

# PYROS PORTABLE TEMPERATURE CALIBRATOR

PYROS 140 - PYROS 375 - PYROS 650



N. A-13487

## Operating range:

-24 °C ÷ +650 °C  
[-11 °F ÷ 1202 °F]

## Applications:

Control and calibration of temperature sensor, in the laboratory and in the field, in conformity with ISO 9000 standards

Control of thermostats.

Automatic computer-controlled calibrations.

These innovative calibrators have been designed for on-site applications and for the severe conditions of the naval and marine sectors.

Their ease of use, compact and practical design, make them unbeatable in industrial processes where the verification of the temperature measurement systems is a key issue for the control of the process and the quality of the final product.

Special attention was paid to reduce weight, size and to reinforce robustness by using an aluminium body and aluminium and stainless steel for many internal parts. Each calibrator is tested in our laboratory and calibrated with our measurement samples in accordance with the international standard. At this stage all the functions are checked against reference parameters and a calibration report is issued.

The thermal part of these calibrators is made of a metal block heated with resistors or with Peltier thermoelectric modules. In the metal block there are one or more holes in which the interchangeable inserts are placed.

The standard inserts available make the calibrators versatile in order to adapt them to the calibration of the temperature sensors with the most common diameters in use. It is also possible to create inserts with special holes upon request.

The equipment provided as standard on each oven includes the power supply cable, the tweezers to extract the inserts, the connection cables of the thermostats, a fuse kit, one or more of the inserts most commonly used, the instructions manual and the calibration report.

Pyros 375 and Pyros 650 calibrators are type approved by **DET NORSKE VERITAS**





# PYROS

## DRY BLOCK PORTABLE CALIBRATORS

### PYROS 140

It covers a range from -24 to 140 °C. It has a stability of  $\pm 0,05$  °C and a precision of  $\pm 0,25$  °C.

The time taken to reach -20 °C is just 17 minutes and the time to reach 120 °C is just 20 minutes: this allows considerable savings in terms of time during calibration that requires more than one verification point.

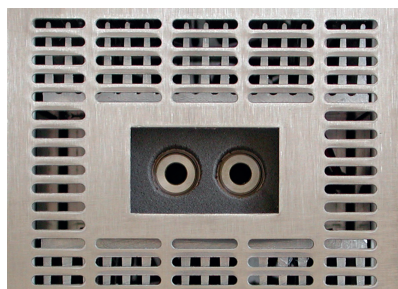
The excellent performances of **PYROS 140** are due to the Peltier cells that heat and cool the thermal block and to the material with which the thermal block itself is made. This material provides an axial and radial uniformity typical of higher end calibrators.

The calibrator has two configuration of holes: one hole with 19 mm diameter (**PYROS140-1H**) and two parallel holes with 13 mm diameters (**PYROS140-2H**).

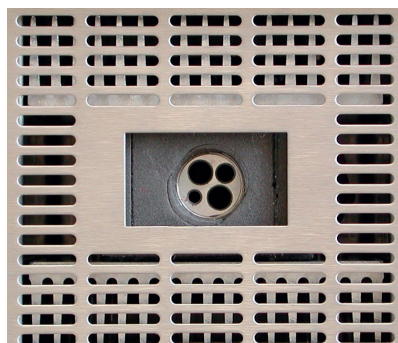
The reduction inserts are put into the holes to adapt the diameter of the probe to be calibrated to the calibrator.

There are 7 inserts available with holes ranging from a diameter of 3.2 to 11,1 mm, while other holes are provided upon request up to 1 mm in diameter.

### PYROS 2H



### PYROS 1H



### PYROS 375

DNV® CERTIFIED



It covers a range from 10 °C above ambient temperature up to 375 °C. It has a stability of  $\pm 0,15$  °C and an accuracy of  $\pm 0,25$  °C at 150 °C, of  $\pm 0,35$  °C at 375 °C.

The time taken to reach 375 °C is just 20 minutes and it takes 40 minutes to reach 100 °C from 375 °C. This allows to save time during calibration operations that requires more than one verification point.

The calibrator has a hole with a diameter of 26x150 mm in which the reduction inserts are inserted to adapt the diameter of the probe to be calibrated to the calibrator.

There are 3 inserts available with holes ranging from a diameter of 3,2 to 12,7 mm while other holes are provided upon request up to 1 mm in diameter.

