

**Kotao na
BIOMASU/
Heating boiler
BIOMASS
OPERATED**

**SERIJE
BIOmax/
SERIES
BIOmax**



INSTRUKCIJE/ INSTRUCTION MANUAL

Montaža, korišćenje i održavanje kotla/ *Asseby, use and maintenance of heating boiler*

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1. Važna upozorenja

OPŠTA UPOZORENJA

- Nakon uklonjenog pakovanja uveriti se u kompletnost isporuke, i u slučaju nedostataka, obratiti se prodavcu koji je prodao kotao.
- Kotao mora biti upotrebljen isključivo za namenu koju je predvideo proizvođač. Isključuje se bilo kakva odgovornost od strane proizvođača za štetu uzrokovanu osobama, životinjama ili stvarima, u slučaju grešaka pri montaži, regulaciji, održavanju ili nepravilnom korišćenju.
- U slučaju curenje vode isključiti uređaj sa električnog napajanja, zatvoriti napajanje vodom i obavestiti ovlašćeni servis ili ovlašćenog monteru.
- Ovo uputstvo je sastavni deo uređaja i mora se čuvati sa pažnjom i mora **UVEK** pratiti uređaj i u slučaju promene vlasnika ili korisnika ili u slučaju priključenja na drugu instalaciju. U slučaju oštećenja ili nestanka tražiti novi primerak od ovlašćenog prodavca.



VAŽNA UPOZORENJA

Podsećamo da korišćenje uređaja na biomasu i vrsto gorivo i koji imaju kontakt sa električnom energijom i vodom zahtevaju poštovanje sigurnosnih mera i to:

- Zabranjeno je korišćenje kotla od strane dece i osoba sa ograničenim mogućnostima bez pratnje.
- Zabranjeno je korišćenje kotla na instalacijama sa radnom temperaturom većom od 110°C, i radnim pritiskom većim od 3 bara.
- Zabranjeno je korišćenje lako zapaljivih goriva (alkohol, nafta).
- Zabranjeno je odlaganje lako zapaljivih materijala u blizini kotla i u blizini vrata za loženje. Pepeo se mora odlagati u zatvorene i nezapaljive spremnike.
- Zabranjeno je spaljivanje otpada i materijala koje sagorevanje prouzrokuje plamen ili opasnost od eksplozije (npr. plastične kese, piljevinu, ugljenu prašinu, blato itd.)
- Zabranjena je bilo kakva intervencija tehničara kog lica (naročito se to odnosi na zamenu grejača ili proveru ispravnosti nekog drugog delova uređaja...) ili isključenje, pre nego se kotao isključi i sa električnog napajanja i to izvlačenjem utičnice iz glavnog mrežnog napajanja.
- Zabranjena je izmena na sigurnosnim elementima.
- Zabranjeno je zatvaranje ventilacionih otvora na prostoriji u kojoj se nalazi kotao. Ventilacioni otvori su neophodni za pravilno sagorevanje.
- Zabranjeno je izlaganje kotla atmosferskim nepravilnostima. Sam kotao nije predviđen za spoljnu montažu i ne sadrži sistem protiv smrzavanja.
- Zabranjeno je isključenje kotla ukoliko spoljna temperatura može da padne ispod NULE (opasnost od smrzavanja).
- U slučaju intervencije na bilo kom elektro uređaju kotla, ceo uređaj isključiti sa elektro instalacije i to tako što se izvadi utičnica iz mrežnog napajanja.

- Rad sa ure ajem kotla zabranjen je ljudima sa posebnim potrebama (uklju uju i i decu) kako fizi kim tako i mentalnim, osim uz nadzor staratelja i ljudi koji su odgovorni za njihova ponašanja.
- Deca moraju biti pod nadzorom staratelja kako se ne bi igrala sa ure ajem kotla.
- Ako je ošte ena strujna zaštita, mora biti zamenjena u samoj fabrici i servisirana od strane ovlaš enog servisera ili kvalifikovanih ljudi da bi se izbegao rizik od strujnog udara.

1.1 Minimalna udaljenost od zapaljivih materijala

- Obezbedite odgovaraju u udaljenost od zapaljivih materijala, ako je potrebno obezbediti zaštitu istih.
- Minimalna udaljenost od zapaljivih materijala je propisana zakonom- molimo da se o tome raspitate kod stru nih lica, koja se bave grejanjem, i dimni ara.
- Minimalna udaljenost kotla i cevi za odvod dimnih gasova od slabo i prose no gorivih materijala treba da bude najmanje 100mm.
- Minimalno rastojanje od lako zapaljivih materijala je 200mm, a isto važi i za materijale ija zapaljivost nije poznata.



Opasnost od požara!

- Skladištenje zapaljivih materijala i te nosti u blizini kotla je zabranjeno.
- Obavezno upozorite korisnike o potrebnoj minimalnoj udaljenosti zapaljivih materijala od kotla.

| Zapaljivost građevinskih materijala | |
|-------------------------------------|--|
| A ... nezapaljivi | azbest, kamen, građevinski kamen, keramičke zidne pločice, terakota, malter, cementna glazura (bez organskih dodataka) |
| B ... koji nisu lako zapaljivi | gipsane kartonske ploče, staklena vlakna, ploče od AKUMINA, IZOMINA, RAJOLITA, LIGNOSA, VELOKSA i HERAKLITA |
| C1 ... slabo gorivi | bukovo i hrastovo drvo, kompozitno drvo, filc, ploče od HOBREKSA, VERZALITA, UMAKARTA |
| C2 ... prosečno gorivi | drvo bora, tise i jele, kompozitni materijali |
| C3 ... lako zapaljivi | Asfalt, karton, celulozni materijali, iverica, pluta, poliuretan, polistiren, polipropilen, polietilen, podna vlakna |

2.Opis kotla

Kotao serije BIOmax je razvijen sa ciljem da RADIJATOR INŽENJERING ponudi tržištu kotao koji je po svojim mehaničkim i termičkim osobinama izrazito namenjen biomasi kao gorivu. Koriste i uopšteni pojam „BIOMASA“ naravno da se pre svega misli na pelet, ali treba ista i mogućnost loženja sa košticama voćna i to pre svega višnja, trešnja. **Ukoliko korisnik želi da koristi neki oblik biomase koji nije naveden, obavezno treba da kontaktira službu konstrukcije i razvoja Radijator inženjeringa ili ovlašćenog prodavca, jer vrlo često pojedini oblici biomase zahtevaju posebna, specifična rešenja sagorevanja.** Prilikom korišćenja navedenih goriva podrazumeva se automatska kontrola glavnih parametara rada. U svim navedenim primerima korišćenja biomase zahteva se određeni stepen suvog goriva.

Samo sagorevanje se u ovoj situaciji odvija pod prinudnom promajom centrifugalnog ventilatora, a postoji izvlačenje dimnih gasova i dodavanje sekundarnog vazduha usisnog ventilatora na izlaznom delu kotla. Naravno da je BIOmax u ovim uslovima sagorevanja efikasniji nego njegovi prethodnici koji funkcionišu po principu slobodne promaje ili prinudne promaje samo jednog ventilatora.

Drveni peleti su dobijeni od 100% celuloze. Ostaci drveta pod visokim pritiskom su sabijeni u pelet prečnika 6mm i dužine 2-3cm. Pelet treba pravilno skladištiti i to na suvom mestu da bi se obezbedilo efikasno sagorevanje. Kotlovi BIOmax 23.1 i BIOmax 35 koriste pelet prečnika 6mm, dužine 5-30mm i vlažnosti do 10% izrađen po standardu **EN 14962-2**.

Serijska kotlova BIOmax proizvodi se za sada u dve varijante snage i to BIOmax23.1 i BIOmax35. BIOmax23.1 pokriva opseg snaga od 15÷23 kW, a BIOmax35 je u opsegu 20÷34,9 kW.

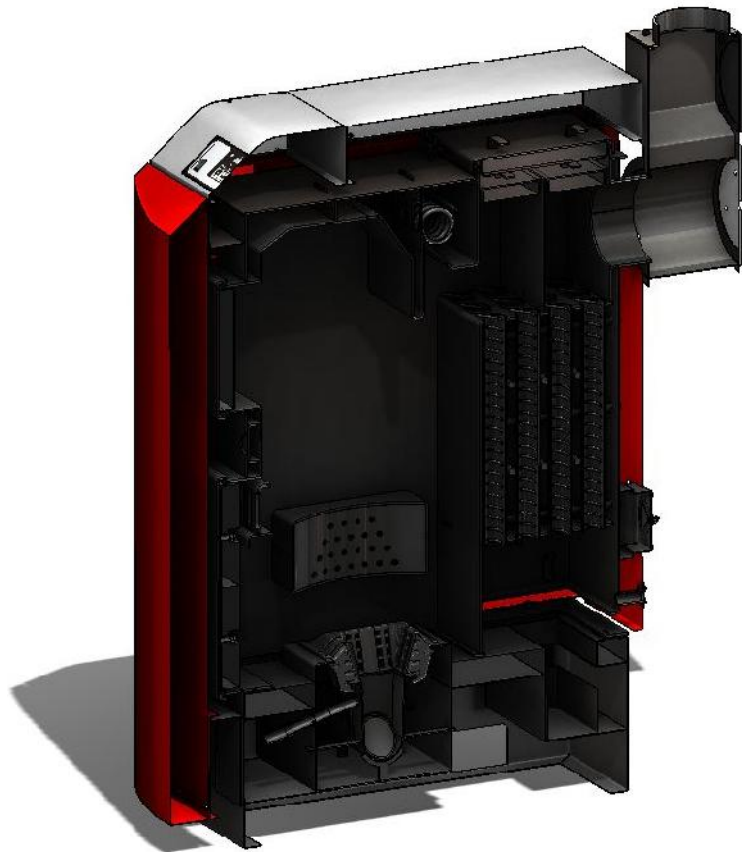
KONSTRUKCIJA

Po spoljašnjem dizajnu, dimenzijama ložišta, otvorima za loženje i ispušćenje BIOmax je zadržao sve dobre osobine predhodnih modela po kojima je RADIJATOR INŽENJERING prepoznatljiv na tržištu.

Vodeni deo kotla, njegov način izmene toplote između dimnih gasova i vode, prilagođen je biomasi. Zbog primene dva ventilatora, tj. prinudne promaje put dimnih gasova duži je nego kod standardnih kotlova. Iz istih razloga moguća je primena usmerivača dimnih gasova tzv. turbulatora koji dodatno povećavaju stepen iskorišćenja kotla. Kod kotlova BIOmax gde su izmenjivačke cevi prečnika 42mm (BIOmax23.1) i 48mm (BIOmax35) spiralni turbulatori su primenjeni i imaju dvostruku ulogu tj. dovode do boljeg iskorišćenja ali i do lakšeg ispušćenja. (pogledati **sliku 1**)

Stepen korisnosti na pelet je preko 90%. Tokom rada dolazi do stvaranja naslaga gareži i pepela na izmenjivačkom delu kotla i to značajno utiče na slabiju izmenu i porast temperature dimnih gasova. Ako se kotao ne koristi duže vreme moguće je toliki porast temperature dimnih gasova da

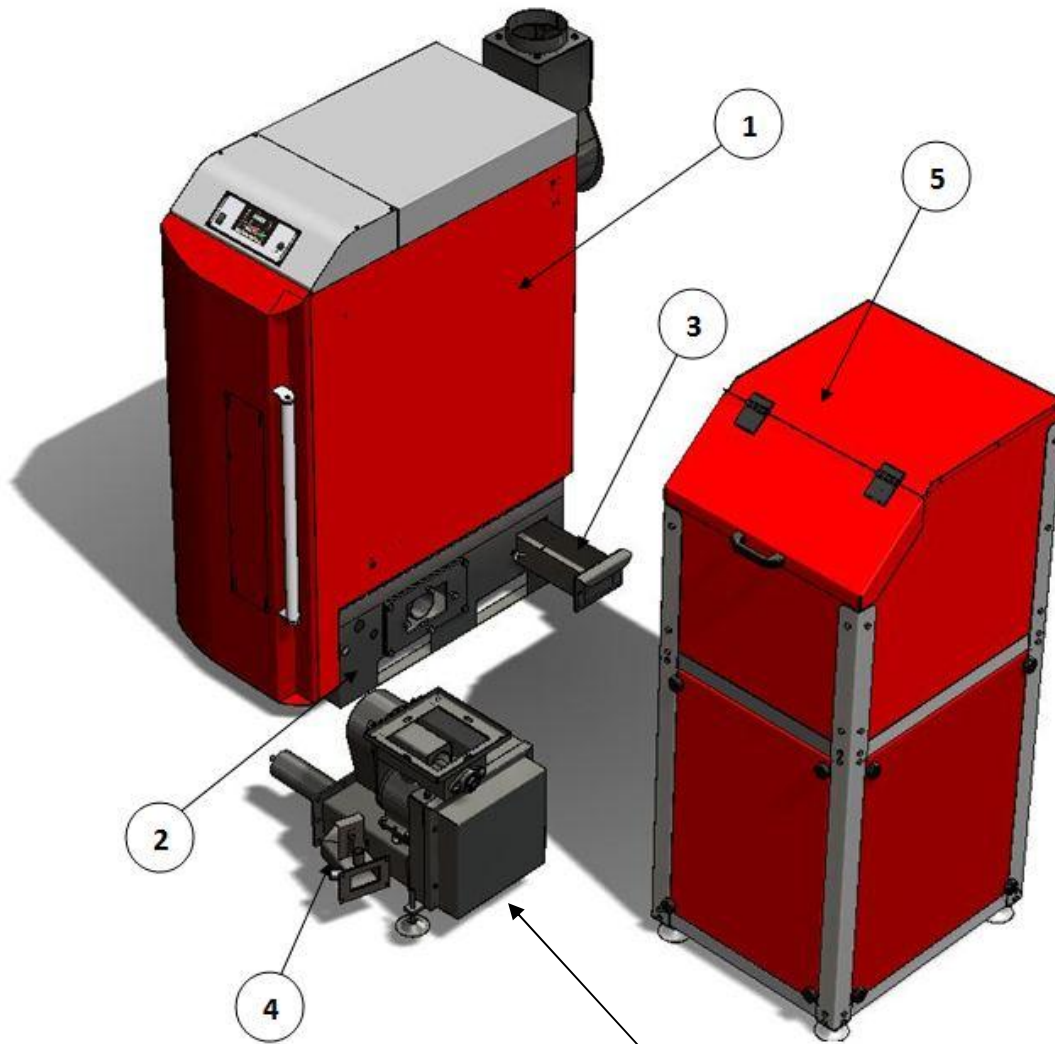
dolazi do prekida rada kotla. Obe velike Biomax kotla poseduju bakarni izmenjivač za priključenje ventila za termičko osiguranje. Svi delovi vodenog dela kotla izrađeni su od bešavnih cevi kvaliteta **ST 35.4** i kotlovskih limova debljine 5mm i više, u zavisnosti od snage kotla. Limovi su kvaliteta **1.0425 EU** standard odnosno **P265GH** standard **EUII**.



Slika1. Presek tela kotla

Ložište (**slika 2,poz.2**) je po svojem principu rada tzv. „izviruće“, gde gorivo iz zone transporta ide vertikalno uvis tj. izvire do zone sagorevanja. Napravljeno je od masivnih izolacijskih materijala i sivog liva.

Transport goriva obezbeđen je pužnim transporterima (**slika 2,poz.5**). Uočljiva je razlika dozatora za BIOmax23.1 i dozatora BIOmax35. Naime, radi se o razlici u vidu ventila za štelovanje vazduha koji se postavljaju na dozator BIOmax23.1 a sve to kako bi se dobila što bolja emisija dimovodnih gasova (**slika2**), dalje objašnjeno u tekstu u **tački 8.2**. Gorivo dolazi iz silosa zapremine 240 L (**slika 2,poz.6**). U slučaju potrebe vrlo je lako, demontirati ceo sklop u tri nezavisne celine: silos, mehanizam za nalaganje i kotao (**slika 2,poz.1 i 2**).



Slika2. Prikaz demontažnih celina kotla

1. Telo kotla
2. Ložište
3. Pepeljara
4. Pužni transporter-dozer
5. Silos



Dozator za BIOmax 23.1



Dozator za BIOmax 35

3. Montaža

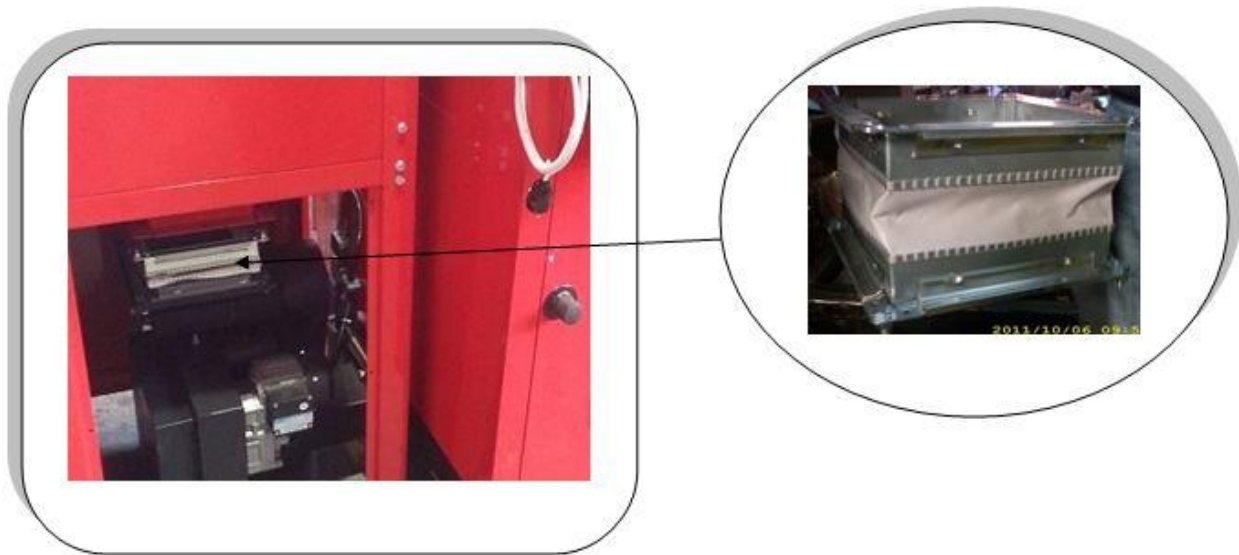
3.1 Opšta upozorenja

Kotao mora biti pravilno postavljen zbog pravilnog rada!

Kotao se isporučuje sa spoljnom oblogom koja sadrži izolaciju debljine 30mm. Položaj silosa i mehanizma za transport peleta je standardno fabrički desni u odnosu na kotao. Moguće je naručiti da se u fabrici sklopi i leva varijanta. Takođe, ako je potrebno lako je promenu izvršiti i na terenu jer je silos i ceo mehanizam dozatora demontažan u odnosu na kotao. Elektro priključci su konektorskog tipa tako da za njihovo rastavljanje i ponovno sastavljanje nije potrebno osoblje specijalizovane elektro struke.



Silos i za Biomax23.1 i BIOmax 35 imaju fleksibilnu vezu sa mehanizmom za transport, a sve to kako bi se izbegle vibracije tokom rada .



Slika3. Prikaz fleksibilne veze



Maksimalni radni pritisak kotla je 3 bar-a, minimalni 1 bar, a maksimalna radna temperatura kotla je 110°C.



Kotao je sa 2 ventilatora, automatikom kao i kerami kim greja ima za potpalu i svi ovi uređaji koriste napajanje 230V, tako da nepravilno instaliranje i neoprezno rukovanje mogu da ugroze ljudski život strujnim udarom.



Kotao na vrsto gorivo i prinudnom promajom treba instalirati prema važe im normama i zakonskim propisima. Svaka izmena ili na mehani koj konstrukciji ili na elektri noj instalaciji smatra e se narušavanjem garancijiskih uslova i doveš e do njenog narušavanja.



Prilikom neodgovornog transporta ili manipulacijom rezervnog dela, ako do e do udara u sklop koji služi za potpalu vrlo verovatno dolazi do ošte enja kerami kih greja a. Ova ošte enja ne podležu garanciji.



Prilikom montaže na hidrauli ku instalaciju kotao mora biti obezbe en na propisan na in od prekora enja maksimalne radne temperature i pritiska.



Za propisnu montažu odgovoran je instalater centralnog grejanja koji priklju uje kotao na hidrauli ki sistem.



Radijator inženjering , kao proizvo a kotla, ne preuzima nikakvu odgovornost za štete prouzrokovane lošim instaliranjem kotla.



Prilikom bilo kakve intervencije na elektro ure ajima BIOmax-a, ceo sistem isklju iti sa glavnog mrežnog napajanja.

Osnovni zahtevi koje treba ispoštovati prilikom montiranja su:

- Kotao može da bude priklju en na otvoreni sistem centralnog grejanja, ali i na zatvoren sistem centralnog grejanja. U slu aju priklju enja na zatvoreni sistem, preporu uje se ugradnja ventila za termi ko osiguranje oticanjem, što je odre eno i odgovaraju im zakonima svake države u kojoj se kotao priklju uje.
- Kotao mora da se nalazi na sigurnoj udaljenosti od lako zapaljivih materijala. Kotao mora biti dovoljno udaljen od mogu ih prepreka u kotlarnici radi iš enja i održavanja. Pogledaj **sliku 10**.
- Elektri no napajanje kotla je 230V i 50Hz i priklju enje svih ure aja koje kotao sadrži treba uraditi prema vaze im propisima i priklju enje radi lice sa odgovaraju im ovlaš enjem.

- Priključenje na dimnjak takođe se radi prema obavezujim propisima kao i preporukama proizvođača što se može videti u narednom tekstu.

3.2 Mere i uređaji bezbednosti kod kotlova BIOmax;

Za bezbedan rad kotla potrebno je ugraditi i održavati ih ispravnim sledećim elemente:

- Ventil sigurnosti na pritisak (slika 4)



Slika 4.



Slika 5.



Slika 6.

- Ventil sigurnosti na pritisak mora biti nazivnog pritiska 1/2 colna baždaren na maksimalno 3 bara. Ovaj sigurnosni element koji spada u grupu limitatora pritiska mora da bude takve konstrukcije da izdrži i kratkotrajna prekoračenja i temperature i pritiska kao i određen sadržaj glikola u tečnosti za grejanje. Obično na istom mestu se priključuju još i odzračak (slika 5) i manometar (slika 6) tako da ova tri elementa zajedno sačinjavaju sigurnosnu grupu i montiraju se preko „T” priključka. Ovaj sigurnosni element mora da podleže i periodičnim ponovnim baždarenjima o čemu investitor tj. korisnik kotla mora da poseduje validnu dokumentaciju.
- Ventil sigurnosti mora biti montiran na najvišoj tački kotla i direktno na kotlu bez bilo kakvog cevovoda ili bilo kojih drugih elemenata između. Za ovu svrhu postoji i posebno predviđen priključak (videti sliku). Strogo je zabranjeno bilo kakvo reduciranje prenika ovog priključka.
- Ispusni tj. izduvni deo ventila sigurnosti mora da bude od cevi čiji je prečnik najmanje jednak nazivnom preniku ispusnog dela ventila. Takođe je dozvoljeno je za njegovu izradu koristiti najviše jedan luk radijusa $r > 3d$.
- Sigurnosni ventil mora posedovati nazivnu pločicu i na njoj sledeće podatke:
 - naziv proizvođača
 - oznaka tipa sigurnosnog ventila/godina ispitivanja
 - nazivni protok
 - podatak za koji toplotni učinak je sigurnosni ventil podešen
 - najviši pritisak otvaranja tj. 3 bara
- Obavezna je provera ispravnosti rada u određenim vremenskim periodima kao i ponovna baždarenja od strane sertifikovanih firmi. Ove obaveze se sprovode u skladu sa zakonom

svake zemlje u kojoj je kotao namontiran. Obavezno uvati pisani dokument o podacima zadnjeg baždarenja sigurnosnog ventila.

- Na povratnom vodu montirati barem još jedan ventil sigurnosti na pritisak.

- **Ventil termi kog osiguranja oticanjem (slika 7)**



Slika 7.

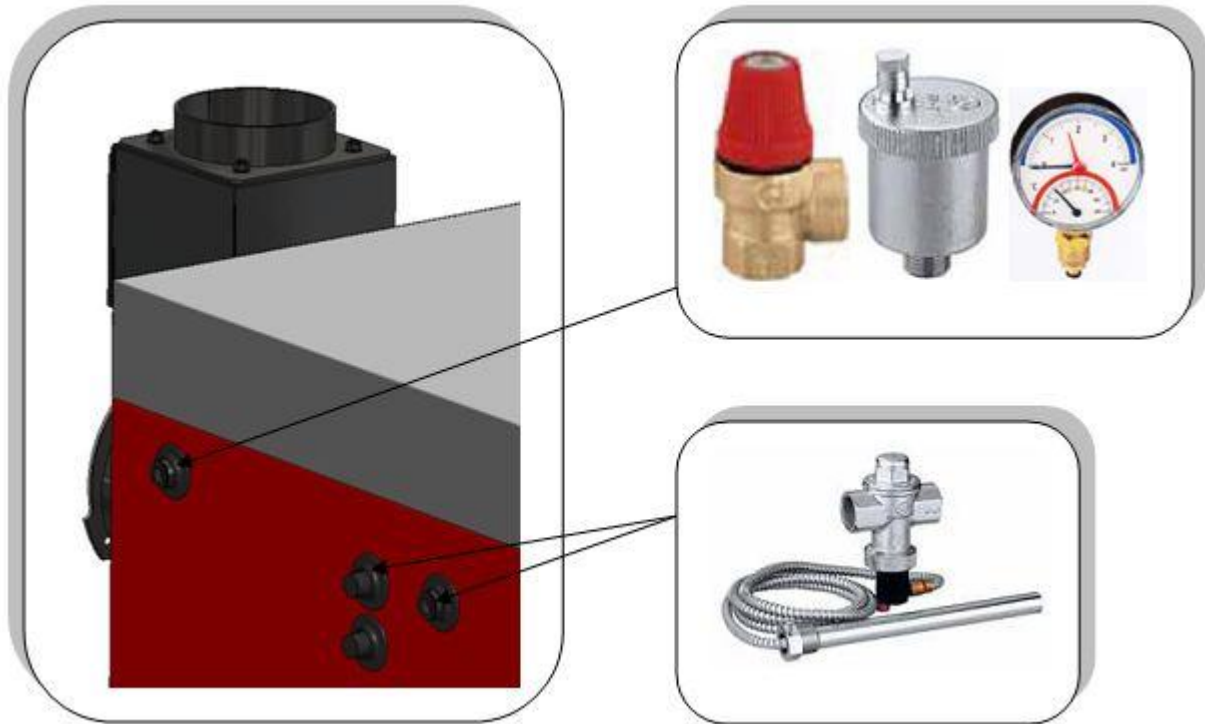
Ovaj sigurnosni element ima tako e ulogu ograni iva a temperature. U daljem tekstu bi e ozna en sa skra enicom VTO.

- U nekim ekstremno opasnim situacijama prelaz vode u vodenu paru je takav da ventili sigurnosti za pritisak nisu dovoljni da obezbede sigurnost hidrauli kog sistema. Iz ovog razloga je obavezna ugradnja VTO. U zavisnosti od zakonskih regulativa zemalja u kojima se kotao montira, VTO je potrebno ugraditi samo za snage ve e od odre enih ili za svaku snagu kotla obavezno ugraditi VTO.
- Mesto ugradnje prikazano je na šemi montaže kotla na instalaciju i na **slici 8**. U kotlu se isporu uje bakarna spirala tako da je potrebno koristiti VTO sa izmenjiva em kao na **slici 8**. Do VTO-a se dovodi hladna sanitarna voda. Kada sonda VTO-a ima informaciju da je temp. preko 95°C VTO se otvara i voda prolazi kroz bakarnu spiralu. Posle izvesnog vremena temp. vode u kotlu se vra a na normalnu.
- Jedan priklju ak spirale koristimo za VTO, a drugi za ispus vode koja je prošla kroz spiralu. Koji je priklju ak spirale za VTO, a koji je ispusni je nebitno. Obavezno je pridržavati se uputstava ugradnje koje je dao proizvo a VTO.
- Obavezno u odre enim vremenskim periodima proveravati funkciju VTO.

Kao što je ve re eno jedan kraj VTO je za montažu na izmenjiva kotla, a do drugog se dovodi hladna voda pod pritiskom. Naro ito je bitno da protok te vode bude neometan i pri nestanku el. energije.



Ukoliko je nemogu e obezbediti dotok hladne sanitarne vode i pri nestanku el.energije, obavezno kotao priklju iti na otvoren sistem.



Slika 8 .Prikaz postavljanja sigurnosnih elemenata

Termostati u automatici kotla (slika 9)

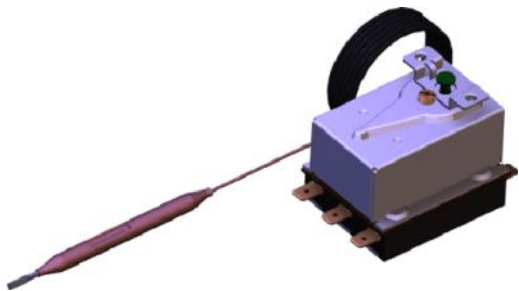
U samoj automatici koja vodi proces sagorevanja i utiče na rad dva kruga grejanja postoje dva termostata. Oba su slične konstrukcije kao termostat prikazan na **slici 9**. i imaju i sigurnosne funkcije kao limitatori temp. vode u kotlu. Zbog sigurnosne uloge u funkcionisanju kotla oba termostata imaju nezavisne sonde za merenje temperature vode.

Prvi termostat je tzv. radni i on služi da ograniči temperaturu do nivoa koji želi korisnik.

