APATOR METRA

ELECTRONIC HEAT COST ALLOCATOR

E-ITN 10

Installation and service manual

TABLE OF CONTENTS

1. INTRODUCTION

E-ITN 10 is modern electronic device intended for ratio based allocation of heat cost in buildings with central heating system.

The heat cost allocator E-ITN 10.4 uses one (E-ITN 10.41) or two temperature sensors with surrounding temperature sensor is used for start only (E-ITN 10.42). Allocators E-ITN 10.5x, E-ITN 10.6 and E-ITN 10.7x are based on the two-sensor measuring principle. Using this principle, allocator ensures measurement of consumption value only when the radiator really emits heat (i.e. it does not measure in the summer).

E-ITN 10 is intended to be installed in one-tube horizontal/vertical and two-tube heating systems with the lowest mean design heating medium temperature ≥ 35 °C or 55 °C (depending on type of the allocator, see chapter 3. Technical specifications) and mean design heating medium temperature ≤ 90 °C.

Each radiator in billing (account) unit with common invoicing heat meter must be equipped with a heat cost allocator of the same type. Technical conditions of heating system must be fulfilled when using heat cost allocators E-ITN 10.

E-ITN 10 is not intended for heat cost allocation for floor heating systems, ceiling radiant heating, flap controlled radiators, radiators with fan, systems with steam heating medium, air heaters and single tube radiators if exceeds the scope of one user. It must not be also used for heating elements that shape and design does not allow reliable transfer of heat to heat cost allocators.
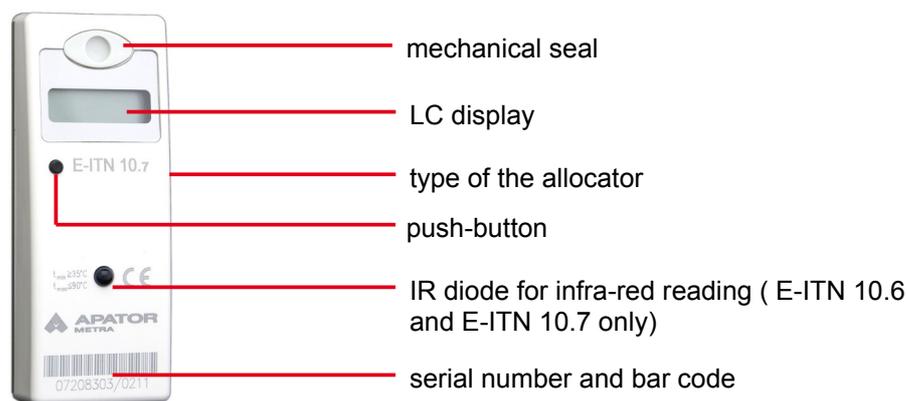
Illustration 1: E-ITN 10

1.1. LC DISPLAY

Basic allocator status and measured values can be displayed on LCD. LCD can display five alphanumeric characters. These values are highlighted by underline and overline in following text, e.g. $\overline{\underline{395}}$.

Meaning of some values may be different if the additional symbol „SM" at the right bottom corner is displayed. These values are mentioned with „SM" symbol in text , e.g. $\overline{\underline{385\ SM}}$.

The last symbol on the display indicate end of the battery life, see chapter 4.5.4. Last year of battery life.

Illustration 2: LC display

To save the battery, after longer period of inactivity (approx. 1 min.), energy-saving mode is activated and display is switched off. Display can be activated by pushing the button (Illustration 1: E-ITN 10).

When pushing the button briefly, notice $\overline{\underline{----}}$ on the display will appear. If the button is not pushed in 1 minute, the display will switch off.

The data displayed on the LCD display may vary depending on the type of the allocator and also on the active operating mode. For more information, see below.

2. DEVICE DESCRIPTION

Installation of allocator consists of mounting of base plate made from aluminium alloy on the radiator, placing of allocator on the base plate, attaching with screw M3x8 and securing with mechanical seal.

The device is resistant against cheating. If any cheating is detected (fully two-sensor types E-ITN 10.5x, E-ITN 10.6 and E-ITN 10.7) allocator switches to the one-sensor mode inconvenient for the user – when cheating is finished, the allocator switches to standard mode.

2.1. TYPE E-ITN 10.41

Allocator uses the one-sensor measuring principle and is equipped with unified scale. No parameters (e.g. parameters related to radiator type, nominal output or coefficient K_C) are set before installation on the radiator. Billing period is year. Allocator can be read only visually.

2.2. TYPE E-ITN 10.42

Allocator uses the two-sensor measuring principle (sensor of surrounding temperature is used for start only, measuring is based only on data from sensor of radiator temperature) and is equipped with unified scale. Conditions for registration start (e.g. parameters related to radiator type, nominal output or coefficient K_C) are set before installation on the radiator. Billing period is year. Allocator can be read only visually.

2.3. TYPE E-ITN 10.51

Allocator uses the two-sensor measuring principle and is equipped with unified scale. For proper evaluation of measured data, it is necessary to set radiator type (in production or manually). Billing period is year. Allocator can be read only visually.

2.4. TYPE E-ITN 10.52

Allocator uses the two-sensor measuring principle and is equipped with unified scale. For proper evaluation of measured data, it is necessary to set radiator type (in production or manually). Billing period is month. Allocator can be read only visually.

2.5. TYPE E-ITN 10.6

Allocator is equipped with individual scale. For proper evaluation of measured data, it is necessary to set:

- radiator type (Kc)
- radiator nominal output (M)
- evaluation coefficient (K_{CHF}) describing heat contact with sensor of radiator temperature

Parameter can be set by manufacturer or before installation with *Programming unit for changing allocator parameters of E-ITN 20.x, 30.x* connected to PC. Radiator type (Kc) can be set in sleeping mode by pressing the button. E-ITN 10.6 can be ordered after agreement with manufacturer only.

Billing period is year.

2.6. TYPE E-ITN 10.71

Allocator uses the two-sensor measuring principle and is equipped with unified scale. For proper evaluation of measured data, it is necessary to set radiator type (in production or manually). Billing period is year. Allocator can be read visually or using infra-red reading device.

2.7. TYPE E-ITN 10.72

Allocator uses the two-sensor measuring principle and is equipped with unified scale. For proper evaluation of measured data, it is necessary to set radiator type (in production or manually). Billing period is month. Allocator can be read visually or using infra-red reading device..

3. TECHNICAL SPECIFICATIONS

Application	min. temperature of the heating medium $t_{min} \geq 55$ °C (E-ITN 10.4x)
	min. temperature of the heating medium $t_{min} \geq 35$ °C (E-ITN 10.5x, 10.6, 10.7x)
	max. temperature of the heating medium $t_{max} \leq 90$ °C
Measuring principle	one-sensor measuring principle (E-ITN 10.41)
	one-sensor measuring principle with starting sensor (E-ITN 10.42)
	two-sensor measuring principle (E-ITN 10.5x, 10.6, 10.7x)
Conditions for registration	temperature of the sensor of the radiator temperature ≥ 28 °C (E-ITN 10.41)
	temperature of the sensor of the radiator temperature ≥ 20 °C, difference of mean temperature of heating medium and surroundings temperature ≥ 4 °C (E-ITN 10.42)
	temperature of the sensor of the radiator temperature ≥ 23 °C, difference of mean temperature of heating medium and surroundings temperature ≥ 4 °C (E-ITN 10.5x, 10.6, 10.7x)
	Note: For E-ITN 10.41 and E-ITN 10.42 conditions for registration can be set differently depending on values in setting protocol
Billing period	year (E-ITN 10.4x, 10.51, 10.6, 10.71)
	month (E-ITN 10.52, E-ITN 10.72)
Resulting rating factor K	unified scale, K = 1 (E-ITN 10.4x, E-ITN 10.5x, E-ITN 10.7x)
	individual scale (E-ITN 10.6)
Calendar functions	E-ITN 10.4x, E-ITN 10.5x • consumption value in the last billing period • for last 24 moths: month values E-ITN 10.6 • for the last billing period: consumption value, average surroundings temperature, number of measuring cycles in single-sensor mode, max. radiator temperature, max. temperature date, min. radiator temperature, min. temperature date • for last 12 months: month values E-ITN 10.71 • consumption value in the last billing period • for last 12 months: month values, min., aver. and max. radiator temperature, average surroundings temperature, number of heating days E-ITN 10.72 • consumption value in the last billing period • for last 12 months: month values • for last 6 months: min., aver. and max. radiator temperature, number of heating days

Display	5 digits LCD + 2 special symbols
Protection against cheating	mechanical seal with billing company label continuous control, when thermal influence is detected, allocator is switched to single-sensor mode (E-ITN 10.5x, 10.6, 10.7x)
Data reading	visual infra-red (E-ITN 10.6, 10.7x only)
Data backup	daily backup of measured values including real time
Function control	automatic, can be activated and controlled by user
Dimensions	97 x 37 x 23 mm
Power supply	lithium battery 3,0 V
Material	ABS / Al – F22
IP code	IP 42
Conformity	ČSN EN 834
Data available via infra-red interface (for exact data structure see manual for decoding software)	E-ITN 10.6 • reading date • serial number • date of billing period beginning • value for the last billing period • alphanumeric code for the last billing period • month values in last 11 months • average surroundings temperature for the last billing period • number of measuring cycles in single-sensor mode for the last billing period • max. radiator temperature in last billing period • day when the max. temperature was achieved • min. radiator temperature in last billing period • day when the min. temperature was achieved E-ITN 10.71 • reading date • serial number • date of billing period beginning • value for the last billing period • alphanumeric code for the last billing period • monthly values in last 11 months • actual value • max. radiator temperature in last 11 months • min. radiator temperature in last 11 months • average radiator temperature in last 11 months • average surroundings temperature in last 11 months • number of days in month when conditions for measuring were fulfilled in last 11 months

	E-ITN 10.72
	- reading date - serial number - date of billing period beginning - value for the last billing period - alphanumeric code for the last billing period - monthly values in last 11 months - value for the last year - max. radiator temperature in last 5 months - min. radiator temperature in last 5 months - average radiator temperature in last 5 months - number of days in month when conditions for measuring were fulfilled in last 5 months - alphanumeric code for the penultimate billing period and 5 previous billing periods

3.1. CONSTRUCTION

Electronic heat cost allocator E-ITN 10 complies with ČSN EN 834:1995.

Allocator consist of cover and printed circuit board with spring and push-button. Cover is made from plastic material. There are marked values of the lowest and highest heating medium temperature, manufacturer's mark, type of the allocator, serial number (both as number and bar code) and optionally the partner's mark on the cover. The base plate is made of aluminium alloy to ensure of a good thermal contact with the radiator.

To install the heat cost allocator, place it at the lower end of the aluminium back plate, push up so that the locks in the housing fit in the aluminium back plate and fix allocator with bolt M3x8 in this position. Then secure the device with seal (marked seal should be inserted into the holes in the upper part of the allocator) against unauthorized manipulation. Now the heat cost allocator can only be uninstalled after breaking the seal.

Devices are equipped with a 16-bit microprocessor with extremely low current consumption and powered by lithium battery. The accuracy of the measuring circuit is independent of the battery voltage. The LCD-display has 5 large main digits separated by dots and two special symbols.

Warning!

Spring on the printed board circuit is intended to maintain the good contact between temperature sensor and base plate. Do not change the temperature sensor position or prestress of the spring.

---

4. OPERATION MODES

4.1. OPERATION MODES

The allocator can be in four operation modes:

- sleeping mode
- mode of waiting for start date
- working mode
- error mode

4.2. SUBMENU NAVIGATION

The allocator contains a simple submenus (depending on current operation mode), that allow to obtain additional informations or perform other activities.

To switch between individual items of menu, push the button briefly. To enter the submenu, choose relevant item and hold the button (approximately 2 seconds) until --A-- appears on LCD. When you release the button, designation of the 1st submenu item appears. Move in menu by short presses of the button. If the button is not pushed for 10 seconds, the LCD returns to the main menu.

