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Prüfbericht
über die Erstprüfung des Heizkessels „PKO 25B“
der Firma SELTRON d.o.o.

Auftrags-Nr.	**PL-21080-P**
Sachbearbeiter	**S. Diem**
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INSTITUT FÜR VERFAHRENSTECHNIK, UMWELTTECHNIK UND TECHNISCHE BIOWISSENSCHAFTEN
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1. Auftraggeber

Firma
SELTRON d.o.o.
TRŽAŠKA cesta 85A
2000 MARIBOR
Slowenien

2. Auftragserteilung

Vom Auftraggeber wurde am 17.05.2021 die Durchführung einer Erstprüfung entsprechend den Anforderungen der EN 303-5, sowie der Vereinbarung gemäß Art. 15a B-VG über das „Inverkehrbringen von Kleinfeuerungen und die Überprüfung von Feuerungsanlagen und Blockheizkraftwerken“ für den Heizkessel

„PKO 25B”

beantragt.

3. Eingereichte Prüfobjekte und Unterlagen

Von der Firma SELTRON d.o.o. wurde am 09.11.2021 ein Heizkessel (Serienprodukt) für die Verfeuerung von Holzpellets mit der Bezeichnung

„PKO 25B“

eingereicht.

Weiters wurden vom Auftraggeber für die Prüfung folgende Unterlagen beigestellt:

- Aufstellungs- und Bedienungsanleitung
- Beschreibung des Typenschildes
- Technische Zeichnungen
- Sicherheits- und Gefahrenanalyse

4. Prüfumfang

Heiztechnische Prüfung zur Beurteilung der Einhaltung der Anforderungen der EN 303-5, sowie der Anforderungen der Vereinbarung gemäß Art. 15a B-VG über das „Inverkehrbringen von Kleinfeuerungen und die Überprüfung von Feuerungsanlagen und Blockheizkraftwerken“.

5. Prüfgrundlagen / Anwendungsbereich

Für die Erstprüfung diente als Grundlage:

EN 303-5: 2012 Heizkessel für feste Brennstoffe, manuell und automatisch beschickte Feuerungen, Nennwärmeleistung bis 500 kW-Begriffe, Anforderungen, Prüfungen und Kennzeichnung.

Diese Norm gilt für Heizkessel und deren Sicherheitseinrichtungen bis zu einer Nennwärmeleistung von 500 kW, die ausschließlich für die Verfeuerung von festen Brennstoffen vorgesehen sind und nach den Festlegungen des Kesselherstellers betrieben werden.

Diese Norm behandelt signifikante Gefahren, gefährliche Situationen und Ereignisse, die für Heizkessel im bestimmungsmäßigen Betrieb relevant sind und vom Hersteller vorhersehbar sind.

Die Heizkessel können mit Naturzug oder mit Gebläse betrieben werden. Die Beschickung kann von Hand oder automatisch erfolgen.

Verordnung (EU) 2015/1189 der Kommission vom 28.04.2015 zur Durchführung der Richtline 2009/125/EG des Europäischen Parlaments und des Rates im Hinblick auf die Festlegung von Anforderungen an die umweltgerechte Gestaltung von Festbrennstoffkesseln.

Delegierte Verordnung (EU) 2015/1187 der Kommission vom 27.04.2015 zur Ergänzung der Richtline 2010/30/EU des Europäischen Parlaments und des Rates im Hinblick auf die Energieverbrauchskennzeichnung von Festbrennstoffkesseln und Verbundanlagen aus einem Festbrennstoffkessel, Zusatzheizgeräten, Temperaturreglern und Solareinrichtungen.

6. Beschreibung des Produktes (Prüfobjekt)

6.1. Aufbau und Funktion

Der Heizkessel „PKO 25B“ der Firma SELTRON d.o.o. ist ein Zentralheizungskessel für Holzpellets mit bevorzugtem Aufstellungsort in einem Heizraum mit einer Leistung von 30 kW. Er besteht aus einer Brennstoffförderereinrichtung, Brennkammer, Kessel mit Wärmetauscher und Mikroprozessorregelung.

6.2. Brennstoffzufuhr

Der Brennstoff wird aus einem integrierten Vorratsbehälter und einer steigend laufenden Förderschnecke in den Brennraum gefördert. Die Fördereinrichtung übernimmt auch die Brennstoffdosierung.

6.3. Brennereinheit, Verbrennungsluftzufuhr

Der Heizkessel „PKO 25B“ der Firma SELTRON d.o.o.ist ein einfacher mit Hand zu befüllender Zentralheizungskessel mit bevorzugtem Aufstellungsort in einem Heizraum. Das Gerät hat linker Hand den Kesselcorpus mit Brennkammer, Aschebereich und Wärmetauscher, rechter Hand ist der Pelletsbehälter mit der Fördertechnik positioniert.

Der Kesselkorpus ist durch drei Türen in verschiedenen Bereichen zugänglich, einerseits in den Ascheraum, in dem auch der durch einen Fallschacht brennstoffversorgte Brenner befindet. Die mittlere Türe führt zum Brennraum, die obere Türe zum zweizügigen liegenden Rohrbündelwärmetauscher, bei dem ein Rohr größeren Durchmessers die Abgase nach vorne führt. Die Abgase wenden an der Türe und werden durch 7 Rohre mit kleinerem Durchmesser nach hinten zum Abgassammelkasten geführt und von diesem durch ein Saugzuggebläse in den Kamin gefördert. In den Rohren mit kleinerem Durchmesser sind Turbulatoren eingesetzt, die den Wärmeübergang an das Kesselwasser intensivieren.

Der Wärmetauscher ist als liegender, gerollter, fassähnlicher Behälter ausgeformt und braucht daher keine Kesselversteifungen.

Der Topfbrenner ist mit einer zu Reinigungszwecken herausnehmbaren Brennerschale versehen, in den durch ein Zuluftrohr sowohl die Primär- als auch Sekundärluft zugeführt werden. Über die Löcher am Brennerschalenboden strömt die Primärluft ein, die Sekundärluft über Lochreihen am Brennerinnenmantel. Die Zündung erfolgt über ein Zündelement, das in einem Rohr zum Brennerschalenboden angebracht ist.

Die Brennstoffversorgung erfolgt über einen händisch zu befüllenden Pelletsbehälter, der in zwei Baugrößen angeboten wird. Die Pellets werden über eine Steigschnecke zu einem Fallrohr geführt und rutschen mittels Schwerkraft in den zuvor beschriebenen Pelletsbrenner. Der Antrieb der Schnecke wird durch einen Spaltpolmotor mit Flachgetriebe sichergestellt.

Die Kesselverkleidung ist mit Steinwolle gedämmt.

Die Verbrennungsregelung wird anhand eines Flammtemperaturfühlers geführt, die Leistung und die Sicherheitserfordernisse durch den Kesselfühler. Die Kesselregelung besteht aus einer Hauptplatine, auf der der Controller positioniert ist und auf der sämtliche Ein- und Ausgänge verarbeitet werden. Die Bedienung erfolgt über ein Bedienbord in Klartextanzeige. In einer Tauchhülse am Kesseldach sind der Kesseltemperaturfühler und das Sensorelement für den Sicherheitstemperaturbegrenzer (STB) untergebracht. Der Kessel ist außen mit einer Wärmedämmung versehen und mit einer Blechverkleidung umhaust.

6.4. Sicherheitseinrichtungen

Der Heizkessel „PKO 25B“ ist mit folgenden Sicherheitseinrichtungen ausgestattet:

- Lambda Sonde zur Überwachung des Restsauerstoffs
- Sicherheitstemperaturbegrenzer (STB)

6.5. Technische Daten des am Prüfstand geprüften Heizkessels

Gerätebezeichnung		PKO 25B			
Seriennummer		2007410			
Foto des am Prüfstand geprüften Gerätes					
Leistungsdaten[1]					
Brennstoff		Holzpellets ENplus-A1			
Nennwärmeleistung	kW	30			
Teillast	kW	10			
Max. Kesselbetriebsdruck	bar	3			
Wasserinhalt	l	85			
Max. Betriebstemperatur	°C	90			
Netzanschluss	V/Hz	230/50			
Elektr. Leistungsaufnahme	W	Standby	3	Volllast	350
Abmessungen[1]					
Gewicht	kg	284			
Höhe	mm	1270			
Standfläche mit Pelletbehälter	mm	915 x 1000			
Anschlüsse Vor-/Rücklauf	Zoll	1			
Anschluss Entleerung	Zoll	3/4			
Abgasrohranschluss	mm	120			

[1] Angaben des Herstellers

7. Durchführung der Prüfung

Die Prüfung erfolgte auf dem Prüfstand des Prüflabors.

Das Gerät wurde nach der Bedienungsanleitung des Herstellers betrieben.

Folgende Prüfläufe wurden durchgeführt:

- Volllastprüfung (maximale Brennstoffmenge), Dauer 6 Stunden
- Teillastprüfung (ca. 30 % der maximalen Brennstoffmenge), Dauer 6 Stunden
- Funktionsprüfung des Temperaturreglers und des Sicherheitstemperaturbegrenzers bzw. -wächters am Heizkessel

8. Prüfaufbau

Der Prüfaufbau erfüllt die Anforderungen der EN 303-5. Eine schematische Darstellung des Prüfaufbaus ist der Abbildung 1 zu entnehmen.

Das Probegas wird aus dem Abgaskanal über eine Sonde entnommen. Zunächst wird das Gas durch einen beheizten Keramikfilter vom Staub befreit. Über eine auf ca. 180 ºC beheizte Leitung gelangt das Probegas zur weiteren Gasaufbereitung. Das Probegas wird durch Abkühlung auf etwa 5 ºC vom größten Teil des Wassers befreit. Mittels einer Pumpe wird das so aufbereitete Gas den einzelnen Analysegeräten (O_2, CO_2, CO und NO) zugeführt. Der FID (C_xH_y) wird von einer separaten beheizten Leitung (180 °C) mit Filter gespeist.

Zur Bestimmung des Staubgehaltes wird ein Teilgasstrom aus dem Abgasstrom abgesaugt. Die darin enthaltenen staubförmigen Stoffe werden mit Hilfe eines Filters abgetrennt. Das Gas wird getrocknet (Trockenturm) und dann in eine Gasuhr zur Feststellung des Volumens geleitet.

Die Auswertung der heiztechnischen Prüfung erfolgt ebenfalls nach der EN 303-5.

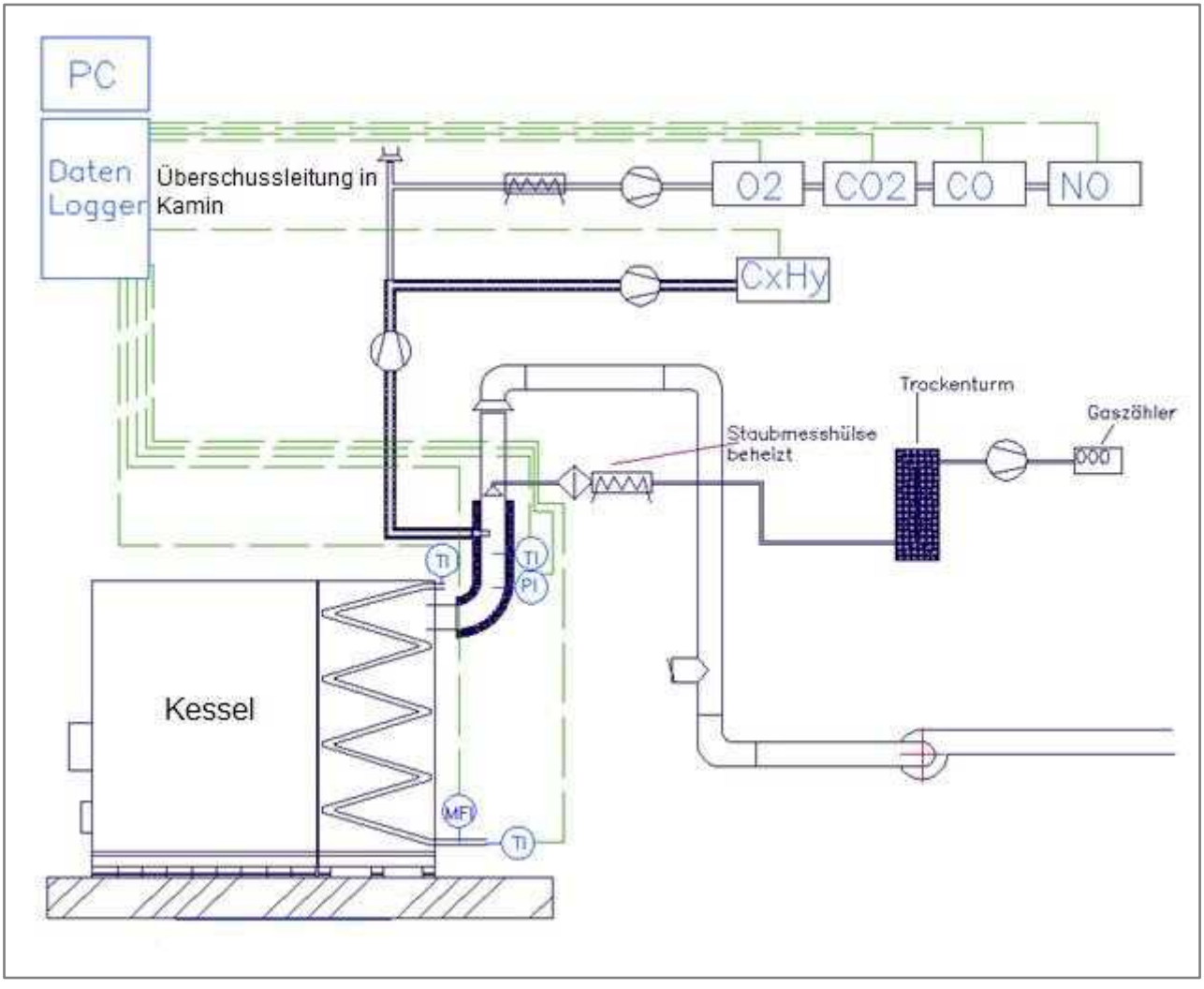

Abbildung 1: Schematische Darstellung des Prüfaufbaus

9. Messgeräte und Messverfahren

Im Folgenden werden die eingesetzten Messgeräte und Messverfahren angeführt.

9.1. Sauerstoff / Kohlenstoffdioxid / Kohlenstoffmonoxid / Stickstoffmonoxid

Messverfahren	:	EN 14 789 (O_2) AA-12 (CO_2) EN 15 058 (CO) AA-14 (NO)
Hersteller/Typ	:	Emerson Process Management AG / NGA 2000
Messprinzipien	:	Paramagnetisch (O_2) Infrarot (CO_2, CO, NO)
Messbereiche	:	0 – 25 % O_2 0 – 20 % CO_2 0 – 1500 ppm CO 0 – 250 ppm NO
Messwertausgänge	:	analog: 0 bis ±20 mA bzw. 0 bis ±10 VDC
Kalibriergase	:	Luft 12,01 % CO_2 in Stickstoff 450,5 ppm CO in Stickstoff 120,4 ppm NO in Stickstoff
Nullgas	:	Stickstoff
Genauigkeit der Messung	:	Untere Nachweisgrenze 1 % vom Messbereichsendwert Fehlergrenze 2 %

9.2. Organische, gasförmige Kohlenwasserstoffe

Messverfahren	:	EN 12619
Hersteller/Typ	:	Testa 123
Messprinzip	:	Flammenionisationsdetektor (FID)
Messbereiche	:	10, 100, 1000, 10000 ppm
Messwertausgänge	:	0-10 V, 0-20 mA (analog)
Brenngas	:	Wasserstoff 5.0
Brennluft	:	Kohlenwasserstofffreie Luft
Kalibriergas	:	80 ppm Propan in Stickstoff
Nullgas	:	Stickstoff
Genauigkeit der Messung	:	Untere Nachweisgrenze 1 % vom Messbereichsendwert Fehlergrenze 1 %

9.3. Staub

Messverfahren	:	ÖNORM M 5861 T1 und T2
Hersteller	:	Ströhlein
Messprinzip	:	Gravimetrisch
Entnahmesonde	:	Einfachsonde nach VDI 2066 (aus korrosionsbeständigem Stahl mit glatten Innenwänden)
Staubsammlung	:	In der Sonde sitzende Edelstahlhülsen mit Quarzwolle
Gasmengenmessung	:	Gasuhr (Balgengaszähler)

Absauggerät	:	Vakuumpumpe mit 4 m^3/h Nennabsaugung. Der abgesaugte Teilgasvolumenstrom kann durch eine Bypassregelung einjustiert werden.
Filterkonditionierung	:	Trockenschrank (160 °C, ca. 4 Std.), Exsikkator (ca. 1 Std.)
Genauigkeit der Messung	:	Untere Nachweisgrenze 5 mg/m^3
(Angabe der m^3 (i.N.))		Fehlergrenze +/- 5 mg/m^3

9.4. Abgastemperatur

Die Messung der Abgastemperatur erfolgte mit einem Widerstandtemperaturfühler Pt100.

9.5. Oberflächentemperaturen

Die Temperaturen an den Oberflächen und im Pelletsfördersystem wurden mit NiCr-Ni Thermodrähten Typ K gemessen.

9.6. Druckmessung

Die Druckmessung erfolgte mit einem Druckmessgerät der Fa. Testo Instruments Typ 6381 mit einem Messbereich von 0 bis 100 Pa.

9.7. Luftfeuchte

Die Erfassung der Luftfeuchte erfolgte kontinuierlich mit einem Messgerät der Firma Testo Typ 175-H2.

9.8. Brennstoffwaage

Die Bestimmung der Brennstoffmenge erfolgte mit einer Waage der Firma Sartorius Typ QS 160008 (Messunsicherheit< 0,2%).

9.9. Elektrische Hilfsenergie

Die Bestimmung der elektrischen Leistungsaufnahme erfolgte mit einem Energiemessgerät Powermeter PM 231 der Fa. Brennenstuhl.

9.10. Registriergerät

Für die EDV-mäßige Erfassung der Messdaten wurden ein PC und das Datenerfassungssystem „Field Point“ der Firma National Instruments verwendet.

10. Brennstoffeigenschaften

Art und Abmessungen			
Bezeichnung	Holzpellets ENplus-A1		**Normanforderungen**
Art	Fichte		
Durchmesser	mm	6	4-10
Länge	mm	20	-

Elementaranalyse (wie verfeuert, kursiv dargestellte Werte sind Ergebnisse externer Analysen)					**Normanforderungen**
Kohlenstoffgehalt	C	%	EN ISO 16948	*46,47*	-
Wasserstoffgehalt	H	%	EN ISO 16948	*5,24*	-
Stickstoffgehalt	N	%	EN ISO 16948	*0,07*	-
Schwefelgehalt	S	%	EN ISO 16994	*0,01*	-
Aschegehalt	a	%	EN ISO 18122	0,32	≤ 0,5
Sauerstoffgehalt	O	%	Rest auf 100	40,15	-
Wassergehalt	w	%	EN ISO 18134-3	7,74	≤ 12

Heizwert*	NCV	MJ/kg	EN ISO 18125	19,16	> 17
Brennwert*	GCV	MJ/kg	EN ISO 18125	20,41	-

*wasserfreie Bezugsbasis

Rechenwerte (Angabe der m³ (i.N.))			
O_2-Bedarf	$V_{O2,min}$	m³/kg	0,88
Luftbedarf	$V_{L,min}$	m³/kg	4,18
Abgasmenge trocken	$V_{A,tr,min}$	m³/kg	4,17
Wasserdampf	V_{H2O}	m³/kg	0,68
Abgasmenge feucht	$V_{A,f,min}$	m³/kg	4,85
CO_2, maximal	-	%	20,76

11. Prüfergebnisse

Versuchstag		14.12.2021	15.12.2021
Messung		Volllast	Teillast
Versuchseinstellungen			
Prüfdauer	min	363	363
Brennstoffmenge	kg	40,2	14,8
Brennstoffwärmeleistung	kW	32,3	11,9
Umsatz	kg/h	6,6	2,5
Mittlerer Unterdruck im Fang	Pa	11,7	11,6
Umgebungsbedingungen			
Luftdruck	mbar	1005,8	1010,7
Relative Luftfeuchte	%	30,1	28,7
Raumtemperatur	°C	24,9	23,4
Mittlere Oberflächentemperaturen			
Kesseldecke	°C	25,5	23,9
Kesselmantel links	°C	27,9	26,7
Kesselmantel rechts	°C	31,0	30,5
Kesselmantel vorne	°C	25,1	23,6
Kesselmantel hinten	°C	49,2	43,7
Kesselboden	°C	30,9	27,4
Türgriff	°C	n.z.	n.z.
Tagesbehälter	°C	30,3	30,0
Förderrohr Außenmantel	°C	32,0	31,8
Betriebsdaten (Angabe der m³ (i.N.))			
Luftzahl (Lambda)	-	1,7	1,8
Abgasmenge, trocken	m^3/kg	6,9	7,6
Abgasmenge, feucht	m^3/kg	7,6	8,3
Volumenstrom	m^3/h	50,3	20,3
Abgasmassenstrom	g/s	16,6	6,8
Mittlere Abgastemperatur	°C	155,3	90,2
c_{pm} Wasserdampf	kJ/m^3K	1,51	1,50
c_{pm} trockenes Abgas	kJ/m^3K	1,32	1,32
Verlust durch fühlbare Wärme im Abgas	kJ/kg	1397,3	774,1
	%	8,0	4,4
Verlust durch CO im Abgas	kJ/kg	13,7	20,0
	%	0,08	0,11
Verlust durch Unverbranntes in der Asche	kJ/kg	273,4	276,8
	%	1,6	1,6

Verlust durch Strahlung	W	400,5	355,3
	%	1,2	3,0
Wirkungsgrad indirekt	%	89,1	90,9
Leistung indirekt	kW	28,8	10,8
Wasserwärmeleistung			
Rücklauftemperatur	°C	52,2	52,2
Vorlauftemperatur	°C	65,7	68,3
Wasserdurchfluss	m^3/h	1,825	0,565
Wärmeleistung direkt	kW	28,6	10,6
Wirkungsgrad direkt	%	88,7	88,9

Versuchstag		14.12.2021	15.12.2021
Messung		Volllast	Teillast
Emissionen, gemessen (Angabe der m^3 (i.N.))			
Sauerstoff	Vol%	8,0	9,1
Kohlenstoffdioxid	Vol%	12,6	11,4
Kohlenstoffmonoxid	ppm	157	207
Stickstoffmonoxid NO	ppm	115	97
Organ. Kohlenstoff	ppm	4	2
Staubmessung 1	mg/m^3	6	9
Staubmessung 2	mg/m^3	11	11
Staubmessung 3	mg/m^3	10	11
Staubmessung 4	mg/m^3	10	11
Staubmessung 5	mg/m^3	12	11
Staubmessung 6	mg/m^3	11	11
Emissionen, bezogen auf 10 Vol-% O_2 und Normzustand (Angabe der m^3 (i.N.))			
Kohlenstoffmonoxid	mg/m^3	166	240
Stickstoffmonoxid als NO_2	mg/m^3	199	184
Organ. Kohlenstoff	mg/m^3	5	4
Staubmessung 1	mg/m^3	5	9
Staubmessung 2	mg/m^3	10	10
Staubmessung 3	mg/m^3	8	11
Staubmessung 4	mg/m^3	9	10
Staubmessung 5	mg/m^3	11	10
Staubmessung 6	mg/m^3	9	10
Emissionen, bezogen auf 13 Vol-% O_2 und Normzustand (Angabe der m^3 (i.N.))			
Kohlenstoffmonoxid	mg/m^3	121	175
Stickstoffmonoxid als NO_2	mg/m^3	145	134
Organ. Kohlenstoff	mg/m^3	4	3

Staubmessung 1	mg/m³	4	7
Staubmessung 2	mg/m³	7	8
Staubmessung 3	mg/m³	6	8
Staubmessung 4	mg/m³	6	8
Staubmessung 5	mg/m³	8	7
Staubmessung 6	mg/m³	6	7
Emissionen, bezogen auf den Energieinhalt des Brennstoffes			
Kohlenstoffmonoxid	mg/MJ	76	109
Stickstoffmonoxid als NO_2	mg/MJ	91	84
Organ. Kohlenstoff	mg/MJ	3	2
Staubmessung 1	mg/MJ	2	4
Staubmessung 2	mg/MJ	4	5
Staubmessung 3	mg/MJ	4	5
Staubmessung 4	mg/MJ	4	5
Staubmessung 5	mg/MJ	5	5
Staubmessung 6	mg/MJ	4	4

Bezugssauerstoff für die Staubmessung			
Staubmessung 1	Vol%	8,3	9,7
Staubmessung 2	Vol%	8,1	9,4
Staubmessung 3	Vol%	8,0	9,1
Staubmessung 4	Vol%	8,0	9,1
Staubmessung 5	Vol%	8,0	9,0
Staubmessung 6	Vol%	7,8	8,9

n.z. … nicht zutreffend

12. Bestimmung des wasserseitigen Widerstandes

Der wasserseitige Widerstand wurde für den Durchfluss bestimmt, welcher der Nennwärmeleistung des Heizkessels bei einer Temperaturdifferenz zwischen Vor- und Rücklauf von 10 K und 20 K entspricht.

