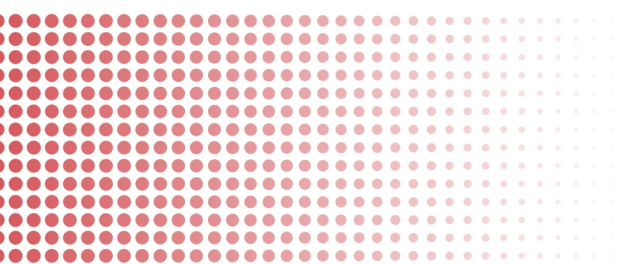


KATALOG PROIZVODA

Best solution for heating

PRODUCT CATALOG



Mikoterm doo je osnovan 1994. godine kao privatno preduzeće za proizvodnju opreme za grejanje. Primarna proizvodnja je bazirana na električnim kotlovima za domaćinstvo, dok portfolio obuhvata i kotlove velike snage, mobilne kotlove, kotlove za podršku drugim uređajima itd. Za proizvodnju ovih uređaja koristimo najsavremenije mašine i alate za obradu i zaštitu lima, što garantuje vrhunsku preciznost, izuzetnu završnu obradu i izdržljivost svih mašinskih delova. Funkcionalan i savremen dizajn je zaštitni znak naših uređaja. Električne instalacije u našim kotlovima su izrađene u skladu sa svim važećim EU propisima, a ugrađene komponente su renomiranih domaćih i inostranih proizvođača, pažljivo birane tokom decenija poslovanja i stalnog unapređenja i razvoja proizvoda. Projektni tim Mikoterm čine stručnjaci koji imaju višegodišnje iskustvo u ovoj oblasti. Mikoterm od 2000. godine izvozi svoje proizvode van Srbije, kako u zemlje regiona i Evrope, tako i šire: Crnu Goru, Bosnu i Hercegovinu, Severnu Makedoniju, Albaniju, Sloveniju, Hrvatsku, UK, Rumuniju, Mađarsku, Austriju, Nemačku, Švedsku, Norvešku, Holandiju, Belgiju, Švajcarsku, Letoniju, Uzbekistan, Litvaniju. Mikoterm radi OEM proizvodnju za nekoliko poznatih evropskih kompanija: Centrometal, Bosch, Advenco, Enerent. Sa ponosom možemo reći da je Mikoterm danas najveći proizvođač električnih kotlova u Srbiji. Od avgusta 2022. godine Mikoterm se nalazi na novoj lokaciji, Industrijska zona Aleksandrovo, Niška 211, 18252 Merošina. Posедуje poslovnu zgradu od 320 m² i proizvodni pogon od 2880 m² sa potpuno opremljenim magacinskim prostorom. Mikoterm veliku pažnju posvećuje zaštiti životne sredine, pa je na svom objektu izgradio solarnu elektranu snage 58kW, a sistemi grejanja i hlađenja u prostorijama bazirani su na energetski najefikasnijim rešenjima. Sva dobijena solarna energija se prvenstveno koristi za sopstvene potrebe, dok se višak proizvedene energije prenosi u nacionalnu distributivnu mrežu.

Mikoterm doo was founded in 1994 as a private company for the production of heating equipment. The primary production is based on electric boilers for households, while the portfolio also includes boilers of high power, mobile boilers, boilers to support other devices, etc. For the production of these devices, we use the most modern machines and tools for the processing and protection of sheet metal, which guarantees top precision, exceptional finishing and durability of all machine parts. Functional and contemporary design is the trademark of our devices. The electrical installations in our boilers are made in compliance with all valid EU regulations, and the built-in components are from renowned domestic and international manufacturers, carefully selected during decades of business and constant product improvement and development. The Mikoterm project team consists of experts who have many years of experience in this field. Since 2000, Mikoterm has been exporting its products outside of Serbia, both to the countries of the region and Europe, and beyond: Montenegro, Bosnia and Herzegovina, North Macedonia, Albania, Slovenia, Croatia, UK, Romania, Hungary, Austria, Germany, Sweden, Norway, Netherlands, Belgium, Switzerland, Latvia, Lithuania, Uzbekistan, Libya. Mikoterm work OEM production for several well-known European companies: Centrometal, Bosch, Advenco, Enerent. We can proudly say that Mikoterm is today the largest producer of electric boilers in Serbia. From August 2022, Mikoterm is located in a new location, Industrial zone Aleksandrovo, Niska 211, 18252 Merosina. It owns an office building of 320 m² and a production plant of 2880 m² with fully equipped warehouse space. Mikoterm pays a lot of attention to the protection of the environment, so it built a solar power plant with a capacity of 58kW on its premises, and the heating and cooling systems on the premises are based on the most energy-efficient solutions. All obtained solar energy is primarily used for own needs, while any excess energy produced is transferred to the national distribution network.



Sadržaj / Contents**01****mTronic 7000 / mTronic 8000 6kW÷24kW**
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Diferencijalni termostat / Differential thermostat

mTronic 7000 / mTronic 8000

Snaga / Power: 6kW - 9kW - 12kW - 18kW - 24kW

Kotao **mTronic 7000** je poboljšana verzija kotla **eTronic 7000** razvijena za potrebe nemačke kompanije **ROBERT BOSCH**. Model **mTronic 8000** sa svojim dodatnim funkcijama je najsavremenijim električni kotao na tržištu. Upravljanje kotlom se vrši preko velikog LCD displeja uz podršku procesorske jedinice. Procesorska jedinica obezbeđuje praćenje svih važnih parametara kotla i samog sistema grejanja, što obezbeđuje dugotrajn rad uređaja. Precizan dizajn obezbeđuje veoma lak rad za servisere i instalatere. Utvrđivanje moguće greške i njeno otklanjanje je maksimalno pojednostavljeno. Bezbednost kotla je obezbeđena kontrolom procesora i mehaničkim zaštitom. Uređaj ima 4 nivoa zaštite. Takođe ima alarme upozorenja ako su neki parametri u kritičnim vrednostima. Sve u svemu, **mTronic 8000** je uređaj koji je trenutno najnapredniji u pogledu funkcija i bezbednosti.

The **mTronic 7000** boiler is an improved version of the **eTronic 7000** boiler developed for the needs of the German company **ROBERT BOSCH**. The **mTronic 8000** model with its additional functions is the most advanced electric boiler on the market. The boiler is controlled via a large LCD display with the support of a processor unit. The processor unit ensures monitoring of all important parameters of the boiler and the heating system itself, which ensures long-term operation of the device. Precise design ensures very easy work for service technicians and installers. Determining a possible error and eliminating it is maximally simplified. Boiler safety is ensured through processor control and mechanical protections. The device has 4 levels of protection. It also has warning alarms if some parameters are in critical values. All in all, **mTronic 8000** is a device that is currently the most advanced in terms of functions and security.

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kW 6÷24

m² ≤240 podno grejanje/
floor heating
≤180 radijatorsko grejanje/
radiator heating
za objekte u skladu sa standardom/
for buildings in accordance with
EN ISO 52016-1:2017

η 99%

IP 40

kg 25÷27



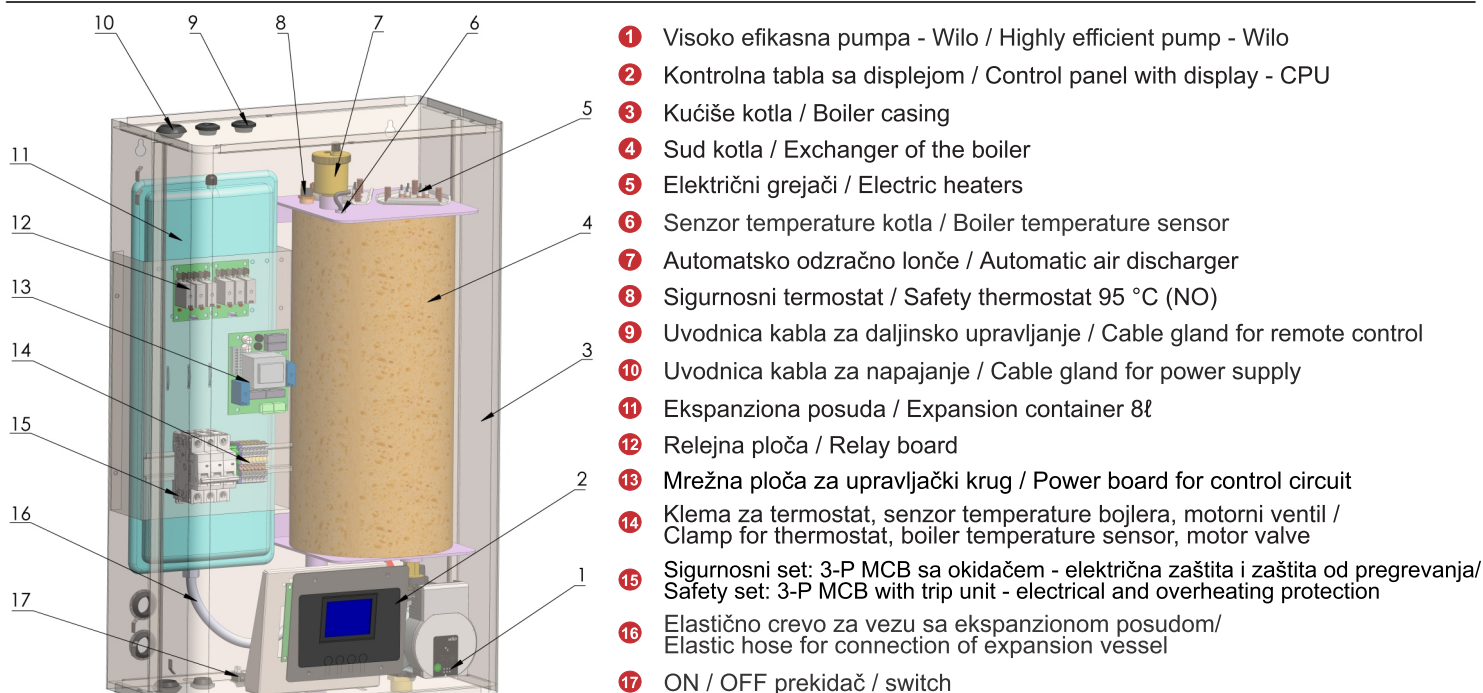
Pregled prednosti kotla mTronic 7000 / Overview of boiler mTronic 7000 advantages:

- > *Podešavanje snage uređaja u više koraka - broj koraka zavisi od nominalne/nazivne snage električnog bojlera (podešava korisnik)/*
Device power adjustment in multiple steps - the number of steps depends on the nominal/rated power of the electric boiler (adjustable by the user).
- > *3 nivoa modulacije angažovane snage: bez modulacije - standardna modulacija - maksimalna modulacija/*
3 levels of modulation of the engaged power: no modulation - standard modulation - maximal modulation.
- > *Uključivanje/isključivanje grejača, sa praćenjem njihovog vremena rada (balansiranje vremena rada grejača) - obezbeđuje duži vek trajanja uređaja/*
Heater on / off, with monitoring their operating time (balancing the operating time of the heaters) - provides longer device life.
- > *Najnoviji model visoko efikasne pumpe sa širokim izborom režima rada/*
The latest model of a highly efficient pump with a wide choice of operating modes.
- > *Zaštita od mrza pomoću posebnog programa / Frost protection using a separate program.*

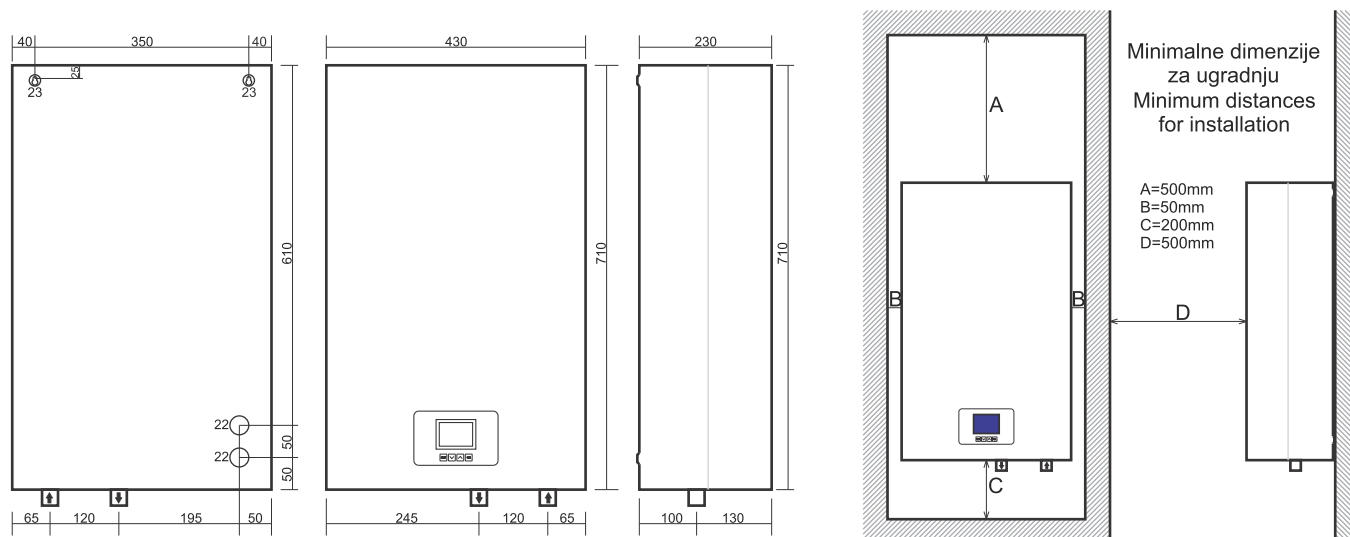
Model mTronic 8000 sa dodatnim funkcijama / Model mTronic 8000 with additional functions:

- > *Mogućnost izbora prioriteta Grejanje/DHW omogućava da se funkcija kotla prilagodi potrebama korisnika/*
The possibility of selecting the Heating/DHW priority allows the boiler function to be adapted to the user's needs.
- > *O.T.C. režim u kome mikrokontroler automatski određuje temperaturu kotla u zavisnosti od spoljne temperature/*
O.T.C. mode in which the microcontroller automatically determines the boiler temperature depending on the outdoor temperature.
- > *RAD KOTLA NA NISKOM PRITISKU - Mogućnost isključenja blokade rada na niskim pritiscima omogućava rad kotla u otvorenim sistemima/*
BOILER OPERATION AT LOW PRESSURE - The possibility of turning off the blocking of operation at low pressure enables the operation of the boiler in open systems.
- > *RELE GREŠKE - Rele sa beznaponskim kontaktima, može se koristiti za daljinsku dojavu informacije o grešci u radu kotla (povezivanje na BMS)/*
ERROR RELAYS - Relays with voltage-free contacts, can be used for remote notification of information about boiler operation errors (connection to BMS).

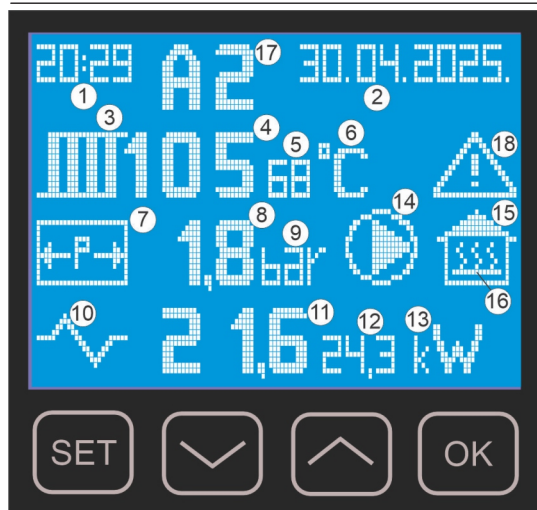
Bitne komponente / Key components



Dimenzije / Dimensions



LCD ekran sa svim simbolima i funkcijama / LCD display with all symbols and functions



- 1 Vreme / Time
- 2 Datum / Date
- 3 Simbol radijatora (temperatura sistema) / Symbol of radiator (temperature of the system)
- 4 Trenutna temperatura sistema / Current temperature of the system
- 5 Željena temperatura sistema / The set temperature of the system
- 6 Simbol merne jedinice temperature / Symbol of measuring unit of temperature (°C)
- 7 Simbol posude pod pritiskom / The symbol of the container under pressure
- 8 Pritisak u sistemu / Pressure in the system(bar)
- 9 Simbol merne jedinice pritiska / Symbol of measuring unit of pressure(bar)
- 10 Simbol električne struje / Symbol of electricity
- 11 Trenutna angažovana snaga kotla / Current engaged boiler power(kW)
- 12 Zadana snaga kotla / The set power of the boiler(kW)
- 13 Simbol merne jedinice električne snage / Symbol of measuring unit of electricity (kW)
- 14 Simbol cirkulacione pumpe / Symbol of the circulation pump
- 15 Simbol prostora koji se greje / Symbol of space that is heated
- 16 Simbol uključenog sobnog termostata / Symbol of switched on room thermostat
- 17 Simboli upozorenja / Warning symbols (A0–A4) ili simboli greške / or error symbols
- 18 Simbol opasnosti / Symbol of danger

Specifikacija proizvoda / Product specification

Model		mT-6kW	mT-9kW	mT-12kW	mT-18kW	mT-24,3kW
grejne grupe	heating groups	3 × 2 kW	6 × 1,5 kW	6 × 2 kW	9 × 2 kW	9 × 2,7 kW
broj stepena za podešavanje snage	number of power degrees	3	6	6	9	9
minimalna snaga	minimum power	2 kW	1,5 kW	2 kW	2 kW	2,7 kW
maksimalna snaga	maximum power	6 kW	9 kW	12 kW	18 kW	24,3 kW
potrebni glavni osigurači za trofazno napajanje	main circuit breakers for three phase power supply	3 × 16A	3 × 20A	3 × 25A	3 × 32A	3 × 40A
potrebni glavni osigurači za monofazno napajanje	main circuit breakers for single-phase power supply	1 × 32A	1 × 50A	/	/	/
potreban mrežni kabl za trofazno napajanje	power cable for three phase power supply	5 × 2,5 mm²	5 × 2,5 mm²	5 × 4 mm²	5 × 4 mm²	5 × 6 mm²
potreban mrežni kabl za monofazno napajanje	power cable for single-phase power supply	3 × 4 mm²	3 × 6 mm²	/	/	/
preporučena grejna * površina-podno/radijat. grejanje	recommended heating * surface-floor/radiator heating	≤60m² f.h. ≤40m² r.h.	≤90m² f.h. ≤60m² r.h.	≤120m² f.h. ≤80m² r.h.	≤180m² f.h. ≤120m² r.h.	≤240m² f.h. ≤160m² r.h.
težina kotla bez vode	weight of boiler without water	25 kg	25 kg	25 kg	26 kg	27 kg
slavina za pražnjenje kotla	drain valve	yes				
dimenzije VxŠxD	dimensions HxWxD	710×430×230 mm				
stepen IP zaštite	Ingress Protection rating	IP 40				
opseg regulacije temperature kotla	temperature range	10 ÷ 80 °C				
sigurnosni ventil	safety valve	da / yes				
sigurnosni termostats	safety thermostat	95 °C				
min. max. radni pritisak	min.max. work pressure	0,3 bar ÷ 2,6 bar				
priprema sanitarne vode	DHW	da / yes (kod modela / in the model mTronic8000)				
tajmer za pripremu sanitarne vode	timer for DHW mode	da / yes (kod modela / in the model mTronic8000)				
monofazna konekcija	single phase connection	da / yes	da / yes	ne / no	ne / no	ne / no

*za objekte u skladu sa / for buildings in accordance with EN ISO 52016-1:2017, f.h.-podno grejanje/floor heating, r.h.-radijatorsko grejanje/radiator heating

eCompact Uz

Snaga / Power: 6kW - 9kW - 12kW - 16kW

Električni kotao eCompact Uz je poboljšana verzija prethodnog ugradnog kotla. Ovaj model takođe ima procesorsku jedinicu koja kontroliše i upravlja radom kotla. Unutar kotla se nalazi visokoefikasna cirkulaciona pumpa. Za razliku od prethodnog modela, ovaj kotao je opremljen većim ekspanzionim posudom od 10 litara. Namenjen je za ugradnju u zid minimalne debljine 131 mm. Elegantan spoljašnji dizajn i veoma lak i jasan pristup unutrašnjim komponentama je značajna prednost u odnosu na ostale kotlove na tržištu. Sve greške u radu se upisuju u njegovu internu memoriju, tako da je posao servisera veoma lak. Ova serija električnih bojlera našla je veliku primenu u izgradnji stambenih zgrada. Izrađuje se u dve varijante, sa i bez sabirnika/razdelnika. Kod većeg modela moguće je ugraditi sabirnik i razdelnik do 7 krugova, za radijatorsko ili podno grejanje, tako da nije potreban dodatni ormar.