Drugi termostat je sigurnosni jer prekida rad ventilatora koji pospešuje plamen, odnosno dodaje novu energiju. Sigurnosna temperatura je ograničena na 95°C.

Pumpu za grejanje je veoma važno priključiti preko automatike iz sigurnosnih razloga.

Kada temp. vode u kotlu dostigne kritičnu vrednost od 95°C ventilator staje sa radom ali pumpa se obavezno uključuje kako bi razmenila toplotu vode kroz radijatore.



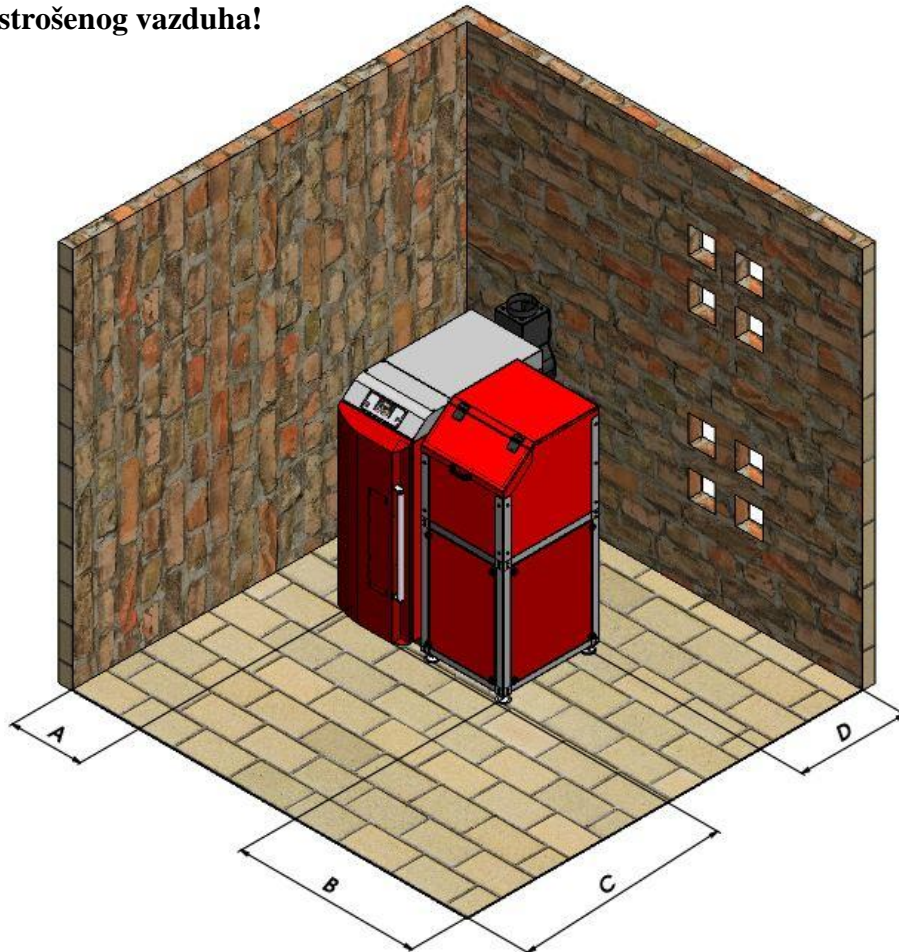
Slika 9. Termostat na automatici

3.3 Kotlarnica

Kotlarnica mora biti obezbeđena od smrzavanja.

Podloga za kotao u kotlarnici mora biti od nezapaljivog materijala. Preporučene vrednosti udaljenosti sve četiri strane kotla u odnosu na zidove kotlarnice ili neka druga kruta tela (akumulacioni bojler itd.) prikazane su na *slici 10*. Ove vrednosti udaljenosti omogućavaju siguran pristup prilikom loženja, dovoljan prostor za održavanje i nesmetan pristup ventilatoru i ventilu za punjenje i pražnjenje. Kotao sa svoje leve strane (kada je silos na desnoj) treba da bude udaljen od zida od 100 do 200mm tj. onoliko koliko je potrebno prostora za priključenje ventila za termičko osiguranje oticanjem. Ako se ventil ne ugrađuje onda prostor može da bude i manji. Prostor sa desne strane kotla, koji se preporučuje da bude barem 800mm od silosa bitan je iz razloga što posle loženja kotla korisnik tada prolazi i izvlači pepeljaru iz zadnjeg dela ložišta. Takođe ovaj prostor je potreban i za eventualno vađenje mehanizma za pelet radi periodičnog održavanja. Prostor iza kotla bitan je zbog montaže na hidraulički sistem ali i zbog eventualne demontaže sistema za elektro potpalu.

Kotlarnica mora da poseduje dovoljne otvore za ventilaciju kako za svež vazduh tako i za odvođenje istrošenog vazduha!



Slika 10. Pozicioniranje kotla u kotlarnici

| Tip kotla | DIMENZIJE | | | |
|-------------------|-----------|--------|--------|--------|
| | A (mm) | B (mm) | C (mm) | D (mm) |
| BIOmax23.1 | 200 | 800 | 1000 | 800 |
| BIO max 35 | 200 | 1000 | 1000 | 1000 |

Ukupna površina ovih otvora je minimalno 150cm² za snage do 50kW, a za snagu preko 50kW površina mora biti veća a za još 2cm² po kW.

$$A = 150\text{cm}^2 + \frac{2\text{cm}^2}{\text{kW}} \times (\sum Q_n - 50\text{kW}) \quad \sum Q_n = \text{moguće snage preko 50kW.}$$

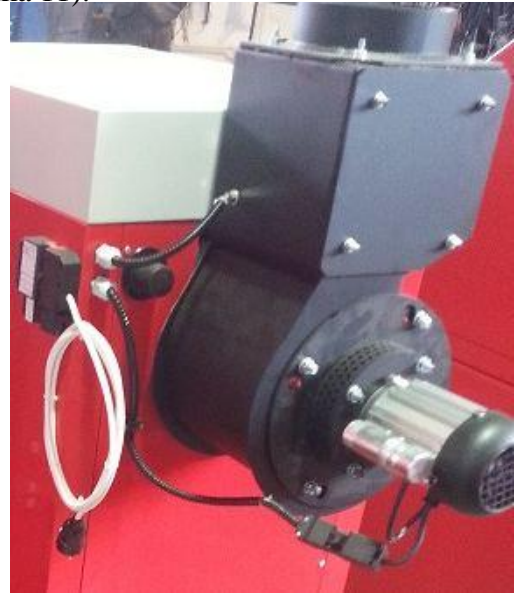
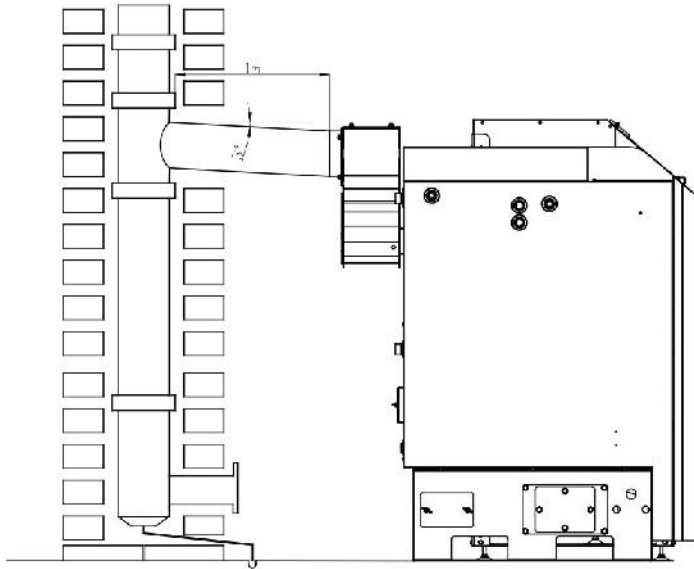
Nedostatak dovoljne ventilacije u kotlarnici može da uzrokuje više problema u radu kotla. Glavni problem je nemogućnost postizanja visokih temperature izlazne vode tj. ne postizanje maksimalne snage što dovodi do kondenzovanja u kotlu.

- Uzeti u obzir neophodan minimalni prostor koji je potreban za prilaz sigurnosnim elementima i za izvršenje operacija iščenja i redovnog remonta.
- Utvrditi da li je stepen električne zaštite u skladu sa karakteristikama prostorije u kojoj će kotao biti smešten.
- Zabranjeno je izlaganje kotla atmosferskim nepravilnostima. Sam kotao nije predviđen za spoljnu montažu i ne sadrži sistem protiv smrzavanja.
- Zabranjeno je zatvaranje ventilacionih otvora na prostoriji u kojoj se nalazi kotao.

Ventilacioni otvori su neophodni za pravilno sagorevanje.

3.4 Priklju enje na dimnjak

Kotao Biomax radi sa prinudnom promajom i to pod dejstvom dva ventilatora, ali ipak treba ispoštovati pravila za odabir dimnjaka kao da se radi o kotlu sa blagim potpritiskom u ložištu na neko drugo gorivo, kao na lož ulje na primer. **Da bi kotao radio dobro pre nik dimnjaka mora da bude barem jednak pre niku dimnja e kotla tj. za Biomax23.1 to je 130mm, a za Biomax 35 to je 160mm, visine 7 do 8 metara sve u zavisnosti od pokrivenosti dimnjaka nekim drugim visokim gra evinama pored njega.** U suprotnom može do i do problema u radu, naro ito u fazi potpale i u režimu rada na vrsto gorivo. Najoptimalnije postavljanje kotla na dimnja u je takvo da prava koja spaja centar izlaza dimnih gasova iz kotla i centar priklju enja na dimnjak bude u blagom usponu (do 3%) (slika 11).

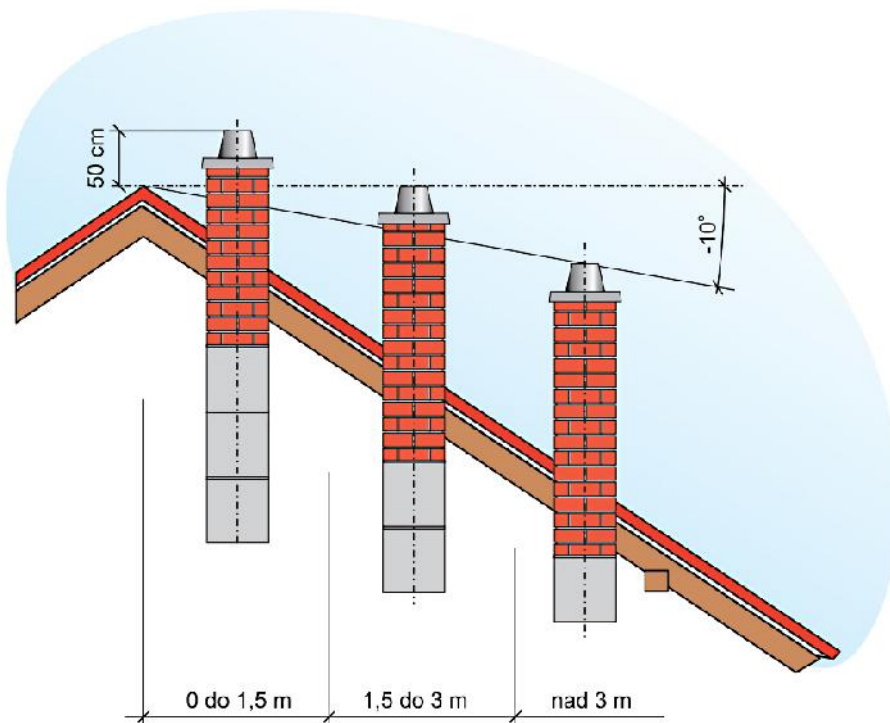


Slika 11. Prikaz priklju enja na dimnjak i prikaz položaja sonde na dimnja i

Treba izbegavati ako je mogu e lukove, a ako nije onda je maksimalni broj lukova (2). Dimni kanal od kotla do dimnjaka poželjno je izolovati, posebno ako ima lukova i dužih deonica. U ku ištu ventilatora izduvnih gasova fabri ki je ugra ena sonda dimnih gasova. Pre puštanja u rad proveriti da li je posle transporta još uvek na svom mestu, jer bez pravilno postavljene sonde nema ni rada kotla.

Sam dimnjak treba da je napravljen od kerami kih cevi, oko njih treba da je izolacija debljine 3-5cm i zadnji spoljni sloj je cigla ili specijalni dimnja ki elementi. Ako dimnjak ipak nije od keramike ve od cigle, površina svetlog preseka takvog dimnjaka mora da bude 30% ve a nego ovakva površina kerami kog dimnjaka.

Dimnjak mora da ima i vratanca za iš enje a ona moraju dobro da dihtuju. Izlaz dimnjaka na krovu mora da bude po odre enim propisima. Razlikuju se dva slu aja: ako je ugao krova manji od 12 i ako je ugao krova veci od 12 . Za ugao manji od 12 visine dimnjaka iznad krova je 1m a za ugao veci od 12 treba pogledati skicu.



Ukoliko mislite da je dimnjak prejak i da isuviše hladnog vazduha prolazi kroz kotao, na izlazu iz kotla postoji klapna kojom može da se smanji protok izduvnih gasova.

Dimnjak treba redovno da se ist ili barem jedanput godišnje.

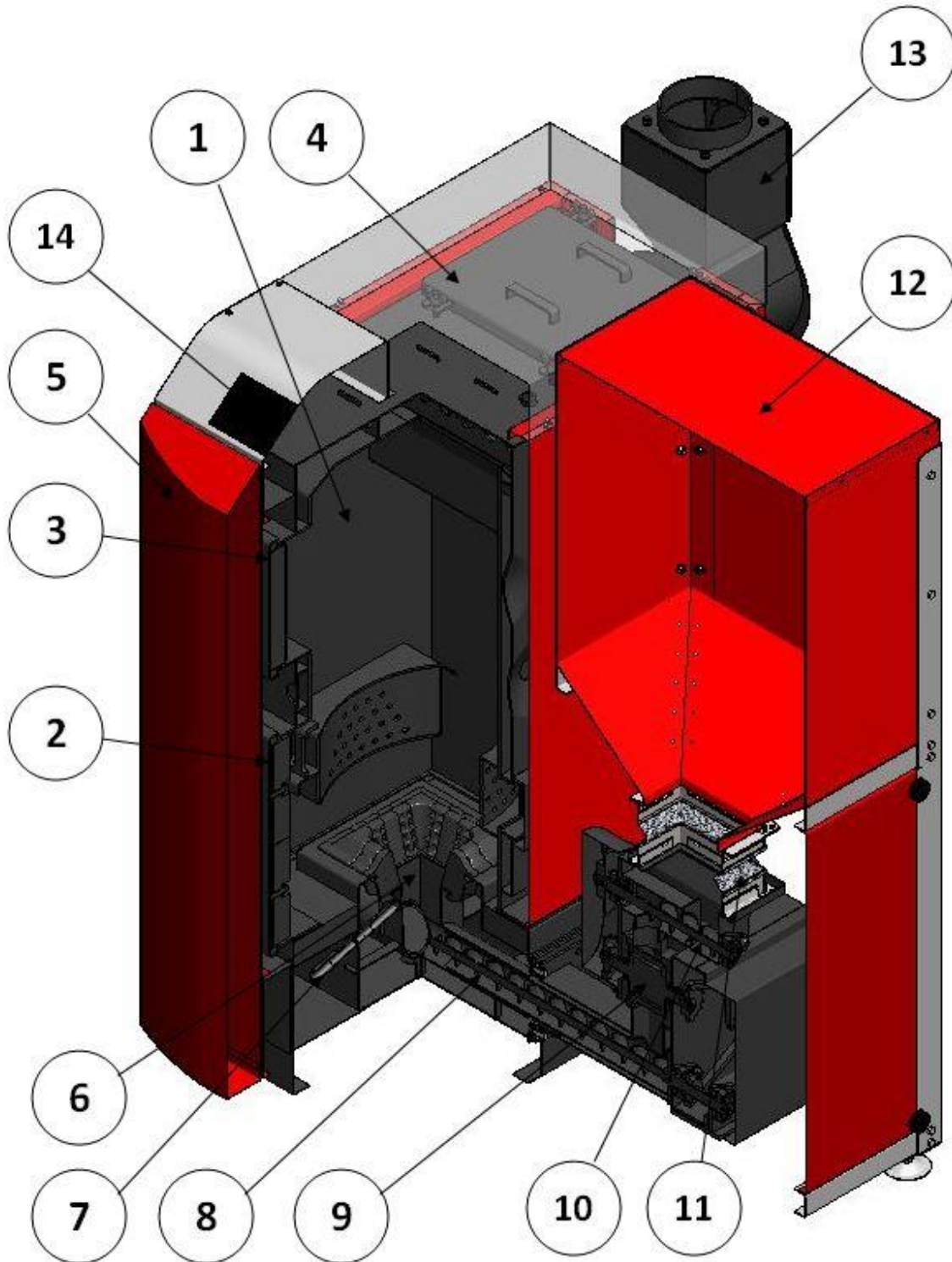


Ukoliko dimnjak nije propisne visine, poprečnog preseka ili ako se ne ist moguće su komplikacije u radu kotla. Pre svega nije moguće visokotemperaturni režim rada, tj. nema maksimalne radne snage, a posledice toga je pojava kondenzacije što utiče na radni vek kotla.



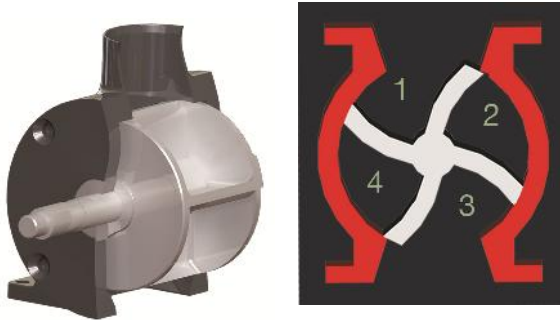
Slab dimnjak je glavni razlog da u toku potpale kotla ili u toku rada imamo pojavu dima na gornjim ili donjim vratima, naročito pri većim brojevima obrtaja ventilatora

4. Presek BIOmax kotla sa opisom elemenata



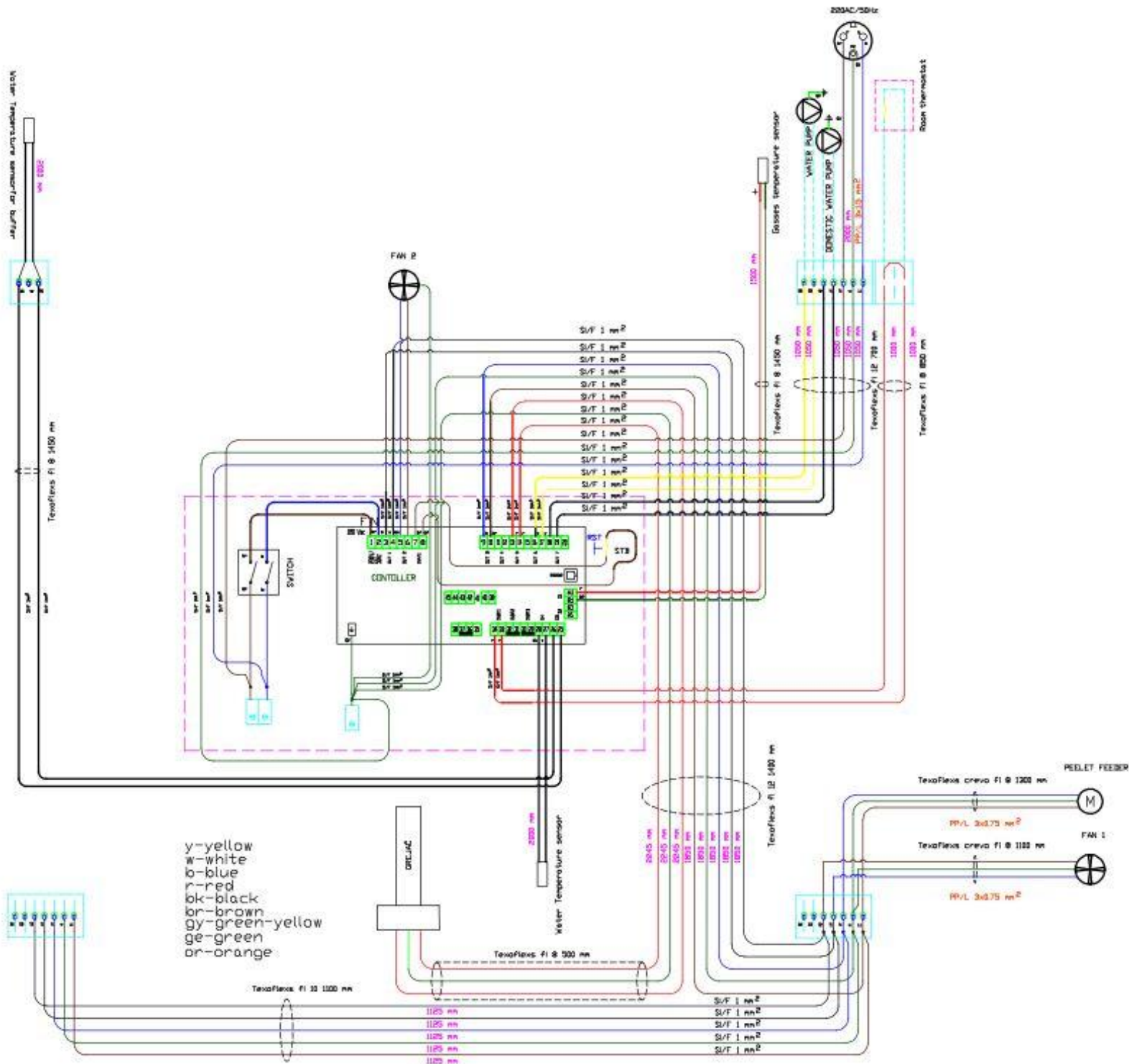
Opis:

1. Telo kotla;
2. Donja vrata za iš enje ložišta;
3. Gornja vrata za iš enje tela kotla;
4. Poklopac otvora za iš enje izmenjiva kih cevi;
5. Vrata oplate;
6. Ložište (PELET);
7. Greja ;
8. Donji pužni transporter;
9. elijasti transporter – VALVOLA;



10. Gornji pužni transporter;
11. Fleksibilna veza silosa i dozatora;
12. Silos;
13. Priklju ak za dimnjak;
14. Automatika.

5. Šema vezivanja automatike



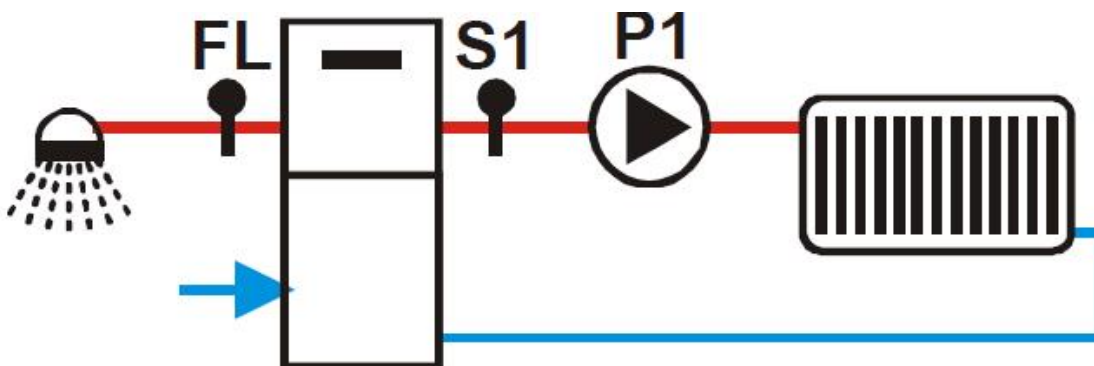
Sve linije koje su prikazane isprekidano na šemi spoljnih priključenja su provodnici koje je potrebno da instalira tehnik ko lice prilikom priključenja spoljnih uređaja na automatiku kotla. Sva priključenja dodatnih uređaja tehnik ko lice obavlja preko dva konektora koja se nalaze na zadnjem delu kotla. Jedan konektor je tropolni, a jedan je sedmopolni. Tropolni je za priključenje sobnog termostata što je prikazano na nalepnici samog konektora.

⚠ Za sobne termostate bitno je da budu sa baterijskim napajanjem tj. da nemaju na sebi bilo kakav dovod napona 220 V. Na samom termostatu za povezivanje se koristi NC (normalno zatvoreni kontakt).

Sedmopolni konektor je za priključenje mrežni kabal i za priključenje cirkulacione pumpe i pumpe akumulatora odnosno bojlera za sanitarnu vodu.

⚠ Kotao može da radi i u slučaju da nije priključena pumpa za centralno grejanje, ali preporuka proizvođača je da se ona ipak priključi jer ima funkciju sigurnosnog elementa. Uključuje se kada temperatura vode u kotlu preraste 90°C.

Kotao je prema fabričkim podešavanjima prilagođen hidro instalaciji kao na slici 12.



Slika 12.

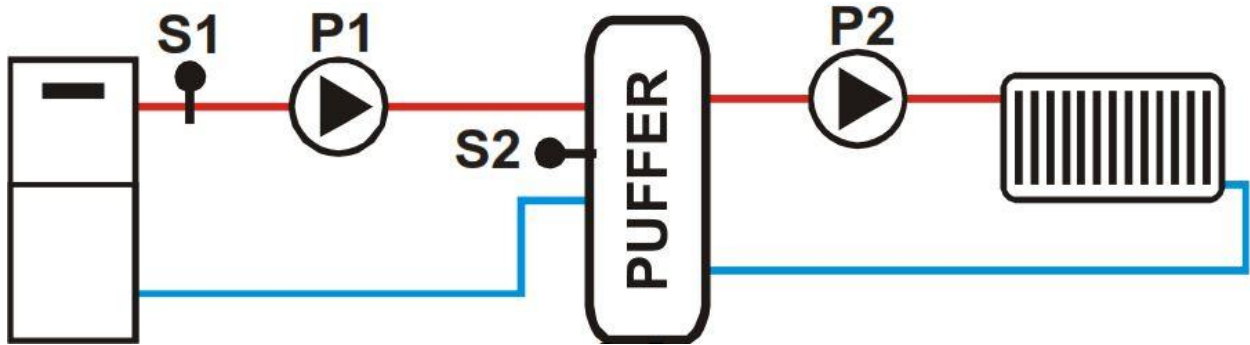
Ogledno je da postoji samo jedno merno mesto S1 i ta sonda je već fabrički postavljena. Druga sonda ovom slučaju ostaje neupotrebljena (saonda fabrički nije postavljena pa se može naručiti direktno od proizvođača kotla „Radijator inženjering“).

⚠ Pumpu P2 koja služi za sanitarnu vodu ne moramo da ugradimo. Parametar koji određuje tip hidro instalacije u samoj automatiki je P37 i za ovakvu hidro šemu je P37 postavljen na 5. Ukoliko želimo da koristimo automatiku da vodi proces i zagrevanja akumulatora preko odgovarajućih pumpe, onda hidraulička šema treba da bude kao na slici 13. Mesto merenja sonde temperature vode u akumulatoru je označeno sa S2.

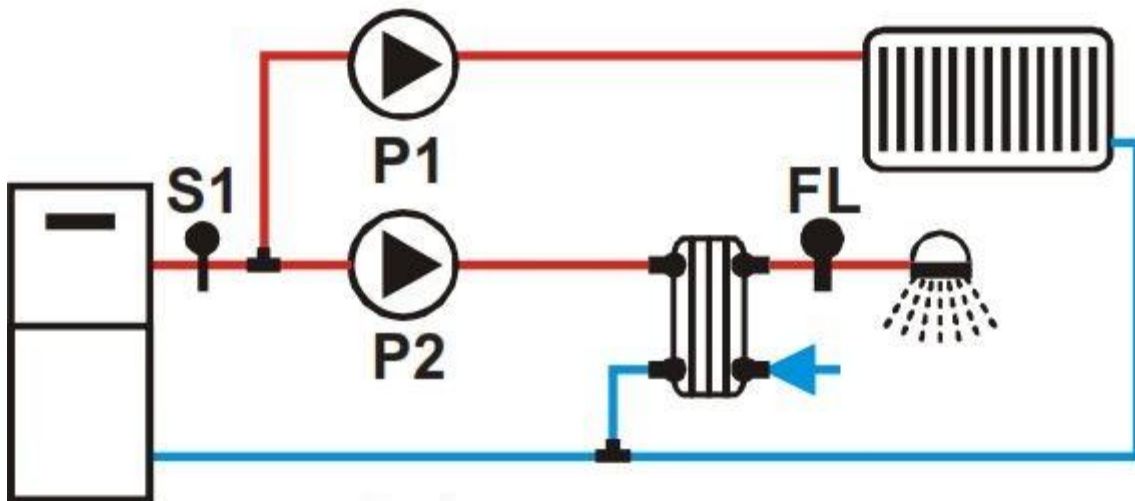
Da bi automatika pravilno vodila rad te pumpe za hidrauli ku vezu i sa akumulatorom onda je potrebno parametar P37 podesiti na vrednost 4.

Ukoliko želimo da automatika vodi proces zagrevanja sanitarne vode i to preko odgovaraju e pumpe, onda hidrauli ka šema treba da je kao na slici 14.

Da bi automatika pravilno vodila rad te pumpe za zagrevanje bojlera sanitarne vode onda je potrebno parametar P37 podesiti na vrednost 3.



