

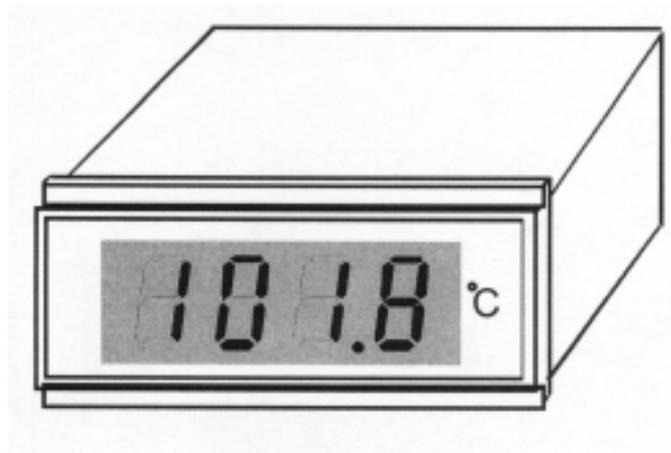
III DIGITAL THERMOMETERS (STATIONARY AND PORTABLE)

ТНЦ-011.....	116
ТТ-Ц016, ТТ-Ц016-01.....	117
ТТЦ-103.....	119
ТО-Ц022, ТО-Ц022-01.....	120
ТО-Ц024-10, ТО-Ц024, ТО-Ц024Б, ТО-Ц022Т.....	121

DIGITAL THERMOMETERS THЦ-011

Designed to measure temperature or other physical values that were previously converted into electrical signal. Work together with thermocouples having NCS K, L, S, R, 50M, Cu 50, 100M, Cu100, 50П, Pt 50, 100П, Pt 100, or signals in the range 0 - 1 V, 0 - 5 mA, 4 - 20 mA, 0 - 20 mA.

Range of measured temperatures (indication range), °C	
50M, 100M, Cu 50, Cu 100	from minus 50 to 200
50П, 100П, Pt 50, Pt 100	from minus 200 to 600
K	from minus 50 to 1200
L	from minus 50 to 800
S, R	from 0 to 180
0 – 1V, 0 - 5 mA, 4 - 20 mA, 0 - 20 mA	from minus 199,9 to 1999
Number of indication orders	3; 5
Power voltage, V	220
Consumption power, BЧA	3
Weight, kg, not more than	0,15
Size, mm	80x40x95
Size of window to mount on panel, mm	34,5x75,5



DIGITAL THERMOELECTRICAL THERMOMETERS
 TT-Ц016, TT-Ц016-01 (TY Y3.48.04850451-057-98)

Designed for operational measurement of the temperature of metal surfaces and non-aggressive fluid, gaseous and viscous substances.

Thermometers include a digital measurement device and a set of thermoelectrical couples. Powered from Krona type battery.

Digital Measurement Device

Specifications	TT-Ц016	TT-Ц016-01
Range of measurement, °C	from minus 10 to 1200	from minus 60 to 199,9
Low order unit (LOU), °C	1,0	0,1
Weight, g	400	400
Size, mm	170x75x37	170x75x37

Thermocouple

Notation	Measured environment	Range, °C	t _{98°C}
T911-01	Viscous substances	from minus 0 to 200	3
T911-03	Fluid, granular, viscous substances	from minus 60 to 600	5
T911-04	Fluid, granular substances	from minus 0 to 800	10
T912	Flat, smooth metal surfaces		
T919	Gaseous environments	from minus 60 to 500	40
T921	Flat, smooth metal surfaces	from 20 to 200	3
T922	Revolving surfaces	from 0 to 250	10
T-003	Semisolid industrial rubber substances	from 0 to 200	10
T930	Multilayer raised materials	from 0 to 180	3
Connector	For connection of desktop thermocouples with NCS K	from minus 60 to 1200	-

