamp Meters, Tachometers, Ohmmeters, Decade Boxes, Power Supplies, Multifunction Calibrators, Frequency / Signal Generators, Oscilloscopes, Frequency Meters, Timer Counters etc.

### Industries / Sectors Served

Chemical, Petrochemical, Refineries, Power Generation (Thermal, Gas, Nuclear & Hydro), Oil & Gas, Manufacturing, Automation, Automotive, Aeronautics, Cement, Steel, Glass, Sugar & other Process Industries.



### Temperature Calibrators

Measurement & Simulation of  
 - T/Cs, RTDs, Resistances & DC Voltages  
 5 digits display for Measurement  
 6 Digits display for Simulation  
 Dual LCD with white LED for backlight

### Loop Calibrators

Capability to Measure & Simulate Voltage & Current & Frequency  
 5 digits display of Measurement & 6 digits display for Simulation  
 Capability to perform Continuity Test & provide Loop Supply (24 V) for Transmitters  
 Dual Liquid Crystal Display with white LED for Backlight

### Multifunction Calibrator

Simultaneous Measurement & Simulation of  
 - mV, V & mA  
 - Ohms, Frequency & Pulse  
 - Thermocouples & RTDs

### Function Generator

Range : 0.5 Hz to 5 Mhz  
 Single, Triangle, Square, Ramp  
 TTL & CMOS Output

### Soldering / De-soldering Station

Temperature Control :  
 Soldering / Desoldering : 50 to 450°C  
 Hot Air Gun : 50 to 550°C  
 Complete with Soldering Iron Set :  
 Hot Air Pencil / Nozzle, Support Rack  
 Antistatic / ESD

## ELECTRICAL & ELECTRONICS (SIGNAL) CALIBRATION TEST BENCH

### CHOICE OF MODULES & UTILITIES



### Thermocouple Calibrator

Measurement & Simulation of  
 - Voltage : 100 mV  
 - Thermocouple : Types R, S, B, E, K, J, T & N  
 Selectable Temperature Output Readings (in °C/°F)

### RTD Calibrator

Measurement & Simulation of  
 - RTD Types : Pt100 : -200 to 850°C  
 Cu50 : -50 to 150°C  
 - Resistance : 400 Ω

### Digital LCR Meter

High Resolution  
 Zero Adjustment  
 3 Function LCR Measurement  
 (Capacitance, Inductance & Resistance)

### Frequency Counter

1 Hz to 120 MHz range  
 8 digits Display (0.3" LED)  
 Overflow Indicator  
 15m Vrms High Sensitivity  
 5 ppm High Stability Timebase  
 Low Pass Filter Function

### Digital Storage Oscilloscope

60/100 MHz Bandwidth  
 Dual Sampling Mode  
 4000 Points Memory  
 Length per Channel  
 56" TFT Colour Display

### UNDER BENCH / PANEL MOUNTED DEVICES

### Voltage & Current Source (AC/DC)



### Decade Resistance Box



### Three Phase Multifunction Power Tester



### Variable DC Power Supply



### Programmable DC Power Supply



## MULTIFUNCTION / MULTIPARAMETER CALIBRATION TEST BENCH



### Application

Our Multifunction / Multi-parameter Calibration Test Benches are widely used for Testing & Calibration of variety of Temperature, Pressure & Electrical / Electronic parameters - all Instruments mounted in a single workstation.

Automatic Testing & Calibration of Test & Measuring instruments can be performed by integrating our powerful "Calman" Software.

### Industries / Sectors Served

Chemical, Petrochemical, Refineries, Power Generation (Thermal, Gas, Nuclear & Hydro), Oil & Gas, Manufacturing, Automation, Automotive, Aeronautics, Cement, Steel, Glass, Sugar & other Process Industries.