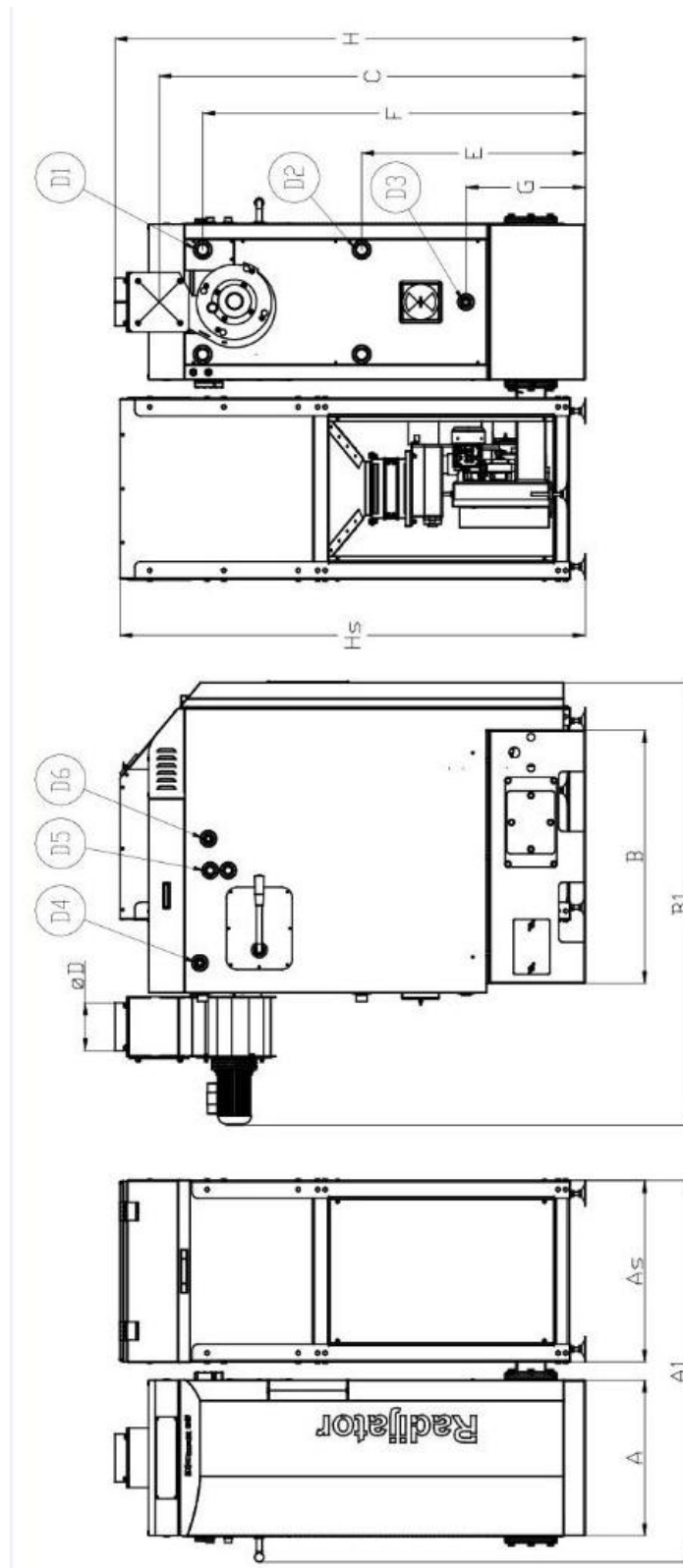
Slika 13.



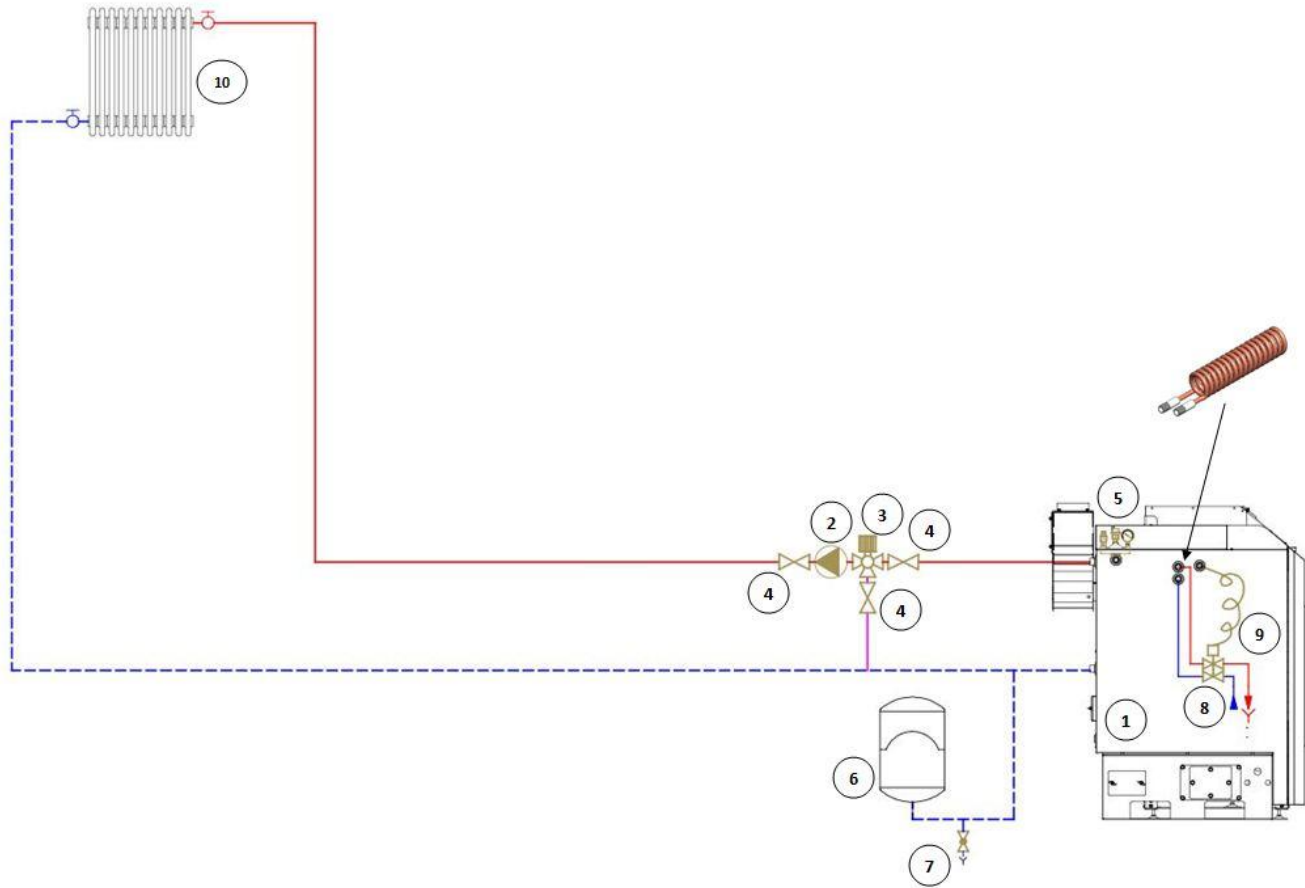
Slika 14.

6. Tabela sa tehni kim podacima

| TIP KOTLA | | BIOmax 23.1 | BIOmax 35 |
|--|-----------|------------------------|----------------------|
| CE oznaka | | CE | CE |
| Klasa kotla po EN 303-5:2012 | | 5 | 5 |
| Radni pritisak | bar | 3 | 3 |
| Probni pritisak | bar | 4,5 | 4,5 |
| Zapremina ložišta | L | 50 | 80 |
| Zapremina vode u kotlu | L | 75 | 95 |
| Težina | kg | 523 | 630 |
| Popre ni presek dimnjaka | mm | 130 | 160 |
| Potrebna promaja dimnjaka | mbar/Pa | 0,18/18 | 0,18/18 |
| Temperatura kotla (min / max) | °C | 60-90 | 60-90 |
| Minimalna temperatura povratnog voda | °C | 60 | 60 |
| Stepen iskoriš enja pri nominalnoj/minimalnoj toplotnoj snazi | % | 91,56/92,03 | 92,08/91,26 |
| Nominalna snaga | kW | 23,83 | 30 |
| Minimalna/ Maksimalna snaga kotla | kW | 6,83/23,83 | 9,00/30,00 |
| Emisija ugljen monoksida (Co) pri minimalnoj toplotnoj snazi (10%O2) | mg/m3 | 164 | 326 |
| Emisija ugljen monoksida (Co) pri nominalnoj topl.snazi (10%O2) | mg/m3 | 233 | 398 |
| Emisija prašine pri nominalnoj/minimalnoj toplotnoj snazi (10%O2) | mg/Nm3 | 19,84/34,89 | 22,37/35,93 |
| Dimenzije | | | |
| | A | 450 | 520 |
| | A1 | 1210 | 1280 |
| | As | 610 | 610 |
| | B | 790 | 845 |
| | B1 | 1400 | 1480 |
| | C | 1315 | 1425 |
| | ØD | 130 | 160 |
| | E | 400 | 750 |
| | F | 1170 | 1280 |
| | G | 400 | 400 |
| | H | 1460 | 1570 |
| | Hs | 1560 | 1560 |
| Priklju ak za toplu vodu iz kotla | D1 | 1" | 1" |
| Priklju ak za hladnu vodu kotla | D2 | 1" | 1" |
| Priklju ak za punjenje i pražnjenje | D3 | 1/2" | 1/2" |
| Priklju ak za sigurnosnu grupu | D4 | 1/2" | 1/2" |
| Priklju ak za ventil termi kog osiguranja oticanjem | D5 | 1/2" | 1/2" |
| Priklju ak za sondu ventila termi kog osiguranja | D6 | 1/2" | 1/2" |



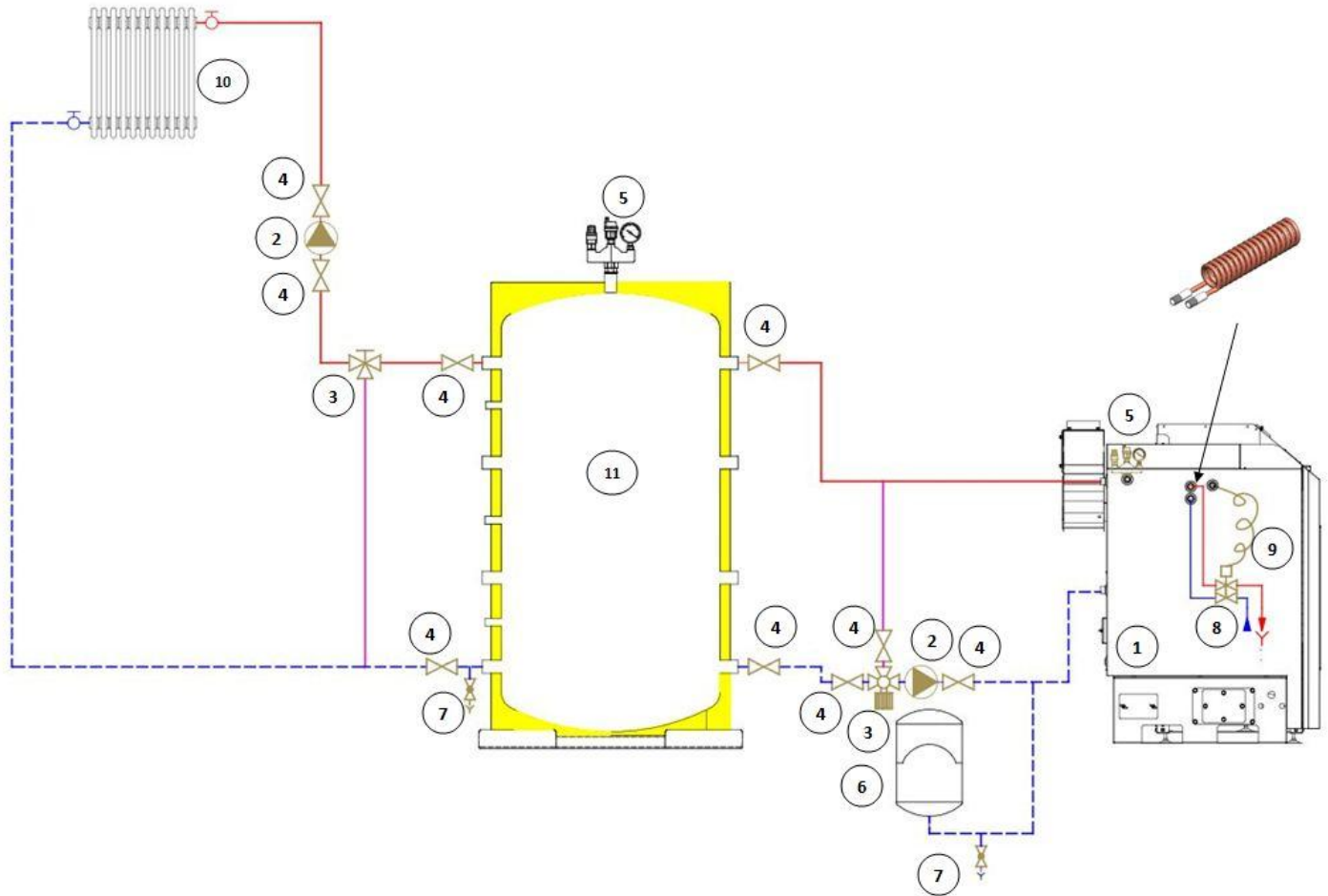
7. Hidrauli ka šema



Hidrauli ka šema

Opis:

1. Toplovodni kotao BIOmax;
2. Pumpa;
3. Mešni ventil;
4. Ventil;
5. Sigurnosna grupa;
6. Ekspanziona posuda;
7. Ventil za punjenje/praznjenje;
8. Ventil termi kog osiguranja;
9. Sonda ventila termi kog osiguranja;
10. Izmenjiva ;



Hidrauli na šema sa akumulatorom

Opis:


1. Toplovodni kotao BIOmax;
2. Pumpa;
3. Mešni ventil;
4. Ventil;
5. Sigurnosna grupa;
6. Ekspanziona posuda;
7. Ventil za punjenje/pražnjenje;
8. Ventil termi kog osiguranja;
9. Sonda ventila termi kog osiguranja;
10. Izmenjiva ;
11. Akumulator.

 **UPOZORENJE!!!**


Veoma važna razlika između u BIOmax35 i 23.1 jeste u tome što se sa zadnje strane kod BIOmax 23.1 nalazi samo jedan priključak za potisni vod i to u desnom gornjem uglu (odnosi se na „D1“), dok je priključak povratnog voda kod istog kotla premešten na bočnu stranu kotla (odnosi se na dimenziju, „E*“).

 **Prilikom montaže na hidrauličnu instalaciju kotao mora biti obezbeđen na propisan način i od prekoračenja *maksimalne radne temperature i pritiska*.**

 **Za propisnu montažu odgovoran je instalater centralnog grejanja koji priključuje kotao na hidraulički sistem.**

 **Radijator inženjering, kao proizvođač kotla, ne preuzima nikakvu odgovornost za štete prouzrokovane lošim instaliranjem kotla.**


8. Start rada kotla i održavanje

 **Prvo puštanje kotla u rad obavlja tehni ko lice koje ima sertifikat izdat od strane Radijator inženjeringa. Obavezna je obuka korisnika kotla.**

Na taj na in to lice je ovlaš eno da prijavi servisnoj službi u samoj fabrici vreme kada je kotao po eo da radi i u kakvom je stanju kotao bio prilikom prvog paljenja, dok kopiju izveštaja o puštanju *kotla u rad* zadržava. Garancija i upustvo za upotrebu se daje kupcu. Jedan primerak garancije se šalje proizvo a u. Ako garancija nije ispunjena, ona nije važe a.

Samo kotlovi koji su pušteni u rad od strane ovlaš enog tehni kog lica podležu uslovima *garancije*.

Naredni tekst je namenjen samom korisniku kotla, kao jedna vrsta podsetnika, da ako ugasi kotao (npr. zbog iš enja) bude u stanju da samostalno pokrene kotao.

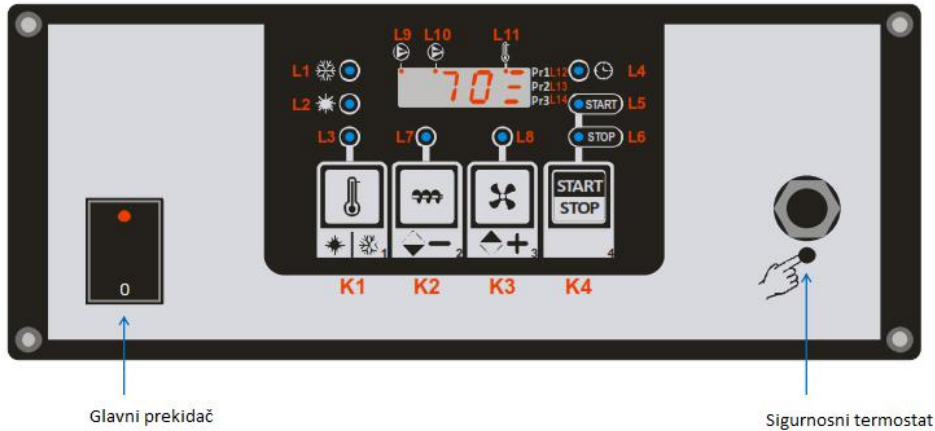
 ***Parametri vezani za rad kotla a koji su dostupni korisniku su na samom displeju. Ostale parametre koji su u tzv. skrivenom meniju ne treba menjati bez saglasnosti tehni kog lica koje je pustilo kotao u rad ili same fabrike.***

8.1 Displej automatike

Komandni panel sa injavaju:

Glavni prekidač, dugme sigurnosnog termostata, displej, grupa komandnih tastera (dugmića), grupa svetlosnih dioda pokazivača.



Sledeća slika je prikaz kontrolnog panela.





Glavni prekidač

Sigurnosni termostat

8.1.1 Komandni tasteri









| Komandni tasteri | Funkcija |
|---|---|
|  | <p>K1</p> <ul style="list-style-type: none"> Pritiskom na taster K1 moguće je promeniti zadatu temperaturu vode u kotlu. Pri tome se svetleća dioda L3 uključuje. Promena vrednosti se vrši pomoću tastera K2(-) i K3(+). Ako taster K1 držimo neprekidno možemo izabrati zimski odnosno letnji režim rada. Pri tome se svetleća dioda L1, odnosno L2 uključuje. Pritiskom na taster K1 potvrđuje se birana vrednost. |
|  | <p>K2</p> <ul style="list-style-type: none"> Pritiskom na taster K2 moguće je promeniti radno vreme puža. Pri tome se svetleća dioda L7 uključuje. Promena vrednosti se vrši pomoću tastera K2(-) i K3(+). Kada se taster K2 drži neprekidno, u režimu ISKLJUČEN (OFF), uključuje se ručno punjenje ložišta peletom. Tokom ove radnje na displeju će biti prikazan natpis "LoAd". Ručno punjenje ložišta peletom se završava kada pustite ovaj taster. Zbog sigurnosti, punjenje ložišta peletom počinje nakon tajmera T72. Pritiskom na taster K2 smanjuje se izabrana vrednost, a takođe se vrši serijsko listanje parametara. |

| | |
|---|--|
|  | <p>K3</p> <ul style="list-style-type: none"> • Pritiskom na taster K3 moguće je promeniti brzinu ventilatora. Pri tome se svetleća dioda L8 uključuje. Promena vrednosti se vrši pomoću tastera K2(-) i K3(+). • Kada se taster K3 drži neprekidno, u režimu ISKLJU EN (OFF), ventilator radi sa maksimalnom brzinom. Tokom ove radnje na displeju može biti prikazan natpis "UEnt". • Pritiskom na taster K3 povećava se izabrana vrednost, a takođe se vrši i listanje parametara. |
|  | <p>K4</p> <ul style="list-style-type: none"> • Kada se taster K4 drži neprekidno, kotao se uključuje/ isključuje. Pri tome se svetleća dioda L5/L6 uključuje. • Prilikom odabira vrednosti tasterima K2 i K3, pritiskom tastera K4 se resetuje odabrana vrednost. |
| <p>K2+K3</p> | <p>K2+K3</p> <p>Kada se tasteri K2 i K3 drže neprekidno, vrši se promena recepta. Pri tome se svetleće diode L12-L14 uključuju. Moguće je vršiti promenu receptata Pr1/Pr2/Pr3. Broj mogućih receptata je određen parametrom P89.</p> |

NAPOMENA:

U režimu **Isklju en (OFF)** možete resetovati prikaz alarma pritiskom na tastere **K2** ili **K3**, ali ako je uzrok alarma i dalje prisutan alarm će se ponovo uključiti.

8.1.2 Svetleće diode

| Svetleće diode | | Funkcija |
|---|------------|--|
|  | L1 | Uključena u zimskom režimu rada. |
|  | L2 | Uključena u letnjem režimu rada. |
| | L3 | Uključena kada je temperatura vode u kotlu manja od A03-A05 . Treperi kada je temperatura vode u kotlu iznad zadate. Isključena kada je temperatura vode u kotlu veća od A03 . |
|  | L4 | Uključena kada je ulaz Chrono zatvoren. |
| START | L5 | Uključena kada je kotao u režimu UKLJU EN . |
| STOP | L6 | Uključena kada je kotao u režimu ISKLJU EN . |
|  | L7 | Uključena kada puž radi. |
|  | L8 | Uključena kada ventilator za sagorevanje radi. |
|  | L9 | Uključena kada pumpa P1 radi. Treperi kada se pumpa isključuje. |
|  | L10 | Uključena ako je ventil/ pumpa P2 uključena. |
|  | L11 | Uključena ako je zatvoren kontakt sobnog termostata. |
| Pr1 | L12 | Uključena kada je izabran recept 1. |
| Pr2 | L13 | Uključena kada je izabran recept 2. |
| Pr3 | L14 | Uključena kada je izabran recept 3. |

8.1.3 Displej

Displej\Temperatura\Režim\Alarmi: etrvorocifreni/slovni displej prikazuje temperaturu vode u kotlu, radni režim i eventualne alarme

| Prikaz | Opis | Prikaz | Opis |
|------------|------------------|------------|------------------------------|
| OFF | Isklju en (OFF) | Mod | Modulacija |
| Chc | Provera | MAn | Mirovanje |
| Acc | Paljenje | Sic | Sigurnosni režim |
| Stb | Stabilizacija | SPE | Gašenje |
| rEc | Ponovno paljenje | ALt | Isklju en sistem sa Alarmima |

| Prikaz | Opis | Prikaz | Opis |
|-------------|---|-------------|-------------------|
| tSic | Otvoren je priklju ak sigurnosnog termostata – tastera za ru no resetovanje | PELL | Nedostatak peleta |
| CALd | Temperatura vode u kotlu je iznad zadate | | |
| AccF | Ne uspelo paljenje | | |
| SPAc | Slu ajno gašenje | | |
| Sond | O itavanje sonde van opsega | | |

NAPOMENA:

- Uklju ivanjem putem glavnog prekida a, kod proizvoda i verzija programa su prikazane na displeju u trajanju od 2 sekunde.

| Displej | Opis |
|---------------|------------------|
| St 14 | Kod proizvoda |
| Ur 1.0 | Verzija programa |

8.2 Start rada kotla na biomasu

- Kotao priključen na hidraulički sistem.
- Uveriti se da je sonda automatike postavljena na dimnjaču kotla (**slika 15.**).



Slika 15. Položaj postavljene sonde

- Uveriti se da je mehanizam za transport peleta vrsto oslonjen na pod, da je klapna ventilatora maksimalno otvorena i da je vošćica klapne za sigurnosni vazduh od 15 do 20 mm. (**slika 16. i 17.**)



Slika 16. Položaj klapne ventilatora



Slika 17. Položaj max. otvorene klapne vent.

- Utičnicu na zadnjoj strani kotla spojiti sa glavnim mrežnim napajanjem.
- Sipati manju količinu peleta u silos i zatvoriti ga.
- U ovoj fazi potrebno je ubaciti pelet u komoru za sagorevanje i to radom transportnog mehanizma za pelet (pellet feeding system). Na taj način postićemo kontinualno raspoređivanje pelet od komore za sagorevanje pa do silosa. Do pokretanja mehanizma za

pelet može do i samo u fazi rada kada na displeju piše „OFF“. Tada pritiskom na komandno dugme 2 koje u svom donjem delu i ima simbol za pužni transporter, dolazi do pokretanja mehanizma. Sve dok držimo dugme pritisnuto mehanizam radi. Kada dugme pustimo mehanizam stane.

Nalaganje komore peletom tzv. ru nom komandom vršiti nešto niže do po etka delova od sivog liva, što je prikazano **slikom18**.



Slika18. Prikaz nivoa peleta

- Sada kada imamo pelet u komori za sagorevanje i kada je on u zoni greja a za potpalu, možemo da startujemo po etak rada kotla. Start se izvodi tako što pritisnemo i držimo komandno dugme 4 više od 3 sekunde. Na donjem delu ovog dugmeta prikazan je i simbol za rastresit materijal, odnosno pelet. U trenutku kada kotao krene u potpalu na displeju piše Chc i u ovih nekoliko sekundi radi samo ventilator. Za vreme ove faze automatika proverava da li su svi ure aji neophodni za rad zaista i priklju eni. Slede i korak je kada na displeju piše Acc. Ovo je oznaka faze paljenja. U fazi potpale u jednom trenutku treba o ekivati da se uklju i i sistem za transport i da se nivo peleta u komori dopuni. Idealno je da kad posle ove dopune pelet bude do samog po etka delova od sivog liva. Kotao je u fazi potpale sve dok dimni gasovi ne pre u temperaturu koja je odre ena parametrom **F18**. Prema fabri kim podešavanjima ova temperatura je **50°**. Prvo se pojavi dim, a u periodu od 7 do 10 minuta i plamen.
- Kada dimni gasovi pre u grani nu temperaturu paljenja na displeju se pokazuje natpis Stb. Ovo zna i da je kotao u fazi stabilizacije plamena tj. sada automatika meri da li dimni gasovi imaju dovoljan prirast za odre eno vreme. Ventilator radi prema parametru za fazu stabilizacije, a i dolazi do dopune ložišta peletom tako e prema parametrima puža u fazi stabilizacije. U trenutku kada je i ovaj faktor zadovoljen kotao ide u radni režim.

 **NAPOMENA:** *Ovo su izmerene vrednosti tokom sertifikovanja.*

- Kao što je već napomenuto u gornjem delu teksta u tački 2. (konstrukcija kotla), dozatori za kotao BIOmax 23.1 i BIOmax 35 se razlikuju, jer se na dozatoru za **BIOmax 23.1** regulacija vazduha za sagorevanje dodatno kontroliše pomoću ventila koji se nalaze na njemu. Da bi se dobila što bolja emisija gasova pri sagorevanju pri nominalnoj ili minimalnoj snazi, potrebno je postaviti ventile na sledeći način:

Položaj ventila za maksimalnu snagu u radu:



Gde je:

Ventil 1: otvoren 100%
Ventil 2: otvoren 100%
Klapna (na dozatoru): Spuštena do crte
Primarni ventilator: 23%
Sekundarni ventilator: 18%
Nalaganje dozatora: 2,5s
Pauza izme u nalaganja dozatora: 8,5s

Položaj ventila za minimalnu snagu u radu:



Gde je:

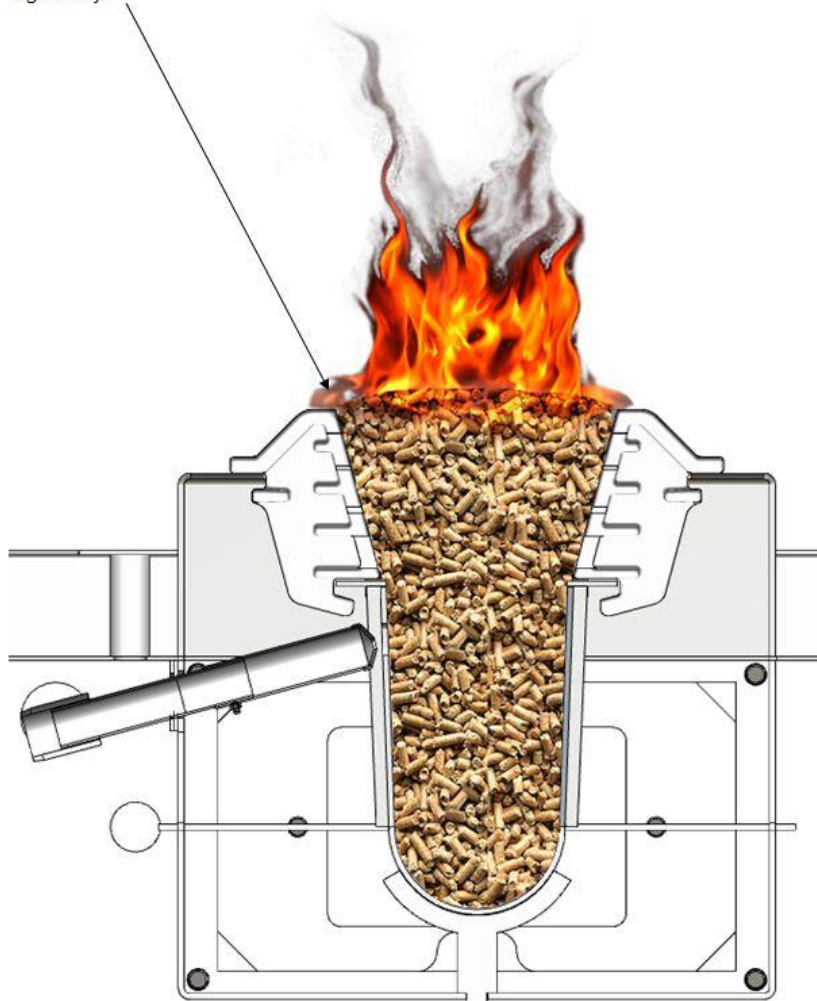
Ventil 1: otvoren 15°
Ventil 2: otvoren 45°
Klapna (na dozatoru): Spuštena do crte
Primarni ventilator: 17%
Sekundarni ventilator: 18%
Nalaganje dozatora: 0,5s
Pauza izme u nalaganja dozatora: 6,5s

- Na automatiku može biti povezan sobni termostat. U ovom slučaju, važno je podesiti temperaturu prostorije koja je glavni parametar za rad kotla i temperaturu vode u kotlu (70°C). Kada je aktiviran rad sobnog termostata, kotao najpre ima zahtev za postizanjem temperature sobe, stoga da je ograničen zadatom temperaturom vode u njemu. Postoji mogućnost da kotao prestane sa radom pre zadate temperature sobnog termostata, u ovom slučaju treba podići i zadatu temperaturu vode u kotlu npr. 70°C.

- Sagorevanje peleta, bez obzira na snagu sa kojom kotao radi, neophodno je podesiti tako da je na vrhu prostora za sagorevanje (**prikazano na slici**). Ovo se postiže podešavanjem doziranja peleta i koli ine vazduha. U slu aju da nivo plamena po inje da se spušta, neophodno je da se produži vreme doziranja ili smanjenje koli ine vazduha. Ako želimo da smanjimo toplotnu mo , neophodno je da smanjimo koli inu vazduha. Ako se desi da se nivo plamena podiže, možemo da smanjimo vreme nalaganja ili pove amo koli inu vazduha. Za ta no odre ivanje parametara potrebno je pratiti proces rada najmanje sat vremena.

NAPOMENA: Uvek se treba pridržavati nominalne ili maksimalne snage sagorevanja peleta, tj.kada pelet sagoreva na vrhu gorionika. U ovom slu aju smanjenje toplotne mo i vršimo smanjenjem zadate temperature vode u kotlu ili zadate temperature sobnog termostata.

Mesto gde pelet „poigrava“ tokom sagorevanja




Upozorenje: Obavezno izvršiti analizu dimnih gasova nakon završetka instalacije kotla. Izmeriti procenat kiseonika (O₂).

8.3 Kratko uputstvo za upotrebu automatike

8.3.1 DOPUNA LOŽIŠTA SA PELETOM, PRIPREMA ZA PALJENJE.

- Sipati pelet u silos
- Na glavnom displeju more da piše **OFF**

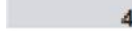


- Pritisnuti i držati dugme  2 . Sve dok držimo dugme transporter radi i na displeju piše **LOAD PELET**.

8.3.2 START POTPALE NA PELET, PREKIDA RADA NA PELET.

- Uključiti glavni prekidač



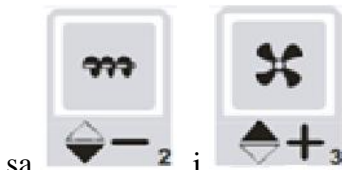
- Pritisnuti dugme  4 i držati 4-5 sekundi.

- Prekid rada kotla na pelet vrši se pritiskom na dugme  4 i držanjem 4-5 sekundi.

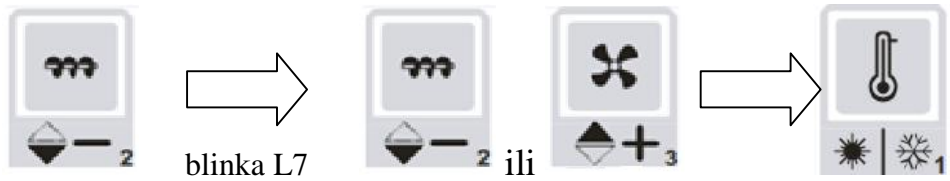
8.3.3 PROMENA VREMENA DOZIRANJA TRANSPORTERA U RADNOM REŽIMU.



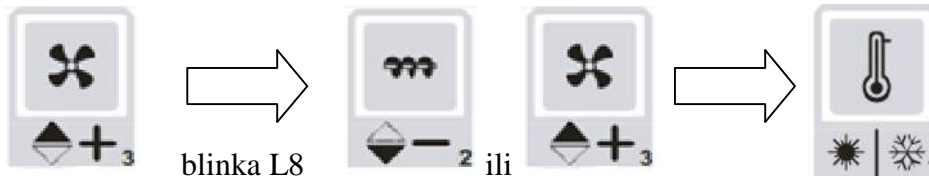
- Pritisnuti jednom kratko  2 ,



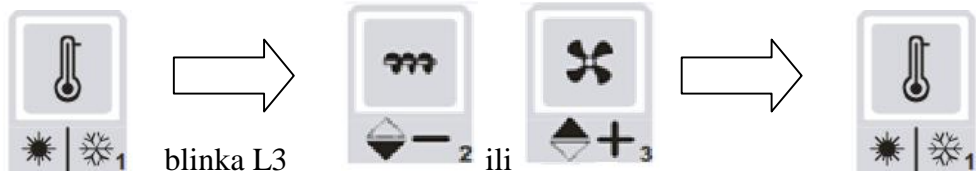
sa  2 i  3 promeniti vrednosti doziranja puža na željenu vrednost.



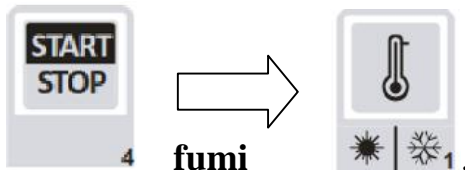
8.3.4 PROMENA JAŠINE VENTILATORA U RADNOM REŽIMU.







8.3.5 PROMENA ZADATE TEMPERATURE VODE U KOTLU.



8.3.6 KAKO Očitati TEMPERATURU DIMOVODNIH GASOVA.



8.3.7 ULAZAK U SKRIVENI MENI.

Pritisnuti   1 i   3 i držati oba dugmeta 5 sekundi. Odmah po ulasku u skriveni MENI na displeju piše **CL 00**. To je prvi parametar.

8.4 Greške prilikom startovanja kotla

Sve moguće greške u početnoj fazi rada tj. prilikom potpale mogu da se podele u tri velike grupe:

- **Grupa I**. Greške u potpali koje se odnose na situaciju kada nema pojave varnica, dima ni bilo kakvog plamena više od 20 minuta od trenutka kada se upalio grejač za potpalu.
- **Grupa II**. Greške u potpali koje se odnose na situaciju kada je došlo do pojave plamena ali se kotao posle izvesnog vremena (nekoliko minuta) ipak ugasio.
- **Grupa III**. Kotao je uspešno potpalio i radio nekoliko sati. Dostigao je zadatu temperaturu i duže vremena nema potrebe da se uključe ni dozirni sistem ni ventilator (najčešće je ova situacija tokom noći). Zatim temperatura pada ili korisnik želi višu temperaturu (najčešće ujutru) i kotao dobija signal da krene u fazu potpale, ali do plamena ne dolazi.

Grupa I

Mogući **uzrok 1**.

- **PROBLEM 1** – Zatvorena klapna ventilatora za primarni vazduh. Ventilator se nalazi na dozatoru.
- Postupak za rešavanje **PROBLEMA 1** – Otvoriti klapnu ventilatora maksimalno

Mogući **uzrok 2**.

- **PROBLEM 2** – Crevo koje spaja kanal vazduha od ventilatora do grejača nije pravilno postavljeno.
- Postupak za rešavanje **PROBLEMA 2** – Pripraviti crevo za vazduh i na kraju istog grejača i na cev kanala za vazduh

Mogući **uzrok 3**

- **PROBLEM 3** – Prostor između grejača i cevnog kućišta u kome je zavijen grejač je zapušten sa katranom i pepelom tako da nema prodora vazduha.
- Postupak za rešavanje **PROBLEMA 3** – Očistiti ovaj prostor i to prvo probati samo sa strane unutar ložišta žicom debljine 1-2mm. Ako ovo ne uspe isključiti kotao iz struje, odvititi grejač i sada očistiti prostor u kome je smešten.

Mogući **uzrok 4**

- **PROBLEM 4** – Prostor u dubini ložišta gde sagoreva pelet je pun nesagorelih ostataka odnosno šljake tako da nema dodira peleta i vrelog vazduha.
- Postupak za rešavanje **PROBLEMA 4** – Očistiti dubinu ložišta i to prvo krupniju šljaku mehanički a sitniju je moguće pokupiti i usisivati.

Mogući uzrok 5

- **PROBLEM 5** – Pelet koji se koristi je velike vlažnosti.
- Postupak za rešavanje **PROBLEMA 5** – Probati sa peletom koji je većeg stepena suvoće.

Mogući uzrok 6

- **PROBLEM 6** – Mrežni napon na koji je priključen kotao je znatno manji od 220-230V tako da je i snaga grejača manja.
- Postupak za rešavanje **PROBLEMA 6** – Priključiti mrežni ispravljač napona ili potpaliti ručno.

Mogući uzrok 7

- **PROBLEM 7** – Posle ručnog nalaganja i automatske dopune ložišta u fazi potpale nivo peleta je takav da pelet nije u kontaktu sa grejačem.
- Postupak za rešavanje **PROBLEMA 7** – Dopuniti nivo peleta.

Mogući uzrok 8

- **PROBLEM 8** – Prebačen je kotao iz automatskog u ručni režim rada. Ako tokom čitave faze potpale ne gori lampica za grejač onda smo sigurni da je kotao u ručnom režimu.
- Postupak za rešavanje **PROBLEMA 8** – Prebaciti kotao u automatski režim potpale.

Mogući uzrok 9

- **PROBLEM 9** – Neispravan elektro grejač za potpalu. Isključiti kotao iz mrežnog napajanja i na priključnim kablovima elektro grejača izmeriti omsku otpornost.
- Postupak za rešavanje **PROBLEMA 9** – Promeniti elektro grejač

Grupa II

Mogući uzrok 1.

- **PROBLEM 1** – Zatvorena je klapna u kotlu kojom se rukuje sa ručicom koja je na bočnoj strani. Pojavljuje se mnogo dima, a dimni gasovi nemaju dovoljno brz porast tako da kotao ide u gašenje.
- Postupak za rešavanje **PROBLEMA 1** – Otvoriti klapnu, tj. gurnuti ručicu ka dimnjaku

Mogu uzrok 2.

- **PROBLEM 2** – Brzina ventilatora u fazi potpale. Brzina ventilatora za primarni vazduh u ovoj fazi je određena parametrima Uc00 i Uc01. Ukoliko je brzina drastično promenjena u odnosu na fabrički podešenu nije dobro ni značajno je smanjiti ni povećati. U slučaju kad je ventilator u potpali slab onda nema porasta temp. dimnih gasova a ako je prejak može doći do brze potrošnje peleta u komori što opet dovodi do smanjenja temp. dimnih gasova u potpali.
- Postupak za rešavanje **PROBLEMA 2** – Podesiti vrednosti parametara Uc00 i Uc01 na fabričke ili blizu fabričkih.

Mogu uzrok 3

- **PROBLEM 3** – Brzina ventilatora u fazi stabilizacije plamena. Kotao uđe u potpalu, pojavi se dim, na displeju piše Stb što znači da je u fazi stabilizacije plamena ali posle toga kotao se ugasi. Najčešće je uzrok ovome je preslab ventilator u fazi stabilizacije što je određeno parametrom Uc04.
- Postupak za rešavanje **PROBLEMA 3** – Povećati brzinu ventilatora parametrom Uc04.

Mogu uzrok 4

- **PROBLEM 4** – Previše ili premalo peleta u fazi stabilizacije. Ako ima malo ili previše peleta dok na displeju piše Stb tj. stabilizacija, može doći do zagušenja plamena i vraćanja kotla u stanje gašenja. Količina peleta u fazi stabilizacije se reguliše parametrom CL04.
- Postupak za rešavanje **PROBLEMA 4** – vrednost parametra CL04 na fabričku ili blisku fabričkoj.

Mogu uzrok 5

- **PROBLEM 5** – Kotao je ušao u fazu stabilizacije ali ide u fazu gašenja jer nema dovoljan prirast temp. dimnih gasova. Naravno je stagnacija odnosno mali pad temp. dimnih gasova u omljiv u trenutku kada kreće dopuna ložišta sa peletima.
- Postupak za rešavanje **PROBLEMA 5** – Povećati temp. dimnih gasova za ulazak sistema u Fire ON a to je parametar F18. Na taj način novi pelet koji ulazi u komoru za sagorevanje teže obara temp. dimnih gasova jer je plamen jači iz razloga što mu se dalo više vremena do trenutka dopunjavanja. Ovaj problem se najčešće javlja kad su slabi dimnjaci ili je vuha dimnjaka iz nekog drugog razloga slaba.

Mogu uzrok 6

- **PROBLEM 6** – Kotao je prošao i fazu stabilizacije ali ide u modulaciju, na displeju piše Nod. Ako se provere dimni gasovi u tom se trenutku zapaža da su previsoki.
- Postupak za rešavanje **PROBLEMA 6** – Proveriti da li je klapna unutar kotla u položaju „otvoreno”. Zatvoriti klapnu tj. pomeriti ručicu na bočnoj strani kotla ka prednjoj strani.

Mogu **uzrok 7**

- **PROBLEM 7** – Kotao je ušao u fazu stabilizacije ali posle izvesnog vremena ide u gašenje.
- Postupak za rešavanje **PROBLEMA 7** – Zaboravljena da se vrati u kotao ili potpuno zatvori fioka za pepeo.

Grupa III

Uvod

Kada kotao dostigne zadatu temperaturu vode u njemu ili vazduha u prostoriji gde je sobni termostat, prelazi u fazu mirovanja, odnosno održavanja plamena ili u originalu Standby fazu. Najbolji primer za ovakav na in rada kotla je no ni rad.

Osnovni cilj ove faze je održati plamen odnosno žar u ložištu tokom višesatnog mirovanja. To se postiže periodičnim uključivanjem i pelet transportera i ventilatora u određenim periodima vremena.

- U trenutku kada je kotao dostigao zadatu temperaturu on ulazi u fazu održavanja plamena. Posle određenog perioda vremena, što je određeno parametrom t04 (u minutima) transporter kreće u rad i ventilatori se aktiviraju. U ovim periodima dolazi do aktiviranja kotla sve dok ne dobije komandu za start zbog postizanja zadate temperature.
- Vreme trajanja jednog procesa rada transportera i ventilatora određeno je parametrom t05 (u sekundama).
- Tokom samog procesa uključivanja transportera njegov rad je određen, periodom što je određeno parametrom CL09 (u sekundama).
- Za vreme procesa održavanja plamena ventilator za primarno sagorevanje se uključuje sa snagom koja je određena parametrom Uc09.

Moguće greške u radu vezane za fazu održavanja plamena:

- Kotao i pored funkcionisanja faze održavanja plamena nema dovoljno peleta za start i rad u normalnom režimu.
- Otklanjanje uzroka greške :
 1. Smanjiti parametar t04, odnosno povećati u estanost rada transportera i ventilatora u fazi mirovanja.
 2. Povećati vreme trajanja procesa tj. parametar t05.
- Previše nesagorelog peleta pri kretanju kotla u rad.
- Otklanjanje uzroka greške :
 1. Povećati parametar t04
 2. Smanjiti parametar t05
 3. Smanjiti snagu ventilatora za primarno sagorevanje u fazi održavanja plamena parametar Uc09.

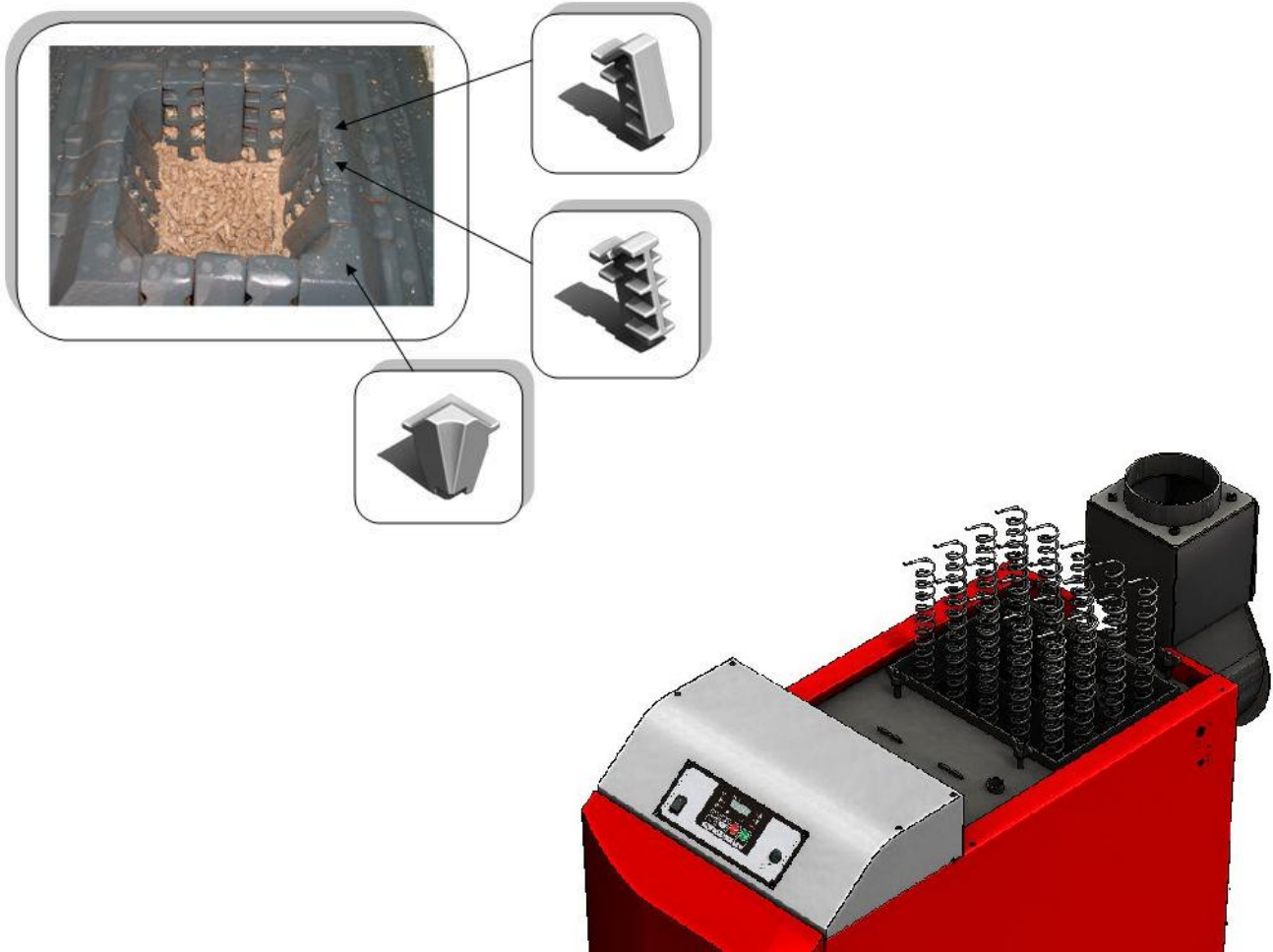
8.5 Održavanje kotla BIOmax

Kotao **BIOmax** zahteva svakodnevno i periodično održavanje.

- Svakodnevno održavanje se odnosi i na prostor samog ložišta od sivog liva gde stalnim izbacivanjem pepela omogućavamo bolji rad elektro grejača za potpalu i bolje sagorevanje tj. veću količinu vazduha kroz vazdušne kanale u sivom livu. Tako će pepeo već u toku dana počinje da se taloži na podu, prostoru oko samog ložišta. Pri prosečnim parametrima sagorevanja 100kg peleta proizvede 1kg pepela.
- Na svakih 3 do 7 dana potrebno je očistiti prostor oko segmenta sivog liva za sagorevanje peleta. Takođe potrebno je očistiti naslage na zidovima samog ložišta. Ovim dobijamo bolji stepen prenosa jer jedan milimetar naslaga katrana i čašice smanjuje provodnost za 5%.
- Jednom u mesec dana potrebno je otvoriti i gornji poklopac za održavanje (dimenzije 372mm x 285mm), izvaditi turbulatore i sa celog tada dostupnog dela kotla skinuti katran i čašice. Sve što se tada skinu pokupi se kroz donje otvore. Održavanje izmenjivih kih cevi vrši se pomeranjem turbulatora gore-dole. **(pogledati sliku 19.)**. Takođe jednom do dva puta u toku grejne sezone bitno je očistiti segmente sivog liva u ložištu koje se lako demontiraju (najpre se vade ugaoni segmenti povlačenjem na gore, pa zatim i ostali zaokretanjem i povlačenjem na gore). **(pogledati sliku 19.)**



Pri održavanju i servisiranju kotla, kotao isključiti sa napajanja.



Slika 19. Prikaz ložišta i turbulatora

Ukoliko u kotlu, tokom korišćenja javi kondenzacija, potrebno je pokupiti kondenzat i ceo kotao iznutra premazati baznim sredstvima za čišćenje ili barem vodenim rastvorom građevinskog krečnaka. Na taj način se vrši neutralizacija kiselina usled kondenzacije.

! Na ovaj način obavezno konzervirati kotao na kraju grejne sezone. U toj situaciji zatvoriti i sve otvore na kotlu da ne dodje do cirkulacije vazduha kroz kotao jer i tako može doći i do pojave vlage u kotlu.

! Održavanje kotla je jedan od najbitnijih faktora za dužinu radnog veka kotla. Naročito je bitno da u vansezoni kotao bude očišćen i da se izvrši neutralizacija kiselina na veće opisan način.

8.6 Natpisna plo ica

Natpisna plo ica je nalepljena na dobro vidljivo mesto na kotlu i sadrži slede e (videti sliku u ta ki NALEPNICE):

1. Tehni ki podaci sa nalepnice:

- Proizvo a (Radijator inženjering)
- Serijski broj kotla (primer: N°:100113033)
- Godina proizvodnje (primer: 2013)
- Tip kotla (BIOmax 23.1 ili BIOmax 35)
- Nazivna toplotna snaga kotla (BIOmax23.1 – 23,83kW ili BIOmax35 – 30kW)
- Podru je upotrebe toplotne snage (BIOmax23.1 – 6.83-23.83kW ili BIOmax35 – 9-30kW)
- Potrebna promaja dimnjaka (20Pa)
- Elektri ni napon (230V)
- Frekvencija (50Hz)
- Ja ina struje (3A)
- Nazivna el. snaga (490W)
- Maksimalna dodatna el. snaga (200W)
- Ukupna el.snaga (690W)
- Težina (BIOmax 23.1-523kg, BIOmax 35-630kg)
- Klasa kotla prema EN 3035 (5)
- Maksimalni pritisak (3 bar)
- Maksimalna temperatura (90°C)
- Koli ina vode izražena u litrima (BIOmax23.1 – 75L ili BIOmax35 – 95L)
- Oznaka tipa goriva-pelet C1

2. Nalepnica uvoznika

3. OEEO

4. Ostale oznake na kotlu



8.6 Izjave



IZJAVA O USAGLAŠENOSTI

U skladu sa direktivom 2006/42/EC o mašinama
Prilog II, deo 1, odeljak A

U ime: "RADIJATOR Inženjering-a" d.o.o. /Živojina Lazića Solunca 6, 36000 Kraljevo, Srbija

IZJAVLJUJE

S potpunom odgovornošću da:

Grejni kotlovi na pelet serije BIOMax nominalne toplotne snage:
BIOMax 23.1 - 23kW i BIOMax 35 - 30kW

ispunjavaju zahteve: Direktive 2006/42/EC o mašinama (stupila na snagu 29/06/2006),

i zahteve sledećih direktiva i propisa:

1. Direktive 2004/108/EC Evropskog Parlamenta i Saveta od 5. Decembra 2004 o približavanju zakonodavstava država članica u vezi elektromagnetne kompatibilnosti (tekst značajan za EEP) i stavljanja van snage Direktive 89/336/EEC;
2. Direktive 2006/95/EC Evropskog Parlamenta i Saveta od 12. Decembra 2006 o usklađivanju zakonodavstava država članica u vezi električne opreme namenjene za upotrebu u okviru određenih granica napona (kodifikovana verzija) (tekst značajan za EEP) i stavljanja van snage direktive 73/23/EEC.

Uređaj je usaglašen sa sledećim EN standardom:
EN 303-5:2012,

i sledećim EN i tehničkim zahtevima: EN 60730-1.

ISPITIVANJE TIPRA KOTLA TUV Rheinland/ Paluska Gyula/ H/B1 12 1037.

Mesto: Kraljevo
Datum: 2014-02-07

Potpis:
Milan Janić, generalni direktor



8.7 Nalepnica

Na kotlu BIOmax nalaze se nalepnice za označavanje priključaka kao i nalepnice za opasnost od strujnog udara, nalepnice za šemu povezivanja i dr.

Nalepnice koje označavaju priključke za povezivanje instalacije:

1. Nalepnica (Potisni vod) 32mm x 74mm



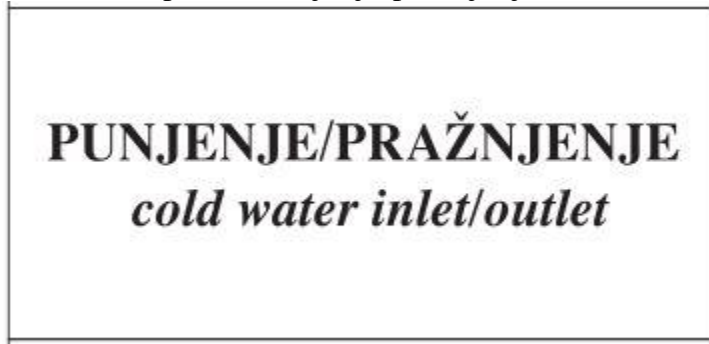
2. Nalepnica (Povratni vod) 32mm x 74mm



3. Nalepnica (Sigurnosna grupa) 32mm x 74mm



4. Nalepnica (Punjenje/pražnjenje) 32mm x 74mm



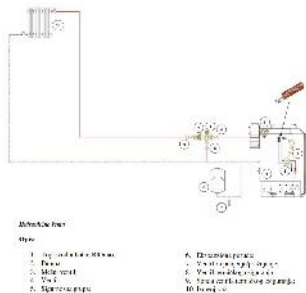
5. Nalepnica (Izmenjiva termi kog osiguranja) 32mm x 74mm



6. Nalepnica (Sonda termi kog osiguranja) 32mm x 74mm



7. Nalepnica (Šema povezivanja) 152mm x 210mm



Nalepnice koje označavaju prisustvo struje, visokog napona i opasnosti:

1. Nalepnica (Napon opasan po život) 60mm x 80mm



2. Nalepnica (Ulaz za sniženim naponom 12V) 60mm x 80mm



3. Nalepnica (Napon opasan po život - VE A) 100mm x 150mm



4. Nalepnica (Uzemljenje) 20mm x 30mm



5. Nalepnica (Prisustvo napona)



Nalepnice koje označavaju upozorenje:

1. Nalepnica (Izloženi pokretni delovi mogu izazvati povrede) 30mm x 80mm



2. Nalepnica (Obavezno poštovanje u rad od strane ovlašćenog servisa)
65mm x 247mm



3. Nalepnica (Pažnja)



4. Nalepnica (Otpad)



Nalepnice sa tehni kim podacima:

Živojina Lazića Solunca br.6
Grdica-36000 Kraljevo
Srbija

N° 100315052
BIOmax 23.1



Živojina Lazića Solunca br.6
Grdica-36000 Kraljevo
Srbija

N° 100515035
BIOmax 35



Živojina Lazića Solunca br.6
Grdica-36000 Kraljevo
Srbija
e-mail: radijator@radijator.rs
www.radijator.rs

| | |
|---------------|------------|
| Pressure max | Temp. max |
| Max. pritisak | Max. temp. |
| 3 bar/300kPa | 90°C |

N°: 100315052
Godina/Year: 2015

| | |
|--|-----------------------|
| PROIZVOĐAČ MANUFACTURER | Radijator Inženjering |
| TIP - MODEL TYPE - MODEL | BIOmax 23.1 |
| NAZIVNA TOPLOTNA SNAGA KOTLA NOMINAL HEAT OUTPUT POWER | 23.83 kW |
| PODRUČJE UPOTREBE TOPLOTNE SNAGE HEAT OUTPUT RANGE | 6.83 - 23.83 kW |
| POTREBNA PROMAJA DIMNJAKA REQUIREMENT AIR FLUE | 20 Pa |
| ELEKTRICNI NAPON VOLTAGE | 230 V |
| FREKVENCIJA FREQUENCY | 50 Hz |
| JACINA STRUJE CURRENT | 3 A |
| NAZIVNA EL. SNAGA NOMINAL ELECTRICAL POWER | 490 W |
| MAX. DODATNA EL. SNAGA MAX. EXTENDED EL. POWER | 200 W |
| UKUPNA EL. SNAGA ALL EL. POWER | 690 W |
| MASA KOTLA MASS OF BOILER | 526 Kg |
| ZAPREMINA VODE U KOTLU VOLUME OF WATER IN THE BOILER | 75 L |
| KLASA KOTLA PO EN 303-5:2012 CLASS OF BOILER ACCORDING TO EN 303-5:2012 | 5 |
| GORIVO FUEL | C1 |



Živojina Lazića Solunca br.6
Grdica-36000 Kraljevo
Srbija
e-mail: radijator@radijator.rs
www.radijator.rs

| | |
|---------------|------------|
| Pressure max | Temp. max |
| Max. pritisak | Max. temp. |
| 3 bar/300kPa | 90°C |

N°: 100515035
Godina/Year: 2015

| | |
|--|-----------------------|
| PROIZVOĐAČ MANUFACTURER | Radijator Inženjering |
| TIP - MODEL TYPE - MODEL | BIOmax 35 |
| NAZIVNA TOPLOTNA SNAGA KOTLA NOMINAL HEAT OUTPUT POWER | 30 kW |
| PODRUČJE UPOTREBE TOPLOTNE SNAGE HEAT OUTPUT RANGE | 9-30 kW |
| POTREBNA PROMAJA DIMNJAKA REQUIREMENT AIR FLUE | 20 Pa |
| ELEKTRICNI NAPON VOLTAGE | 230 V |
| FREKVENCIJA FREQUENCY | 50 Hz |
| JACINA STRUJE CURRENT | 3 A |
| NAZIVNA EL. SNAGA NOMINAL ELECTRICAL POWER | 490 W |
| MAX. DODATNA EL. SNAGA MAX. EXTENDED EL. POWER | 200 W |
| UKUPNA EL. SNAGA ALL EL. POWER | 690 W |
| MASA KOTLA MASS OF BOILER | 630 Kg |
| ZAPREMINA VODE U KOTLU VOLUME OF WATER IN THE BOILER | 95 L |
| KLASA KOTLA PO EN 303-5:2012 CLASS OF BOILER ACCORDING TO EN 303-5:2012 | 5 |
| GORIVO FUEL | C1 |

8.8 Proizvođa



RADIJATOR D.O.O.
Živojina Lazića Solunca br.6
36000 Kraljevo, Srbija

9. Garancija

1. Radijator inženjering pokriva razli ite garancijske periode za razli ite delove (što je navedeno u daljem tekstu) samo ako su ispunjeni slede i uslovi garancije:

- 1.1. Kotao mora biti priklju en po navedenim hidrauli kim šemama iz tehni kog uputstva, naro ito obratiti pažnju na sigurnosne ventile, termi ko osiguranje oticanjem, mešaju i ventil za zaštitu hladnog kraja kotla odnosno protiv kondenzacije, opseg radnog pritiska kotla, opseg radne temperature kotla, uslove u kotlarnici itd.
(videti ta ku 7.)
- 1.2. Kotao mora biti priklju en na dimnjak propisanog popre nog preseka, karakteristika izolacije i visine. **(videti ta ku 3.4)**
- 1.3. Dimovod od kotla do dimnjaka mora mora biti izveden po tehni kom uputstvu.
- 1.4. Kod kotla moraju biti izvršena i navedena elektro priklju enja iz tehni kog uputstva, naro ito se misli na karakteristike sobnog termostata, karakteristike mrežnog napona koji mora biti u odre enim granicama.
- 1.5. Korisnik mora da se pridržava navedenih uputstava o koriš enju i održavanju.
(videti ta ku 8.)