The eCompact Uz electric boiler is an improved version of the previous model. This model one also has a processor unit that controls and manages the operation of the boiler. Inside the boiler there is a highly efficient circulation pump. Unlike the previous model, this boiler is equipped with a larger expansion tank of 10 liters. It is intended for installation in a wall with a minimum thickness of 131 mm. Elegant exterior design and very easy and clear access to internal components is a significant advantage over other boilers on the market. All operating errors are written to its internal memory, so the work of the service technician is very easy. This series of electric water heaters found great application in the construction of residential buildings. It is made in two variants, with and without manifold. With the larger model, it is possible to install a busbar and manifold up to 7 circuits, for radiator or underfloor heating, so that no additional cabinet is needed.

Pregled prednosti kotla / Overview of boiler advantages:

- > **Ušteda prostora zbog načina ugradnje (ugradnja u zid) / Space saving due to installation method (built in wall).**
- > **Jednaka raspodela snage između faza / Equal power distribution between phases.**
- > **Električni kotao za grejanje sa izborom režima rada (radijatorsko grejanje ili podno grejanje) / Electric heating boiler with operating mode selection (radiator heating or underfloor heating).**
- > **3 nivoa modulacije angažovane snage: bez modulacije – standardna modulacija – maksimalna modulacija / 3 levels of modulation of the engaged power: no modulation – standard modulation – maximal modulation**
- > **Najnoviji model visoko efikasne pumpe sa širokim izborom režima rada / The latest model of a highly efficient pump with a wide choice of operating modes.**
- > **Duži model ima mogućnost ugradnje razdelnika sa 3-7 krugova / The longer model has the option of installing a manifold with 3-7 circles.**
- > **Modeli do 9kW su fabrički pripremljeni za priključenje na monofazno napajanje / Models up to 9kW are factory-prepared for connection to mono-phase power supply.**
- > **Podešavanje snage uređaja u više koraka - broj koraka zavisi od nominalne/nazivne snage električnog kotla (podešava korisnik) / Device power adjustment in multiple steps - the number of steps depends on the nominal/rated power of the electric boiler (adjustable by the user).**

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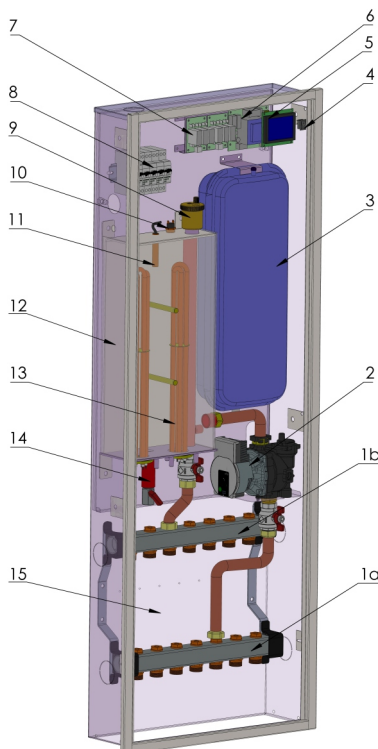


**bez razdelnika
without manifold**



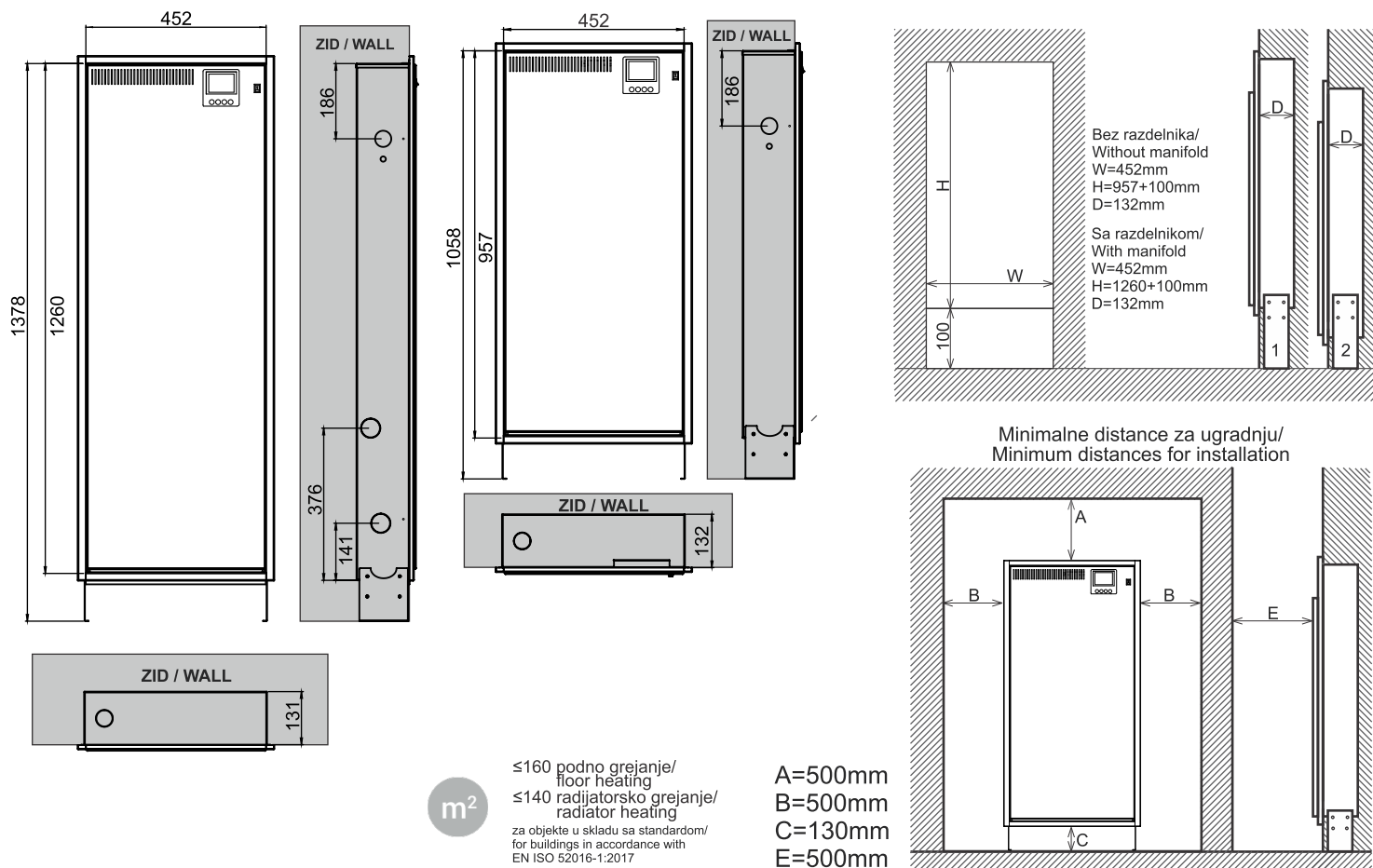
**sa razdelnikom
with manifold**

Bitne komponente / Key components



- 1a Sabirnik / Collector
- 1b Razdelnik / Splitter
- 2 Visoko efikasna pumpa - Wilo / Highly efficient pump - Wilo
- 3 Ekspanzionna posuda / Expansion container 8l
- 4 ON / OFF prekidač / switch
- 5 Kontrolna tabla sa displejom / Control panel with display - CPU
- 6 Mrežna ploča za upravljački krug / Power board for control circuit
- 7 Relejna ploča / Relay board
- 8 Sigurnosni set: 3-P MCB sa okidačem - električna zaštita i zaštita od pregrevanja / Safety set: 3-P MCB with trip unit - electrical and overheating protection
- 9 Automatsko odzračno lonče / Automatic air discharger
- 10 Sigurnosni termostat / Safety thermostat
- 11 Temperaturna sonda / Temperature probe
- 12 Sud kotla / Exchanger of the boiler
- 13 Električni grejači / Electric heaters
- 14 Slavina za punjenje i pražnjenje / Filling and emptying tap
- 15 Kućište kotla / Boiler casing

Dimenzije / Dimensions



Specifikacija proizvoda / Product specification

Model		eC UZ-6kW	eC UZ-9kW	eC UZ-12kW	eC UZ-16kW
grejne grupe	heating groups	3 × 2 kW	6 × 1,5 kW	6 × 2 kW	6 × 2,7 kW
minimalna snaga	minimum power	2 kW	1,5 kW	2 kW	2,7 kW
maksimalna snaga	maximum power	6 kW	9 kW	12 kW	16 kW
potrebni glavni osigurači za trofazno napajanje	main circuit breakers for three phase power supply	3 × 16A	3 × 20A	3 × 25A	3 × 32A
potrebni glavni osigurači za monofazno napajanje	main circuit breakers for single-phase power supply	1 × 32A	1 × 50A	/	/
potreban mrežni kabl za trofazno napajanje	power cable for three-phase power supply	5 × 2,5 mm ²	5 × 2,5 mm ²	5 × 4 mm ²	5 × 4 mm ²
potreban mrežni kabl za monofazno napajanje	power cable for single-phase power supply	3 × 4 mm ²	3 × 6 mm ²	/	/
preporučena grejna * površina-podno/radijat. grejanje	recommended heating * surface-floor/radiator	≤60m ² f.h. ≤40m ² r.h.	≤90m ² f.h. ≤60m ² r.h.	≤120m ² f.h. ≤80m ² r.h.	≤160m ² f.h. ≤110m ² r.h.
težina kotla bez vode	weight of boiler without water	32 kg	34 kg	34 kg	34 kg
sigurnosni ventil	safety valve	integriran unutra / integrated inside			
slavina za pražnjenje kotla	filling and drain valve	da / yes			
opseg regulacije temp. u radijatorskom režimu	temperature range in radiator mode	10 ÷ 80 °C			
opseg regulacije temp. u podnom režimu	temperature range in underfloor mode	10 ÷ 50 °C			
sigurnosni termost	safety thermostat	podno grejanje/floor heating-65 °C / radijatorsko grejanje/radiator heating-95 °C			
min. max. radni pritisak	min.max. work pressure	0,3 bar ÷ 2,6 bar			
stepen IP zaštite	Ingress Protection rating	IP 20			
monofazna konekcija	single phase connection	da / yes	da / yes	ne / no	ne / no

*za objekte u skladu sa / for buildings in accordance with EN ISO 52016-1:2017, f.h.-podno grejanje/floor heating, r.h.-radijatorsko grejanje/radiator heating

eCompact Plus

Skenirajte QR kod da bi posetili web stranicu/
Scan the QR code and visit the site page



Snaga / Power: 6kW - 9kW - 12kW - 18kW - 24kW - 27kW

Serijski **eCompact Plus** su blok kotlovi istih dimenzija kao i mTronic, identični u hidrauličnom delu kotla, ali za manje zahtevne korisnike. Namenjen je isključivo za grejanje, nije namenjen za pripremu potrošne tople vode. Rad se kontroliše preko mikroprocesorske jedinice.

Korisnički modul se sastoji od dva 7-segmentna displeja i led dioda koje signaliziraju koji parametar se prikazuje na displeju i 3 soft touch tastera ispod ekrana za maksimalno pojednostavljeno podešavanje.

Svojom funkcionalnošću i kvalitetom ovaj kotao se pozicionirao u kategoriju premium kotlova. Pouzdanost i servisne karakteristike kao i kod svih Mikoterm modela, su na najvišem nivou.

The **eCompact Plus** series are block boilers of the same dimensions as the mTronic, identical to the hydraulic part of the boiler, but for less demanding users. It is intended exclusively for heating, it is not intended for the preparation of domestic hot water. Operation is controlled via a microprocessor unit.

The user module consists of two 7-segment displays and led diodes that signal which parameter is displayed on the display and 3 soft touch buttons below the display for maximum simplified adjustment.

With its functionality and quality, this boiler has positioned itself in the category of premium boilers. Reliability and service characteristics are at the highest level, as with all Mikoterm models.



kW 6÷27

m²

≤270 podno grejanje/
floor heating
≤200 radijatorsko grejanje/
radiator heating

η 99%

IP 40

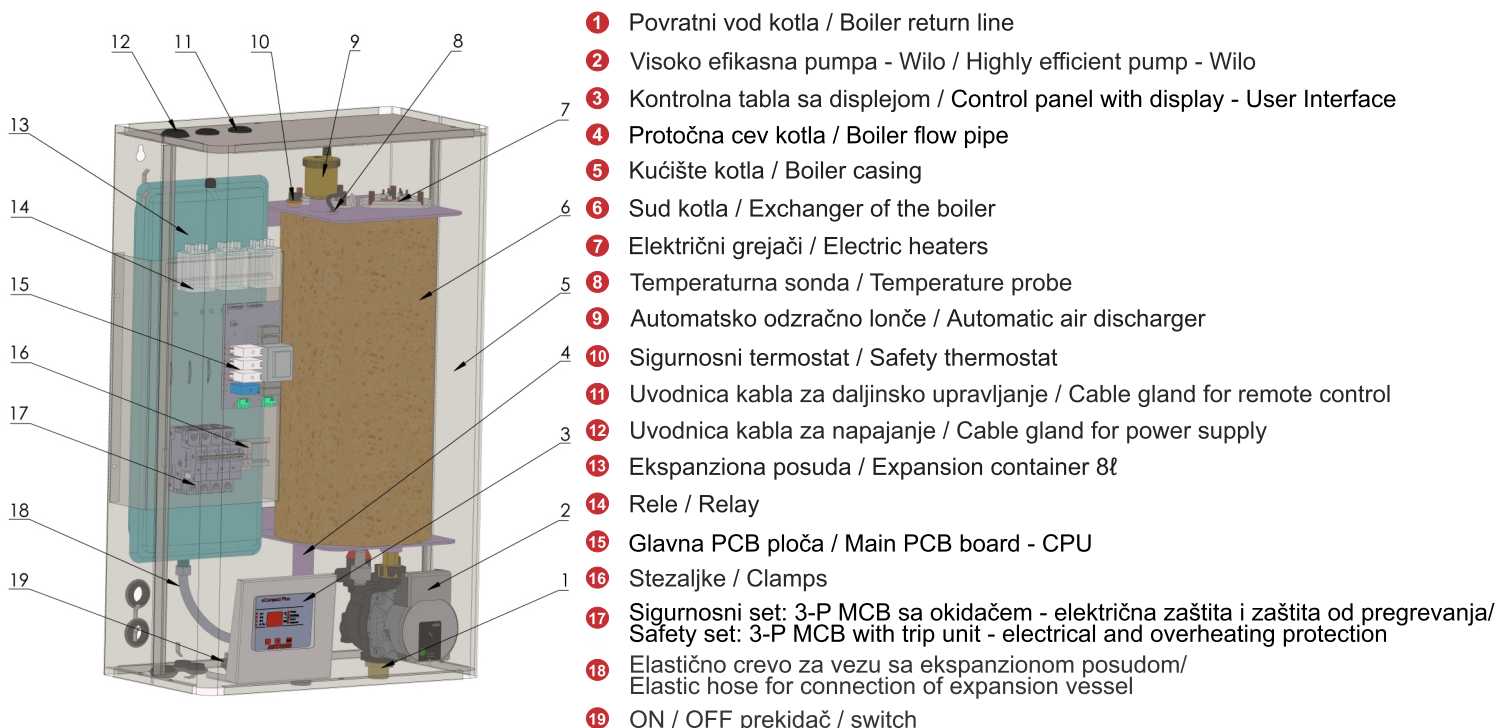
za objekte u skladu sa standardom/
for buildings in accordance with
EN ISO 52016-1:2017

kg 23÷25

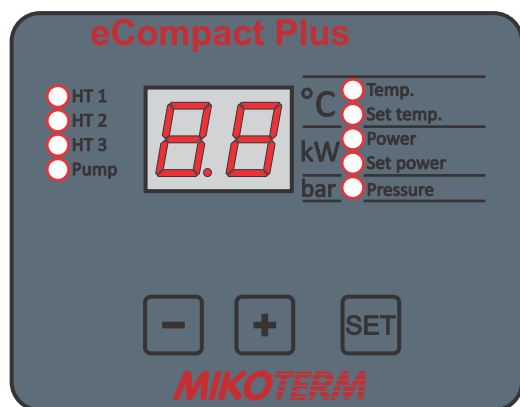
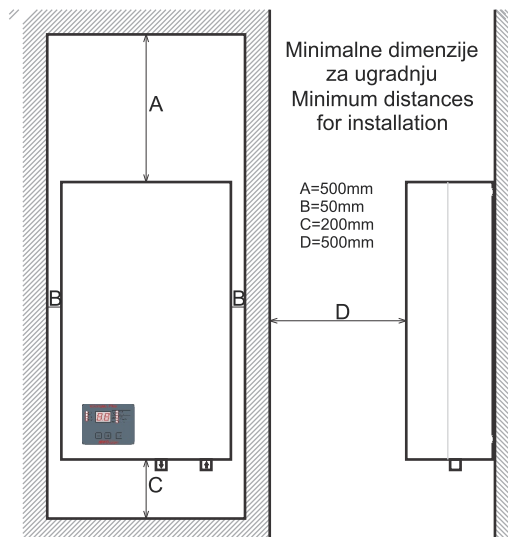
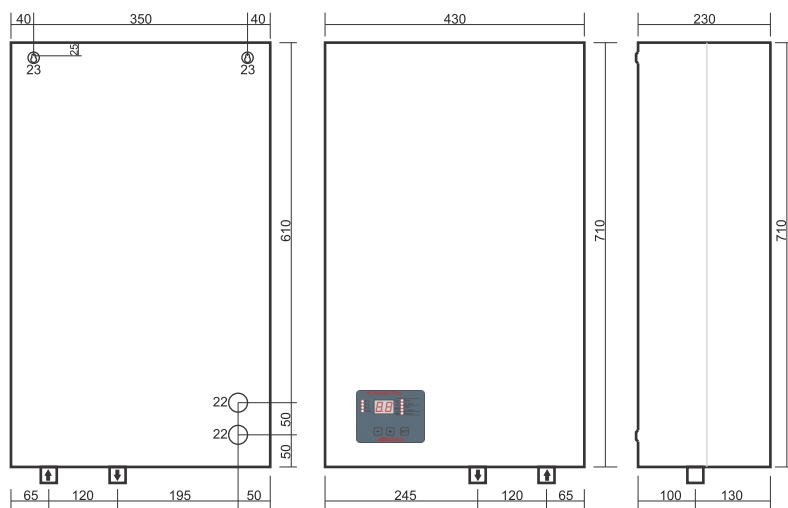
Pregled prednosti kotla / Overview of boiler advantages:

- > **Električni bojler za grejanje / Electric boiler for heating.**
- > **Podešavanje snage uređaja u tri koraka (podešava korisnik) / Device power adjustment in three steps (adjustable by the user).**
- > **Uključivanje/isključivanje grejača, sa praćenjem njihovog vremena rada (balansiranje radnog vremena grejača) - obezbeđuje duži vek trajanja uređaja / Heater on / off, with monitoring their operating time (balancing the operating time of the heaters) - provides longer device life.**
- > **Sigurnosni limitator temperature sa daljinskim okidačem napona (bez napajanja u redovnom radu, duži radni vek) / Safety temperature limiter with remote voltage trigger (without power supply in regular operation, longer working life).**
- > **Najnoviji model visoko efikasne pumpe sa širokim izborom režima rada / The latest model of a highly efficient pump with a wide choice of operating modes.**
- > **Jednostavan pregled svih parametara sistema preko korisničkog interfejsa / Easy overview of all system parameters via user interface.**
- > **Modeli do 9kW su fabrički pripremljeni za priključenje na monofazno napajanje / Models up to 9kW are factory-prepared for connection to single-phase power supply.**

Bitne komponente / Key components



Dimenzije / Dimensions

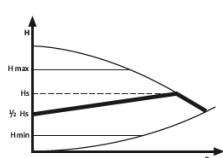
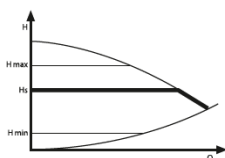


- HT 1:** Dioda za indicaciju rada grejača br. 1 / Indicates work of heater no. 1
HT 2: Dioda za indicaciju rada grejača br. 2 / Indicates work of heater no. 2
HT 3: Dioda za indicaciju rada grejača br. 3 / Indicates work of heater no. 3
Pump: Dioda za indicaciju rada cirkulacione pumpe / Indicates work of circulating pump
Temp: Prikaz trenutne temperature [°C] / Current temperature display [°C]
Set temp: Prikaz zadate temperature [°C] / Display of set temperature [°C]
Power: Prikaz trenutno uključene snage [kW] / Current engaged power [kW]
Set power: Prikaz zadate snage [kW] / Display of set power [kW]
Pressure: Prikaz trenutne vrednosti pritiska [bar] / Current pressure [bar]
"-" Taster za smanjenje vrednosti parametra i kretanje kroz MENU prema dole / Button to reduce parameters value and search down through Menu
"+" Taster za povećanje vrednosti parametra i kretanje kroz MENU prema gore / Button to increase parameters value and search up through Menu
"SET" Taster za odabir parametra koji treba podesiti / Button to select parameter

Specifikacija proizvoda / Product specification

Model		CP-6kW	CP-9kW	CP-12kW	CP-18kW	CP-24 kW	CP-27 kW
stepeni snage	power steps	3 × 2 kW	3 × 3 kW	3 × 4 kW	3 × 6 kW	3 × 8 kW	3 × 9 kW
minimalna snaga	minimum power	2 kW	3 kW	4 kW	6 kW	8 kW	9 kW
maksimalna snaga	maximum power	6 kW	9 kW	12 kW	18 kW	24 kW	27 kW
potrebni glavni osigurači za trofazno napajanje	main circuit breakers for three phase power supply	3 × 16A	3 × 20A	3 × 25A	3 × 32A	3 × 40A	3 × 50A
potrebni glavni osigurači za monofazno napajanje	main circuit breakers for single-phase power supply	1 × 32A	1 × 50A	/	/	/	/
potreban mrežni kabl za trofazno napajanje	power cable for three phase power supply	5 × 2,5 mm ²	5 × 2,5 mm ²	5 × 4 mm ²	5 × 4 mm ²	5 × 6 mm ²	5 × 6 mm ²
potreban mrežni kabl za monofazno napajanje	power cable for single-phase power supply	3 × 4 mm ²	3 × 6 mm ²	/	/	/	/
preporučena grejna * površina-podno/radijat.	recommended heating * surface-floor/radiator	≤60m ² f.h. ≤40m ² r.h.	≤90m ² f.h. ≤60m ² r.h.	≤120m ² f.h. ≤80m ² r.h.	≤180m ² f.h. ≤120m ² r.h.	≤240m ² f.h. ≤160m ² r.h.	≤270m ² f.h. ≤180m ² r.h.
težina kotla bez vode	weight of boiler without water	24 kg	24 kg	25 kg	25 kg	26 kg	26 kg
dimenzije VxŠxD	dimensions HxWxD	710x430x230 mm					
opseg regulacije temperature kotla	temperature range	10 ÷ 80 °C					
sigurnosni termost	safety thermostat	95 °C					
min. max. radni pritisak	min.max. work pressure	0,4 bar ÷ 2,6 bar					
stepen IP zaštite	Ingress Protection rating	IP 40					
monofazna konekcija	single phase connection	da / yes	da / yes	ne / no	ne /no	ne / no	ne /no

*za objekte u skladu sa / for buildings in accordance with EN ISO 52016-1:2017, f.h.-podno grejanje/floor heating, r.h.-radijatorsko grejanje/radiator heating



Karakteristike pumpe / Pump characteristics

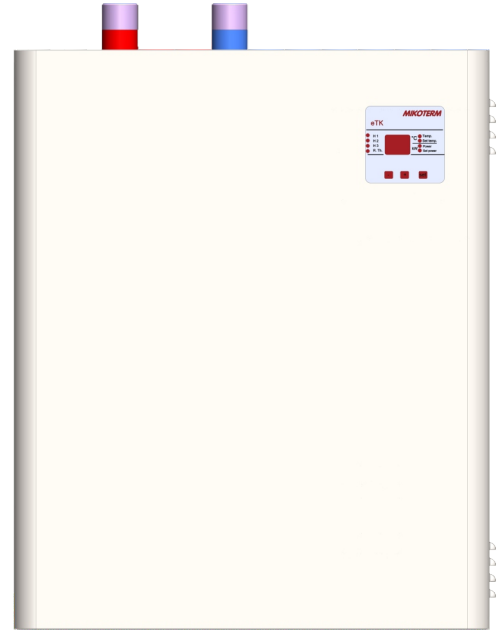
Maksimalni maseni protok	Maximum flow rate	2,1m ³ /h
Maksimalna visina vodenog stuba	Maximum water column height	6,8m
Maksimalna temperatura medija	Maximum media temperature	100 °C
Min/Max snaga pumpe	Mini. and max. pump power	3 ÷ 43W; (EEI): ≤0,2



Snaga / Power: 6kW - 9kW - 12kW - 18kW - 24kW - 30kW - 36kW - 40kW - 45kW

eTK model je namenjen za zidnu montažu. Male dimenzije čine ovaj model pogodnim za ugradnju u bilo koji deo zgrade. Našli su primenu kao osnovni izvor energije, ali vrlo često i kao rezervno rešenje kod kotlova na pelet, gas, čvrsto gorivo... Kotao može da kontroliše rad eksterne cirkulacione pumpe. Kotlom upravlja mikroprocesorski termoregulator koji optimalno koristi svaki grejač. Korisnik može da vidi trenutnu temperaturu na displeju u bilo kom trenutku ili kretanjem kroz meni, brzo i jednostavno, može da vidi sve parametre sistema. Ovaj model, kao i ostali, ima mogućnost upravljanja preko sobnog termostata. U ovom modelu, pored dodate mikroprocesorske jedinice, maksimalna sigurnost je obezbeđena dodavanjem sigurnosnog sklopa koji se sastoji od tropolnog prekidača sa naponskim okidačem, koji u slučaju pregrevanja prekida glavno napajanje. Napredni softver, prema dinamičkim promenama temperature modulira angažovanu snagu grejača, tako da se zadata temperatura kotla precizno održava uz najmanju potrošnju energije.

The **eTK** model is intended for wall mounting. Small dimensions make this model suitable for installation in any part of the building. They have found use as a basic source of energy, but very often as a backup solution with pellet, gas, wood boilers... The boiler can control the operation of the external circulation pump. The boiler is controlled by a microprocessor thermoregulator that optimally uses each heater. The user can see the current temperature on the display at any time or by moving through the menu, quickly and easily, can view all system parameters. This model, like the others, has the option of control via a room thermostat. In this model, in addition to the added microprocessor unit, maximum safety is ensured by adding a safety assembly that consists of a three-pole circuit breaker with voltage trigger, which in case of overheating interrupts the main power supply. Advanced software, according to dynamic temperature changes modulates the engaged power of the heaters, so that the set boiler temperature is precisely maintained with the least energy consumption.

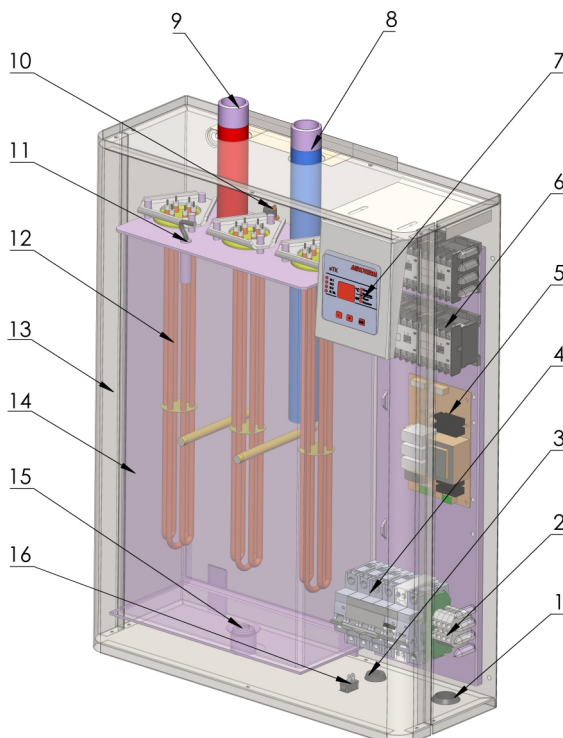


Pregled prednosti kotla / Overview of boiler advantages:

- > **Električni bojler za grejanje (montaža na zid) / Electric boiler for heating (wall mounting).**
- > **Uključivanje/isključivanje grejača, sa praćenjem njihovog vremena rada(balansiranje radnog vremena grejača)-obezbeđuje duži vek trajanja uređaja/ Heater on / off, with monitoring their operating time (balancing the operating time of the heaters) - provides longer device life.**
- > **Jednostavan pregled svih parametara sistema preko korisničkog interfejsa / Easy overview of all system parameters via user interface.**
- > **Daljinsko upravljanje preko sobnog termostata / Remote control via room thermostat.**
- > **Mogućnost upravljanja eksternom cirkulacionom pumpom / The possibility of controlling an external circulation pump.**
- > **Modeli do 9kW su fabrički pripremljeni za priključenje na jednofazno napajanje / Models up to 9kW are factory-prepared for connection to single-phase power supply.**

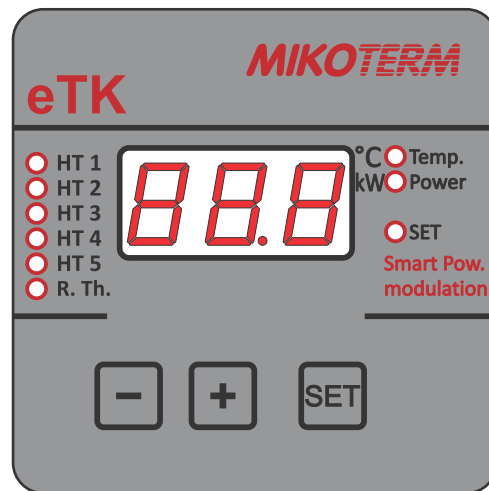
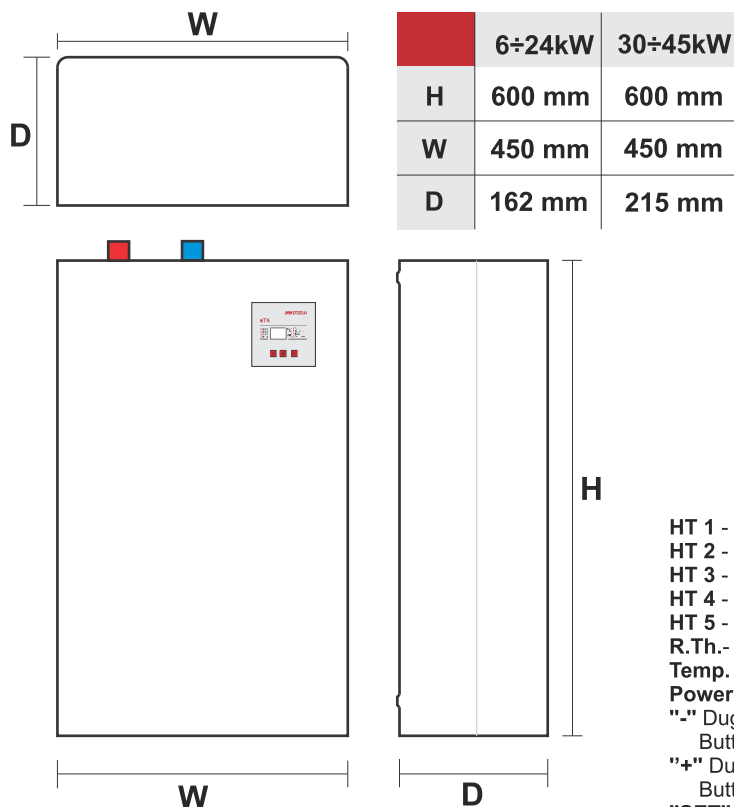
Podešavanje snage uređaja u tri ili pet koraka - broj koraka zavisi od nominalne/nazivne snage električnog kotla, kotlovi veće snage od 24 kW imaju mogućnost podešavanja snage u pet koraka (podešava korisnik). / Device power adjustment in three or five steps - the number of steps depends on the nominal/rated power of the electric boiler, higher-power boilers from 24 kW have the ability to adjust the power in five steps (adjustable by the user).

Bitne komponente / Key components



- 1 Uvodnica kabla za napajanje / Cable gland for power supply
- 2 Stezaljke / Clamps
- 3 Uvodnica kabla za daljinsko upravljanje / Cable gland for remote control
- 4 Sigurnosni set: 3-P MCB sa okidačem-električna zaštita i zaštita od pregrevanja/ Safety set: 3-P MCB with trip unit - electrical and overheating protection
- 5 Glavna PCB ploča / Main PCB board - CPU
- 6 Releji, kontaktori za električne grejače / Relays, contactors for electric heaters
- 7 Kontrolna tabla sa displejom / Control panel with display - User Interface
- 8 Povratni vod kotla / Boiler return line
- 9 Protočna cev kotla / Boiler flow pipe
- 10 Sigurnosni termostat / Safety thermostat
- 11 Senzor temperature kotla / Boiler temperature sensor
- 12 Električni grejač / Electric heater
- 13 Kućište kotla / Boiler casing
- 14 Sud kotla / Exchanger of the boiler
- 15 Priključak za sigurnosni ventil / Connecting for safety valve
- 16 ON / OFF prekidač / switch

Dimenzije i displej / Dimensions and display



HT 1 - Označava rad grejača br. 1 / Indicates work of heater no. 1
 HT 2 - Označava rad grejača br. 2 / Indicates work of heater no. 2
 HT 3 - Označava rad grejača br. 3 / Indicates work of heater no. 3
 HT 4 - Označava rad grejača br. 4 / Indicates work of heater no. 4
 HT 5 - Označava rad grejača br. 5 / Indicates work of heater no. 5
 R.Th. - Označava status sobnog termostata / Indicates the status of room thermostat
 Temp. - Prikaz trenutne temperature / Current temperature display [°C]
 Power - Prikaz trenutne snage / Present engaged power [kW]
 "-" Dugme za smanjenje vrednosti parametara i pretraživanje nadole kroz Meni /
 Button to reduce parameters value and search down through Menu
 "+" Dugme za povećanje vrednosti parametara i pretragu nagore kroz Meni /
 Button to increase parameters value and search up through Menu
 "SET" Dugme za izbor parametara / Button to select parameter

kW 6÷45 η 99% IP 20 kg 20÷29

m²

≤420 podno grejanje/
 floor heating
 ≤300 radijatorsko grejanje/
 radiator heating
 za objekte u skladu sa standardom/
 for buildings in accordance with
 EN ISO 52016-1:2017

Specifikacija proizvoda / Product specification

Model		eTK-6kW	eTK-9kW	eTK-12kW	eTK-18kW	eTK-24 kW	eTK-30 kW	eTK-36kW	eTK-40kW	eTK-45kW
stepeni snage	power steps	3×2kW	3×3kW	3×4kW	3×6kW	3×8kW	5x6kW	5x7.2kW	5x8kW	5x9kW
broj stepena snage	number of power degrees	3	3	3	3	3	5	5	5	5
potrebni glavni osigurači za trofazno napajanje	main circuit breakers for three phase power supply	3×16A	3x20A	3x25A	3x32A	3x40A	3x50A	3×63A	3×63A	3×80A
potrebni glavni osigurači za monofazno napajanje	main circuit breakers for single-phase power supply	1×32A	1×50A	/	/	/	/	/	/	/
potreban mrežni kabl za trofazno napajanje	power cable for three phase power supply	5×2,5mm²	5×2,5mm²	5×4mm²	5×4mm²	5×6mm²	5×10mm²	5×10mm²	5×16mm²	5×16mm²
potreban mrežni kabl za monofazno napajanje	power cable for single-phase power supply	3x4mm²	3x6mm²	/	/	/	/	/	/	/
zapremina vode u kotlu	volume of water in the boiler	14,2 l	14,2 l	14,2 l	14,2 l	14,2 l	21 l	21 l	21 l	21 l
težina kotla bez vode	weight of boiler without water	20 kg	21 kg	21 kg	21 kg	22 kg	28 kg	28 kg	28 kg	29 kg
dimenzije VxŠxD	dimensions H×W×D	600×450×162 mm						600×450×215 mm		
hidraulični priključci	hydro connections	1" MPT								
maksimalni pritisak	maximum pressure	3 bar								
minimalni pritisak	minimum pressure	0,5 bar								
opseg regulacije temperature kotla	temperature range	10 ÷ 80 °C								
sigurnosni termostat	safety thermostat	95 °C								
stepen IP zaštite	Ingress Protection rating	IP 20								
preporučena grejna * površina-podno/radijat.	recommended heating * surface-floor/radiator	≤60m² f.h. ≤40m² r.h.	≤90m² f.h. ≤60m² r.h.	≤120m² f.h. ≤80m² r.h.	≤180m² f.h. ≤120m² r.h.	≤240m² f.h. ≤160m² r.h.	≤300m² f.h. ≤200m² r.h.	≤360m² f.h. ≤240m² r.h.	≤400m² f.h. ≤270m² r.h.	≤420m² f.h. ≤300m² r.h.