# MULTIFUNCTION / MULTIPARAMETER CALIBRATION TEST BENCH

## CHOICE OF MODULES & UTILITIES

### Mains Power Supply - Single / Three Phase

Universal AC Power Supply  
230V (25A / 40A); 50 Hz / 60 Hz  
Emergency ON/OFF Switch  
Lamp Indication; Voltmeter  
115V Single Phase Power Supply (optional)  
415V Three Phase Power Supply (optional)

### Fixed DC Power Supply

Supply Voltage : 230V AC  
Output : 5V / 12V / 24V / 48V; 2A / 5A / 10A  
Banana Socket  
Lamp Indication  
Digital Volt / Ammeter

### Programmable DC Power Supply (Variable)

Programmable Voltage / Current :  
a) 0 to 36V DC / 3A  
b) 0 to 72V DC / 1.5A  
Constant Voltage & Constant Current Mode  
Single Output

### Precision Digital Multimeter

5½ / 6½ digit Resolution  
3 Hz ... 300 Hz AC Bandwidth  
Null feature allows to remove Lead Resistance / Fixed Offsets  
Min. / Max. / Avg. Readouts  
Continuity & Diode Test

### Function Generator

Range : 0.5 Hz to 5 Mhz  
Single, Triangle, Square, Ramp  
TTL & CMOS Output

### Digital Storage Oscilloscope

60/100 MHz Bandwidth  
Dual Sampling Mode  
4000 Points Memory  
Length per Channel  
56" TFT Colour Display

### Air Supply Modules - Pressure Panel \*

Air Filter / Pressure Regulator  
Ranges : 0 to 2.5 / 6 / 10 Bar/Kg/Cm²  
Dial Size : 63 mm  
Accuracy : 1.6%  
Pressure Output Ports : Quick Fit Type

### Air Supply Modules - Vacuum Panel \*

Vacuum Regulator  
Vacuum Gauge Range : -1 to 0 Bar  
Dial Size : 63 mm / 100 mm  
Accuracy : ±1.6%  
Vacuum Output Ports : Quick Fit Type

### Digital Pressure Indicator with EPM

Ranges : -0.85 upto 40 Bar (Pneumatic);  
0 upto 700/1000 Bar thro' one or more Internal / External Pressure Modules  
Accuracy : ±0.05%/±0.025% FS  
Selectable Pressure Units thro' Keypad  
High Resolution Graphic Display

### Thermocouple Calibrator

Measurement & Simulation of  
- Voltage : 100 mV  
- Thermocouple : Types R, S, B, E, K, J, T & N  
Selectable Temperature Output Readings (in °C/°F)

### RTD Calibrator

Measurement & Simulation of  
- RTD Types : Pt100 : -200 to 850°C  
Cu50 : -50 to 150°C  
- Resistance : 400 Ω

### Temperature Calibrator

Measurement & Simulation of  
- T/Cs, RTDs, Resistances & DC Voltages  
5 digits display for Measurement  
6 Digits display for Simulation  
Dual LCD with white LED for backlight

### Loop Calibrators

Capability to Measure & Simulate Voltage & Current & Frequency  
5 digits display of Measurement & 6 digits display for Simulation  
Capability to perform Continuity Test & provide Loop Supply (24 V) for Transmitters  
Dual Liquid Crystal Display with white LED for Backlight

### Multifunction Calibrator

Simultaneous Measurement & Simulation of  
- mV, V & mA  
- Ohms, Frequency & Pulse  
- Thermocouples & RTDs

### Sub-Zero Temperature Calibrator MTC 40

Micro-Controller based  
Range : -40 from Ambient to 123°C  
Resolution : ±0.1°C  
Accuracy : ±0.3°C  
Stability : ±0.05°C  
Immersion Dia : 19 mm  
Immersion Depth : 100 mm

### Low Temperature Dry Block Calibrator

350H / 350H2  
Range : 20°C above Ambient to 350°C  
Resolution : 0.1°C  
Accuracy : ±1°C;  
Stability : 0.3°C / ±0.4°C  
Immersion Dia : 25 mm  
Immersion Depth : 110 mm / 190 mm

