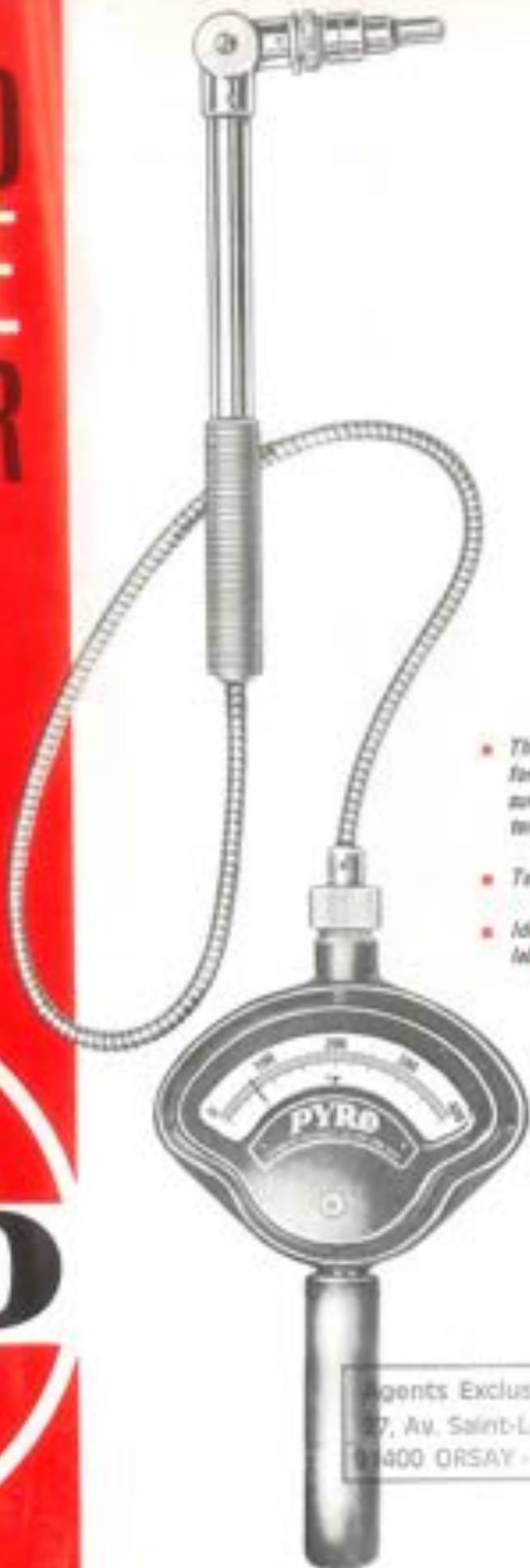


PYRO SURFACE PYROMETER

catalog no. 759



- The all-purpose instrument for quick and accurate surface and sub-surface temperature readings.
- Ten instruments in one!
- Ideal for industrial and laboratory requirements.



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THE PYROMETER INSTRUMENT CO., INC.

Plant - Laboratory - Service

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THE PYRO SURFACE PYROMETER

The improved PYRO Surface Pyrometer now offers advanced and unique features not found in any other portable pyrometer. It has been especially designed to meet the steadily increasing need for combining the highest degree of laboratory accuracy with industrial requirements for ruggedness, dependability and ease of operation. It is completely self-contained, portable, compact, and quick-reading, made to a rugged test to be used by any operator without experience, and yet absolutely accurate for laboratory and research work. The wide selection of interchangeable ranges, interchangeable thermocouples, and extension arms makes this instrument extremely versatile and portable for use on ANY SURFACE or SUB-SURFACE. Suitable for both metallic, for or current, ranging in extremely high temperature measurements within the range of the instrument. PYRO Single and Double Range Surface Pyrometers thus provide the solution to the familiar problem of temperature measuring problems arising daily in every industrial plant or scientific laboratory.