2. Garancijska izjava

Izjavljujemo:

- da proizvod ima propisana i deklarirana kvalitetna svojstva.
Obavezujemo se, da emo na zahtev kupca ako pravovremeno u garancijskom roku podnese zahtev za popravku, o svakom trošku izvršiti sve popravke kvarova, tako da e proizvod raditi u skladu sa deklariranim svojstvima,
- da e proizvod u garancijskom roku raditi besprekorno ako se budu poštovala uputstva za upotrebu, rad i montažu,
- da emo u garancijskom roku biti spremni da otklonimo sve kvarove na proizvodu i držati na zalihama sve potrebne rezervne delove,
- **garancijski rok po inje od DANA KUPOVINE I TRAJE 60 MESECI ILI 72MESECA OD DATUMA PROIZVODNJE (datum proizvodnje nalazi se na nalepnici sa zadnje strane kotla),**
- **GARANCIJA OD 60 MESECI VAŽI SAMO AKO SE KOTAO REDOVNO SERVISIRA OD STRANE CENTRALNOG SERIVISA RADIJATOR INŽINJERINGA u periodu nazna enim za isti (dalje u tekstu),**
- **garancija važi ako je garantni list overen od strane prodavca i ako je upisan datum kupovine i priložen ra un. TAKO E BITNO JE IMATI I NALOG ZA PUŠTANJE U RAD. (overen od strane ovlaš enog servisa)**

3. Garancijski period od godinu dana važi za sledeće delove:

- Za sve ležajeve serije UCFL,
- elektro grejača za potpalu,
- Ležajeve elijastog sigurnosnog transportera (valvole),

4. Garancijski period od dve godine važi za sledeće delove:

- lance za prenos obrtnog momenta 083,
- donje pužne spirale,
- ventilator primarnog vazduha,
- ventilator sekundarnog vazduha,
- automatiku kotla sa sigurnosnim termostatom,
- sondu dimovodnih gasova,
- sondu temperature kotlovske vode,
- Motor reduktor,
- Segmente za sagorevanje od sivog liva,
- Elektro konektore,
- Izolacijske materijale na vratima i otvorima za pušnice,
- Delove elijastog sigurnosnog transportera (valvole) koji su od sivog i nodularnog liva.

5. Garancijski rok ne važi:

- ukoliko se posle svake grejne sezone ne odradi redovan servis,
- za zamenu delova kod redovnog godišnjeg održavanja u skladu sa uputstvima,
- kod kvarova koje je na osnovu kupac zbog nestručnog rukovanja proizvodom,
- kod mehaničkih kvarova nastalih prilikom transporta i prilikom korišćenja (vrsti predmeti),
- ako je proizvod instaliran nestručno, suprotno važećim propisima iz tog područja,
- ukoliko se utvrdi da hidraulička šema nije urađena po preporukama firme „Radijator inženjering”,
- ako je kupac koristio proizvod iznad deklariranih svojstava i u normalnim okolnostima,

6. Garancijski rok prestaje da važi:

- ako se ustanovi da je kvarove otklanjala neovlašćena osoba ili neovlašćeni servis,
- ako kod popravke nisu bili upotrebljeni i ugrađeni originalni delovi,
- kad ističe garancijski rok.

7. Kod prijave kvarova obavezno je dati sledeće podatke:

- naziv i tip proizvoda,
- datum kupovine,
- fabrički ili radionički broj kamina,
- kratak opis kvara, odnosno nedostatka,
- tačna adresu i kontakt telefon, mejl.

8. Redovan godišnji servis

Redovan servis se odrađuje na kraju svake grejne sezone u period od 15.4. do 31.8. i naplaćuje se utvrđenim cenovnikom firme “Radijator Inženjering”. Servisni postupak tehničkih lica koja obavljaju redovne godišnje servise, a koja su od strane proizvođača ovlašćena za to, obuhvataju sledeće operacije:



NAPOMENA: Serviser je dužan da pregleda sve navedene delove (sa liste) dozatora i izmenjivača, i ukoliko dođe do zamene bilo kojih delova na iste korisnik dobija gore navedenu garanciju kao i garanciju na još 12 meseci na telo kotla (izmenjivača). Garancija se može produžiti do 5 god. od datuma puštanja u rad. Servis i produženje servisa može da obavlja lice koje šalje centralni servis “Radijator inženjering”-a. Na nezamenjene delove posle odrađenog servisa garancija ne važi.

- Demontaža silosa za pellet od pellet transportera;
- Demontaža pellet transportera od kotla;
- Skidanje oba lanca;
- Demontaža segmenata za sagorevanje od ložišta i čišćenje prostora ložišta ispod segmenata. Provera stanja segmenata i njihovog međusobnog zazora;
- čišćenje prostora cevi ložišta u kojoj se okreće donja pužna spirala;
- Podmazivanje svih ležajeva gornje i donje pužne osovine i provera njihove ispravnosti. Ležaj ne sme da ima otežano okretanje ili naprsline na kućištu. U suprotnom ležaj se menja. Ukoliko se utvrdi da je do oštećenja ležaja došlo zbog upadanja vrstog predmeta u pelet transporter (zbog greške korisnika ili proizvođača peleta), Radijator inženjering naplaćuje vrednost ležaja. Ako je do oštećenja ležaja došlo zbog povlačenja plamena u sam pelet transporter i to iz razloga loše postavljenih parametara prilikom korišćenja, Radijator inženjering naplaćuje vrednost ležaja;
- Skidanje lanaca sa obe strane vratila elijastog sigurnosnog transportera (valvole) i provera ispravnosti ležajeva 6004 u valvoli. Ukoliko je okretanje ležajeva

otežano, zameniti ležajeve sa obe strane. Ukoliko je do oštećenja ležaja valvole došlo zbog upada vrstog tela koje nije iz samog kotla (zbog greške korisnika ili proizvođača peleta) Radijator inženjering naplaćuje vrednost ležajeva;

- Proveriti oštrinu ivica rotora;
- Izvaditi sondu dimnih gasova i otkloniti je od naslaga;
- Provera ispravnosti oba ventilator;
- Provera dihtovanja gornjih i donjih vrata;
- Provera održavanja kotlovske izmenjivača.

Contents:

1. Important warning;
 - 1.1 Minimum distance from flammable materials;
2. Description of the boiler;
3. Assembly;
 - 3.1 General warnings;
 - 3.2 Measures and safety devices for boilers;
 - 3.3 Boiler room;
 - 3.4 Connection to the chimney;
4. Cross-section of BIOmax boiler with a description of the boiler elements;
5. Schematic connection of automation;
6. Table of technical data;
7. Hydraulic scheme;
8. Boiler operation and maintenance;
 - 8.1 Control panel;
 - 8.2 Operation start of the boiler operated by biomass;
 - 8.3 Short manual for automatic control;
 - 8.4 Mistakes during ignition and start of the boiler;
 - 8.5 Maintenance of boiler;
 - 8.6 Nameplate;
 - 8.7 Declaration;
 - 8.8 Sticker;
 - 8.9 Manufactured;
9. Warranty.

1. Important warnings

GENERAL WARNINGS

- After the removing of the package check for the completeness of the delivery, in the case of defects, please contact the dealer who sold the boiler.
- The boiler must be used solely for the purpose envisaged by the manufacturer. Any liability of the manufacturer is excluded for damages to persons, animals or things, in case of errors during installation, regulation, maintenance or improper use.
- In case of leakage of water the device should be switched from the mains supply, close the water supply and inform the authorized service and authorized installers.
- This manual is an integral part of the device and must be kept with care and must always follow the device even in case of change of owner or user, or in case of connection to another installation. In case of damage or failure look for a new copy of an authorized dealer.



IMPORTANT WARNINGS

We emphasize that the use of the device working on bio-mass and solid fuel, having contact with electricity and water, demands respect and security measures such as:

- The use of the boiler by the children and people with limited capabilities without accompaniment is not allowed.
- It is forbidden to use boiler installations operating at temperatures higher than 110 ° C, and pressure greater than 3 bar.
- It is not allowed to use easily inflammable fuels (alcohol, oil) for faster wood ignition.
- It is forbidden to store easily flammable materials near the boiler and close the door for firing. The ashes must be disposed off in closed and non-flammable containers.
- It is prohibited to incinerate waste materials which cause combustion flame or explosion hazard (eg. plastic bags, sawdust, coal dust, mud, etc.).
- It is prohibited to any person or technical intervention or cleaning the boiler before it is switched off the main power supply switch, the setting on the device (0) "off".
- It is prohibited to change the safety elements.
- It is forbidden to close the vents in the room where the boiler is located. Air vents are needed for proper combustion.
- No exposure to atmospheric turbulents. The boiler is not designed for outdoor use and contains no anti-freeze system.
- It is forbidden to turn off the boiler when the outside temperature can drop below zero (to prevent freezing).
- Be aware of safety air valve position (detailed explanation in the chapter **OPERATION START OF BOILER**).
- In the case of intervention on any electrical device of boiler, switch off all the electrical wiring and so it is removed from the mains socket.

- Work with of boiler unit is forbidden for people with special needs (including children) to physical and mental health, except under the supervision of a guardian, and the people who are responsible for their behavior.
- Children must be supervised by a guardian as they do not play with the appliance boiler.
- If the damaged power protection, must be replaced in the factory and serviced by an authorized dealer or qualified people to avoid the risk of electric shock.

1.2 Minimum distance from flammable materials

- Provide adequate distance from flammable materials, if necessary to ensure the protection of the same.
- Minimum distance from flammable materials is required by law - please inquire of professionals who deal with heating and Emission effluents.
- The minimum distance of the boiler and flue pipe gas from the low and averagely combustible materials should be at least 100 mm.
- Minimum distance from flammable materials is 200 mm , and the same goes for materials whose flammability is not known.



Risk of fire!

- Storage of flammable materials and liquids in the vicinity of the boiler is prohibited.
- Be sure to warn users about the required minimum distance of combustible material from the boiler.

| Combustibility of Construction materials | |
|---|---|
| A ... Noncombustible | asbestos, stone, building stone, ceramic wall tiles. terracotta, plaster, screed (without organic additives) |
| B... Non easily flammable | Gypsum cardboard slab, glass fiber slab of ACUMINE, ISOMINE, ROYALITE, LIGNOS, VELOX, HERACLITE |
| C1.. Low combustible | beech and oak wood, composite wood, file, slab of HOBREX, Versalite, umakart |
| C2 ... Averagely combustible | wood of pine, yew and pine, composite materials |
| C3... Easily combustible | Asphalt, paperboard, cellulose materials, chipboard, cork, polyurethane, polystyrene, polypropylene, polyethylene fiber floor |

2. Description of the boiler

Boiler BIOmax is developed as the Company RADIJATOR ENGINEERING might offer to the market the boiler, which by its mechanical and thermal properties is specially intended for biomass as fuel. Using the general term "**BIOMASS**", of course, it is primarily meant and considered - the pellet, but it should be noted and the possibility of firing the seeds of fruit (cherries, blackcherries...). **If the user wants to use some form of biomass that is not listed, be sure to call the service design and development RADIJATOR INŽENJERING or an authorized dealer, because very often some forms of biomass require a separate, specific combustion solutions.** When using these fuels means the automatic control of the main operating parameters. In all stipulated examples of using biomass it requires a certain degree of dryness of the fuels.

Only the combustion takes place in this situation under the forced drafts centrifugal fan, there is a pull-out gas, and adding secondary air intake fan on the exit part of the boiler. Of course it is BIOmax in these conditions combustion more efficient than its predecessors, which operate on the principle of free draft or forced draft just one fan.

Wood pellets are produced from 100 % cellulose. Wood residues under high pressure are compressed into pellets of 6 mm in diameter and in length of 2- 3cm . Pellets should be stored correctly in a dry place to ensure efficient combustion. Boilers BIOmax 23.1 and BIOMax 35 use pellet of 6mm diameter, of 5 -30mm length and humidity up to 10 % manufactured in accordance with **EN 14962-2**.

Series of boilers BIOmax IS MANUFACTURED in two variants: BIOmax23.1 and BIOmax35. BIOmax23.1 covers the power range of 15–23 kW and BIOmax35 is in the range of 20–34,9kW.

CONSTRUCTION

By exterior design, size firebox openings for heating and cleaning BIOmax kept all the good features of the previous model in which the RADIJATOR INŽENJERING distinctive market.

Water part of the boiler, its mode changes between flue gas heat and water, adjusted to biomass and wood. Because of the the application of two fans, that is forced draft flue gas path is longer than standard boilers. For the same reasons, the usage of routers flue gases - turbulators further increase the efficiency of the boiler. In BIOMax boilers where the exchanger tubes are of 42mm diameter (BIOmax 23.1) and 48mm (BIOmax35) spiral turbulence units have been applied having the dual role i.e. leading to greater efficiency as well as to facilitate cleaning.

(see **Figure 1**)

Efficiency of pellet is over 90 %. In normal mode the flue gas temperature at the exit is about 120 ° C, and in maximum regimes it is below 150 ° C. These values may at any time to observed on the display. Each TKAN boiler has a copper heat exchanger for the connection of the fan for

thermal safety as well as the flap for fire initiation. All parts of the water portion of boiler are made of seamless pipe **ST 35.4** quality and boiler plate thickness of 5 mm or more, depending on the power of boiler. Sheets are of the quality of the Standard **1.0425 EU** i.e. Standard **P265GH EUH**.

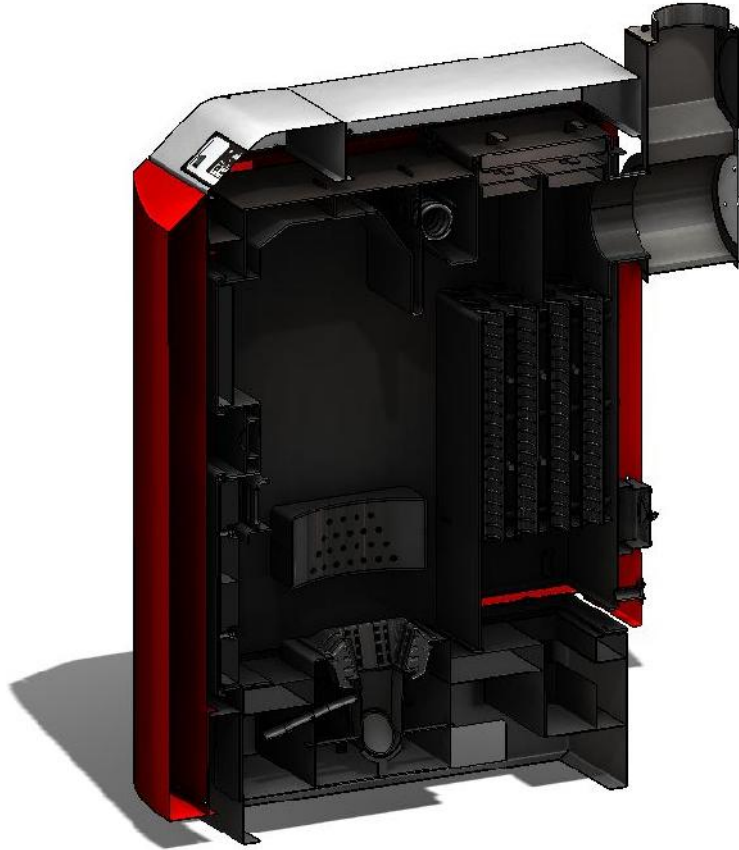


Figure 1. Cross-section of BIOmax boiler

Combustion chamber (**figure 2, pos. 2**), in its principle of work. The so-called, „spring up“, where the zone of transport of fuel is going vertically upwards i.e. it springs up to the combustion zone. It is made of solid insulating materials and cast iron.

Fuel transport (**figure 2, pos. 4**) is provided by screw transporters. There is a noticeable difference in the feeder for BIOmax23.1 and the feeder for BIOmax35. In fact, there is the difference in the form of valves for setting the air assembled onto the feeder of BIOmax23.1, all these in order to get the best possible emission of flue gases (**figure 2**), further explained in text in **item 8.2**. The fuel is coming from the silo of the capacity of 240 L (**figure 2, pos. 5**). If necessary, it is easy to dismantle the whole assembly into three independent entities: silo, the mechanism for setting and boiler. (**figure 2**)

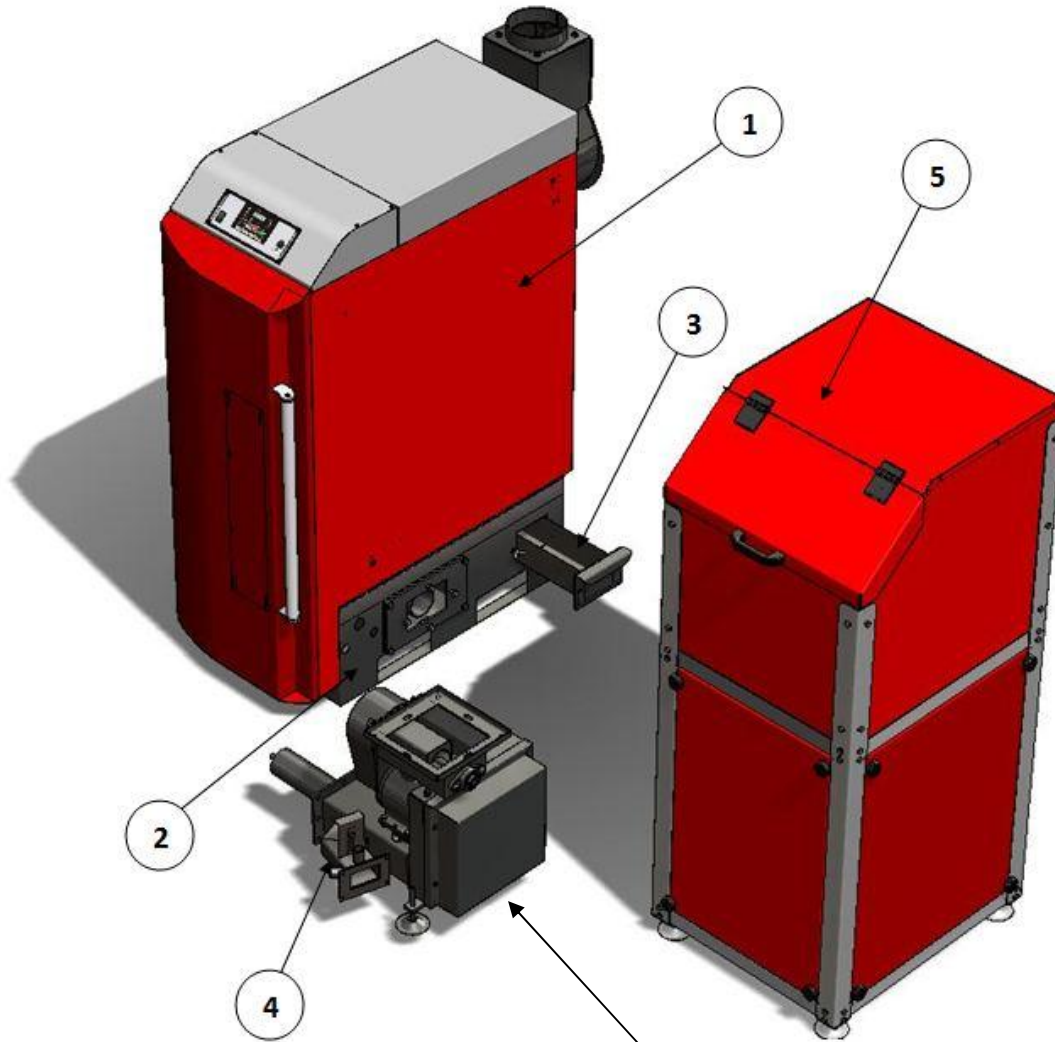


Figure2. Parts of boiler

Discription:

1. Body of boiler;
2. Combustion chamber;
3. Ashtray;
4. Feeder;
5. Silos;



3. Assembly

3.1 General warnings

The boiler must be set correctly for proper operation!

The boiler is supplied with an external coating containing insulation, 30mm thick.

The position of the silo and the mechanism of transport of pellets is a standard factory right in relation to the boiler. It is possible to order the factory assembled and left variant. Also, if you need to easily make changes in the field because the silos and the whole mechanism disassemble dosing in relation to the boiler. Electrical connections easy switch ON easy OFF, and reassembly is not necessary personnel specialized electrical field.



Silos for Biomax 23.1 and BioMax 35 have a flexible connection with the transport mechanism, in order to avoid vibration during operation.

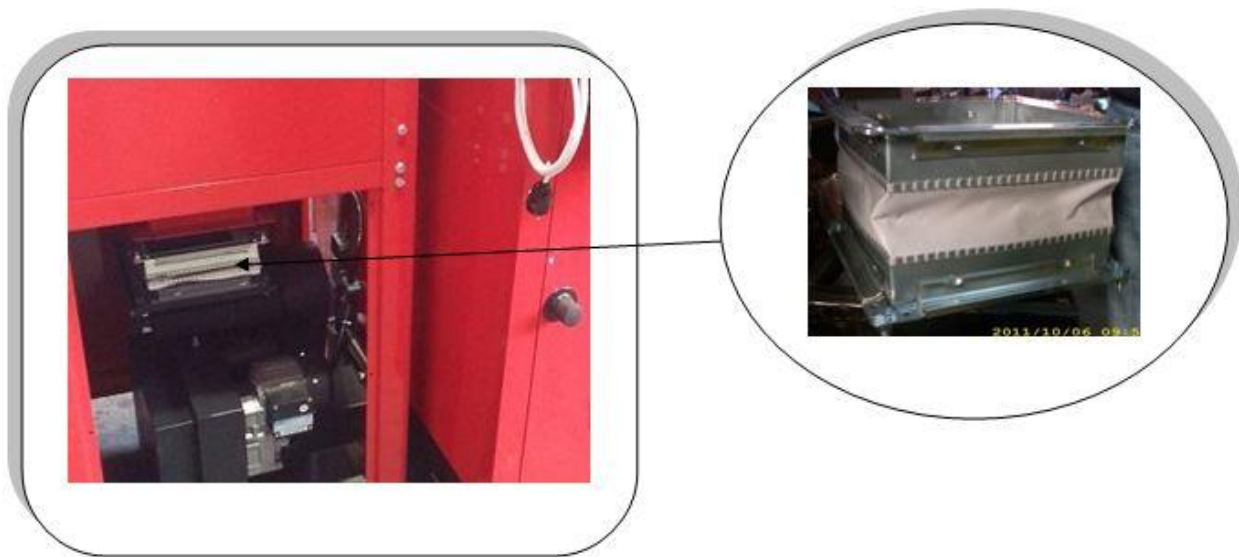


Figure3. Preview flexible connections



Maximum operating pressure of the boiler is 3 bar, 1 bar the minimum and maximum operating temperature of the boiler is 110 C.



Boiler with 2 fans, automation and ceramic heaters for wood and all of these devices use 230V power, so that incorrect installation and careless handling may endanger human life electrocution.



Solid fuel boiler and forced draft should be installed according to valid standards and legal regulations. Any mechanical or electrical change in the design or installation shall be deemed a violation of guarantee conditions and will lead to its distortion.



In an assembly the boiler should be properly protected against the excessive overpressure and overheating.



When installing the hydraulic installation of the boiler must be provided in a prescribed way of overdraft maximum operating temperature and pressure.



For the proper installation the plumber/installer is responsible.



The manufacturer (Radijator inzenjering) does not take any responsibility coming from the incorrect installation of the boiler.



When any intervention on the electrical devices BIOmax , the whole system off the main power supply.

The basic requirements to be complied with during the installation:

- The boiler can be connected to an open system of central heating, but also to a closed system of central heating. In case of connection to a closed system, it is recommended to install the valve for thermal insurance, which is determined by the respective laws of each state in which the boiler is connected.
- The boiler must be located at a safe distance from combustible materials. The boiler must be far enough from possible obstacles in the boiler room for cleaning and maintenance. See **figure 9**.
- Electric power for the boiler is 230V 50Hz and connection of all devices that the boiler has should be done according to valid regulations and connection is done by a person with proper authority.
- Connection to the chimney also done according to the binding regulations and manufacturer's recommendations as can be seen below.

3.2 Measures and safety devices for boilers BIOmax;

For safe operation of boiler it is necessary to assemble and maintain the following elements in working condition:

- **Pressure Safety valve (figure 4)**



Figure 4.



Figure 5.



Figure 6.

- Pressure safety valve must be of nominal diameter of 1/2 inch calibrated to a maximum of 3 bars.
This security element which belongs to the group of pressure limiters must be of such construction to withstand short-term overdrafts and temperatures and pressure as well as the content in the liquid glycol for heating.
Usually in the same place the vent (**Figure 5**) and the pressure gauge (**Figure 6**) are connected so that these three elements together constitute a security group and can be mounted over T" connector.
This safety element must be subjected to periodic re-calibration , of which the investor, i.e. the user of the boiler must have valid documentation.
- Safety valve must be mounted on the highest point directly to the boiler and the boiler without any pipeline or any other elements in between. For this purpose there is a specially designed connector (see picture). Any reduction in diameter of the connector is prohibited.
- Ispusni tj. izduvni deo ventila sigurnosti mora da bude od cevi iji je pre nik najmanje jednak nazivnom pre niku ispusnog dela ventila.Tako e dozvoljeno je za njegovu izradu koristiti najviše jedan luk radijusa $r > 3d$.
- The safety valve must have a nameplate and the following information on it
 - Name of manufacture;
 - Designation of type of safety valve / year of testing;
 - Nominal flow rate;
 - Data for which thermal effect the safety valve is set;
 - The highest opening pressure 3 bars.
- It is obligatory to check the correct functioning at regular intervals as well as the re-calibration by certified companies. These responsibilities are carried out in accordance with the law of every country in which the boiler is assembled. Always keep the written documentation of the last calibration data for the safety valve.
- On the return line assemble at least another pressure safety valve.

- The valve of thermal safety by swelling (Figure 7)



Figure 7.

This safety element also has a role of a limiter of temperature. Below it will be marked with the abbreviation VTO.

- In some extremely dangerous situations in the transformation of water into vapor is such that the pressure safety valves are not sufficient to ensure the safety of the hydraulic system. For this reason, the installation of VTO is mandatory. Depending on the regulations of the countries in which the boiler is assembled, it is necessary to install the VTO only for the determined higher powers or for each power of a boiler it is the obligatory to instal the VTO.
- Place the installation is shown in the Assembly diagram of boiler onto the installation in **Figure 8**. The boiler is supplied with a copper coil so it is necessary to use the VTO with trhe exchanger, as shown in **Figure 8**. Cold sanitary water is brought to the VTO. When the VTO-probe has the information that the temperature is over 95 degrees the VTO is opened and water flows through copper coil. After some time the temperature of water in boiler returns to its normal state.
- One connection of coil is used for VTO and the other for draining of water that has passed through the coil. The choice of either connection; for VTO or for the discharge is irrelevant. It is necessary to follow the installation instructions provided by the manufacturer of the VTO.
- Be sure to check up, in certain periods of time, the functioning of the VTO.

As stated above one end of the VTO is for the mounting on the exchanger of the boiler, and the other is supplied with cold water under pressure. It is particularly important that the water flow is unobstructed even when the electricity is switched off.



If it is impossible to provide the inflow of cold sanitary water at the time of electricity switch off , the boiler must be connected onto the open system.