### Medium Temperature Dry Block Calibrator 650H / 650H2

Range : 20°C above Ambient to 650°C  
Resolution : 0.1°C  
Accuracy : ±1.5°C  
Stability : 0.5°C / ±0.6°C  
Immersion Dia : 25 mm  
Immersion Depth : 110 mm / 190 mm

### High Temperature Dry Block Calibrator 1200 HN

Stable high temperature source for calibration of multiple (upto 6) Sensors at high temperature  
Range : 300 to 1200°C; Resolution : 1°C  
Accuracy : Better than ±3°C  
Stability : Better than ±0.5°C  
Immersion Dia : 45 mm  
Immersion Depth : 150 mm

### Soldering / De-soldering Station

Temperature Control :  
Soldering / Desoldering : 50 to 450°C  
Hot Air Gun : 50 to 550°C  
Complete with Soldering Iron Set :  
Hot Air Pencil / Nozzle, Support Rack  
Antistatic / ESD

### Decade Resistance Box

Accuracy 0.05% - 4, 6, 7 & 8 decade models  
- Range 11.111 MΩ  
Megohm Decade Boxes : 100 KΩ to 1000 MΩ  
High Resistance Box - 9 Decades  
- Range 1 KΩ to 600 GΩ, 500V Rating  
Capacitance Box, 5 Decades  
- Range 10 pF to 11.11 mF

\* Modules & specifications are indicative. Actual Specifications will vary depending upon the Module.

# MOBILE CALIBRATION SYSTEM / MARINE TRAINER KIT

## MOBICAL SERIES

Temperature, Pressure and/or Electrical & Electronics Modules mounted in rack, placed inside Mobile (sturdy) Trolley case, ready for use as Table-top Unit.

### TYPICAL CONFIGURATION OF MODULES

#### Electrical & Electronics

##### Mobical EE

- Function Generator
- 5½ digit Digital Multimeter
- Multifunction Calibrator
- Decade Resistance Box
- Variable AC & DC (Programmable) Power Supplies
- Power Supply for Unit Under Test

#### Pressure & Temperature

##### Mobical PT

- Pressure Indicator  
Pneumatic : -0.85 to 25 Bar & Hydraulic : Upto 350 Bar
- Built-in / External Hand Pumps
- Dual Dry Block Temperature Calibrators
- Range : -35 from Ambient to 123°C & 50 to 350°C
- Multifunction Calibration & Power Supply for Unit Under Test

Typical Systems supplied to  
Goa Shipyard Ltd. (7 Nos.)



For Module details, refer previous pages

#### Multi-parameter Trainer

(Electrical, Electronics, Pressure & Temperature)

##### Mobical PTES

- Dry Block Temperature Calibrators (2 Nos.)  
Range : -35 from Ambient to 123°C & 50 to 350°C
  - Function Generator
  - 5½ digit Digital Multimeter
  - Process (Multifunction) Calibrator
  - Decade Resistance Box
  - Variable AC & DC Power Supply for Units Under Test
  - Integrated / Interfaced with  
CPU & foldable Touch Screen Monitor
- CALMAN Plus - Calibration Management Software for Automatic / Semi-Automatic Test / Calibration routines; Data Collection / Storage etc.





# FLOW & LEVEL CALIBRATION SOLUTIONS

## PROCESS FLOW METER CALIBRATION SYSTEM

### FLOCAL Series



Typical Calibration Lab Installation (upto DN 150)



**Basic Calibration**, using 0.2% Traceable Calibration Accuracy Master Flow Meter in 'Comparison' (Master/Slave) Mode (One or more Masters, based on the Flow Ranges/Sizes of UUT).

**Calibration Accuracy Enhancement** (Uncertainties upto 0.2%) thro' Gravimetric (Collection Chamber Mounted on Precision Weigh Scale) & or Pre-Calibrated Volume Chambers (for Low Volumes).