Activation process of item is the same as entering the submenu. Find the relevant item and hold the button (for approximately two seconds), till notice --A-- on the LCD appears.

Movement in options is the same – briefly press the button. Selected option confirmation as well – by long (approx. 2 s) press of the button, till notice --A-- appears on LCD.

4.3. SLEEPING MODE

Allocator consumption is reduced to a minimum since no measuring and no calculations are carried out and furthermore allocator does not transmit the data. Sleeping mode is suitable for prolonged storage prior to allocator use. The storage period should not exceed one year.

In sleeping mode allocator allows the following operations:

- displaying of set radiator type (E-ITN 10.5x, 10.6, 10.7x only)
- setting of radiator type (E-ITN 10.5x, 10.6, 10.7x only)
- activation of working mode
- allocator self test

Sleeping mode is indicated with notice uPr on the display. If the display does not show any value or notice (due power saving), press the button briefly to switch LCD on.

4.3.1. Submenu structure in sleeping mode

When notice uPr appears, hold the button till notice --A-- is displayed and indicates sub menu activation. Submenu activation and navigation in the items is described in chapter 4.2. Submenu navigation.

Table 1: Submenu structure in sleeping mode, type E-ITN 10.4x

Allocator self test	ti
Activation of working mode	Act

Table 2: Submenu structure in sleeping mode, type E-ITN 10.5x, 10.6, 10.7x

Radiator type (e.g. 2)	tot 2
Setting of radiator type	ntt
Activation of working mode	Act
Allocator self test	ti

4.3.1.1. *Activation of working mode*

If the allocator is in a sleeping mode, working mode can be activated using button. For activation of working mode, sub menu item Act is used.

Working mode activation:

1. Switch to sub menu in sleeping mode.
2. When notice Act appears, press and hold the button till notice --A-- is displayed. When you release the button, first menu item is displayed: chapter 4.5.1. Menu structure in working mode.

4.3.1.2. *Allocator self test*

Allocator self test is used for control of all LCD segments and to test A/D converter for temperature measurement. We can run the test in sleeping mode, working mode and also in mode of waiting for start date. Option is located in sub menu whose activation was described above.

To start the test:

1. Switch to submenu item marked as ti (allocator test) with brief press of the button.
2. While ti is displayed, press and hold the button, till notice --A-- appears.
3. Allocator self test has three phases. 1st phase: all segments are turned on $\boxed{8.8.8.8.8 \text{ BAT} \atop \text{SM}}$. 2nd phase: radiator temperature is displayed, e.g. 36.4°C and in 3rd phase surrounding temperature appears. e.g. 25.4°C SM (or --°C SM for one sensor allocator E-ITN 10.41). Every value is displayed for 2 seconds and LCD is automatically switched into the main menu when self test is completed.

If A/D converter malfunction is detected, allocator switches to fault mode and notice Error is displayed on LCD.

4.3.1.3. *Setting of radiator type (E-ITN 10.5x, 10.6, 10.7x only)*

Switch to the submenu in sleeping mode. Switch to submenu on 2nd item marked as ntt (radiator type setting) with button short presses. While ntt is displayed, press and hold the button, till notice --A-- appears. After button release, notice ot x is displayed (number „x" indicates the selected type of radiator).

Press the button briefly to browse in radiator types and than choose the right one. Confirm selected type of radiator with long press (hold the button till --A-- is displayed). After button release submenu item tot x appears (number „x" gives us selected type of the radiator).

Table 3: Radiator setting – options

Steel plate radiator with vertical offsets	ot 0
Steel plate radiator with smooth front panel	ot 1
Steel segmented radiator	ot 2
Cast iron segmented radiator	ot 3
Universal, average value 0 to 3 (E-ITN 10.6 only)	ot 4

4.4. MODE OF WAITING FOR START DATE

This mode is suitable when you require to start multiple allocators on the same date. In this mode, the allocator regularly updates real time and compares current date with start date. When the start date is reached, the allocator will start measuring (switch to working mode).

Mode of waiting for start date is indicated with notice: e.g. o 1.12. (date indicates the date of start). If the display does not show any indication (because of power saving), press the button briefly to switch it on.

In mode of waiting for start date, following actions can be performed:

- displaying of set radiator type (E-ITN 10.5x, 10.6, 10.7x only)
- allocator self test

4.4.1. Submenu structure in mode of waiting for start date

For submenu activation and navigation between items see chapter 4.2. Submenu navigation. Allocator self test activation is described in chapter 4.3.1.2. Allocator self test. Radiator type selection for E-ITN 10.5x, 10.6, 10.7x is described in chapter 4.3.1.3. Setting of radiator type (E-ITN 10.5x, 10.6, 10.7x only).

Table 4: Submenu structure in mode of waiting for start date, type E-ITN 10.4x

Allocator self-test	ti

Table 5: Submenu structure in mode of waiting for start date, type E-ITN 10.5x, 10.6, 10.7x

Radiator type (e.g. 2)	tot 2
Allocator self-test	ti

4.5. WORKING MODE

In working mode allocator performs temperature measurement, calculates the increase of value (if measurement conditions are met), transmits measured data, updates real-time and makes some other actions in regular intervals.

4.5.1. Menu structure in working mode

If nothing is displayed press the button briefly.

Table 6: Submenu structure in working mode, type E-ITN 10.4x, 10.5x, 10.7x

Value for current billing period	245
Value for last billing period	458 SM
Alphanumerical code for last billing period	A.0.i.h.t.
Serial number – first part	-0700
Serial number – second part	0060-
* Radiator temperature	53.3°C
* Surroundings temperature – E-ITN 10.42, 10.5, 10.6, 10.7x – E-ITN 10.41	26.7°C SM --°C SM
* Date of billing period beginning – E-ITN 10.4x, 10.51, 10.71 – E-ITN 10.52, 10.72	u 1.12. dF 1.
* Current date	10.12.
* Current time	12-45

Note: menu items marked as * are optional, see chapter 5.1. Allocator parameters setting.

Table 7: Submenu structure in working mode, type E-ITN 10.6

LCD test	8.8.8.8.8. BAT SM
Current date	10.12.
Start of the billing period	u 1.2.
Value for last billing period	458 SM
Alphanumerical code	A.0.i.h.t.
Average surroundings temperature for last billing period	23.7°C SM
Value for current billing period	245

4.5.1.1. Value for current billing period

Value for current billing period is displayed as 389 (without insignificant zeros). It is calculated from the beginning of the current billing period.

4.5.1.2. Value for the last billing period

Value for the last billing period is displayed as $\overline{3258\ \text{SM}}$. Transfer of measured value for actual billing period to value for the last billing period is performed, when new billing period is achieved in 00:00:00.

4.5.1.3. Alphanumerical code

5 digit alphanumeric code comprises from numbers and letters mentioned from following set: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, b, c, d, E, F, h, i, J, L, n, o, P, r, t, u.

On LCD it is displayed e.g. $\overline{\text{A.0.i.h.t}}$. Alphanumerical code is created when transfer of measured value for actual billing period to measured value for last billing period is performed. If transfer of measured value was never done before, $\overline{..-.-..}$ appears on the display (alphanumeric code value is not available).

Alphanumerical code is generated for every consumption value in last billing period and every code is unique. Code is also different for every billing period even for the same allocator.

This can be useful if measured values are reported by tenant directly without entering billing company employee. Further check of consumption values can be done with decoding software EITN-10. For more information refer to Installation and service manual for decoding software EITN-10.

4.5.1.4. Serial number (E-ITN 10.4x, 10.5x, 10.7x only)

Serial number is 8 digit figure and it is also labelled on the cover. Serial number is divided in two parts. E.g. serial number „32000015" is displayed as figure $\overline{-3200}$ and $\overline{0015-}$. Symbol „ - " distinguish between first and second part of the serial number.

4.5.1.5. Temperature of the radiator sensor (E-ITN 10.4x, 10.5x, 10.7x only)

Temperature of the radiator sensor is displayed as $\overline{45.9°C}$ with accuracy of one decimal place.

4.5.1.6. Temperature of the surroundings sensor (E-ITN 10.4x, 10.5x, 10.7x only)

Temperature of the surroundings sensor is displayed as $\overline{26.7°C\ \text{SM}}$ with accuracy of one decimal place.. One sensor allocator E-ITN 10.41 display $\overline{--°C\ \text{SM}}$ only .

4.5.1.7. Date of the billing period beginning

Beginning of the billing period is displayed as $\overline{\text{u 1.2.}}$ (year versions) or as $\overline{\text{dF 15}}$ (month versions). After the date is reached, allocator transfers value for current billing period to value for last billing period and alphanumeric code is generated at 00:00:00 .

Beginning of the year billing period can be set by manufacturer or with *Programming unit for changing allocator parameters of E-ITN 10.4, 10.5, 10.6, 10.7* connected to PC or notebook to any required date.

4.5.1.8. Current date

Current date is displayed as $\overline{3.12.}$. Calendar takes leap years into account.

4.5.1.9. Current time (E-ITN 10.4x, 10.5x, 10.7x only)

Current time is displayed in 24 cycle, e.g. $\overline{8\text{-}56}$ (8:56 AM). Summer time is not distinguished.

4.5.1.10. Display test (E-ITN 10.6 only)

During display test all segments are turned on $\boxed{8.8.8.8.8.\ \text{BAT}_{\text{SM}}}$. The test is important when the measured values are read visually.

4.5.1.11. Average surroundings temperature for the last billing period (E-ITN 10.6 only)

Average surroundings temperature is displayed as $\overline{24.4°C\ \text{SM}}$ with accuracy of one decimal place.

4.5.2. Month consumption values

Month consumption values (value at the end of the month) can be displayed for E-ITN 10.4 and 10.5 up to 23. month back from current date, for E-ITN 10.6 and 10.7 up to 11. month back from current date, for more information see chapter 3.Technical specifications.

4.5.2.1. Activation of the submenu with month values (E-ITN 10.4x, 10.5x, 10.7x only)

Enter submenu from the main menu. When the display is on and 1st menu item is displayed (value for the current billing period, e.g. $\overline{389}$), press and hold the button, till notice $\overline{--A--}$, is displayed. After button release, 1st submenu item $\overline{du}$ is displayed (month values).

Table 8: Submenu structure in working mode, type E-ITN 10.4x, 10.5x, 10.7x

Month values	$\overline{\overline{du}}$
Type of the radiator (e.g. 2), 10.5x, 10.7x only	$\overline{tot\ 2}$
Allocator self-test	$\overline{\overline{ti}}$

To switch between the submenu items, press the button shortly. If the button is not pressed in 20 seconds, allocator switches back to the main menu and the 1st item is displayed.

When submenu item „month value" $\overline{du}$ is displayed, press and hold the button till $-\overline{A}--$ appears. After release, current month number e.g. $\overline{10.07}$ (10 – month number, 07 – last two digit of the year) is be displayed.

Procedure how to run allocator test is described in chapter 4.3.1.2. Allocator self test.

4.5.2.2. Activation of the submenu with month values (E-ITN 10.6 only)

Enter submenu from the main menu. When the display is on and menu item „value for the last billing period" is displayed (e.g. $\overline{3258\ SM}$) press and hold the button, till notice $\overline{--A--}$ is displayed. After release, current date e.g. $\overline{10.07}$ (10 – month 07 – last two digits of the year) is displayed.

4.5.2.3. Structure of submenu with month values

Except current moth, values correspond with measured values at the end of the month from the beginning of the billing period.

Table 9: Structure of submenu with month values

m0 – current moth, r0 - last two digits of the year	„m0. r0"
x0 – value for current billing period	„x0"
m1 – last month, r1 - last two digits of the year	„m1. r1"
x1 – value at the end of the last month	„x1"
…	…
m11 - x. month back, r11 - last two digits of the year	„m11. r11"
x11 – value at the end of the xth month back	„x11"

Total number of displayed items is 24 (E-ITN 10.4x, 10.5) or 12 (E-ITN 10.6, 10.7x)

To switch between submenu items, press the button shortly. To end this submenu, do not press the button for 20 seconds, allocator will switch back to the main menu. Also the long button press can be used to exit. Press and hold the button till $\overline{--A--}$ appears. Then 1st menu item „du" (E-ITN 10.4x, 10.5x, 10.7x) or item „display test" (E-ITN 10.6) will appear.

4.5.3. Menu structure in service mode (E-ITN 10.6 only)

Allocator can be switched into service mode by following procedure: when item „LCD test" ( ) is displayed, press and hold the button, till notice $-\overline{A}--$ appears. After release allocator will switch into the service mode.

Table 10: Menu structure in service mode, type E-ITN 10.6

Number of measuring cycles in single-sensor mode	7526. SM
Max. temperature of radiator sensor in last billing period	61.9°C SM
Date when max. temperature of radiator sensor in last billing period was reached	3.12. SM
Min. temperature of radiator sensor in last billing period	25.4°C SM
Date when min. temperature of radiator sensor in last billing period was reached	12.12. SM
Value for penultimate billing period	3258 SM

Values are not displayed in 6 s intervals like in user mode, it is necessary to press the button shortly to see next value. If button is not pressed for 20 s, allocator switch back to the user mode. Switching to user mode can be speed up by button long press (press and hold the button till --A-- appear on the display.

4.5.3.1. *Number of measuring cycles in single-sensor mode*

Number of measuring cycles is single-sensor mode in last billing period is displayed as e.g. 7526 SM (without meaningless zeros). Maximal displayable value is 99 999. If this value is exceeded, E SM is displayed.

4.5.3.2. *Max. temperature of radiator sensor in last billing period*

Maximal temperature of radiator sensor in last billing period is displayed as e.g. 61.9°C SM with accuracy to one decimal place.

4.5.3.3. *Date when the max. temperature of radiator sensor in last billing period was reached*

Date when the maximal temperature of radiator sensor was reached is displayed as e.g. 3.12. SM.

4.5.3.4. *Min. temperature of radiator sensor in last billing period*

Minimal temperature of radiator sensor in last billing period is displayed as e.g. 25.4°C SM with accuracy to one decimal place.

4.5.3.5. *Date when the min. temperature of radiator sensor was reached in last billing period*

Date when the minimal temperature of radiator sensor was reached is displayed as e.g. 12.12. SM.

4.5.3.6. *Value in penultimate billing period*

Value in penultimate billing period is displayed as e.g. 3258 SM. Value will be overwritten at 00:00:00 when the new billing period begins.

4.5.4. Last year of battery life

Battery lifetime is programmed in the microprocessor memory and the last year of battery lifetime is indicated on LCD by blinking of the special symbol: BAT. After finishing this time the symbol stays displayed permanently. Calculated battery lifetime is 10 years + 1 year reserve.

4.6. ERROR MODE

In error mode the notice Error is permanently displayed and allocator does neither measure temperatures, count the increase of consumption nor transmit measured data. Allocator just actualizes real time. Allocator switches from working mode to error mode automatically after registration of serious error (e.g. fault in A/D converter, when the power supply of microprocessor was interrupted and loss of data in RAM memory occurred, etc.).

Allocator backups important data to permanent memory daily. Data in this memory are saved even if the power supply is interrupted. Even in the case of battery failure these data are not lost. Saved data could be read by special tools.

5. OTHER INFORMATIONS

5.1. ALLOCATOR PARAMETERS SETTING

Basic settings as per Setting protocol is done by manufacturer. Parameters can be changed later with Programming unit for changing allocator parameters of E-ITN 10.4, 10.5, 10.6, 10.7 connected to PC. Settings or parameters adjustment can be performed only via built-in interface that is available only when allocator is opened (disassembled from back plate).

5.2. TRANSPORTATION

E-ITN 10 allocators can be transported under following conditions:

- devices can be transported by all usual covered means of transport
- devices must be in original package
- originally packed devices must be stored and secured to avoid mechanical damages during transportation
- devices can not be transported together with aggressive substances
- temperature during transportation from -10 °C to +55 °C
- relative humidity from 45 % to 75 %

5.3. STORAGE

E-ITN 10 is an electrical device and can be stored under these conditions:

- devices must be originally packed by manufacturer and individually stored in antistatic bags
- storage temperature from +10 °C to +30 °C
- relative humidity from 45 % to 75 %
- devices must be stored in clean covered areas without aggressive substances and stored properly to avoid mechanical damage

5.4. APPLICATION AND DISPOSAL

"This device is subject to a waste management in accordance with local legislation."

5.5. DEFECTS AND THEIR ELIMINATION

Any E-ITN 10 defect should be repaired by manufacturer only.

5.6. WARRANTY

If device E-ITN 10 is installed and handled according to manufacturer instructions mentioned in Installation and service manual, manufacturer provide warranty under the valid legislation unless agreed differently.

The warranty is void if device was used contrary to Installation and service manual or damaged:

- during transport or storage by customer or reseller
- when mounted or dismantled to the customer device
- because of improper handling or installation into other device than agreed in manual
- if the product was exposed to different environment than agreed in manual
- if mechanically or in other way damaged by user

6. ACCOMPANYING DOCUMENTATION

6.1. ORDERING

Order must include Setting protocol that is available on the website for business partners. In every order following items must be specified:

- quantity
- type
- attach Setting protocol – if column "required value" is empty, default values are set
- spare parts (extra pieces)
- delivery date
- method of transport

Order example: 100 pcs E-ITN E-ITN 10.71, required delivery 28.2.2012, EXW + filled Setting protocol.

6.2. PACKING

Allocators are disassembled and packed in the boxes, packing sheet is included in every box (see Illustration 3: Packing sheet) with mark of the producer, device type, number of items and their serial numbers, packing date and the name of the operative who checked and packed the products. The lids of boxes are marked with label "THIS SIDE UP!". The boxes are non-returnable. Boxes are stored always cover up on the standard shipping pallets.

Electronic heat cost allocator E-ITN 10 is sensitive to static electricity. For this reason, each allocator is shipped in antistatic packaging. Antistatic package should be removed just before installation.

APATOR METRA

PACKING SHEET

Production order:

Product: Electronic heat cost allocator **E-ITN**

Serial numbers		
Month / year of production	**Initial serial number**	**Final serial number**

Package content	
Part	**Quantity**
Allocator body	
Base plate	
Seal (E-ITN 10.x only)	

Mounting material					
Type	**Quantity**	**Type**	**Quantity**	**Type**	**Quantity**
0001		0008		0052	
0002		0009		0053	
0003		0010		0054	
0004		0011		0055	
0005		0012		0056	
0006		0051		0057	

Packed by:		
Date of packing:	Signature:	
Controlled by:		
Date of control:	Signature:	

In case of material shortage (excess), please mention also responsible employee in complaint protocol.

2012/08a [EN]

Illustration 3: Packing sheet

E-ITN 10 INSTALLATION

7. INSTALLATION METHODS

7.1. ALLOCATOR INSTALLATION

The back plate is mounted on the radiator using mounting material in compliance with EN 834:1995 and with Installation and service manual. Mounting material is provided by manufacturer and supplied with allocator, see chapter 7.3. List of installation material.

Installation can be done only by person professionally trained by the manufacturer.

Warning!

Static electricity is harmless for humans but can seriously damage electronic devices. When handling or installing the product follow these rules:

• **discharge accumulated static electricity by touching the hand with a grounded metal object (e.g. radiator) before installation,**
• **keep the product in antistatic package until installation,**
• **do not touch the PCB before or during installation,**
• **avoid PCB contact with other items, especially metallic,**
• **never remove PCB from the housing,**
• **do not touch metal parts when handle the product (e.g. temperature sensor body).**

Use only original parts or parts approved by the manufacturer for installation, pay attention to the tightening of mounting material specified torque.

7.2. ALLOCATOR BACK PLATE

The back plate is made of aluminium alloy and designed to have the best heat transfer from the radiator to the allocator. It is necessary to install back plate to the radiator with recommended mounting material to ensure the optimal thermal contact.

The standard back plate is produced with mounting holes, see Illustration 4: Standard back plate.

If agreed with manufacturer, custom back plate version can be produced, e.g. to install the allocators to formerly installed welding bolts on panel radiators.
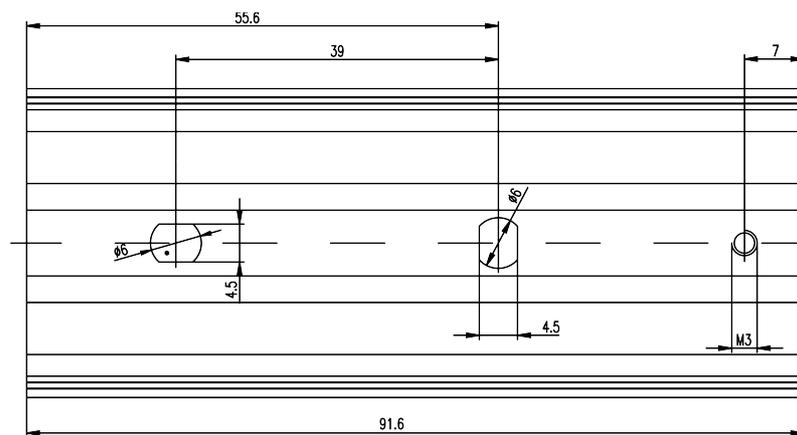

Illustration 4: Standard back plate

7.3. LIST OF INSTALLATION MATERIAL

Mounting material is used to install allocator to the radiator. Manufacturer does not guarantee the accuracy of coefficient Kc when used a different installation material.

Type	Mounting accessories content
0001	bolt M4x25 + serrated lock washer + clamp III
0002	bolt M4x50 + serrated lock washer + clamp IV + spacer 45
0003	bolt M4x35 + serrated lock washer + clamp III
0004	bolt M4x115 + serrated lock washer + clamp III
0005	bolt M4x25 + serrated lock washer + clamp
0006	bolt M4x80 + serrated lock washer + clamp III
0007	bolt M4x115 + serrated lock washer + clamp III
0008	bolt M4x80 DIN 7985A 4.8 shape Z Zn + serrated lock washer + clamp III
0009	2pc nut M3 spec + 2pc serrated lock washer + 1pc clamp FONAL (8 mm)
0011	2pc nut M3 spec + 2pc serrated lock washer + 1pc clamp FONAL (10 mm)
0012	2pc nut M3 spec + 2pc serrated lock washer + 1pc clamp FONAL (12 mm)
0051	2pc bolt M3x6 type G DIN 32 501 AlMg3 + 2pc serrated lock washer + 2pc nut M3 spec.
0052	2pc bolt M3x6 type G DIN 32 501 ST 36-2 + 2pc serrated lock washer + 2pc nut M3 spec.
0053	2pc bolt M3x10 type G DIN 32 501 ST 36-2 + 2pc serrated lock washer + 2pc nut M3 spec.
0054	2pc bolt M3x12 type G DIN 32 501 ST 36-2 + 2pc serrated lock washer + 2pc nut M3 spec.
0055	2pc bolt M3x10 type G DIN 32 501 ST 36-2 + 2pc serrated lock washer + 2pc nut M3 spec. + 1ks clamp
0056	1pc bolt M3x6 type G DIN 32 501 ST 36-2 + 2pcs bolt M4x8 + 1pc nut M3 + 1 pc spacer – register
0057	2 pc bolt M3x8 type G DIN 32 501 ST 36-2 + 2 pc serrated lock washer + 2pcs nut M3

7.4. E-ITN 10 MOUNTING PLACE ON SEGMENTED AND PANEL RADIATORS

Place with suitable relation between the displayed value and the heat emission of the radiator over a sufficiently operating range must be determined for allocator installation. Place of installation must be determined according to the unified criteria in single billing (accounting) unit. E-ITN 10 installation must be permanently protected against manipulation.

Warning: Failure to comply mounting procedure may result allocator malfunction!

7.4.1. Vertical position:

Option 1. - New installation:

Install E-ITN 10 into 75% of the total radiator height (measured from bottom) – in relation to lower hole of back plate. If the height of the radiator is less than 400mm install allocator to 50 % of total height. Variations of the mounting points height must not exceed ± 10 mm.

Option 2. - Installation instead evaporating allocators RTN 01, RTN 02:

E-ITN 10 into 75-80% of the total radiator height (measured from bottom) – in relation to lower hole of back plate. If the height of the radiator is less than 400mm install allocator to 50 % of total height. Place of installation must be determined according to the unified criteria in single billing unit (e.g. 75 % of radiator height). Variations of the mounting points height must not exceed ± 10 mm.

7.4.2. Horizontal position:

For both variants of vertical installation, place E-ITN 10 into the half of length L. In cause of odd number of the spaces, place E-ITN 10 into the gap closer to the end of the radiator, i.e. at radiator with 10 segments between 5. and 6. segment. On radiators with length L>2000 mm or radiators with excessive nominal output install two E-ITN 10.
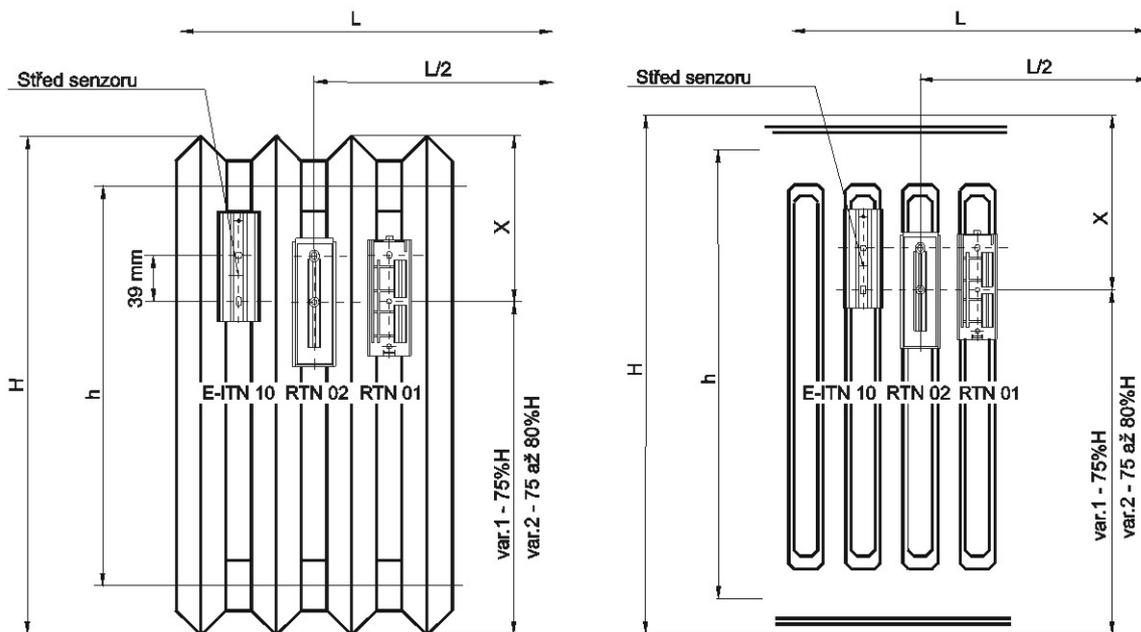

Illustration 5: E-ITN 10, RTN 01, RTN 02 location on segmented and panel radiators
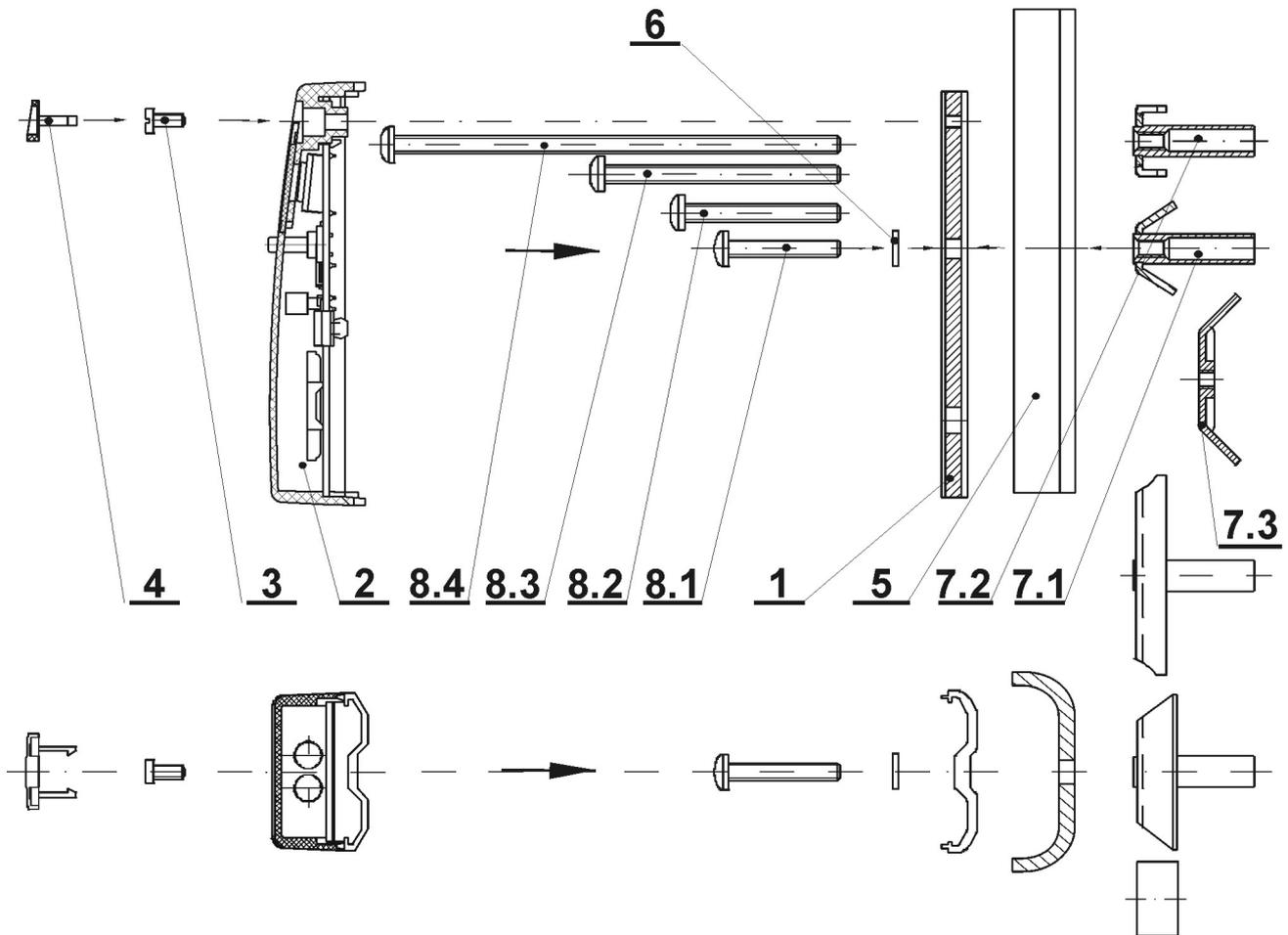
7.5. INSTALLATION ON SEGMENTED RADIATORS

Illustration 6: E-ITN 10 mounting material for segmented radiators

1	Back plate	7.2	Clamp IV
2	Allocator body	7.3	Clamp
3	Bolt M3x8	8.1	Bolt M4x25
4	Seal	8.2	Bolt M4x35
5	Spacer 45	8.3	Bolt M4x50
6	Washer 4 ČSN 02 1746.25	8.4	Bolt M4x115
7.1	Clamp III		

7.5.1. Description of installation

E-ITN 10 back plate should be installed on the radiator with clamps and bolts as follows:
- place back plate into the final location and fix with clamp and bolt through the centre hole,
- tighten to a torque 1 Nm,
- place the allocator into the back plate profile groove from bottom, align it with the base plate and push allocator to connect it with the back plate and fix allocator with bolt M3x8 in this position,
- now secure the device with seal (marked seal should be inserted into the holes in the upper part of the allocator) against unauthorized manipulation.

When using cast iron radiator with a very rough surface (large grain) it is recommended to grind off these grains at the place where back plate will be installed.

After installation, installation protocol has to be filled up (including date of installation, room, type of the radiator, allocator serial number, etc.).

7.5.2. Installation differences

a) When installing on the radiators with difficult access (KALOR 3,TERMO) follow these steps:
- insert the mounting bolt through centre hole of the back plate and screw it on several threads to the clamp,
- slide prepared set from the top between radiator segments (clamp is in upright position) and place in the mounting height,
- tighten the back plate to a torque 1 Nm.

b) For installation on radiators with larger distance between the segments (Svratouch radiator) :
- use clamp IV and insert the spacer 45 under E-ITN 10 back plate (Illustration 6: E-ITN 10 mounting material for segmented radiators).

c) For radiators with solid and long cells, as KUVAL radiators:
- use a screw with a length 80 mm (Illustration 6: E-ITN 10 mounting material for segmented radiators).
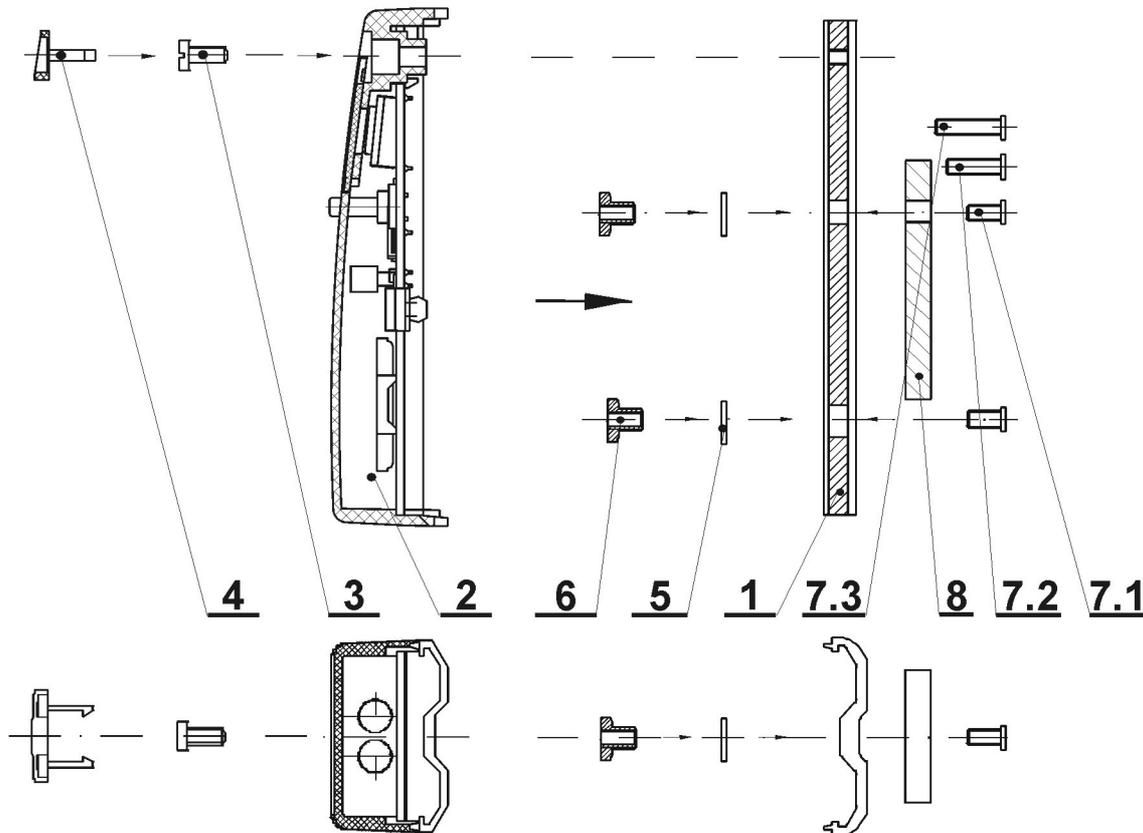
7.6. INSTALLATION ON PANEL RADIATORS