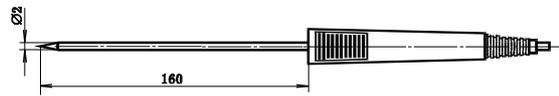


Fig. 1 - T911-01

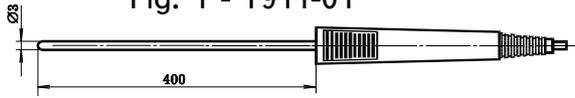


Fig. 2 - T911-03

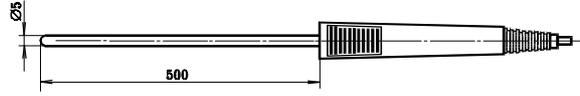


Fig. 3 - T911-04

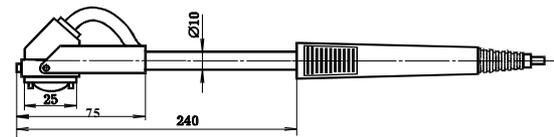


Fig. 4 - T912

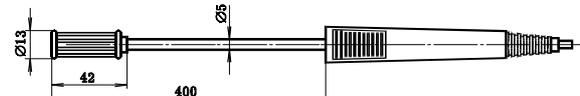


Fig. 5 - T919



Fig. 6 - T921

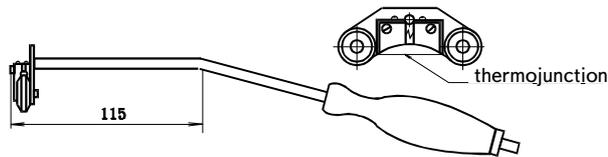


Fig. 7 - T922

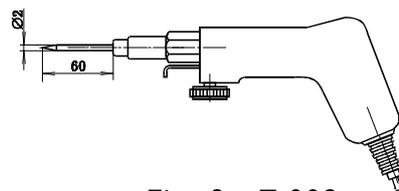


Fig. 8 - T-003

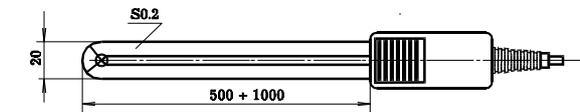


Fig. 9 - T930

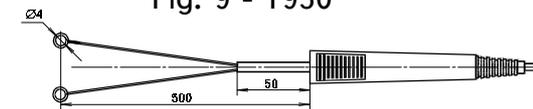


Fig. 10 - Connector

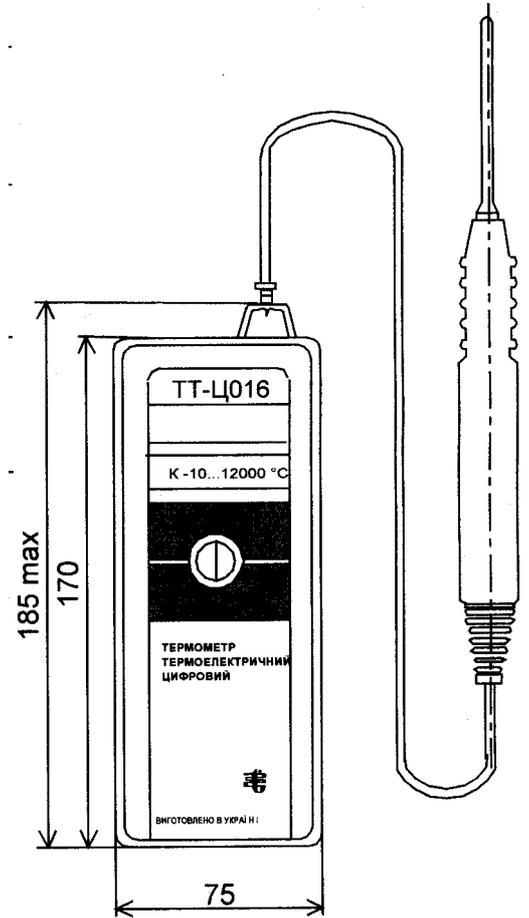


Fig. 11 - Digital measurement device

Specific part numbers and quantity of thermocouples should be selected by customer.

Thermometer error, not more than, °C

for TT-Ц016

± 4 at $t < 300^\circ\text{C}$;

$\pm [4 + 0,01(t - 300)]$ at $t > 300^\circ\text{C}$;