PYRO SURFACE PYROMETERS FEATURE

ACCURACY: PYRO Surface Pyrometers are manufactured of the highest quality materials and with the finest precision workmanship. Every component going into the final assembly passes through numerous inspections and the completed instrument is individually calibrated against the highest laboratory standards. The outstanding features briefly described on this page combined with these high manufacturing standards result in an accuracy of 1% which is unsurpassed by any other instrument of this type.

AUTOMATIC COMPENSATION: Every PYRO Surface Pyrometer is equipped with an automatic internal cold and junction compensation as standard equipment. Changes in ambient temperatures are thus automatically compensated within the instrument itself, and the temperature presents any measurement error due to external temperature variations.

RUGEDNESS: The sturdy and compact construction of the instrument, extension arms and thermocouples permits the toughest handling and abuse without fear of damage. An automatic internal shock dampens the instrument movement when the extension arm is disconnected, and prevents excessive swing of the galvanometer pointer during transit. The exclusive PYRO Lock-based on the extension arm permits the thermocouple extension to be locked in any desired position or angle and it CANNOT move loose while the instrument is in use.

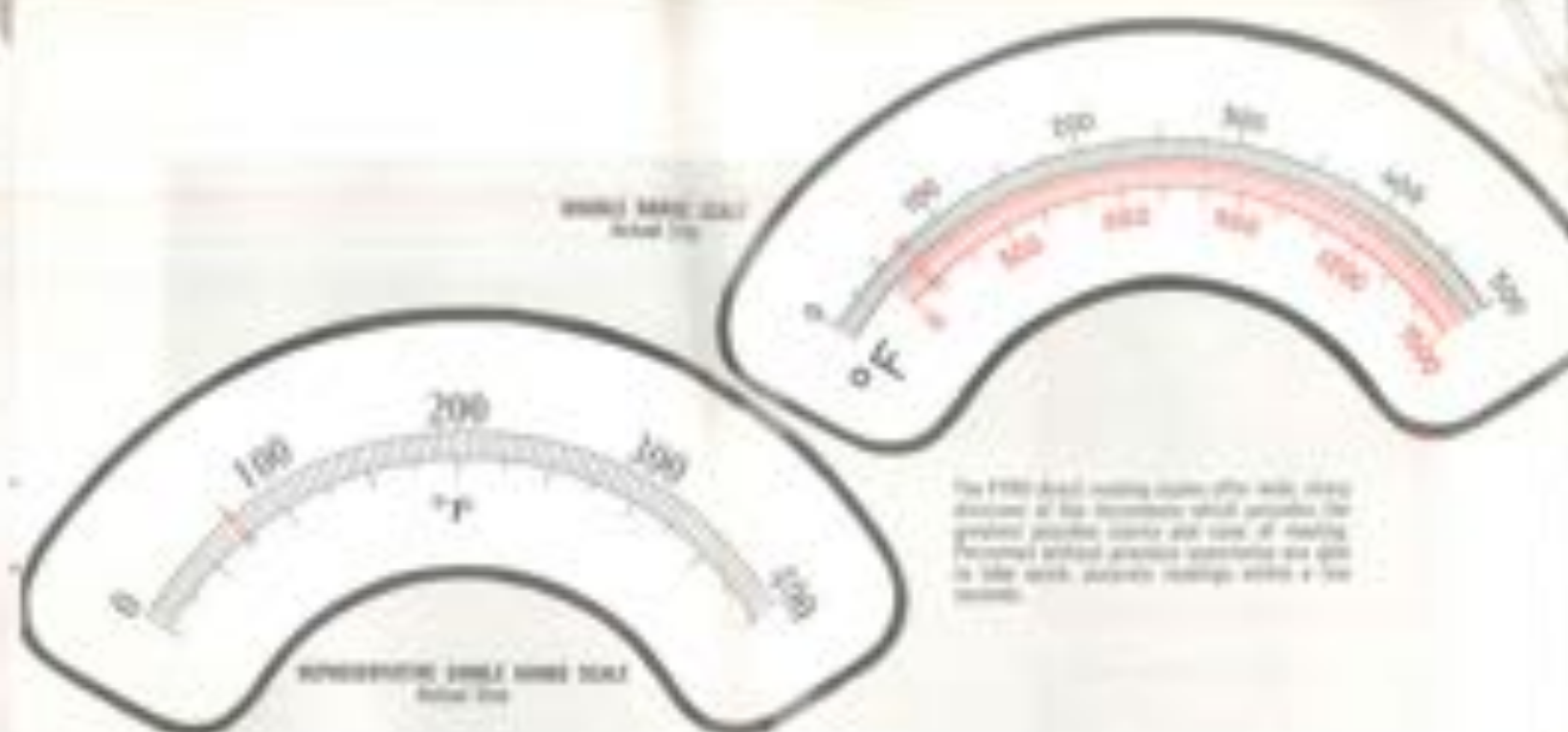
SIMPLICITY OF OPERATION: PYRO Surface Pyrometers are completely self-contained, require no source of power and can be used by any operator without previous experience. The simplicity of design requires only that the operator select the desired thermocouple, attach it to the instrument without the use of any tools or other equipment, and apply it to the application or load. TRUE temperature readings of the material under measurement are indicated on the large direct reading scale within a matter of a very few seconds.