*za objekte u skladu sa / for buildings in accordance with EN ISO 52016-1:2017, f.h.-podno grejanje/floor heating, r.h.-radijatorsko grejanje/radiator heating

TK-Profesional

Snaga / Power: 40kW - 50kW - 60kW

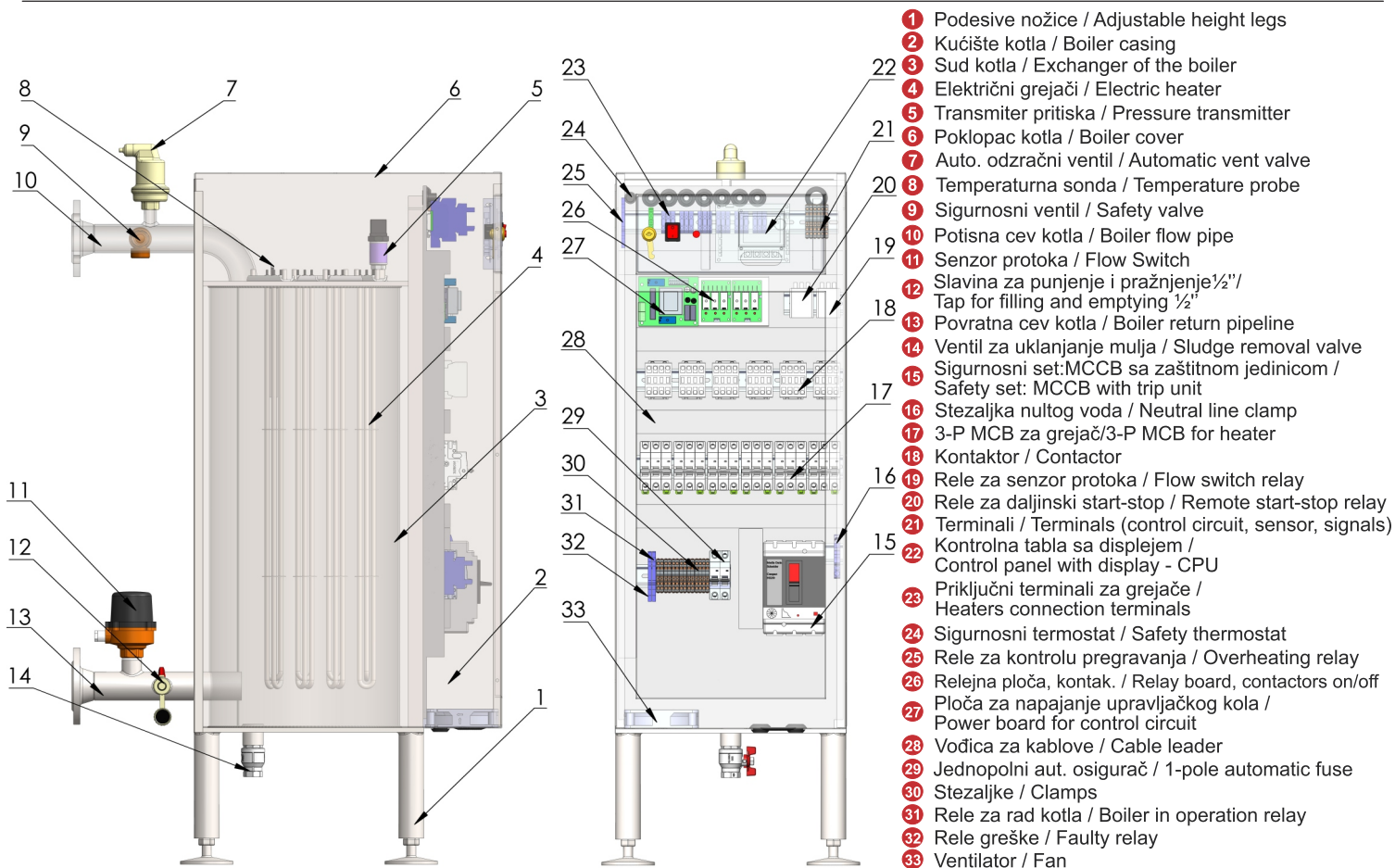
Električni toplovodni kotlovi **TK-Profesional** namenjeni su za grejanje većih prostora, kuća, stambenih zgrada, proizvodnih hala, poslovnih prostorija itd. Kotlovi snage 40 kW i više opremljeni su mikroprocesorskim termoregulatorom sa grafičkim LCD displejem. Minimalni protok se obezbeđuje ugradnjom prekidača protoka. Precizno nivelisanje uređaja postiže se pomoću podešivih nožica. Kotlovi TK-Profesional 40-60kW mogu se opcionalno povezati na centralizovani sistem za nadzor i upravljanje (BMS, SCADA,...), preko RS485 RTU modula, korišćenjem ModBus protokola. Moguće je povezati do 10 kotlova iste snage u kaskadu sa dodatnim **Kaskadnim regulatorom CPK09-M**.

Electric hot water boilers **TK-Professional** are intended for heating larger spaces, houses, residential buildings, production halls, business premises, etc. Boilers with a power of 40 kW and more are equipped with a microprocessor thermoregulator with a graphic LCD display. Minimum flow is ensured by installing a flow switch. Precise leveling of the device is achieved through adjustable feet. TK-Professional 40-60kW boilers can optionally be connected to a centralized monitoring and control system (BMS, SCADA,...), via an RS485 RTU module, using the ModBus protocol. It is possible to connect up to 10 boilers of the same power in a cascade with an additional **Cascade regulator CPK09-M**.

Pregled prednosti kotla / Overview of boiler advantages:

- > **Ugrađene komponente vrhunskog kvaliteta koje obezbeđuju dug vek trajanja kotla / Built-in premium quality components that ensure a long boiler life.**
- > **Zaštita od mraza pomoću posebnog programa / Frost protection using a separate program.**
- > **Svi sigurnosni elementi su ugrađeni: prekidač protoka, sigurnosni termostat, odzračni ventil / All safety elements are installed: flow switch, safety thermostat, air valve...**
- > **Daljinsko praćenje i upravljanje putem RS485 RTU modula, koristeći ModBus protokol / Remote monitoring and management via RS485 RTU module, using ModBus protocol.**
- > **Svi parametri sistema prikazani na korisničkom interfejsu. Jednostavno podešavanje temperature i snage sistema grejanja. / All system parameters displayed on the user interface. Easy adjustment of temperature and power of the heating system.**
- > **Kontrola temperature kotla prema spoljašnjoj temperaturi - O.T.C. režim rada (opciono) / Boiler temperature control according to outdoor temperature - O.T.C. operating mode (optional).**
- > **3 nivoa modulacije angažovane snage: bez modulacije – standardna modulacija – maksimalna modulacija / 3 levels of modulation of the engaged power: no modulation – standard modulation – maximal modulation**
- > **Podešavanje snage uređaja u više koraka - broj koraka zavisi od nominalne/nazivne snage električnog kotla (podesivo od strane korisnika). / Device power adjustment in multiple steps - the number of steps depends on the nominal/rated power of the electric boiler (adjustable by the user).**

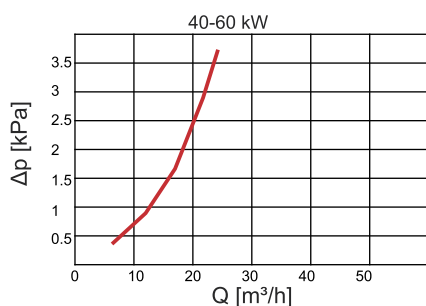
Bitne komponente / Key components



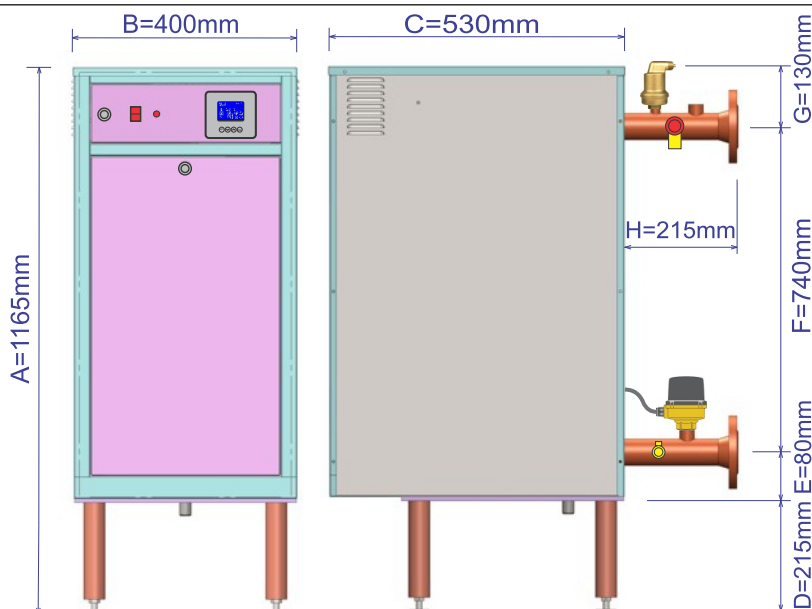
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Dimenzije i hidraulične karakteristike / Dimensions and hydraulics characteristics



Model	40 kW	50 kW	60 kW
DN	40		
Qmin [m³/h]	2,5	2,5	3
Qmax [m³/h]	6	8	10
Δ T [°C]	Optimalna brzina protoka/Optimum flow rate [m³/h] u zavisnosti od/depending on ΔT: Q= f {ΔT [°C]}		
5	5,4	6,8	8,1
10	2,7	3,4	4,1
15	2,2	2,7	3,1



OTC režim rada / OTC operating mode



Specifikacija proizvoda/Product specification

Model		TK-Profesional 40kW	TK-Profesional 50kW	TK-Profesional 60kW
grejne grupe	heating groups	4 × 10 kW	5 × 10 kW	6 × 10 kW
osigurači grejača	heater fuses	4 × 3P C25A	5 × 3P C25A	6 × 3P C25A
maksimalna nazivna struja	rated current	3 × 58A	3 × 72,5A	3 × 87A
potrebni glavni osigurači	required circuit breakers	3 × 63 A	3 × 80 A	3 × 100 A
potreban mrežni kabl	power cable	Cu 3 × 16 mm²	Cu 3 × 25 mm²	Cu 3 × 35 mm²
potreban zaštitni vod	protective earth cable	Cu 1 × 16 mm²	Cu 1 × 25 mm²	Cu 1 × 35 mm²
težina	weight	92kg	94kg	94kg
preporučena grejna * površina-podno/radijat.	recommended heating * surface-floor/radiator	≤400m² f.h. ≤320m² r.h.	≤500m² f.h. ≤400m² r.h.	≤600m² f.h. ≤480m² r.h.
Maksimalna koncentracija glikola u medijumu	Max. concentration of glycol in the medium	30 %		
MCCB sa naponskim okidačem	MCCB with voltage releises	160 A / 36kA		
Mikroprocesorski termoregulator (CPU)	Microprocessor thermoregulator (CPU)	EK_CPU_1_6 fw: vs15.03.005		
zapremina vode u kotlu	volume of water in the boiler	60 l		
priključni napon	power supply	3N ~ 400 / 230V 50Hz		
priključak na hidrauličnu mrežu	hydraulic connection	DN 40 (6/4"); PN 16		
min i max radni pritisak	min and max pressure	0,4 bar ÷ 4 bar (on request 6 bar)		
sigurnosni ventil	safety valve	½col 4,5 bar		
stepen IP zaštite	Ingress Protection rating	IP 20		
opseg regulacije temperature kotla	temperature range	10 ÷ 90 °C		
sigurnosni termostat	safety thermostat	95 °C		
komunikacija sa kaskadom / protokol	communication with cascade / protocol	RS485_RTU / ModBus		
komunikacija sa BMS-om / protokol	communication with BMS / protocol	RS485_RTU / ModBus		

*za objekte u skladu sa / for buildings in accordance with EN ISO 52016-1:2017, f.h.-podno grejanje/floor heating, r.h.-radijatorsko grejanje/radiator heating

TK-Profesional

Snaga / Power: 70kW - 80kW - 90kW - 100kW

Kotlovi TK-Profesional 70-100kW kao i ostali iz ove serije proizvode se po najstrožim bezbednosnim standardima EU. Kontrola i regulacija rada kotla vrši se preko mikroprocesorske jedinice koja prima informacije od digitalnih senzora pritiska i temperature. Automatizacija je fizički odvojena od posude kotla. Precizno nivelisanje uređaja postiže se pomoću podesivih antivibracionih nožica od tvrde gume (otporne). Kotlovi TK-Profesional 70-100kW mogu se opcionalno povezati na centralizovani sistem za nadzor i upravljanje (BMS, SCADA,...), preko RS485 RTU modula, korišćenjem ModBus protokola. Moguće je povezati do 10 kotlova iste snage u kaskadu sa dodatnim **Kaskadnim regulatorom CPK09-M**.

TK-Profesional 70-100kW boilers as well as others from this series are produced according to the strictest EU safety standards. Control and regulation of boiler operation is performed through a microprocessor unit that receives information from digital pressure and temperature sensors. The automation are physically separated from the boiler vessel. Precise leveling of the device is achieved through adjustable anti-vibration feet made of hard rubber (resistant). TK-Professional 70-100kW boilers can optionally be connected to a centralized monitoring and control system (BMS, SCADA,...), via an RS485 RTU module, using the ModBus protocol. It is possible to connect up to 10 boilers of the same power in a cascade with an additional **Cascade regulator CPK09-M**.

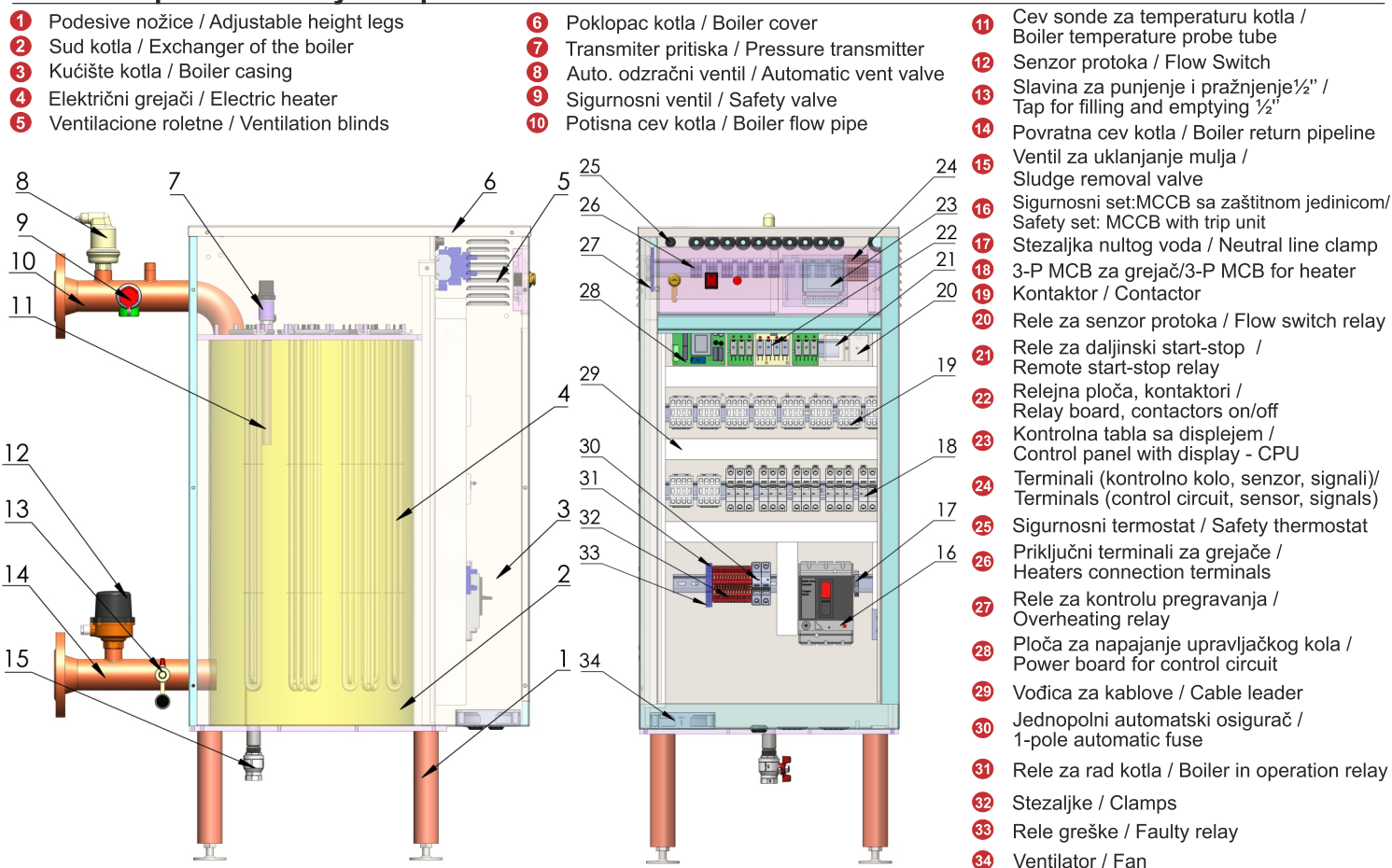
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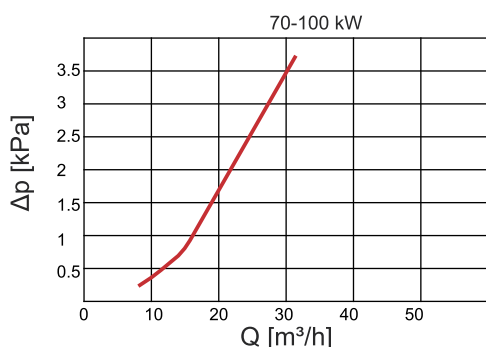
Pregled prednosti kotla / Overview of boiler advantages:

- > Ugrađene komponente vrhunskog kvaliteta koje obezbeđuju dug vek trajanja kotla / Built-in premium quality components that ensure a long boiler life.
- > 3 nivoa modulacije angažovane snage: bez modulacije – standardna modulacija – maksimalna modulacija / 3 levels of modulation of the engaged power: no modulation – standard modulation – maximal modulation
- > Svi sigurnosni elementi su ugrađeni: prekidač protoka, sigurnosni termostats, odzračni ventil / All safety elements are installed: flow switch, safety thermostat, air valve...
- > Daljinsko praćenje i upravljanje putem RS485 RTU modula, koristeći ModBus protokol / Remote monitoring and management via RS485 RTU module, using ModBus protocol.
- > Kontrola temperature kotla prema spoljašnjoj temperaturi - O.T.C. režim rada (opciono) / Boiler temperature control according to outdoor temperature - O.T.C. operating mode (optional).
- > Zaštita od mraza pomoću posebnog programa / Frost protection using a separate program.
- > Podešavanje snage uređaja u više koraka - broj koraka zavisi od nominalne/nazivne snage električnog kotla (podesivo od strane korisnika). / Device power adjustment in multiple steps - the number of steps depends on the nominal/rated power of the electric boiler (adjustable by the user).