The appliance's innovative ventilation system allows the calibrator to keep the temperature on the top of the calibrator lower compared to competitors' ones. The air flow on the upper part is diverted to the rear of the appliance by a tangential flow that touches the calibration well.

As a result, the heads of the thermocouples, which contain the connection terminals of the compensated cables, remain at a considerably lower temperature reducing very much the compensation errors produced by the heads heating.

### PYROS 650

DNV® CERTIFIED



It covers a range from 15 °C above ambient temperature up to 650 °C. It has a stability of  $\pm 0,30$  °C and a all-range accuracy of  $\pm 0,50$  °C.

The time taken to reach 650 °C is just 35 minutes and it takes about 60 minutes to reach 100 °C from 650 °C. This allows to save time during calibration operations that require more than one verification point.

The calibrator has a hole with a diameter of 26x150 mm in which the reduction inserts are inserted to adapt the diameter of the probe to be calibrated to the calibrator.

There are 6 inserts available with holes ranging from a diameter of 3,2 to 17,5 mm while other holes are provided upon request up to 1 mm in diameter.

The appliance's innovative ventilation system allows the calibrator to keep the temperature on the top of the calibrator lower compared to competitors' ones. The air flow on the upper part is diverted to the rear of the appliance by a tangential flow that touches the calibration well.

As a result, the heads of the thermocouples, which contain the connection terminals of the compensated cables, remain at a considerably lower temperature reducing very much the compensation errors produced by the heads heating.

COMPARISON TABLE:

| Technical specification                       | PYROS 140  | PYROS 375  |   | PYROS 650  |
|---|--|--|---|--|
| Operating range<br>(t amb. 20 °C / 68 °F)     | -24 °C ÷ 140 °C<br>(-11 °F ÷ 284 °F)                               | amb.+10 °C ÷ +375 °C<br>(Amb. +18 °F ÷ 707 °F)                     |   | amb.+15 °C ÷ +650 °C<br>(Amb. +27 °F ÷ 1202 °F)                    |
| Mean heating time<br>(stabilization included) | From amb. to 120 °C / 248 °F<br>20 min                             | From 30 °C / 86 °F to 375 °C / 707 °F<br>20 min                    |   | From 50 °C / 122 °F to 650 °C / 1202 °F<br>35 min                  |
| Mean cooling time<br>(stabilization included) | From amb. to -20 °C / -4 °F<br>17 min                              | From 375 °C / 707 °F to 100 °C / 212 °F<br>40 min                  |   | From 650 °C / 1202 °F to 100 °C / 212 °F<br>60 min                 |
| Axial uniformity                              | ±0,05 °C at -20 °C<br>±0.09 °F at -4 °F                            | ±0,10 °C at 50 °C<br>±0.1 °F at 122 °F                             | ±0,02 °C at 50 °C<br>±0.03 °F at 122 °F   | ±0,13 °C at 250 °C<br>±0.2 °F at 482 °F                            |
|   | ±0,04 °C at 0 °C<br>±0.07 °F at 32 °F                              | ±0,20 °C at 150 °C<br>(±0.3 °F at 302 °F)                          | ±0,05 °C at 150 °C<br>(±32.09 °F at 302 °F)                                       | ±0,15 °C at 450 °C<br>(±32.27 °F at 842 °F)                        |
|   | ±0,10 °C at 100 °C<br>(±32.1 °F at 212 °F)                         | ±0,30 °C at 375 °C<br>(±32.5 °F at 707 °F)                         | ±0,15 °C at 375 °C<br>(±0.27 °F at 707 °F)  | ±0,35 °C at 650 °C<br>(±0.6 °F at 1202 °F)                         |
| Radial uniformity<br>(at 40 mm)               | Not available  | ±0,10 °C at 50 °C<br>(±0.1 °F at 122 °F)                           | ±0,05 °C at 50 °C<br>(±0.09 °F at 122 °F)   | ±0,22 °C<br>(±0.39 °F)   |
|   |  | ±0,15 °C at 150 °C<br>(±0.27 °F at 302 °F)                         | ±0,10 °C at 150 °C<br>(±0.1 °F at 302 °F)   |  |
|   |  | ±0,20 °C at 375 °C<br>(±0.3 °F at 707 °F)                          | ±0,15 °C at 375 °C<br>(±0.27 °F at 707 °F)  |  |
| Hole depth                                    | 104 mm [4 in.]   | 150 mm [5.9 in.]   |   | 150 mm [5.9 in.]   |
| Hole diameter                                 | 2 x 13 mm [0.07 x 0.51 in]<br>1 x 19 mm [0.03 x 0.74 in]           | 26 mm [1 in.]  |   | 26 mm [1 in.]  |
| Display accuracy<br>(±1 digit)                | ±0,25 °C at 100°C<br>± 0.45 °F at 212 °F                           | ±0,25 °C at 150 °C<br>(±0.45 °F at 302 °F)                         | ±0,25 °C at 150 °C<br>(±0.45 °F at 302 °F)  | ±0,50 °C<br>(±0.9 °F)  |
|   |  | ±0,35 °C at 375 °C<br>(±0.6 °F at 707 °F)                          | ±0,35 °C at 375 °C<br>(±0.6 °F at 707 °F)   |  |
| Stability                                     | ±0,05 °C - (± 0.09 °F)   | ±0,15 °C - (±0.27 °F)  | ±0,10 °C - (±0.1 °F)  | ±0,30 °C - (±0.5 °F)   |
| Display Resolution                            | 0,1 °C - [0.1 °F)  | 0,1 °C - [0.1 °F)  |   | 0,1 °C - [0.1 °F)  |
| Units of measure                              | °C / °F  | °C / °F  |   | °C / °F  |
| Over temperature cut out                      | No   | Yes  |   | Yes  |
| Switch test                                   | 12 VAC DC  | 5 VAC DC   |   | 5 VAC DC   |
| PC Interface                                  | RS 232   | RS 232   |   | RS 232   |
| Display                                       | LED double line  | LED double line  |   | LED double line  |
| IN / OUT                                      | RS232  | RS232  |   | RS232  |
| Temperature ramps                             | Yes  | Yes  |   | Yes  |
| Calibration                                   | From 1 to 10 calibration points                                    | From 1 to 10 calibration points                                    |   | From 1 to 10 calibration points                                    |
| Calibrator size                               | 130 x 260 x 280 mm<br>(5.1 x 10 x 11 in.)                          | 130 x 260 x 280 mm<br>(5.1 x 10 x 11 in.)                          |   | 130 x 260 x 280 mm<br>(5.1 x 10 x 11 in.)                          |
| Calibrator weight                             | 4,9 kg - (10 lb)   | 5,4 kg - (11 lb)   |   | 6,0 kg - (13 lb)   |
| Power supply                                  | Voltage supply<br>100/230 VAC ±10% - 50/60 Hz                      | Automatic switchable voltage supply<br>115/230 VAC ±10% - 50/60 Hz |   | Automatic switchable voltage supply<br>115/230 VAC ±10% - 50/60 Hz |
| Electric power                                | 80 W   | 600 W  |   | 600 W  |
| Diameter of the sensor used:                  | PYROS140-1H: Pt100 probe Ø 3 mm<br>PYROS140-2H: Pt100 probe Ø 3 mm |  | PYROS375: Pt100 probe Ø 6 mm / Pt100 probe Ø 3 mm<br>PYROS650: TcN probe Ø 4,5 mm |  |

Ambient temperature: 20 °C

## RIGID CASE



**Code:**  
2MFR526MAX5053

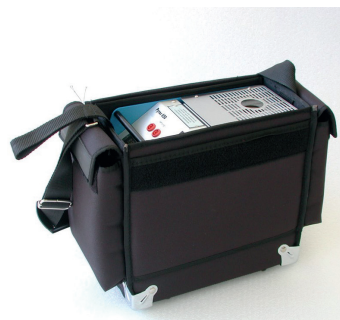
**Size:**  
410 x 535 x 220 mm  
(16 x 21 x 8.6 in.)

**Weight:**  
3 kg  
(6 lb)

**Shipping size:**  
470 x 640 x 330 mm  
(18.5 x 25 x 12.9 in.)

Sturdy ABS waterproof and dust proof carrying case with sealing gaskets suited for use in marine applications and in harsh environments. Anti-shock EPM foam on the inside with compartments for the calibrator, the inserts and documentation, compensation valve for the difference between internal and external pressure, closing hooks and loop to insert the lock.