DURABILITY: The instrument is mounted in a special rubber-cushioned metal housing which not only makes the system immune to external magnetic and electric influences, but also makes it fully resistant to shock, dust and moisture. The heavy, permanent magnet type galvanometer housed in this mounting insures accurate and reliable temperature readings over a long period of years.

INTERCHANGEABILITY: The wide selection of thermocouples and extension arms illustrated and described on the following pages are all interchangeable in the instrument without the use of tools or the necessity of adjustment or readjustment. A compact, push-button carrying case, as illustrated on page 3, is furnished with every instrument and provides individual cushioned compartments for the storage of each part.

EASE OF READING: The fan-shaped design of the indicator provides the most practical and legible direct reading scale of any instrument of its type. The indicator has a length of 4 1/2" with clearly defined scale divisions which can be read very easily. The highly damped instrument movement provides extremely rapid deflection of the pointer to the correct temperature readings in a matter of a very few seconds.

CONVENIENCE: From the wide variety of interchangeable temperature ranges, extension arms and thermocouples, it is possible to select the instrument most suited to individual requirements and, thus, solve a number of problems with one unit where previously separate instruments would be required. If, at any future time, other applications arise, different types of thermocouples may be secured and used interchangeably with the original equipment. PYRO Surface Pyrometers offer the most practical and convenient solution to the familiar problem of surface and sub-surface temperature measuring problems which arise daily in every conceivable plant and laboratory.



New! The PYRO DOUBLE RANGE SURFACE PYROMETER

PYRO has expanded its line of Surface Pyrometers by incorporating new engineering designs, features and techniques in its Double Range Surface Pyrometer, Model No. 1158 to combine the high accuracy and stability of a low range instrument with the wide field of other applications arising for temperature measurements up to 1500°F. This unique instrument also incorporates all the exclusive advantages of the standard single range surface pyrometer described on the opposite page.

DUAL SCALE: The actual size illustration of the double range shows above emphasizes the extreme ease with which temperatures can be read accurately and quickly. The low range from 0-1000°F is subdivided into 1° divisions over its 4" length, and the high range is set off in red color and is divided into easily read 20° subdivisions.

DOUBLE COMPENSATION: In order to obtain the high accuracy always guaranteed in all PYRO instruments,

an exclusive engineering feat not found in any other instrument of this type provides true automatic internal cold and junction compensation. The instrument thereby corrects itself automatically for all ambient temperature changes on both scale ranges — insures true temperature measurement under all conditions.

PERFORMANCE: The new Model No. 1158 has been designed and engineered to offer and maintain an accuracy of 1% on both scales, thus providing the accuracy required with a low temperature range instrument, yet permitting equally accurate observations for elevated temperatures to 1500°F. Only PYRO can offer this outstanding feature!

EASE OF OPERATION: The large selection switch is conveniently located at the base of the meter casing near the handle, permitting the operator to change from one scale to the other by a simple flick of the thumb gripping the handle.

CARRYING CASE: An extremely compact, light-weight carrying case which accommodates any selection of instrument, extension arms and thermocouples is furnished with every PYRO Single and Double Range Surface Pyrometer. Separate individual compartments are provided for each part insuring safe storage and a convenient method of transporting the unit when necessary. The case measures 20" long, 7" wide, and 4" high.



INSTRUMENT MODELS

To facilitate the selection of the proper equipment required for various applications, PYRO Surface Pyrometers are broken down into components which include the instrument, extension arms and thermocouples. When ordering, it is necessary to specify the model number of the instrument, according to the respective temperature range as indicated below, as well as the extension arm and thermocouple by model and type numbers. The plastic-lined carrying case with individual cushioned compartments for all parts, illustrated on page 3, is furnished with every instrument.

††† Specified Case plastic-lined with a divider, add the extra \$1.00 to the instrument Model Number.

Model No.	Temp. Range	Length in. in.
10	0-1000	12
20	0-1000	12
30	0-1000	12
40	0-1000	12
50	0-1000	12
60	0-1000	12
70	0-1000	12
80	0-1000	12
90	0-1000	12
100	0-1000	12

SPECIAL TEMPERATURE RANGES

Although the standard scale ranges available for the interchangeable PYRO Surface Pyrometer instrument cover most most surface and gas-surface temperature requirements, unusual applications may require special temperature scales. Therefore, upon request and at slight additional cost, the following are available: Intermediate ranges, surface temperature scales and instruments and thermocouples for measurement above 1500°F. When these special situations arise, it is suggested that a description of the application and the temperature involved be referred to PYRO for suitable recommendations and quotations.

INTERCHANGEABLE EXTENSION ARMS

PYRO Extension Arms are used with any selection of instruments or thermocouples; all parts can be interchanged without the use of tools or modification. Each arm is furnished with exclusive Lock-Swivel, thermocouple connector ring that screws on to any desired thermocouple, and locking ring for attaching the arm to the instrument. In addition, a new Quick-Change connector is available. This development eliminates the tightening operation and permits the thermocouple to be slipped into or out of the connector ring.

Model No.	TYPE
10	Rigid extension arm, 12" long
40	Flexible extension arm, 42" long with 12" metal base and plastic grip handle and 30" flexible extension arm section
100	12" rigid arm with Quick-Change connector
400	42" flexible arm with Quick-Change connector
1000	12" "solid" rigid section to extend length of Model 10 and 100

Longer or shorter interchangeable rigid or flexible extension arms are available upon request to meet special applications.

SPECIAL PURPOSE EXTENSION ARMS

TYPE NO. 101: This roll or hand type thermocouple is furnished complete with a 10" rigid extension arm for direct connection to the instrument. The thermocouple does not disconnect from the arm and is usually used where interchangeability with other thermocouples is not necessary. It is designed for measuring or monitoring surface temperatures such as wall and ceiling walls, drying pans, heating furnaces, cylinders, pipes, etc. The hot junction of the thermocouple is connected fast between "V" guides so that it is automatically centered on the surface. A universal joint permits easy adjustment to any surface angle or to the position of the operator.

SPECIAL LAY-UP THERMOCOUPLES

For low-current measurements in confined areas where the standard surface type thermocouples described here can not be used, the Types No. 210 and 211 have been designed to be inserted into a 1/4" diameter. A lay-up thermocouple is built into the end of and at 90° to the extension arm. It may be connected to any of the above listed instruments but is not adapted for the other interchangeable thermocouples described on Page 3.

TYPE NO. 210: Special Flexible Extension Arm 42" long with grip handle and built-in lay-up type thermocouple.