Illustration 7: E-ITN 10 mounting material for panel radiators

1	Back plate	6	Nut M3 spec.
2	Allocator body	7.1	Bolt M3x6
3	Bolt M3x8	7.2	Bolt M3x10
4	Seal	7.3	Bolt M3x12
5	Washer 4 ČSN 02 1746.25	8	Spacer

7.6.1. Installation on panel radiators

E-ITN 10 back plate should be installed on the panel radiators with two welded bolts thread M3 and special nuts as follows:

- mark the place for both welding bolts on the radiator,
- remove the paint within the diameter of 10 mm on the marked places,
- weld the bolts to the radiator with two-head welding pistol,
- if one-head welding pistol is used, second bolt have to be in distance 39±1 mm towards the upper edge of the radiator, remove the paint within the diameter of 10 mm on the marked place,
- attach back plate to the bolts and than to the radiator, screw the nuts to the bolts with socket wrench M7,
- tighten the nuts to a torque 1 Nm,
- place the allocator into the back plate profile groove from bottom, align it with the base plate and fix allocator with bolt M3x8 in this position,.
- now secure the device with seal (marked seal should be inserted into the holes in the upper part of the allocator) against unauthorized manipulation.

After installation, installation protocol have to be filled up (including date of installation, room, type of the radiator, allocator serial number, etc.)

Warning!

Televisions or other devices with screen must be apart at least 2-3 meters from the place welding. Devices must be switched off and disconnected from electrical network. Shock during welding can negatively affect pacemaker. It is necessary to warn the user and explain him requirement of his absence during installation.
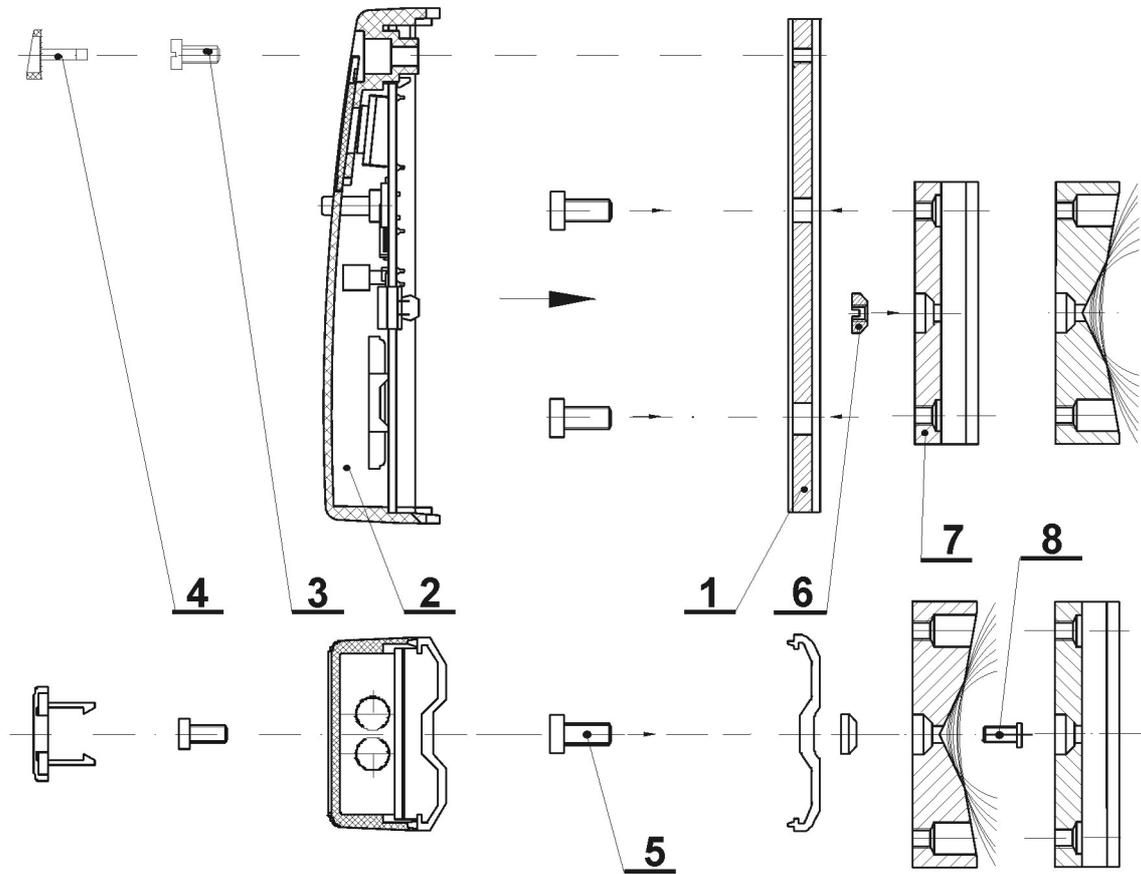

7.7. INSTALLATION ON HORIZONTAL AND VERTICAL REGISTERS

Illustration 8: E-ITN 10 Mounting material for tubular radiators

1	Back plate	5	Bolt M4x8
2	Allocator body	5	Nut M3
3	Bolt M3x8	7	Spacer - register for ø 30 to 110 mm
4	Seal	8	Bolt M3x6

7.7.1. Installation on horizontal and vertical registers

E-ITN 10 back plate should be installed on the tubular radiators with spacer, welded bolt M3x6 and nut M3, and two bolt M4x8:

- mark the place for welding bolt on the radiator
- remove the paint within the diameter of 10 mm on the marked place to see metal surface
- weld bolt M3x6 onto the register pipes with a one-head welding pistol
- place the spacer on the bolts tighten to a pipe that front surface is always perpendicularly to the ground,
- screw the back plate in vertical position to the spacer with two bolts M4,
- place the allocator into the back plate profile groove from bottom, align it with the base plate, push the allocator to connect it with the back plate and fix with bolt M3x8 in this position,
- now secure the device with seal (marked seal should be inserted into the holes in the upper part of the allocator) against unauthorized manipulation.

7.7.2. Proper E-ITN 10 installation on different register types

Horizontal tubes - bare and ribbed:

I. Ribbed tube straight with l ≤ 6 m and bare with l ≤ 12 m
    - 1x E-ITN 10 in the centre of the tubular element

II. Ribbed tube straight with l > 6 m and bare with l > 12 m
    - 2x E-ITN 10 in the beginning and the end of the tubular element

III. Ribbed or bare tube with one curve
    - 1x E-ITN 10 in the beginning of the tubular element arch
    - in case of register welded into the frame, place E-ITN 10 on a vertical tube

IV. Ribbed or bare tube with two curves
    - 2x E-ITN 10 in the beginning of the upper curve and in the end of the lower curve
    - in case of register welded into the frame, place E-ITN 10 on a vertical tube

V. Ribbed or bare tube with more than two curves
    - 2x E-ITN 10 always in the beginning of the upper curve and in the end of the lower curve
    - in case of register welded into the frame, place E-ITN 10 on a vertical tube

VI. Ribbed or bare tubes connected in parallel
    - 2x E-ITN 10 into the middle or approximately to 75% (odd number of tubes) of the height of the tubular element
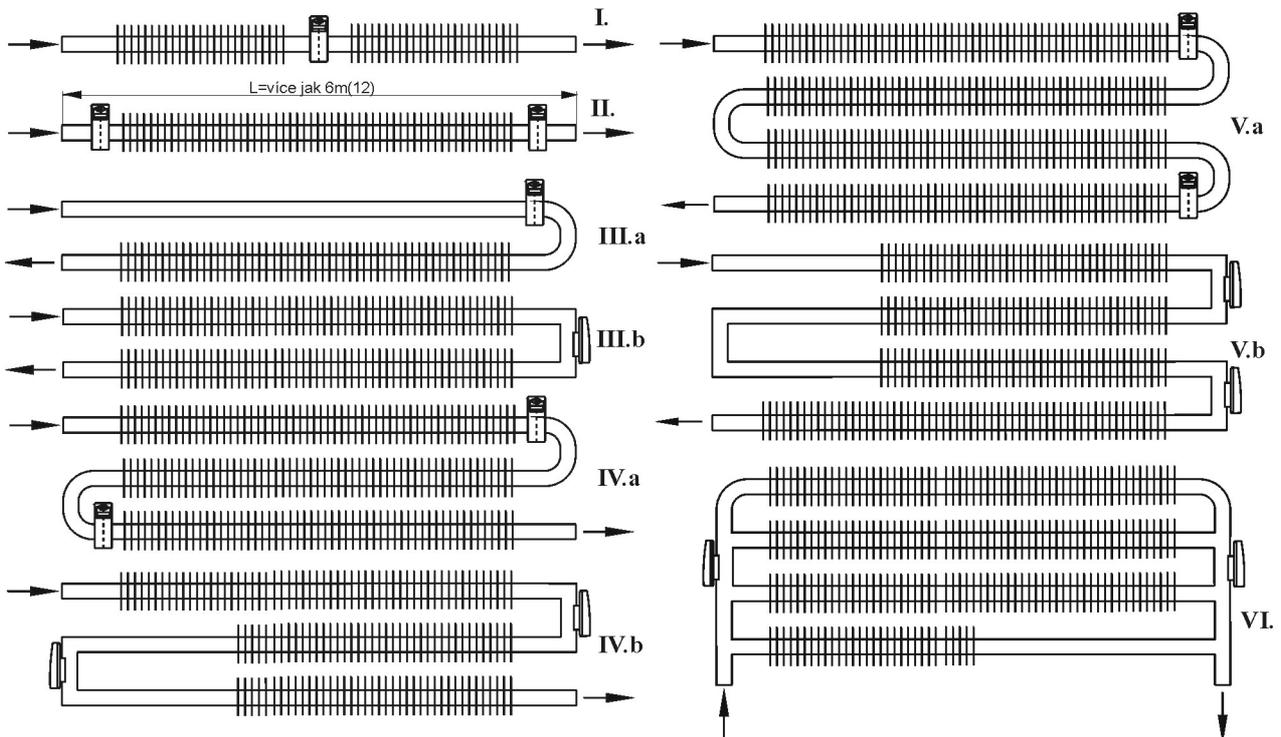

Illustration 9: E-ITN 10 location on horizontal tubular radiators

Vertical bare tubes:

I. Bare tube with one curve
   - 1x E-ITN 10 in the beginning of the tubular element curve
   - in case of register welded into the frame, place E-ITN 10 on a horizontal tube

II. Bare tube with two curves
   - 2x E-ITN 10 in the beginning of the upper curve and in the end of the lower curve
   - in case of register welded into the frame, place E-ITN 10 on a horizontal tube

III. Bare tube with more than two curves
   - 2x E-ITN 10 in the beginning of the first curve and in the end of the (last) upper curve
   - in case of register welded into the frame, place E-ITN 10 on a horizontal tube
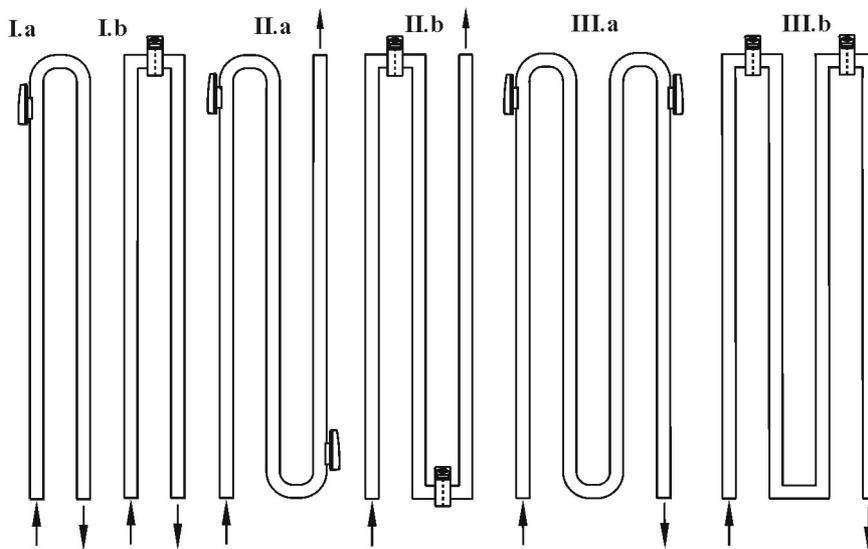

Illustration 10: E-ITN 10 location on vertical tubular radiators

- Two or more small tubes connected in parallel
- 1x E-ITN 10 in 75% of the total height and nearest to the centre of tubular element
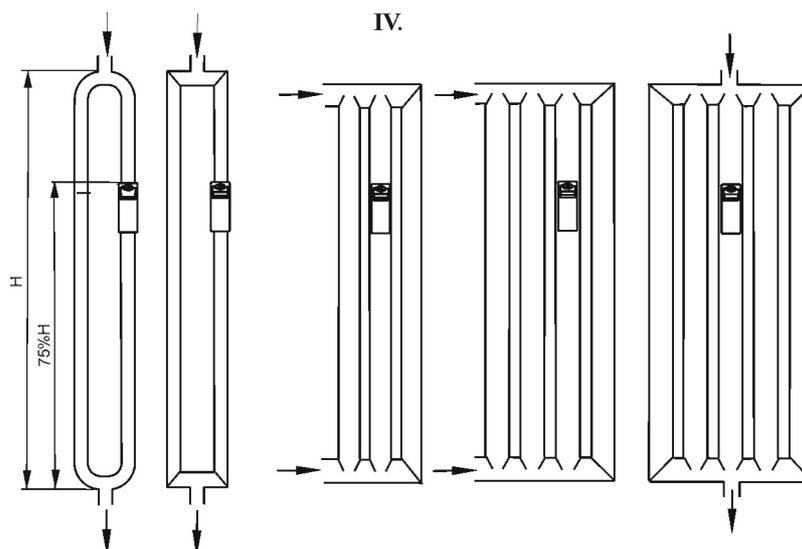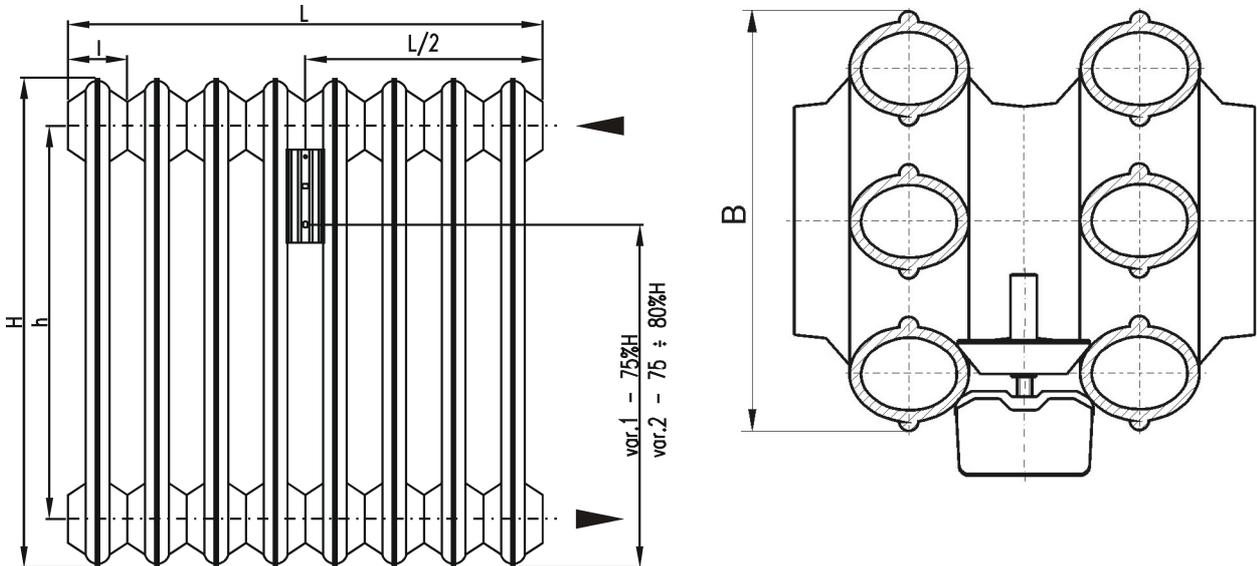

Illustration 11: E-ITN 10 location on vertical tubular radiators

Note: If register does not match with those patterns, ask manufacturer for information.

7.8. MODEL NO. 1 – CAST IRON RADIATORS

Verified on: KALOR 500/110, manufacturer: ŽDB GROUP a.s., plant Viadrus

Basic dimensions of the KALOR – 500x110 for 10 segments, data for correct allocator installation (mm):

Height – H	Mounting distance - h	Length- L	Segment length - l	Depth - B	MM
580	500	600	60	110	0001

Heat output Q_N [W] of the KALOR radiators can be found in manufacturer catalogue: ŽDB GROUP a.s., plant VIADRUS, Bezručova 300, 735 93 BOHUMÍN

Table 11: Types of heating elements belonging to the model group 1

	Type of the radiator	Manufacturer of the radiator	MM
1	KALOR 1	ŽDB GROUP a.s., plant VIADRUS	0001
2	Slávia 500,1000/100	ŽDB	0004
3	Slávia 500,600,1000/150	ŽDB	0004
4	Slávia 300,500,600,1000/200	ŽDB	0004
5	Slávia 300,500,600,1000/250	ŽDB	0004
6	500/150	KUVAL s.r.o Kralovice	0008
7			
8			
9			
10			

7.9. MODEL NO. 2 – CAST IRON RADIATORS WITH FLAT VERTICAL FRONT PANEL

Verified on: KALOR 3, manufacturer: ŽDB GROUP a.s. , plant Viadrus

Basic dimensions of the KALOR 3 for 10 segments, data for correct allocator installation (mm):

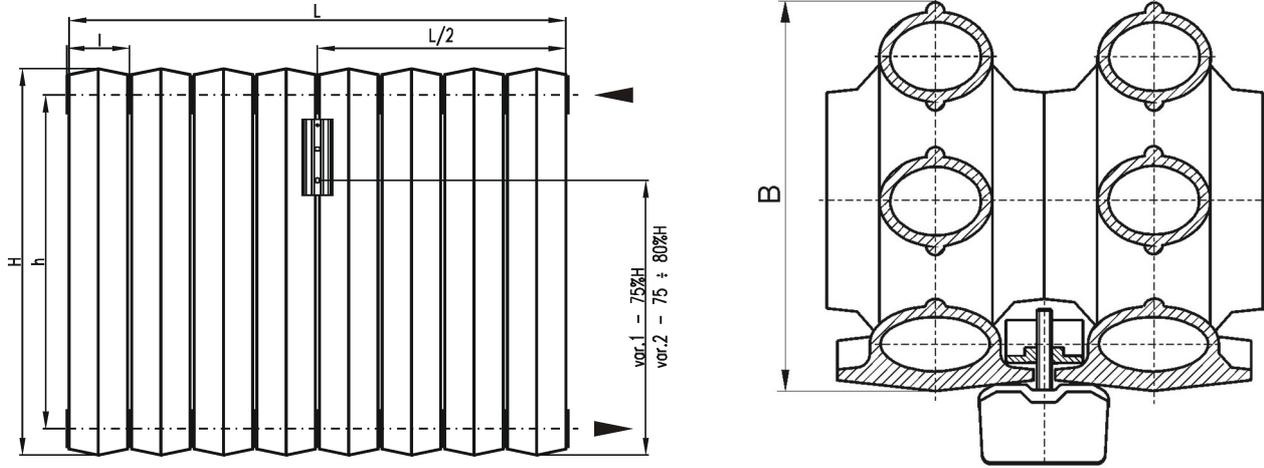| Length - H	Mounting distance – h	Length- L	Segment length - l	Depth - B	MM
580	500	600	60	110	0006

Heat output Q_N [W] of the KALOR 3 radiator can be found in manufacturer catalogue: ŽDB GROUP a.s., plant VIADRUS, Bezručova 300, 735 93 BOHUMÍN

Table 12: Types of heating elements belonging to the model group 2

	Type of the radiator	Manufacturer of the radiator	MM
1	THERMO	ŽDB a.s., závod VIADRUS	0006
2			
3			
4			
5			
6			
7			
8			
9			
10			

7.10. MODEL NO. 3 – CAST IRON RADIATORS WITH DISTANCE PAD

Verified on S-130, manufacturer: Romania
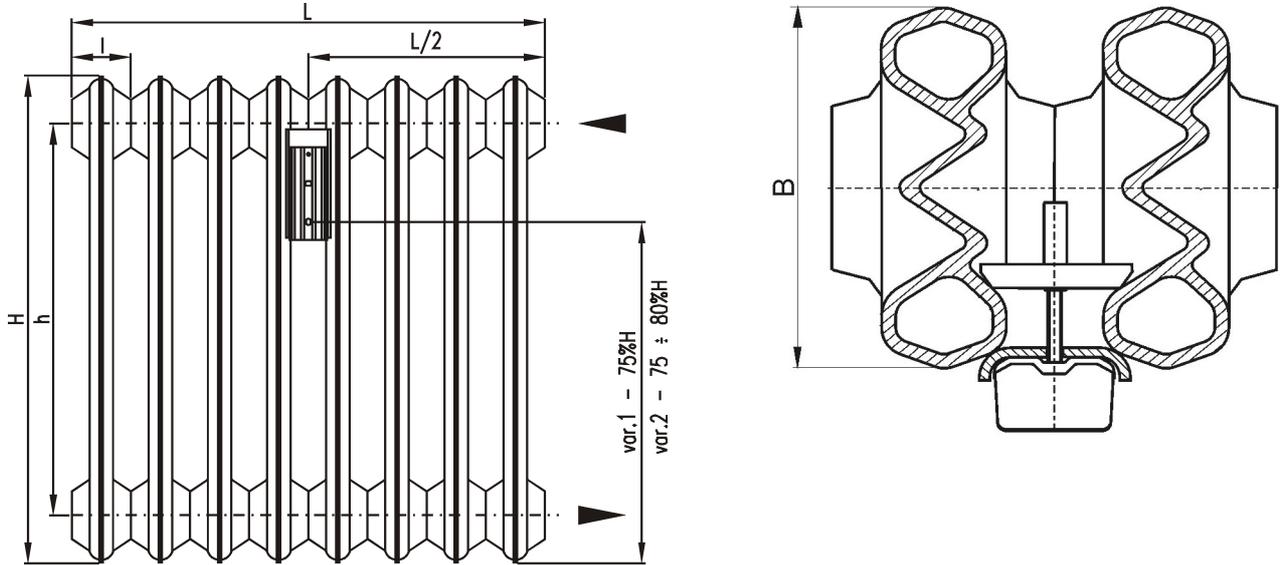
Basic dimensions of the S-130 for 10 segments, data for correct allocator installation (mm):

Height - H	Mounting distance – h	Length - L	Segment length - l	Depth - B	MM
580	500	890	80	130	0002

Table 13: Types of heating elements belonging to the model group 3

	Type of the radiator	Manufacturer of the radiator	MM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