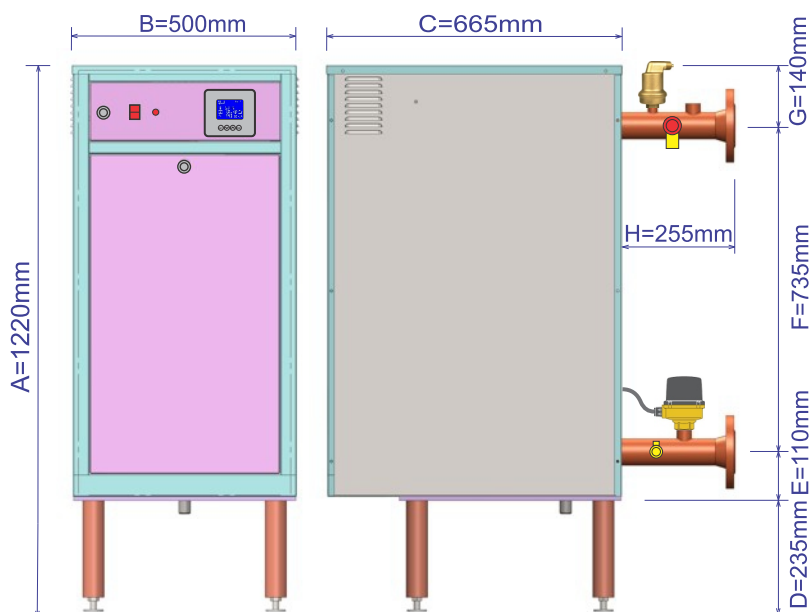
Bitne komponente / Key components



Dimenzije i hidraulične karakteristike / Dimensions and hydraulics characteristics



Model	70 kW	80 kW	90 kW	100 kW
DN	50			
Qmin [m³/h]	3,5	4	4,5	5
Qmax [m³/h]	11	12	15	16
Δ T [°C]	Optimalna brzina protoka/Optimum flow rate [m³/h] u zavisnosti od/depending on ΔT: Q= f {ΔT [°C]}			
5	9,45	10,8	13,5	15
10	4,7	5,4	6,8	7,5
15	3,6	4,1	5,2	5,7



OTC režim rada / OTC operating mode



Specifikacija proizvoda/Product specification

Model		TK-Profesional 70kW	TK-Profesional 80kW	TK-Profesional 90kW	TK-Profesional 100kW
grejne grupe	heating groups	7 × 10 kW	8 × 10 kW	9 × 10 kW	10 × 10 kW
osigurači grejača	heater fuses	7 × 3P C25A	8 × 3P C25A	9 × 3P C25A	5 × 3P C40A
maksimalna nazivna struja	rated current	3 × 101,5A	3 × 116A	3 × 130A	3 × 145A
potrebni glavni osigurači	required circuit breakers	3 × 125 A	3 × 125 A	3 × 160 A	3 × 160 A
potreban mrežni kabl	power cable	Cu 3 × 35 mm²	Cu 3 × 50 mm²	Cu 3 × 50 mm²	Cu 3 × 70 mm²
potreban zaštitni vod	protective earth cable	Cu 1 × 25 mm²	Cu 1 × 25 mm²	Cu 1 × 35 mm²	Cu 1 × 35 mm²
težina	weight	130kg	132kg	135kg	136kg
preporučena grejna * površina-podno/radijat.	recommended heating * surface-floor/radiator	≤700m² f.h. ≤560m² r.h.	≤800m² f.h. ≤640m² r.h.	≤900m² f.h. ≤720m² r.h.	≤1000m² f.h. ≤800m² r.h.
Maksimalna koncentracija glikola u medijumu	Max. concentration of glycol in the medium	30 %			
MCCB sa naponskim okidačem	MCCB with voltage releases	160 A / 36kA			
Mikroprocesorski termoregulator (CPU)	Microprocessor thermoregulator (CPU)	EK_CPU_1_6 fw: vs15.03.005			
zapremina vode u kotlu	volume of water in the boiler	90 l			
priključni napon	power supply	3N ~ 400V 50Hz			
priključak na hidrauličnu mrežu	hydraulic connection	DN 50 (2"); PN 16			
senzor protoka min/max protok za uključenje grejanja	flow switch min/max flow for enabled heating	3m³/h ÷ 9m³/h			
min i max radni pritisak	min and max pressure	0,4 bar ÷ 4 bar (on request 6 bar)			
sigurnosni ventil	safety valve	3/4" 4,5 bar			
stepen IP zaštite	Ingress Protection rating	IP 20			
opseg regulacije temperature kotla	temperature range	10 ÷ 90 °C			
sigurnosni termostat	safety thermostat	95 °C			
komunikacija sa kaskadom / protokol	communication with cascade / protocol	RS485_RTU / ModBus			
komunikacija sa BMS-om / protokol	communication with BMS / protocol	RS485_RTU / ModBus			

*za objekte u skladu sa / for buildings in accordance with EN ISO 52016-1:2017, f.h.-podno grejanje/floor heating, r.h.-radijatorsko grejanje/radiator heating

TK-Profesional

Snaga / Power: 120kW - 140kW - 160kW - 180kW - 200kW - 240kW

Kotlovi **TK-Profesional 120-240kW** su kompaktni uređaji namenjeni za grejanje većih stambenih ili poslovnih objekata. Posuda kotla je napravljena od (lima) čelika, testirana na pritisak od 6 bara, dok je maksimalni radni pritisak 4 bara. Kotlovi su opremljeni sistemom „Multistage protection“, koji permanentno prati temperaturu i pritisak u sistemu. Precizno nivelisanje uređaja postiže se pomoću podesivih antivibracionih nožica od tvrde gume (otporne). Kotlovi TK-Profesional 120-240kW mogu se opcionalno povezati na centralizovani sistem za nadzor i upravljanje (BMS, SCADA,...), preko RS485 RTU modula, korišćenjem ModBus protokola. Moguće je povezati do 10 kotlova iste snage u kaskadu sa dodatnim **Kaskadnim regulatorom CPK09-M**.

Boilers **TK-Professional 120-240kW** are compact devices intended for heating larger residential or commercial buildings. The boiler vessel is made of (sheet) steel, tested at a pressure of 6 bar, while the maximum working pressure is 4 bar. The boilers are equipped with a "Multistage protection" system, which permanently monitors the temperature and pressure in the system. Precise leveling of the device is achieved through adjustable anti-vibration feet made of hard rubber (resistant). TK-Professional 120-240kW boilers can optionally be connected to a centralized monitoring and control system (BMS, SCADA,...), via an RS485 RTU module, using the ModBus protocol. It is possible to connect up to 10 boilers of the same power in a cascade with an additional **Cascade regulator CPK09-M**.

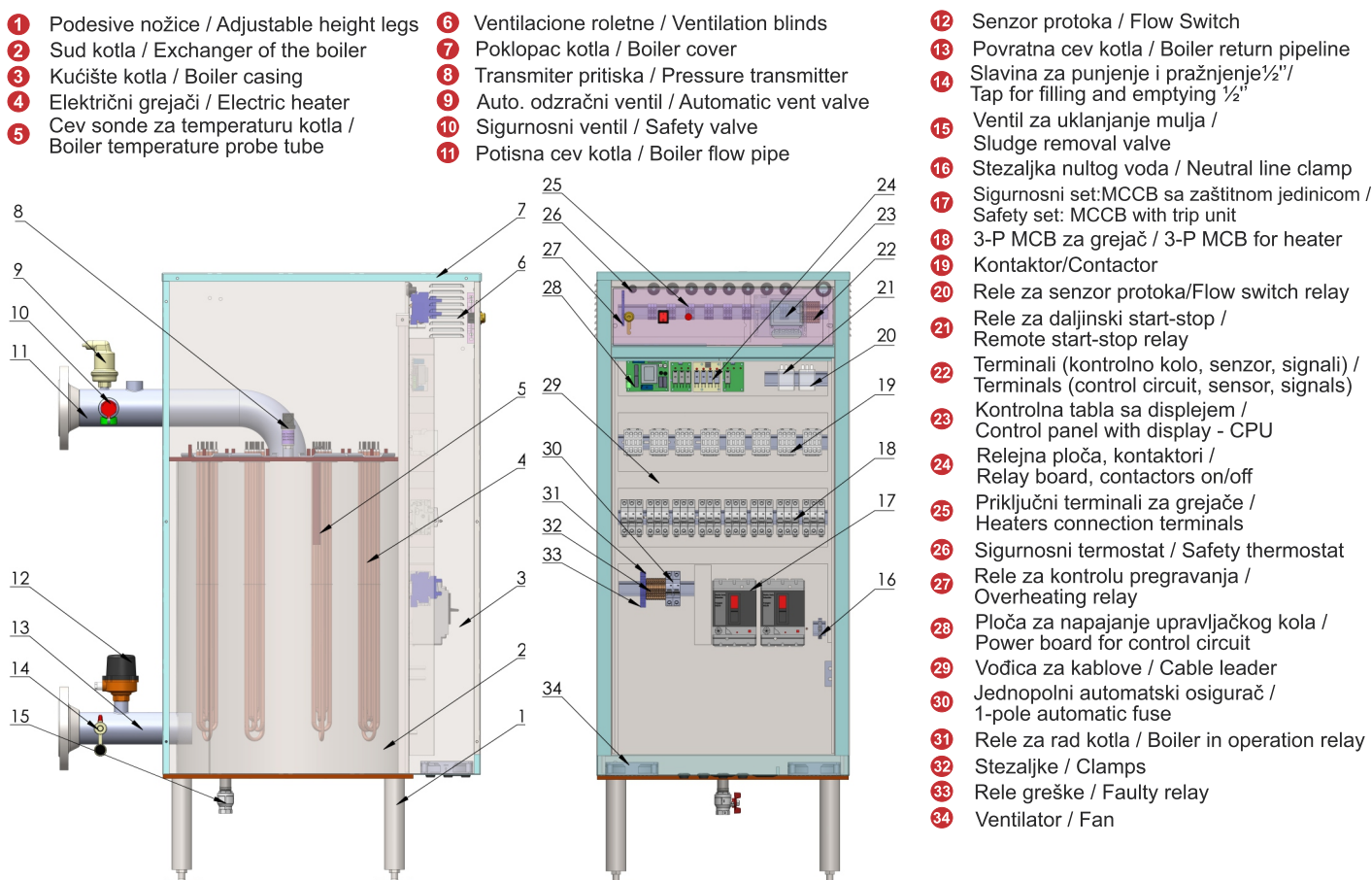
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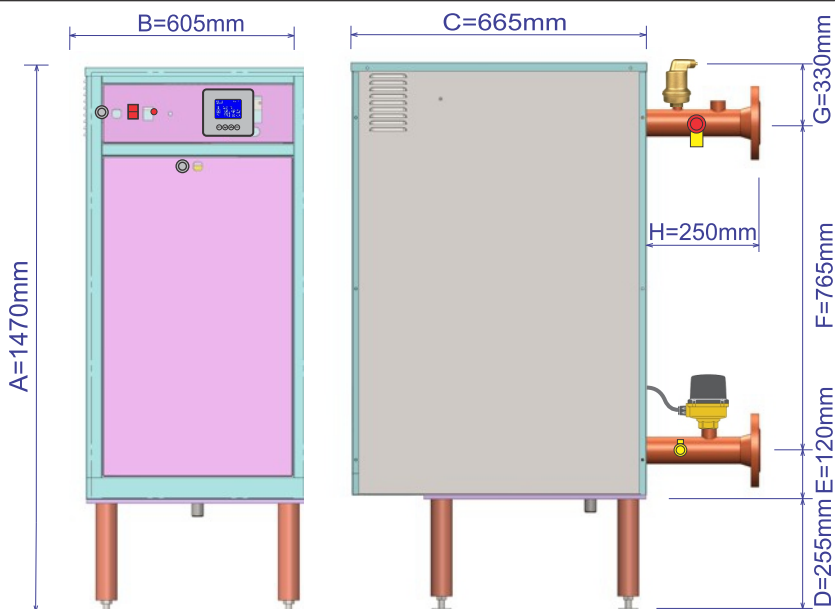
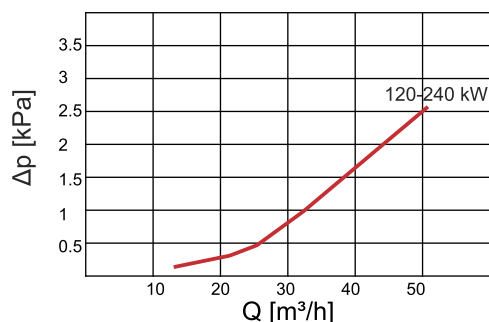
Pregled prednosti kotla / Overview of boiler advantages:

- > **Ugrađene komponente vrhunskog kvaliteta koje obezbeđuju dug vek trajanja kotla / Built-in premium quality components that ensure a long boiler life.**
- > **3 nivoa modulacije angažovane snage: bez modulacije – standardna modulacija – maksimalna modulacija / 3 levels of modulation of the engaged power: no modulation – standard modulation – maximal modulation**
- > **Svi sigurnosni elementi su ugrađeni: prekidač protoka, sigurnosni termostats, odzračni ventil / All safety elements are installed: flow switch, safety thermostat, air valve...**
- > **Daljinsko praćenje i upravljanje putem RS485 RTU modula, koristeći ModBus protokol / Remote monitoring and management via RS485 RTU module, using ModBus protocol.**
- > **Kontrola temperature kotla prema spoljašnjoj temperaturi - O.T.C. režim rada (opciono) / Boiler temperature control according to outdoor temperature - O.T.C. operating mode (optional).**
- > **Zaštita od mraza pomoću posebnog programa / Frost protection using a separate program.**
- > **Podešavanje snage uređaja u više koraka - broj koraka zavisi od nominalne/nazivne snage električnog kotla (podesivo od strane korisnika) / Device power adjustment in multiple steps - the number of steps depends on the nominal/rated power of the electric boiler (adjustable by the user).**

Bitne komponente / Key components



Dimenzije i hidraulične karakteristike / Dimensions and hydraulics characteristics



Model	120 kW	140 kW	160 kW	180 kW	200 kW	240 kW
DN	65	80				
Qmin [m³/h]	6	7	8	9	10	12
Qmax [m³/h]	20	23	26	30	33	40
Δ T [°C]	Optimalna brzina protoka/Optimum flow rate [m³/h] u zavisnosti od/depending on ΔT: $Q = T \cdot \Delta T$ [°C]					
5	18	21	26,4	29,7	33	42
10	9	10,5	13,2	14,9	16,5	21
15	6,9	8	10,1	11,3	12,6	16

OTC režim rada / OTC operating mode



Specifikacija proizvoda / Product specification

Model		TK-Profesional 120kW	TK-Profesional 140kW	TK-Profesional 160kW	TK-Profesional 180kW	TK-Profesional 200kW	TK-Profesional 240kW
grejne grupe	heating groups	6 × 20 kW	7 × 20 kW	8 × 20 kW	9 × 20 kW	10 × 20 kW	6 × 40 kW
osigurači grejača	heater fuses	6 × 3P C40A	7 × 3P C40A	8 × 3P C40A	9 × 3P C40A	10 × 3P C40A	12 × 3P C40A
maksimalna nazivna struja	maximum required current	3 × 174A	3 × 203A	3 × 232A	3 × 261A	3 × 290A	3 × 248A
potrebni glavni osigurači	main circuit breakers	3 × 200 A	3 × 250 A	3 × 250 A	3 × 300 A	3 × 315 A	3 × 400 A
potreban mrežni kabl	power cable	2 cable Cu 3 × 35 mm²	2 cable Cu 3 × 50 mm²	2 cable Cu 3 × 50 mm²	2 cable Cu 3 × 70 mm²	2 cable Cu 3 × 70 mm²	2 cable Cu 3 × 95 mm²
potreban zaštitni vod	protective platoon required	Cu 1 × 35 mm²	Cu 1 × 35 mm²	Cu 1 × 50 mm²	Cu 1 × 50 mm²	Cu 1 × 70 mm²	Cu 1 × 70 mm²
težina	weight	195kg	197kg	200g	200kg	200kg	217kg
zapremina vode u kotlu	volume of water in the boiler	170 l	170 l	170 l	170 l	170 l	170 l
priključak na hidrauličnu mrežu	hydraulic connection	DN65(2½");PN16	DN65(2½");PN16	DN65(2½");PN16	DN65(2½");PN16	DN65(2½");PN16	DN65(2½");PN16
sigurnosni ventil	safety valve	3/4" 4,5 bar	3/4" 4,5 bar	3/4" 4,5 bar	3/4" 4,5 bar	3/4" 4,5 bar	3/4" 4,5 bar
preporučena grejna * površina-podno/radijat.	recommended heating* surface-floor/radiator	≤1200m² f.h. ≤1000m² r.h.	≤1400m² f.h. ≤1150m² r.h.	≤1600m² f.h. ≤1300m² r.h.	≤1800m² f.h. ≤1450m² r.h.	≤2000m² f.h. ≤1600m² r.h.	≤2400m² f.h. ≤2000m² r.h.
Maksimalna koncentracija glikola u medijumu	Max. concentration of glycol in the medium	30 %					
MCCB sa naponskim okidačem	MCCB with voltage releises	160 A / 36kA					
Mikroprocesorski termoregulator (CPU)	Microprocessor thermoregulator (CPU)	EK_CPU_1_6 fw: vs15.03.005					
priključni napon	power supply	3N ~ 400V 50Hz					
min/max protok za uključenje grejanja	flow switch min/max flow for enabled heating	3m³/h ÷ 9m³/h					
min i max radni pritisak	min and max pressure	0,4 bar ÷ 4 bar					
stepen IP zaštite	Ingress Protection rating	IP 20					
opseg regulacije temperature kotla	working temperature	10 ÷ 90 °C					
sigurnosni termosta	security thermostat	95 °C					
kommunikacija sa kaskadom / protokol	communication with cascade / protocol	RS485_RTU / ModBus					
kommunikacija sa BMS-om / protokol	communication with BMS / protocol	RS485_RTU / ModBus					

*za objekte u skladu sa / for buildings in accordance with EN ISO 52016-1:2017, f.h.-podno grejanje/floor heating, r.h.-radijatorsko grejanje/radiator heating