## WATER METER CALIBRATION SYSTEM

### WATCAL Series



- Different systems to suit Domestic / Industrial / Bulk Water Meters - (Mechanical, Electrical, Ultrasonic etc.).
- Calibration of Multiple Meters/Sizes : DN 10 to DN 40 to DN 300 in 1 or more lines
- Test/Calibration Methods per ISO 4064/3 Standards:  
**Gravimetric** : Collection Chamber(s) mounted on Weighing Scale(s) &  
**Volumetric** : thro' pre-calibrated Volume Chambers
- Precise flow adjustment using Rotameters / Electro-Magnetic Flow Meters
- One or more pumps to suit (with VFD / Manual Throttle for Flow Control)
- Clamping : Manual / Pneumatic / Hydraulic etc.
- Flow Rates :  
 1 LPM to 335 LPM (for Domestic Water Meter)  
 10 LPM to 1500 M<sup>3</sup>/Hr (for Industrial Meter)

## GAS METER CALIBRATION SYSTEM

### (Bell Prover Type)

### GASCAL Series



- A Boon for Calibration of Domestic Gas Meters - OEMs, Hotels, Hospitals & R&D Institutions.
- Flow Rates : 0.018 to 6 Cu.M/Hour
- Suitable for Gas Meter Sizes :  
 G1.6, G2.5, G4, G6
- Bell Prover : Capacity 20/100/200 Litres
- Accuracy :  $\pm 0.2\%$  &  $\pm 0.5\%$  (Traceable to ISO/IEC 17025 Accredited Laboratory).
- Upstream/Downstream Pressure & Temperature Measurement
- D.P. Gauges (for measurement of pressure loss) : 0 to 1.0 Inch of Water (0 to 250 Pa)
- Meter Clamping : Pneumatic
- Simultaneous Calibration of multiple Meters (Provision to mount 2/4/6/8 Meters)

Consult us for higher capacity Bell Provers for Calibration of Industrial / Bulk Meters.

## LEVEL CALIBRATION SYSTEM

### LTR / LCS Series



**For Primary, Interface & Total Liquid Testing & Calibration of various Types / Models of Level Measurement (& Control) Devices including**  
**Float / Displacer / Radar / Capacitance / Ultrasonic / Magnetic**  
 - both Inbuilt & External Chamber types.

For more detailed specifications/catalogs, kindly write to us.

### Sub-Zero to High Temperature

#### MTC Series

With Signal  
Measurement  
Capability



- MTC 40** -40°C above Amb. to 123°C; Accuracy :  $\pm 0.3^\circ\text{C}$
- MTC 350** 50 to 350°C; Accuracy :  $\pm 0.4^\circ\text{C}$
- MTC 650** 50 to 650°C; Accuracy :  $\pm 0.6^\circ\text{C}$
- MTC 1200** 300 to 1200°C; Accuracy :  $\pm 0.2^\circ\text{C}$

### Low & Medium Temperature

Heavy Duty  
Model



- 350H** 10°C above Amb. to 350°C, Accuracy :  $\pm 1.0^\circ\text{C}$
- 650H** 20°C above Amb. to 650°C, Accuracy :  $\pm 1.5^\circ\text{C}$

### Medium Temperature

Economy Model



- ETC 600** 50°C 600°C, Accuracy :  $\pm 0.1\%$  F.S.
- ETC 600-2** 50°C 600°C, Accuracy :  $\pm 0.15\%$  F.S.

### Micro Oil Bath

#### MOB 250

Stirred  
Bath



- 20°C to above Ambient to 250°C
- Accuracy :  $\pm 0.6^\circ\text{C}$ ; Stability :  $\pm 0.2^\circ\text{C}$

### High Temperature

#### 1200 HN



- 300°C to 1200°C. Accuracy : Better than  $\pm 3^\circ\text{C}$

### Low, Medium & High Temperature

Black Body Calibration System



- BBSL** 10°C above Ambient to 350°C
- BBSM** 20°C above Ambient to 600°C
- BBSH** 500°C to 1200°C



### Hand Pumps

Pneumatic &  
Hydraulic



PHP  
Series

HHP  
Series

Pneumatic :  
-0.90 Bar Vacuum to 2 bar upto 40 Bar  
Hydraulic : 0 to 200, 350 // 700 & 1000 Bar  
Oil / Water operated.

### Handheld Pressure Calibrators

MPC / MPCE Series



Pneumatic :  
-0.85 to 2 upto 40 Bar  
Hydraulic :  
0 to 70 / 700 Bar  
Accuracies :  $\pm 0.1\%$ ,  $\pm 0.05\%$ ,  $\pm 0.025\%$  F.S.

### Portable Pressure Calibrators



PPC Series

Pneumatic :  
-0.85 to 2 upto 20 Bar

Hydraulic :  
0 to 200 / 400 Bar

Dual Model

Pneumatic : -0.85 to 20 Bar &  
Hydraulic : 0 to 400 Bar

Accuracies :  
 $\pm 0.05\%$ ,  $\pm 0.025\%$  F.S.

### Dead Weight Testers



Pneumatic &  
Hydraulic

Pneumatic :  
0.5 to 35 Bar  
Hydraulic :  
Upto 1200 Bar

Accuracy :  
 $\pm 0.1\%$ ,  $\pm 0.05\%$ ,  $\pm 0.025\%$ ,  
 $\pm 0.015\%$  Reading

### Comparison Testers



Ranges : Upto 1400 Bar  
Screw & Hand Pump Models  
Oil / Water Operated

### Signal Calibrators

T/C, RTD & Loop



Ideal for quick Loop Checking & Calibration of  
Transmitters, Simulation / Measurement of mV & mA

# CALIBRATION MANAGEMENT SOFTWARE

## CALMAN *Plus*

The Nagman's **Calman *Plus*** (Calibration Management) Software is a powerful tool for calibration of devices in the process industries under the present day quality guidelines such as ISO 9000. The **Calman *Plus*** automates the process of calibration making them quicker & easier.

This Software has been developed with our experience / knowledge of the Calibration Softwares of the various reputed International Manufacturers & in the current stage of development, **Calman *Plus*** Software supports, in addition to Nagman's own range of Temperature, Pressure & Signal Calibrators, several world brand Calibrators, Test & Measuring Instruments & enables perform Semi-Automatic / Automatic Calibration & Certificate Generation. Our motto was "to develop a single Software which could communicate with diverse instruments" making Automatic Calibration user friendly, simpler & easier.

In addition to these listed Instruments, Nagman has the capability to develop Drivers for other Make / Model Calibrators / Instruments.

### Features

- Capable of storing all information of Field Instruments in a single Database
- Stores individual calibration information of instruments
- Communicates with many instruments using RS-232 Serial Bus, also option available to calibration instruments without Serial Interface - Manually
- Maintains history of Calibration Records
- Calibration Reports in compliance with ISO 9001.
- Calibration due date reminder
- Printing of User Definable Calibration Reports
- Compatible with Microsoft Windows Platform
- Powerful Graphical Presentation
- All Screens in full colour / Help Screens
- Modular & Expandable
- Simultaneous Calibration of Temperature, Pressure or Electrical / Signal Calibrators (optional)

The **Calman *Plus*** Software Package built on Modular concept offers utmost flexibility enabling the user to choose any combination from world's leading brand Calibrators with possibility of future Add-ons (per user requirement) on Modular basis!

The unique feature of **Calman *Plus*** with ability to communicate with diverse instruments helps to save considerable cost on investment and being a single dedicated programme reduces chances for confusion / mistakes during calibration.

The historical data storage format of **Calman *Plus*** helps the User to ascertain the performance of the instrument over a period of time and enables him/her to fix-up optimum recalibration intervals for instruments.

