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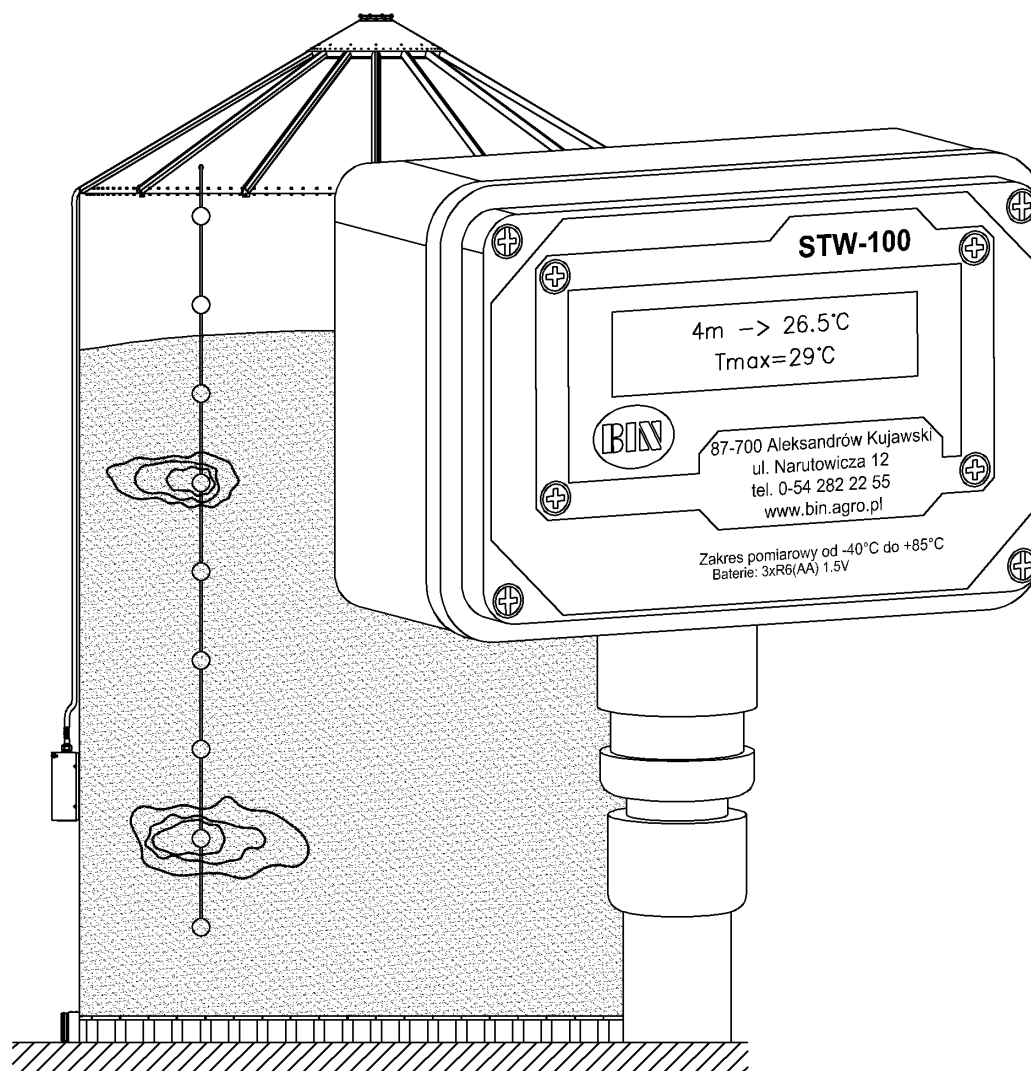
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MULTIPOINT THERMOMETER FOR MEASUREMENTS OF GRAIN TEMPERATURE IN SILOS

Type: STW-100

Model: TEMP_S_P4, TEMP_S_P6, TEMP_S_P8, TEMP_S_P10, TEMP_S_P12
TEMP_S_P14, TEMP_CZYT/1



INSTALLATION AND OPERATING MANUAL

Drawings and descriptions included in this manual may contain optional and special components, not provided in the standard version. Before placing an order, the Customer may obtain comprehensive and up-to-date information on the products to be ordered. We reserve the right to make changes in our products. All rights reserved. Any reproduction, even partial, is allowed solely with our consent.



Aleksandrów Kujawski/A4 format

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Chapter I. General and introductory information

1. Introduction

The Operating Manual aims at acquainting the user with a correct operation of the purchased product. This Operating Manual contains practical guidelines that must be known to the user of the multipoint thermometer for measurements of the temperature in silos. **If any content of this Operating Manual is not understood by or unclear for the user, please contact the manufacturer or their representative.**



This Operating Manual forms an integral part of the product, and should be kept for further reference.



Before starting to operate the thermometer, read this Operating Manual, and, in particular, the chapters concerning safety at work.



Each use of the device for purposes other than those specified in the Operating Manual will be treated as the misuse. The manufacturer of the product shall not be held responsible for damages resulting from its misuse. The user bears the sole risk related to the misuse. All and any unauthorised changes to the product design exclude the manufacturer's responsibility regarding any resultant damages.



The warning sign in the operating manual indicates that the special caution must be exercised because of the danger to people and possibility of product damage.

2. Safety

2.1. Basic safety rules

1. People employed to use or operate the thermometer are obliged to observe the general OHS provisions.
2. The user is obliged to read and understand operating manuals for the thermometer and for all other auxiliary equipment, and to strictly adhere to them.
3. In particular, the following is forbidden:
 - operation by any “third” persons, who are not familiar with the Operating Manual;
 - operation by any persons that are ill or intoxicated (with alcohol or narcotic drugs, etc.) or by minors.
4. The location of the thermometer operation and its controllers should be secured against any access of children and unauthorised people.
5. An owner of the thermometer is obliged to provide it with detailed occupational health and safety instructions.
6. All components of the system and the temperature reader must be secured against any damage.
7. Before commencing installation, inspect the thermometer and its components for any potential damage during transport or storage.
8. A particular attention should be paid to ensuring that the instrument is not damaged during its installation (cutting of electric cables, crushing or cutting of the measuring probe, etc.).
9. During installation of the probe securing device, evaluate the condition of the housing seal and sealing of the cable entries. Damaged seals and cable entries should be replaced with new ones, ensuring tightness of the housing.
10. Before starting installation works, connect the reader and test it for a correct operation.

11. Measuring probes of a relevant length are used for a specific silo model.
12. The repair and maintenance operations can only be conducted by able-bodied adults holding relevant qualifications.
13. Any dismantling, extending, shortening, cutting, etc. of any components of the measuring probe (a plug, temperature sensors, electrical cables, etc.) is unacceptable. A failure to follow the above notes may result in the damage to the entire device.
14. During temperature measurements, protect the reader against precipitation (rain, snow, etc.).
15. It is forbidden to leave the temperature reader connected to the measuring probe after readout, i.e. keeping it connected to the measuring probe for a long time in variable weather conditions may shorten the life of power supply batteries or result in a damage to the device.
16. The thermometer must be connected and started and tested by an installation company authorised by BIN.
17. Always replace all batteries with identical new ones – of “R6” (“AA”) type – 3 batteries.
18. Non-earthed non-intrinsically safe circuits of the battery powered measuring device, e.g. the temperature reader supplied by BIN Sp. z o.o., can be connected to the Hirschmann CA3LS connection of the probe securing device.
19. It is forbidden to install more than one probe in one BIN type silo, except for silos specially prepared or equipped for installation of more temperature probes.
20. The measuring probe and the reader contain electronic components, therefore, they should be protected against water, fire, chemical substances, etc.
21. During operation, be careful not to damage the measuring probe, e.g. by being grabbed by a screw conveyor, cut by a spade, etc.
22. When the reader is not connected, the connecting plug should be secured with a cap.
23. Before each filling of the silo, inspect the measuring probe for a correct fixing to the silo structure (including the correctness of installation of a screw with an eye and the measuring probe in the saddle clamp).
24. If the device is delivered without a nominal plate or the nominal plate is destroyed, the user should notify this to the manufacturer to receive its copy.
25. It is forbidden to make any changes in design or to change the intended use of the equipment without the manufacturer’s consent in writing.

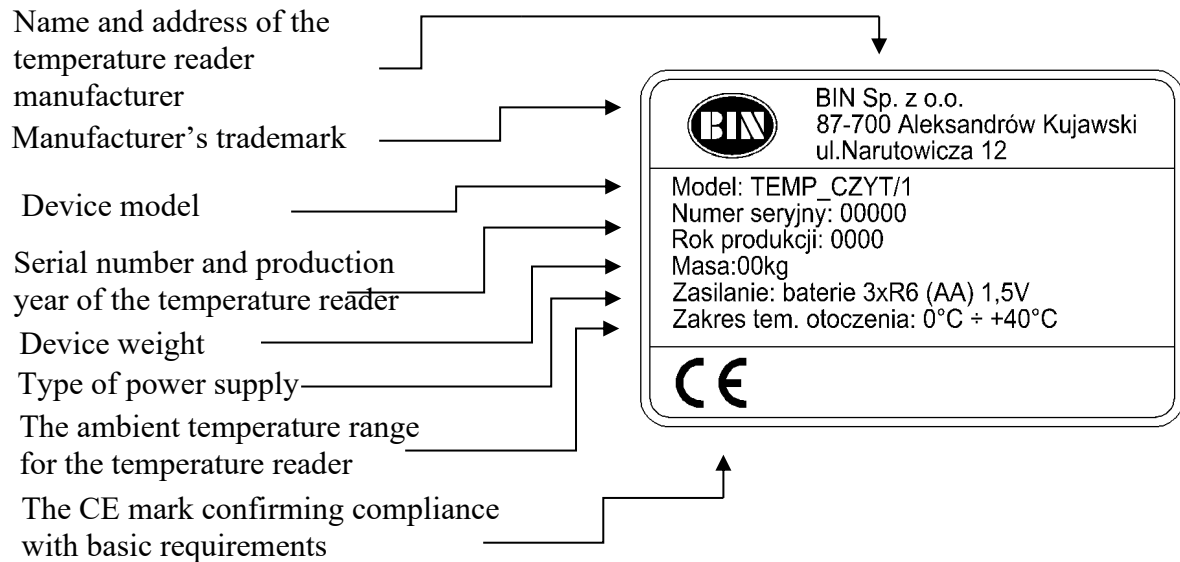
2.2. Nominal plate and information on the product



Note! Nominal plates and other information provided on the product must be kept legible and clean. If they are damaged or destroyed, or a part containing them is replaced, new plates should be purchased from BIN Company and installed on the product to replace damaged ones.

a) Nominal plate of the temperature reader

The nominal plate is installed inside the temperature reader housing.



b) Nominal plate of the measuring probe with a securing device

The nominal plate is installed on the housing of the probe securing device.