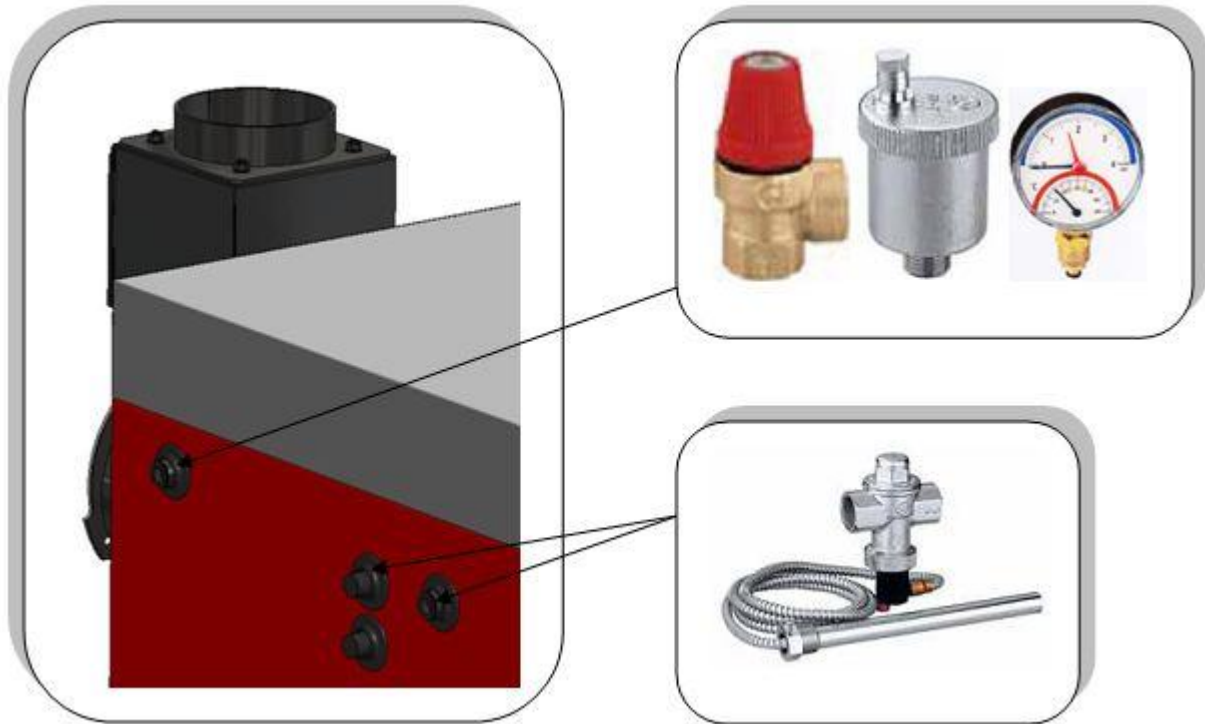


Figure 8 . Installation of safety elements

- **Thermostats in the automation of the boiler (Figure 9)**

Within the automation itself that leads the combustion process and influences the work of two cycles of heating, there are two thermostats. Both are of similar construction as the thermostat shown in **figure 9** and they have safety functions as limiters of the temperature of water in the boiler. Because of the safety role in the functioning of the boiler, both thermostats have the independent probes for measuring of water temperature. The first thermostat is the so-called „working thermostat” work and it serves to limit the temperature to a level the user wants. Another thermostat is the „safety thermostat” because it stops the operation of the fan which favors the flame, and adds a new energy. Safety temperature is limited to 95 degrees Celsius. **It is very important to connect the pump for heating through automation for safety reasons. When the temperature of water in the boiler reaches the critical value of 95 degrees the fan stops working, but the pump is necessarily switched on to exchange the heat of water through radiators.**

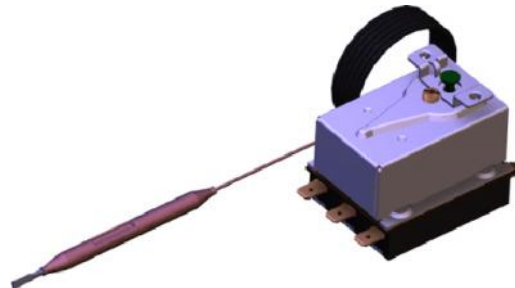


Figure 9. Thermostat on automatic

3.3 Boiler room

Boiler room must be secured against freezing.

The support surface of the boiler in the boiler room must be of non-combustible material. Recommended distance of all four sides of the boiler in relation to the boiler walls or other solid body (water heater, etc.) are shown in **Figure 10**. These values allow a safe distance access when firing, sufficient space for cleaning and easy access to fan and valve for filling and emptying. Boiler at its left hand side should be away from the wall 200 mm i.e. as much as needed for the connection of valves for thermal safety by over flow. If the valve is not to be installed then the space can be smaller. The flap handle for firing is removable and can be placed either on the left or right side of the boiler. The space on the right side of the boiler, which is recommended to be at least 800mm from the silos is important because after cleaning the boiler the user then goes and pulls out the ashtray from the back of the firebox. **Boiler room must have sufficient ventilation holes for fresh air as well as for the outlet of the exhaust air!**

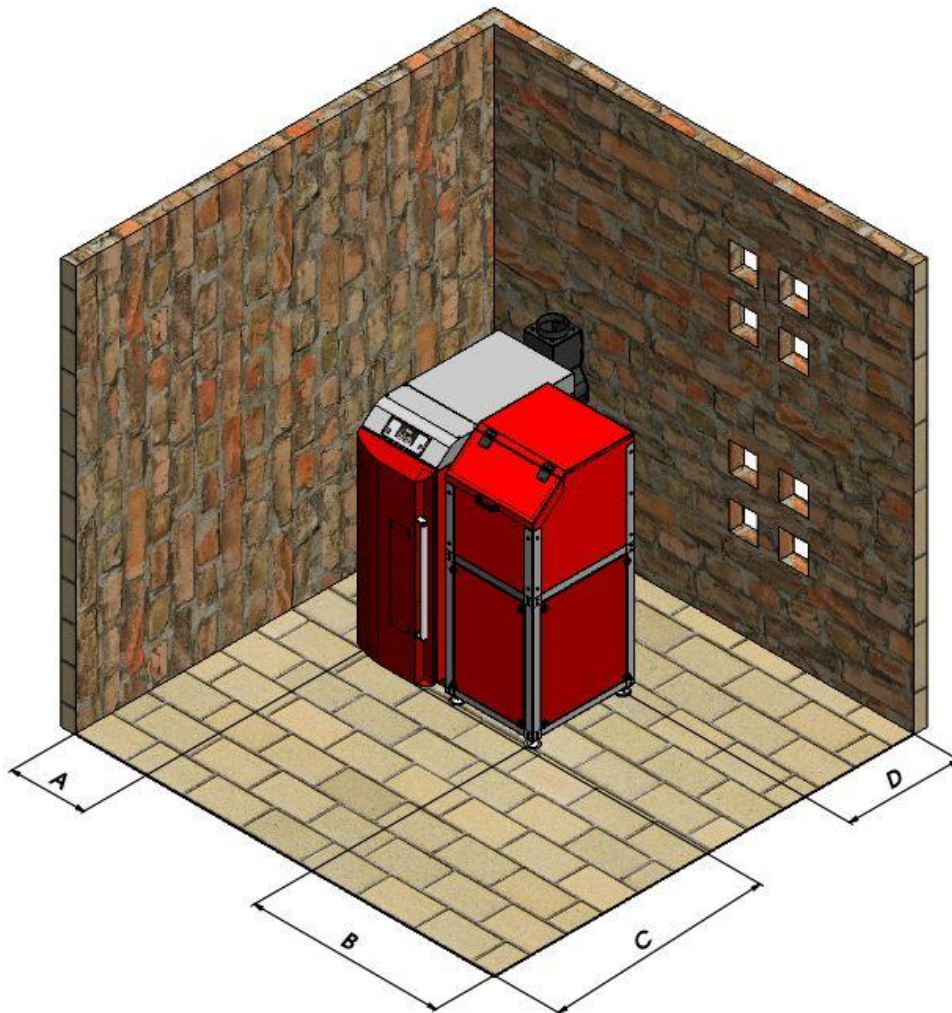


Figure 10. Positioning of boiler in the Boiler room

| Type of boiler | DIMENSIONS | | | |
|-------------------|------------|--------|--------|--------|
| | A (mm) | B (mm) | C (mm) | D (mm) |
| BIOmax23.1 | 200 | 800 | 1000 | 800 |
| BIO max 35 | 200 | 1000 | 1000 | 1000 |

Total space of this openings is minimum 150cm² fro the boilers of the power of 50kW and for the power over 50kW the space must be larger for another 2cm² per 1kW.

$$A=150\text{cm}^2+\frac{2\text{cm}^2}{\text{kW}}\times(\sum Q_n - 50\text{kW}) \quad \sum Q_n = \text{possible power of over 50kW.}$$

The lack of sufficient ventilation in the boiler room can cause more problems in the work of boiler. Main problem is the inability to achieve high output water temperature i.e. the lack of maximum power which leads to condensation in the boiler.

- Take into account the required minimum space required for access and security elements to carry out cleaning operations.
- Determine whether the degree of electrical protection is in accordance with the characteristics of the room where the boiler will be located.
- No exposure to atmospheric influences. The boiler itself is not anticipated for outdoor use and contains no anti-freeze system.
- It is forbidden to close the vents in the boiler room in which the openings are necessary for proper combustion.

3.4 Connection to the chimney

Boiler Biomax works with forced draft and is under the influence of two fans, but we also need to respect the rules for the selection of the chimney as it is a boiler with mild potpritisikom in fireplace to another fuel, such as fuel oil, for example. **For a good operation of boiler the diameter of the chimney must be at least equal to the diameter of the flue outlet of boiler i.e. for BIOMax23.1 130mm , and for BIOMax 35 160mm diameters, height from 7 to 8 feet, all depending on the coverage of the chimney by other high building constructions next to it .** Optimal placement of boiler chimneys on such rights to the exit connects the center of flue gases from the boiler and the chimney connection center is a gentle ascent (up 3%). (figure 11).

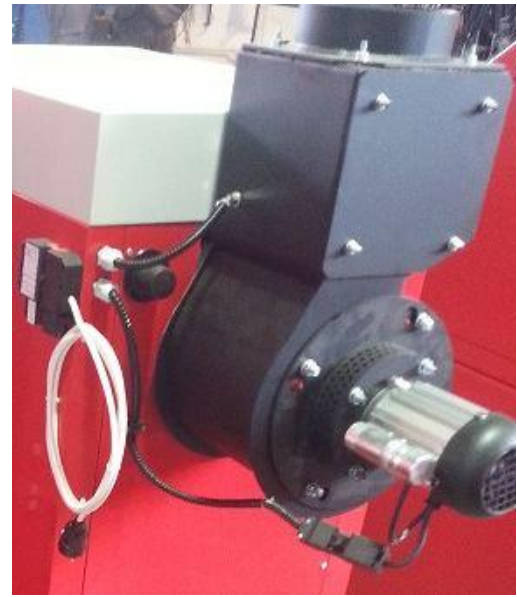
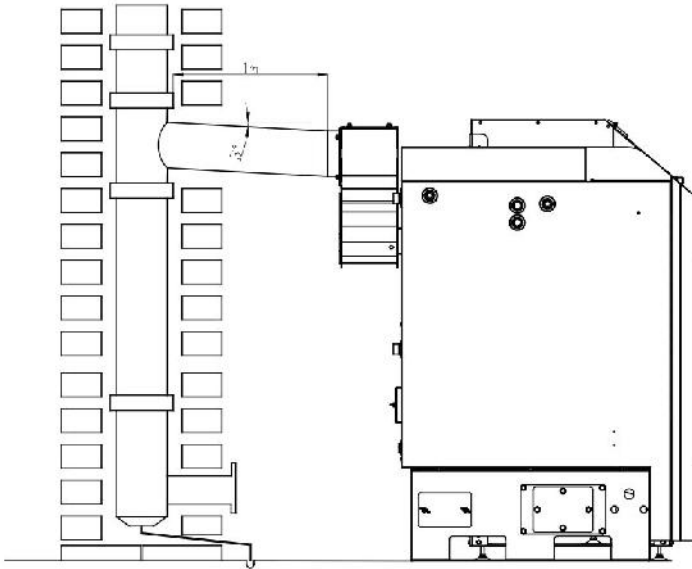
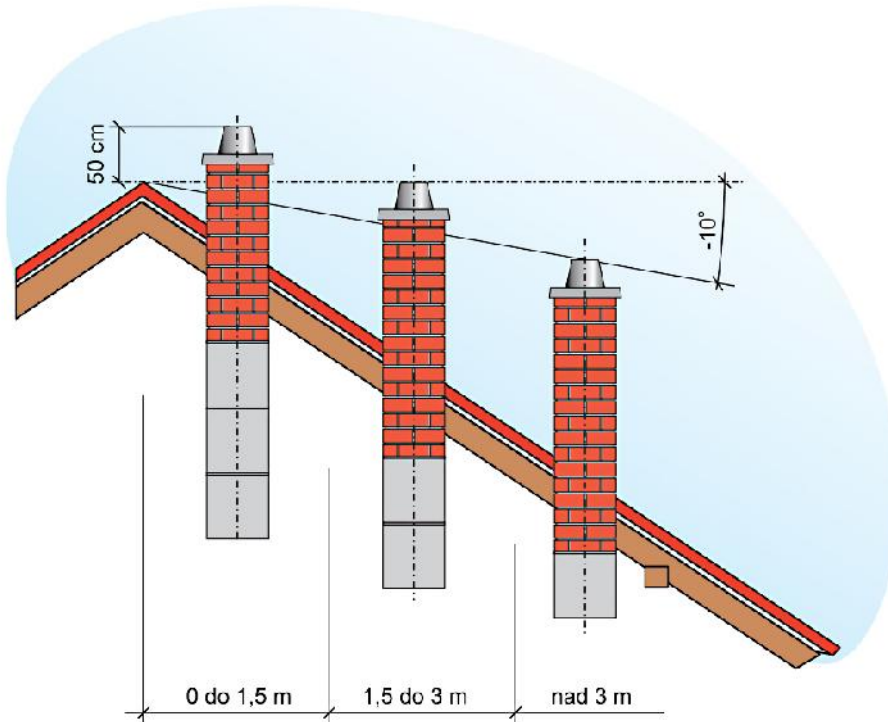


Figure 11. Preview of connection to the chimney and view position on the probe Chimneys

If possible, arcs should be avoided, but if not possible, then the maximum number of arcs is 2. The fume channel from the boiler to the chimney, should desirably be insulated, specially if it has arcs and longer sections.

On the smoke pipe, approximately 100mm from the flue outlet from boiler, a hole should be drilled and a temperature gauge should be mounted for flue gas temperature measurings. Without information about the temperature of flue gases there isn't the automatic mode of the boiler. The chimney itself should be made of ceramic pipes, and around them there should be the insulation of 3- 5cm thickness and the outer layer is of the bricks or special elements. If the chimney is not from ceramic pipes but of bricks, the light opening area of such chimney shall be 30 % higher than the surface of this ceramic pipes chimney.

The chimney must have a door for cleaning and it must be well sealed. Chimney outlet on the roof must be according to certain regulations. There are two cases: if the angle of the roof is less than 12° and if the roof angle is bigger than 12° . For angle less than 12° the height of the chimney above the roof is 1 m and for the larger than 12° , then look at the sketch.



If you think that the chimney is too strong and too much cold air passes through the boiler, at the exit of the boiler there is a valve which can reduce the flow of exhaust gases. The chimney should be cleaned regularly or at least once a year.

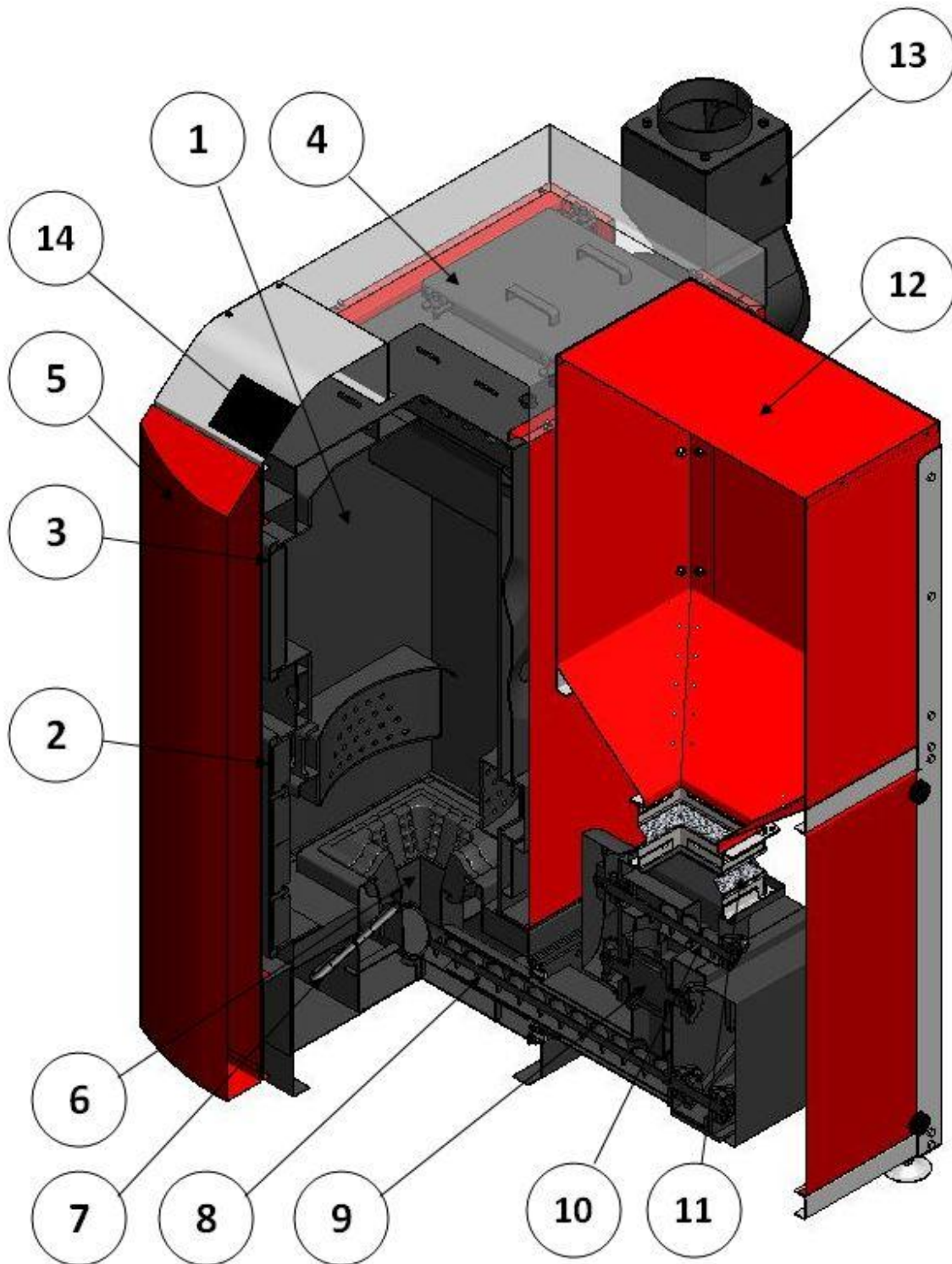


If the chimney is not of proper height, cross section, or if it is not enough clean as possible, then the complications in the work of boiler are possible. First, of all it is not possible to achieve the high temperature regime of work, i.e. there is not the maximum operation power, and the consequence of that is the occurrence of condensation which affects the life of the boiler.



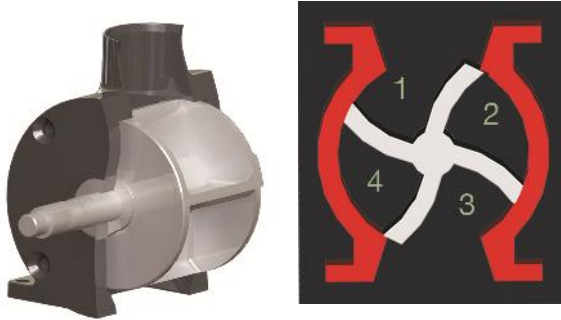
Weak/poor chimney is the main reason when during the ignition of the boiler or during the operation there is the appearance of smoke on the upper or lower door, especially at higher fan speeds.

4. Cross-section of BIOmax boiler with a description of the boiler elements



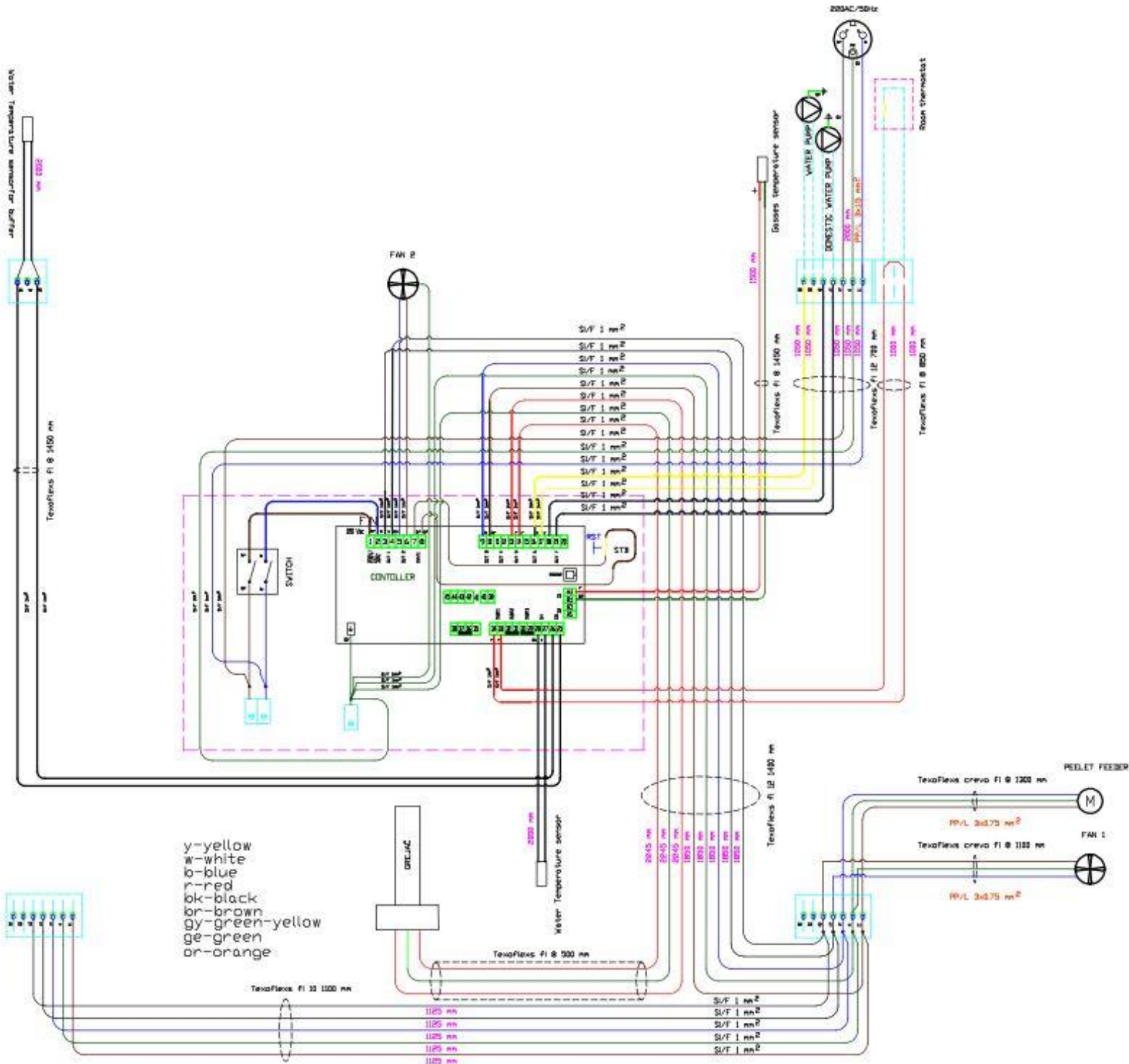
Description:

1. Body of boiler;
2. Lower door for cleaning;
3. Upper door for cleaning;
4. Cover for cleaning;
5. Door of panel;
6. Combustion (pellets);
7. Ignition;
8. Lower screw conveyor;
9. Rotation safety element;



10. Upper screw conveyor;
11. Flexible connection;
12. Silos;
13. Chimneys;
14. Automatic.

5. Schematic connection of automation



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All lines that are displayed in the intermittent form in the diagram of external connections are the conductors which should be installed by the technician when connecting the external devices onto the automation system of the boiler. All the connections of the additional devices are performed by the technician through three connectors located at the rear of the boiler. One connectors are three-pole connectors while one is seven-pole connector. One three-pole connector serves for the connection of the room thermostat as shown on the label the connector itself.

! *For the room thermostats it is important to be battery-powered on, i.e. they should not have any supply of the voltage of 220 V. On the thermostat for the connection NC is used (normally closed contact).*

Seven-pole connector is for connecting network cable and for the connection of the circulation pump and the battery pump i.e. of the heater for sanitary water.

! *The boiler can operate even if none of the pumps is connected, but manufacturer's recommendation is that, at least, the pump₁ (central heating pump) because it has the function of a security element. It is switched on when the boiler water temperature exceeds 90°C.*

The boiler is adjusted according to the default factory hydro installation as in **Figure 12**.

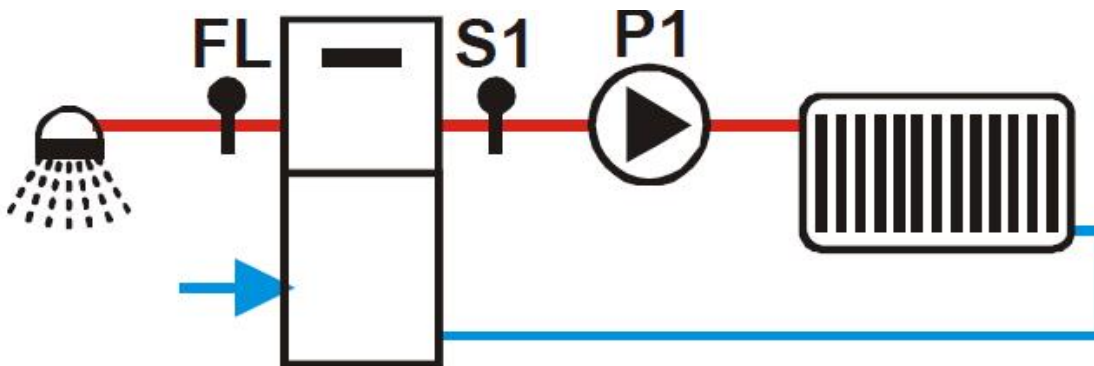



Figure 12.

It is obvious that there is only one measuring point S1 and that probe is already positioned. The second probe that is connected onto the connector on the back of the boiler, in this case, remains unused. (probe factory is not set and can be ordered directly from the manufacturer of boiler „Radijator inženjering“).

 We need not assemble the pump P2 which serves for the hot water. The parameter which determines the type of hydro installation inside the automation system is P37 and for this hydro scheme is P37 set to 5.

If we want to use automation to keep the process and the puffer warming up through the appropriate pump, then the hydraulic scheme should be as shown in **figure 13**. The point of probe measuring for water temperature in the puffer is marked with S2.

In order to run operation of automation properly for the hydraulic connection and with the, then it is necessary to adjust the parameter P37 onto the value 4.

If we want the automation to keep the process of heating the sanitary water through the appropriate pump, then the hydraulic scheme should be as in **figure 14**.

In order the automation system should keep the operation of that pump for heating the boiler with sanitary water, then it is necessary to adjust the parameter 37 onto the value 3.

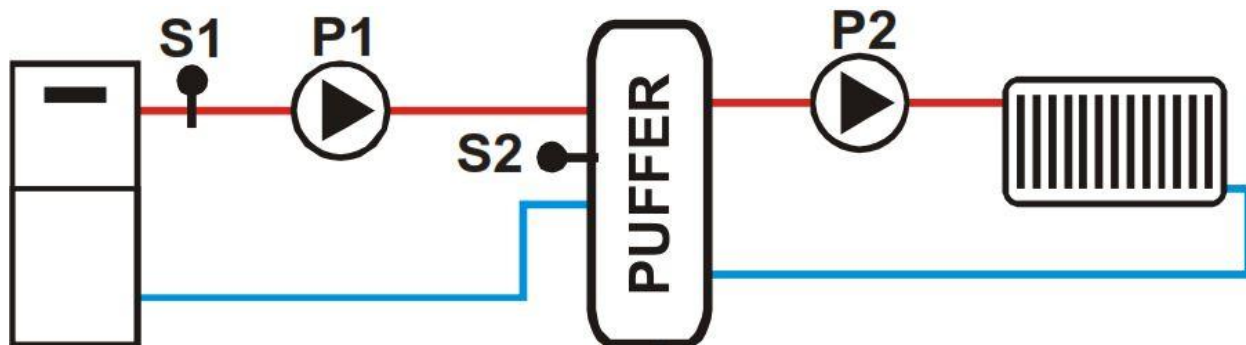


Figure 13.