Temperaturdifferenz in K	Differenzdruck in mbar
10	67
20	62

13. Bestimmung der elektrischen Hilfsenergie

In der folgenden Tabelle ist die elektrische Leistungsaufnahme als Mittelwert des jeweiligen Lastzustandes angegeben.

Im Bereitschaftszustand (PSB)	W	2,1
Bei Teillast (el_{min})	W	16,0
Bei Volllast (el_{max})	W	34,1

14. Raumheizungs-Jahresnutzungsgrad, Energieeffizienz-Index (EEI) und Energieeffizienzklasse

In der folgenden Tabelle ist der berechnete Raumheizungs-Jahresnutzungsgrad, der Energieeffizienzindex (EEI) und die dazugehörige Energieeffizienzklasse angegeben.

Raumheizungs-Jahresnutzungsgrad (ηs)	%	80
Energieeffizienz-Index (EEI)	-	116
Energieeffizienzklasse	-	A^+

15. Raumheizungs-Jahres-Emissionen

In der folgenden Tabelle sind die berechneten Raumheizungs-Jahresemissionen bezogen auf 10 Vol-% O_2 und Normzustand angegeben.

Raumheizungs-Jahres-Emissionen		
Kohlenstoffmonoxid	mg/m^3	229
Stickstoffmonoxid als NO_2	mg/m^3	186
Organ. Kohlenstoff	mg/m^3	4
Staub	mg/m^3	10

16. Auslegungswerte für den Kamin

Die Werte in der folgenden Tabelle sind jene Werte aus dem Volllastversuch.

Mittlere Abgastemperatur in der Messstrecke	°C	155,3
Mittlerer CO_2-Gehalt	%	12,6
Unterdruck im Fang	Pa	11,7
Abgasmassenstrom	g/s	16,6

17. Funktionsprüfung des Temperaturreglers und des Sicherheitstemperaturbegrenzers bzw. –wächters am Heizkessel

Beim Heizkessel „PKO 25B“ handelt es sich um ein Feuerungssystem, das schnell abschaltbar ist. Die Ausrüstung besteht aus einem Temperaturregler und einem Sicherheitstemperaturbegrenzer (STB) (EN 303-5, Kap. 4.3.8.3a).

17.1. Reduzierung der Wärmeabnahme um 40%

Dazu wurde der Kessel mit Holzpellets bei Nennwärmeleistung mit einer Vorlauftemperatur von 68,2 °C betrieben und der Temperaturregler auf eine maximale Kesseltemperatur von 85 °C eingestellt. Bei Versuchsbeginn wurde die Wärmeabnahme auf 40 % reduziert. Der Regler beginnt nach ca. 15 Minuten die Leistung zu reduzieren, dabei erreichte die Vorlauftemperatur einen Maximalwert von 76,4 °C (Grenzwert 100 °C).

17.2. Wegfall der Wärmeabnahme

Da der Heizkessel PKO 25B“ ohne eine Einrichtung zur Abfuhr der Restwärmeleistung gemäß der EN 303-5 ausgeführt ist, wurde ein Betriebs- bzw. Störfall eines Stromausfalls und Wegfalls der Wärmeabnahme simuliert.

Beim Versuch mit plötzlichem Wegfall der Wärmeabnahme wurde der Kessel bei Nennwärmeleistung und einer Vorlauftemperatur von 66,8 °C betrieben. Bei Versuchsbeginn wurde die Wärmeabnahme abgeschaltet (Heizkreislaufpumpe aus).

Nach ca. 6 Minuten reduziert die Regelung die Leistung. Die Brennstoffförderung wird gestoppt und eine Fehlermeldung erscheint am Display. Dabei erreichte die Kesseltemperatur den Maximalwert von 103,8 °C (Grenzwert 110 °C).

17.3. Simulation des Ausfalls des Abgasventilators

Während des Nennlastbetriebes wurde der Abgasventilator gestoppt. Die Brennstoffförderung wird nach ca. 30 Sekunden abgeschaltet. Eine Fehlermeldung erscheint am Display. Der noch vorhandene Brennstoff wird auf Grund der Thermik weiterverbrannt, wobei der maximale CO-Gehalt im Abgaskanal unter 2 % bleibt. (Grenzwert < 5 %).

17.4. Simulation des Ausfalls der Luftzufuhr

Während des Nennlastbetriebes wurde die Luftzufuhr verschlossen. Die Brennstoffförderung wird nach ca. einer Minute abgeschaltet. Eine Fehlermeldung erscheint am Display. Der noch vorhandene Brennstoff wird auf Grund der Thermik weiterverbrannt, wobei der maximale CO-Gehalt im Abgaskanal unter 1 % bleibt. (Grenzwert < 5 %).

17.5. Öffnen der Brennraumtüre

Während des Betriebs wurde die Türe zum Brennraum geöffnet. Sofort erscheint im Display eine Fehlermeldung. Der Abgasventilator dreht sich mit voller Leistung (100 %), so dass keine gefährliche Gasansammlung im Raum entsteht.

17.6. Überfüllung des Brennraumes

Eine Überfüllung des Brennraumes wird durch die Regelung verhindert. Eine Überprüfung konnte nicht durchgeführt werden.

17.7. Stromausfall

Beim Versuch mit Unterbrechung der Stromversorgung wurde der Kessel bei Nennwärmeleistung und einer Vorlauftemperatur von 65 °C betrieben. Bei Versuchsbeginn wurde die Stromversorgung des Kessels und der Zirkulationspumpe abgeschaltet. Nach 29 Minuten wurde eine maximale Kesseltemperatur von 72,3 °C erreicht Grenzwert 110 °C). Der maximale CO-Gehalt im Abgaskanal betrug 0,4 %. (Grenzwert < 5 %).

18. Zusammenfassung und Darstellung der Messergebnisse

Von der Firma SELTRON d.o.o. wurde der Heizkessel zur Verfeuerung von Holzpellets mit der Bezeichnung „PKO 25B“ zur Durchführung einer heiztechnischen Prüfung entsprechend den Anforderungen der EN 303-5 und der Vereinbarungen gemäß Art. 15a B-VG über das „Inverkehrbringen von Kleinfeuerungen und die Überprüfung von Feuerungsanlagen und Blockheizkraftwerken“ eingereicht.

Als Brennstoff dienten Holzpellets nach ENplus-A1.

Folgende Prüfläufe wurden durchgeführt.

- Volllast (maximale Brennstoffmenge), Dauer: 6 Stunden
- Teillast (ca. 30% der Volllast), Dauer: 6 Stunden
- Sicherheitsprüfungen

Die Prüfergebnisse beziehen sich ausschließlich auf die Prüfgegenstände zum Zeitpunkt der Prüfung.

Aufgrund der durchgeführten Prüfungen und vorgelegten Unterlagen können folgende Ergebnisse festgestellt werden:

18.1. Technische Dokumentation

Die Dokumentation entspricht den Anforderungen der EN 303-5 und der Vereinbarung gemäß Art. 15a B-VG über das „Inverkehrbringen von Kleinfeuerungen und die Überprüfung von Feuerungsanlagen und Blockheizkraftwerken“.

18.2. Sicherheitstechnische Prüfung

Bei der Prüfung nach EN 303-5 wurden keine sicherheitstechnischen Mängel festgestellt.

18.3. Leistung

Die vom Hersteller angegebene Nennleistung von 30 kW für den Kessel „PKO 25B“ wird als zutreffend anerkannt.

18.4. Wirkungsgrad

In der folgenden Tabelle sind die Wirkungsgrade des Heizkessels zu entnehmen. Zusätzlich sind die geforderten Grenzwerte angeführt.

	Wirkungsgrad in %	
	Volllast	Teillast
PKO 25B	88,7	88,9
EN 303-5 Klasse 5 (87+log Q_N)	88,5	
Vereinbarung gemäß Art. 15a B-VG (72,3+7,7 log Q_N)	83,7	
	Raumheizungs-Jahresnutzungsgrad (ηs) in %	
PKO 25B	80	
Verordnung (EU) 2015/1189	77	

18.5. Emissionen

Die gemessenen Emissionen sind in der folgenden Tabelle zusammengefasst. Zusätzlich sind die geforderten Grenzwerte angeführt.

		Prüfergebnisse „PKO 25B" (Angabe der m³ (i.N.))			Grenzwerte (Angabe der m³ (i.N.))	
		mg/m³ bei 10 % O_2 nach EN 303-5	mg/m³ bei 13 % O_2	mg/MJ	EN 303-5 Kl. 5 mg/m³ bei 10 % O_2	15a BVG mg/MJ
CO	Volllast	166	121	76	500	250
	Teillast	240	175	109		
NO als NO_2	Volllast	199	145	91	-	100
	Teillast	184	134	84		
HC (Org. C)	Volllast	5	4	3	20	20
	Teillast	4	3	<3		
Staub[1]	Volllast	9	6	4	40	20
	Teillast	10	8	5		

[1]Mittelwert aus sechs Einzelmessungen, wobei jede den Grenzwert unterschreitet.

18.6. Raumheizungs-Jahres-Emissionen

Die berechneten Raumheizungs-Jahres-Emissionen sind in der folgenden Tabelle zusammengefasst. Zusätzlich sind die geforderten Grenzwerte angeführt.

	Prüfergebnisse „PKO 25B" (Angabe der m³ (i.N.))	Grenzwerte (Angabe der m³ (i.N.))
	mg/m³ bei 10 % O_2	Verordnung (EU) 2015/1189 mg/m³ bei 10 % O_2
CO	229	500
NO als NO_2	186	200
HC (Org. C)	4	20
Staub	10	40

Der Prüfer

Dipl.-Ing. S. Diem

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A-1060 WIEN, GETREIDEMARKT 9/166

Der Leiter

Ing. Dipl.-Ing. Dr. S. Müller

Anhang A

Datenblätter mit zeitlichen Emissionsverläufen 2 Seiten

Auftrags Nr:	PL-21080-P
Prüfobjekt:	PKO25B

Versuchstag:	14.12.2021
Brennstoff:	Holzpellets

Elementaranalyse		
Kohlenstoffgehalt	%	46,47
Wasserstoffgehalt	%	5,24
Stickstoffgehalt	%	0,07
Schwefelgehalt	%	0,01
Aschegehalt	%	0,32
Sauerstoffgehalt	%	40,15
Wassergehalt	%	7,74

Rechenwerte		
O_2-Bedarf	m^3/kg	0,88
Luftbedarf	m^3/kg	4,18
Abgasmenge trocken	m^3/kg	4,17
Wasserdampf	m^3/kg	0,68
Abgasmenge feucht	m^3/kg	4,85
CO_2 maximaler	%	20,76
Heizwert	MJ/kg	17,49

Lastzustand	-	Volllast
Start der Messung	hh:mm	09:50
Ende der Messung	hh:mm	15:54
Heizdauer	min	363
Brennstoffmenge	kg	40,2
zugeführte Leistung (Heizdauer)	kW	32,3
Umsatz	kg/h	6,6
Mittlerer Unterdruck im Fang	Pa	11,7

Umgebungsbedingungen		
Luftdruck	mbar	1005,8
Luftfeuchte	%	30,1
Raumtemp.	°C	24,9

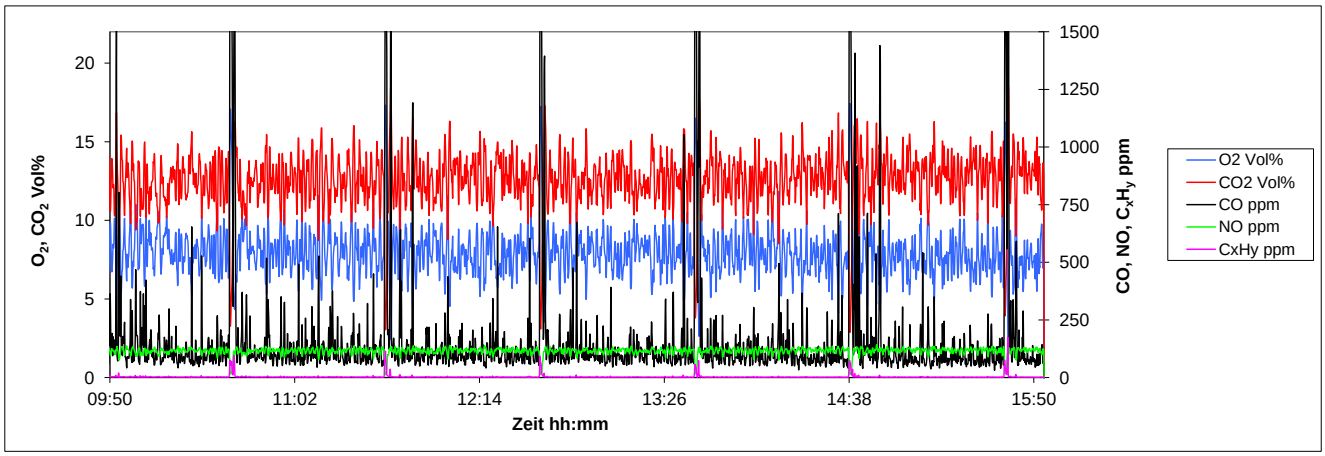
Abgastemperaturen		
Maximalwert	°C	159,5
Mittelwert	°C	155,3

Lambda	-	1,7
Abgasmenge trocken	m^3/kg	6,9
Abgasmenge feucht	m^3/kg	7,6
Volumenstrom	m^3/h	50,3
Abgasmassenstrom	g/s	16,6
cp_m Wasserdampf	kJ/m^3K	1,51
cp_m trockenes Abgas	kJ/m^3K	1,32
Verlust durch fühlbare Wärme im Abgas	kJ/kg	1397,3
	%	8,0
Verlust durch CO im Abgas	kJ/kg	13,7
	%	0,08
Verlust durch Unverbranntes in der Asche	kJ/kg	273,4
	%	1,6
Verlust durch Strahlung	W	400,5
	%	1,2
Wirkungsgrad indirekt	%	89,1
Leistung indirekt	kW	28,8

Oberflächentemperaturen		**Mittlere**	**Maximum**
Kesseldecke	°C	25,5	26,1
Kesselmantel links	°C	27,9	30,6
Kesselmantel rechts	°C	31,0	32,4
Kesselmantel vorne	°C	25,1	26,5
Kesselmantel hinten	°C	49,2	58,1
Kesselboden	°C	30,9	31,8
Türgriffe	°C	n.z.	n.z.
Tagesbehälter	°C	30,3	32,9
Förderrohr Außenmantel	°C	32,0	34,5

Kessel-Wärmeleistung		
Rücklauftemperatur	°C	52,2
Vorlauftemperatur	°C	65,7
Wasserdurchfluss	m^3/h	1,825
Leistung	kW	28,6
Wirkungsgrad direkt	%	88,7

Emissionswerte gemessen (Angabe der m^3 (i.N.))					**Staubmessung**					
					09:55 - 10:40	10:55 - 11:40	11:55 - 12:40	12:55 - 13:40	13:55 - 14:40	14:55 - 15:40
O_2	CO_2	CO	NO	C_xH_y	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
%	%	ppm	ppm	ppm	6	11	10	10	12	11
8,0	12,6	157	115	4	Bezugs-O_2 in %					
					8,3	8,1	8,0	8,0	8,0	7,8
Emissionswerte bezogen auf 10 % O_2 nach EN 303-5										
		mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
		166	199	5	5	10	8	9	11	9
Emissionswerte bezogen auf 13 % O_2										
		mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
		121	145	4	4	7	6	6	8	6
Emissionswerte bezogen auf den Energieinhalt des Brennstoffes										
		mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ
		76	91	3	2	4	4	4	5	4



Auftrags Nr:	PL-21080-P
Prüfobjekt:	PKO25B

Versuchstag:	15.12.2021
Brennstoff:	Holzpellets

Elementaranalyse		
Kohlenstoffgehalt	%	46,47
Wasserstoffgehalt	%	5,24
Stickstoffgehalt	%	0,07
Schwefelgehalt	%	0,01
Aschegehalt	%	0,32
Sauerstoffgehalt	%	40,15
Wassergehalt	%	7,74

Rechenwerte		
O_2-Bedarf	m^3/kg	0,88
Luftbedarf	m^3/kg	4,18
Abgasmenge trocken	m^3/kg	4,17
Wasserdampf	m^3/kg	0,68
Abgasmenge feucht	m^3/kg	4,85
CO_2 maximaler	%	20,76
Heizwert	MJ/kg	17,49

Lastzustand	-	Teillast
Start der Messung	hh:mm	10:12
Ende der Messung	hh:mm	16:15
Heizdauer	min	363
Brennstoffmenge	kg	14,8
zugeführte Leistung (Heizdauer)	kW	11,9
Umsatz	kg/h	2,5
Mittlerer Unterdruck im Fang	Pa	11,6

Umgebungsbedingungen		
Luftdruck	mbar	1010,7
Luftfeuchte	%	28,7
Raumtemp.	°C	23,4

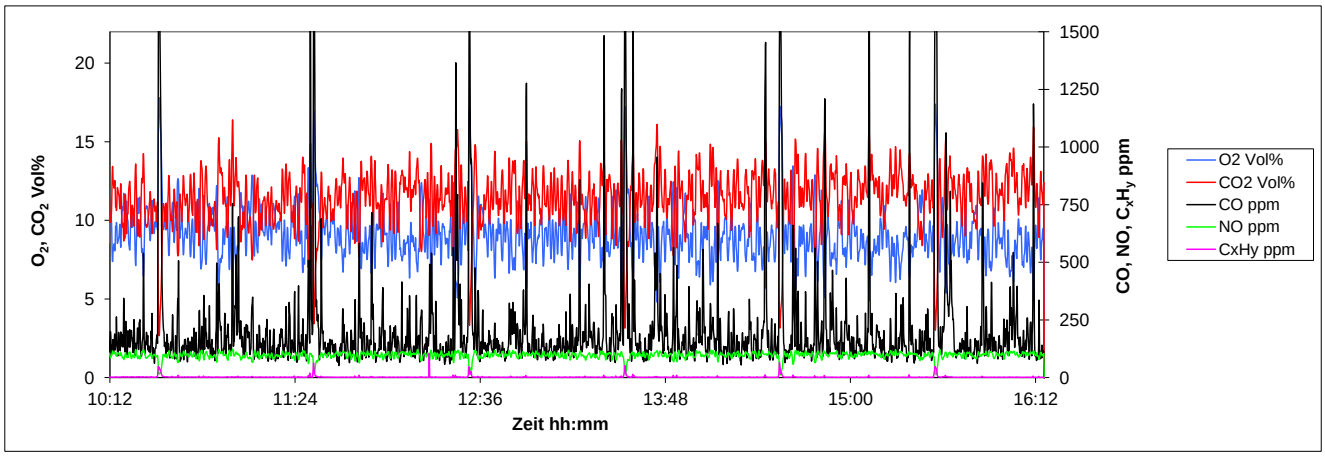
Abgastemperaturen		
Maximalwert	°C	95,4
Mittelwert	°C	90,2

Lambda	-	1,8
Abgasmenge trocken	m^3/kg	7,6
Abgasmenge feucht	m^3/kg	8,3
Volumenstrom	m^3/h	20,3
Abgasmassenstrom	g/s	6,8
cp_m Wasserdampf	kJ/m^3K	1,50
cp_m trockenes Abgas	kJ/m^3K	1,32
Verlust durch fühlbare Wärme im Abgas	kJ/kg	774,1
	%	4,4
Verlust durch CO im Abgas	kJ/kg	20,0
	%	0,11
Verlust durch Unverbranntes in der Asche	kJ/kg	276,8
	%	1,6
Verlust durch Strahlung	W	355,3
	%	3,0
Wirkungsgrad indirekt	%	90,9
Leistung indirekt	kW	10,8

Oberflächentemperaturen		**Mittlere**	**Maximum**
Kesseldecke	°C	23,9	25,4
Kesselmantel links	°C	26,7	29,8
Kesselmantel rechts	°C	30,5	31,9
Kesselmantel vorne	°C	23,6	24,8
Kesselmantel hinten	°C	43,7	55,3
Kesselboden	°C	27,4	28,0
Türgriffe	°C	n.z.	n.z.
Tagesbehälter	°C	30,0	31,9
Förderrohr Außenmantel	°C	31,8	33,9

Kessel-Wärmeleistung		
Rücklauftemperatur	°C	52,2
Vorlauftemperatur	°C	68,3
Wasserdurchfluss	m^3/h	0,565
Leistung	kW	10,6
Wirkungsgrad direkt	%	88,9

Emissionswerte gemessen (Angabe der m^3 (i.N.))					**Staubmessung**					
					10:20 - 11:05	11:20 - 12:05	12:20 - 13:05	13:20 - 14:05	14:20 - 15:05	15:20 - 16:05
O_2	CO_2	CO	NO	C_xH_y	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
%	%	ppm	ppm	ppm	9	11	11	11	11	11
9,1	11,4	207	97	2	Bezugs-O_2 in %					
					9,7	9,4	9,1	9,1	9,0	8,9
Emissionswerte bezogen auf 10 % O_2 nach EN 303-5										
		mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
		240	184	4	9	10	11	10	10	10
Emissionswerte bezogen auf 13 % O_2										
		mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
		175	134	3	7	8	8	8	7	7
Emissionswerte bezogen auf den Energieinhalt des Brennstoffes										
		mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ	mg/MJ
		109	84	2	4	5	5	5	5	4