**Calman *Plus*** has the capability to integrate the entire Calibration System in a Plant & uplink to the Centralized ERP System.

INSTRUMENT DETAILS				Format No: JSD-CL-08			
Tag No.	DWT	Input Range	0 To 10000 psi	Make	psi	Output Range	0 To 10000 psi
Serial No.	12	Location	Testing	Description	PRESSURE GAUGE	Calibration Date	05/02/2015
Accuracy	1 % of FS	Due Date	05/02/2016	Gravimetric	0.750	Temperature (t)	27
Alpha Value	0.00025	Customer	IN				

MASTER INSTRUMENTS DETAILS

Description	Make	So. No.	Model No.	Range	Accuracy	Certificate No.	Due Date
Deadweight Tester	Signon	123	DEADWEIGHT TESTER	0 TO 1200 bar	± 0.015 % of S.D.	2	05/02/2016

CALIBRATION DETAILS

Sr. No.	Set Value bar	Before Calibration			After Calibration				
		Actual Value psi	Actual Output psi	% of Error	Remarks	Actual Value psi	Actual Output psi	% of Error	Remarks
1	1	14.4737	14.0000	-0.4737	PA25	14.4737	14.0000	-0.4737	PA25
2	5	72.3604	72.0000	-0.3604	PA25	72.3604	72.0000	-0.3604	PA25
3	10	144.7367	144.0000	-0.7367	PA25	144.7367	144.0000	-0.7367	PA25
4	15	217.1051	217.0000	-0.1051	PA25	217.1051	217.0000	-0.1051	PA25
5	20	289.4738	289.0000	-0.4738	PA25	289.4738	289.0000	-0.4738	PA25

ENVIRONMENTAL CONDITION

Temperature	22	Humidity	44
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**System Interfacing Diagram**



**Pressure Gauge Calibration**



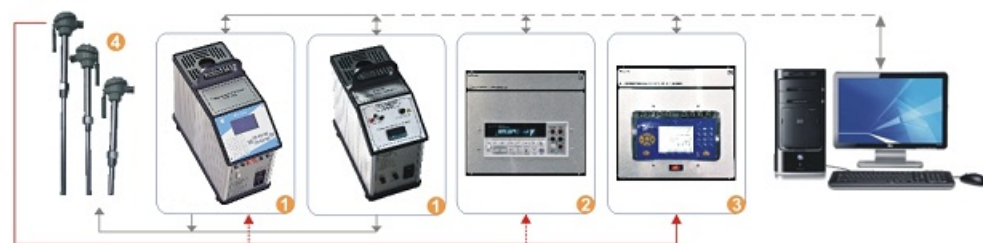
- ① Nagman Pressure Calibrators ② Handheld Manometer\* ③ Pressure Calibrator/Controller\* ④ Hand Pump (for Pressure generation) ⑤ Pressure Gauge (Unit under Test)

**Pressure Transmitter Calibration**



- ① Nagman Pressure Calibrators ② Digital Multimeter\* ③ Pressure Calibrator/Controller\* ④ Hand Pump (for Pressure generation) ⑤ Pressure Transmitter\* (UIT)

**Temperature Sensor / Transmitter Calibration**



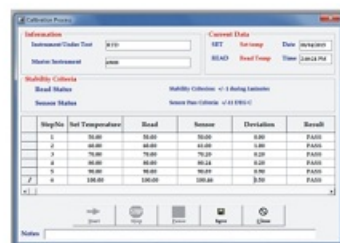
- ① Nagman Temperature Calibrators ② Digital Multimeter\* ③ Multifunction Calibrator\* ④ RTD / Thermocouple

\* Third Party Instruments

**CALTEMP**

**Caltemp** is a dedicated simple & cost effective Temperature Calibration Software which supports Semi-Automatic & Manual Calibration.