7.11. MODEL NO. 4 – STEEL RADIATORS

Verified on: NERIA 500/150, manufacturer: NERIA a.s., Hustopeče u Brna
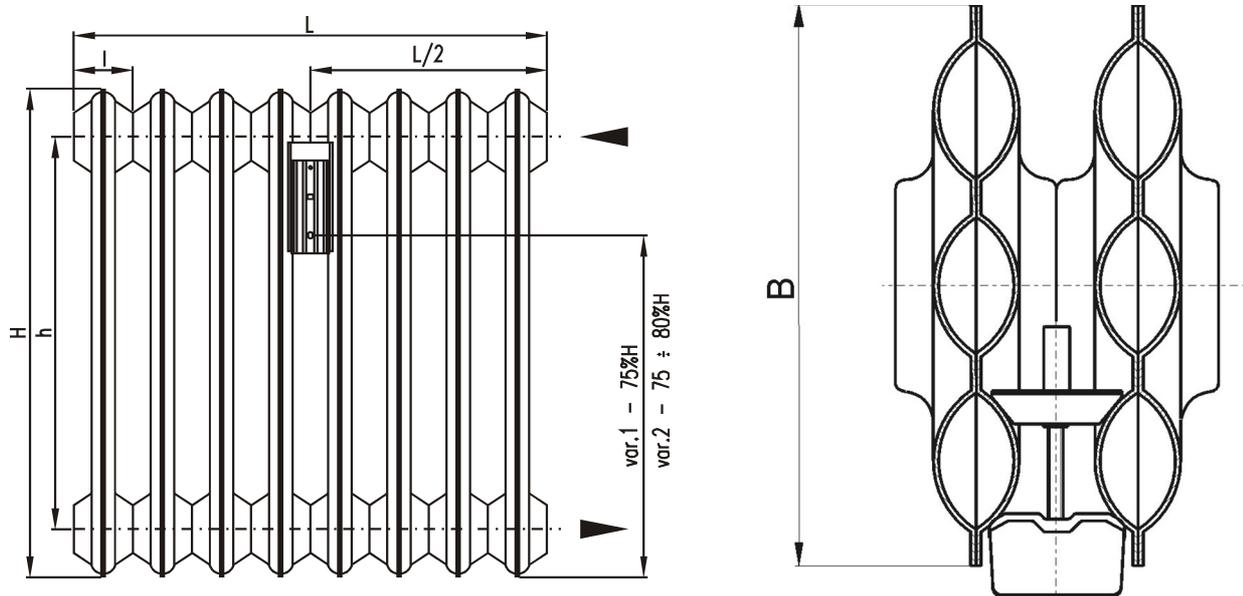
Basic dimensions of the NERIA 500/150 for 10 segments, data for correct allocator installation (mm):

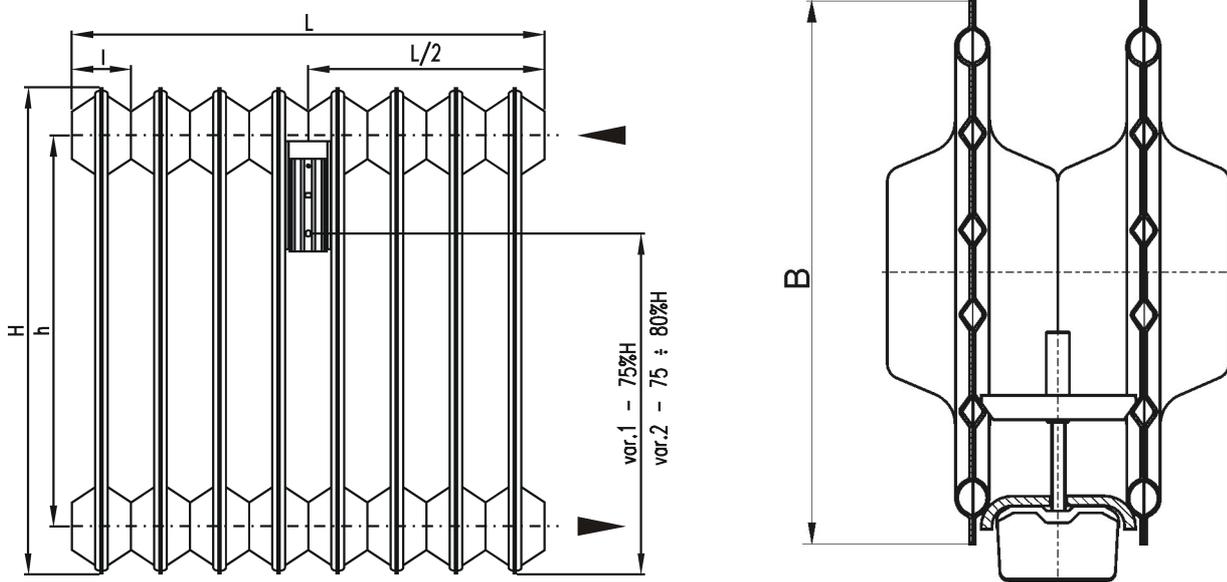| Height – H	Mounting distance - h	Length- L	Segment length - l	Depth - B	MM
607	500	455	45,5	150	0001

Heat output Q_N [W] of the 500/150 radiator can be found in manufacturer catalogue: NERIA a.s., Vinařská 2, 693 01 Hustopeče u Brna

Table 14: Types of heating elements belonging to the model group 4

	Type of the radiator	Manufacturer of the radiator	MM
1	350,500,1000/200;1000/150,200	VD Olomouc	0003
2	500/155	Rukov Rumburk	0006
3	500/178	OPP Rokycany	0006
4	J500/3, 500/200	OPP Beroun se sídlem ve Zdicích	0006
5	500,1000/200	PP Kamenice nad Lipou	0006
6	500/200/1,3	Jihokov Hustopeče u Brna	0006
7	500/150	OPP Gottwaldov	0003
8	500/150, 200, Nora 500/160	OPP Kovotex Prievidza	0006
9	011-500/150	OOP Žilina	0006
10	500/160,220 900/160	ZVL Čalovo	0001
11	MT 520	OSP Martin	0006
12	500/200	OPMP Nové Mesto nad Váhom	0006
13	500/160, 220	Štátny majetok Čadca	0006

7.12. MODEL NO. 5 – STEEL RADIATORS WITH DISTANCE PAD

Verified on: Svratouch 500/160, manufacturer: Dílo - Svratouch

Basic dimensions of the SVRATOUCH 500/160 for 10 segments, data for correct allocator installation (mm):

Height- H	Mounting distance - h	Length- L	Segment length - l	Depth - B	MM
600	500	500	50	160	0002

Heat output Q_N [W] of the 500/160 radiator can be found in manufacturer catalogue: Dílo, výrobní a obchodní družstvo, 539 42 Svratouch

Table 16: Types of heating elements belonging to the model group 5

	Type of the radiator	Manufacturer of the radiator	MM
1	500/185	Dílo – Svratouch	0002
2			
3			
4			
5			
6			
7			
8			
9			
10			

7.13. MODEL NO. 6 – PANEL RADIATORS WITH SHAPED FRONT SIDE

Verified on: RADIK, KLASIK mod, type 10, manufacturer: KORADO, a.s. Česká Třebová
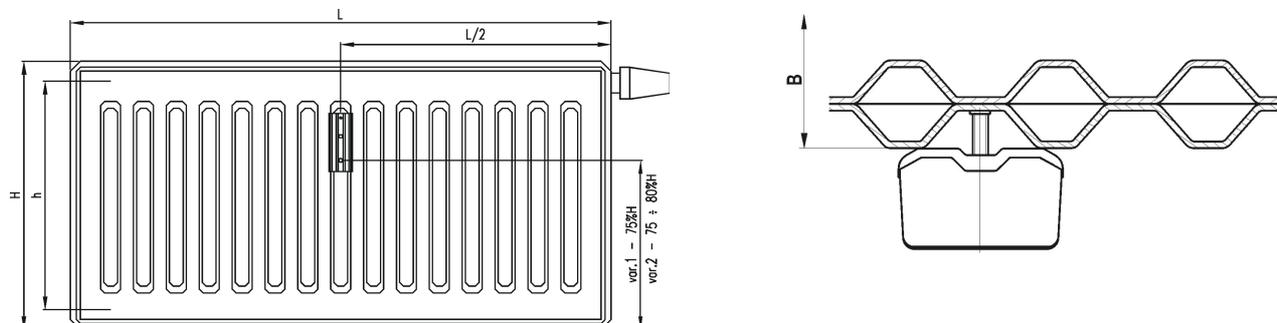
Basic dimensions of the RADIK, KLASIK modification, type 10 and data for correct allocator installation (mm):

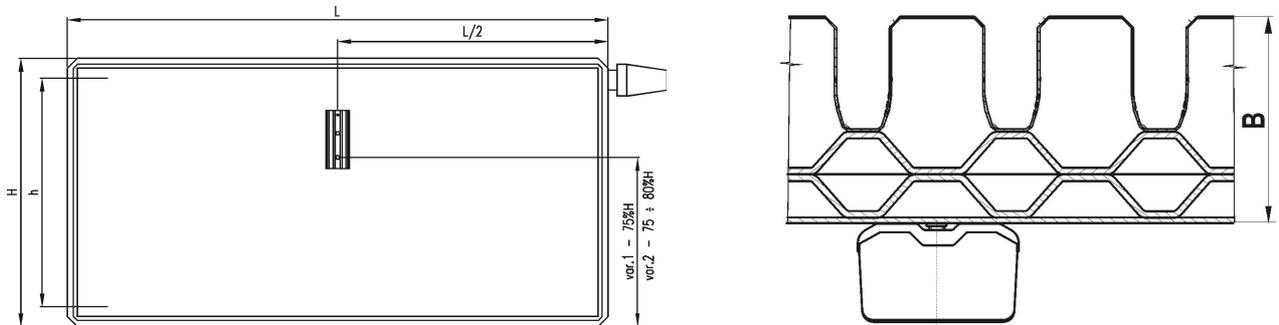| Height - H	Mounting distance - h	Length- L	Depth - B	MM
600	546	1200	47	0053

Heat output Q_N [W] of the RADIK radiator can be found in manufacturer catalogue: KORADO, a.s. Bratří Hubálků 869, 560 02 ČESKÁ TŘEBOVÁ

Table 15: Types of heating elements belonging to the model group 6

	Type of the radiator	Manufacturer of the radiator	MM
1	RADIK D91 D93 D95 D97	KORADO a.s., Č.Třebová	0054
2	P-3, P-4, P-4B, PJ-4, PJ-4B, P-40	VSŽ Košice	0053
3	RADIK KLASIK ,VK,VKL,VKU,VKC	KORADO a.s., Č.Třebová	0053
4	Korad	U.S. Stell Košice s.r.o.	0053
5	Profil	Kermi	0054
6	Kompakt, Universalkompakt	Brugman	0054
7	Danuferr LUX – N	Danuferr	0053
8	Dia Plus, Dia Ventil	Rurmo-DiaNorm	0053
9	Purmo VKO	Rettig-Heating Sp.z o.o.	0053
10	VN 4000 NTR	Vogel a Noot	0053
11	Cosmoprofil	Cosmoprofil (Vogel a Noot)	0053
12	Cosmonova	Cosmonova (Vogel a Noot)	0053
13	Compact,Integra,Vertical,Faro	Radson	0053
14	Compact,Novello	Caradon Stelrad B.V.	0053
15			

7.14. MODEL NO. 7 – PANEL RADIATORS WITH A FLAT FRONT PANEL

Verified on: RADIK PLAN, VENTIL KOMPAKT mod, type 11, manufacturer : KORADO, a.s. Česká Třebová

Basic dimensions of the RADIK, VENTIL KOMPAKT modification, type 11 PLAN VK and data for correct allocator installation (mm):