Kaskadni regulator / Cascade regulator

CPK09-M

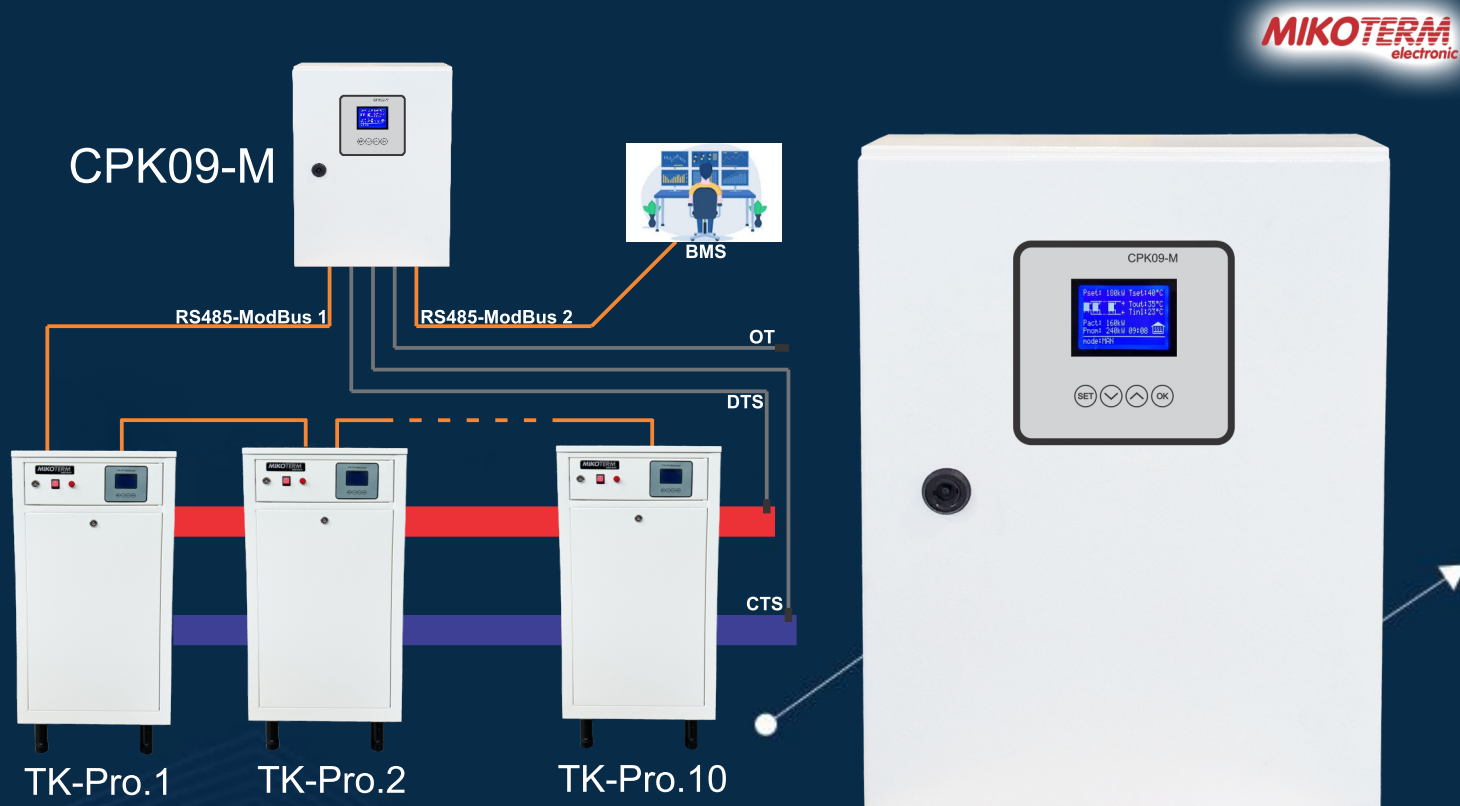
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Kaskadni regulator **CPK09-M** je uređaj namenjen za kontrolu i upravljanje sistemom od više paralelno povezanih kotlova serije **TK-Professional** iste nominalne snage, koje korisnik kontroliše kao jedan kotao. Takođe, CPK09-M se može povezati sa BMS-om, odnosno centralizovanim sistemom za nadzor i upravljanje, putem ModBus RTU (RS485) protokola, što daje mogućnost sagledavanja kotlarnice kao dela celog objekta, a samim tim i preciznijeg upravljanja i uštede energije. Kaskadni regulator CPK09-M pruža mogućnost kontrole do 10 kotlova povezanih paralelno i podešenih za rad u kaskadnom režimu. Prikazuju se kao jedan veći kotao, čija je snaga jednaka ukupnoj snazi svih povezanih kotlova. Podešavanje snage i zadate temperature potisnog voda sistema kaskadno povezanih kotlova moguće je direktno na kaskadnom regulatoru, kao i daljinski putem ModBus komunikacije. Kaskadni kontroler raspoređuje snagu na pojedinačne kotlove tako da svi raspoloživi kotlovi budu što ravnomernije opterećeni, rade u najoptimalnijem režimu za njih – kako bi radni vek svakog kotla bio što duži. Ukoliko tokom rada dođe do prekida komunikacije između kaskadnog regulatora i jednog od kotlova, maksimalna raspoloživa snaga se smanjuje za snagu kotla od kojeg kaskadni regulator ne dobija informacije. Ukoliko u određenom periodu eksploatacije nije potrebno uključiti sve kotlove povezane u kaskadu (zbog manje potrebne snage), pojedinačni kotlovi se jednostavno mogu isključiti. Kaskadni regulator će nastaviti da radi sa preostalim uključenim kotlovima, sve što je potrebno uraditi jeste da se u listi konfiguracije kaskadnog regulatora odčekeraju kotlovi koji su isključeni. Opciono, kaskadni regulator može kontrolisati temperaturu razdelnika prema spoljašnjim uslovima (Outdoor Temperature Compensation).

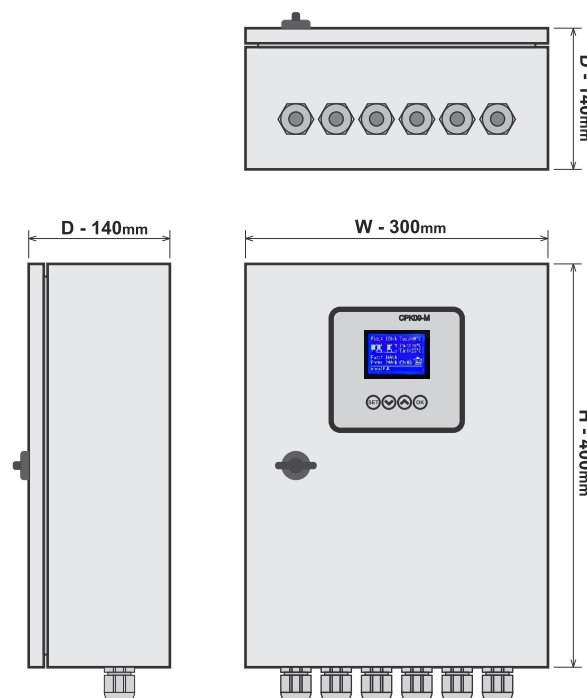
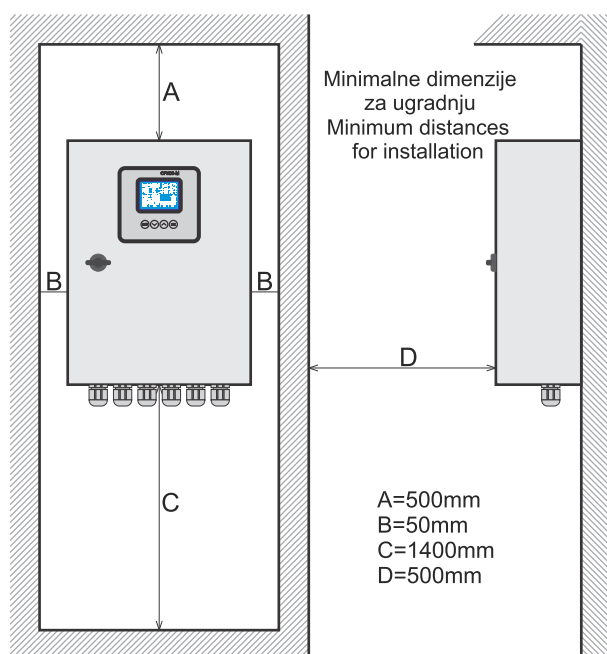
Cascade regulator **CPK09-M** is a device intended for the control and management of a system of several parallel-connected boilers of the **TK-Professional** series with the same nominal power, which the user controls as one boiler. Also, CPK09-M can be connected to BMS, that is, a centralized monitoring and control system, via the ModBus RTU (RS485) protocol, which gives the possibility of viewing the boiler room as part of the entire facility, and thus more precise management and energy saving. Cascade regulator CPK09-M provides the ability to control up to 10 boilers connected in parallel and set to work in cascade mode. They are displayed as one larger boiler, the power of which is equal to the total power of all connected boilers. Setting the power and set temperature of the pressure line of the system of cascade connected boilers is possible directly on the cascade regulator, as well as remotely via ModBus communication. The cascade controller distributes power to individual boilers so that all available boilers are loaded as evenly as possible, they work in the most optimal mode for them - so that the working life of each boiler is as long as possible. If during operation there is a communication interruption between the cascade regulator and one of the boilers, the maximum available power is reduced by the power of the boiler from which the cascade regulator does not receive information. If in a certain period of exploitation it is not necessary to engage all the boilers connected in a cascade (due to less required power), individual boilers can simply be turned off. The cascade regulator will continue to work with the remaining boilers on, all that needs to be done is to de-check the boilers that have been switched off in the configuration list of the cascade regulator. Optionally, the cascade regulator can control the temperature of the distributor according to the external conditions (Outdoor Temperature Compensation).

CPK09-M connected to system



Kontrola i upravljanje sa jednog mesta / Control and management from one place

Dimenzije / Dimensions



Specifikacija proizvoda/Product specification

	Jedinica/ Unit	CPK09-M
Masa uređaja / Device mass	kg	9
Stepen zaštite (voda i prašina) / Protection level (water and dust)		IP 54
Stepen zaštite (spoljašnji mehanički uticaji) / Protection level (external mechanical influences)		IK 02
Maksimalna temperatura okoline / Maximum ambient temperature	°C	-20 ÷ 70
Maksimalna relativna vlažnost okoline / Maximum relative humidity of the ambient	%	90
Maksimalan broj kotlova u kaskadnoj vezi / Maximum number of boilers in cascade connection		10
Napon mreže / Network voltage	VAC	230
Stezaljke za kablove za napajanje sa oprugom / Spring-loaded power cable clamps	mm ²	4
Opružne stezaljke senzora, signala i komunikacije / Spring clamps of sensors, signals and communication	mm ²	2,5
Glavni osigurač / Main Fuse (MCB)	A	1-p C6A
Minimalni poprečni presek kabla za napajanje / Minimum cross-section of the power cable	mm ²	Cu 3×0,75
Potrošnja uređaja u režimu pripravnosti / Device consumption in stand-by mode	W	3
Maksimalna potrošnja uređaja / Maximum device consumption	W	11
Merni opseg senzora temperature / Measuring range of temperature sensors	°C	-50 ÷ 125
Minimalni poprečni presek kablova za senzore temperature / Minimum cross-section of cables for Temperature sensors	mm ²	Cu 2×0,2 (AWG24)
Maksimalna dužina kabla za senzore temperature / Maximum cable length for Temperature sensors	m	20
Minimalni poprečni presek kablova za komunikaciju / Minimum cross-section of cables for Communication	mm ²	Uvijeni kabli / Bus twisted cable 2×0,1 (AWG26)
Maksimalna dužina komunikacionog kabla / Maximum communication cable length	m	100
Komunikacioni protokol kaskadnog regulatora i kotlova-BMS-a / Communication protocol of cascade regulator and boilers-BMS		RS485 ModBus RTU
Relejni signal „Kotao u radu / Greška u radu kotla / Greška u komunikaciji sa kotlom“ Relay signal "Boiler in operation / Boiler operation error / Error in Communication with Boiler"		Kontakt bez napona / Voltage-free contacts, I _{max} =10A, 230VAC
Spoljni uslovi za rad kotla (daljinsko pokretanje / zaustavljanje) / External conditions for boiler operation (remote start / stop)		24VDC
Mikroprocesorska jedinica (CPU) / Microprocessor Unit (CPU)		EK_CPU_1_6

TK-eLG Snaga / Power: 6kW; 9kW

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Kotao **TK-eLG** je namenjen za podršku toplotnoj pumpi i može da radi samo u paru sa toplotnom pumpom vazduh/voda **LG Therma V Monobloc**. Postoji mogućnost adaptacije na druge toplotne pumpe, da bi mogao da radi sa toplotnim pumpama drugih proizvođača, potrebno je prilagoditi senzor temperature prema konkretnoj toplotnoj pumpi. Ovaj uređaj nema radni termostat (ima zaštitni termostat), već informaciju sa senzora temperature prosleđuje termoregulatoru toplotne pumpe. Termoregulator toplotne pumpe odlučuje da li će i kada biti uključen električni grejač. Električni kotao TK-eLG igra važnu ulogu u pravilnom radu toplotne pumpe koja koristi ekološki prihvatljiv gas R32 za koji standard ne dozvoljava ugradnju električnih grejača u kućište toplotne pumpe. Kotao Mikoterm TK-eLG je namenjen za montažu na zid. Kotao se fiksira na zid pomoću isporučenog kompleta za montažu.

The **TK-eLG** boiler is intended to support the heat pump and can only work in pair with the heat pump air / water **LG Therma V Monobloc**. There is a possibility of adaptation to other heat pumps, in order to be able to work with heat pumps of other manufacturers, it is necessary to adapt the temperature sensor according to the specific heat pump. This device does not have a working thermostat (it has a protective thermostat), but forwards the information from the temperature sensor to the thermoregulator of the heat pump. The thermoregulator of the heat pump decides whether and when the electric heater will be switched on. Electric boiler TK-eLG plays an important role in the proper operation of a heat pump that uses environmentally friendly gas R32 for which the standard does not allow the installation of electric heaters in the heat pump housing. The Mikoterm TK-eLG boiler is intended for wall mounting. The boiler is fixed to the wall using the supplied mounting kit.

IP 20 (6-9kW)

IP 54 (6kW)



**Unutrašnja instalacija/
Indoor installation**

**Spoljašnja instalacija/
Outdoor installation**

Pregled prednosti kotla / Overview of boiler advantages:

- > Podrška toplotne pumpe LG Therma V Monoblock.
LG Therma V Monoblock heat pump support.
- > Male dimenzije kotla omogućuju laku montažu na zid uz pomoć isporučenog montažnog seta.
The small dimensions of the boiler allow easy wall mounting with the help of the supplied mounting kit.
- > Lako i brzo električno povezivanje sa toplotnom pumpom, montiran senzor temperature.
Easy and fast electrical connection to the heat pump, mounted temperature sensor.
- > Mogućnost povezivanja na trofazno i na monofazno napajanje.
Possibility of connection to three-phase and single-phase power supply.
- > Nije potrebno hidraulično premošćavanje kotla (bypass) kada pumpa radi na hlađenju, zbog paro-nepropusne izolacije.
Hydraulic bypass of the boiler is not required when the pump is running on cooling, due to vapor-tight insulation.
- > Sigurnosni sklop - potpuno isključivanje napajanja u slučaju pregrevanja.
Safety circuit - completely shuts off the power in case of overheating
- > Privremeno može zameniti toplotnu pumpu i preuzeti zagrevanje objekta.
It can temporarily replace the heat pump and take over the heating of the building

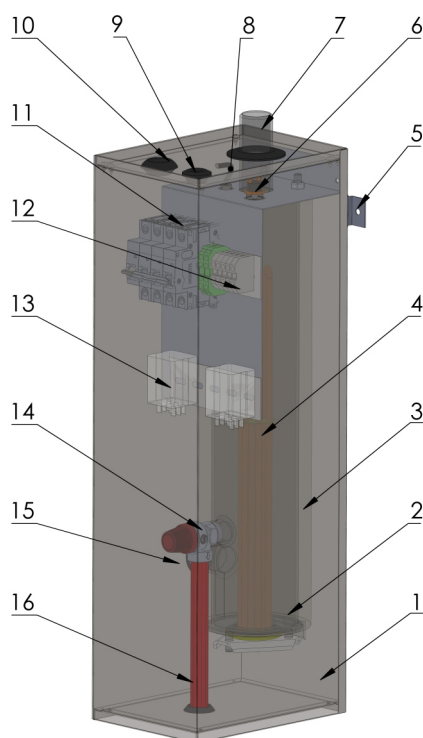
IP 20/54

kW 6-9

η 99%

kg 10,5

Bitne komponente / Key components



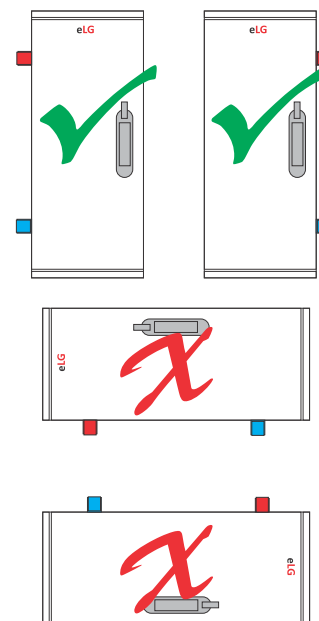
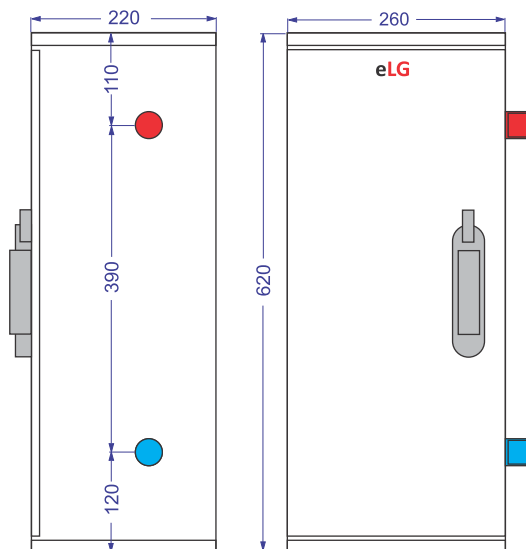
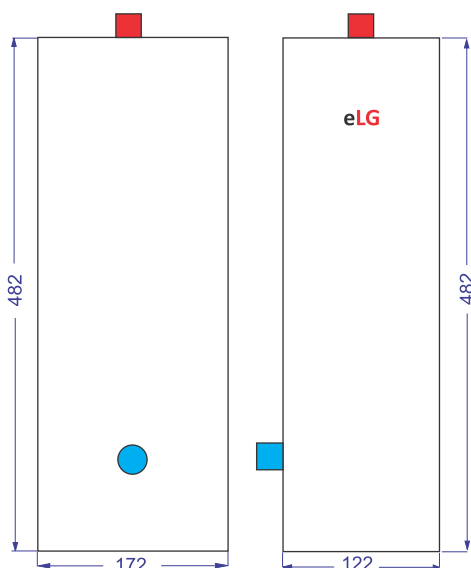
- 1 Kućište kotla / Boiler casing
- 2 Sud kotla / Exchanger of the boiler
- 3 Izolacija suda kotla / Boiler vessel insulation
- 4 Električni grejač / Electric heater
- 5 Set za montažu / Mounting bracket
- 6 Sigurnosni termostat / Safety thermostat
- 7 Potisni vod kotla / Boiler pressure line
- 8 Temperaturna sonda / Temperature probe
- 9 Uvodnica kabla za signal / Cable gland for signal
- 10 Uvodnica kabla za napajanje / Cable gland for power supply
- 11 Sigurnosni set: 3-P MCB sa okidačem - električna zaštita i zaštita od pregrevanja/
Safety set: 3-P MCB with trip unit - electrical and overheating protection
- 12 Kleme / Clamps
- 13 Relejne grupe / Relay groups
- 14 Sigurnosni ventil / Safety valve
- 15 Povratni vod kotla / Return line
- 16 Odvodno crevo / Drain hose

Dimenzije / Dimensions

Dimenzije TK-eLG IP20 za
unutrašnju montažu / Dimensions
TK-eLG IP20 for indoor installation

Dimenzije TK-eLG IP54 za
spoljašnju montažu / Dimensions
TK-eLG IP54 for outdoor installation

Položaj za ugradnju/
Installation position



! važno/important !

- Model eLG IP20 proizvodi se samo sa hidrauličnim izvodima levo i gore/
The eLG IP20 model is produced only with left and top hydraulic outlets.
- Model eLG IP54 se proizvodi posebno sa hidrauličnim izvodima levo ili desno/
The eLG IP54 is produced separately with left or right hydraulic outlets.