## SHOULDER BAG®



**Code:**  
2TRMBAG-PYROS

**Size:**  
400 x 170 x 285 mm  
(15 x 6.6 x 11 in.)

**Weight:**  
1 kg  
(2 lb)

**Shipping size:**  
450 x 250 x 415 mm  
(17 x 9 x 16 in.)

Sturdy Cordura® suitcase with two side pockets for the inserts, a front pocket for the documents and a shoulder carrying strap. Particularly lightweight, it is suitable to carry and protect the calibrator and its inserts.



## HOW TO ORDER

### PYROS140-1H / PYROS140-2H

#### STANDARD EQUIPMENT:

- Electric power cable.
- Tweezers for insert removing.
- Kit of fuses.
- Thermostat connection cables.
- Instructions manual.
- Test report.

**PYROS140-1H:** calibrator 1 hole

- **2D3391:** 4 holes insert
- **2D3463:** blank insert

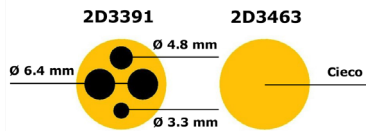
**PYROS140-2H:** calibrator 2 holes

- **2D3199-003:** 1 hole insert
- **2D3199-004:** 1 hole insert

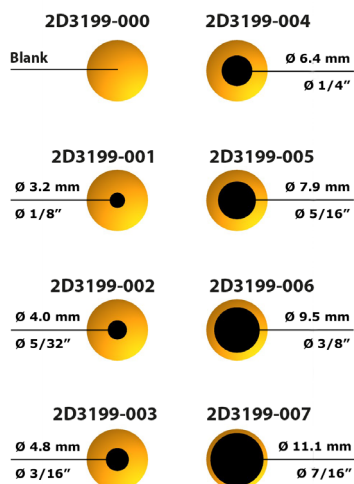
#### ORDERING CODES:

- **2D3199-000:** blank insert (Pyros140-2H only)
- **2D3391:** 4 holes insert
- **2D3463:** blank insert
- **2D3199-001:** 1 hole insert
- **2D3199-002:** 1 hole insert
- **2D3199-003:** 1 hole insert
- **2D3199-004:** 1 hole insert
- **2D3199-005:** 1 hole insert
- **2D3199-006:** 1 hole insert
- **2D3199-007:** 1 hole insert
- **2MFR526MAX5053:** plastic marine case
- **2TRMBAG-PYROS:** Cordura® soft bag

#### PYROS 140-1H INSERTS:



#### PYROS 140-2H INSERTS:



### PYROS 375

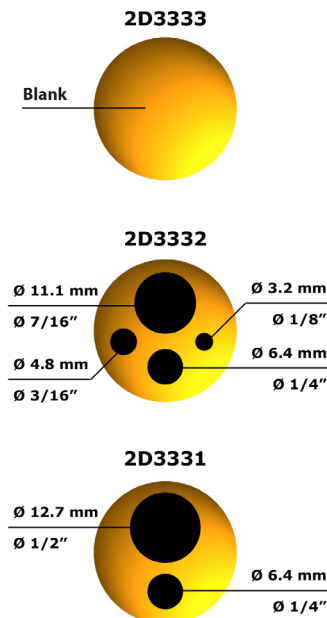
#### STANDARD EQUIPMENT:

- Electric power cable.
- Tweezers for insert removing.
- Kit of fuses.
- Thermostat connection cables.
- Instructions manual.
- Test report.
- Insert **2D3332**.

#### ORDERING CODES:

- **PYROS 375:** calibrator.
- **2D3333:** blank insert.
- **2D3332:** 4 holes insert.
- **2D3331:** 2 holes insert.
- **2MFR526MAX5053:** plastic marine case.
- **2TRMBAG-PYROS:** Cordura® soft bag.

#### PYROS 375 INSERTS:



### PYROS 650

#### STANDARD EQUIPMENT:

- Electric power cable.
- Tweezers for insert removing.
- Kit of fuses.
- Thermostat connection cables.
- Instructions manual.
- Test report.
- Insert **2D3133**.

#### ORDERING CODES:

- **PYROS 650:** calibrator.
- **2D2927:** blank insert.
- **2D2928:** 2 holes insert.
- **2D2929:** 1 hole insert.
- **2D2930:** 4 holes insert.
- **2D3033:** 3 holes insert.
- **2D3034:** 1 hole insert.
- **2D3133:** 4 holes insert.
- **2MFR526MAX5053:** plastic marine case.
- **2TRMBAG-PYROS:** Cordura® soft bag.

#### PYROS 650 INSERTS:

