



ČESKÝ METROLOGICKÝ INSTITUT



Type Approval Certificate

č. 0111-CS-A046-05

Czech Metrology Institute in accordance with the Act No 505/1990 Coll.
approved

**temperature recorders used for frozen food transportation
type R0110, R0110E, S0141**

under observation of technical data referred to in Annex of this Certificate.

Type approval mark:

TCM 321/05 - 4207

Applicant: **COMET SYSTEM, s.r.o.**
1. máje 1220
756 61 Rožnov pod Radhoštěm
Czech Republic
ID: 60776846

Manufacturer: **COMET SYSTEM, s.r.o.**
Czech Republic

Valid until: **19 May 2015**

Information on judicial remedies:

The judicial remedies against this decision are available to the applicant through Czech Metrology Institute to Czech Office for Standardization, Metrology and Testing within 15 days since the receipt of this Certificate.

Description:

Essential characteristic, approved conditions special conditions, examination results including technical drawings and schemas are set out in the technical test report appertaining to this certificate. The certificate comprises the front page and the technical test report totally having 5 pages.

Dated: at Brno, 20 May 2005



RNDr. Pavel Klenovský
Director General

Technical Test Report

1. Description of device

The temperature recorders used for frozen food transportation are made in two designs. Type S0141 is four- channel with external sensors, types R0110 and R0110E are one- channel with internal sensor and with different temperature ranges and accuracies. (See table basic metrological characteristics).

2. Basic metrological characteristics

	S0141	R0110	R0110E
Measuring range [°C]	-90 ÷ 260	-40 ÷ 80	-30 ÷ 70
Resolution [°C]	0,1	0,1	0,1
Input accuracy [°C]	±0,2 in range (-50 ÷ 100)	±0,4	±0,6 @ -30 ÷ 30 ±0,8 @ 30 ÷ 70
Response time [min]	< 3	< 16	
Time of recording	10 s ÷ 24 hod		
Working temperature [°C]	-30 ÷ 70 at (0 ÷ 100) % RH	-40 ÷ 80	
Storage temperature [°C]	-40 ÷ 85 at (0 ÷ 100)% RH	-40 ÷ 85	
Power supply	Lithium 3,6 V		
Lifetime (typical)	5 years	7 years	
Material of housing	polycarbonat		
IP protection	IP 67		
Dimension (without sensor) [mm]	93x64x29	93x64x27	
Class	1 according to ČSN EN 12 830		
Software	Ver. 1.12.3.2		

3. Device indication

It must be shown minimal data in order to EN 12 830 point 8 on the device (reference to European Standard EN 12 830, manufacturer, serial number, suitability for storage (S) and transport (T), type of climatic environment (A,B,C,D or E), accuracy class 1 or 2) and mark of type approval TCM 321/05-4207. It must be shown unambiguously assignment of sensor to indication equipment on the name label. This name labels must be from the durable material, description indelible. Affixing of name labels shall not impede the correct function of the recorder.

4. Test

Technical test was made on the standard equipment CMI OI Brno in order to EN 12 830 and TPM 3362-02. Platinum resistance sensor with the AC resistance bridge ASL F 250 was used as the standard. Temperatures were generated in the liquid bathes and in the climatic chamber.

The consequent facts were ascertained by this test:



General

The means of temperature measurement by the recorder is independent of any temperature measurement which is used to control the refrigerating system.

Measuring range

The measuring range from (-30 to 30) °C is conform to the following limits :

Lower limit ≤ -25 °C Higher limit ≥ 15 °C Span ≥ 25 °C

Locking of the settings

The date and time of the beginning of recording is readable from the recorded data.

The settings which configure the parameters of the recording are protected against accidental modifications with a code number.

Recording

The temperature in °C, time, date, and place of measurement are recorded.

The maximum difference between two following recording dates can be set from 10 s to 24 hours (20 possible intervals).

Autonomous power supply

Status of the power supply is indicated on the device.