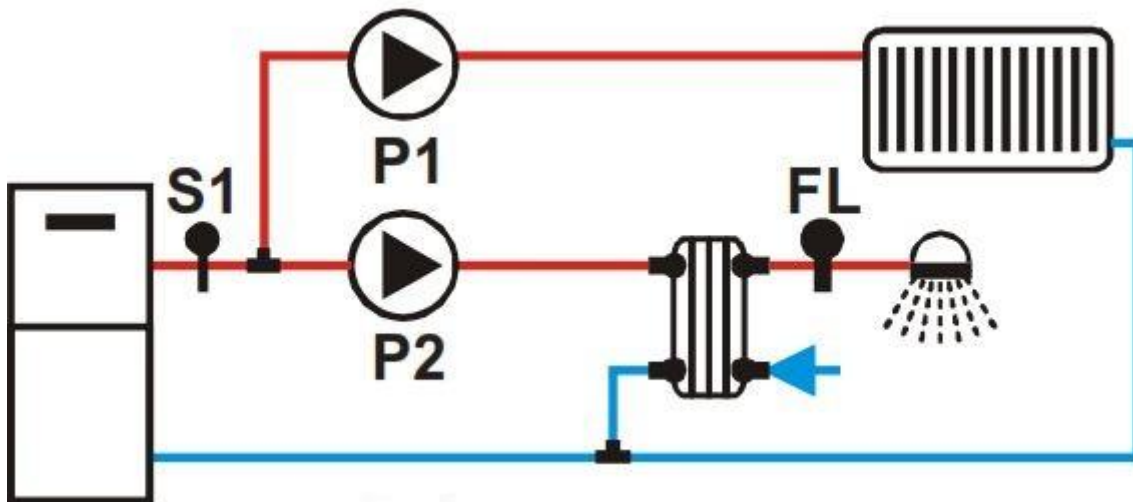
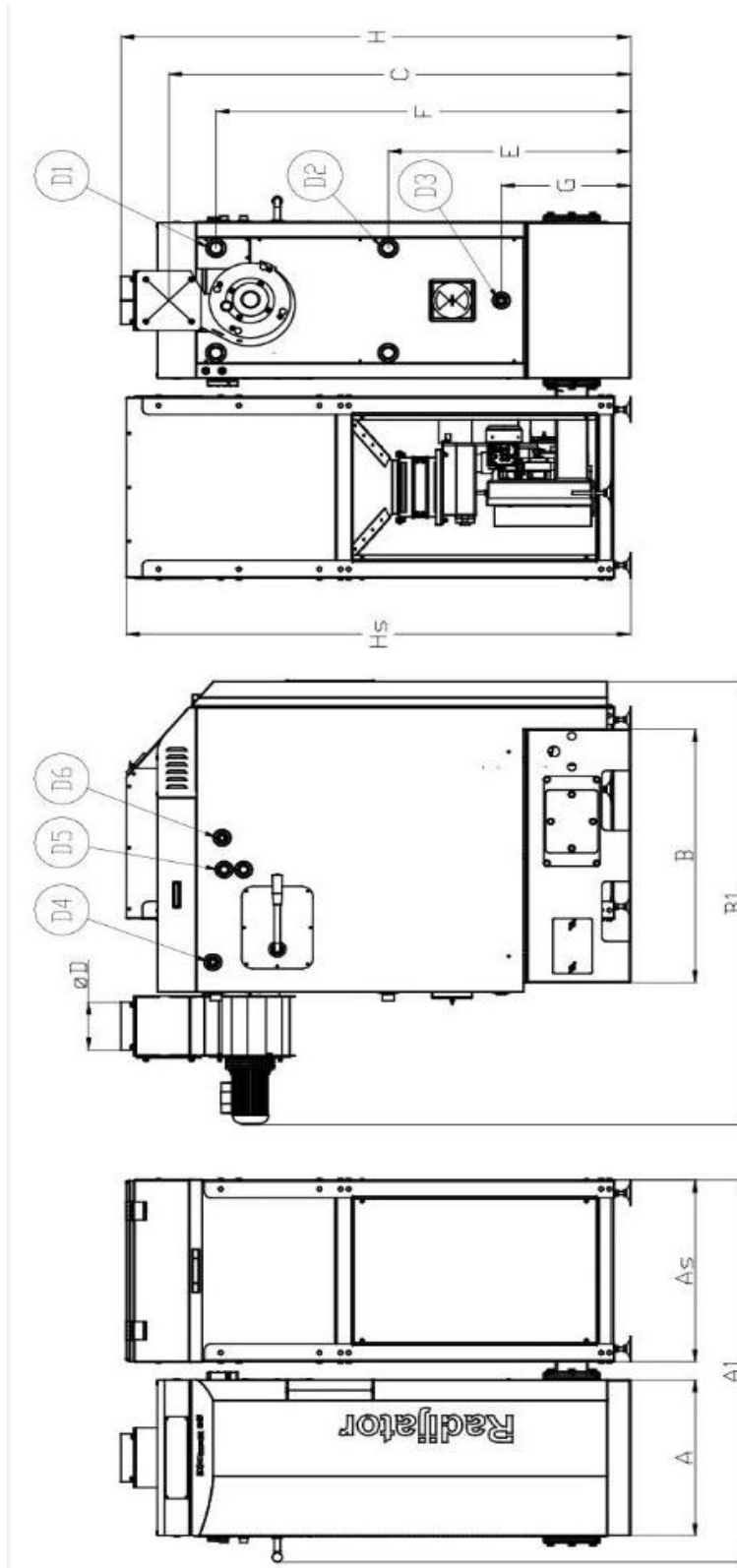


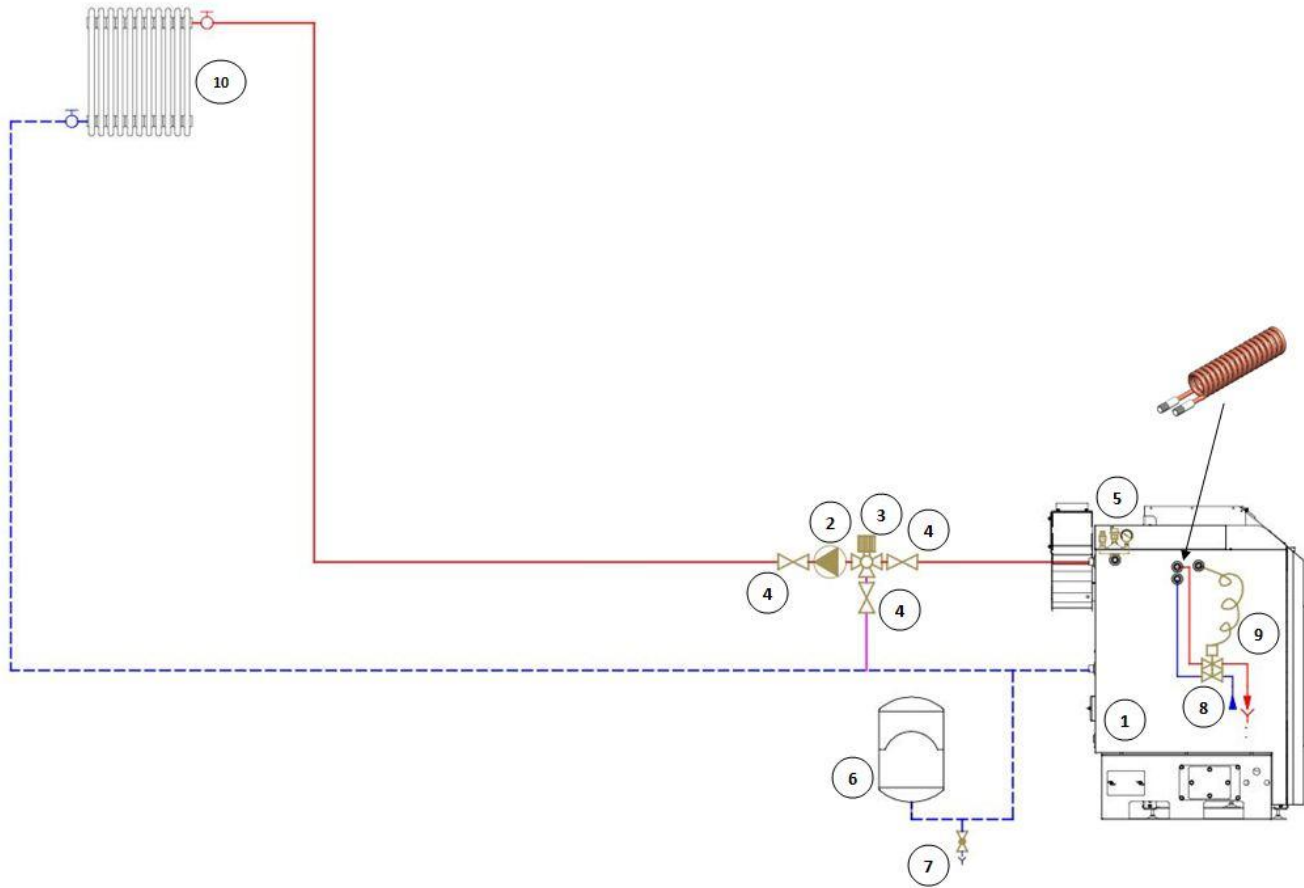
Figure 14.

6. Table of technical data

| Type of boiler | | BIOmax 23.1 | BIOmax 35 |
|--|----------------|------------------------|------------------|
| CE designation | | CE | CE |
| Class of Boiler according to EN 303-5:2012 | | 5 | 5 |
| Working Pressure | bar | 3 | 3 |
| Test Pressure | bar | 4,5 | 4,5 |
| Volume of combustion chamber | L | 50 | 80 |
| Volume of water in the boiler | L | 75 | 95 |
| Weight | kg | 523 | 630 |
| Cross section of chimney | mm | 130 | 160 |
| Necessary chimney draft | mbar/Pa | 0,18/18 | 0,18/18 |
| Boiler temperature (min / max) | °C | 60-90 | 60-90 |
| Minimum return temperature | °C | 60 | 60 |
| Efficiency degree at nominal/minimal thermal power | % | 91,56/92,03 | 92,08/91,26 |
| Nominal Power | kW | 23,83 | 30 |
| Minimum / Maximum Power of Boiler | kW | 6,83/23,83 | 9,00/30,00 |
| Carbon monoxide (CO) with a minimum thermal input (10%O2) | mg/m3 | 164 | 326 |
| Carbon monoxide (CO) at a nominal heat power (10%O2) | mg/m3 | 233 | 398 |
| Dust at nominal/minimal heat power (10%O2) | mg/Nm3 | 19,84/34,89 | 22,37/35,93 |
| Dimensions | | | |
| | A | 450 | 520 |
| | A1 | 1210 | 1280 |
| | As | 610 | 610 |
| | B | 790 | 845 |
| | B1 | 1400 | 1480 |
| | C | 1315 | 1425 |
| | ØD | 130 | 160 |
| | E | 400 | 750 |
| | F | 1170 | 1280 |
| | G | 400 | 400 |
| | H | 1460 | 1570 |
| | Hs | 1560 | 1560 |
| Connections for hot water boiler from boiler | D1 | 1" | 1" |
| Connections for cold water boiler | D2 | 1" | 1" |
| Connections for filling and emptying boiler | D3 | 1/2" | 1/2" |
| Connections for the safety valve and vent pressure | D4 | 1/2" | 1/2" |
| Connector for thermal valve insurance swelling VTO | D5 | 1/2" | 1/2" |
| Connections for probe VTO | D6 | 1/2" | 1/2" |



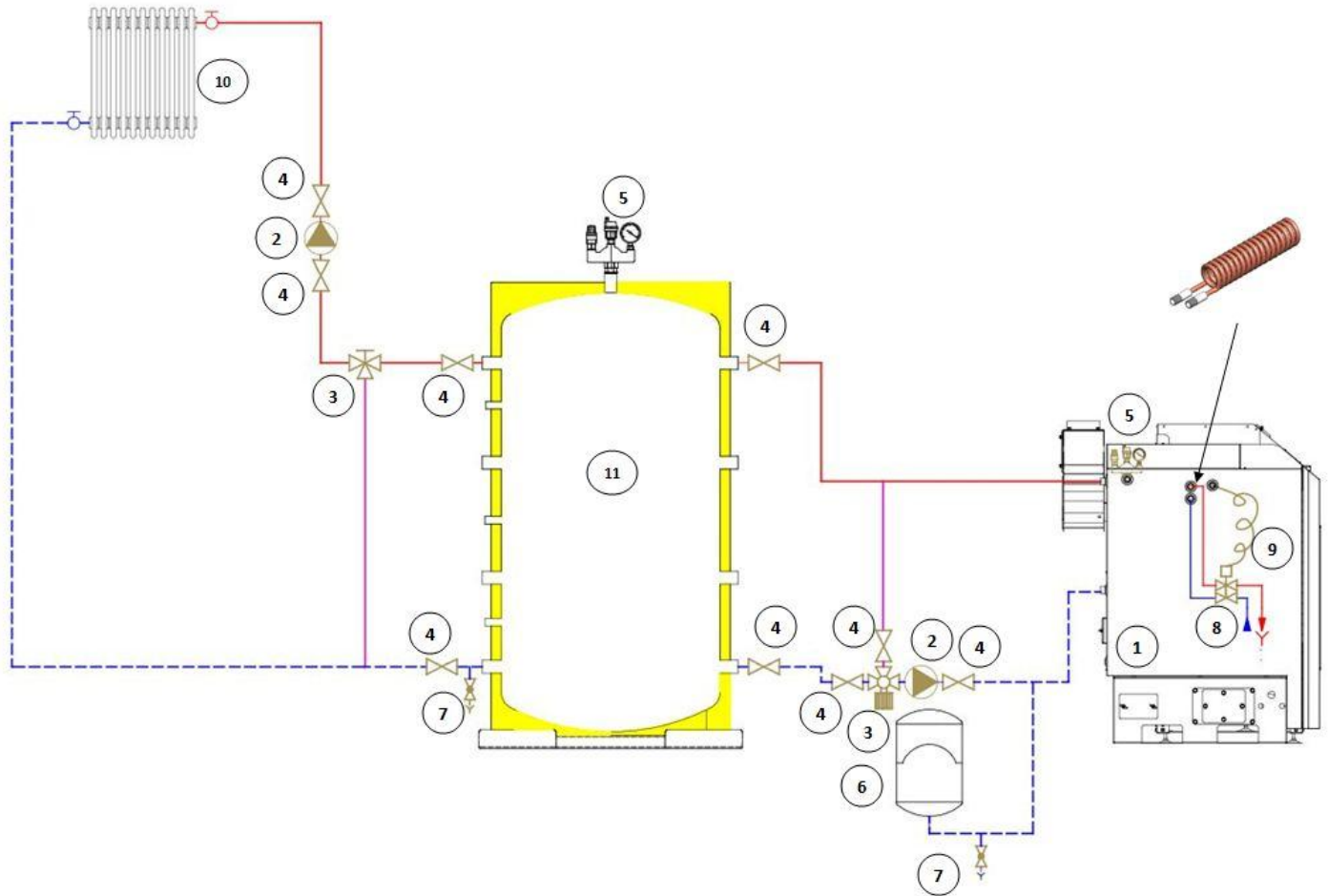
7. Hydraulic scheme



Hydraulic scheme

Description:

1. Boiler BIOmax;
2. Pump;
3. Mixing valve;
4. Valve;
5. Safety group;
6. Expansive vessel;
7. Valve for inlet/outlet cold water;
8. Over heating temperature safety valve;
9. Sonda probe fot safety valve;
10. Exchanger.




Hydraulic scheme with akumulation

Description:


1. Boiler BIOmax;
2. Pump;
3. Mixing valve;
4. Valve;
5. Safety group;
6. Expansive vessel;
7. Valve for inlet/outlet cold water;
8. Over heating temperature safety valve;
9. Sonda probe fot safety valve;
10. Exchanger;
11. Puffer (akumulation).

 **WARNING!!!**

*The most important difference between BIOmax35 and BIOmax23.1 is that the back side of BIOmax23.1 is just an outlet for the pressure line to the upper right corner (referring to the "D1"), while the return line connection with the same boiler moved to side of the boiler (refer to dimension "E *").*

 *In an assembly the boiler should be properly protected against the excessive overpressure and overheating.*

 *For the proper installation the plumber/installer is responsible.*

 *The manufacturer (Radijator inzenjering) does not take any responsibility coming from the incorrect installation of the boiler.*

8. Start of boiler operation and cleaning



First Commissioning of the boiler is performed by a Technician who has a Certificate issued by the “Radiator engineering” Co. Training of boiler users is mandatory.

In this way, the person is authorized to notify the customer service in the factory, time when the boiler started its operation in the condition of the boiler at its first firing, while a copy of the commissioning of the boiler in operation is retained. Guarantee and instruction manual are given to the customer. One copy of Guarantee is sent to the manufacturer.

If the guarantee is not filled in, it is not valid.

Only boilers that are operated only by authorized persons subject to technical conditions of complete guarantee of two years.

The following text is intended for the user of the boiler, as a kind of reminder, that if you turn off the boiler (eg for cleaning) will be able to independently run the boiler.



The parameters related to the operation of the boiler and which are available to the user on the display. Other parameters that are called hidden menu should not be changed without the approval of the technical person who has put the boiler into operation or the factory.

8.1 Control board

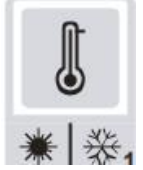

Control panel consisting of:



The main switch, safety thermostat button, the display, the group command buttons (buttons), a group of light-emitting diode pointer.

The picture below is the image of the Control Panel.



8.1.1 Buttons









| Button | Function |
|---|---|
|  | <p>K1</p> <ul style="list-style-type: none"> • With a Click enters to modify the value of the Boiler thermostat: Led L3 blinking: with buttons K2 and K3 modify the actual set value. • A long pressure enters to modify the function Winter/ Summer signalled by the led L1/L2. • In modify parameters saves the set value. |
|  | <p>K2</p> <ul style="list-style-type: none"> • With a Click enters to modify the value of the Working time of the cochlea engine: Led L7 blinking: with buttons K2 and K3 it is possible to modify the actual set value. • A long pressure activates the manual loading of the combustibile for the length of the pressure activating the cochlea engine: the display shows LoAd. The procedure is possible only with state OFF. With a safety valve the loading starts after the timer T72. |

| | |
|---|--|
| | <ul style="list-style-type: none"> In modify parameters it is possible to decrease the value and the sliding of the parameters' codes. |
|  | <p>K3</p> <ul style="list-style-type: none"> With a Click enters to modify the value of the fan speed: Led L8 blinking: With buttons K2 and K3 it is possible to modify the actual set value. A long pressure activated the fan at the maximum speed for the length of the pressure. The display shows UEnt. The procedure is possible only with state OFF. In modify parameters it is possible to increase the value and the sliding of the parameters' codes. |
|  | <p>K4</p> <ul style="list-style-type: none"> With a long pressure ignites/extinguishes the boiler: Led L5/Led L6 on. With a click enters the menu visualisation of the temperature values provided by the system. In modify parameters exits without saving. |
| <p>K2+K3</p> | <p>K2+K3</p> <p>With a long pressure of both the buttons it is possible to modify the combustion recipe. It is signalled by led L12-L14: with buttons K2 and K3 it is possible to modify the actual value Pr1/Pr2/Pr3. The maximum settable combustion recipes in the user menu is limited to the parameter P89.</p> |

NOTE:

In state **OFF** or **EXTINGUISHING**, in case of alarms, pushing the button **K2** or **K3** it is possible to end the Visualisation. If present again after the reset, they are shown again.

8.1.2 Led

| Led | Function |
|---|---|
|  | L1 On for selection modality Winter. |
|  | L2 On in modality Summer. |
| | L3 On for boiler temperature less than A03-A05 . Blinking for temperature more than the above thermostats. Off for temperature more than A03 . |
|  | L4 On if contact Crono closed. |
| START | L5 On in State Boiler On. |
| STOP | L6 On in State Boiler Off. |
|  | L7 On for Auger On. |
|  | L8 On for Combustion Fan On. |
|  | L9 On for Pump 1 On. Blinking for Pump P1 deactivated from Ambient thermostat. |
|  | L10 On for Valve/Pump P2 on. |
|  | L11 On if Contact Ambient thermostat closed. |
| Pr1 | L12 On to choose Program Pellet 1. |

| | | |
|------------|------------|---------------------------------------|
| Pr2 | L13 | On to choose Program Pellet 2. |
| Pr3 | L14 | On to choose Program Pellet 3. |

8.1.3 Display

Display\Temperature\State\Alarms: the 4 digit Display shows the water temperature in the Boiler, the name of the state and the alarms.

| Display | State | Display | State |
|------------|------------------|-------------|------------------------|
| OFF | OFF | Mod | Modulation |
| Chc | Check Up | MAAn | Standby |
| Acc | Ignition | Sic | Safety |
| Stb | Stabilisation | SPE | Extinguishing |
| rEc | Recover Ignition | ALt | Boiler OFF with alarms |

| Display | State | Display | State |
|-------------|---------------------------------|-------------|---------------------|
| tSic | Error Safety Rearmed thermostat | PELL | Lack of Combustible |
| CALd | Error Water Over temperature | | |
| AccF | Error no Ignition | | |
| SPAc | Error Accidental Extinguishing | | |
| Sond | Probes out of range | | |

NOTE:

When supplying with the Main Switch the display shows for 2 seconds the Product Code and the Firmware Version:

| Display | Description |
|---------------|------------------|
| St 14 | Code for product |
| Ur 1.0 | Firmware Version |

8.2 Operation start of boiler on biomass

- Boiler connected to Hydraulic system.
- Ensure that the probe is set to automatic flue (**figure 15.**).



Figure 15. Placing the probe

- Check whether the mechanism for transport of pellet is firmly supported onto the floor, that the flap of the fan is maximum opened and the flap guide for safety air is from 15 to 20 mm. (**Figure 16. and 17.**)



Figure 16. Position of the fan damper



Figure 17. Position of max. opening of vent. flap

- Power outlet on the back boiler connected to the main power network.
- Infuse a small amount of pellets in the silos and close it.

At this stage it is necessary to insert the pellets into the combustion chamber by means of the work of the transport mechanism for the pellet (pellet feeding system). In this way we achieve a continuously distributed pellet from the combustion chamber to the silo. The

initiation of mechanism for pellet can be achieved only at the stage when on the display it says 'OFF'. Then press the command button 2, which in its lower part has a symbol of the screw conveyor, and the mechanism starts up. As long as we are holding the button pressed the mechanism is in operation. When we release the button the mechanism stops. Loading the pellet into the chamber, by the-so-called manual command is to be performed a little lower, up to the starting position of the parts of grey cast iron, as shown in **figure18**.



Figure 18. Level display pellets

- Now that we have the pellets in the combustion chamber and when they are in the zone of the heater for initiation of fire, we can start the operation of the boiler. Start is performed by pressing and holding the command button 4 for more than 3 seconds. On the lower part of this button there is the displayed symbol for the loose material or pellets. At a time when the boiler goes on with the start of ignition, on the display there is the mark –written as Chc, for the few seconds only the fan is working. During this phase of the automatic system checks whether all devices necessary for the operation are actually connected. The next step is when the display says Acc. This is the mark for the phase Ignition. In the stage ignition, at one time, it should be expected that the system for transportation should be switched and the level of pellets in the chamber should be re-filled. It is ideal, after this re-filling, the pellet should be located up to the beginning of grey cast iron parts. The boiler is in the ignition phase until the flue gases exceed the temperature that is pre-determined by parameter F18. According to the factory settings, the temperature is 50. First the smoke appears and during the period from 7 to 10 minutes the flame is starting.
- When the flue gases exceed the limit temperature of the ignition on the display there appears the mark Stb. This means that the boiler flame is in the phase of stabilization, i.e. now the automatic system is measuring whether the flue gases have enough increase for certain time. The fan is working according to the parameter for the stabilization phase, and there is a supplement feed of the pellet in the firing chamber, also in accordance with the parameters of the screw conveyor in the stage stabilization. When this factor is satisfied the boiler goes into operating mode.

Burning time:

Maximum heat power:

| | | |
|---------------------------------------|----------|-------|
| - Burning time | (h) | 6 |
| - Amount of heat energy | (kWh) | 143 |
| - Amount of pellets consumed | (kg) | 31,82 |
| - Calorific value of pellets consumed | (kWh/kg) | 4,874 |

The minimum heating value:

| | | |
|---------------------------------------|----------|-------|
| - Burning time | (h) | 6 |
| - Amount of heat energy | (kWh) | 41 |
| - Amount of pellets consumed | (kg) | 9,32 |
| - Calorific value of pellets consumed | (kWh/kg) | 4,874 |

***NOTE : These are the values measured during certification.***

- As already noted in the above part of the text in item 2 (boiler construction) , feeders for boiler **BIOMax 23.1** and **BIOMax 35** are different, because on the feeder for **BIOMax 23.1** the Control of combustion air is additionally controlled by a valve located on it. To obtain the best possible emissions from combustion of the nominal or minimum power it is necessary to set the valves as follows:

Valve position for maximum power at work:



Where is:

Valve 1 : Open 100 %
Valve 2 : Open 100 %
Flap (on feeder) : lowered up to line mark
The primary fan : 23%
The secondary fan : 18 %
Loading the feeder : 2.5 s
Pause between loading the feeder : 8.5 s

Valve position for minimum power at the work:



Where is:

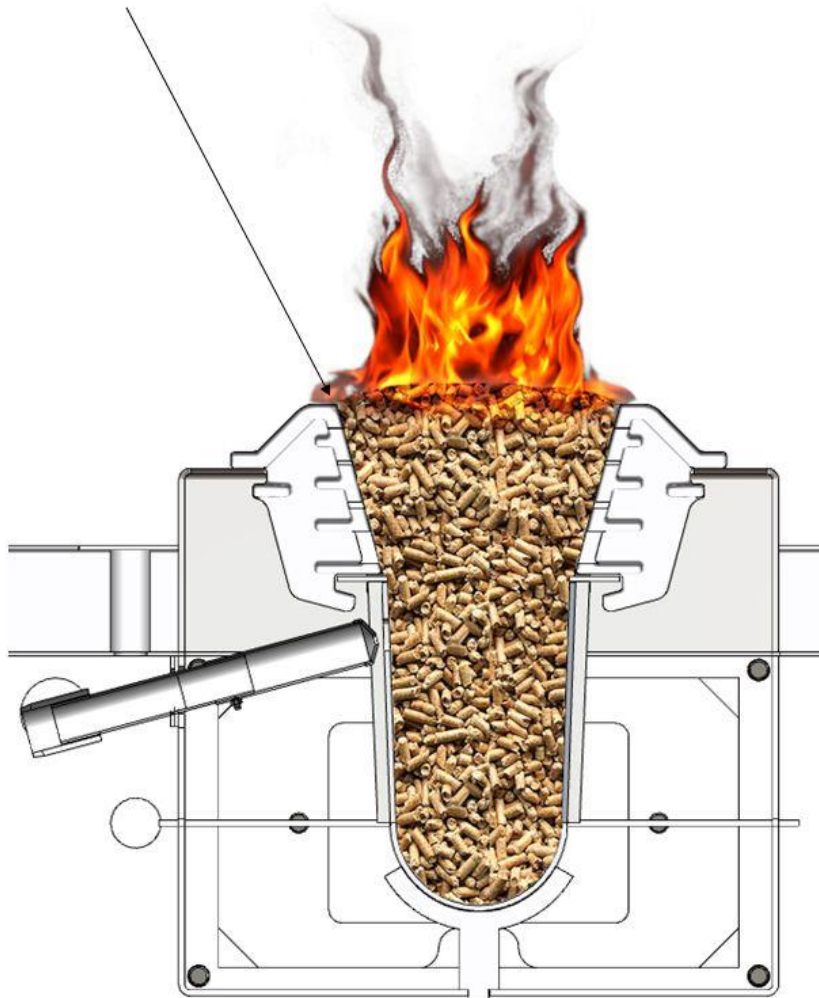
Valve 1: Open 15°
Valve 2 : Open 45°
Flap (on feeder) : lowered up to line mark
The primary fan : 17 %
The secondary fan : 18 %
Loading the feeder : 0.5 s
Pause between loading the feeder: 6,5 s

- The room thermocouple (thermostat) can be connected to automation system. In this case, it is important to adjust the room temperature, which is the main parameter for the operation of the boiler and water temperature in boiler (70 °C). When the room thermostat is activated, the boiler has the first need to reach the room temperature, under the condition that it is limited by adjusted degree of water temperature in it. There is a possibility that the boiler stops working before the adjusted temperature of the room thermostat, in this case the set temperature of the water in the boiler should be raised, Example to: 70 °C.

- The combustion of the pellets, regardless of the power at which the boiler is operating, it is necessary to adjust so that in the space at the top of the combustion chamber (**shown in the figure**). This is achieved by adjusting the dosage of pellets and by the amount of air. In the case the level of the flame begins to be lowered, it is necessary to extend the time of dosing or the reduction of the amount of air. If we want to reduce thermal power, it is necessary to reduce the amount of air. If it happens that the level of flame rises, we can reduce the time of loading or increase the amount of air. To accurately determine the parameters it is necessary to monitor the process of operation for at least an hour.

NOTE : Always, nominal or maximum power of burning wood pellets should be observed, i.e. when pellet is burned on top of the burner. In this case, the decrease of the heat power is performed by reducing the set boiler water temperature or set the temperature of the room thermostat.

Place where pellets „dancing“ during combustion




Warning: Be sure to make the analysis of the flue gases after the finish of installation of the boiler. Measure the percentage of oxygen (O₂).

8.3 Short manual for automatic control

8.3.1 Re-LOADING FIREBOX WITH PELLETS, PREPARATION OF STARTING.

- Infuse pellets in a silos.
- The main display must write **OFF**



- Push the button and keep . As long as we keep working conveyor button and the display says **LOAD PELLET**.


8.3.2 START IGNITION PELLETS, STOP WORKING ON PELET.

- Turn the main switch.



- Push the button  and keep it in that position for 4-5 seconds.





- Break of operation of pellet boiler is done by pressing the button  and keeping for 5 seconds.