Anhang B

Anforderungen (Prüfung nach EN 303-5, Kap. 4) 5 Seiten

Kap.	Normanforderung	Erfüllt
4.1	**Allgemeine Anforderungen**	
	Der Heizkessel besteht aus formbeständigen, nichtbrennbaren Werkstoffen nach EN 13501-1 und ist so beschaffen, dass	Ja
	a) er den beim bestimmungsgemäßen Betrieb auftretenden Beanspruchungen standhalten kann	
	b) der Wärmeträger (Wasser) nicht gefährlich erwärmt werden kann (≤110°C)	
	c) Gase nicht in gefährlicher Menge aus dem Kessel, der Beschickungseinrichtung oder dem Vorratsbehälter in den Aufstellraum oder in die Brennstoff-Förderleitung gelangen können	
	d) keine Flammen herausschlagen, sowie keine Glut herausfallen kann	
	e) gefährliche Ansammlungen von zündfähigen Gasen im Brennraum und in den Heizgaszügen verhindert werden (>5% CO)	
	Nicht brennbare Werkstoffe werden verwendet für Bauteile im Inneren von Steuer-, Regel- und Sicherheitseinrichtungen und elektrische Ausrüstung.	
	Steuer-, Regel- und Sicherheitseinrichtungen und elektrische Ausrüstungen sind derart angeordnet, sodass diese nicht übehitzt werden können.	
	Die Werkstoffe für die druckbeanspruchten Bauteile entsprechen den allgemein anerkannten Regeln der Technik.	
	Der Kessel ist so konstruiert, dass er sicher hantiert werden kann.	
	Freiliegende Teile, die während dem Betrieb und bei einer Wartung zugänglich sind, besitzen keine scharfen Kanten und Ecken die Bedienungs- und Wartungspersonal verletzen könnten	
	Motoren und Ventilatoren sind so befestigt, dass Geräusche und Vibrationen minimiert sind.	
4.2	**Bauanforderungen**	
4.2.1	**Fertigungsunterlagen**	
4.2.1.1	*Zeichnungen*	
	In den Zeichnungen für den Heizkessel und in dazugehörigen Unterlagen sind angegeben:	Ja
	a) die festgelegten Werkstoffe	n.g.
	b) die Schweißverfahren, die Nahtform (im Allgemeinen genügt das Symbol der Schweißnaht) und die Schweißzusatzwerkstoffe	n.g.
	c) die maximal zulässige Betriebstemperatur in °C	Ja
	d) der maximal zulässige Betriebsüberdruck in bar	Ja
	e) der Prüfüberdruck in bar	Ja
	f) die Nenn-Wärmeleistung oder der Wärmeleistungsbereich für die einzelnen Kesselgrößen in kW	Ja
4.2.1.2	*Fertigungskontrollen*	
	Wurde nicht geprüft.	n.g.
4.2.2	**Heizkessel aus Stahl und solche aus Nichteisen-Metallen**	
4.2.2.1	*Ausführen von Schweißarbeiten*	
	Kesselhersteller, die Schweißarbeiten durchführen, müssen die Anforderungen von EN 287-1 und EN ISO 9606-2 erfüllen.	n.g.
4.2.2.2	*Schweißnähte und Schweißzusatzwerkstoffe*	
	Wurde nicht geprüft.	n.g.

Kap.	Normanforderung	Erfüllt
4.2.2.3	*Stahlteile unter Druckbeanspruchung*	
	Die verwendeten Stähle sind nach EN 10025-1 (Sorte S235JRG2) klassifiziert.	H
4.2.2.4	*Mindest-Wanddicken*	
	6 mm - für feuer- und wasserberührte Wände des Füll- und Brennraumes	H
	4 mm - für Wände der Konvektionsheizflächen außerhalb des Brennraumes - für runde Rohre der Konvektionsheizflächen außerhalb des Brennraumes - für nur wasserberührte Wände	
	Bei Heizkesseln, die aus einzelnen geometrisch gleichen Bauteilen (Gliedern) bestehen, muss die Festlegung der Mindest-Wanddicke für den ganzen Nennleistungsbereich des Heizkessels entsprechend den Anforderungen der individuellen Kesselglieder gemäß Tabelle 3 erfolgen.	n.z.
	Die Wanddickentoleranzen für Kohlenstoff-Stähle müssen innerhalb der in der EN 10029 angegebenen Werte liegen.	H
4.2.3	**Heizkessel aus Gusswerkstoffen**	
	Der Kessel ist aus Stahl.	n.z.
4.2.4	**Anforderungen an die Gestaltung**	
4.2.4.1	*Entlüftung des Wasserraumes*	
	Der Heizkessel bzw. seine Teile sind so gestaltet, dass wasserseitig eine vollständige Entlüftung möglich ist.	Ja
	Während der Prüfläufe wurde kein Siedegeräusch wahrgenommen.	Ja
4.2.4.2	*Reinigung der Heizflächen*	
	Durch eine genügende Zahl und zweckentsprechende Anordnung von Reinigungs-öffnungen müssen die Heizflächen heizgasseitig zur Besichtigung und Reinigung durch chemische Mittel und Bürsten zugänglich sein.	Ja
	Spezialwerkzeuge (z. B. Spezialbürsten) sind nicht erforderlich.	Ja
4.2.4.3	*Erkennbarkeit der Flammen*	
	Eine Einrichtung, die eine Besichtigung der Flamme oder des Glutbettes ermöglicht, ist vorhanden.	Ja
4.2.4.4	*Wasserseitige Dichtheit*	
	Es gibt keine Löcher für Schrauben zur Befestigung von Teilen, die an vom Wasser durchströmten Räume münden.	Ja
4.2.4.5	*Austauschteile*	
	Für den Austausch von Teilen, die vom Betreiber selbst ausgewechselt werden können, sind Beschreibungen in der Bedienungsanleitung enthalten.	Ja
4.2.5.6	*Wasserseitige Anschlüsse*	
	Die Gewindestutzen entsprechen den internationalen Normen. Die Anschlüsse sind leicht zugänglich und erfüllen die jeweilige Funktion. Vor- und Rücklaufanschluß: G 1“ (mind. 20 mm)	Ja
	Ein Anschluß zum Füllen und Entleeren ist vorhanden. Die Größe des Anschlusses beträgt G ½“ (soll für Kessel mit Leistung bis 70 kW: G ½“)	Ja
4.2.4.7	*Anschlüsse für Regel- und Anzeigeeinrichtungen und Sicherheitstemperaturbegrenzer*	
	Der Kessel ist sowohl mit einer Temperaturmessung für die Regelung, als auch mit einem Sicherheitstemperaturbegrenzer ausgestattet.	Ja
	Die Tauchhülsen sind so angeordnet, dass eine unbeabsichtigte Positionsänderung der Temperatursensoren verhindert wird.	Ja

<table>
<tr><th>Kap.</th><th>Normanforderung</th><th>Erfüllt</th></tr>
<tr><td></td><td>Der Einbauort der Anschlüsse ist so festgelegt, dass die Kesselwassertemperatur hinreichend genau erfasst wird.</td><td>Ja</td></tr>
<tr><td>4.2.4.8</td><td>Wärmedämmung</td><td></td></tr>
<tr><td></td><td>Die Wärmedämmung entspricht dem üblichen Standard.</td><td>Ja</td></tr>
<tr><td>4.2.4.9</td><td>Wasserseitiger Widerstand des Heizkessels</td><td></td></tr>
<tr><td></td><td>Temperaturdifferenz ΔT in K 10 20
Druckdifferenz ΔP in mbar 67 62</td><td>Ja</td></tr>
<tr><td>4.2.4.10</td><td>Brennstoffvorratsbehälter</td><td></td></tr>
<tr><td></td><td>Externer Vorratsbehälter für Pellets</td><td>Ja</td></tr>
<tr><td>4.2.4.11</td><td>Füllraum</td><td></td></tr>
<tr><td></td><td>Der Füllraum ist so gestaltet, dass ein einwandfreies Nachrutschen des Brennstoffs und die erforderliche Brenndauer sichergestellt sind.</td><td>Ja</td></tr>
<tr><td>4.2.4.12</td><td>Ascheraum</td><td></td></tr>
<tr><td></td><td>Das Aschebehältervolumen beträgt ca. 45l und reicht für 12 Stunden Volllastbetrieb aus.</td><td>Ja</td></tr>
<tr><td></td><td>Wenn Einrichtungen für einen selbsttätigen Asche- und Schlackeaustrag vorgesehen sind, gilt diese Anforderung als erfüllt.</td><td>Ja</td></tr>
<tr><td>4.3</td><td>Sicherheitsanforderungen</td><td></td></tr>
<tr><td>4.3.1</td><td>Allgemeines</td><td></td></tr>
<tr><td></td><td>Potenzielle Gefährdungen durch den Heizkessel einschließlich des Betriebs der Feuerung und einer Beschickungseinrichtung sind sowohl durch konstruktive Maßnahmen als auch durch die Verwendung von Sicherheitseinrichtungen zu verhindern. Bei möglichen Ausfällen der Sicherheitseinrichtung selbst muss die Sicherheit aufrechterhalten bleiben.</td><td>Ja</td></tr>
<tr><td></td><td>Der Hersteller hat eine Risikobewertung nach EN ISO 12100 mit spezieller Berücksichtigung der Kesselausführung und des verwendeten Brennstoffs vorgenommen.</td><td>Ja</td></tr>
<tr><td></td><td>Die Risikobewertung deckt die in 4.3.4 bis 4.3.9 angegebenen Elemente ab</td><td>Ja</td></tr>
<tr><td>4.3.2</td><td>Handbeschickung</td><td></td></tr>
<tr><td></td><td>Der Kessel ist für den Betrieb mit Holzpellets konstruiert.</td><td>n.z</td></tr>
<tr><td>4.3.3</td><td>Sicherheit gegen Rückbrand für automatische Heizkessel</td><td></td></tr>
<tr><td>4.3.3.1</td><td>Allgemeines</td><td></td></tr>
<tr><td></td><td>Automatische Beschickungssysteme müssen so gestaltet sein, dass ein Rückbrand verhindert wird</td><td>Ja</td></tr>
<tr><td>4.3.3.2</td><td>Temperaturleitung</td><td></td></tr>
<tr><td></td><td>Die Beschickungseinrichtung befindet sich außerhalb des Kesselkörpers, sodass ein natürlich belüfteter Zwischenraum entsteht. Die Oberflächentemperatur der Beschickungs-einrichtung (ohne jegliche Isolation) und in einem Abstand von 15 cm erreichte während der heiztechnischen Prüfung folgende maximale Werte (Grenzwert 85 °C):
<table>
<tr><td></td><td></td><td>Volllast</td><td>Teillast</td></tr>
<tr><td>Förderrohr Außenmantel</td><td>°C</td><td>34,5</td><td>33,9</td></tr>
<tr><td>Tagesbehälter</td><td>°C</td><td>32,9</td><td>31,9</td></tr>
<tr><td>Raumtemperatur</td><td>°C</td><td>24,9</td><td>23,4</td></tr>
</table>
</td><td>Ja</td></tr>
</table>

<table>
<tr><th>Kap.</th><th>Normanforderung</th><th>Erfüllt</th></tr>
<tr><td>4.3.3.3</td><td colspan="2">Rückströmung von zündfähigen Verbrennungsprodukten in die Brennstoffzuführung oder in den integrierten Vorratsbehälter</td></tr>
<tr><td></td><td>Signifikante Mengen an Verbrennungsprodukten, die zündfähige Konzentrationen oder kritische Energiemengen zur Entzündung von Holz (wie z. B. Funken oder heiße Gase) beinhalten, werden durch die Anwendung einer gerichteten Strömung verhindert. Der Abgasventilator sorgt für einen stabilen Unterdruck im Kessel.
Weiters gelangt der Brennstoff über eine Steigschnecke in Verbindung mit einer Brennstoffrutsche in die Brennkammer.</td><td>Ja</td></tr>
<tr><td>4.3.3.4</td><td colspan="2">Brandausbreitung in die Brennstoffzuführung oder in den integrierten Vorratsbehälter</td></tr>
<tr><td></td><td>Siehe 4.3.3.3</td><td>Ja</td></tr>
<tr><td>4.3.3.5</td><td colspan="2">Alternativer Nachweis der Sicherheit gegen Rückbrand</td></tr>
<tr><td></td><td>Alternative Nachweise sind nicht notwendig</td><td>n.z.</td></tr>
<tr><td>4.3.4</td><td colspan="2">Sicherheit gegen Brennstoffüberfüllung oder Unterbrechung der Brennstoffzufuhr</td></tr>
<tr><td></td><td>Der Betrieb des Kessels in der Startphase und im kontinuierlichen Betrieb mit einer auf maximale Kapazität eingestellten Beschickungseinrichtung oder bei einer Unterbrechung der Beschickungseinrichtung darf nicht zu einer gefährlichen Situation führen.</td><td>Ja</td></tr>
<tr><td></td><td>Der Heizkessel muss mit einer Sicherheitseinrichtung zur Unterbrechung der Brennstoffversorgung ausgestattet sein, wenn die Verbrennung im Brennraum unvollständig ist oder nicht vorhanden ist.</td><td>Ja</td></tr>
<tr><td></td><td>Die Prüfung auf Unterbrechung der Brennstoffzufuhr nach 5.16.2 kann entfallen, wenn eine Sicherheitseinrichtung, Sicherheitsklasse B oder C nach 4.3.1 verwendet wird.</td><td>Ja</td></tr>
<tr><td></td><td>In der Zündphase muss bei unzureichender oder nicht vorhandener Verbrennung eine Sicherheitseinrichtung die Brennstoffzufuhr unterbrechen, wenn eine für die Brenneranlauffunktion vom Hersteller angegebene Sicherheitszeit überschritten wird. Ein Ausfall der Sicherheitseinrichtung zur Ermittlung einer nicht ausreichenden Verbrennung darf nicht zu einer gefährlichen Situation führen.</td><td>Ja</td></tr>
<tr><td>4.3.5</td><td colspan="2">Sicherheit gegen Verbrennungsluftmangel oder unvollständiger Verbrennung</td></tr>
<tr><td></td><td>Siehe Bericht, Kap. 17.3. Ausfall des Abgasventilators
Die max. CO-Konzentration im Kessel (gemessen im Fang) blieb unter 1 Vol -%.</td><td>Ja</td></tr>
<tr><td>4.3.6</td><td colspan="2">Oberflächentemperaturen</td></tr>
<tr><td></td><td>Die Oberflächentemperatur an der Außenseite des Heizkessels (inklusive Boden und Kesseltüren) wurden während der heiztechnischen Prüfung kontinuierlich gemessen. Die maximal gemessene Oberflächentemperaturen sind in folgender Tabelle zusammengefasst.
<table>
<tr><td></td><td></td><td>Volllast</td><td>Teillast</td></tr>
<tr><td>Kesseldecke</td><td>°C</td><td>26,1</td><td>25,4</td></tr>
<tr><td>Kesselmantel links</td><td>°C</td><td>30,6</td><td>29,8</td></tr>
<tr><td>Kesselmantel rechts</td><td>°C</td><td>32,4</td><td>31,9</td></tr>
<tr><td>Kesselmantel vorne</td><td>°C</td><td>26,5</td><td>24,8</td></tr>
<tr><td>Kesselmantel hinten</td><td>°C</td><td>58,1</td><td>55,3</td></tr>
<tr><td>Kesselboden</td><td>°C</td><td>31,8</td><td>28,0</td></tr>
<tr><td>Raumtemperatur</td><td>°C</td><td>24,9</td><td>23,4</td></tr>
</table>
Grenzwert: 60 K über Raumtemperatur
Der Kessel wird nur auf einen nicht brennbaren Boden aufgestellt.</td><td>Ja</td></tr>
</table>

<table>
<tr><th>Kap.</th><th>Normanforderung</th><th>Erfüllt</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td></td><td>Volllast</td><td>Teillast</td></tr>
<tr><td>Bedienungsgriff</td><td>°C</td><td>-</td><td>-</td></tr>
<tr><td>Raumtemperatur</td><td>°C</td><td>-</td><td>-</td></tr>
</table>
Grenzwert: 35 K über Raumtemperatur bei Metallen und gleichwertigen Stoffen</td><td>n.z.</td></tr>
<tr><td>4.3.7</td><td>Heizgasseitige Dichtheit</td><td></td></tr>
<tr><td></td><td>Im Brennraum herrscht Unterdruck.</td><td>n.z.</td></tr>
<tr><td>4.3.8</td><td>Temperatur-Regel- und Begrenzungseinrichtungen</td><td></td></tr>
<tr><td>4.3.8.1</td><td>Allgemeines</td><td></td></tr>
<tr><td></td><td>Die erforderliche Ausrüstung wird vom Kesselhersteller mitgeliefert .</td><td>Ja</td></tr>
<tr><td>4.3.8.2</td><td>Temperaturregel- und Temperaturbegrenzungseinrichtungen für offene Heizungsanlagen</td><td></td></tr>
<tr><td></td><td>Der Heizkessel ist für geschlossene Anlagen geeignet.</td><td>n.z.</td></tr>
<tr><td>4.3.8.3</td><td>Temperaturregel- und Temperaturbegrenzungseinrichtungen für geschlossene Heizungsanlagen</td><td></td></tr>
<tr><td></td><td>Für den Einsatz in thermostatisch abgesicherten Heizungsanlagen muß das Feuerungs-system entweder schnell oder teilweise abschaltbar sein oder/und die vom Heizungs-system nicht abgenommene Wärme bzw. die Restwärmeleistung muss über einen Sicherheitswärmetauscher oder andere gleichwertige Einrichtungen zuverlässig abgeführt werden können. Dementsprechend sind folgende Ausrüstungsvarianten entsprechend den Anforderungen nach EN 12828 zu unterscheiden:</td><td>Ja</td></tr>
<tr><td></td><td>a) das Feuerungssystem ist schnell abschaltbar;
die erforderliche Ausrüstung besteht aus:
• einem Temperaturregler;
• einem Sicherheitstemperaturbegrenzer;</td><td>Ja</td></tr>
<tr><td></td><td>b) das Feuerungssystem ist teilweise abschaltbar</td><td>n.z.</td></tr>
<tr><td></td><td>c) das Feuerungssystem ist nicht abschaltbar und die Nenn-Wärmeleistung <100 kW</td><td>n.z</td></tr>
<tr><td>4.3.8.4</td><td>Einrichtungen zur Abfuhr überschüssiger Wärme</td><td></td></tr>
<tr><td></td><td>Wird als Wärmetauscher ein Speicher-Wassererwärmer verwendet, so ist er so auszulegen, dass er die vorgenannte Bedingung bei seiner maximalen Betriebstemperatur erfüllt</td><td>n.z.</td></tr>
<tr><td></td><td>Die thermische Ablaufsicherung muss bei Sicherheitswärmetauschern, die ausschließlich der Wärmeabfuhr im Störfall dienen, im Kühlwasserzufluß vor dem Wärmetauscher eingebaut sein</td><td>n.z.</td></tr>
<tr><td>4.3.9</td><td>Zubehör für den Heizkessel</td><td></td></tr>
<tr><td>4.3.9.1</td><td>Allgemeines</td><td></td></tr>
<tr><td></td><td>Wenn der Heizkessel werksseitig mit zusätzlichen Armaturen ausgerüstet ist und wenn deren Wartung für die ordnungsgemäße Funktion und Sicherheit erforderlich ist, sollte diese leicht, ohne wesentliche Demontagen, ausgeführt werden können</td><td>n.z.</td></tr>
<tr><td>4.3.9.2</td><td>Elektrische Sicherheit</td><td></td></tr>
<tr><td></td><td>Die elektrische Sicherheit des Heizkessels und der Schnittstellen (z. B. Stecker) zwischen Regeleinrichtungen müssen den Anforderungen der EN 60335-2-102 entsprechen</td><td>n.g.</td></tr>
<tr><td>4.3.9.3</td><td>Elektromagnetische Verträglichkeit</td><td></td></tr>
<tr><td></td><td>Die Anforderungen an die elektromagnetische Verträglichkeit müssen entsprechend EN 61000-6-2 und EN 61000-6-3 eingehalten werden.</td><td>n.g.</td></tr>
</table>

Anhang C

Anforderungen an die Unterlagen der Feuerstätte (Prüfung nach EN 303-5, Kap.7 und 8) 3 Seiten

Unterlagen für die Feuerstätte

Kennzeichnung

	Normanforderung	Geprüft nach Kap.	Erfüllt
	Allgemeines	7.1	
	Jeder Heizkessel ist mit einem Kesselschild zu versehen. Das Kesselschild muss in der Landessprache des Bestimmungsortes ausgeführt und an einer zugänglichen Stelle angebracht sein.		Ja
	Angaben auf dem Kesselschild	7.2	
a)	Name und Firmensitz des Herstellers;		Ja
b)	Handelsbezeichnung, Typ;		Ja
c)	Herstellernummer und Baujahr (Codierung zulässig);		Ja
d)	Nennwärmeleistung bzw. Wärmeleistungsbereich;		Ja
e)	Kesselklasse;		Ja
f)	Maximaler zulässiger Betriebsdruck in bar;		Ja
g)	Maximale zulässige Betriebstemperatur in °C;		Ja
h)	Wasserinhalt in l;		Ja
i)	Elektroanschluss (V,Hz, A) und Leistungsaufnahme in W;		Ja
j)	Brennstoffklasse nach Abschnitt 1 und für Klasse E der geprüften Brennstoffe.		Ja
	Anforderungen an das Schild	7.3	
	Das Schild muss bezüglich Werkstoff und Beschriftung beständig sein. Die Beschriftung muss abriebfest sein. Unter normalen Betriebsbedingungen darf sich das Schild nicht stärker verfärben, sodass ein Lesen der Angaben erschwert wird. Selbstklebende Schilder sollten sich bei Feuchtigkeit und Temperatur nicht ablösen		Ja

Technische Unterlagen im Lieferumfang des Heizkessels

	Normanforderung	Geprüft nach Kap.	Erfüllt
	Allgemeines	8.1	
	Für jeden Heizkessel müssen die nachfolgend genannten Unterlagen in der Sprache des Landes zur Verfügung stehen, in welches das Gerät geliefert wird, wobei die Unterlagen nach 8.2 und 8.3 jedem Heizkessel beizufügen sind.		Ja
	Technische Informationen und Montageanleitung	8.2	
	Diese Unterlagen müssen mindestens die folgenden Angaben enthalten		
a)	Notwendiger Förderdruck in mbar;		Ja
b)	Wasserinhalt des Heizkessels in Liter;		Ja
c)	Abgastemperatur bei Nenn-Wärmeleistung und bei kleinster Wärmeleistung in Grad Celsius:		Ja