Readout of the momentary temperatures

The readout of the present temperatures at the display is possible with a resolution of 0,1°C.

Response time t_{90}

At a temperature difference in air of 20 °C higher or lower the display of the temperature recorder type SXXXX resp. RXXXX shows latest after 3 resp. 16 minutes 90 % of the really temperature.

Exactness of the clock

The maximum error of the clock in a duration of 72 hours is less than 0,1 % of the recorded time.

Error limits**Determination of temperature measurement error**

At the test of the reference conditions of 23 ± 3 °C inside the measuring range of -30 to 30 °C

The maximum error limit is lower than ± 1 °C.



Climatic tests**Influence of ambient temperature**

The carrying out of the test occurs according to the standard EN 12 830 point 5.6.3.2, event. 5.6.3.3.

	S0141	R0110	R0110E
Ambient temperature of the temperature recorder t_{et} [°C]	67,5 -29,4	22,8	22,8
Recorder display [°C]	67,5 -29,5	22,6	22,5
Error limit temperature recorder display [°C]	0,0 -0,1	-0,2	-0,3

After the test there is no mechanical damage recognizable. The error limits under reference conditions were met.

Mechanical tests

Test station VTÚPV, V. Nejedlého 691, 682 03 Vyškov
 Standard of the test ČSN EN 12 830 kap. 5.6.5, 5.6.6
 Test unit S0141, ser. Nr. 03930001, 03930002
 Test report number 760-09/2003

Equipment under test satisfies the requirements of the above mentioned standards.

Degree of protection

Test station FTZÚ, Pikartská 7, 716 07 Ostrava - Radvanice
 Standard of the test ČSN EN 60 529:1993+A1:2001
 Test unit RXXXX, SXXXX
 Test report number FTZÚ 04 E 0022, FTZÚ 04 E 0023

Equipment under test satisfies the requirements of the above mentioned standards..

Electrical tests

Test station VTÚPV, V. Nejedlého 691, 682 03 Vyškov
 Standard of the test ČSN EN 61326, ČSN CISPR 16-1, ČSN EN 55 022
 Test unit S0141, ser.Nr. 03930004, 03930005
 Test report number 730-091/2003, 730-134/2003

Equipment under test satisfies the requirements of the above mentioned standards.



5. Verification

The verification of recorders used for frozen food transportation is performed according to TPM 3362-02. Recorders, which meet the relevant tests, are identified by the official mark – stick (both indication device and sensor). Affixing of the official mark shall not impede the correct function of the recorder.

6. Validity period of verification

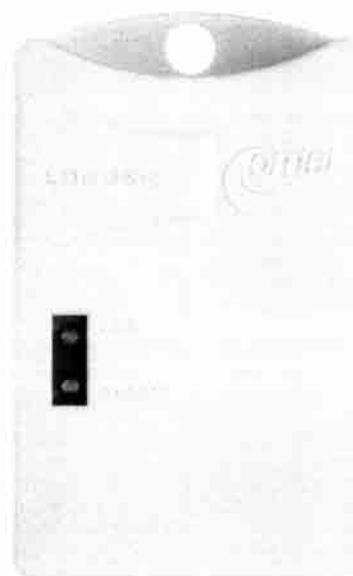
Validity period of the verification is set up by the decree of Ministry of Industry and Trade.

7. Measuring instrument specimen

In sense of decree 262/2000 Coll. §1, subsection 4, implemented the Law of Metrology, specimen were given back to the test applicant where they will be deposited at disposal for further possible revisions.

8. Summary

The temperature recorders used for frozen food transportation type S0141, R0110, R0110E, manufacturer COMET System s.r.o. were tested according to the requirements of European Standard EN 12 830. Based on the test results it was found, that the recorders fulfill the requirements of the above mentioned metrological regulation and are able to perform the function, which are designed for. The relevant documents are deposited at the test performer.



Temperature recorders type S0141, R0110