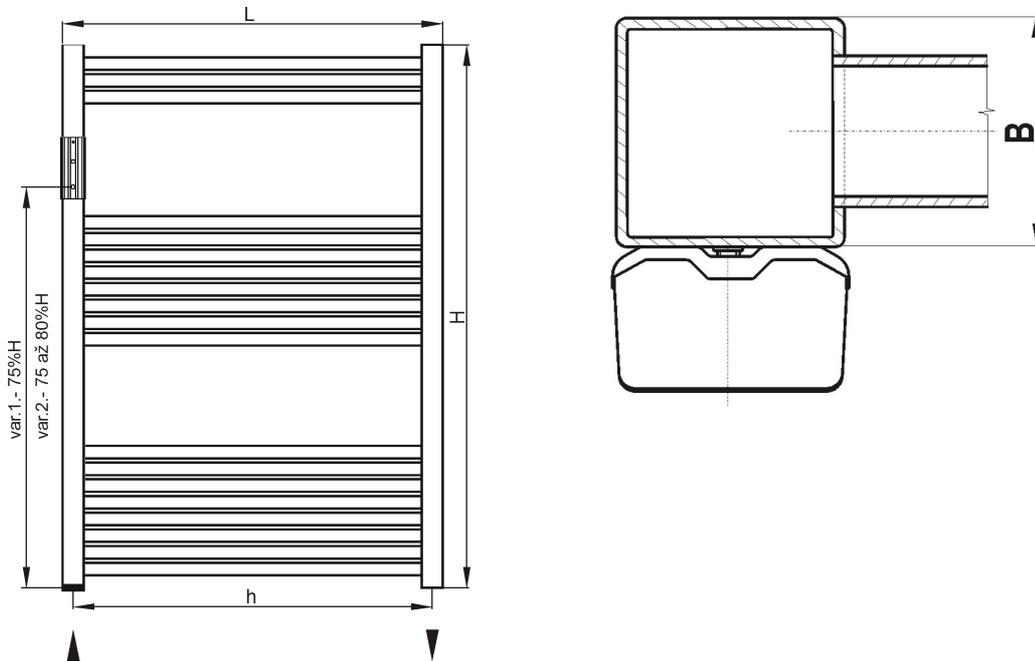| Height - H	Mounting distance - h	Length- L	Depth - B	MM
600	546	1200	65	0052

Heat output Q_N [W] of the RADIK radiator can be found in manufacturer catalogue: KORADO, a.s. Česká Třebová, Bratří Hubálků 869, 560 02 ČESKÁ TŘEBOVÁ

Table 16: Types of heating elements belonging to the model group 7

	Type of the radiator	Manufacturer of the radiator	MM
1	RADIK Plan Klasik,VK, VKL,Hygiene	Korado a.s. Č.Třebová	0052
2	Piano-Universalkompakt	Brugman (JAM Praha)	0052
3	Plan	Kermi	0052
4	Plan-Ventil, Duo Finesse	Purmo – DiaNorm	0052
5	Purmo Plan	Rettig-Heating Sp. z o.o.	0052
6	Radson Planora	Radson	0052
7			
8			
9			
10			

7.15. MODEL NO. 8 – TUBULAR RADIATORS - LADDER

Verified on: K 750/1640, manufacturer: Thermal – trend, s.r.o..

Basic dimensions of the K 750/1640 and data for correct allocator installation (mm):

| Height - H	Mounting distance - h	Length - L	Depth - B	MM
1640	720	750	30	0052

Heat output Q_N [W] of the K 600/940 radiator can be found in manufacturer catalogue: Thermal – trend, s.r.o. Starovičky 11, Hustopeče u Brna

Table 17: Types of heating elements belonging to the model group 8

	Type of the radiator	Manufacturer of the radiator	MM
1	KM, KO, K	Thermal – trend, s.r.o.	0052
2	Grenada, Panama	AMTEX Radiátory s.r.o. Blansko	0052
3	Koralux Linear, Linear Classic	KORADO a.s. Č.Třebová	0052
4	Koralux Rondo, Rondo Classic	KORADO a.s. Č.Třebová	0053
5	Clasic, Premier, Eliptic	Neria a.s. Hustopeče u Brna	0053
6			
7			
8			
9			
10			

7.16. MODEL NO. 10 – RADIATORS MADE FROM SMOOTH OR RIBBED TUBES - REGISTER

Verified on: smooth register 2x1200 - ø 76/3, manufacturer: unknown
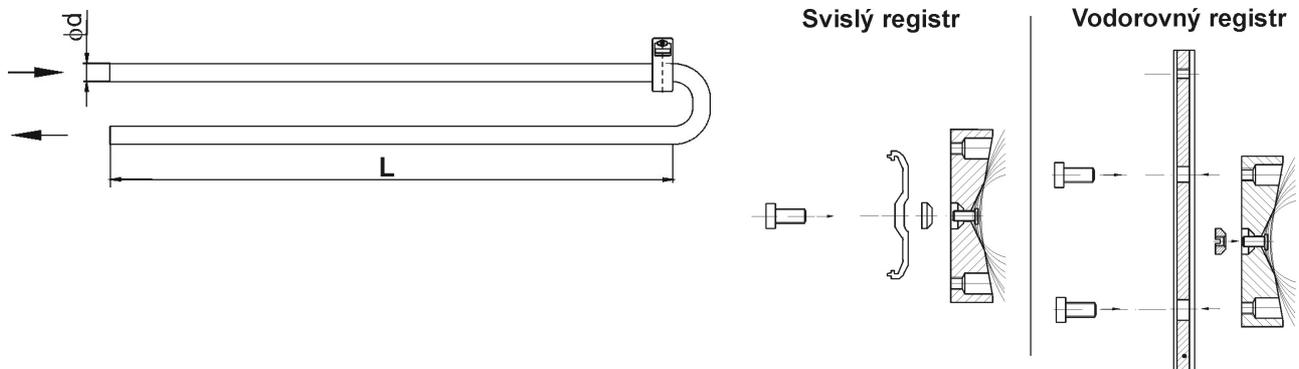
Steel registers are used only in areas with low hygiene and aesthetic requirements. Dimensions are chosen accordingly to needs. Registers are usually made accordingly to drawings attached with project. Mounting material can be used for pipes from ø 30 to ø 110 mm.

Basic dimensions of the horizontal radiator register ø 76 (mm):

| Total length - L	Tube diameter– ø d	Mounting location	MM
2x1200	76	As per diagram	0056

Illustrations and the figures are indicative only. Installation of two allocators must be recorded in installation protocol.

For more information's about E-ITN 10 installation refer to chapter: 7.7. Installation on horizontal and vertical registers.

7.17. MODEL NO.12 – ALUMINIUM RADIATOR WITH VERTICAL RIBS

Verified on: ARMAT 500, manufacturer: Armatmetal spol. s r.o., Olomouc
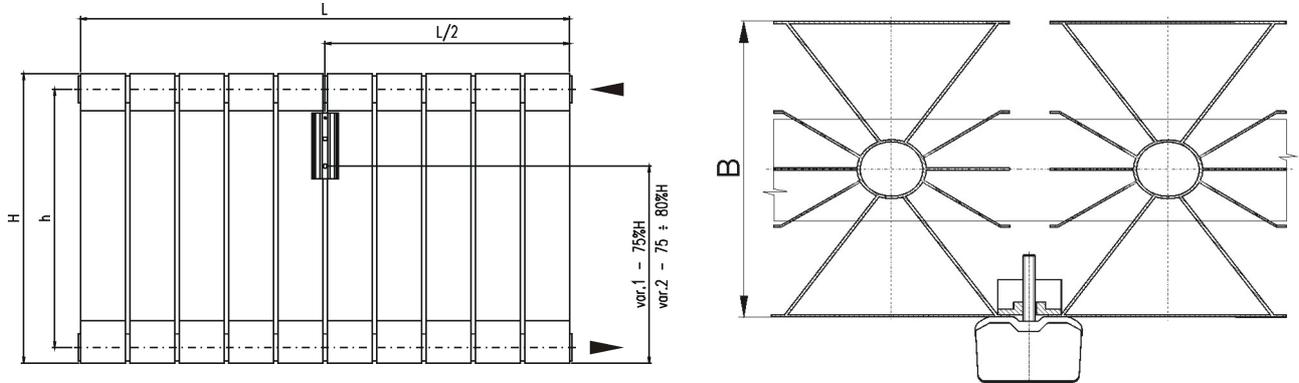
Basic dimensions of the ARMAT 500/160 for 10 segments, data for correct allocator installation (mm):

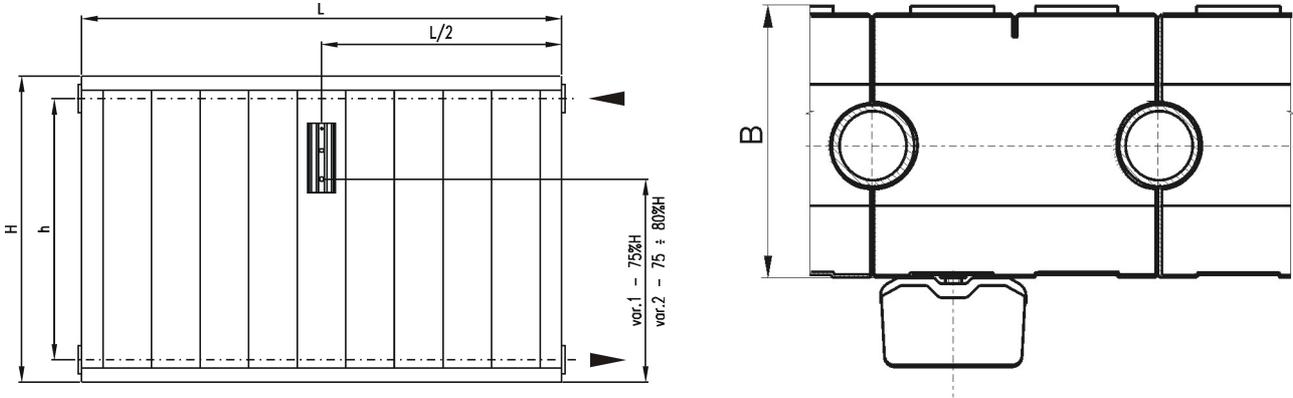| Height – H	Mounting distance – h	Length–L	Cell length – l	Depth – B	MM
540	500	800	80	100	0009

Heat output Q_N [W] of the 500/160 radiator can be found in manufacturer catalogue: Armatmetal spol. s r.o., Řepčínská 86, 776 02 Olomouc

Table 18: Types of heating elements belonging to the model group 12

	Type of the radiator	Manufacturer of the radiator	MM
1	SOLAR, EKONOMIK	LIPOVICA trade s.r.o.	0009
2	EKO CALIDOR	TRIO Brno s.r.o.	0009
3	FONDITAL		0009
4	GHIDINI	WÄRME s.r.o. Brno	0009
5	TEPOR	Kamenice u Prahy	0009
6	CM	REGULUS s.r.o.	0009
7	ODEON	F.A.I.S. Brno k.s.	0009
8	GIACOSTAR	GIACOMINI	0009
9	ARMAT	ARMATMETAL s.r.o.	0009
10			

7.18. MODEL NO.14 – TUBULAR RADIATOR WITH ALLUMINUM FRONT DESK

Verified on: U 548, manufacturer: UNIVA BLANSKO

Basic dimensions of the U 548 160 for 10 segments, data for correct allocator installation (mm):

Height – H	Mounting distance – h	Length–L	Cell length – l	Depth – B	MM
580	540	710	71	65	0051

Heat output Q_N [W] of the 500/160 can be found in manufacturer catalogue: UNIVA Blansko, Poříčí 26, 678 33 Blansko

Table 19: Types of heating elements belonging to the model group 14

	Type of the radiator	Manufacturer of the radiator	MM
1	U 548	UNIVA Blansko	0051
2			
3			
4			
5			
6			
7			
8			
9			
10			