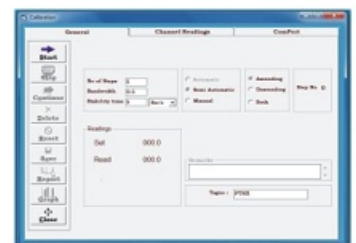
**Supported Models :**  
650H, MOB 250,  
FB-06L/S, 1200 HN & 1500 HN.



**CALPRESS**

**Calpress** is a dedicated & cost effective Calibration Software which enables & supports Semi-Automatic & Manual Calibration.

**Supported Models :**  
MPC, MPC-E & PPC Series



**MTCCal**

**MTCCal** is a dedicated & cost effective Calibration Software which enables & supports Automatic / Semi-Automatic & Manual Calibration. In Report Format, Customer Logo is user defined.

**Supported Models :**  
MTC 40, MTC 650 & MTC 1200



**METCAL**

**Metcal** is a dedicated & cost effective Calibration Software designed specially for **Model : Metcal 650** which enables & supports Automatic / Semi-Automatic & Manual Calibration. In Report Format, Customer Logo is user defined.



# CENTRE FOR CALIBRATION

The **Centre for Calibration (CFC)** is an 'Independent Profit Centre', - Unit of Nagman Instruments & Electronics (P) Ltd., Chennai, a pioneer and leader in the Calibration field in India.

Having manufactured and sold over **30,000 Calibrators, 500+ Dead Weight Testers & 600+ Calibration Test Benches**, Nagman understands Calibration at its best and have designed the Centre to serve the diverse Calibration requirements of Large, Medium, Small Scale Industries -Effectively and Comprehensively.

The Centre is equipped with sophisticated Calibration Equipments both Primary & Working / Transfer Standards which are traceable to National & International Standards. Facility includes **Computerized Automatic Calibration** & Report generation conforming to **ISO Standards**.

Nagman "**Centre for Calibration**" offers a wide range / variety of **CALIBRATION** related Services covering most Process Parameters-& serves almost every type of **Industry / Institution / Establishment**.

Nagman **Centre for Calibration, Chennai** enjoys the unique distinction of obtaining **NABL Accreditation (as per ISO / IEC 17025:2005 Standards)** simultaneously for **Thermal, Mechanical (Pressure / Mass / Linear), Electro-Technical, Dimensional & Flow Parameters**.

## NABL Accreditation for Sub-Centre

Nagman **Sub-Centre at Mumbai** is offering **NABL Accredited Calibration Services (as per ISO/IEC 17025:2005 Standards)** simultaneously for 3 parameters - **Thermal, Mechanical (Pressure / Mass / Linear), & Electro-Technical**.

Nagman "**Centre for Calibration**" is staffed with qualified & well trained Team Leaders & Engineers in Laboratory Management, Internal Auditing and Proficiency Testing.

**Training Workshops** on "**Calibration Techniques**" are conducted periodically at Nagman's Lab at Chennai as well as at customer locations.

## SERVICES OFFERED

### Laboratory Calibration

Including "Express" - same day Calibration

### Site Calibration

During Plant Shutdown / Routine Maintenance / Commissioning / Performance Trials

### Mobile Calibration Laboratory

Calibration Service at your door steps!

### Annual Maintenance Contracts

Periodic visits on preplanned dates

### Comprehensive Calibration Job Packages

Including Mobilization of Master Standards, Manpower etc.

### Consultancy Services

For Setting up Calibration Lab & obtaining Accreditation

### Calibration Workshops / Training

Structured Training in Calibration Techniques for Technicians / Engineers / Managers - at our Centre or Customer's facility.

### Calibrator Rentals (first time in India)

A wide variety of Portable Calibrators, Transfer Standards, Simulators, Dead Weight Testers etc. - a boon to Project Consultants / Executants / Erection & Commissioning Contractors.



## FLUID FLOW CALIBRATION LABORATORY

Nagman, in its constant endeavour to enhance its calibration capabilities had recently ventured into offering Fluid Flow Calibration Services for Process Industries in India.

