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**TWO-TERM ELECTRIC
TEMPERATURE SWITCHES
type ERT-01**

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1. INTRODUCTION

1.1. SECURITY INSTRUCTIONS

1.1.1. Application

Electric temperature switches are designed for regulation in systems where it is necessary to have constant temperature by changing inflow of powering medium, for e.g. by control of electromagnetic manifolds, switching on the heating devices, pumps, fans and others.

Moreover, they may be used as indicators of temperature exceeding or drop and they may be used in protection systems and anti-damage systems in various industrial devices.

1.1.2. Definitions used in description

- **Operator** – person, who use product according to application (PN-EN 61010-1, July 2004),
- **Technical inspection** - person or group of people responsible for using and conservation of product, this person has to assure of well special training for OPERATORS (PN-EN 61010-1, July 2004),

1.1.3. Allowed activities range

- **For operator** – switch's using.
- **For technical inspections** – activities like for operator, mechanical and electrical assembly and activities connected with controlling.

1.1.4. Power supply connection

Assembly and starting works should be done only by electricians with qualifications or staff instructed by them – according to actual law rules of electrotechnics.

1.1.5. Instructions and warnings

Body damage and/or serious material damages might be formed if user doesn't keep of instructions and warnings. Servicing staff have to be instructed and acquaint with whole safety instructions and warnings. For well and safe level switch's working there has to be assured right transport, storage, assembly, starting and conservation's instruction.

Main attentions of safety in mentioned operation and maintenance manual were marked as pictograms:

	This sign means: Pointer. „Pointer” indicates on action or any process important for well-working of product. Material damages might be formed if user doesn't keep of instructions.
	This sign means: Warning. „Warning ” indicates on action or any process, which might be danger for staff or makes material damages if those aren't made correctly.

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1.2. SUBJECT OF TECHNICAL PRODUCT DOCUMENTATION

Technical Product Documentation subject is using, construction and assembling of electric temperature switches.

1.3. APPLICATION, MARKINGS ACC. TO SWW AND PKWiU

Electric temperature switches are designed for on – off adjustment of temperature. They maintain required temperature value. Moreover, they may be used as indicators of temperature exceeding or drop and they may be used in protection systems and anti-damage systems in various industrial devices.

Designation according to Polish Classification of Products and Services (PKWiU): 26.51.70.0

Designation according to Systematic List of Products (SWW): -0918-131

1.4. CONSTRUCTION AND WORKING RULES

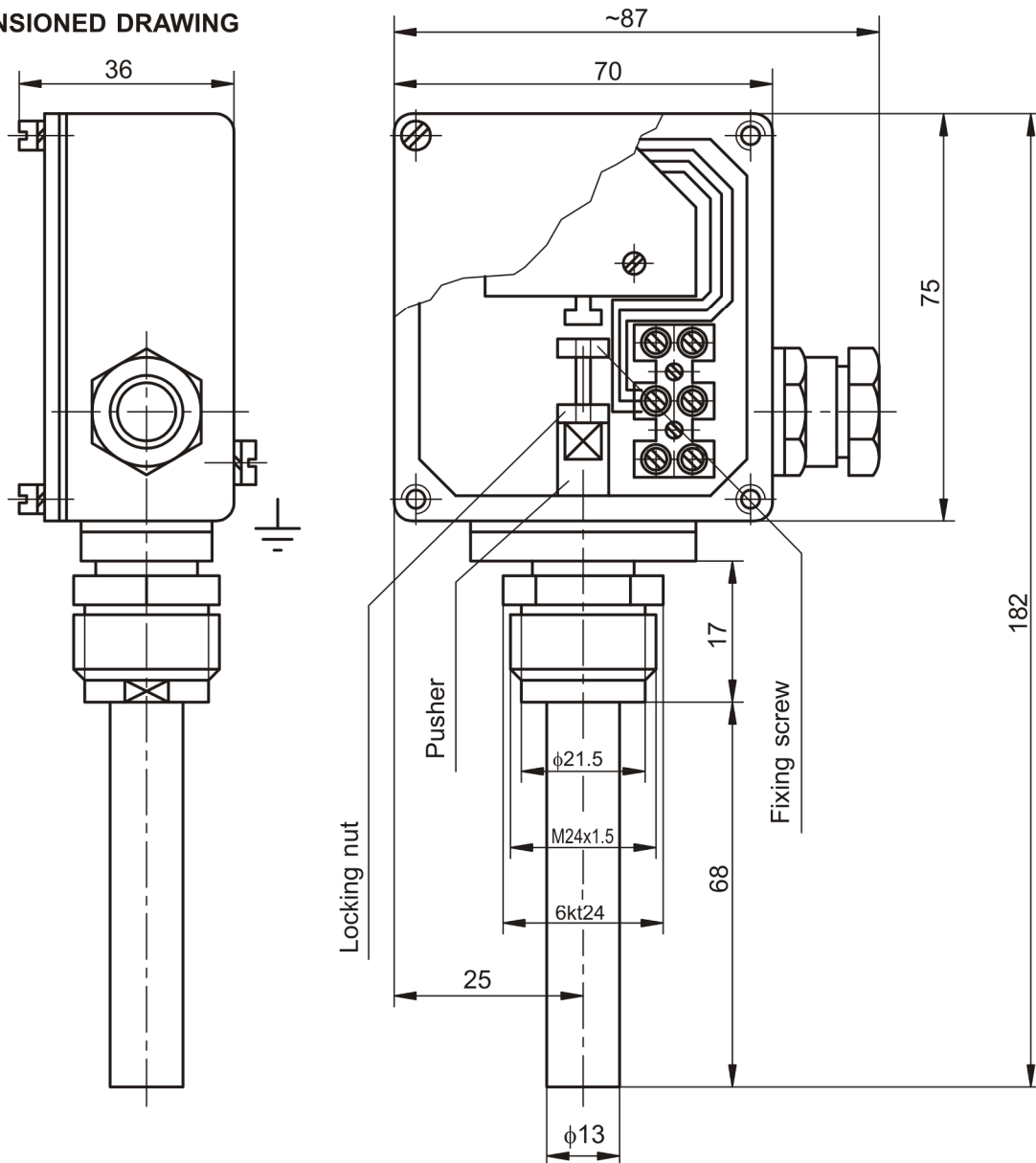
Electric temperature switch consists of temperature sensor, which cylindrical casing is filled of thermostatic medium and the casing is closed leakproof from upper by elastic bellows. The sensor is fixed to the housing by the connector. The nut with thread M24x1,5 is used for fixing the switch on the object. The pusher pushed to the bellows by elastic spring is inside the connector. To protect the housing by splash-proof the housing is closed by the cover with seal. Electric wires are supplied by the gland and terminal strip to the micro-switch. The screw M5 is used for earthing or zeroing the switch. Electric temperature switch works on the basis of change the thermostatic liquid volume closed into the sensor with elastic bellows.

Temperature sensor is inside the medium, when the temperature has to be switch. The increase of temperature than requested makes that thermostatic liquid volume increases and the elastic bellows bends. The bellows movement by the pusher is transmitted on micro-switch and the contacts are switches making break in inflow the current to the device which supplied powering mediums. Recombination the circuit will be when the temperature decreases. The difference of temperature between breaking of electric circuit and recombination of his one acc. to technical data is determine as difference of power-ups.

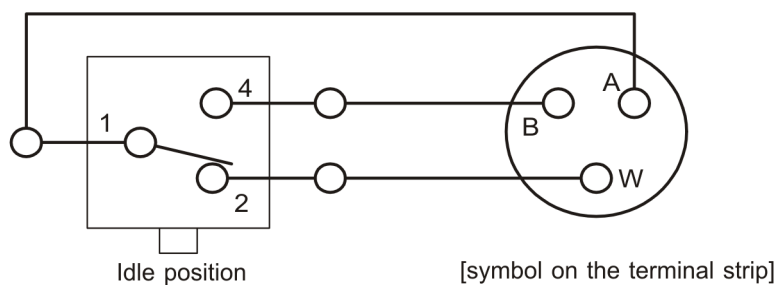
Electric temperature switch is set on requested regulation temperature. When we have to change regulation temperature (in range of temperature given by the manufacturer) it is possible to make by change the position of regulation screw of the temperature switch. The change on requested regulation temperature might be done as follows:

- to switch the switch into signaling system, which is constructed of source of supply and signaling lamp on voltage 24V,
 - to turn on the nut protected the regulation screw,
 - put the sensor of switch in the vessel with switching-on or switching-off requested temperature,
 - depending on put the pusher the regulation screw has to be screwing in till the switch-on (or switch-off) the signaling circuit. This function has to be done carefully so as to minimal move of the pusher makes switch-on (or switch-off) the signaling circuit.
 - to check the property of setting by put the switch's sensor in the vessel with liquid at temperature lower by 3°C than requested. Next should be heating with speed of 5°C/1 minute; when signaling circuit switches on to read the temperature on control thermometer and to compare with requested. If the discrepancies will be higher than 1,5°C the changing functions have to be make again.
- The changing of regulation temperature might be done on the object, too, if it is possible to measure the temperature of heating medium in the same time. the procedure has to be done using thermostat.

DIMENSIONED DRAWING



ELECTRIC CIRCUIT DIAGRAM



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2. TECHNICAL DATA

Table no. 1

No.	Parameters	Unit type	ERT-01-00	ERT-01-01
1.	Temperature value setting range	°C	30-70	70-110
4.	Repeatability	°C	1,5	1,5
2.	Sensor's diameter	mm	13	13
3.	Switches difference	°C	≤4	≤4
5.	Sensor's length	mm	68	68
6.	Time-constant	sec	30	30
7.	Assembly thread	-	M24x1,5	M24x1,5
8.	Frequency of connection	No. of connections /h	60	60
9.	Mechanical durability	No. of cycles	5x10 ⁶	5x10 ⁶
10.	Vibrations resistance	-	0...10Hz at 6g	0...10Hz at 6g
11.	Impulse waves resistance		10g	10g
12.	Ambient temperature	°C	-20...+80	-20...+80
13.	Rated switching current: Ie/AC15 Ue400V; 50...60Hz e/DC13 220V=	A	1 0,5	1 0,5
14.	Permissible overload of setting temperature	°C	20	20
15.	Permissible medium pressure	MPa	6,3	6,3
16.	Mass	kg	0.5	0.5

3. ORDERING METHOD AND EXAMPLE OF ORDERING

Order should contain the following data:
Temperature switch type, e.g. ERT -01-00,

4. MAINTENANCE INSTRUCTION

4.1. ASSEMBLY INSTRUCTION

Switches may be installed in closed rooms or at least protected from weather conditions: rain, snow, etc., and free from excessive chemical exhalations.

Switches are in the factory equipped with connection terminals, used for welding the impulse pipe. Impulse pipe is the controller fixing element.

Switches may operate in any position.

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4.2. STARTING AND SERVICE INSTRUCTION

4.2.1 Preparing products for starting

Switches may be installed in closed rooms or at least protected from weather conditions: rain, snow, etc., and free from excessive chemical exhalations.

Electric temperature switch should be assembled on regulation objects to whole sensor is submerged in the liquid.

Switches may operate in any position.

To make the thread M24x1,5 on the wall of the tank, the pipe or welding the threaded sleeve for built-in the temperature switch. Assembly the switch by screwing the sensor's nut into threaded hole and pressing down the sealing insert. Regulated circuit has to be turned on into electric contacts (pins) of switch, checking first if the current and voltage don't exceed value given in the Table no. 1 (point 2. Technical Data).

4.2.2 Maintenance instruction

After installation, connecting electric circuit and checking its operation, the switches do not require further operation.

4.3 CONSERVATION INSTRUCTION

Two-term electric temperature switch should be checked not often than once a year. Conservation includes electric connecting terminals, protection of regulation screw and assembly of switch.

4.4. INDUSTRIAL SAFETY INSTRUCTION



Workers who make assembly of temperature switches on objects should have general knowledge of safety instruction and this Technical Product Documentation. Assembly can't be making if system is live.

Temperature switch might be zeroing or grounding – it depends on kind of object.

Marking screw helps in make mentioned actions.

5. STORAGE AND TRANSPORT TERMS

Switches received from the producer should be stored in rooms free from chemical exhalations and assuring environment temperature from 5 to 30°C and relative humidity from 30 to 80%.

The switch technical condition should be checked at least once a year.

Switches should be stored in the package, assuring protection from mechanical damages.

Switches should be transported in the packages. Pay attention for immobilizing the switches during transport.

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6. SETS DELIVERY

Pressure switch ERT-01- should be accompanied with:

- ☐ Technical product documentation,
- ☐ Guarantee card

7. GUARANTY TERMS

Guaranty terms are determined in guarantee card of Manufacturer – Controlmatica ZAP-PN EFAL Sp. z o.o., Ostrów Wlkp., Poland – guarantee card is added to the each piece of temperature switch.

ATTENTION: The right of introducing design changes in the product, without deteriorating of its operation parameters, is reserved.

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