	Normanforderung	**Geprüft nach Kap.**	**Erfüllt**
d)	Abgasmassenstrom bei Nenn-Wärmeleistung und kleinster Wärmeleistung in Kilogramm pro Sekunde;		Ja
e)	Abgasanschlussdurchmesser in Millimetern;		Ja
f)	Wasserseitiger Widerstand in mbar;		
g)	Nenn-Wärmeleistung bzw. Wärmeleistungsbereich für jede Brennstoffart in Kilowatt;		Ja
h)	Kesselklasse;		Ja
i)	Brenndauer in Stunden für jede Brennstoffart bei QN;		Ja
j)	Einstellbereich des Temperaturreglers in °C;		Ja
k)	minimale Rücklauftemperatur am Kesseleintritt in °C;		Ja
l)	Brennstoffart und Wassergehalt sowie Brennstoffstückgröße sowie Details nach Tabelle 7 der EN 303-5;		Ja
m)	Füllraum in Litern und Füllöffnungsabmessungen in mm;		Ja
n)	Erforderliche Pufferspeichergröße in Litern, wenn $Q_{min} > 0{,}3\ Q_N$;		n.z.
o)	Benötigte Hilfsenergie in Watt;		Ja
p)	Benötigte Stand-by Energie in Watt;		Ja
q)	Benötigte Kaltwassertemperaturdruck in °C und benötigter Wasserdruck für Sicherheitswärmetauscher in bar;		n.z.
r)	Elektroanschluss inklusive Geräte- und Hauptschalter;		Ja
s)	Betrieb des Heizkessels mit oder ohne Gebläse;		Ja
t)	Betrieb des Heizkessels mit Über- oder Unterdruck am Rauchgasaustritt;		Ja
u)	Betrieb des Kessels in kondensierender oder nichtkondensierender Betriebsweise;		n.z.
v)	Die Anleitung muss Informationen über Schallemissionen enthalten, sowie Informationen zur Schallmessung und Möglichkeiten zur Schallreduzierung des Heizkessels;		Ja
	Die Montageanleitung muss Angaben enthalten über:		
w)	den Zusammenbau des Heizkessels vor Ort (wenn nötig), gegebenenfalls über die notwendige Wasserdruckprüfung nach 5.4.2 oder 5.5.2.2;		n.z.
x)	die Aufstellung;		Ja
y)	die Inbetriebnahme, wobei Hinweise zu geben sind über die einzustellende Feuerungsleistung im Leistungsbereich;		Ja
z)	Anleitungen über den Einbauort bzw. die Einbaulage der Messfühler für Regelung, Anzeige und Sicherheitseinrichtungen;		Ja
	Außerdem muss allgemein auf die für die sicherheitstechnische Ausrüstung der Anlage zu beachtenden Normen und Vorschriften hingewiesen werden.		
	- Maßnahmen bei Lüftungsgeräten im Raumluftverbund		Ja
	- Maßnahmen für genügende und reine Luftzufuhr		Ja
	- Selbstverriegelnde und dichtende Messöffnungen		Ja
	- Emissionsmessung nach Erstinstallation		Ja
	- Mündliche Unterweisung durch Fachpersonal vor Inbetriebnahme		Ja
	- Maßnahmen für richtige Brennstofflagerung		Ja
	- Wartungsempfehlungen des Heizkessels		Ja
	- Maßnahmen zur richtigen Dimensionierung des Heizsystems		Ja
	- Maßnahmen zur richtigen Dimensionierung der Abgasanlage und des Verbindungsstücks		Ja

n.z. …. Nicht zutreffend

	Normanforderung	Geprüft nach Kap.	Erfüllt
	- Abstand zu brennbaren Materialien		Ja
	- Anweisungen zur weiteren Isolation, wenn notwendig		n.z.
	- Mindestabstände zu Wänden und Decken, damit eine reibungslose Wartung und Reinigung möglich ist.		Ja

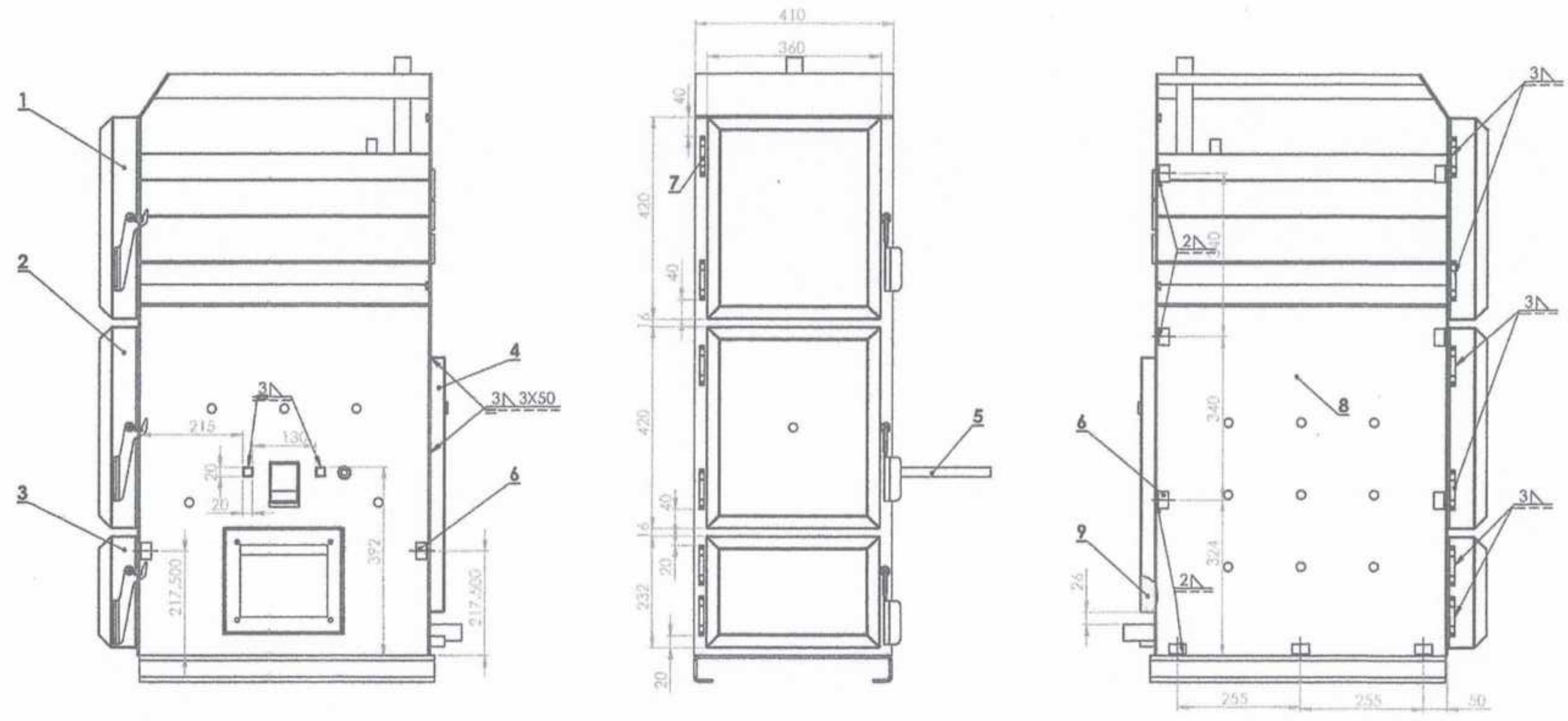
Bedienungsanleitung

	Normanforderung	Geprüft nach Kap.	Erfüllt
	Die Bedienungsanleitung muss Hinweise enthalten über	8.3	
a)	Notwendiger Förderdruck in mbar;		Ja
b)	Die Bedienung des Heizkessels, dessen gefahrlose Beschickung und das Öffnen von Türen;		Ja
c)	Die Reinigung und deren Zeitabstände, einschließlich der dafür erforderlichen Geräte;		Ja
d)	Das Verhalten bei Störungen;		Ja
e)	Die Begründung der Empfehlung für einen ständigen, fachgerechten Wartungsdienst und die erforderlichen Wartungsintervalle;		Ja
f)	Die Brennstoffart und den Wassergehalt sowie die Brennstoffstückgröße (bei Stückholz zusätzlich Schichtrichtung);		Ja
g)	Die maximale Füllhöhe des Füllraumes mit Brennstoff;		n.z.
h)	Die Brenndauer für die Brennstoffarten bei Nenn-Wärmeleistung;		Ja
i)	Andere Druckschriften (Prospekte usw.) dürfen keine der Bedienungsanleitung widersprechenden Angaben enthalten.		Ja

Anhang D

Technische Zeichnungen	1 Seite
Typenschild	1 Seite
Aufstellungs- und Bedienungsanleitung	86 Seiten

Tolerancije dužina								Toleranc. uglova		
3-6	6-30	30-120	120-400	400-1000	1000-2000	2000-4000		10	10-50	50-120
± 0,1	± 0,2	± 0,3	± 0,5	± 0,8	± 1,2	± 2		± 1°30'	± 30'	± 10'



Poz.	Naziv dijela	Kom.	Materijal	Dimenzije	Mase	Broj standarda
9.	Izolacija	1	Staklena vuna	355x525x30		
8.	Zavareno tijelo kotla	1	S235 JR	410x608x1265	163,7	TK-25-15-ZAV.
7.	Baglame za vrata	6				
6.	Drzaci oplate	11	S 235 JR	36x35x2	0,02	TK-25-26
5.	Nosac dozatora	2	S 235 JR	20x20x2x240	0,026	TK-25-31
4.	Ukrasni lim	1	S 235 JR	414,4x584,4x1,5	0,35	TK-25-17
3.	Sklop donjih vrata	1	S 235 JR	360x81x232	2,97	TK-25-12-ZAV.
2.	Sklop srednjih vrata	1	S235 JR	360x81x420	4,59	TK-25-11-ZAV.
1.	Sklop gornjih vrata	1	S 235JR	360x81x420	4,59	TK-25-10-ZAV.

	Datum	Prezime i ime	Potpis	ThermoFLUX d.o.o.
Konstruisao	12.02.2013	Bičo S.dipl.ing.maš.		
Crtao	12.02.2013	Šeremet S.dipl.ing.maš.		
Pregledao	12.02.2013	Bičo S.dipl.ing.maš.		Površinska zaštita: Crni lak RAL 9005, 20 µm
Odobrio	12.02.2013	Bičo S.dipl.ing.maš.		
Mjerilo: 1:7		KOTAO PELLING 25 kW Sklop tijela kotla		Veza sa: TK-25-15-C_MON.
Tolerancije mjera prema ISO 2768 - 1m				Br.crteža: TK-25-15-B_ZAV.

SELTRON

PKO 25B

Peletni kotel
Woodpellets
Holzpellets

Tehnični podatki - Technical data - Technische daten

Nominalna moč Nominal thermal output Nennleistung	30 kW	V skladu s standardom In accordance with standard Nach dem Standard	EN 303-5:2012 EV 2015/1187
Minimalna moč Minimum boiler output Minimale Leistung	10 kW	Električni priključek Electrical connection Elektrischer Anschluss	230 V / 50 Hz / 6 A
Izkoristek pri nominalni moči Efficiency at nominal power Wirkungsgrad bei Nennleistung	88,7 %	Poraba električna moči Electric power consumption Elektrische Leistungsaufnahme	45 W
Max. delovna temperatura Max. operating temperature Max. Betriebstemperatur	90°C	Dimenzije kotla (Š x G x V) Dimensions of the boiler (W x D x H) Abmessungen des Kessels (B x T x H)	911 x 1010 x 1400 mm
Max. tlak kotla Max. boiler pressure Max. Kesseldruck	3 bar	Teža kotla Weight of the boiler Gewicht des Kessels	294 kg
Volumen vode v kotlu Water volume in the boiler Wasservolumen im Kessel	85 lt	Leto proizvodnje Year of manufacturing Baujahr	2020
Gorivo Fuel Brennstoff	Peleti Pellets Pellets	Masni pretok dim.plinov pri maks.topl.moči Flue gas mass flow at max.heat output Abgasmassenstrom bei max. Heizleistung	0,02 kg/s
Klasifikacija po EN 303-5 Classification by EN 303-5 Klassifizierung nach EN 303-5	5		

CE

SELTRON d.o.o. | Tržaška cesta 85 A | 2000 Maribor | Slovenia

EN

SELTRON

Instruction for installation
Service manual

Pellet boiler PKO

Content

SAFETY WARNINGS

Incorrect use can lead to damage and destruction of devices and things.
Supplied instructions and local regulations must be considered.

Warning in these instructions do not exclude local laws and regulations.
Distracting external factors, such as low quantity of fresh air or improper intervention into device can lead to serious injuries.
Problems with flue gas channels, such as inadequate dimensions or irregular cleaning may let to poor combustion and formation of harmful emissions.
Room where the boiler is placed has to have connection for external air or air vent so enough combustion air can flow into the room. Blocked fresh air supply can lead to poisoning with CO as well as incorrect operation of the boiler.
In a case of smell of a smoke or flue gas leakage, immediately leave the room and open all doors and windows and ventilate the room. If flue gasses are still present, immediately turn OFF the boiler in call service department.
In the room where boiler is installed do not store flammable or explosive products. Connection and installation of the boiler can be performed by qualified person in accordance with instructions and local regulations.
First start-up can be performed only by authorized person, otherwise warranty on the product is not valid.
When boiler is working do not unplug it from electricity.
Regular cleaning and maintenance of the boiler is key to long and stable operation. Only pellets can be use as fuel. Use of other fuel is not allowed!
During use, parts of the boiler may become hot so be careful when handling. Be sure not to touch the parts without proper insulation.

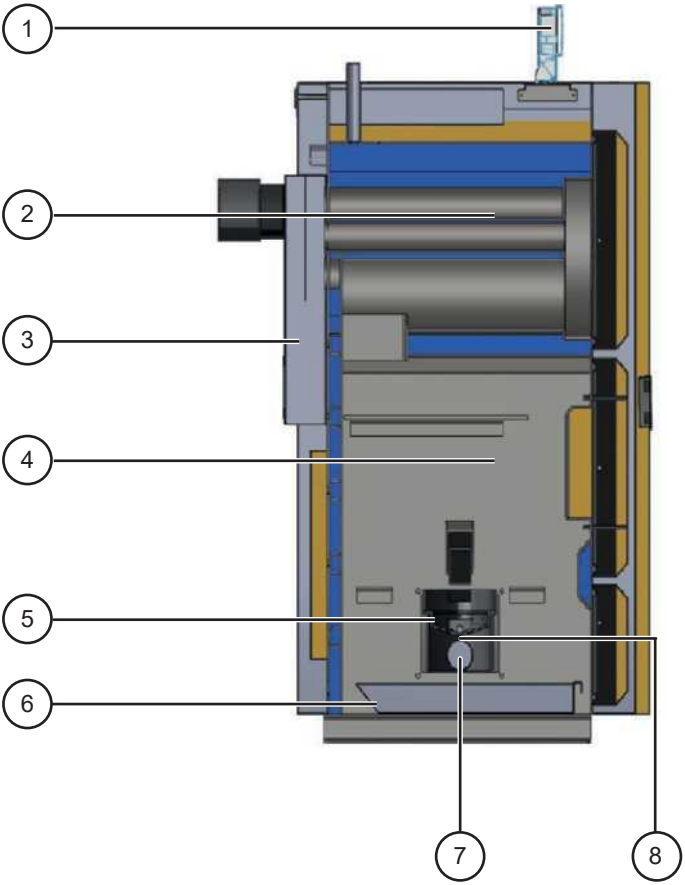
APPROPRIATE FUEL

Only pellets from natural wood can be used for heating. The diameter of the pellets should be maximum 6 mm. For efficient and stable operation use quality pellets, without additives. We suggest pellets that comply with Austrian standard ENplus (A1, A2) or GERMAN DINplus. Make sure, that pellets have equal diameter and the length should be between 1 and 4 cm. Pellets should be well compressed, what can be seen as amount of dust in the bag (there should be as little dust as possible).

ŐNORM A1 standard allows:
Maximum length 4 cm, left dust in the bag till max. 1 %, left ash after burning till 0,7 %

Boiler should not be used for disposal burning.

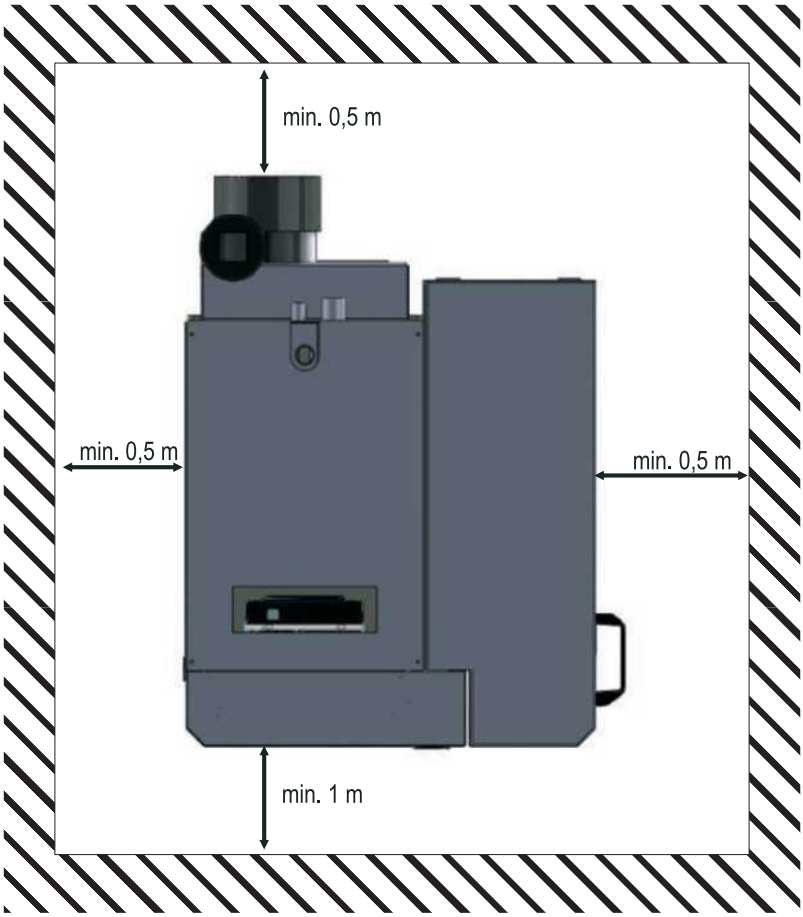
BOILER CROSS-SECTION



1. Controller
2. Heat exchanger
3. Flue gas chamber
4. Burning chamber
5. Burning pot
6. Ash tray
7. Burning air connection
8. Pellet igniter

BOILER PLACEMENT

Due to safety and service procedures certain distance to the walls or other objects is necessary. At rear, left and right side, the distance should be minimum 50 cm. At the front the 1 minimum distance should be 1 m.

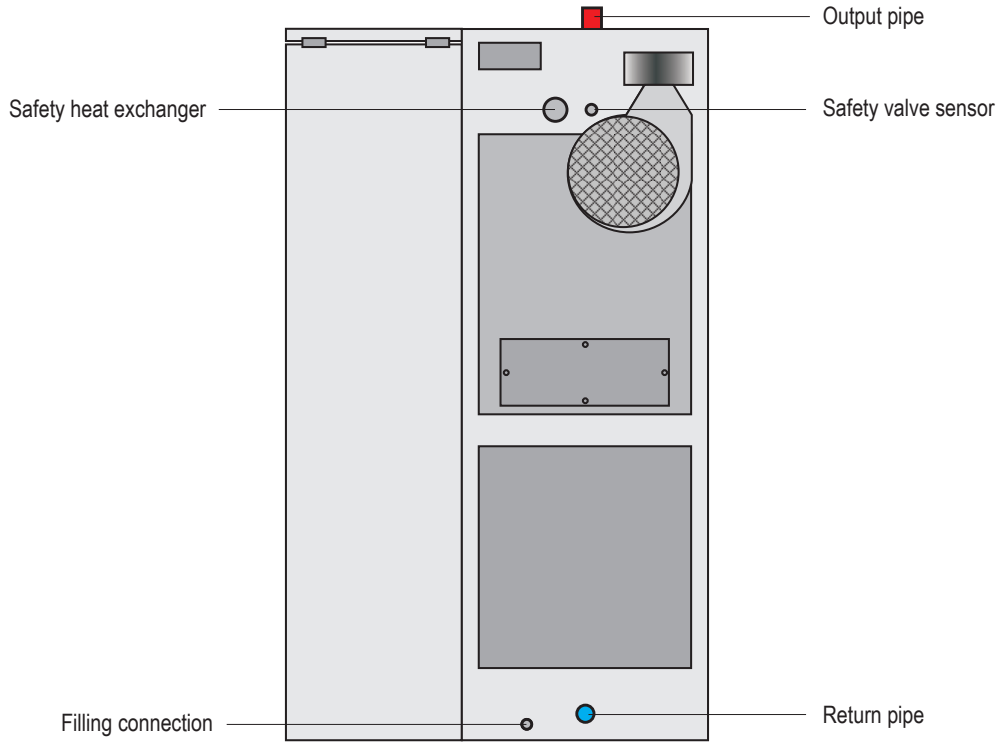


INSTALATION AND CONNECTION

Boiler has integrated two safety elements, which are used for protection against potential damages and one optional safety element.