We are pleased to advise that this Laboratory is Accredited by NABL, Delhi for performing Recalibration Services (as per ISO/IEC 17025:2005 Standards).



C-1212

**ACCREDITED BY NABL, INDIA**  
(AS PER ISO/IEC 17025:2005 STANDARDS)

Fluid Flow  
Calibration  
Laboratory



Flow Lab  
Control Console

### Flow Meter Calibration Methods :

Comparison / Gravimetric

### Types of Process Flow Meters that can be calibrated :

Turbine, Vortex, Coriolis Mass, Electro-Magnetic, Ultrasonic etc.

**Accuracy :**  $\pm 0.2\%$  Reading

### Flow Lab :

Liquid Mass Flow Rate	Max. 360 TPH	CMC : 0.15%
Liquid Volume Flow Range	Max. 360 M <sup>3</sup> /H	CMC : 0.2%
Quantity of Mass	Max. 5000 Kg.	CMC : 0.04%
Quantity of Volume	Max. 5 M <sup>3</sup>	CMC : 0.15%

**По вопросам продаж и поддержки обращайтесь:**

Алматы (7273)495-231	Калининград (4012)72-03-81	Омск (3812)21-46-40	Сыктывкар (8212)25-95-17
Ангарск (3955)60-70-56	Калуга (4842)92-23-67	Орел (4862)44-53-42	Тамбов (4752)50-40-97
Архангельск (8182)63-90-72	Кемерово (3842)65-04-62	Оренбург (3532)37-68-04	Тверь (4822)63-31-35
Астрахань (8512)99-46-04	Киров (8332)68-02-04	Пенза (8412)22-31-16	Тольятти (8482)63-91-07
Барнаул (3852)73-04-60	Коломна (4966)23-41-49	Петрозаводск (8142)55-98-37	Томск (3822)98-41-53
Белгород (4722)40-23-64	Кострома (4942)77-07-48	Псков (8112)59-10-37	Тула (4872)33-79-87
Благовещенск (4162)22-76-07	Краснодар (861)203-40-90	Пермь (342)205-81-47	Тюмень (3452)66-21-18
Брянск (4832)59-03-52	Красноярск (391)204-63-61	Ростов-на-Дону (863)308-18-15	Ульяновск (8422)24-23-59
Владивосток (423)249-28-31	Курск (4712)77-13-04	Рязань (4912)46-61-64	Улан-Удэ (3012)59-97-51
Владикавказ (8672)28-90-48	Курган (3522)50-90-47	Самара (846)206-03-16	Уфа (347)229-48-12
Владимир (4922)49-43-18	Липецк (4742)52-20-81	Саранск (8342)22-96-24	Хабаровск (4212)92-98-04
Волгоград (844)278-03-48	Магнитогорск (3519)55-03-13	Санкт-Петербург (812)309-46-40	Чебоксары (8352)28-53-07
Вологда (8172)26-41-59	Москва (495)268-04-70	Саратов (845)249-38-78	Челябинск (351)202-03-61
Воронеж (473)204-51-73	Мурманск (8152)59-64-93	Севастополь (8692)22-31-93	Череповец (8202)49-02-64
Екатеринбург (343)384-55-89	Набережные Челны (8552)20-53-41	Симферополь (3652)67-13-56	Чита (3022)38-34-83
Иваново (4932)77-34-06	Нижний Новгород (831)429-08-12	Смоленск (4812)29-41-54	Якутск (4112)23-90-97
Ижевск (3412)26-03-58	Новокузнецк (3843)20-46-81	Сочи (862)225-72-31	Ярославль (4852)69-52-93
Иркутск (395)279-98-46	Ноябрьск (3496)41-32-12	Ставрополь (8652)20-65-13	
Казань (843)206-01-48	Новосибирск (383)227-86-73	Сургут (3462)77-98-35	
Россия +7(495)268-04-70	Киргизия +996(312)-96-26-47	Казахстан +7(7172)727-132	