for TT-Ц016-01

$\pm 2,5$

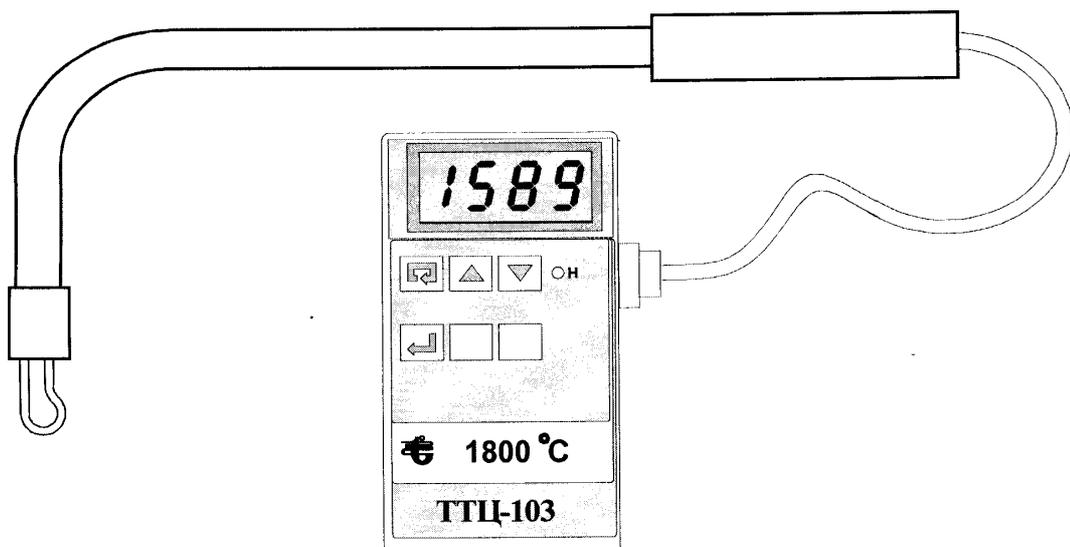
**MICROPROCESSOR THERMOELECTRICAL THERMOMETER
TTL-103 (TY 25.5Ц2.828.018-89)**

Designed to measure temperature of melted metal. Consists of digital measurement device and thermoelectrical couple package mounted into a special holder (so called fishing rod).

Measurement process involves submerging the package into melted metal and reading value from numeric display after measurement process is completed.

Sound and light signals are provided after measurement is over while measured temperature value (up to 32 values) is stored in the memory automatically and may be retrieved afterwards.

Range of controlled temperatures, °C	from 0 to 1800
Acceptable value of main error, %, not more than	1
Resolution, °C	1
Ambient temperature, °C	from 5 to 60
Power supply, V	3,6
Consumed power, Wt, not more than	0,012
Size, mm:	
of measurement device	125x70x25
thermocouple housing	1200x400



THERMOMETER OF RESISTANCE TO-Ц022, TO-Ц022-01

Designed for stationary and instantaneous temperature measurement of grain, bran, flour, and other agricultural products. May also be used for other applications. Thermometer contains a digital measurement device and resistance thermocouples.

The set includes a Krona type battery.

Range of measured temperatures, °C:

for TO-Ц022

from minus 20 to 100

for TO-Ц022-01

from minus 50 to 150

Low order unit (LOU), °C:

for TO-Ц022

0,1

for TO-Ц022-01

1,0

Acceptable main error, max, °C:

TO-Ц022 with:

thermocouples of B class tolerance

$\pm(1,0+0,004/t)\pm 01$ OMP

thermocouples of C class tolerance

$\pm(1,2+0,007/t)\pm 01$ OMP

TO-Ц022-01 with:

thermocouples of B class tolerance

$\pm 2\pm 1$ OMP

thermocouples of C class tolerance

$\pm 3\pm 1$ OMP

Power

autonomous

Weight, kg:

digital device

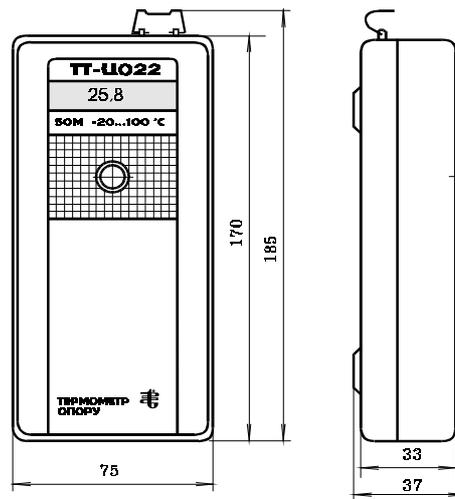
0,4

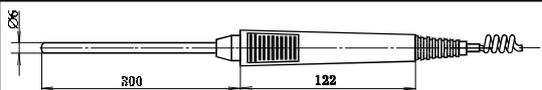
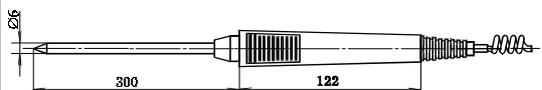
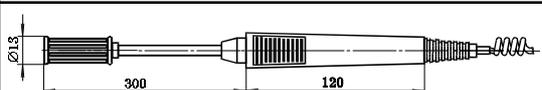
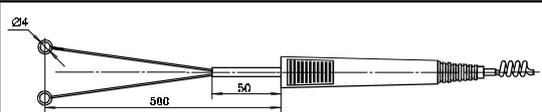
thermocouples TO-010, TO-010-01, TO-011