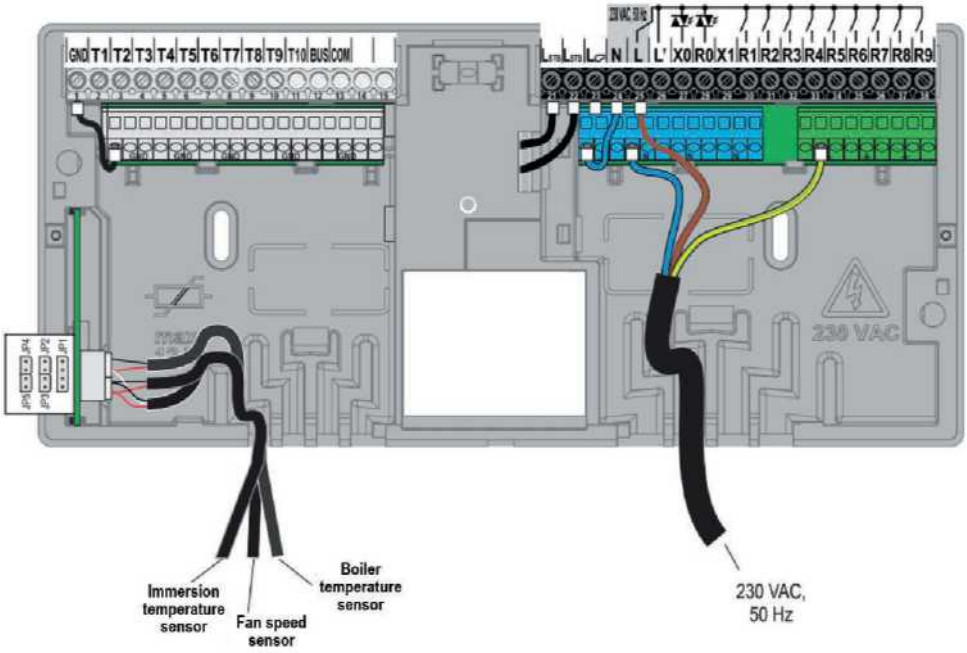
Pressure switch: Switch is connected to flue gas chamber and it checks underpressure in the boiler. If there is not enough underpressure the boiler will not start **(Presostat ERR).**

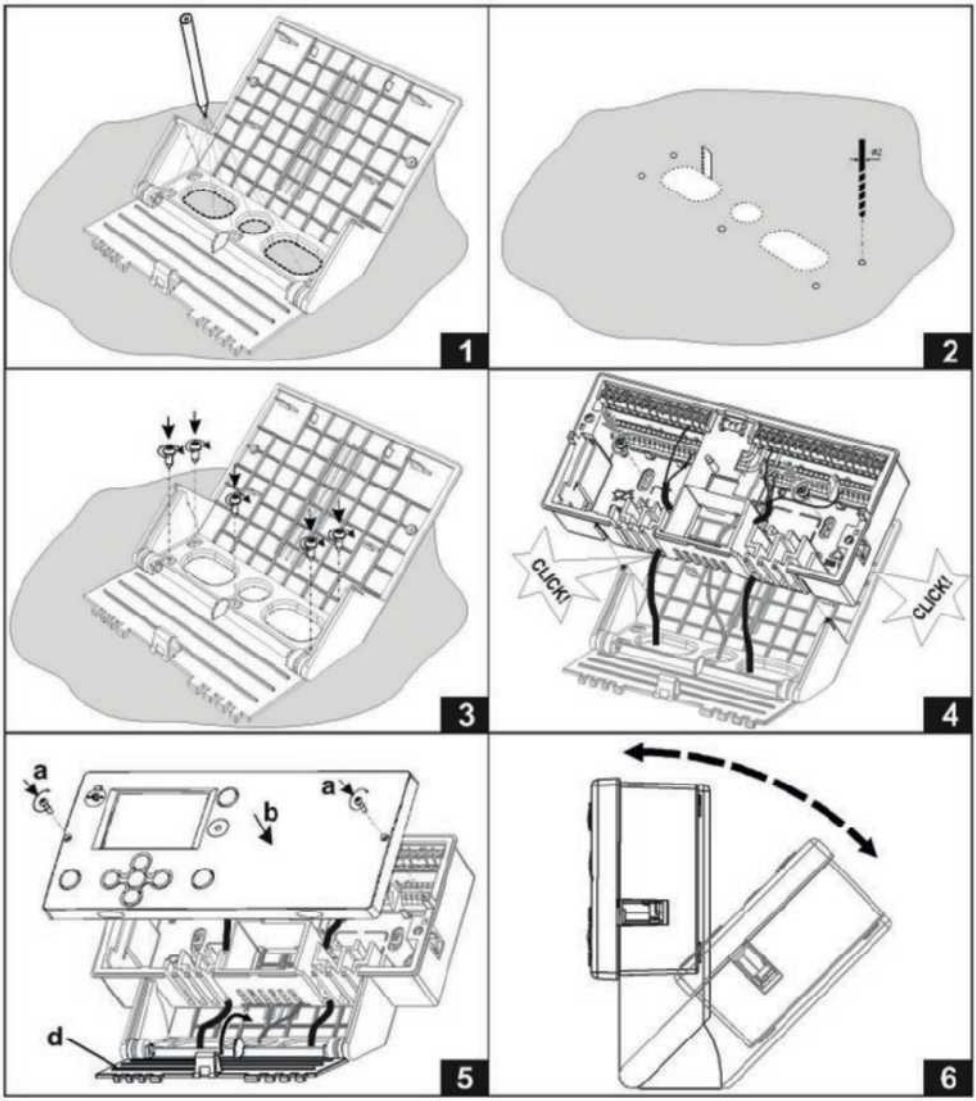
STB fuse: Controller has built-in thermal fuse, which serves to protect the boiler against overheating. STB switch is activated if the temperature gets above 110 °C.



INSTRUCTIONS ON THE INSTALLATION LOCATION OR THE INSTALLATION POSITION OF THE SENSORS FOR CONTROL, DISPLAY AND SAFETY DEVICES

The connection of control devices should be performed by a qualified professional or an authorized organization. Before intervening in the wiring, make sure that the main switch is turned off. The regulations for low-voltage installations according to IEC 60364 and VDE must be observed 0100, legal regulations for accident prevention, legal regulations for environmental protection and other national regulations. Before opening the housing, make sure that the power supply is disconnected at all poles. Failure to follow instructions may result in serious injury, such as burns or even life-threatening. The controller must be connected via an isolator Switch for all poles. The pole spacing when the switch is open must be at least 3 mm. All low-voltage connections, e.g., temperature sensor connections must be laid separately from connections that are under mains voltage. All temperature sensor connections are made the left panel and live connections to the right panel of the controller. Relay R0 on X0 is designed as a semiconductor relay and is used to control the speed of the fan (X0) or feed auger (R0).





1. Hold the console to the mounting location and mark the holes for the grommets and screws.
2. Cut out holes for the lead-ins and drill holes for the screws.
3. Fasten the console with the screws provided.
4. Connect the controller bracket to the console and secure with the screws provided. Feed the switch cables through the opening on the left, the capillary tubes of the thermal discharge safety device through the middle opening and the cable for the mains voltage through the opening on the right.
5. Make the electrical connections, close the console cover (d), put the controller (b) back into the bracket and secure with screws (a).
6. Set the control console to the desired position.

CONNECTING THE TEMPERATURE SENSOR

Immersion temperature sensor
The immersion temperature sensor is intended for installation in the boiler sleeve, heat accumulator, domestic water heater, solar collector and other places. It is ensured that the sensor rests against the sleeve walls. Secure the sensor against falling out with a clamp or screw.

Contact temperature sensor
Mount the contact temperature sensor on the flow line above the circulation pump or behind the mixing valve. Thoroughly clean the pipeline at the selected location. Place the sensor on the cleaned area and fasten it with the enclosed spring clip.

Outdoor air temperature sensor
Mount the outside temperature sensor on the north or north-west facade, approx. 2 meters above the floor. Installation above the windows or air shafts and on the southern facade is not permitted. First remove the protective cover and then loosen the two fastening screws. Screw the sensor into the intended position using the wall screw provided. Feed the cable into the sensor through the entry from the bottom and connect.

Room temperature sensor
Mount the room temperature sensor on the interior wall of the living room that is not exposed to sunlight and away from heat sources and draughts. First remove the cover, then screw the base to the chosen spot about 1.5 meters above the floor. It can be installed on the standard flush-mounted box or directly on the wall. You need a two-wire signal cable for the electrical connection. If thermostatic valves are installed on radiators in the room where the room unit is located, they must be fully open. If the room temperature sensor is connected to terminal T1, parameter S1.4=1 must be set. If the room temperature sensor is connected to terminal T8, parameter S1.5=1 or S1.5=4 must be set.

FLUE GAS CONNECTION

For a good and stable operation, the flue gases pipes should have proper dimensions. Used flue gas pipes should be in accordance with standard EN 13384-1. Diameter of the flue gas connection on the boiler is 120 mm.

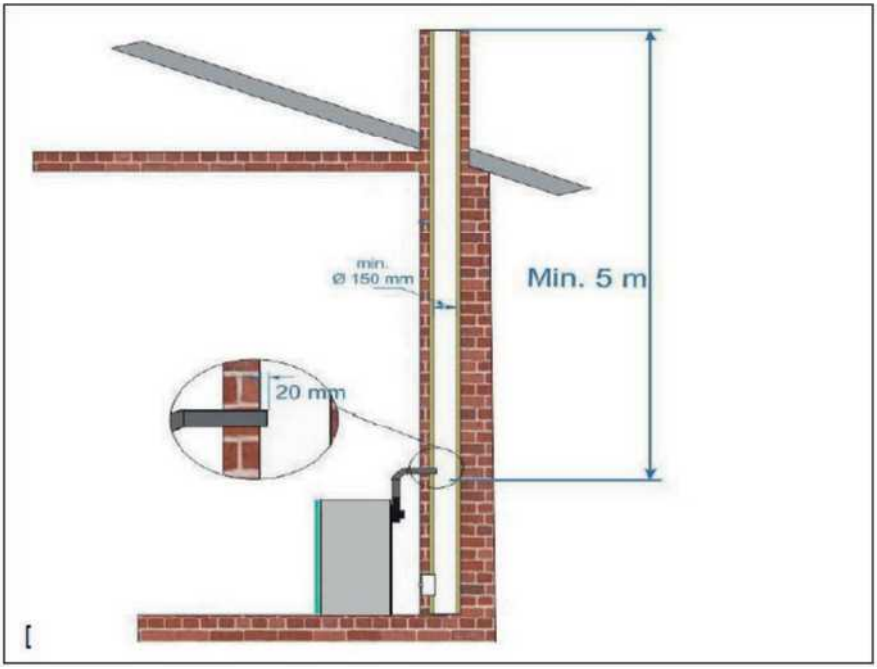
Flue gas pipes should be made in accordance with profession and local regulations. Flue has pipes should be designed for heating with biomass boilers.

Flue has pipes should be constructed in such a way so that access for inspection and cleaning is possible trough entire length.

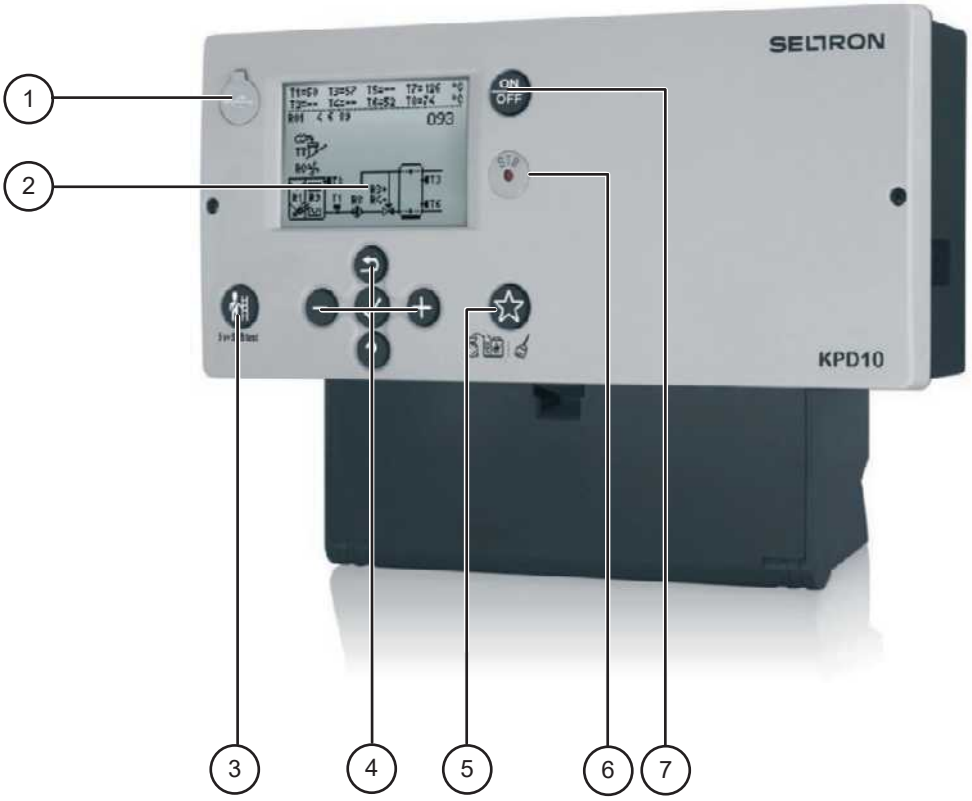
During construction do not make bends, grater then 45 °C and be careful that no pipes are placed horizontally or downwards.

Flue gas pipes should be sealed tight so no gas leakage is possible.

Pipes should be dimensioned and constructed so that the natural draught in the boiler is minimum 9 Pa.



BOILER CONTROLLER



1 - USB connection

2 - Graphic display

3 - Menu for system test, emission measurement and STB test

4 - Keyboard

5 - Pellet filling and cleaning program activation

6 - STB safety

7 - ON/OFF button

KEYBOARD

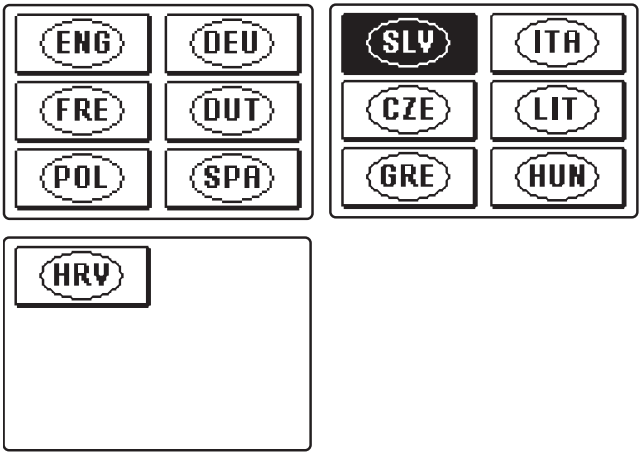
Key	Description
−	Left, value reduction
+	Right, value increase
✓	Enter into menu, value confirmation
?	Help
⮌	Return
ON / OFF	ON/OFF of the controller. Please see page 16
	System test, emission test, STB test **Warning: These functions can be performed only by qualified person!**
☆	Filling of pellets, boiler cleaning

INITIAL CONTROLLER SETUP

KPD boiler controllers are equipped with an innovative solution “Easy start” which enables the setup of controller in just three or four easy steps.

When the controller is connected to the power supply for the first time, the display first shows the program version and company logo and then the first step of the procedure for controller settings is started.

STEP 1 - LANGUAGE SETUP

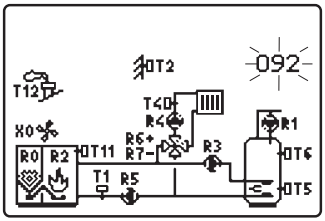


Use buttons — and + to select the requested language.
Confirm the selected language by pressing ✓ .

The controller requires confirmation of language selection with ✓ button.

In case you chose the wrong language, return to the language selection with the ⮌ button.

STEP 2 - HYDRAULIC SCHEME SETUP



Select a hydraulic scheme for controller operation.
Move between schemes with buttons — and +.
Confirm the selected scheme by pressing ✓.

The controller requires a confirmation of language selection with the button ✓.
In case you choose the wrong scheme, return to scheme selection with the button ⮌.

Later you can change the selected hydraulic scheme with service parameter S1.1.

STEP - SETUP OF HEATING CURVE STEEPNESS FOR HEATING CIRCUIT

Set the heating curve steepness for the first heating circuit.
Change the value with buttons — and +.
Confirm the selected value by pressing ✓.

The controller requires a confirmation of the set heating curve steepness with the button ✓. In case you choose the wrong heating curve steepness, return to heating curve steepness selection with the button ⮌.

Later you can change the heating curve steepness with parameter P2.1.
The meaning of heating curve steepness is described in detail on page 47.

RESET

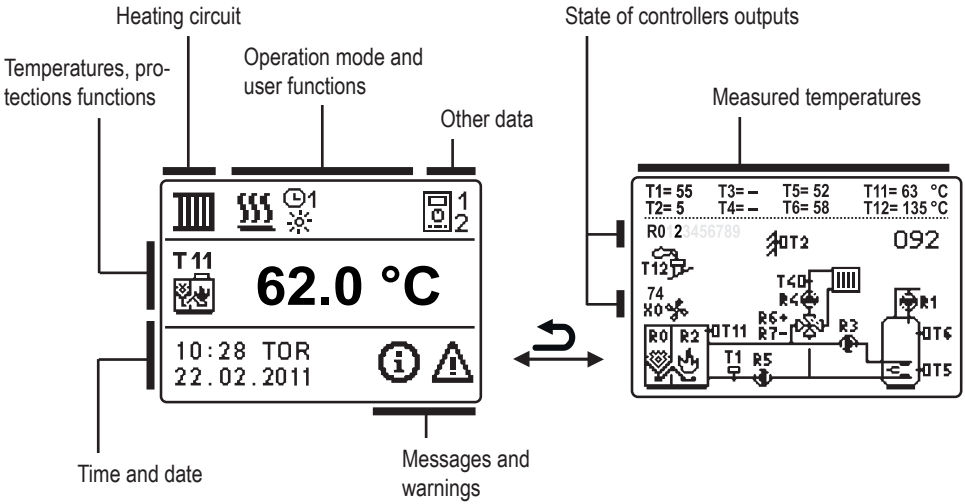
Disconnect the controller from power supply. Press and hold the button **?** *and connect power supply.*

Attention! *The controller will be reset and requires additional setting. When the controller is reset, all of its previous settings are deleted.*

GRAPHIC LCD DISPLAY

On the LCD display we can look up all the important data for the controller operation.

DESCRIPTION AND PRESENTATION OF THE BASIC SCREEN:



Review of data on the screen:
In the middle of the screen are displayed operation mode and active user functions. To switch between heating circuits and the screen with the hydraulic scheme review use the button ⮌ .
Temperatures, active outputs, protection functions and other data appear in the bottom section of the screen. To review temperatures and other data, use buttons — and +.
The number of sensors and other data displayed on the screen depends on the selected hydraulic scheme and controller settings.

If you wish to retrieve the requested data after using the keyboard, look for the data with buttons — and + , then confirm it by pressing the button ✓ for 2 seconds.

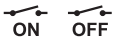
If you press the button ⮌ for 2 seconds, the temperature review will change from a single line review into a double line review or vice versa. In the two-line temperature review, the measured temperature appears in the first line, and the requested or the calculated temperature appears in the second line.

DESCRIPTION OF SYMBOLS PRESENTED ON THE DISPLAY

SYMBOLS FOR HEATING CIRCUITS AND HEAT SOURCE

Symbol	Description
	Pellet boiler.
	Mixing heating circuit.
	D. h. w. heating.

SYMBOLS FOR BOILER OPERATION MODE

Symbol	Description
	Boiler start based on timer.*
	Boiler stop based on timer.*
	Turned OFF.
	Boiler ignition (numbers indicate the timer till the end of ignition phase
	Boiler works with minimum power.
	Boiler works (number indicated the power of boiler).
	Boiler works with maximum power.
	Boiler stop (numbers indicate the time till the end of stop phase).
	Overheating function activated.
	Boiler cleaning.
	ON with external contact OFF with external contact
	Manual mode.
	Emission measurement.
	STB fuse test.

* The number indicates whether it is the first or second time program.

SYMBOLS FOR HEATING OPERATION MODE INDICATION

Symbol	Description
	Room heating.
	Room cooling.
	Operation according to timer - day temperature. *
	Operation according to timer - night temperature. *
	Requested day temperature operating mode.
	Requested night temperature operating mode.
	OFF.

SYMBOL FOR D. H. W. MODE

Symbol	Description
	DHW Operation according to timer - ON mode. *
	DHW Operation according to timer - OFF mode. *
	OFF.
	ON.

SYMBOLS FOR USER FUNCTIONS

Symbol	**Description**
	PARTY operation mode.
	ECO operation mode.
	Holiday operation mode.
	One-time DHW heating.
	Anti-legionella protection.
	Automatic switchover to summer heating mode.

Symbol	**Description**
	Floor drying.
	Operation with constant stand-pipe temperature.
	Remote activation.
	Boost heating.

SYMBOLS FOR INDICATION OF TEMPERATURES AND OTHER DATA

Symbol	**Description**
	Measured temperature.
	Calculated or requested temperature.
	Room temperature.
	Outdoor temperature.
	Boiler temperature.
	Stand-pipe temperature.
	Return-pipe temperature.
	Domestic hot water temperature.
	Heat accumulator temperature.
	Floor temperature.
	Boiler return-pipe temperature.
	Flue gas temperature.
	Temperature of the area where heat pump is installed.
	D. h. w. circulation pipe temperature.
	Pellet level in the hopper (number indicates part of left pellets in the hopper).
	Burner.
	Heating circuit pump.

Symbol	Description
R0123456789 R0123456789	Status of the controller's control outputs - relays are switched on. Status of the controller’s control outputs - relays are switched off.
	Mixing valve - closing.
	Mixing valve - opening.
	D. h. w. warming pump.
	Circulation pump for d. h. w.
	Electric heater.
	Output operation according to program timer.
T1, T2, ...T12	Temperature measured by sensors.
TR1, TR2	Temperature measured by a room sensor or room unit DD2+.
	Heating circuit is switched off or has limited temperature due to priority of d .h. w. warming.
	Limitation of stand-pipe temperature due to exceeded maximum floor temperature.
	Limitation of stand-pipe temperature due to exceeded maximum temperature difference between stand and return-pipe i.e. exceeded maximum power of heating circuit.
	Limitation of stand-pipe temperature due to unsurpassed minimum boiler temperature.
	Limitation of stand-pipe temperature due to the unsurpassed heat source return-pipe temperature.

SYMBOLS FOR PROTECTION FUNCTIONS

Symbol	Description
	Boiler overheating protection.
	Accumulator overheating protection.
	D. h. w. storage tank overheating protection.
	Frost protection - heating circuit.
	Frost protection - boiler switch-on to minimum temperature.

SYMBOLS FOR THE INDICATION OF COMMUNICATION BETWEEN DEVICES

Symbol	Description
	Devices connected to communication port COM.
	Room unit DD2+ is connected. The number beside room unit indicates, whether this is the first or the second room unit.
	State of the controller in bus connection.
	Standalone controller - not in bus network.
	The first controller in bus network.

SYMBOLS FOR MESSAGES AND WARNINGS

Symbol	Description
	**Message** In the event of exceeding the maximum temperature or when a protection function is switched on, the symbol on display flashes. When maximum temperature is no longer exceeded or when a protection function has switched off, a turned on symbol will note the recent event. By pressing the button **?**, the message review screen is retrieved.
	**Warning** In the event of sensor malfunction, bus network error or com connection error, the symbol on display flashes. When the error is eliminated or is no longer present, a turned on symbol will note the recent event. By pressing the button **?** , the message review screen is retrieved.

HELP, MESSAGES AND WARNINGS SCREEN

By pressing the button **?**, the help, messages and warnings screen is retrieved. A new window opens with the following icons.

Short instructions
Short instructions on the use of controller.

Controller version
Review of the controller type and program version.

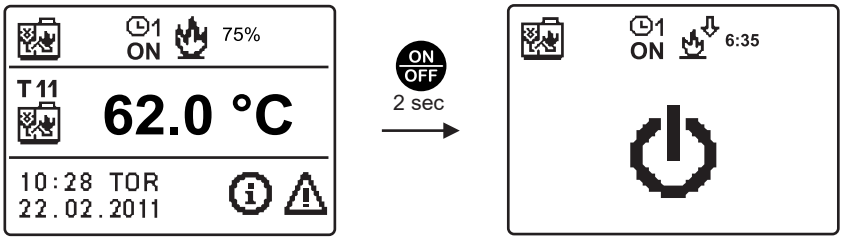
Messages
List of exceeded maximum temperatures and list of activated protection functions. By pressing the buttons — and + navigate through the list of messages. Exit the list by pressing the button ⮌.