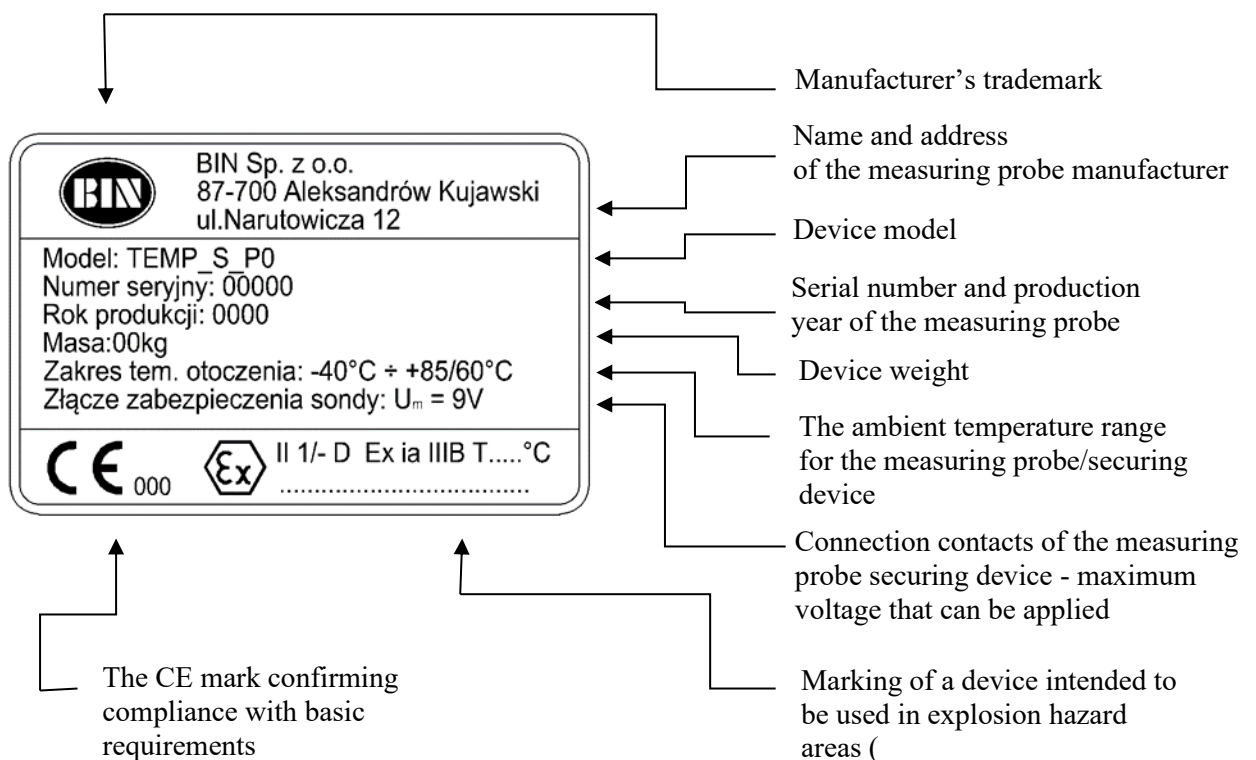

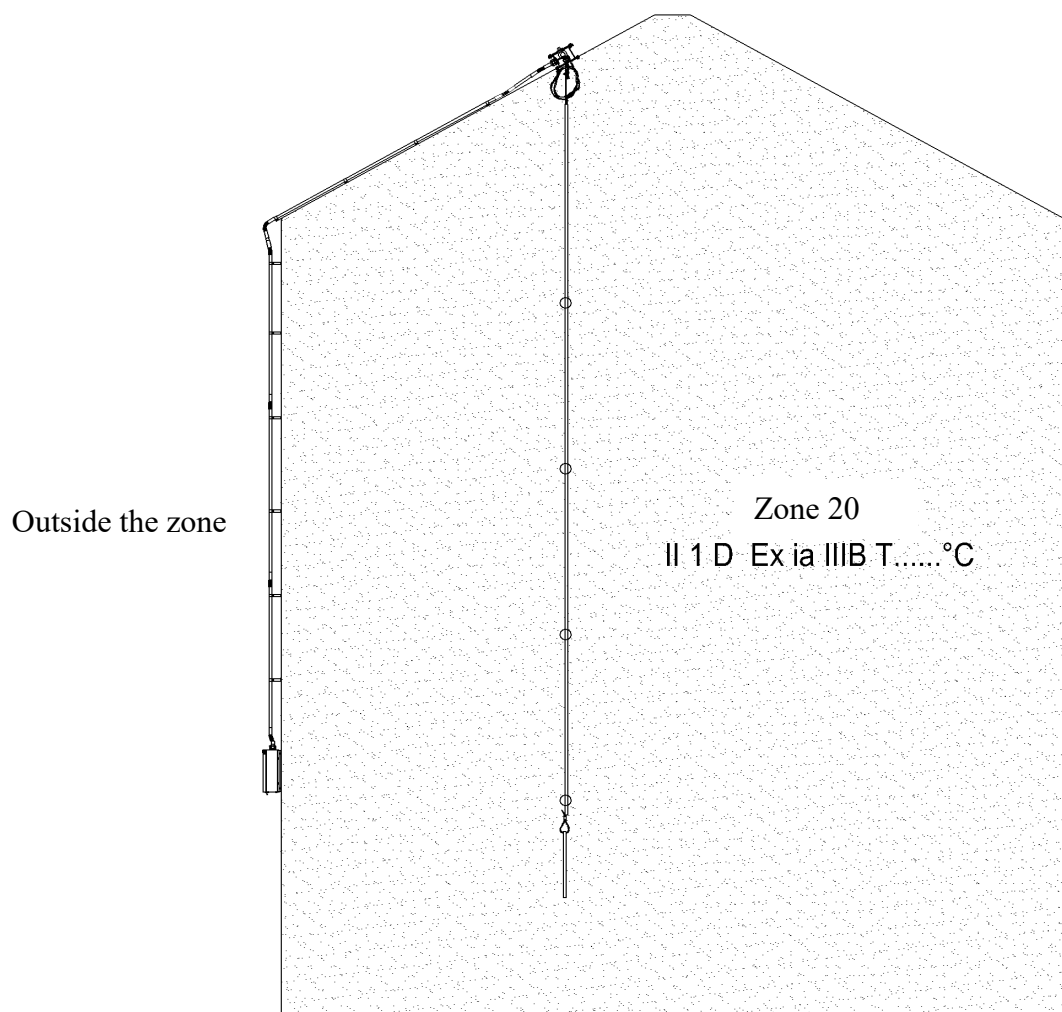
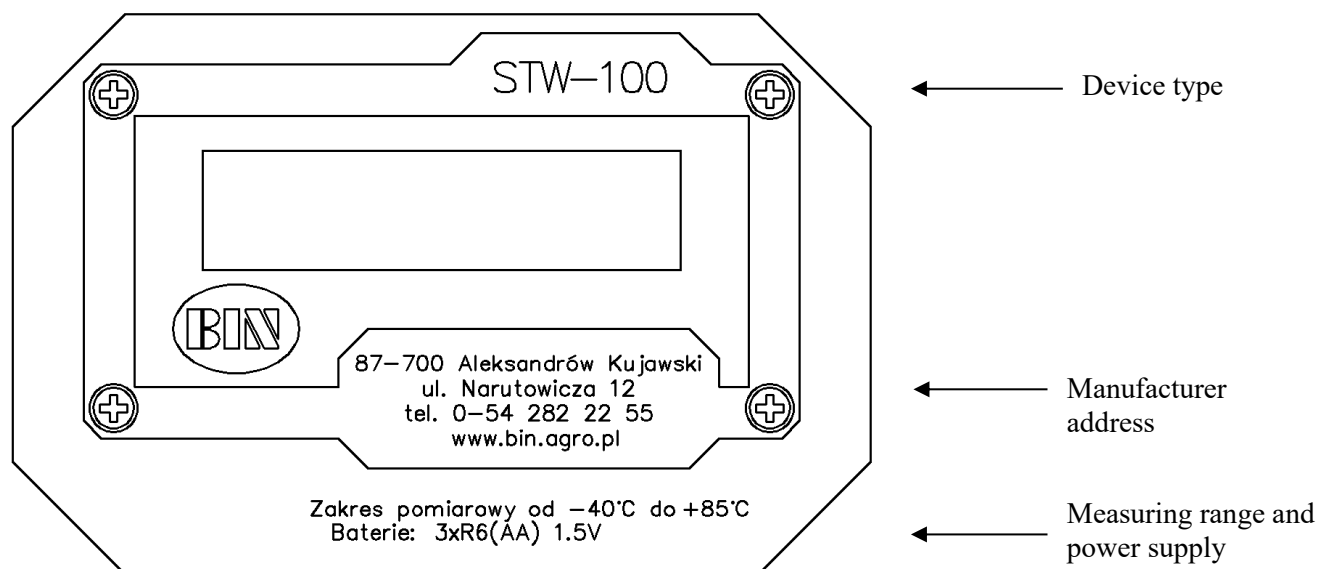


Table 1 Marking of a device intended to be used in explosion hazard areas.

	Marking of an explosion proof protection.
II	Group of devices: II - to be used at locations other than mining plants
1/-	Category of devices to be used in zones: 1 in zones 0 or 20 - outside the zone
D	D - dust explosive atmospheres
Ex	A symbol indicating that a device corresponds to one or several types of the explosion-proof designs
ia	A symbol of each type (level) of the securing device applied ia – intrinsic safety (in relation to EPL Da), the device is intrinsically safe in dust atmospheres, not able to cause ignition during normal operation, and normal operation and in the case of two countable damages and those uncountable damages that create most unfavourable conditions.
IIIB	Marking of electrical equipment groups: IIIB - non-conductive dust
T.....°C	Maximum equipment surface temperature.