from 0,15 to 0,22

Size of digital device, mm

170x75x37



Notation	Packaging and size	Measured environment	Range, °C	$t_{98}^{\circ\text{C}}$
TOM-0591	Packaging and size – according to Specifications 405 212 005 TY	Granular substances (grain, bran, flour)	from minus 30 to 60	240
TO-010		Fluid, granular substances	from minus 50 to 150	180
TO-010-01		Fluid, granular, viscous substances	from minus 50 to 150	180
TO-011		Gaseous environments	from minus 50 to 150	180
З'єднувач		To connect stationary thermocouples having NSC 50M		

DIGITAL THERMOMETERS TO-Ц024-10, TO-Ц024, TO-Ц024Б, TO-Ц022T

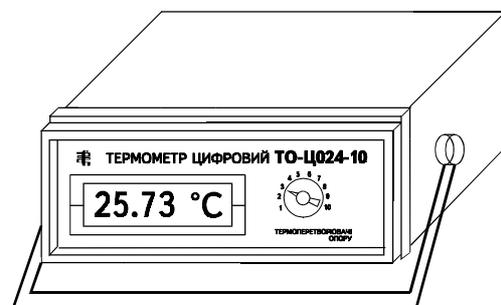
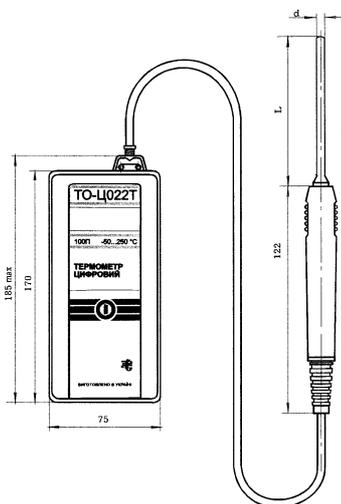
The thermometers are designed to provide accurate measurement of temperature of fluid, gaseous, granular and viscous substances.

Thermometers TO-Ц024, TO-Ц024Б, TO-Ц022T are single channel.

Thermometer TO-Ц024-10 works with ten or fewer thermocouples of resistance with NSC 100П, tolerance class A. Specific thermocouple is selected by means of rotary switch. The system contains a portable devices and thermocouples of resistance with 2.5 m long connecting wires (custom lengths are available too). Thermocouple of thermometer TO-Ц024Б can have a line of connection 1000 m long and be used in explosive zones. Thermometer TO-Ц022T is a portable device with autonomous power supply. All thermometer models (except for Ц022T) can interface with PC.

Range of measurement, °C		from minus 50 to 250
Threshold of acceptable min absolute error of thermometer, °C		$\pm 0,1 - 0,2$ at $50 \leq T \leq 100$ °C $\pm 0,2 - 0,4$ at $100 < T \leq 250$ °C
	for individual calibration (single channel option), °C	$\pm(0,05+0,0005T)$ at $minus\ 20 < T < 100$ °C
Number of decimal positions of display		5 (4 for TO-Ц022T)
Value of smallest order, °C:		$\pm 0,01$ at $minus\ 19,99 \leq T \leq 99,99$ $\pm 0,1$ at $minus\ 50,0 \leq T \leq minus\ 20,0$ $100,0 \leq T \leq 250,0$
	for other models	0,01
Index of thermal inertia of thermal couples, s, not more than:		
	e_{∞}	7
	e_{air}	50
Power supply:		
DC, V		8 - 12 (for TO-Ц022T – Krona type battery)
AC (with power box)		220 V; 50 Hz
Size of digital device (without handle) (except for TO-Ц022T), mm		250x165x100
Weight of thermometer, not more than, kg		1

Specifications (ranges, NSC, errors, etc.) can change, same as the type of thermocouples included.



No rotary switch for TO Ц024,
TO-Ц024Б