Warnings
List of sensors and other component malfunctions. By pressing the buttons — and + navigate through the list of messages. Exit the list by pressing the button ⮌.

Delete list of messages and warnings
Delete list of messages, list of warnings, all unconnected sensors, error for lack of pellets and error of STB fuse.
Attention: *You will not be able to delete the sensors necessary for the controller's.*

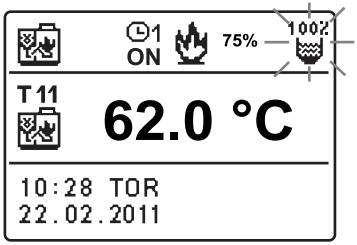
ON AND OFF OF THE CONTROLLER

If we press button ON/OFF we turn ON the controller and boiler. On the display the data about operation modes will be shown.
To switch off the boiler, press and hold the button ON/OFF for 2 seconds. If the boiler is not working, then controller will turn OFF immediately. If the boiler works, the process of shot down starts. On the display the icon for OFF is displayed and the symbol for shot off time starts running 10:35. When the boiler is OFF, the symbol is not shown anymore.



PELLET FILLING

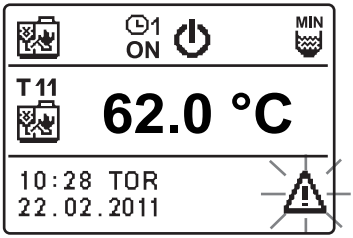
Controller displays the quantity of pellets in the hopper.
When we will the pellets fully into the hopper, we press ☆, where submenu is open and we chose the symbol . After we confirm it, the full amount of pellets (100%) will be shown on the top right part of display.



We have to be careful, the we always first fill the pellets and then we reset the quantity in the controller. Always we fill the hopper till the top (10 cm from the top of the hopper down).

ERROR IN THE CONTROLLER, DUE TO LACK OF PELLETS

If pellets run out during working of the boiler, the error will be shown on the display.



First we will the pellets into the hopper, then we check the error by pressing **?** and with **—** and **+** we select symbol ⚠.
When we see the error **»PELETI error«** we confirm it with button ✓ and we exit by pressing button ⮌.

SAFETY TEMPERATURE LIMITER STB

Safety temperature limiter is used as a thermal protection of heat source. It disconnects heat source power supply if temperature of heat source exceeds 110 °C. Activated safety temperature limiter is indicated with red illuminated **STB and STB error** is displayed.

If a safety temperature limiter STB activates in normal operation mode a qualified service person needs to check the heating system for proper operation before continuing with system operation.

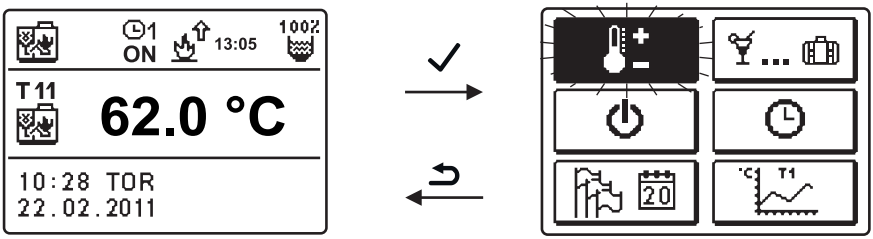
EMISSION MEASUREMENT AND STB TEST

Emission measurement and STB test can be performed only by service man.

A short press of the button activates the emission measurement operating mode. A detailed description of the operation is described in the Boiler Installation and Setup Instructions in the section Emission measurement and boiler setup on page 68.

A long press of the button (5 seconds) activates the STB thermal fuse test. A detailed description of the operation is described in the Boiler Installation and Setup Instructions in the chapter STB thermal fuse test operation on page 69.

ENTERING AND NAVIGATING THROUGH THE MENU



To enter the menu press the button ✓. To navigate through the menu, use buttons — and +, and confirm your selection by pressing the button ✓.

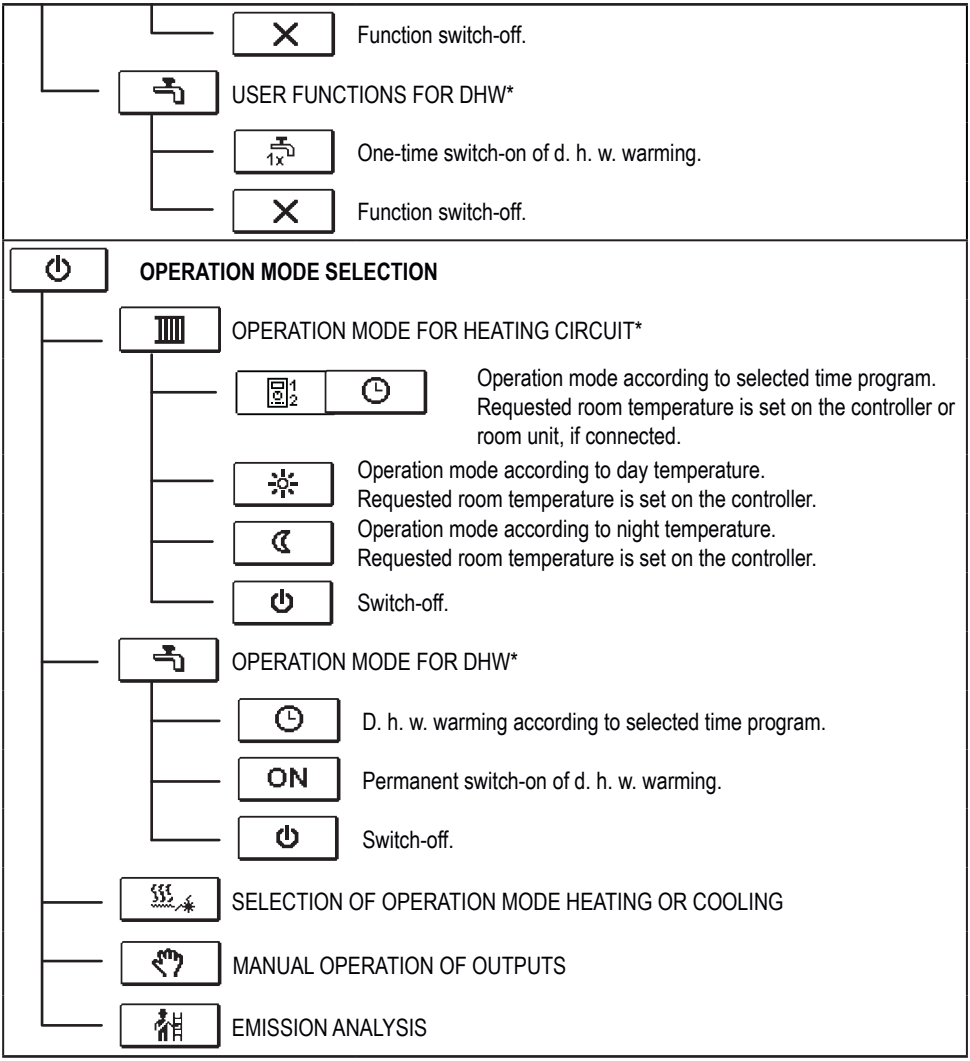
You can return to the previous screen by pressing ⮌.

If no button is pressed for some time, the screen illumination will be switched off or reduced according to the setting.

MENU STRUCTURE AND DESCRIPTION

- **TEMPERATURE SETTING**
  - Day temperature.
  - Night temperature.
  - DHW temperature.
  - Boiler temperature / storage tank temperature.
- **USER FUNCTIONS**
  - USER FUNCTIONS FOR THE FIRST HEATING CIRCUIT*
    - PARTY operation mode.
    - €CO ECO operation mode.
    - Holiday operation mode.

* Not available with all schemes.



* Not available at all schemas.

TIME PROGRAMS

- TIME PROGRAM FOR HEATING CIRCUIT*
  - 1 The first time program.
  - 2 The second time program.
- TIME PROGRAM FOR DHW
  - 1 The first time program.
  - 2 The second time program.
- TIME PROGRAM FOR PELLET BOILER*
  - 1 The first time program.
  - 2 The second time program.

BASIC SETTINGS

- User language.
- Time and date.
- SETTINGS
  - Duration of active display illumination and return to the main menu.
  - Intensity of active display illumination.
  - Intensity of stand-by display illumination.
  - Contrast.

DATA OVERVIEW

- Graphic display of operating hours of the first and second burner stage.
- Graphic display of daily temperatures for the period of past week.
- Detailed graphic display of temperatures for the current day.
- Output operation time counters.
- Special service data.

USER PARAMETERS

- P1 General settings.
- P2 Settings for the heating circuit.
- P3 Not available.
- P4 DHW settings.
- P5 Basic setting for energy source.

SERVICE PARAMETERS

- S1 General service parameters.
- S2 Service parameters for heating circuit.
- S3 Service parameters for return boiler water temperature.
- S4 Service parameters for d. h. w..
- S5 Basic setting for energy source.
- S6 Service parameters for pellet boiler.
- S7 Service parameters for pellet boiler.
- S8 Not available.

PARAMETERS FOR ENERGY MEASUREMENT

PARAMETERS FOR FLOOR DRYING

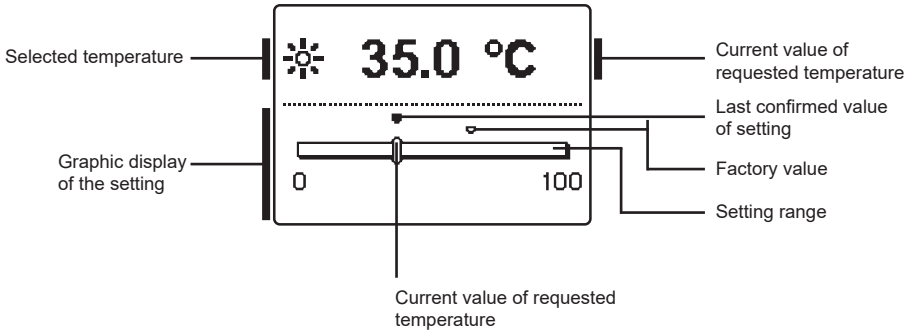
FACTORY SETTINGS

- RESET Reset of controller parameters.
- RESET Reset of time programs.
- RESET Reset of all settings and initial controller setup.
- Save user settings.
- Upload user settings.

TEMPERATURE SETTINGS

The menu displays the temperatures available by selected hydraulic scheme.

Select the temperature with buttons −, + and ✓.
A new screen with temperatures will open:



Set the requested temperature with buttons − and + and confirm it with the button ✓.

Exit the setting by pressing ⮌.

USER FUNCTIONS

User functions enable additional comfort and benefits of using the controller. The following user functions are available in the menu:

Heating circuit *

DHW **

USER FUNCTIONS FOR HEATING CIRCUIT:

PARTY operation mode

PARTY function activates operation according to the requested comfort temperature. Select Party function with buttons — and + and activate it with the ✓. To set the expiration time and requested temperature, select the button .

Now use the — and + buttons to select the setting you wish to change and press the button ✓. The value will begin to flash. Change the value with buttons — and + and confirm it by pressing the button ✓.

Exit the setting by pressing the ⮌.

ECO operation mode

PARTY function activates operation according to the requested comfort temperature. Select Party function with buttons — and + and activate it with the ✓. To set the expiration time and requested temperature, select the button €CO.

Now use the — and + buttons to select the setting you wish to change and press the botton ✓.The value will begin to flash. Change the value with buttons — and + and confirm it by pressing the button ✓.

Exit the setting by pressing the ⮌.

* Available only with schemas with heating circle.
** Available only with schemas with sanitary hot water.

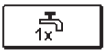
 **Holiday mode**

The Holiday mode activates the heating circuit control according to the selected energy saving temperature until a specified date.
Select the Holiday mode by pressing — and + and activate it by pressing the key ✓.
To set the end date of the Holiday mode and the chosen energy saving temperature, select the icon  again.

Now use the keys — and + to select the setting you want to change and press the key ✓
The value starts flashing. Use the keys — and + to change the value and confirm it with the key ✓ .

To exit the setting, press ⮌.

User functions for d. h. w. warming:

 **One-time activation of d. h. w. warming**

This function activates immediate d. h. w. warming to the requested temperature. When the requested d. h. w. temperature is reached, the function deactivates automatically.
Use buttons — and + to select the one-time d. h. w. warming and activate it by pressing the button ✓.

Exit the setting by pressing the button ⮌.

OPERATION MODE SELECTION

In the menu are selection of operation mode for each heating circuit, for d. h. w. warming and other operation modes. Following operation modes are available in the menu:


Heating circuit.


Domestic hot water.


Manual operation.


Switchover between heating and cooling.


Emissions analysis.

OPERATION MODE FOR HEATING CIRCUIT:


Operation according to selected time program
Operation according to the selected time program with day and night temperature which is set on the controller.


Operation according to the selected time program with day and night temperature which is set on the room unit DD2+.


Operation mode according to day temperature
Controller operates according to the requested day temperature which is set on controller.


Operation mode according to night temperature
Controller operates according to the requested night temperature which is set on controller.


Switch-off
Controller is switched off. Frost protection remains active, if operation mode heating is selected. Overheating protection remains active, if operation mode cooling is selected.

OPERATION MODE FOR D. H. W. WARMING:

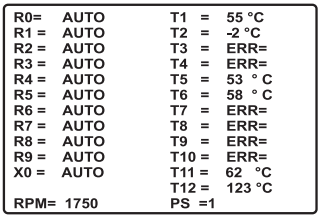

D. h. w. warming according to selected time program
D. h. w. is warmed according to the selected time program.

Permanent activation of d. h. w. warming
D. h. w. warming operates continuously.


Switch-off
D. h. w. is not being warmed.

MANUAL OPERATION MODE:

This operation mode is used when testing the heating system or in the event of a malfunction. Each control output can be manually switched on, off or set to operate automatically.



Move between outputs R0 to X0 with buttons — and +.
Select the output by pressing ✓. Value ON, OFF or AUTO will begin to flash.
Now you can change the output status with buttons — and +. Confirm the setting by pressing ✓.

Exit the setting by pressing the button ⮌.

HEATING AND COOLING MODE SELECTION:

To switchover between heating and cooling select icon and press key ✓.

Heating

Cooling

For cooling function, a room sensor or a room unit DD2+ needs to be connected and the system for cooling water supply must be switched on.

When switching between heating and cooling, you should change the requested day and night temperature.

EMISSION ANALYSIS:

This operation mode is intended for emission measurement. Controller controls the boiler power at 75 % witch activation of energy users and so it provides boiler operation without burner switch-off's.
Function automatically expires after 45 minutes or it can be switched off earlier by selecting the icon once again.
Detailed description you can find on page 68.

Emission analysis should be performed by service man only!

TIME PROGRAM SETTINGS

Weekly time programs enable automatic switchover between day and night temperature or activation and deactivation of domestic hot water warming.

Heating circuit

Domestic hot water

Pellet boiler

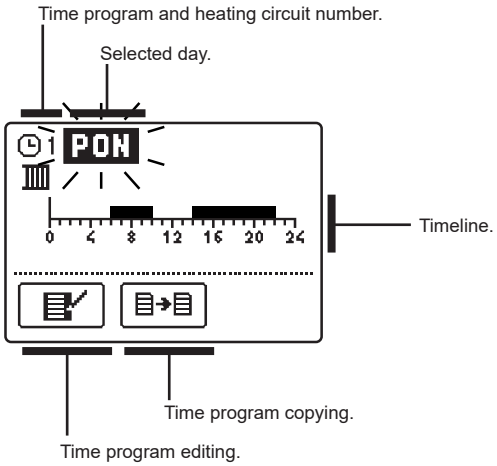
For each heating circuit there are two time programs available.

1 First time program

2 Second time program

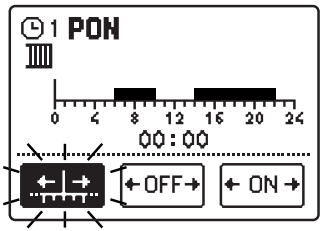
Changing of the timer

Select the requested heating circuit and time program with buttons −, + and ✓.
A new screen will appear:



Select the day, which you wish to edit or copy with buttons −, + and ✓. Now use buttons −, + and ✓ to select the icon for time program management e or the icon for time program copying .

Time program editing

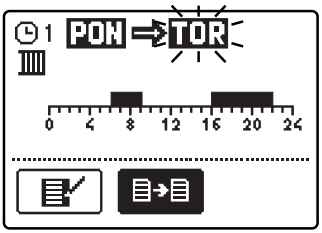


A new screen appears with the display of time program and three icons for editing the program:

- free movement of the cursor
- OFF - redrawing of switch-off interval or night temperature
- ON - redrawing of switch-on interval or day temperature

Select the requested command icon with buttons — and + and confirm the selection by pressing the button ✓. Cursor will appear on the time line. Now draw the requested time interval course with buttons — and +. Finish drawing of time program by pressing the button ✓.
Exit the time program editing by pressing the button ⮌.

Time program copying



A new screen appears with the display of time program for the selected day. On the top of the screen you will find the field for the selection of day or a group of days into which you wish to copy your time program.
Select the day or a group of days with buttons — and +.
Press the button ✓ to copy.

Exit the copying by pressing the button ⮌.

Default settings of time programs

The first time program for room heating and d. h. w. warming and pellet boiler working 1

Day	Switch-on interval
MON. - FRI.	05:00 - 07:30 13:30 - 22:00
SAT. - SUN.	7:00 - 22:00

The second time program for room heating and d. h. w. warming and pellet boiler working 2

Day	Switch-off interval
MON. - FRI.	05:00 - 07:30
SAT. - SUN.	7:00 - 23:00

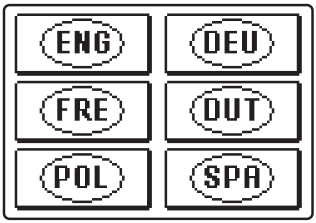
BASIC SETTINGS

This menu is intended for the setting of language, time, date and display.

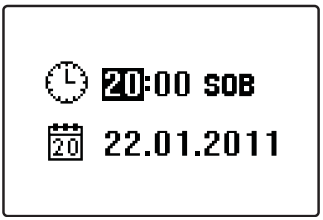
User language

Select the requested user language with buttons − , + and confirm it by pressing ✓.

Exit the setting by pressing the button ⮌.



Time and date



Display settings

The following settings are available:

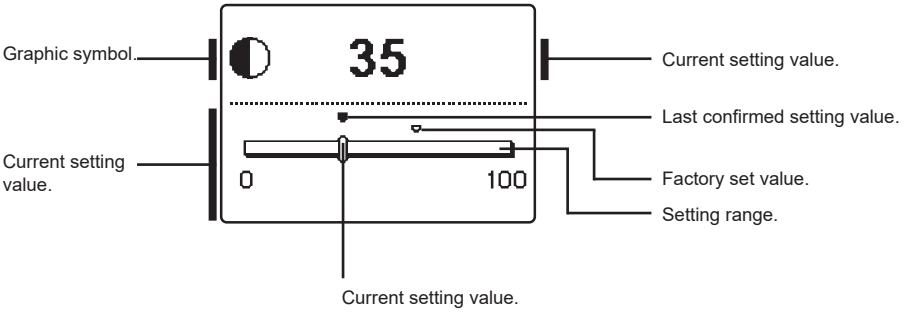
Duration of active display illumination and return to the main menu.

Intensity of active display illumination.

Intensity of standby display illumination.

Contrast.

Select and confirm the requested setting with buttons −, + and ✓.

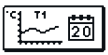


Change of setting is stored only if confirmed with the button ✓.

DATA OVERVIEW

The following icons for accessing data on the controller operations are available in the menu:

GRAPHIC DISPLAY OF OPERATING HOURS OF THE FIRST AND SECOND BURNER STAGE



GRAPHIC DISPLAY OF DAILY TEMPERATURES FOR THE PERIOD OF PAST WEEKA

Graphic display of daily temperature courses for each sensor. Temperatures are recorded for the past week of operation.

DETAILED GRAPHIC DISPLAY OF TEMPERATURES FOR CURRENT DAY

Detailed graphic display of temperature course in the current day for each sensor. The frequency of temperature recording can be set with parameter P1.7.

OUTPUT OPERATION TIME COUNTERS

Displayed are operation times of controller's outputs.

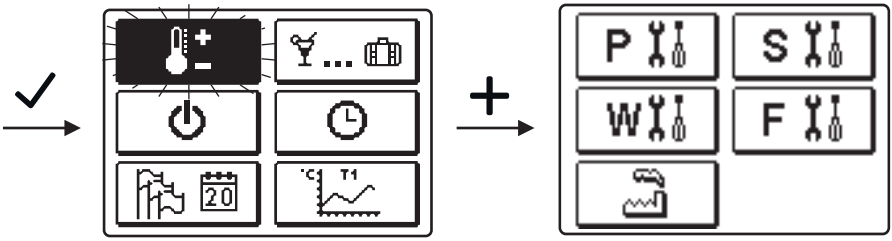
SPECIAL SERVICE DATA

These serve to provide diagnostics for technical support.

You can review temperature graphs by moving between sensors with buttons — and +. Press button ✓ on selected sensor. Date begins to flash. Now move between days with buttons — and +. Press button ✓ to return to sensor selection. You can change the range of temperature display on the graph with the button question mark ? . Exit temperature review by pressing the button ⮌.

CONTROLLER PARAMETERS

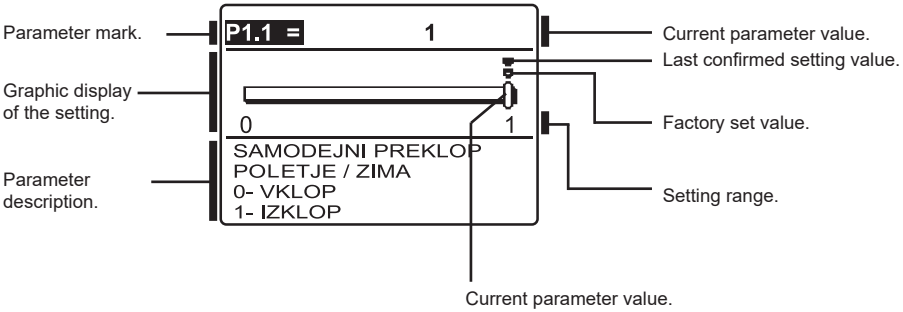
All additional settings and adaptations of the controller's operations are performed with the help of parameters. Available are user, service and function parameters. Located are on the second menu screen.



In each group, only the parameters used in the selected hydraulic scheme can be seen. Factory set values of parameter settings also depend on the selected hydraulic scheme.

P USER PARAMETERS

User parameters are divided into the following groups: P1 - general settings, P2 - settings for the first heating circuit, P3 - settings for the second heating circuit, P4 - settings for domestic hot water, P5 - settings for boilers, and P6 - settings for alternative energy sources. When you select the requested group of parameters in the menu, a new screen appears:



You can change the settings by pressing the button ✓. The setting value will begin to flash. Now you can change it with buttons — and +. Confirm the setting by pressing the button ✓. Now you can move on to another parameter with buttons — and + and repeat the procedure. Exit the parameter settings by pressing the button ⮌.