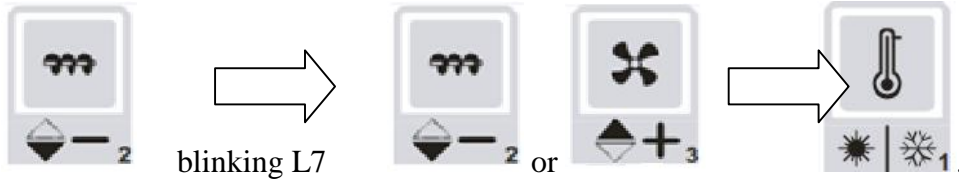
8.3.3 CHANGING FEEDING SYSTEM TIME ON OPERATING MODE.



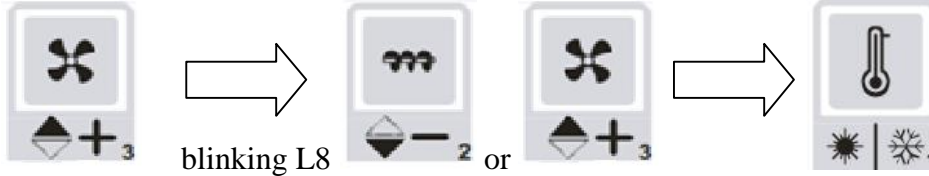
Push one short ,



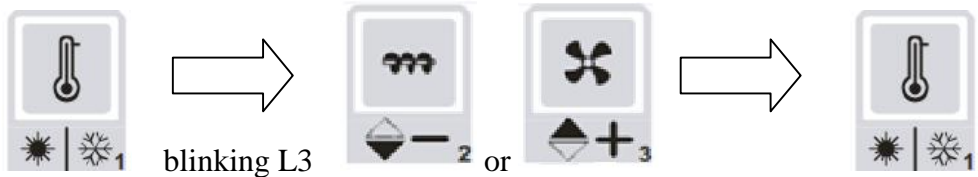
with  and  change value of feeding system.



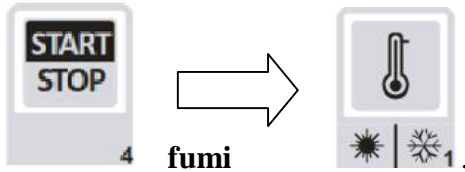
8.3.4 CHANGE IN VOLUME FAN OPERATING MODE.







8.3.5 CHANGE THE SET TEMPERATURE IN THE BOILER.



8.3.6 HOW TO READ THE TEMPERATURE OF FLUE GASES.



8.3.7 ENTRY INTO THE HIDDEN MENU.

Push   ₁ and   ₃ and keep both buttons 5 seconds. Immediately after entering in „hide“ MENI on display write **CL 00**. That is first parameter.

8.5 Mistakes during ignition and start of the boiler

All possible mistakes in the initial phase of operation, i.e. during the ignition, can be divided into three major groups:

- **Group I** . Mistakes in the ignition relating to the situation when there is not an occurrence of sparks, smoke or any flames for longer than 20 minutes from the moment you turned on the heater for ignition.
- **Group II** . Mistakes in the ignition related to the situation in the event the flame occurred, but the boiler after some time (a few minutes later) was extinguished.
- **Group III** . Boiler was successfully ignited and worked for several hours. It reached the set temperature , and for a long time there is no need to switch on either the fan or dosing system (usually this situation is during the night). Then the temperature drops or the user wants a higher temperature. (usually in the morning) and the boiler receives a signal to start the ignition phase, but the flame is out.

Group I

Possible **cause 1**.

- **CAUSE 1** – Closed fan flap for primary air. The fan is positioned on the dispenser.
- The procedure for **troubleshooting 1** – Open the fan flap at maximum.

Possible **cause 2**.

- **CAUSE 2** – The hose that connects the channel of the air from the fan to the heater is not properly set.
- The procedure for **troubleshooting 2** – Attach the air hose both onto the heater casing and the air duct

Possible **cause 3**

- **CAUSE 3** – The space between the heater and the pipe casing in which the screwed heater is clogged with tar and ashes so there is no air infiltration.
- The procedure for **troubleshooting 3** – Clean this area, first only try from the side inside the combustion chamber with the wire of the thickness 1-2 mm. If this fails switch off the boiler from the mains, now unscrew the heater and clean up the area in which it is located.

Possible **cause 4**

- **CAUSE 4** – Deep area of the combustion space where the pellets are burning is full of unburnt residues, i.e. of the slag so that there is no contact of pellets and hot air.
- The procedure for **troubleshooting 4** – Clean the deep area of the combustion chamber, first clean the rough particles of slag mechanically and the fine slag can be removed by means of vacuum cleaner.

Possible **cause 5**

- **CAUSE 5** – Pellets used are of high humidity.
- The procedure for **troubleshooting 5** – Try to use pellet that has a higher level of dryness.

Possible **cause 6**

- **CAUSE 6** – Electric supply voltage onto which the boiler is connected is much lower than 220-230V so the capacity of the heater is lower.
- The procedure for **troubleshooting 6** – Connect the AC Voltage adapter or ignite manually.

Possible **cause 7**

- **CAUSE 7** – After the manual setting and automatic addition in the ignition area the pellet level is such that the pellet is not in contact with the heater.
- The procedure for **troubleshooting 7** – Re-charge the level of pellets.

Possible **cause 8**

- **CAUSE 8** – The boiler is set from automatic to manual mode of operation. If, along the whole phase of ignition, the heater lamp is not lighted, then we are sure that the boiler is in manual mode.
- The procedure for **troubleshooting 8** – Switch the boiler into automatic ignition.

Possible **cause 9**

- **CAUSE 9** – Faulty electric heater for ignition. Switch off the boiler from the mains supply and on the the electrical heater cords measure the resistance.
- The procedure for **troubleshooting 9** – Change electric heater.

Group II

Possible **cause 1.**

- **CAUSE 1** – The flap in the boiler is closed which is operated with a handle positioned on the side. A lot of smoke appears and flue gases do not rise fast enough so the boiler is fading out.
- The procedure for **troubleshooting 1** – Open the flap, i.e. push the lever towards the chimney.

Possible **cause 2.**

- **CAUSE 2** – Fan speed in the phase of ignition. The speed of fan for primary air at this stage is determined by the parameters and Uc00 and Uc01. If the speed is drastically changed compared to the factory default adjustment it is not good nor is it significant to reduce or or to increase it. In case when the fan, in the phase of ignition, is weak, then there is no increase in temperature of flue gases, but if it is too strong it can cause the rapid consumption of pellets in the chamber, which in turn leads to a reduction in temperature of flue gases in the ignition.
- The procedure for **troubleshooting 2** – Adjust values of parameters Uc00 and Uc01 the factory default or close to the factory default values.

Possible **cause 3**

- **CAUSE 3** – Fan speed in the flame stabilization phase. The boiler enters the ignition and the smoke appears, on the display it says Stb, which means that it is in the flame stabilization phase, but after that the boiler goes out. The most frequent cause for this is too weak fan in the stabilization phase which is adjusted by means of parameter UC04.
- The procedure for **troubleshooting 3** – Increase the fan speed by means of the parameter UC04.

Possible **cause 4**

- **CAUSE 4** – Too much or too little pellets in the phase of stabilization. If there is too many or too little pellets, while on the display it says – Stb – i.e. the stabilization, this may cause the blocking of flame and restoring the boiler into the state extinguishing. The quantity of pellets in the stabilization phase is regulated by means of parameter CL04.
- The procedure for **troubleshooting 4** – Set the value of the parameter CL04 to factory default or close to factory adjustment.

Possible **cause 5**

- **CAUSE 5** – The boiler has entered the phase of stabilization but it is going into the extinction phase because there is not a sufficient increase in temperature of flue gases.

Specifically there is the stagnation, i.e. a slight decrease of temperature of flue gases which is visible when re-filling of pellets is done into the furnace.

- The procedure for **troubleshooting 5** – Raise the temperature of flue gases to enter the system of the parameter F18. This way new pellet entering the combustion chamber lowers the temperature of flue gases in a more harder way as the flame is stronger because it had more time until the re-filling of fuel. This problem most frequently occurs when the chimneys are poor in construction or the drought from any other reason is weak.

Possible **cause 6**

- **CAUSE 6** – The boiler has passed the stabilization phase but it is going into modulation, and on the display it says - Nod. If flue gases are checked, at this point, it is distinct that they are too high.
- The procedure for **troubleshooting 6** – Check whether the flap inside the boiler is in the position, „open”. Close the flap, i.e. moving the handle on the side towards the front of the boiler.

Possible **cause 7**

- **CAUSE 7** – The boiler has entered the phase of stabilization, but after a while the fire is extinguished.
- The procedure for **troubleshooting 7** – You forgot to push back the ashes tray into its compartment and to completely close the ash tray.

Group III

Introduction

When the boiler reaches the set temperature of the water in it, or the air in the room, where the room thermostat, turns into a resting phase keeping the flame or, originally said „Standby phase“. best example for this type of boiler is its operation at night.

The main objective of this phase is to maintain the flame or live coals in the firebox during several hours of standby. It is achieved through periodic turning of both the pellet conveyor and fan in certain periods of time.

- At the time when the boiler has reached the set temperature it enters the phase of flame maintenance. After a certain period of time, as determined by the parameter T04 (in minutes) the conveyor starts and fans are activated. During this period it comes to activating of the boiler until it receives the command to start due to the achieved temperature.
- The duration of the process of conveyor and fan operations is determined by the parameter t05 (in seconds).
- During the process of the start of conveyor operation, its work is determined by period as determined by the parameter CL09 (in seconds)

- During the process of maintaining the flames the fan for primary combustion is switched on with the power which is determined by the parameter Uc09.

Possible mistakes in the work related to the maintenance phase of the flame:

- Boiler operation, beside the functioning of the phase of flame maintenance, does not have enough pellets for the start and work in normal mode.
- Eliminating the cause of mistake:
 1. Reduce the parameter t04, i.e. increase the frequency of conveyor and fan work in the phase of idle work.
 2. Increase the duration of the process time, i.e. the parameter t05.
- Too much of unburnt pellet when boiler starts its work.
- Eliminating the cause of mistake:
 1. Increase the parameter t04
 2. Reduce the parameter t05
 3. Reduce the fan power for the primary combustion in the maintenance phase – the parameter Uc09.

8.5 Maintenance of boiler BIOmax

BIOmax boiler requires daily and periodic cleaning.

- Daily cleaning refers to the area of the firebox of cast iron where by continuous ash ejection provides a better electric heaters work, a better firewood burning, i.e. a bigger amount of air through air channels in the gray casting. But even during the day the ash begins to accumulate on the floor, and the space around the furnace. The average parameter of 100 kg of pellets produce 1 kg of ashes in combustion process.
- In every 3 to 7 days it is necessary to clean the space between cast iron segments. Also it is necessary to clean the deposits on the walls of the firebox. By this we provide a better transfer as one millimeter layer of tar and soot decreases the conductivity by 5%.
- Once a month you need to open the top cover for cleaning (dimensions 372mm x 285mm), remove the turbulence units, and from the whole available space of the boiler remove tar and soot. All you take off at that time is then collected through the bottom hole. Cleaning of exchanger tubes is done by moving the turbulence unit up and down (see **Figure 19**). Also, once or twice, during the heating season, it is important to clean the segments of cast iron in the furnace, which can be easily dismantled (first angular segments are removed by pulling them upwards, and then the others by swinging and pulling up) (see **Figure 19**).



While maintaining and servicing the boiler, the boiler is to be switched off the power supply.

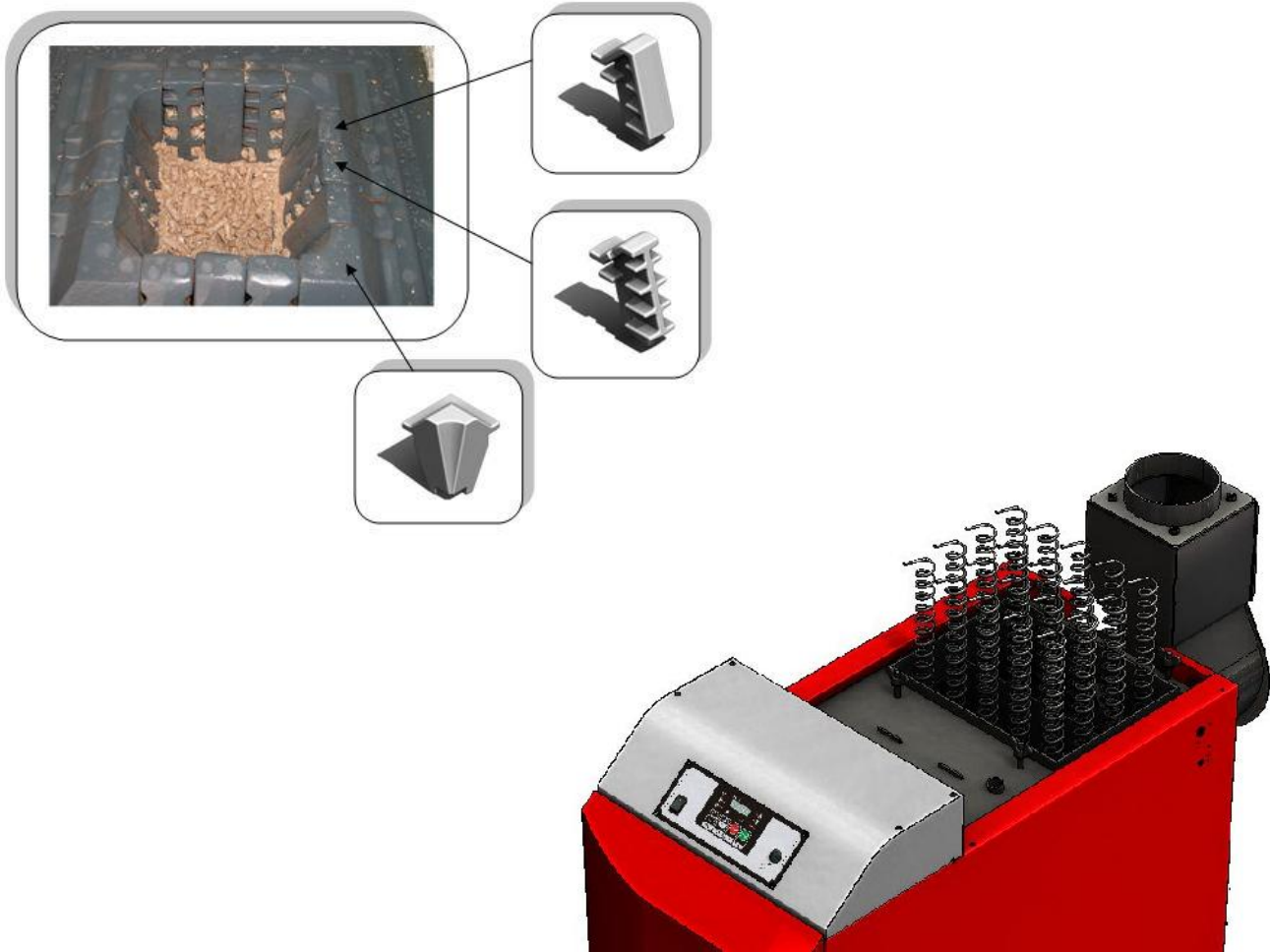


Figure 19. Showing removing of turbulence unti from the boiler BIOmax and removal of cast segments of furnace

If, during the cleaning in the boiler there appears the condensation it is necessary to collect the condensed matter and the whole boiler inside should be coated by base means for cleaning or else by means of water solution of construction lime. In this way the neutralization of acids is carried out due to condensation.

! *In this way the boiler is conserved at the end of the heating season. In this situation, close all openings of the boiler to prevent the circulation of air through the boiler as the moisture can occur in the boiler as well.*

! *Maintenance of the boiler is one of the most essential factors for the length of working life of the boiler. It is particularly important that the boiler be cleaned when out of operation season and neutralization of acids be done as already described.*

8.6 Nameplate

The nameplate is stuck on a well visible place on the boiler and includes the following (see the image in the item: STICKERS):

1. Technical data on sticker:

- Manufacturer (Radijator inženjering)
- Serial number of boiler (primer: N°:100113033)
- Year of product (primer: 2013)
- Type of boiler (BIOmax 23.1 or BIOmax 35)
- Nominal power of boiler (BIOmax23.1 – 23,83kW or BIOmax35 – 30kW)
- Heat output range (BIOmax23.1 – 6,83-23,83kW or BIOmax35 – 9-30kW)
- Necessary chimney draft (18Pa)
- Electric density (230V)
- Frequency (50Hz)
- Current (3A)
- Nominal electrical power (490W)
- Max.extended el.power (280W)
- All.el.power (690W)
- Weight boiler (BIOmax 23.1-523kg, BIOmax 35-630kg)
- Class of boiler according to EN 303-5 (5)
- Max. pressure (3 bar)
- Max. temperature (90°C)
- Quantity of water in boiler (BIOmax23.1 – 75L or BIOmax35 – 95L)
- Class fuel - pellets (C1)

2. Sticker of importer

3. OEEQ

4. Other markings on the boiler



8.6 Declaration



DECLARATION OF CONFORMITY

UNDER THE DIRECTIVE 2006/42/EC ON MACHINERY
ANNEX II, PART 1, SECTION A.

On behalf of "RADIJATOR Inženjering" d.o.o./ Živojina Lazića Solunca 6; 36000
Kraljevo; Serbia

DECLARES

Own responsibility: **Heating boiler burning pellet production series BIOmax with nominal thermal output: BIOmax 23.1-23kW and BIOmax 35-30kW**

meet the requirements of: **DIRECTIVE 2006/42/EC ON MACHINERY (EFFECTIVE 29/06/2006),**

and the requirements of the following directives and regulations:

1. **Directive 2004/108/EC** of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility (Text with EEA relevance) and repealing **Directive 89/336/EEC**;
2. **Directive 2006/95/EC** of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (codified version) (Text with EEA relevance) and repealed **Directive 73/23/EEC**.

The machine complies with the following EN introduced harmonized standards:
EN 303-5:2012,

and the following EN and technical requirements: **EN 60730-1.**

TYPICAL BOILER TEST TÜV Rheinland/ Paluska Gyula/ H/B1 12 1037.

Location: Kraljevo
Date: 2014-02-07

Signature: 
Miroslav Jamić, general manager /

8.7 Sticker

On the boiler BIOmax there are stickers identifying the connections as well as labels against the risk of electric shock, stickers for scheme of connections etc.

Labels that indicate connection to the installation:

1. Sticker (Hot water) 32mm x 74mm



2. Sticker (Cold water) 32mm x 74mm



3. Sticker (Safety group) 32mm x 74mm



4. Sticker (Cold water inlet/outlet) 32mm x 74mm



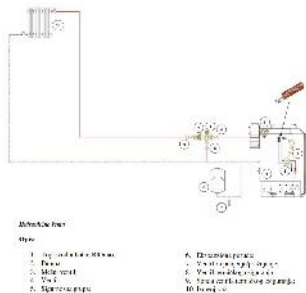
5. Sticker (inlet/outlet of thermal safety relief valve) 32mm x 74mm



6. Sticker (Probe of temperature safety relief valve) 32mm x 74mm



8. Sticker (Hydraulic scheme) 152mm x 210mm



Labels that indicate the presence of electricity high voltage and danger:

1. Sticker (Hazardous voltage) 60mm x 80mm



2. Nalepnica (Input with low voltage 12V) 60mm x 80mm



3. Nalepnica (Hazardous voltage - BIGGER) 100mm x 150mm



4. Sticker (Safety electrical connection) 20mm x 30mm



5. Sticker (Presence of voltage)



Labels that indicate warning:

1. Sticker (Exposed moving parts can cause severe injury) 30mm x 80mm



2. Sticker (Only an approved installer is authorized to start boiler)
65mm x 247mm



3. Sticker (Warning)



5. Sticker (Waste)

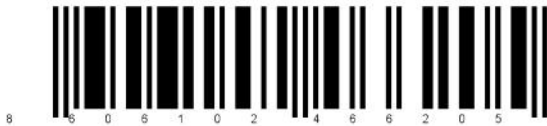


Labels with technical data:



Življina Lazića Solunca br.6
Grđica-36000 Kraljevo
Srbija

N° 100315052
BIOMax 23.1



Življina Lazića Solunca br.6
Grđica-36000 Kraljevo
Srbija

N° 100515035
BIOMax 35



Življina Lazića Solunca br.6
Grđica-36000 Kraljevo
Srbija
e-mail: radijator@radijator.rs
www.radijator.rs

| | |
|---------------|------------|
| Pressure max | Temp. max |
| Max. pritisak | Max. temp. |
| 3 bar/300kPa | 90°C |

N°: 100315052
Godina/Year: 2015

| | |
|--|-----------------------|
| PROIZVOĐAČ MANUFACTURER | Radijator Inženjering |
| TIP - MODEL TYPE - MODEL | BIOMax 23.1 |
| NAZIVNA TOPLOTNA SNAGA KOTLA NOMINAL HEAT OUTPUT POWER | 23.83 kW |
| PODRUČJE UPOTREBE TOPLOTNE SNAGE HEAT OUTPUT RANGE | 6.83 - 23.83 kW |
| POTREBNA PROMAJA DIMNIJAKA REQUIREMENT AIR FLUE | 20 Pa |
| ELEKTRIČNI NAPON VOLTAGE | 230 V |
| FREKVENCIJA FREQUENCY | 50 Hz |
| JACINA STRUJE CURRENT | 3 A |
| NAZIVNA EL. SNAGA NOMINAL ELECTRICAL POWER | 490 W |
| MAX. DODATNA EL. SNAGA MAX. EXTENDED EL. POWER | 200 W |
| UKUPNA EL. SNAGA ALL EL. POWER | 690 W |
| MASA KOTLA MASS OF BOILER | 526 Kg |
| ZAPREMINA VODE U KOTLU VOLUME OF WATER IN THE BOILER | 75 L |
| KLASA KOTLA PO EN 303-5:2012 CLASS OF BOILER ACCORDING TO EN 303-5:2012 | 5 |
| GORIVO FUEL | C1 |



Življina Lazića Solunca br.6
Grđica-36000 Kraljevo
Srbija
e-mail: radijator@radijator.rs
www.radijator.rs

| | |
|---------------|------------|
| Pressure max | Temp. max |
| Max. pritisak | Max. temp. |
| 3 bar/300kPa | 90°C |

N°: 100515035
Godina/Year: 2015

| | |
|--|-----------------------|
| PROIZVOĐAČ MANUFACTURER | Radijator Inženjering |
| TIP - MODEL TYPE - MODEL | BIOMax 35 |
| NAZIVNA TOPLOTNA SNAGA KOTLA NOMINAL HEAT OUTPUT POWER | 30 kW |
| PODRUČJE UPOTREBE TOPLOTNE SNAGE HEAT OUTPUT RANGE | 9-30 kW |
| POTREBNA PROMAJA DIMNIJAKA REQUIREMENT AIR FLUE | 20 Pa |
| ELEKTRIČNI NAPON VOLTAGE | 230 V |
| FREKVENCIJA FREQUENCY | 50 Hz |
| JACINA STRUJE CURRENT | 3 A |
| NAZIVNA EL. SNAGA NOMINAL ELECTRICAL POWER | 490 W |
| MAX. DODATNA EL. SNAGA MAX. EXTENDED EL. POWER | 200 W |
| UKUPNA EL. SNAGA ALL EL. POWER | 690 W |
| MASA KOTLA MASS OF BOILER | 630 Kg |
| ZAPREMINA VODE U KOTLU VOLUME OF WATER IN THE BOILER | 95 L |
| KLASA KOTLA PO EN 303-5:2012 CLASS OF BOILER ACCORDING TO EN 303-5:2012 | 5 |
| GORIVO FUEL | C1 |

8.8 Manufactured



RADIJATOR D.O.O.
Živojina Lazi a Solunca br.6
36000 Kraljevo, Srbija

9. Warranty

1. Co.”Radiator Engineering” covers different warranty periods for different parts (as specified further on) only if the following conditions of guarantee are fulfilled:

- 1.1. The boiler must be connected to the aforementioned hydraulic schemes of technical instruction , especially pay attention to the safety valves, thermal fuse swelling, mixing valve for protection of the cold portion of boiler or against condensation, the range of work pressure of boiler,r operating temperature of the boiler, the conditions in the boiler room, etc.(see item 7)
- 1.2. The boiler must be connected to the chimney of prescribed cross-section, characteristics of insulation and height. (see item 3.4)
- 1.3. Flue gas outlet from boiler to the chimney must be constructed according to the technical instructions.
- 1.4. The said electrical connections must be done on the boiler according to the technical instructions, particularly this refers to the characteristics of the room thermostat, the characteristics of the power supply, which must be within certain limits.
- 1.5. The user must follow the following instructions on how to use and maintain the boiler. (see item 8)

2. Warranty statement

We herewith declare:

- the product has the prescribed and declared quality properties . We are committed, we will, on the request of the buyer, if he timely submits the Request for the repair within the warranty period, do at any expense all repairs, so that the product will operate in accordance with the declared properties,
- that the product is will operate flawlessly within the warranty period if the instructions for the use, installation and operation are respected,
- that in the warranty period will be ready to remove all product failures and keep in stock all the necessary spare parts,
- **warranty period starts from the DATED OF PURCHASE AND LASTS FOR 60 or 72 MONTHS, from the date of manufacture (the date of manufacture is located on the label on the back of the boiler),**
- **60 MONTHS WARRANTY VALID ONLY IF THE BOILER service regularly by the central service “RADIJATOR INŽINJERING”, within the period specified for the same (in text below),**
- **warranty is valid if the warranty card is stamped by the Seller, with the registered date of purchase and the attached Sale Invoice/Bill. IT IS ALSO IMPORTANT TO HAVE THE ORDER FOR COMMISSIONING (certified by the Service).**

3. The Guarantee period of one year applies to the following parts:

- all bearings of the series UCFL,
- electric heaters firing,
- bearings of the cellular security conveyor (valvole).

4. Warranty period of two years applies to the following parts:

- motor gearbox,
- chains fortorque transmission 083,
- lower worm spiral,
- primary air fan,
- secondary air fan,
- boiler automation system with safety thermostat,
- probes for flue gases,
- the probe for temperature of boiler water,
- segments for combustion of cast iron,
- electrical connectors,
- insulating materials on doors and openings for cleaning,
- parts of cellular security conveyor (valvole) which are made of gray and ductile iron castings.

5. Warranty period does not apply:

- if after each heating season the regular servicing is not performed,
- the replacement of parts in the regular annual maintenance in accordance with the instructions,
- when failures are made by the purchaser due to improper handling of the product,
- with mechanical failures made during transport and during use (solid objects),
- if the product is installed improperly, contrary to the regulations in force in that area,
- if it is determined that the hydraulic scheme is not done according to the recommendations of the "Radijator inženjering",
- if the customer was using the product over the declared properties in normal circumstances.

6. Warranty period expires:

- if it is determined that the defects were removed by the unauthorized persons or unauthorized service,
- if at repair the original parts were not built in,
- when the warranty period expires.

7. When Reporting failures it is necessary to give the following information:

- name and type of product,
- the date of purchase,
- factory or workshop of the fireplace,
- A brief description of the fault, or lack of,
- full address of owner and contact telephone number, e-mail.

8. Regular annual service

Regular service is performed at the end of the heating season in the period from 15.4. to 31.8 and charged by the established price list of the Co. " Radiator Engineering". Service procedure by the technical persons performing regular annual service, which are authorized by the manufacturer for this, including the following operations:



NOTE: The Service Provider is in obligation to inspect all of the following parts (from the list) feeder and exchanger, and if it comes to replacing of any parts of the same, the user receives the above-mentioned warranty and guarantee for another 12 months placed on the body of the boiler (exchanger). The warranty can be extended up to 5 years from the date of commissioning. Service and extension of service can be performed by a person sent by the Central Service of the Co. "Radiator engineering ". For not changed parts, after the servicing work, the service guarantee is not valid.

- dismantling silos pellet from pellet conveyor;
- dismantling of pellet conveyor from the boiler;
- disassembly of both chains;
- removal of the segments for the combustion from the furnace and furnace space cleaning beneath segments. Checking of the state of segments and their mutual gap;
- cleaning the space of the tube in furnace in which the lower worm spiral is rotating;
- Lubricating of all bearings, top and bottom screw shaft and checking of their proper operational state. Bearing must not have difficulty in turning or cracks in the in the housing. Contrarily the bearing is replaced. If it is determined that the damage to the bearing is due to intrusion of solid objects into the pellet carrier (due to user's mistake or the manufacturer of pellet mistake), Co. "Radiator Engineering" shall charge value of the bearing. If the damage to the bearing is due to the withdrawal of the flame into the pellet transporter itself for reasons of poorly set parameters when using the boiler, Co. "Radiator Engineering" shall charge the value of the bearing.

- removing the chains on both sides of the shaft of the cellular security conveyor (valvoles) and inspection of the proper condition of the bearings 6004 in the valvoles. If rotating of the bearings is difficult, replace the bearings on both sides. If the damage of the bearings of valvoles is due to intrusion of solid body that is not from the boiler (due to user's mistake or manufacturer's of pellets mistake) Co. "Radijator engineering" shall charge the value of the bearings ;
- check the sharpness of the edges of the rotor;
- remove the probe of the flue gas and clean the layers of sediment;
- check both fans;
- check the sealing of the upper and lower doors;
- check the maintenance of the boiler heat exchanger.

GARANTNI LIST / GUARANTEE LIST

Tip kotla / Boiler type

Fabrički broj / Factory No.

Garantni rok / Guarantee period

60 MESECI / 60 MONTHS

**Datum proizvodnje /
Date of manufacture**

**Potpis ovlašćenog lica /
Signature of Authorized person**

pečat / stamp

Prodato u firmi / Company of Sale

Datum prodaje / Date of Sale

Potpis / Signature

pečat / stamp