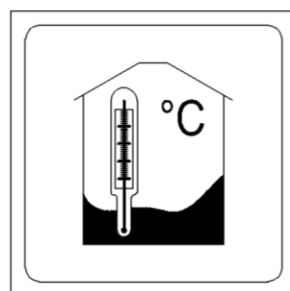
c) Information on the temperature reader



d) Information marks on the housing of the measuring probe securing device



***READ
OPERATING
MANUAL***



***PLACE OF THE
MEASUREMENT
OF THE GRAIN
TEMPERATURE IN THE
SILO***

3. Ordering the product

Thermometers of the STW-100 type and spare parts can be ordered from BIN Sp. z o.o. or authorised BIN sales representatives.

Each time, before purchasing any components, a person placing the order should consult the manufacturer or a sales representative in detail about the planned purchase.

4. Transport of purchased devices

Transport of the components is arranged by a seller or the ordering person, under an additional agreement.



THERMOMETERS OF THE STW-100 TYPE MUST BE SECURED AGAINST MOISTURE DURING THEIR TRANSPORT AND STORAGE.

If the components get or are stored wet, this may cause irreversible changes in the device parameters. The manufacturer shall not be held responsible for the above-mentioned defects resulting from a failure to observe the above recommendations.

Chapter II. Thermometer STW-100

1. General product description

1.1. Product design and intended use

The multipoint thermometer of the STW-100 type is designated to measure the grain temperature in silos of the BIN and KONSIL type. Regardless of a number and types of measuring probes with a securing device, one reader is sufficient to operate all of them in all cases. The thermometer should not work during thunderstorms or in the vicinity of high voltage lines, transformer stations, etc.

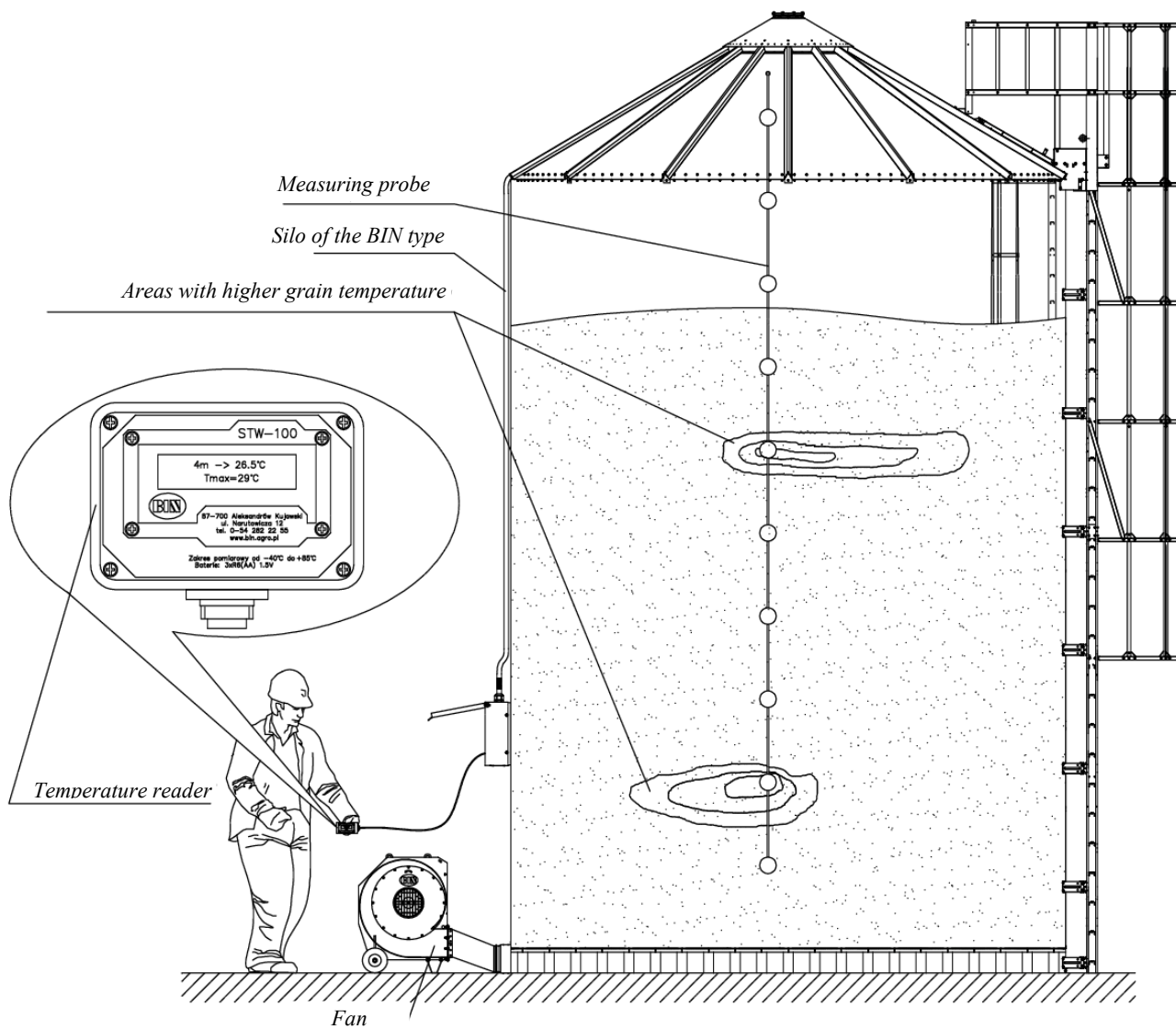


Figure 1 Design and intended use of a multipoint thermometer for grain temperature measurements in silos.

The multipoint thermometer of the STW-100 type (Figure 1) consists of the following basic components: the temperature reader, model TEMP_CZYT/1, and the measuring probe with the securing device, model TEMP_S_P.....

A reader is a device with a display, on which the user can read out the temperature on individual sensors of the measuring probe. The second row in the display shows the maximum temperature in the silo. The reader is equipped with a socket for connecting the measuring probe with the securing device. This device is not intended for continuous operation. It is a portable device powered by direct current of ca. 4.5 V using three R6 (AA) batteries. The reader can only be used outside explosion risk areas.

The measuring probe with a securing device consists of temperature sensors spaced along it every 1 m. The sensors are fixed to a steel rope with its one end of a design enabling fixing it in the silo roof. All sensors are connected with an electrical cable routed outside the silo and connected to the probe securing device. The securing device is provided with a cable with a plug for connecting the temperature reader. The probe with the sensors can be installed and used in explosion risk areas. The protective feature is ensured by the probe securing device installed on the external parts of silo side walls (outside the explosion risk zone). The explosion protection feature is ensured by the intrinsic safety, i.e. reduction of the electricity in the measuring probe to the level at which it cannot cause the ignition, both due to spark generation and to heating.

Table 2 Intended use of the thermometer of the STW-100 type.