P1 *Basic settings:*

Par.	Parameter name	Description	Setting range	Default value
P1.1	AUT. SWITCHOVER SUMMER / WINTER	Automatic switch-off and switch-on of heating in respect to average one-day outdoor temperature.	0 - NO 1 - YES	1
P1.2	AVERAGE OUTDOOR TEMP. FOR SUMMER / WINTER SWITCHOVER	Setting of average one-day outdoor temperature at which the heating should switch-off or switch-on.	10 ÷ 30 °C	18
P1.3	OUTDOOR TEMP. FOR ACTIVATION OF FROST PROTECTION	Setting of outdoor temperature by which the frost protection will activate and run boiler at minimum temperature.	-30 ÷ 10 °C	-10
P1.4	REQUESTED ROOM TEMP. WHEN HEATING IS SWITCHED OFF	Setting of requested room temperature when heating is switched off.	2 ÷ 12 °C	6
P1.5	TEMPERATURE ROUND UP	Precision of displayed temperatures.	0 - 0.1 °C 1 - 0.2 °C 2 - 0.5 °C 3 - 1.0 °C	2
P1.6	AUT. SHIFT OF CLOCK TO SUMMER / WINTER TIME	With the help of a calendar, the controller carries out the automatic clock changeover between summer and winter time.	0 - NO 1 - YES	1
P1.7	PERIOD OF TEMPERAT. LOGGING	By setting this field you define how often the measured temperatures are saved.	1 ÷ 30 min	5
P1.8	TONES	By setting this field you define whether key pressing is accompanied with sound signals or not.	0- OFF 1- KEYS 2- ERRORS 3- KEYS AND ERRORS	1
P1.9	ADVANCED DISPLAY OF TEMPERATURES	Advanced display of temperatures displays temperatures on main screen in double rows. First row is measured temperature; second row is required or calculated temperature.	0 - NO 1 - YES	1
P1.10	ANTIFREEZE PROTECTION	This is determined by degree of protection against freezing, which depends of the possibility of freezing. Stage 0 is selected when there is not potential for freezing Stage 1 is selected when there is potential for freezing if no room unit is connected, potentially weakest parts are protected. Stage 2 is selected when there is potential for freezing. When system is turned OFF, system is still protected against freezing. Stage 3 is selected, when there is high potential for freezing of the system	0 - NO PROTECTION 1 - STAGE 1 2 - STAGE 2 3 - STAGE 3 (MAXIMUM PROTECTION)	1

P2 *Settings for heating circuit:*

Par.	Parameter name	Description	Setting range	Default value
P2.1	HEAT CURVE STEEPNESS	Heating curve steepness indicates what temperature is required for the heating bodies by a determined outdoor temperature.	0,2 ÷ 2,6	**0,7**- floor **1,0**- rad.

Par.	Parameter name	Description	Setting range	Default value
P2.2	PARALLEL SHIFT OF HEATING CURVE	Setting of parallel shift of heating curve or calculated stand-pipe temperature. Use this setting to eliminate deviation between actual and requi-red room temperature.	-15 ÷ 15 °C	0
P2.3	DURATION OF BOOST HEATINGA	Duration of boosted room temperature by changeover from night to day heating period.	0 ÷ 200 min	0
P2.4	ROOM TEMPERATURE INCREASE BY BOOST HEATING	Boost room temperature increase by changeover from night to day heating period.	0 ÷ 8 °C	3

P4 *Settings for domestic hot water:*

Par.	Parameter name	Description	Setting range	Default value
P4.1	D. H. W. TEMPERATU-RE IN OFF PERIOD	Setting of d. h. w. temperature in OFF program timer interval.	4 ÷ 70 °C	4
P4.2	PRIORITY OF D. H. W. WARMING TO CIRCUIT 1	Setting if d. h. w. heating has priority to room heating in circuit 1.	0- NO 1- YES	0
P4.7	TIME PROGRAM FOR D. H. W. CIRCULATION	Selection of d. h. w. warming time program which will be used for d. h. w. circulation. Setting 1 is first time program for domestic hot water warming. Setting 2 is second time program for domestic hot eater warming. Setting 3 is selected time program for domestic hot water warming.	1 - PROG. 1 2 - PROG. 2 3 - SELEC-TED PROG.	3
P4.8	RUNNING TIME FOR D. H. W. CIRCULATION PUMP	Setting of running time for d. h. w. circulation pump. Pump run-ning period is always followed by the pump stand-by period.	0 ÷ 600 sec	300
P4.9	STAND-BY TIME FOR D. H. W. CIRCULATION PUMP	Setting of stand-by time for d. h. w. circulation pump. Pump stand-by period is always followed by the pump running period.	0 ÷ 60 min	10

P5 *Basic setting for energy source:*

Par.	Parameter name	Description	Setting range	Default value
P5.2	MIN. BOILER TEMPE-RATURE	Setting of min. boiler temperature.	10 ÷ 90 °C	55
P5.3	MIN. STORAGE TANK TEMPERATURE	Setting of min. temperature for heat transfer.	20 ÷ 70 °C	30
P5.8	WORKING MODE OF PELLET BOILER	Setting of working mode of pellet boiler: 1- Pellet boiler is working based on time program. 2- Pellet boiler is working based on external contact T7 (Connection T7 has to be closed for working). 3- Pellet boiler is working based on time program or external contact. 4- Pellet boiler is working based on time program and external contact.	1- PROG. 2- T7 3- PROG. ALI T7 4- PROG. IN T7	2

Par.	Parameter name	Description	Setting range	Default value
P5.9	PELLET HOOPER CAPACITY (KG)	Default setting to set the size of the hopper. Based on these value, the % of pellets in the hopper is calculated.	10 ÷ 1000 kg	135
P5.10	CAPACITY OF SCREW FEEDER (KG/H)	Default setting of feeder capacity. Based on these value, the % of pellets in the hopper is calculated.	1 ÷ 30 kg/h	8,1

HEATING CURVE

With adjusting of heating curve the controller is adapted to the building. Proper heating curve adjusting is very important for optimal heating control. Heating curve steepness indicates, what temperature is required for the heating bodies by a determined outdoor temperature. The steepness value depends mainly on the heating system type (floor, wall, radiator, convector heating) and insulation of the building.

Determining the heating curve steepness

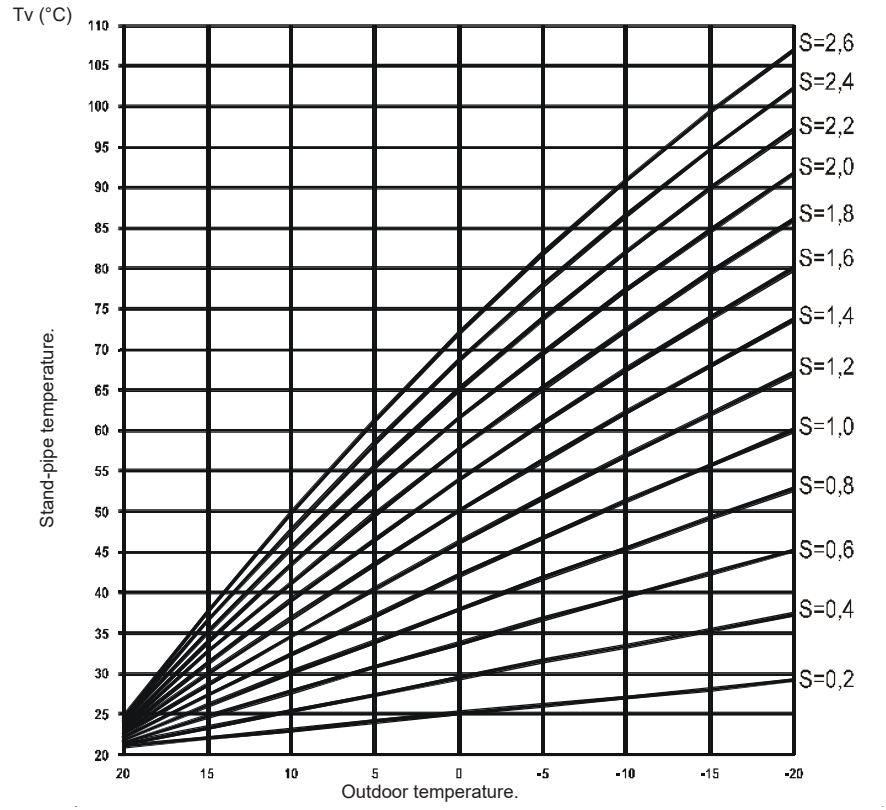
If you have enough data, you can determine the heating curve steepness with a calculation, otherwise from experience, based on the evaluation of heating system dimensioning and building insulation.
The heating curve steepness is set correct, if the room temperature remains stable, even by large outdoor temperature changes.
While the outdoor temperature is above + 5 °C, you can adjust the room temperature by changing the day or night temperature or with the parallel shift of the heating curve (parameters P2.2).
If the object is under heated by low outdoor temperatures, the heat curve steepness needs to be increased. If the object is overheated by low outdoor temperatures, the heat curve steepness needs to be decreased. The maximum steepness increase/decrease should not be greater than 0.1 to 0.2 units per one observation. At least 24 hours must pass between two observations.

Standard settings of the heating curve steepness:

Heating system	Setting range
floor	0,2 - 0,8
wall	0,4 - 1,0
radiator	0,8 - 1,4

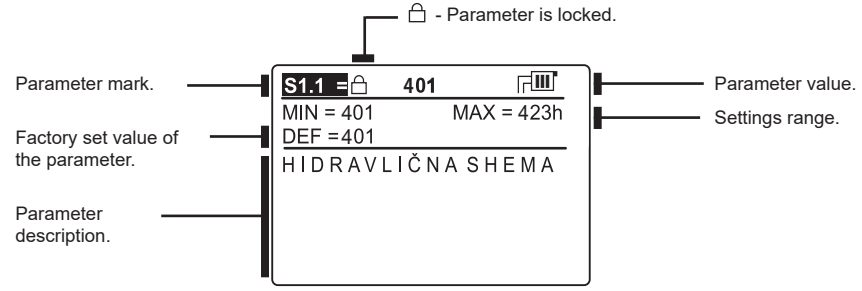
With adjusting the heat curve steepness, the controller is tuned with the building. For optimal controller operation, the right setting of the heat curve steepness is very important.

Heat curve diagram:

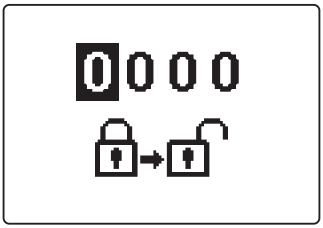


SERVICE PARAMETERS

Service parameters are divided into the following groups: S1 - general settings, S2 - settings for the first heating circuit, S3 - settings for the second heating circuit, S4 - settings for domestic hot water, S5 - settings for boilers in S6 - settings for alternative energy sources.
Service parameters enable you to choose among various additional functions and adaptations of controller's operation. When you select the requested parameter group, a new screen appears:



You can change the setting by pressing the button ✓. Parameters are locked by default. A new screen appears for the entry of unlocking code:



Use buttons — and + to find the number you wish to change and press the button ✓. When the number begins to flash, you can change it with buttons — and + and confirm it by pressing ✓. When the correct code is entered, the controller will unlock the parameters and return to the menu with the selected group of parameters.

Exit the unlocking code entry by pressing the button ⮌.

The factory set code is 0001.

You can change the parameter value with buttons — and +. Confirm the selection by pressing the button ✓. Now you can move on to another parameter with buttons — and + and repeat the procedure. Exit parameter settings by pressing the button ⮌.

Only a trained professional shall perform the changing of service and function parameters.

S1 *General service settings:*

Par.	Parameter name	Description	Setting range	Default value
S1.1	HYDRAULIC SCHEME	Selection of hydraulic scheme.	Depends of type of controller.	/
S1.2	CODE FOR UNLOCKING THE SERVICE SETTINGS	This setting enables the change of code which is necessary to unlock the service settings (S and F parameters). WARNING! Keep new code on a safe place. Without this code is impossible to change service settings.	0000 - 9999	0001
S1.4	T8 SENSOR FUNCTION	Selection function for sensor connected to input T8: 1- RF, room sensor 2- EF, Sensor for limitation of max. floor temperature. Max. temperature can be set with parameter S2.11. 3- RLF, return pipe sensor. Activates limitation of difference between stand and return pipe and by that the limitation of max. heating circuit power. Max. difference is set with parameter S2.14. 4- BF3, d. h. w circulation with temperature sensor. Sensor is placed onto (hot) exit pipe from storage tank. D. h. w. circulation pump is activated if temperature increase is detected. Duration time of circulation is set with parameter P4.8 5- SVS, d. h. w. circulation with flow switch. D. h. w. circulation pump is activated if contact is closed. Duration time of circulation is set with parameter P4.8. 6- RFHP, RFHP, room sensor in ambient where d. h. w. heat pump is installed. D. h. w. warming with other heat sources is disabled if room temperature is higher as set with parameter S4.11.	1- RF 2- EF 3- RLF 4- BF3 5- SVS 6- RFHP	1
S1.5	DIGITAL INPUT T1, T6, T8	This setting defines controller operation mode if short circuit is detected on input T1, T6 or T8. 1- Day temperature operation mode, regardless to currently selected operation mode. See also parameter S1.9. 2- Additional direct circuit is connected. Temperature requirements of additional direct circuit (P3.5 and P3.6) are also considered for calculation of requested boiler temperature. By schemes with two heat sources the switchover to other heat source is done with delay, set with parameter S5.15. 3- Additional direct circuit is connected. Temperature requirements of additional direct circuit (P3.5 and P3.6) are also considered for calculation of requested boiler temperature. By schemes with two heat sources the switchover to other heat source is done without delay. 4- Switchover from heating to cooling operation mode. 5- Boost heating function is activated. This setting disables regular boost heating function which is activated by changeover from night to day temperature period. 6- Liquid fuel boiler is blocked. Controller will operate only with solid fuel boiler. 7- Counter for boiler operation time.	1- REMOTE SWITCH--ON 2- DIR. CIRCUIT, DELAY. 3- DIR. CIRCUIT 4- COOLING 5- BOOST 6- BOILER BLOCKING 7- BURNER HOURS	1
S1.6	ANTI-BLOCK FUNCTION	All outputs that haven't been activated in the last week are activated on Friday between 20:00 and 20:15. for 60 seconds.	0- NO 1- YES	0
S1.8	BUILDING TYPE (TIME CONSTANT)	Selection of building type (time constant). For heavy (thick walls) and good isolated buildings select higher value. For light (thin walls, no heat accumulation) and poor isolated objects select lower value.	0 ÷ 12 h	0
S1.9	SENSOR T1 CALIBRATION	Correction of displayed measured temperature for sensor T1.	-5 ÷ 5 °C	0

Par.	Parameter name	Description	Setting range	Default value
S1.10	SENSOR T2 CALIBRATION	Correction of displayed measured temperature for sensor T2.	-5 ÷ 5 °C	0
S1.11	SENSOR T3 CALIBRATION	Correction of displayed measured temperature for sensor T3.	-5 ÷ 5 °C	0
S1.12	SENSOR T4 CALIBRATION	Correction of displayed measured temperature for sensor T4.	-5 ÷ 5 °C	0
S1.13	SENSOR T5 CALIBRATION	Correction of displayed measured temperature for sensor T5.	-5 ÷ 5 °C	0
S1.14	SENSOR T6 CALIBRATION	Correction of displayed measured temperature for sensor T6.	-5 ÷ 5 °C	0
S1.15	SENSOR T7 CALIBRATION	Correction of displayed measured temperature for sensor T7.	-5 ÷ 5 °C	0
S1.16	SENSOR T8 CALIBRATION	Correction of displayed measured temperature for sensor T8.	-5 ÷ 5 °C	0
S1.17	SENSOR T9 CALIBRATION	Correction of displayed measured temperature for sensor T9.	-5 ÷ 5 °C	0
S1.18	SENSOR T10 CALIBRATION	Correction of displayed measured temperature for sensor T10.	-5 ÷ 5 °C	0
S1.19	SENSOR T11 CALIBRATION	Correction of displayed measured temperature for sensor T11.	-5 ÷ 5 °C	0
S1.20	SENSOR T12 CALIBRATION	Correction of displayed measured temperature for sensor T12.	-5 ÷ 5 °C	0

S2 *Service settings for heating circuit:*

Par.	Parameter name	Description	Setting range	Default value
S2.1	INFLUENCE OF ROOM TEMP. DEVIATION	Set the influence of room temperature deviation. Lower value means lower influence, higher value means higher influence.	0,0 ÷ 3,0	1
S2.2	INFLUENCE OF ROOM SENSOR T8	Setting of room sensor T1 or T8 influence on the operation of first circuit. 1- automatic room sensor influence - room sensor has no influence if room unit DD2+ is connected - room sensor has influence if room unit DD2+ isn't connected 2- room sensor has influence 3- room sensor has no influence This setting has affect only if S1.4=1	1- AVTO 2- YES 3- NO	1
S2.3	INFLUENCE OF DD2+ ROOM SENSOR	Setting of DD2+ room sensor influence on the operation of first circuit. 1- influence has only room unit DD2+ controlling the first circuit (coding switch on room unit S.2=OFF). It can be set on first, second or both room units. 2- influence has only first room unit DD2+ (coding switch on room unit S.4=OFF) 3- influence has only second room unit DD2+ (coding switch on room unit S.4=ON) 5- room unit DD2+ has no influence	1- AVTO 2- 1. DD2+ 3- 2. DD2+ 4- 1. IN 2. DD2+ 5- NO	1
S2.4	PUMP OPERATION MODE	Setting of pump operation mode. Settings have the following meaning: 1- STAND. (circulation pump of mixing circuit - regular) 2- pump switches off, if requested room temperature is reached (only direct circuit) 3- operation according to time program P1 4- operation according to time program P2 5- SEL. PROG. (operation according to selected time program).	1 - STANDARD 2 - OFF 3 - TIME PR. P1 4 - TIME PR. P2 5 - SELECTED TIME PR.	1
S2.5	MINIMUM STAND-PIPE TEMPERATURE	Setting of minimum stand-pipe temperature limitation, when heating is active.	10 ÷ 90 °C	20
S2.6	MAXIMUM STAND-PIPE TEMPERATURE	Setting of maximum stand-pipe temperature limitation	20 ÷ 150 °C	45- floor 85- radiat.

Par.	Parameter name	Description	Setting range	Default value
S2.7	STILL STAND OF MIXING VALVE CONTROL	Setting of stand-pipe temperature deviation by which the mixing valve control is in stand-by.	0,2 ÷ 3,0 °C	0,6
S2.8	MIXING VALVE P - CONSTAN	Setting of mixing valve position correction intensity. Smaller value means shorter movements, higher value means longer mixing valve movements.	0,5 ÷ 2,0	1
S2.9	MIXING VALVE I - CONSTANT	Setting of mixing valve control frequency - how often mixing valve position is being controlled. Smaller value means low frequency, higher value means higher frequency of mixing valve corrections.	0,4 ÷ 2,5	1
S2.10	MIXING VALVE D - CONSTANT	Sensitivity of mixing valve for stand-pipe temperature changes. Smaller value means low sensitivity, higher value means high sensitivity.	0,0 ÷ 2,5	1
S2.11	MAKSIMALNA TEMPERA- TURA ESTRIHA	Setting of maximum floor temperature limitation by floor heating. Setting is active only if floor sensor is installed and parameter S1.4=2 (for sensor T1).	10 ÷ 50 °C	25
S2.12	MINIMUM STAND-PIPE TEMPERATURE IN COOLING MODE	Setting of minimum stand-pipe temperature in cooling mode. CAUTION! Too low stand-pipe temperature can cause dewing of heating bodies and pipelines.	10 ÷ 20 °C	15
S2.13	SHIFT OF TEMPERATU- RE, REQUIRED TO ACTIVATE STAND-PIPE CONTROL	Shift of calculated min. stand-pipe temperature by which the mixing valve control will activate. Negative values mean activation of mixing valve control by lower calculated stand-pipe temperatures, positive values mean activation of mixing valve control by higher calculated stand-pipe temperatures.	-10 ÷ 10 °C	0
S2.14	LIMITATION OF TEMP. DIFFERENCE BETWEEN STAND AND RETURN PIPE	Setting of maximal difference between stand-pipe and return pipe temperature. This way the highest power of heating system is limited. Limitation of difference between stand and return pipe is activated with parameter S1.4=3.	3 ÷ 30 °C	10
S2.15	CONSTANT STAND-PIPE TEMPERATURE	Selection of operation with constant stand-pipe temperature. Setting range is 10 ÷ 140 °C. CAUTION: This function deactivates weather compensated control of mixing valve.	0- NO 1- YES	0
S2.16	CIRCULATION PUMP SWITCH-OFF DELAY	Setting of circulation pump switch-off delay when there is no requirement for heating.	0 ÷ 10 min	5
S2.17	VALVE ACUATOR SPEED	Time that valve actuator needs for a complete turn of 90°.	1 ÷ 8 min	2

S3 *Service setting for a return temperature control:*

Param.	Parameter name	Description	Setting range	Default value
S3.7	STILL STAND OF MIXING VALVE CONTROL	Setting of stand-pipe temperature deviation by which the mixing valve control is in stand-by.	0 ÷ 5 s	1
S3.8	MIXING VALVE P - CONSTANT	Setting of mixing valve position correction intensity. Smaller value means shorter movements, higher value means longer mixing valve movements.	0,5 ÷ 2,0	1
S3.9	MIXING VALVE I - CONSTANT	Setting of mixing valve control frequency - how often mixing valve position is being controlled. Smaller value means low frequency, higher value means higher frequency of mixing valve corrections.	0,4 ÷ 2,5	1
S3.10	MIXING VALVE D - CONSTANT	Sensitivity of mixing valve for stand-pipe temperature changes. Smaller value means low sensitivity, higher value means high sensitivity.	0,0 ÷ 2,5	1
S3.16	CIRCULATION PUMP SWITCH-OFF DELAY	Setting of circulation pump switch-off delay when there is no requirement for heating.	0 ÷ 10 min	5
S3.17	VALVE ACUATOR SPEED	Time that valve actuator needs for a complete turn of 90°.	1 ÷ 8 min	2

S4 *Service settings for domestic hot water:*

Param.	Parameter name	Description	Setting range	Default value
S4.1	OUTPUT R3 FUNCTION	Setting of output R3 alternative operation mode. 1- operation according to selected hydraulic scheme 2- operation according to selected program timer for d. h. w. warming. 3- d. h. w. warming without temp. difference (by warming with heat pump).	1- SCHEME 2- TIME 3- WITHOUR DIFF.	1
S4.2	HYSTERESIS FOR D. H. W. WARMING	Setting of difference between switch-on and switch-off point for domestic hot water warming.	2 ÷ 20 °C	6
S4.3	MAX. D. H. W. TEMPERATURE	Setting of max. allowed d. h. w. temperature. If this temperature is exceeded the warming will stop unconditionally.	50 ÷ 90 °C	80
S4.5	LEGIONELLA - ACTIVATION	Activation of legionella function.	0 - NO 1 - YES	0
S4.6	LEGIONELLA - ACTIVATION DAY	Setting of day when the legionella protection should activate.	1 - MON 2 - TUE 3 - WED 4 - THU 5 - FRI 6 - SAT 7 - SUN	5
S4.7	LEGIONELLA - ACTIVATION TIME	Setting of hour when the legionella protection should activate.	0 ÷ 23 h	5
S4.11	MIN. AMBIENT TEMP. FOR D. H. W. HEAT PUMP	D. h. w. is warmed only with heat pump if ambient temperature is above the set point temperature. D. h. w. warming from central heating system will activate when the ambient temperature drops below set-point temperature. Set parameter S1.4=8	5 ÷ 30 °C	16