TYPE NO. 211: Special Rigid Extension Arm 12" long with built-in lay-up type thermocouple.



INTERCHANGEABLE THERMOCOUPLES

In order to meet individual requirements, a large variety of interchangeable thermocouples are available with PYRO Surface Pyrometers. All have been designed for accurate temperature measurements and all have been tested carefully and checked by Bureau of Standards accuracy. The exclusive design of the PYRO Locking Connector permits the use of ANY PYRO Surface Thermocouple in the same instrument. For a variety of applications, our thermocouples can be interchanged with almost any type of thermocouple without the use of tools. These adapters in other types of thermocouples for direct attachment to the instrument have been reported. They can be secured separately and used in any other instrument without adjustment or modification.

FLAT AND ROUGH SURFACES

The roll or hand type thermocouples are useful in Type No. 101, but described on page 4 except that they are interchangeable with the other thermocouples shown on this page.

TYPE NO. 101A: The universal roll thermocouple head fits in with any one of the thermocouples rigid or flexible type described on page 3 and is particularly desirable if it is to be used in connection with other thermocouples for interchangeability. The head has a gap of 1/2" and accommodates both roll and smooth surfaces up to 1/2" in diameter.

TYPE NO. 101B: Similar to Type No. 101A except that the head has a gap of 1/2" and is designed for use on smooth rolls and is curved arms.

TYPE NO. 101C: Similar to Type No. 101A except that the head has a gap of 1/2" and may be used on rolls and smooth surfaces above 1/2" in diameter.

RELATIVELY FLAT SURFACES

These thermocouples are designed for use on relatively flat surfaces—smooth or rough, clean or coated, hard or soft—and require no gap, about 1/4" in diameter for contact. The thermocouple junction is mounted in a slanted cylinder with a conical tip which automatically centers itself against the surface in the proper position.

TYPE NO. 102: The Roll or Hand Type Thermocouple is the most popular for use on flat surfaces. It has a very fast and accurate which offers accurate temperature readings within 3 seconds. With one touch or scratch the surface and it is automatically read for smooth, dry, porous, rough, clean, and very perfect offering a contact area 1/4" in diameter or larger.

TYPE NO. 103: The Silver Tip Thermocouple is constructed with a 1/4" probe ending about 1/2" in length. It is used for Type No. 101 but requires approximately 1 to 10 seconds for accurate readings. The contact area must be flat and 1/4" in diameter or larger. The roll spring from contact armature and perfect alignment of the thermocouple tip with the surface being measured. Applications are similar to Type No. 102.

TYPE NO. 104: Similar to Type No. 103 except the silver tip is 1/4" in diameter, requires contact area of 1/4" and has a tapered end of the armature.

METALLIC SURFACES

TYPE NO. 105: The Flat Type offers instantaneous temperature readings of any CLEAN metallic surface. It is only necessary to press the sharp pointed probe against the surface to be measured. However, these probes may scratch the surface slightly and, therefore, should not be used on finished surfaces. Applications include:

Measuring temperature of springs, valves, fuel, valve stems, engine heads, and similar materials.

PLASTIC, RUBBER, SEMI-FLUID MATERIALS

The Needle Type Thermocouples are used for determining temperatures of materials such as plastics, rubber, chemicals, pharmaceuticals, greases and similar materials. The needles are constructed of hollow stainless steel hypodermic type tubing and will not corrode, will not damage the material, and will not break when they are placed. The thermocouple junction is located in the sharply pointed tip so that a minimum measurement of the point is required for quick and accurate temperature readings.

TYPE NO. 106: This very fine and accurate needle thermocouple is approximately 1/16" long and has a diameter of 1/64". It is only necessary to push the point of the thermocouple about 1/16" into the area being measured.

TYPE NO. 107: This 1/16" Needle Thermocouple is 1/16" in diameter and has a longer probe than the Type No. 106. It is necessary to push the point about 1/16" into the material being measured.