Silo model	Device name	Thermometer model
NBIN10, NBIN10W, NBIN20N, NBIN20, NBIN20R, NBIN20W, NBIN20WR, NBIN40N, NBIN40, NBIN60, NBIN60R	Measuring probe with a securing device (4-point)	TEMP_S_P4
NBIN20WW, NBIN40W, NBIN40WW, NBIN60W, NBIN60WR, NBIN100U, NBIN101U, NBIN100RU, KONSIL40/4, KONSIL40/5, KONSIL60/3, KONSIL60/4, KONSIL100/4	Measuring probe with a securing device (6-point)	TEMP_S_P6
NBIN60WW, NBIN100WU, NBIN101WU, NBIN100WRU, NBIN200U, KONSIL40/6, KONSIL40/7, KONSIL60/5, KONSIL60/6, KONSIL100/5, KONSIL100/6, KONSIL200/6	Measuring probe with a securing device (8-point)	TEMP_S_P8
NBIN200WU, NBIN1500_N, KONSIL60/7, KONSIL60/8, KONSIL100/7, KONSIL100/8, KONSIL200/7, KONSIL200/8	Measuring probe with a securing device (10-point)	TEMP_S_P10
NBIN500, NBIN501, NBIN1001, NBIN1500_P, KONSIL200/9, KONSIL200/10	Measuring probe with a securing device (12-point)	TEMP_S_P12
NBIN500W, NBIN501W, NBIN1001W, NBIN1500, NBIN1500_W	Measuring probe with a securing device (14-point)	TEMP_S_P14
	Temperature reader	TEMP_CZYT/1



Regardless of a number and types of measuring probes, one reader is sufficient to operate all of them in all cases.



It is forbidden to install more than one probe in one BIN type silo, except for silos specially prepared or equipped for installation of more temperature probes.

1.2. Technical specification

Table 3 Technical specification of the measuring probe with a securing device, TEMP_S_P.....

Product model	TEMP_S_P.....
Ambient temperature range	$-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +85^{\circ}\text{C}^*$ * max. ambient temperature for the probe securing device: $+60^{\circ}\text{C}$
Terminals of the CA3LS connectors of the probe securing device	$U_m = 9\text{ V}$
The protection degree of the probe securing device	IP56
Power supply (from the temperature reader)	$U_n = 4.5\text{ V}$
Device weight	$1100 \div 2700\text{ g}$
Dimensions (the length of the probe with the securing device)	$9 \div 35.5\text{ m}$

Table 4 Technical specification of the temperature reader, TEMP_CZYT/1.

Product model	TEMP_CZYT/1
Readout mode	automatic
Probe detection	automatic
Screen	LCD display
Device weight	200 g
Dimensions [mm]	L128 x W110 x H60
Ambient temperature	$+0^{\circ}\text{C} \div +40^{\circ}\text{C}$
Storage temperature	$+5^{\circ}\text{C} \div +40^{\circ}\text{C}$
Power supply	3 x R6 (AA) 1.5 V

2. Installation and start-up

Installation of the thermometer requires the use of special equipment, and relevant know-how. Therefore, the equipment can only be installed by installation companies authorised by BIN. The installation company should cooperate with an entity ordering installation, in terms of works organisation, financial settlements, and acceptance of installation works.



Any dismantling, extending, shortening, cutting, etc. of any components of the measuring probe with a securing device (a plug, temperature sensors, securing device components, electrical cables, etc.) is unacceptable. A failure to follow the above notes may result in the damage to the entire device.

The measuring probe for thermometer STW-100 should be installed in the silo. The remaining installation with the device should be placed outside the silo, near the entry ladder (about 30 cm from the ladder) – Figure 2, Figure 3, Figure 4.

1. Install clamps with supports on the side surface of the silo (detail I) – maintain the required distance between the first clamp and the housing of the probe securing device and the silo foundation surface (detail III) and the distance between the remaining clamps of ca. 50 cm.
2. Attach tubes and elastic connectors to the clamps – adjust the length of the last tube to the passing from the side surface to the silo roof surface (detail I).
3. On the silo roof surface, install clamps without supports (detail I) and place tubes with flexible connections.
4. Install the probe clamp (detail II).
5. Connect the end of the last tube with the PG21 gland with flexible connectors (detail II).
6. The electric cable of the measuring probe should be placed in the previously installed tubes and connectors.