Specifikacija proizvoda / Product specification

Model TK eLG 6kW / 9kW		monofazno napajanje/ single-phase power supply 6kW			trofazno napajanje/ three-phase power supply 6kW			monofazno napajanje/ single-phase power supply 9kW			trofazno napajanje/ three-phase power supply 9kW		
stepen korisnog dejstva	utility level	99%			99%			99%			99%		
kontrolni signali sa toplotne pumpe	control signals from thr heat pump	1	2	1+2	1	2	1+2	1	2	1+2	1	2	1+2
podela stepeni snage	power division	1 × 2kW	2 × 2kW	6kW (2+4kW)	2kW	4kW	6kW (2+4kW)	1 × 3kW	2 × 3kW	9kW (3+6kW)	3kW	6kW	9kW (3+6kW)
potrebni glavni osigurači	main circuit breakers	1 × 16A	1 × 25A	1 × 32A	3 × 16A			1 × 16A	1 × 32A	1 × 50A	3 × 16A		
minimalni presek napojnog kabla	minimum cross-section of the power cable	3 × 2,5 mm ²	3 × 4 mm ²	3 × 4 mm ²	5 × 2,5 mm ²			3 × 2,5 mm ²	3 × 6 mm ²	3 × 6 mm ²	5 × 2,5 mm ²		
priključni napon	connection voltage	1N ~ 230V 50Hz			3N ~ 400/230V 50Hz			1N ~ 230V 50Hz			3N ~ 400/230V 50Hz		
stepen zaštite	Ingress Protection rating	IP 20 / IP54									IP 20		
maksimalni pritisak	maximum pressure	3 bar									3 bar		
minimalni pritisak	minimum pressure	0,5 bar*									0,5 bar*		
opseg regulacije temperature kotla	temperature range	Regulacija preko toplotne pumpe / Regulation via heat pump									Regulacija preko toplotne pumpe / Regulation via heat pump		
sigurnosni termost	safety thermostat	95 °C									95 °C		
zapremina vode u kotlu	volume of water in the boiler	4,5 l									4,5 l		
priključak potisnog voda	discharge line connection	DN25 (1") MPT or DN32 (5/4") MPT									DN32 (5/4") MPT		
priključak povratnog voda	return line connection	DN25 (1") MPT or DN32 (5/4") MPT									DN32 (5/4") MPT		
težina kotla bez vode	weight of boiler without water	IP 20 = 9 kg / IP 54 = 14 kg									IP 20 = 10 kg		

* - Napomena: kotao nema ugrađen granični presostat, navedeni min pritisak je zbog pravilnog rada cirkulacione pumpe sistema.

- Note: the boiler does not have a built-in pressure limiter, the specified min. pressure is because to the correct operation of the system circulation pump.

eMobile Snaga / Power: 10,8kW; 21kW; 36kW

Mobilna električna grejna jedinica eMobile je generator toplote za zatvorene sisteme grejanja. Proizvodi se u tri varijante, snage 10,8kW; 21,6kW i 36kW. Za kontrolu rada zadužen je mikroprocesorski termoregulator (CPU), na čijem displeju su prikazani svi zadati trenutni parametri sistema. Merenja temperature i pritiska vrše se digitalnim senzorima što obezbeđuje visoku preciznost. Uređaji od 21,6kW i 36kW se mogu koristiti za sušenje betonske košuljice, prema standardu DIN EN 1264-4. U tu svrhu CPU (21,6kW i 36kW) ima integrisana dva fiksna programa i jedan podesiv program sa maksimalnim trajanjem od 30 dana. Jedinice od 21,6kW i 36kW su opremljene sa tri tipa industrijskih utikača što daje mogućnost upotrebe različitih priključaka na terenu. Sve grejne jedinice su opremljene visoko efikasnom pumpom, ekspanzionom posudom i električnim i hidrauličnim sigurnosnim elementima po EU standardima.

The eMobile mobile electric heating unit is a heat generator for closed heating systems. It is produced in three variants, power 10.8kW; 21.6kW and 36kW. The microprocessor thermoregulator (CPU) is in charge of the operation control, and its display shows all the set current system parameters. Temperature and pressure measurements are performed with digital sensors, which ensures high accuracy.

Devices of 21.6kW and 36kW can be used for drying concrete screed, according to DIN EN 1264-4. For this purpose, the CPU (21.6kW and 36kW) has integrated two fixed programs and one configurable program with a maximum duration of 30 days. The 21.6kW and 36kW units are equipped with three types of industrial plugs, which allows the use of different connections in the field. All heating units are equipped with a highly efficient pump, expansion vessel and electrical and hydraulic safety elements according to EU standards.



eMobile 10,8kW



eMobile 21,6



eMobile 36kW

kW 10,8; 21,6; 36

m² ≤410 floor heating
≤340 radiator heating
za objekte u skladu sa/for buildings in accordance with
EN ISO 52016-1:2017
pri spoljnoj temp. 0 °C i naponu 230V/at an external
temp. of 0 °C and a voltage of 230V

η 99%

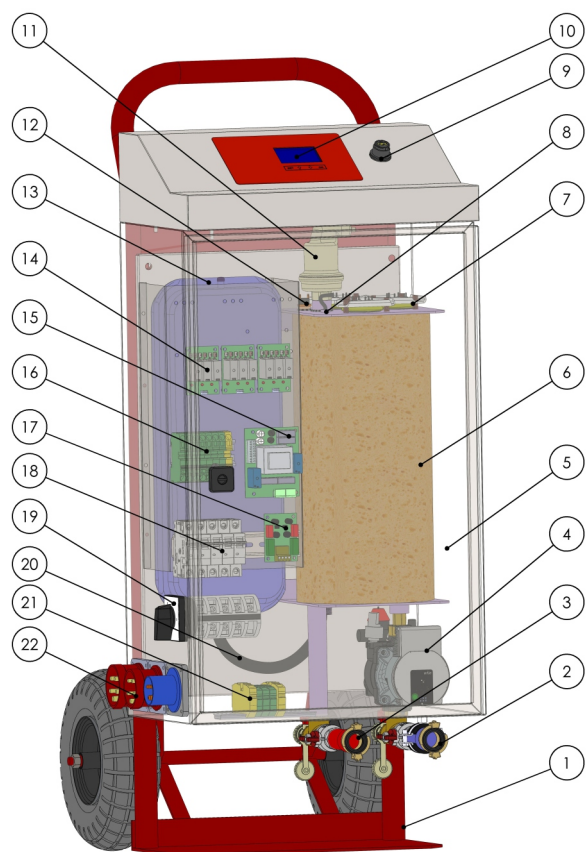
IP 44

kg 25÷60

Pregled prednosti / overview of advantage:

- > **Modulacija angažovane snage (moguć izbor: max/standard/off).**
Modulation of engaged power (possible choice: max / standard / off).
- > **Programi za sušenje estriha (21,6 i 36kW).**
Screed drying programs (21,6 and 36kW).
- > **Izbor jezika (21,6 i 36kW): engleski, nemački i francuski.**
Language selection (21,6 and 36kW): english, german, french.
- > **Snimanje datoteke u internu memoriju i preuzimanje preko USB port-a do 10 datoteka, svaka do 30 dana (21,6 and 36kW).**
File recording in internal memory and download via USB port - up to 10 files, up to 30 days each (21,6 and 36kW).
- > **Električni i hidraulični sigurnosni elementi prema EU standardima.**
Electrical and hydraulic safety elements according to EU standards.
- > **3 tipa industrijskih utikača (21,6 i 36kW) omogućavaju prilagođenje uslovima na terenu. Maksimalna snaga se automatski ograničava prema utikaču koji se koristi.**
3 types of industrial plugs (21.6 and 36kW) allow adaptation to field conditions. Maximum power is automatically limited by the plug used.

Bitne komponente / Key components



- 1 Ručna kolica / Handcart
- 2 Ulazni hidraulični priključak / Inlet hydraulic connection "Geka" 1"
- 3 Izlazni hidraulični priključak / Output hydraulic connection "Geka" 1"
- 4 Visoko efikasna pumpa - Wilo / Highly efficient pump - Wilo
- 5 Kućište kotla / Boiler casing
- 6 Sud kotla / Exchanger of the boiler
- 7 Električni grejači / Electric heaters
- 8 Senzor temperature / Temperature sensor
- 9 USB A port za preuzimanje podataka / USB A port for data download
- 10 Kontrolna tabla / Control panel
- 11 Senzor temperature / Temperature sensor
- 12 Sigurnosni termostat / Safety thermostat (95 °C)
- 13 Ekspanziona posuda / Expansion container 10l
- 14 Ploča sa relejima električnih grejača / Board with relays of electric heaters
- 15 Ploča za napajanje / Power supply board (230V AC / 24+8V DC)
- 16 Stezaljke / Clamps
- 17 Ploča za detekciju utikača / Plug detection board
- 18 Automatski električni osigurači sa automatskim okidačem / Automatic electric fuses with shunt trip release
- 19 Glavni prekidač / Main switch
- 20 Fleksibilna cev za konekciju ekspanzione posude / Flexible connection pipe of the expansion vessel
- 21 Stezaljke nultog voda / Neutral line clamp
- 22 Utikači / Plugs (1N~230V 16A; 3N~400V 16A 3N~400V 32A)

Specifikacija proizvoda / Product specification

eMobile		eMobile - 10,8 kW	eMobile - 21,6 kW	eMobile - 36 kW
snaga	power	10,8 kW	21,6 kW	36 kW
grejne grupe	heating groups	6 × 1,8 kW	9 × 2,4 kW	4 × 9 kW
ekspanziona posuda	expansion vessel	Zilio Italy 8L	Zilio Italy 10L	Zilio Italy 10L
napajanje	power supply	3N~230/400V 50Hz; 16A	1N~230V 50Hz; 16A 3N~230/400V 50Hz; 16A 3N~230/400V 50Hz; 32A	1N~230V 50Hz; 16A 3N~230/400V 50Hz; 32A 3N~230/400V 50Hz; 63A
nominalna struja	rated current	3×15,6A	3×31,3A	3×52,2A
težina kotla bez vode	weight of boiler without water	25 kg	60 kg	60 kg
dužina kabla	cable length	5 m	---	---
min.max. radni pritisak	min.max. work pressure	0,6 bar ÷ 2,6 bar	0,4 bar ÷ 2,6 bar	0,4 bar ÷ 2,6 bar
dimenzije	dimensions	1120x559x503mm	1120x600x550mm	1120x600x550mm
opseg temperature	temperature range	10 ÷ 80 °C	10 ÷ 90 °C	10 ÷ 90 °C
preporučena grejna površina pri spoljnoj temp. 0 °C i naponu 230V	recommended heating surface at an external temp. of 0 °C and a voltage of 230V	≤120 floor heating ≤100 radiator heating	≤250 floor heating ≤200 radiator heating	≤410 floor heating ≤340 radiator heating
sigurnosni termostat	safety thermostat	95 °C		
sigurnosni ventil	safety valve	3 bar		
pumpa	pump	visoko efikasna pumpa / highly efficient pump		
stepen zaštite	ingress protection rating	IP 44		
dolazni hirauični priključak	inlet hydraulic connection	IG 3/4 MS		
odlazni hirauični priključak	output hydraulic connection	IG 3/4 MS		

*za objekte u skladu sa / for buildings in accordance with EN ISO 52016-1:2017

Mikoterm toplotne pumpe Mikoterm heat pumps

Snaga / Power: 9kW; 13kW; 16kW; 20kW, 26kW

Mikoterm monoblok toplotna pumpa vazduh-voda, je namenjena za grejanje, hlađenje i pripremu sanitarne tople vode (DHW). Kompresori su zasnovani na EVI naprednoj tehnologiji sa visokim stepenom iskorišćenja koji je karakterističan za ove uređaje u celini. Svaka jedinica u sebi sadrži sledeću dodatnu opremu: električni kotao za podršku rada toplotne pumpe, cirkulacione pumpe sa frekventnom regulacijom i PWM vođenjem, odzračno lonče, sigurnosni ventil, ekspanzionu posudu, ECM motor ventilatora. Posebna prednost kod ovih mašina je mogućnost povezivanja na servisni klad proizvodjača, kojim se daljinski može pratiti rad mašine i utvrđivati svaki proces u radu ili prilikom zastoja. Za svoj rad, uređaj koristi freon R32 koji je veoma efikasan (10% više od R410A) i koji ima mali uticaj na prirodno okruženje. Spada u grupu zelenih freonskih gasova.

The Mikoterm monoblock air-water heat pump is intended for heating, cooling and preparation of sanitary hot water (DHW). The compressors are based on EVI advanced technology with a high degree of utilization that is characteristic of these devices as a whole. Each unit contains the following additional equipment: electric boiler to support the operation of the heat pump, circulation pumps with frequency regulation and PWM control, air vent, safety valve, expansion tank, ECM fan motor. A special advantage of these machines is the ability to connect to the manufacturer's service cloud, which can be used to remotely monitor the operation of the machine and determine every process in operation or during downtime. For its operation, the device uses freon R32, which is very efficient (10% more than R410A) and has little impact on the natural environment. It belongs to the group of green freon gases.

Skenirajte QR kod da bi posetili web stranicu/
Scan the QR code and visit the site page



Bitne komponente / Key components

VENTILATOR SA DC MOTOROM

Motor ventilatora bez četkica obezbeđuje visoku efikasnost i nizak nivo buke

FAN WITH A DC MOTOR

Brushless fan motor provides high efficiency and low noise level

SPECIJALNI SLOJ ZAŠTITE POVRŠINA

Omogućava brzo i pravilno odmrzavanje

HYDROPHILIC STEAMER SUR-FACE

Provides quick and correct defrosting

UNUTRAŠNJE SPIRALNO OREBRENJE CEVI

Značajno povećava efikasnost grejanja

RIBBED STEAMER PIPES WITH A SPIRAL INNER STRUCTURE

Considerably increases heating efficiency

INTEGRISANI TERMINALNI BLOK

Obezbeđuje brzo povezivanje kablova za napajanje

INTEGRATED TERMINAL BLOCK

Assures quick connection of supply cords

UGRAĐEN ELEKTRIČNI GREJAČ

Pružna podršku i zaštitu od ekstremno niskih temperatura

BUILT-IN ELECTRIC HEATER

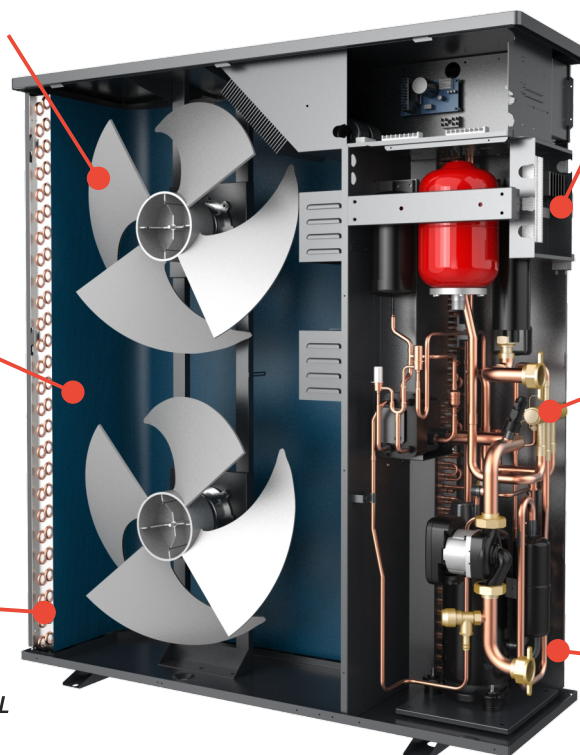
Provides support and protection from extremely low temperatures