TYPE NO. 108: Mounted in the Type No. 101 but somewhat more rugged because of the 1/4" stainless steel length of 1/2" and weighs 1/2" probe.

LIQUIDS, GASES, MOLTEN SOFT METALS

The Immersion Type Thermocouples are furnished in both the "standard" and "protected type" as described and are used for temperatures up to 1000°F. For standard applications and for liquids and gases, the standard type is recommended. For PYRO Immersion Thermocouples is recommended.

TYPE NO. 109: The 1/2" Bellows Thermocouple is designed for general temperature checking requirements, such as oil tanks, liquids, molten soft metals, and soft surface temperatures. Its design is for measuring temperature. The surface of the material must be clean and free of scale or slag if used. For Type No. 109 or No. 111 should be used.

TYPE NO. 110: The 1/2" Bellows Thermocouple is made of stainless steel and designed for liquids, gases, molten soft metals and similar high temperatures. The surface temperature must be 1000°F. It is not affected by surface deposits or scale and is suitable for use where it is required.

TYPE NO. 111: Mounted in Type No. 101 except that the tube is 1/2" long.

SPECIAL PURPOSE TYPES

TYPE NO. 112A: The End Type Thermocouple has been designed for measuring temperatures between plates, thin, hollow, thin and other materials under pressure. It consists of a thermocouple 200" in diameter which extends in the area being measured. The length of the tube is 1/2" but longer lengths may be furnished upon request.

TYPE NO. 113: Small probe-type hand type thermocouple designed for measuring the temperature of molten or burning liquid materials such as paper, plastic, packaging films, liquids, etc.

AIR TEMPERATURES

TYPE NO. 114: Special Air Temperature Probe, 1/2" long, 1/4" in diameter, for measurement of air and atmospheric temperatures. Requires heat: 1 minute.





PYRO SURFACE PYROMETER APPLICATIONS

Calendar Rolls
 Bearings
 Plates
 Dies and Molds
 Steam Traps
 Brake Drums
 Heat Sealing Machines
 Rubber Processing
 Electrical Appliances
 Paper & Box Board
 Plastic Molding
 Rotating Rolls
 Paraffins
 Motor Parts
 Plastic Materials
 Leather Processing
 Heating Forms
 Drying Cans
 Textile Mills
 Food Processing
 Chemicals
 Pharmaceuticals
 Power Plants
 Dye Works
 Aircraft Maintenance
 Linoleum
 Foundries

Shell Molding
 Printing and Type Setting
 Embossing
 Metal Fabrication
 Extrusions
 Engine Heads
 Castings
 Bars & Sheets
 Welding Operations
 Oil Baths
 Thermo-Settings
 Steam Lines
 Oven Chambers
 Heat Treating
 Bonding Operations
 Spinning Mills
 Laundries
 Aircraft Plants
 Woven Soft Metals
 Ceramics & Pottery
 Rolling Mills
 Wire & Cable
 Petroleum Refineries
 Heating Systems
 Research Labs.
 Insulating Materials
 Railroad Shops

SPECIAL APPLICATIONS

When it is found that the instruments or thermocouples described herein do not meet the requirements of special applications, every effort will be made to solve such problems. Simply send a brief outline of the problem giving pertinent information and it will be handled promptly and thoroughly by the PYRO engineers. Inquiries concerning other types of heat measuring problems will be also welcomed. The following bulletins are available upon request.

Write for special catalogs

- No. 86 on PYRO Optical Pyrometers
- No. 96 on PYRO Micro-Optical Pyrometers
- No. 105 on PYRO Radiation Pyrometers
- No. 107 on PYRO Optical Pyrometer
Calibrating Set
- No. 156 on PYRO Immersion Pyrometers
- No. 177 on PYRO Indicating Pyrometers
- No. 186 on PYRO Economy-Type Surface
Pyrometers
- No. 30-FS on PYRO Food Service Pyrometers