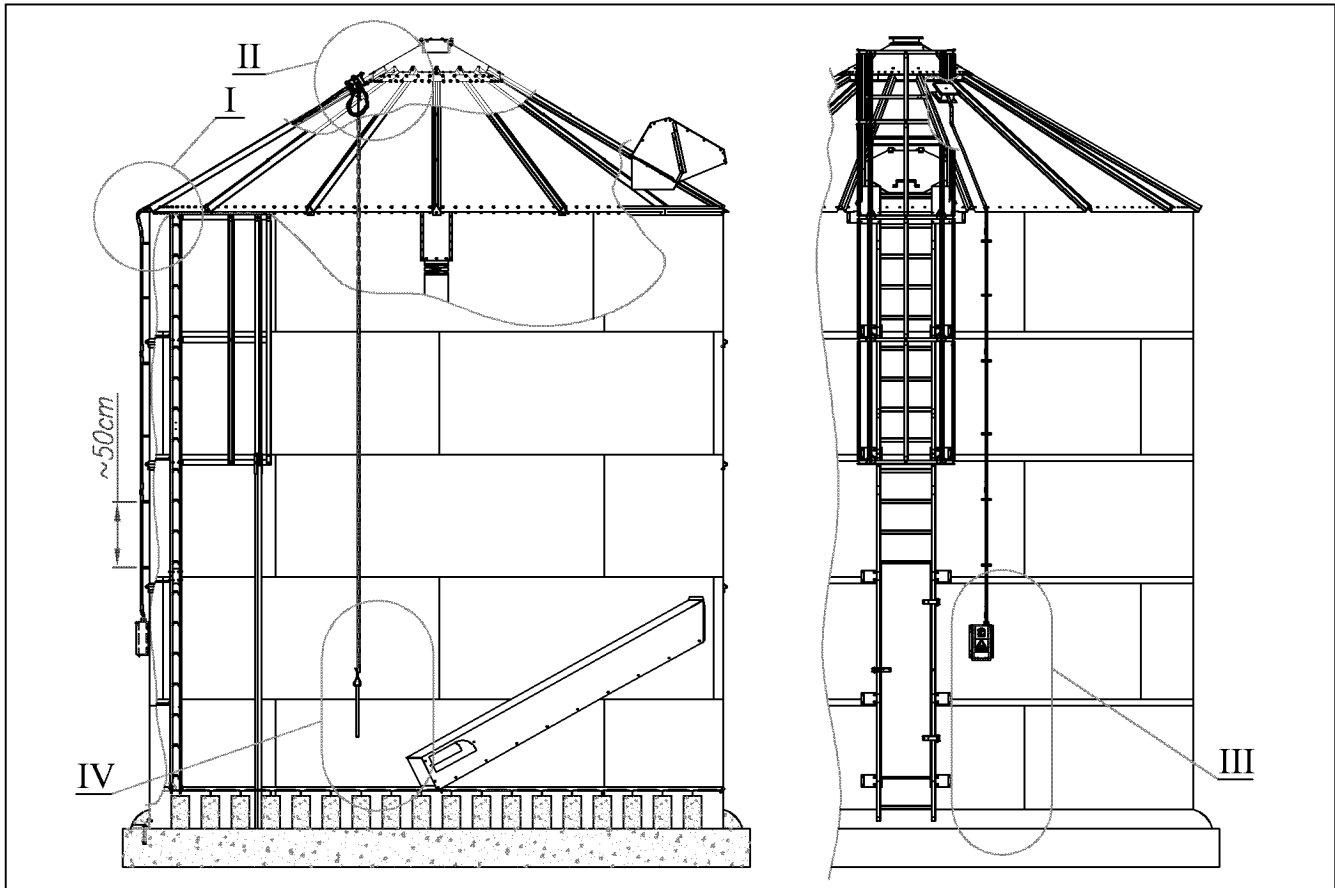


To facilitate the installation, the tubes and flexible connectors can be removed from the clamps, then the probe electric cable should be placed in them at a convenient location (observing the required sequence). Then install the tubes back in the clamps.

7. Fix the measuring probe to the screw with an eye using the saddle clamp (detail II), maintaining the required distance between the probe end and the perforated floor surface (detail IV).
8. Secure the excess electric cable with cable ties (detail II).
9. Connect the probe electric cable to the securing device (Figure 4)
10. Verify fixing of all components for correctness and remove installation faults, if necessary.
11. Attach the reader and perform the test temperature readout.
 - if the temperature reader shows the correct temperature for all probe sensors, the reader can be disconnected and the actual operation of the device can begin,
 - if the reader is connected and no characters are visible on its display, disconnect the reader and check the batteries, replace them with new ones if necessary,
 - if the reader still does not show anything, shows incorrect values or its work is defective in any other way, contact the manufacturer.



The manufacturer does not accept any repairs, installation or dismantling (even partial) of any component of the thermometer of the STW-100 type by the user. Installation, dismantling, repairs, and similar operations can only be performed by BIN Sp. z o.o. or its authorised representative.



I *for all silos of the BIN type*

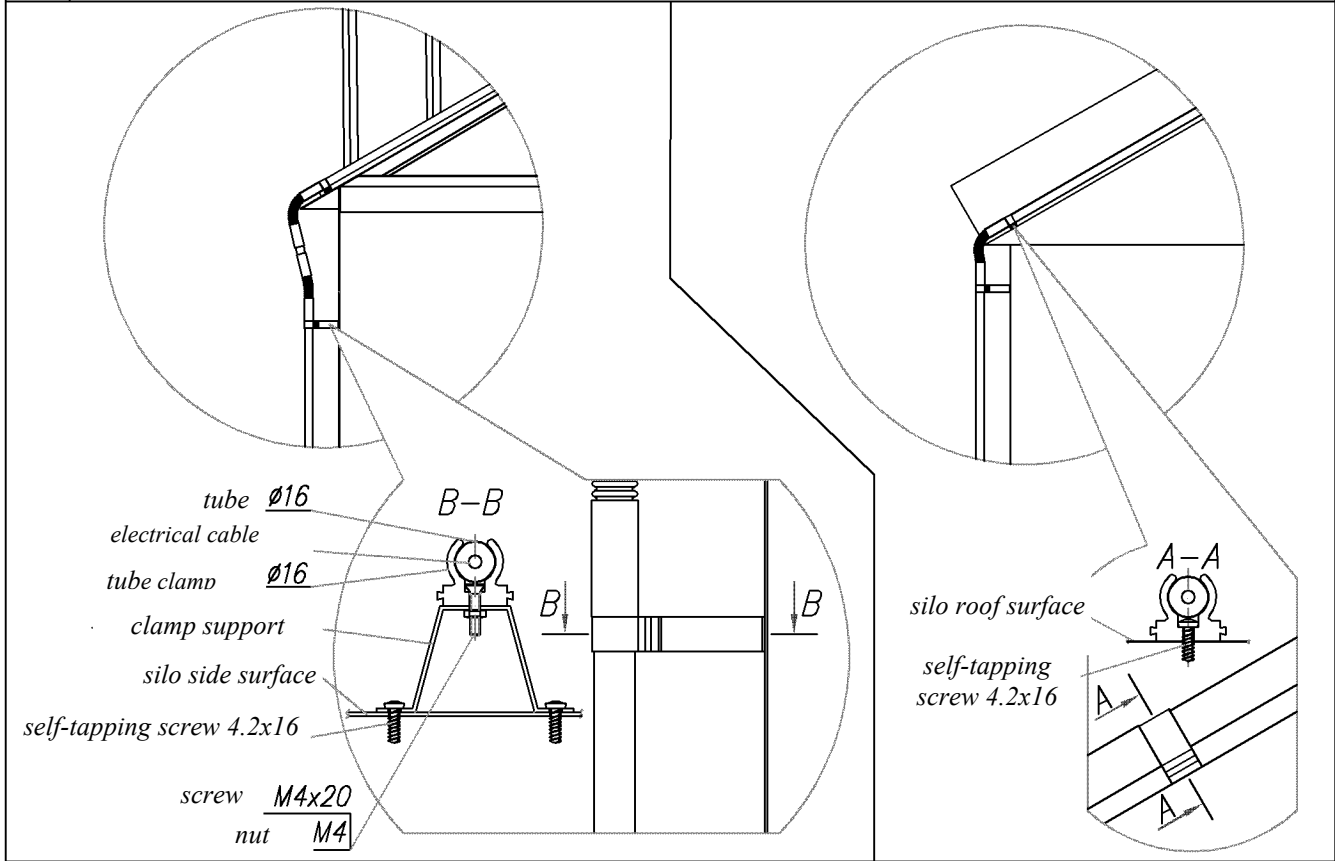


Figure 2 Installation of the thermometer STW-100 (part 1).