PAMUČNA ZAŠTITNA MREŽICA

Dodatno smanjenje buke pri radu

COTTON PROTECTIVE MESH

Additional reduction of operation noise



Specifikacija proizvoda / Product specification

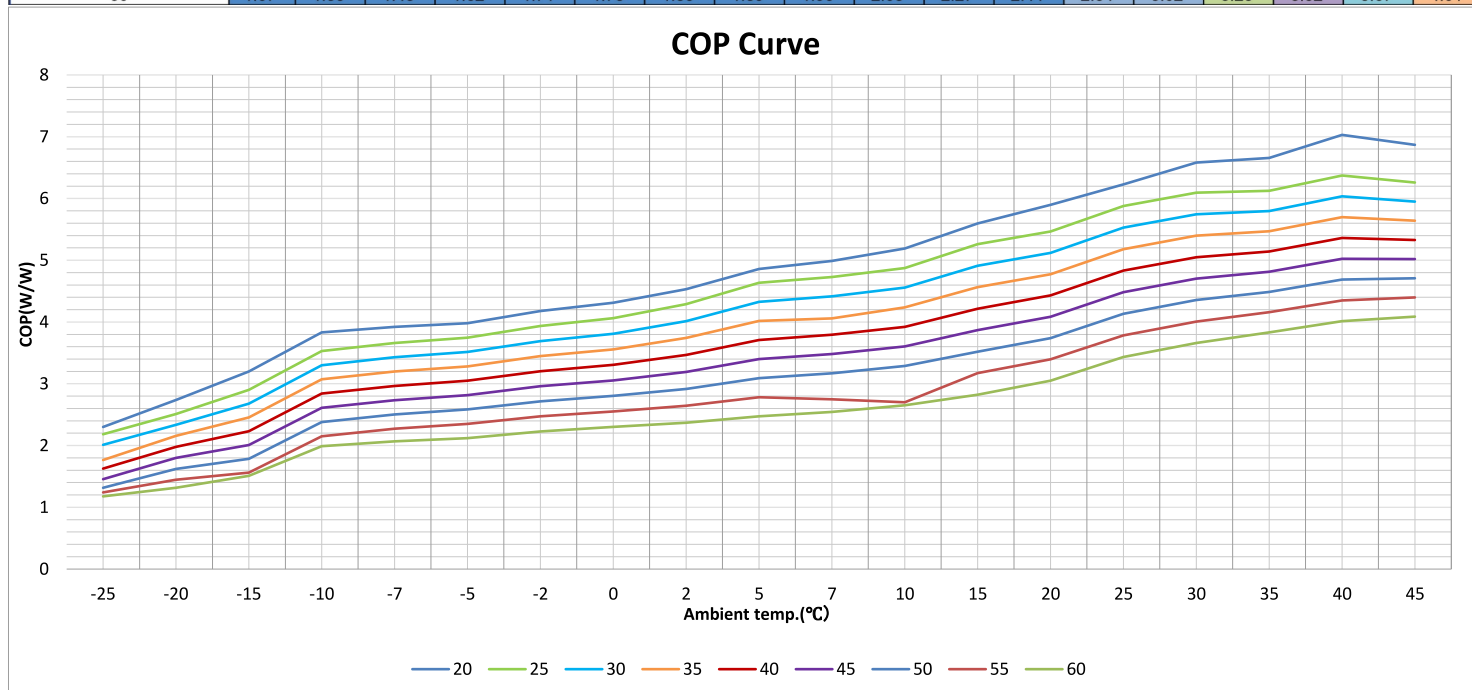
MODEL	mHP09M/02 mHP09T/02	mHP13M/02 mHP13T/02	mHP16T/02	mHP20T/02	mHP26T/02
[Space Heating/Grejanje prostora] Ambient Temp./Temp. ambijenta (DB/WB): 7°C/6°C, Water Temp./Temp vode (Inlet-ulaz/Outlet-izlaz): 30°C/35°C					
Max Heating Capacity/Max kapacitet grejanja (kW)	2.32~9.13	4.32~13.15	4.81~15.88	6.36~20.49	8.54~26.08
Power Input /Ulazna snaga (kW)	0.38~2.04	0.71~2.90	0.81~3.91	1.08~4.89	1.46~6.26
COP/Koeficijent iskorišćenja	6.11~4.48	6.08~4.53	5.94~4.06	5.89~4.19	5.85~4.17
[Space Heating/Grejanje prostora] Ambient Temp./Temp. ambijenta (DB/WB): 7°C/6°C, Water Temp./Temp vode (Inlet-ulaz/Outlet-izlaz):50°C/55°C.					
Max Heating Capacity/Max kapacitet grejanja (kW)	1.81~8.35	3.63~11.91	3.90~15.99	3.41~18.8	4.67~25.9
Power Input /Ulazna snaga (kW)	0.43~2.92	0.87~4.26	1.03~5.92	0.89~7.13	1.04~9.62
COP/Koeficijent iskorišćenja	4.21~2.86	4.17~2.80	3.79~2.70	3.83~2.64	4.49~2.69
[Space Cooling/Hladjenje prostora] Ambient Temp./Temp. ambijenta (DB/WB): 35°C / -, Water Temp./Temp vode (Inlet-ulaz/Outlet-izlaz): 12°C/7°C.					
Max Heating Capacity/Max kapacitet grejanja (kW)	1.43~7.93	4.06~9.52	2.63~13.66	3.31~17.4	4.37~21.4
Power Input /Ulazna snaga (kW)	0.32~2.48	1.05~3.62	0.59~4.81	0.76~6.14	1.02~7.32
EER/Koeficijent energetske efikasnosti	4.47~3.20	3.87~2.63	4.46~2.84	4.36~2.83	4.28~2.92
[Hot Water/Topla voda] Ambient Temp./Temp. ambijenta (DB/WB): 20°C/15°C, Water Temp. from/Temp. vode od 15°C to/do 55°C					
Max Heating Capacity/Maks. kapacitet grejanja (kW)	10.31	12.86	16.81	23.97	26.98
Power Input /Ulazna snaga (kW)	2.43	3.01	3.94	5.65	6.47
COP/Koeficijent iskorišćenja	4.25	4.27	4.27	4.24	4.17
Electric Heater Rated Input/Snaga el. grejača (kW)	3		3/6/9 (podesivo/adjustable)		
Max. Power Input/Maksimalna snaga (kW)	6.1(3.1+3)	7.4(4.4+3)	9.6(6.6+3) 12.6(6.6+6) 15.6(6.6+9)	10.5(7.5+3) 13.5(7.5+6) 16.5(7.5+9)	14.5(11.5+3) 17.5(11.5+6) 20.5(11.5+9)
Max. Running Current/Maks. struja (A)	27.8(14.1+13.7)	33.7(20+13.7)	25.2(11.5+13.7) 20.6(11.5+9.1) 25.2(11.5+13.7)	26.4(12.7+13.7) 21.8(12.7+9.1) 26.4(12.7+13.7)	33.2(19.5+13.7) 28.6(19.5+9.1) 33.2(19.5+13.7)
Max. Outlet Water Temp./Maks. temp. vode na izlazu (°C)	60				
Operation Range/Radni opseg temperature (°C)	-25 ÷ 43				
Power Supply/Napajanje (V/Ph/Hz)	220-240V~/50Hz		380~415V/3N~/ 50Hz		
Rated Water Flow/Nazivni protok vode (m³/h)	1.6	2.1	2.7	3.4	4.4
Compressor Brand/Marka kompresora	Panasonic/Mitsubishi		Mitsubishi		
Circulating Pump Brand/ Marka cirkulacione pumpe	Shinhoo				
Expansion Tank/Ekspanziona posuda (L)	2		5		
ErP Level/Stepen energetske efikasnosti (35°C)	A+++				
ErP Level/Stepen energetske efikasnosti (55°C)	A++				
Amount of R32 gas in the unit (kg)/Količina R32 gasa u jedinici (kg)	1,3	1,6	2,3	2,67	3,05
Sound Pressure Level at 1m/Nivo zvučnog pritiska na 1m (dB(A))	43~54	43~55	44~55	45~58	46~59
Water Pipe Connection/Hidraulični priključak (inch)	G1 1/4"				
Cable cross section/Presek kabla	3x6mm²/ 5x1,5mm²	3x6mm²/ 5x2,5mm²	5x4mm²	5x4mm²	5x6mm²
Fuse/Osigurač	40(A)/25(A)	40(A)/25(A)	32(A)	32(A)	40(A)
Dimensions (L×W×H)/Dimenzije (D×Š×V) (mm)	1263 × 440 × 875		1263 × 440 × 1377		
Net unit weight (kg)/Masa jedinice neto (kg)	107	111	120	135	140

☐ Monofazna struja / Single-phase current ☐ Trofazna struja / Three-phase current

COP do / up to 6.26

Zadržavanje visokog COP-a na niskim temperaturama. Minimalna radna temperatura -25°C
Retention of high COP at low temperatures. Minimum working temperature -25°C

		90Hz		85Hz		80Hz		75Hz		70Hz		65Hz		60Hz		55Hz			
Outlet (°C)	Ambient (°C)	-25	-20	-15	-10	-7	-5	-2	0	2	5	7	10	15	20	25	30	35	40
30		1.89	2.60	2.86	3.27	3.57	3.76	4.09	4.31	4.52	4.80	5.01	5.16	5.76	6.18	6.59	6.92	7.37	7.82
35		1.72	2.32	2.57	2.87	3.14	3.35	3.47	3.55	3.79	4.15	4.53	4.69	5.16	5.57	5.96	6.22	6.67	7.11
40		1.55	2.05	2.32	2.67	2.91	3.05	3.17	3.25	3.41	3.65	3.92	4.15	4.57	5.07	5.33	5.57	5.87	6.27
45		1.44	1.85	2.12	2.52	2.61	2.75	2.87	2.95	3.07	3.25	3.61	3.87	4.23	4.62	4.83	5.07	5.37	5.69
50		1.32	1.67	1.88	2.07	2.19	2.35	2.52	2.64	2.76	2.85	3.12	3.37	3.77	4.06	4.27	4.45	4.77	4.99
55		1.24	1.46	1.63	1.75	1.82	1.90	1.99	2.05	2.17	2.35	2.80	2.75	3.22	3.51	3.77	3.96	4.07	4.30
60		1.07	1.35	1.48	1.62	1.71	1.78	1.85	1.89	1.96	2.03	2.27	2.44	2.84	3.02	3.28	3.52	3.67	4.01

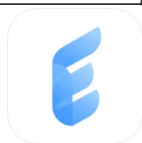


Primer/example:

Temp. ambienta/ambient temp. -7°C, temp. vode u sistemu / temp.water in system 35°C, COP 3,2

Temp. ambienta/ambient temp. 7°C, temp. vode u sistemu / temp.water in system 35°C, COP 4,1

Eco-Home aplikacija i IoT Funkcija / Eco-Home application and IoT Function



Upravlajte svojom pumpom preko Eco-Home aplikacije
Control your pump via the Eco-Home app



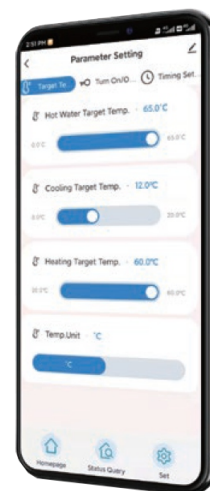
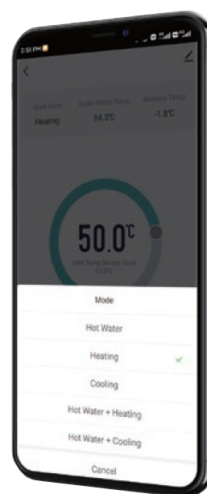
Kontrolišite sve jedinice preko e-home aplikacije
Controlling all units from E-home



Daljinsko uključivanje/isključivanje
Turn ON/OFF remotely



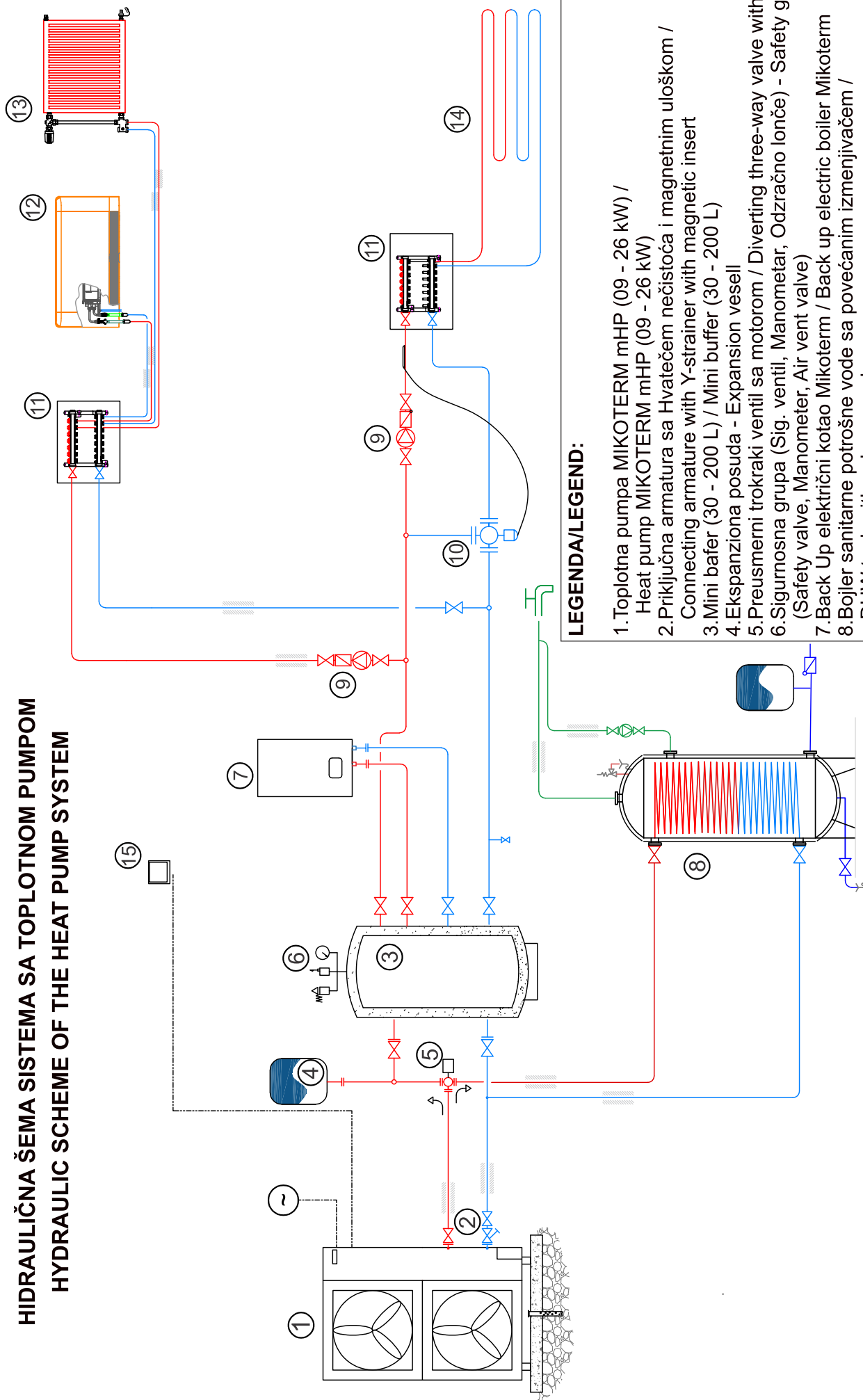
Izbor režima rada
Select working modes



Uz pomoć IoT funkcije, servis ima mogućnost daljinske dijagnostike i kontrole.

With the help of the IoT function, the service has the possibility of remote diagnostics and control.

HIDRAULIČNA ŠEMA SISTEMA SA TOPLOTNOM PUMPOM HYDRAULIC SCHEME OF THE HEAT PUMP SYSTEM

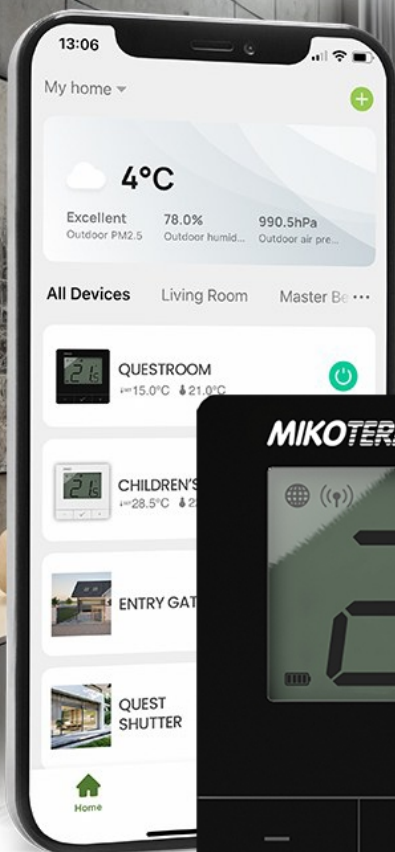


LEGENDA/LEGEND:

1. Toplotna pumpa MIKOTERM mHP (09 - 26 kW) / Heat pump MIKOTERM mHP (09 - 26 kW)
2. Prikjučna armatura sa Hvatečem nečistoća i magnetnim uloškom / Connecting armature with Y-strainer with magnetic insert
3. Mini bafer (30 - 200 L) / Mini buffer (30 - 200 L)
4. Ekspanzionna posuda - Expansion vessel
5. Preusmerni trokraki ventil sa motorom / Diverting three-way valve with motor
6. Sigurnosna grupa (Sig. ventil, Manometar, Odračno lonče) - Safety group (Safety valve, Manometer, Air vent valve)
7. Back Up električni kotao Mikoterm / Back up electric boiler Mikoterm
8. Bojler sanitarne potrošne vode sa povećanim izmenjivačem / DHW tank with enlarge exchanger
9. Pumpna grupa grejnog kruga / Pump group of the heating circuit
10. Mešni ventil podnog grejanja / Mix valve for floor heating
11. Razdelnik-Sabirnik / Distributor-Collector
12. Ventil konvektor (Fan-Coiler) / Fan Coiler
13. Radijator / Radiator
14. Podno grejanje / Floor heating
15. Kontroler toplotne pumpe / Heat pump controller



Uštedite novac, smanjite potrošnju električne energije
Save money, reduce electricity consumption



M20i

Pregled prednosti / overview of advantage:

- > Termostat za upravljanje standardnim uređajima za grejanje(npr. elektro kotlovi) / Thermostat for controlling standard heating devices(e.g.electric boilers).
- > Komunikacija u standardu Wi-Fi 2.4 Ghz / Communication in standard Wi-Fi 2.4 Ghz.
- > Kompatibilan sa aplikacijom ENGO Smart i Tuya / Compatible with ENGO Smart and Tuya app.
- > Mogucnost postavljanja minimalno i maksimalno podešene temperature / The possibility of setting the minimum and maximum set temperature.
- > Bežična komunikacija u standardu 868 Mhz / Wireless communication in the 868 Mhz standard.
- > Funkcija GREJANJE/HLAĐENJE / HEATING/COOLING function.
- > Brzo konfigurisanje u smart mobilnoj aplikaciji / Quick configuration in the smart mobile application.
- > Kontrola se može deliti sa mnogim korisnicima / Control can be shared with many users.
- > Funkciju planiranja i PIN zaključavanje / Scheduling function and PIN lock.
- > Fabrički uparen i spreman za rad / Factory paired and ready to go.

Specifikacija proizvoda / Product specification



Napajanje kontrolera / Supply of controller	2 x baterija / battery AA
Napajanje primejnika / Supply of receiver	230 V AC 50 Hz
Maks. opterećenje prijemnika / Max. receiver load	16 (5) A
Izlazni signal prijemnika / Receiver output signal	Bežnaponski relej / Voltage-free relay NO / COM
Raspon regulacije temp. / Temp. control range	5 - 35°C
Upravljački algoritam / Control algorithm	TPI ili Histereza / TPI or Hysteresis ($\pm 0,2^{\circ}\text{C}$ do $\pm 2^{\circ}\text{C}$)
Komunikacija / Communication	Bežična / Wireless, 868 Mhz + Wi-Fi 2,4 Ghz
Dimenzije / Dimensions [mm]	Kontroler / controller: 80 x 80 x 22; prijemnik / receiver: 96 x 96 x 27

Diferencijalni termostat / Differential thermostat SOLAR

Skenirajte QR kod i posetite stranicu sajta
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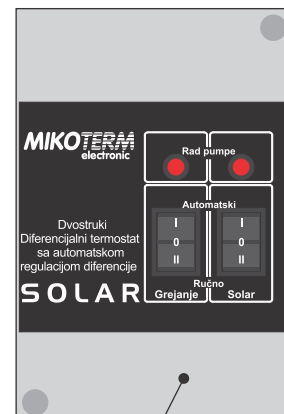
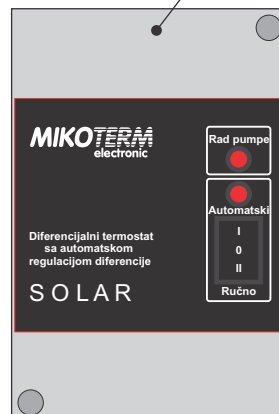
Elektronski konfigurisan termostat za upravljanje solarnim sistemima. Automatska regulacija diferencije od 15 °C do 7 °C. Veoma pouzdan i tačan termostat. Elektronika upravlja kompletnim radom termostata i veoma preciznim senzorima obezbeđuje najbolje iskorišćenje sunčeve energije. Izrađuje se u dve varijante:

- Jednosruki diferencijalni termostat SOLAR za upravljanje solarnim sistemom
- Dvostruki diferencijalni termostat SOLAR za upravljanje solarnim sistemom i grejanjem

Electronically configured thermostat for controlling solar systems. Automatic differential control from 15 °C to 7 °C. Very reliable and accurate thermostat. The electronics control the complete operation of the thermostat and provide the best use of solar energy with very precise sensors. It is made in two variants:

- Single differential thermostat SOLAR for solar system control
- Double differential thermostat SOLAR for solar system and heating control

Za upravljanje solarnim sistemom
For solar system management

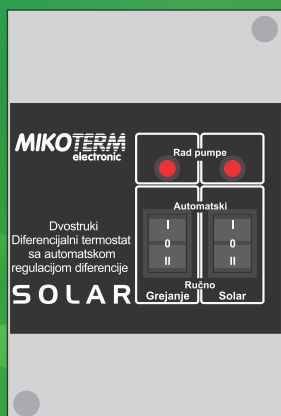


Za upravljanje solarnim sistemom i grejanjem
For managing the solar system and heating

Iskoristite moć Sunca - SOLAR diferencijalni termostat Harness the power of the Sun - SOLAR diff.thermostat

MIKOTERM
electronic

***Efikanas izvor energije
za vašu toplu vodu***



***Efficient energy
source for your
hot water***



[illegible]

[illegible]

MIKOTERM
electronic



AAA

Platinasta izvrsnost



Mikoterm primenjuje medjunarodni sistem upravljanja kvalitetom ISO 9001 kao i ISO 14001 i ISO 45001, sertifikovane od strane renomiranog sertifikacionog tela TUV NORD. Svi kotlovi poseduju odgovarajuće izjave o usaglašenosti (ateste).

Mikoterm applies the international management system quality ISO 9001 as well as ISO 14001 and ISO 45001, certified by a renowned certification body TUV NORD. All boilers have appropriate declarations of conformity (certificates).

www.mikoterm.com



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the products

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