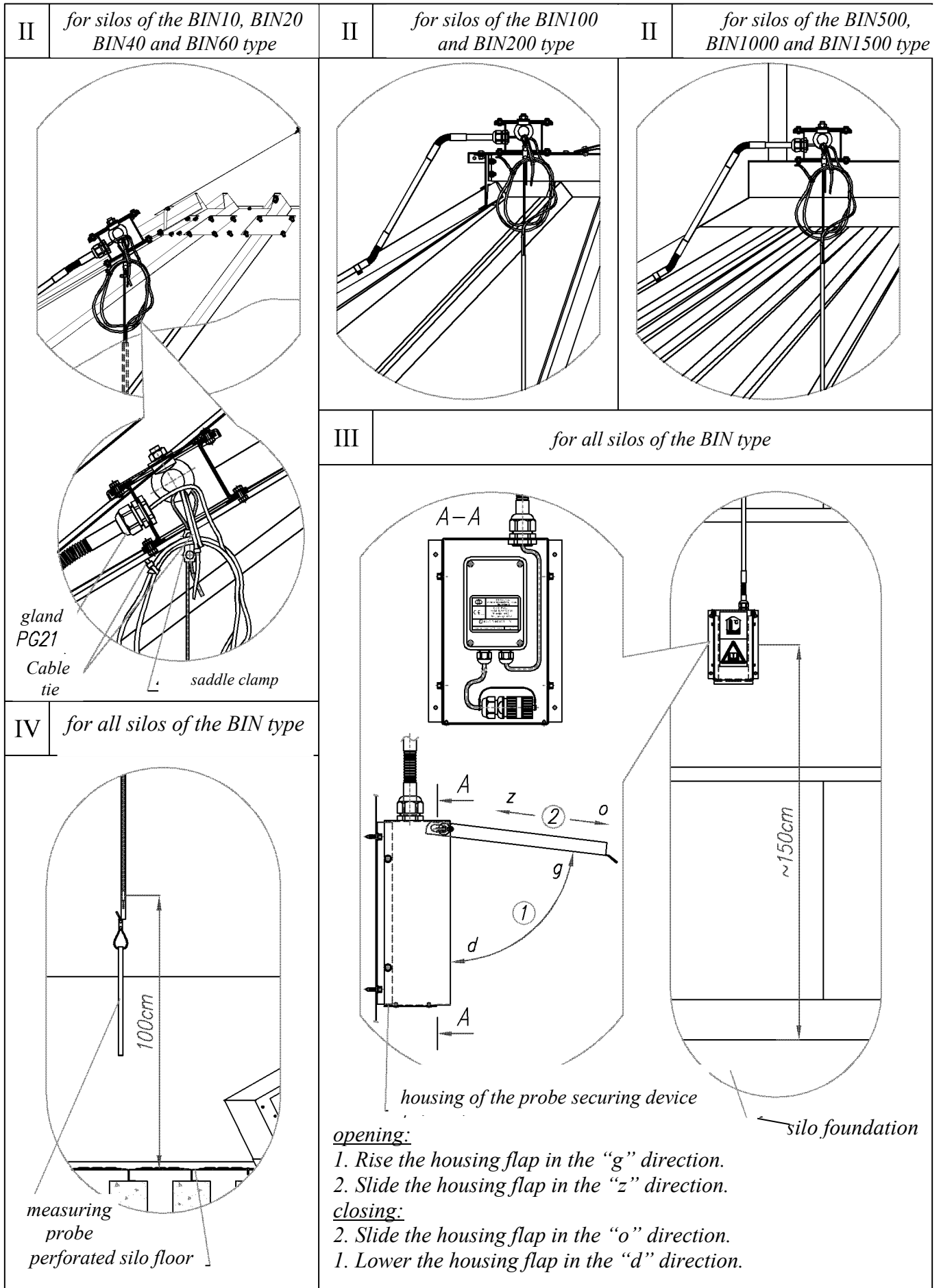


Figure 3 Installation of the thermometer STW-100 (part 2).

Diagram for connecting the probe cable to the terminal

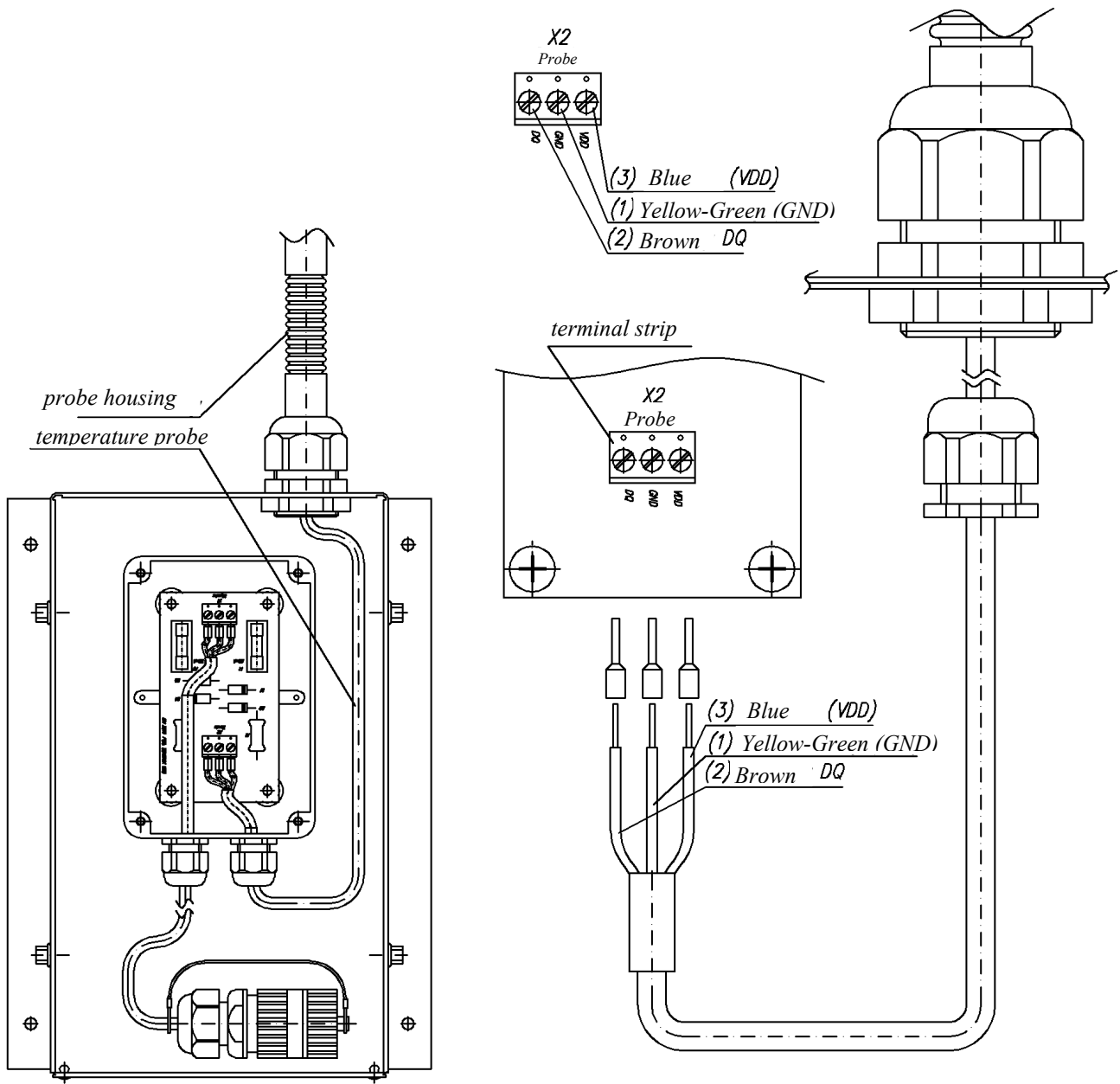


Figure 4 Installation of the thermometer STW-100 (part 3).

3. Use and operation of the thermometer

Correct operation and punctual maintenance inspections, maintenance and possible repairs guarantee availability of the full operating capacity of the thermometers and prevent their premature and excessive wear.

Temperature measurement:

1. Open the flap of the probe securing device housing (Figure 3),
2. Unscrew the protective cap from the connecting plug (Figure 4),
3. Screw the connecting plug to the socket on the reader housing,
4. Wait several seconds,
5. An information about the number of sensors in the measuring probe is appears on the display. Then the device will show the temperature for every 1 m of the grain height in the silo (starting from 1 m above the perforated floor),
6. After the readout, the reader should be disconnected and the plug secured with the protective cap.
7. Close the flap of the probe securing device housing (Figure 3).

When not in use, store the reader in a dry room, at ca. +5–+40°C, protected against direct sunlight.



Replacement of the batteries:



Always replace the batteries with the reader disconnected from the measuring probe.

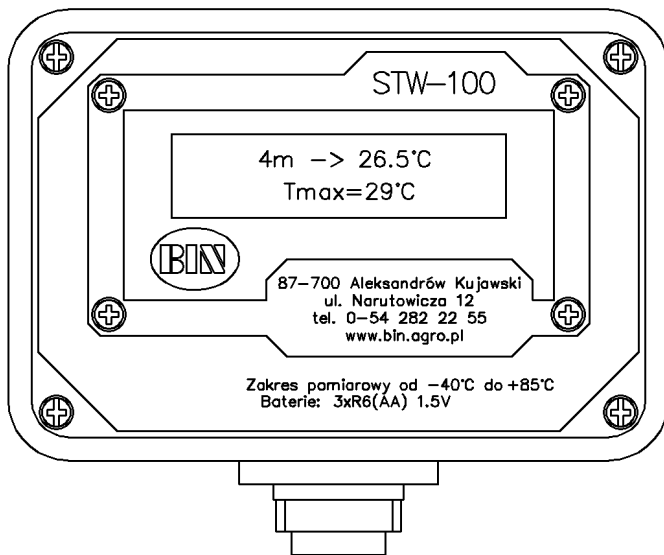
1. Unscrew the screws fixing both parts of the reader housing (Figure 5),
2. Remove the back part of the reader housing,
3. Replace the batteries, paying particular attention to the correct arrangement of all batteries in their compartments (the “+” on the battery must match the “+” of the compartment).
4. After replacing the batteries, reassemble the housing and verify the reader operation by connecting it to the measuring probe.



Always replace all batteries with identical new ones – of “R6” (“AA”) type – 3 batteries.



When the reader is not connected, the connecting plug of the measuring probe should be secured with a cap.



Screws fixing both parts of the reader housing

A value of the temperature in the silo at the specified height from the floor. (in the Fig.: 26,5°C at 4 m from the silo floor)

The highest value of the temperature in the silo as measured by the probe. (in the Fig.: Tmax = 29°C)

Figure 5 Description of information displayed by the reader and the method for dismantling its housing.

Chapter III. Final and supplementary information

1. Storage

During a longer break in the use of the device, store the temperature reader in a dry room, at ca. +5–+40°C, protected against direct sunlight. The measuring probe with the securing device should remain installed at the place of its operation.

When starting the equipment after a longer break in use, follow the guidelines for the start-up (specified in this Operating Manual).

2. Disassembling and disposal

When it is found that the device cannot be no longer operated:

- dismantle all thermometer parts and units;
- sort the parts according to a location and a method for their disposal;
- all metal, plastic and other parts and units should be transferred to specialist entities processing and disposing of such materials;
- secure other parts against possible adverse effects on humans and the natural environment

As of 10/11/2022, I approve for use the Operating Manual:

Multipoint Thermometer for Measurements of Grain Temperature in Silos

revision - 9

issued on - 05/05/2022.

Chief Constructor
Mieczysław Laskowski

.....
(signature)

3. Guarantee

BIN Spółka z o. o. guarantees correct operation of the purchased product from our company. The guarantee covers 12 months from the date of sales and is valid only together with a proof of sales issued to a user by us or by our representative. The guarantee covers free of charge removal of defects significantly affecting product performance. Therefore, application of guarantee provisions under Article 558.1 of the Civil Code is explicitly excluded.

General Guarantee Terms and Conditions.

1. The territory of the guarantee application

This guarantee is valid within the territory of Poland. The guarantor shall cover costs of transport related to an accepted guarantee complaint for a distance of up to 250 kilometres covered, according to standard rates.

2. The guarantee does not apply to defects resulting from incorrect or excessive operation, natural wear of parts, or other reasons outside the manufacturer's control.

3. The guarantee shall not cover any other costs not specified above, especially costs being a consequence of the equipment stoppage.

4. The guarantee becomes invalid in the following cases:

- use of the product contrary to its intended use;
- when installation was incorrect or any unapproved changes were made;
- works requiring specialist licences are performed by unauthorised persons.

Specific Guarantee Terms and Conditions.

1. In the case of Products delivered as components - a customer shall verify condition of these components on delivery, and then will store them on their own responsibility until they are assembled.

Flat components of galvanised sheets require special attention. They should be stored in a way ensuring a free flow of air around each component. When wet galvanised metal sheets are in contact, this results in formation of irremovable spots, even during a short storage.

2. When arrangements made during placement of an order or included in the Operating Manual include obligations for a buyer, then the guarantee does not cover consequences of failure to perform or incorrect performance of these obligations.

3. Outdated financial liabilities of a buyer towards the warrantor or the seller result in a loss of the guarantee rights until the outstanding liabilities are covered.

Exercising guarantee rights

The customer notifies to the seller in writing any defects found. The seller shall notify the customer about a way of handling their complaint, and a place and a time of guarantee repair no later than within 14 days of receiving the notification.

Manufacturer:

BIN Sp. z o.o.
87-700 Aleksandrów Kujawski
at Narutowicza 12

Appendix 1. Anomalies (including problems and faults) during operation of the thermometer of the STW-100 type.

Thermometer malfunction	Possible cause of the thermometer malfunction	Way to remove the anomaly
The reader cannot be (mechanically) connected to the temperature probe.	<ul style="list-style-type: none"> - no or damaged connecting plug of the temperature probe - damaged connecting socket of the reader 	Inspect, repair or replace the temperature probe plug and/or the connecting socket of the reader
After connecting the reader to the temperature probe, no information is shown on the display.	<ul style="list-style-type: none"> - empty or damaged batteries of the thermometer - no (electrical) connection of the reader and the temperature probe - temperature probe damaged 	Replace batteries of the thermometer. Inspect and repair the electrical connection between the reader and the temperature probe. Repair or replace the temperature probe.
The reader shows incorrect temperature values.	<ul style="list-style-type: none"> - incorrectly installed temperature probe - temperature probe damaged 	Correct installation, repair or replace the temperature probe.
Actual values of the temperature measurements differ from indications in the display.	<ul style="list-style-type: none"> - incorrectly (too low or too high) installed temperature probe - temperature probe damaged 	Correct installation, repair or replace the temperature probe.