Param.	Parameter name	Description	Setting range	Default value
S4.12	D. H.W. WARMING PUMP SWITCH-OFF DELAY	The maximum delay time off the circulation pump when you reach your desired hot water temperature.	0 ÷ 10 min	5

Basic service setting for energy source:

Par.	Parameter name	Description	Setting range	Default value
S5.3	BOILER TEMPERATURE INCREASE FOR CIRCUIT 1	Setting of boiler temperature increase in comparison with calculated stand-pipe temperature for circuit 1.	0 ÷ 25 °C	5
S5.5	BOILER TEMP. INCREASE FOR D. H. W. WARMING	Setting of boiler temperature increase in comparison with requested d. h. w. temperature.	0 ÷ 25 °C	10
S5.8	HYSTERESIS OF PELLET BOILER	Setting of temperature range for boiler power modulation.	4 ÷ 12 °C	8
S5.13	MAX. BOILER OR HEAT ACCUMULATOR TEMP	Setting of max. l boiler temperature or heat accumulator temperature. If this temperature is exceeded controller transfers surplus heat to d. h. w. storage tank and heating circuits. Limitation of max. stand-pipe temperature in heating circuits remains active.	60 ÷ 160 °C	90
S5.14	MIN. BOILER RETURN PIPE TEMP	Setting of min. allowed boiler return pipe temperature for classic or high-temperature boilers. This setting is valid only by schemes with boiler return pipe limitation.	10 ÷ 90 °C	55
S5.17	EXTERANAL CONTACT T7	Setting of external contact T7 function. 1- When contact T7 closed, the boiler is working. 2- When contact T7 open, the boiler is working. 3- When contact T7 closed the boiler is working, until the storage tanks is filled.	1- NORMAL 2- INVERTED 3- BURNER	1
S5.18	MAX. FLUE GASES TEMPERATURE	Setting of maximum flue gas temperature.	70 ÷ 350 °C	200

S6 *Service settings for boiler:*

Par.	Parameter name	Description	Setting range	Default value
S6.1	BLOW OF AIR BEFORE START-UP	Before each start-up of the boiler, a safety blow-out of the combustion chamber shall be carried out in order to remove any flue gases and ash out from the pellet combustion chamber. With this parameter the duration of the blow-out is set.	5 ÷ 180 sec	30
S6.2	POWER OF THE BLOW BEFORE START-UP	Setting of the fan power during start-up blow.	10 ÷ 100 %	95
S6.3	START-UP - PELELT FEEDING	Setting the time of pellet filling into the burning pot.	3 ÷ 180 °C	90
S6.4	START-UP - IGNITER ON TIME	Setting the duration of igniter being ON.	5 ÷ 900 °C	420
S6.5	START-UP - TIME OF LOW SPEED FAN	Setting the time of low fan speed during start-up.	5 ÷ 900 sec	60
S6.6	START-UP - LOW SPEED FAN	Setting the power of the fan during ignition process.	10 ÷ 100 %	25
S6.7	START-UP - TIME OF HIGH SPEED FAN	Setting the power of the fan during ignition process.	10 ÷ 100 %	50
S6.8	START-UP - TEMPERATURE INCREASE FOR FLAME DETECTION	Setting the value for the temperature increase of flue gasses to detect flame.	2 ÷ 20 °C	3
S6.9	START-UP - TEMPERATURE OF FLUE GASSES FOR SUCESFULL IGNITION	Setting the value of the flue gasses temperature for successful ignition. When these value is reached, the boiler goes to standard working power.	50 ÷ 90 °C	75
S6.10	START-UP - TIME TO REACH FLUE GASSES TEMERATURE FOR IGNITION	Setting the maximum duration of the ignition time. During these time, the temperature of flue gasses witch is set with parameter S6.9 has to be reached. If temperature is not reached the controller will consider is as start-up failure. Based on the setting S6.13 the start-up phase can be automatically repeated.	300 ÷ 900 sec	600
S6.11	START-UP- PELLET FEEDING TO REACH THE RIGHT IGNITION TEMPERATURE OF FLUE GASSES	After flame is detected these value means how much pellets will be added for successful ignition. These feeding lasts until the set flue gas temperature is reached S6.10.	20 ÷ 60 %	30
S6.12	START-UP- FAN SPEED TO REACH FLUE GASSES TEMPERATURE FOR IGNITION	Setting of the fan speed after flame detection to reach the flue gasses temperature S6.10 of successful ignition.	10 ÷ 100 %	70
S6.13	START-UP- REPETITION TIMES	Setting of how many repetitions of ignitions are made after first ignition process.	1 ÷ 5	2
S6.14	MIN. BOILER POWER FEEDING	Setting of amount of pellets added at minimum boiler power. A lower value means dosing a smaller amount of pellets into burning pot.	5 ÷ 60 %	32
S6.15	MIN BOILER POWER FAN SPEED	Setting of fan speed at minimum power.	10 ÷ 90 %	30
S6.18	MAX BOILER POWER FEEDING	Setting of amount of pellets added at maximum boiler power. Higher value means more pellets dosing into burning pot.	20 ÷ 90 %	78

Par.	Parameter name	Description	Setting range	Default value
S6.19	MAX BOILER POWER-FAN SPEED	Setting of fan speed at maximum power.	20 ÷ 100 %	94
S6.20	AIR CORRECTION	Correction of the fan speed. With this correction the fan speed during whole power range is corrected. With value lower of 0 we reduce default fan speed. With value higher than 0 we increase default fan speed.	-5 ÷ 5 %	0

S7 *Service settings for boiler:*

Par.	Parameter name	Description	Setting range	Default value
S7.1	BOILER SHUTDOWN - TIME OF SHUTDOWN	Setting of the time of shutdown procedure. Pellet feeding is stopped, only fan is working.	30 ÷ 900 sec	360
S7.2	BOILER SHUTDOWN-FAN SPEED	Setting of fan speed during shutdown procedure.	15 ÷ 100 %	60
S7.6	BOILER CLEANING CYCLE	Setting of the cleaning cycle during boiler operation. After time set the cycle of fan speed at higher power starts to blow out unburned particles in the burning pot.	15 ÷ 240 min	60
S7.7	BOILER CLEANING TIME	Setting of boiler cleaning time duration.	5 ÷ 120 sec	20
S7.8	BOILER CLEANING FAN SPEED	Setting of fan power during cleaning time.	15 ÷ 100 %	95
S7.17	MINIMUM BOILER POWER LIMITATION	Setting of the minimum power of the boiler.	10 ÷ 15 kW	10
S7.18	MAXIMUM BOILER POWER LIMITATION	Setting the maximum boiler power. With schemas without storage tank, these setting is important for optimal working.	16 ÷ 25 kW	25

PARAMETER FOR MEASUREMENT OF ENERGY

In the group W you can find parameters for measurement of gained energy.

Parameters for energy measurement:

Par.	Parameter name	Description	Setting range	Default value
W1.1	**ENERGY MEASUREMENT**	With the setting we activate energy measurement	0- NO 1- YES	**0**
W1.2	**MEDIUM**	We select the medium in the system.	0- WATER 1- PROPYLENGLYCOL 2- ETHYLENGLYCOL 3- TYFOCOR 4- TYFOCOR LS, G-LS 5- THESOL	**0**
W1.3	**CONCENTRATION OF THE ANTIFREEZE**	We select the percentage of the antifreeze in the water if mixture.	10 ÷ 100 %	**40**
W1.4	**HOT SENSOR**	We select sensor in the boiler.	1- T1 2- T2 3- T3 4- T4 5- T5 6- T6 7- T7 8- T8 9- T9 10- T10 11- T11 12- T12	**1**
W1.5	**COLD SENSOR**	We select sensor in the return connection.	1- T1 2- T2 3- T3 4- T4 5- T5 6- T6 7- T7 8- T8 9- T9 10- T10 11- T11 12- T12	**10**
W1.6	**FLOW SENSOR**	If flow sensor is installed we select YES.	0- NO 1- YES	**0**
W1.7	**No. OF IMPULSES OF FLOW SENSOR**	We add the characteristic of the flow sensor, witch tell the amount of flow per impulse.	0,5 ÷ 25 l/imp	**1**
W1.8	**FLOW IN THE HEATING CIRC.**	We add the flow in the heating circle, when the pump is working.	1 ÷ 100 l/min	**20**

MEASUREMENT OF ENERGY

KPD allow regulators around and accurate measurement of energy produced.
For measuring the energy, we need an additional sensor for measuring the temperature of the return water to the boiler - cold sensor.
Measurement of energy is activated by setting the parameter W1.1 = 1st The media and the concentration of media yes Set parameters W1.2 and W1.3.

Approximate measurement
In this method of measurement is required on a mechanical flow meter to read the maximum flow and the value entered in the setting W1.8.

Movement is necessary to read, when the circulation pump is operating normally. Return flow sensor in the boiler set with the parameter W1.5.

The accurate measurement of energy by means of a pulsed flow meter
For the accurate measurement of the energy needed in the circuit of the boiler installed flowmeter with impulse encoder. Accurate measurement of energy is activated by setting the parameter W1.6 = 1st With parameter W1.7 inserts flow ratio for the built-in meter.
Return flow sensor in the boiler set with the parameter W1.5.

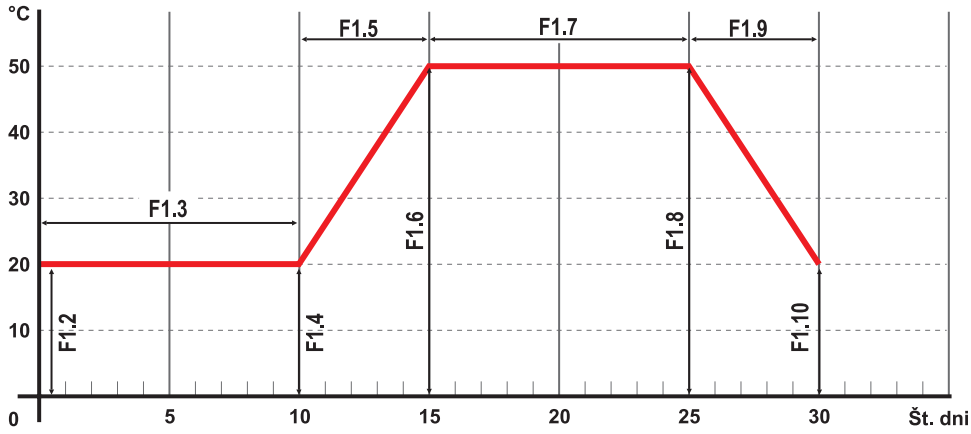
Measurement of energy produced in both cases is informative and serves for personal needs. Measured data cannot be used for the calculation of energy or for similar purposes.

The procedure for F parameters setting is the same as the procedure for service settings (see 44).

F 1 ***Table with descriptions of parameters:***

Param.	Parameter name	Setting range	Default value
F1.1	**FLOOR DRYING**	0- NO 1- YES	**0**
F1.2	**INTERVAL 1: START TEMPERATURE**	10 ÷ 60 °C	**20**
F1.3	**INTERVAL 1: DURATION**	1 ÷ 15 days	**10**
F1.4	**INTERVAL 2: START TEMPERATURE**	10 ÷ 60 °C	**20**
F1.5	**INTERVAL 2: DURATION**	1 ÷ 15 days	**5**
F1.6	**INTERVAL 3: START TEMPERATURE**	10 ÷ 60 °C	**50**
F1.7	**INTERVAL 3: DURATION**	1 ÷ 15 days	**10**
F1.8	**INTERVAL 4: START TEMPERATURE**	10 ÷ 60 °C	**50**
F1.9	**INTERVAL 4: DURATION**	1 ÷ 15 days	**5**
F1.10	**INTERVAL 4: END TEMPERATURE**	10 ÷ 60 °C	**20**

Floor drying profile - default setting:



DEFAULT SETTINGS

The menu contains the tools to help you set the controller.

RESET OF CONTROLLER PARAMETERS
Resets all parameter settings P1, P2, P3, P4, P5, P6, S1 (except S1.1), S2, S3, S4, S5, S6 and F1 to factory set values.

RESET OF TIME PROGRAMS
Deletes the set time programs and retrieves factory set time programs.

RESET OF CONTROLLER AND RE-START OF THE FIRST SETTING
Restores all parameters to default values and restarts the controller initial setup.

SAVE USER SETTINGS
Saves all controller settings as a safety copy.

LOAD USER SETTINGS
Uploads all controller settings from the safety copy. If a safety copy doesn't exist, this command is not executed.

Before executing the commands listed above, the controller requires a confirmation of the selected command.

BASIC OPERATION DESCRIPTIONS

MIXING HEATING CIRCUIT

Stand-pipe temperature calculation
The upper limit of stand-pipe temperature calculation is set with maximum stand-pipe temperature - parameters S2.2 and S3.2, lower limit is set with minimum stand-pipe tempe rature - parameters S2.6. Parameters S2.1 are used to set the influence of room temperature deviation on the calculation of stand-pipe temperature, and with the parameters P2.2 and P3.2 you can adjust the parallel shift of heating curve.

Heating switch off
If the calculated stand-pipe temperature isn‘t for few °C higher than the room temperature, the heating is automatically switched off. Heating is automatically switched off if room temperature is not measured and when the outdoor temperature approaches the required temperature. The temperature difference between calculated stand-pipe temperature and room temperature at which the boiler will switch off can be increased or decreased with parameters S2.13.
At automatic heating switch off, a temperature of 4 °C is set for stand-pipe temperature and the circulation pump is switched off with delay - parameters S2.16. Other pump operation modes can be selected with parameters S2.4.

Intensive - BOOST heating
Define time and intensity of intensive (BOOST) heating, which is activated at transition of time program from night to day heating interval with parameters P2.3.

Limitation of ΔT or power of heating circuit
To limit the maximum power of the heating circuit, use the T8 sensor, to measure the return-pipe temperature. Set the parameter S1.4=3, then set the maximum difference between stand-pipe and return-pipe temperature with parameter S2.14.

Working of mixing circle with fix temperature on stand-pipe
If we need a fix temperature of stand-pipe we have to enable it with parameter S2.15.

PELLET BOILER

With schemes 092 and 092b is target boiler temperature one of the highest temperatures listed below:
- Value of parameter S5.3 increased for calculated temperature of stand-pipe.
- Value of parameter S5.5 increased for target temperature of DHW.
- Set target temperature of the boiler (in menu) when external contact T7 is active or time program is enabled.

With schemes 093 in 093b is the target boiler temperature combines of target storage tank temperature (or hydraulic separator) increased for 10 °C.

Target temperature of the storage tank is set based on:
- Set target temperature of the storage tank (in menu), when time program is enabled or T7 contact is enabled.
- calculated temperature of the source from controller in BUS connection.

Boiler has also minimum target temperature, which is higher for hysteresis S5.8 of the set minimum boiler temperature P5.2 or 15 °C higher then minimum return water temperature S5.14.

Target boiler temperature is limited for maximum allowed boiler temperature S5.13, decreased for 5 °C.

With parameter P5.8 we set conditions for boiler ignition:
P5.8=1 - Boiler ignition, when the timer is ON.
P5.8=2 - Boiler ignition, when external contact T7 is closed.
P5.8=3 - Boiler ignition, when timer is ON or external contact T7 is closed.
P5.8=4 - Boiler ignition, when timer is ON and external contact T7 is closed.

With parameter S5.17=2 we can invert the external contact T7, witch ignites the boiler when the contact is open. If we set the parameter S5.17=3 with schemes 093 and 093, when the contact T7 is closed, the storage tank will be heated to target temperature (even in the case if the contact T7 is open again during heating procedure). These last setting is used, when we want to control pellet boiler with oil boiler logic of control.

Storage tank (hydraulic separator) filling with schemes 093 093b:
At the heating demand the storage tank is heater until the return water to boiler is minimum 5 minutes the same of higher as target temperature. Reheating of the storage tank start again, when the temperature of storage tank at the top falls again below target temperature.

Power regulation of pellet boiler:
The power is regulated, based on difference between actual and target temperature. Until the actual temperature is lower than target temperature for more than hysteresis of parameter S5.8 the boiler will work with maximum power. When the difference is lower than hysteresis, the boiler will start modulating power. When the boiler reached target temperature it works on minimum power. When the actual temperature if higher then target temperature for half of the hysteresis S5.8 the boiler will go into OFF mode.

HEAT ACCUMULATOR

HEAT ACCUMULATOR PROTECTION

If temperature of heat accumulator drops below the set minimum heat accumulator temperature (parameter P5.3), the mixing valve will gradually begin to close. If heat accumulator temperature exceeds the maximum heat accumulator temperature (parameter S5.13), the heat accumulator overheating protection is activated, which opens the mixing valve up to the maximum stand-pipe temperature (parameters S2.6). The protection is deactivated, when heat accumulator temperature drops below the maximum temperature.

DOMESTIC HOT WATER

D. h. w. warming with pellet boiler

Set the required d. h. w. temperature for the inactive time program interval with parameter P1.4. If boiler temperature exceeds the maximum boiler temperature (parameter S5.13), the d. h. w. will be warmed up to the maximum temperature set with parameter S4.3.
D. h. w. warming pump is switched off with delay. The delay time is set with parameter S4.12.

D. h. w. warming in storage tank with integrated heat pump

In this case, a special operation mode of d. h. w. control is activated by setting the parameter. S1.4=6. Install a room sensor in the room, where the heat pump is located Controller will block the d. h. w. warming with boiler if the heat pump room temperature is higher as set with parameter S4.11.

Priority of d. h. w. warming over room heating

With parameters P4.2 you can set the priority of d. h. w. warming over room heating.
By direct heating circuit is suggested to set priority to d. h. w. warming.

DOMESTIC HOT WATER CIRCULATION

The d. h. w. circulation pump is operating according to the time program for the d. h. w. circulation - parameter P4.7. The pump is operating with running and standby intervals which are set with parameters P4.8 and P4.9.

D. h. w. circulation with the use of sensor

If T8 sensor is free, it can be used to activate the d. h. w. circulation with parameter S1.4=4. The sensor needs to be installed on the exit pipe from the d. h. w. storage tank (hot pipe). Whenever an immediate temperature rise for at least 5 K is detected, the d. h. w. circulation pump is switched on for the time set with parameter P4.8.

D. h. w. circulation with flow switch

If T8 sensor is free, it can be used to activate the d. h. w. circulation with a flow switch - parameter S1.4=5. The switch needs to be installed on the exit pipe from the d. h. w. storage tank (hot pipe). If flow switch detects flow, the d. h. w. circulation pump is switched on for the time set with parameter P4.8.

REMOTE HEATING SWITCH-ON

Setting S1.6=1 allows remote switching on of room heating and domestic hot water warming by means of a telephone-controlled Telewarm G1-D or Tele-warm G44 remote switch or other device with a potentially free control switch.
The controller shall switch on the room heating to the selected daily temperature and the domestic hot water warming when a short circuit is detected at input T1, T6 or T8.

OPERATION MODES IN CASES OF SENSOR MALFUNCTION

Outdoor sensor is not connected or has a failure
In such case, the controller operates as a P-controller according to room temperature deviation. If room temperature sensor also has a failure or is not connected, the controller will maintain constant stand-pipe temperature, which is:
- 25 °C higher as the set day or night temperature; for radiator heating system,
- 10 °C higher as the set day or night temperature; for floor heating system.

Stand-pipe sensor is not connected or has a failure
The controller assumes a 120 °C stand-pipe temperature and deactivates room heating. Heating can be reactivated only by manual operation mode.

Boiler sensor is not connected or has a failure
The controller assumes an 85 °C boiler temperature and activates the burner, if heating is required. The boiler temperature can be set manually on a boiler thermostat.

Room sensor is not connected or has a failure
Room heating operates uninterrupted, according to the outdoor temperature.

Return-pipe sensor is not connected or has a failure
Room heating operates uninterrupted, without influence of return-pipe temperature.

The sensors of d. h. w. are not connected or have a failure
If one sensor has a failure, the controller uses only the other sensor. If both sensors have a failure, the controller switches off the pump for d. h. w. warming.

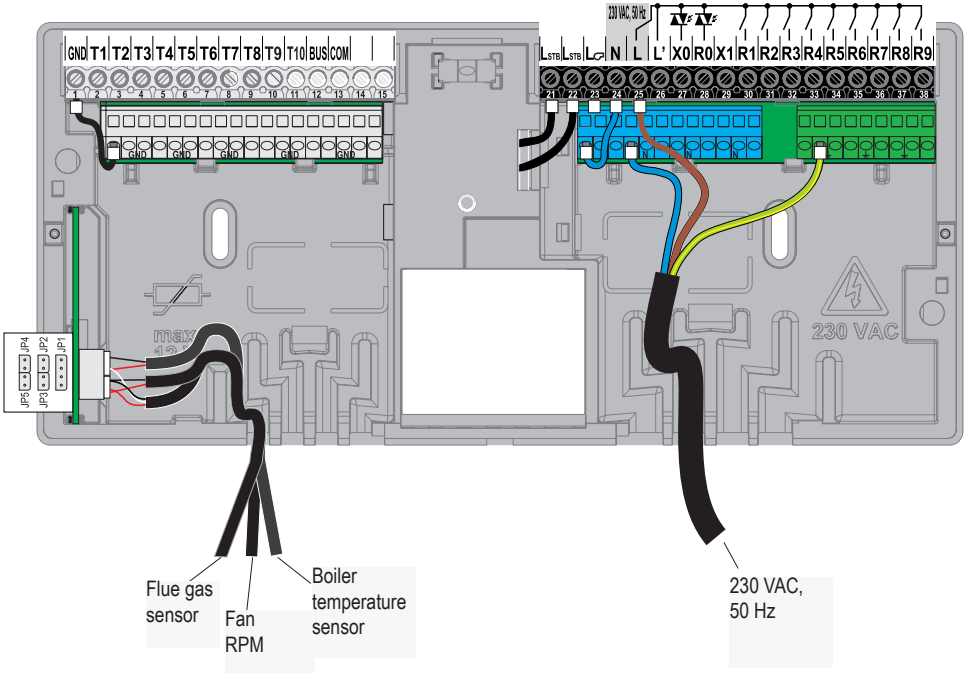
Table: resistance of Pt1000 temperature sensors

Temp. [°C]	Resist. [Ω]	Temp. [°C]	Resist. [Ω]	Temp. [°C]	Resist. [Ω]	Temp. [°C]	Resist. [Ω]
-20	922	35	1136	90	1347	145	1555
-15	941	40	1155	95	1366	150	1573
-10	961	45	1175	100	1385	155	1592
-5	980	50	1194	105	1404	160	1611
0	1000	55	1213	110	1423	165	1629
5	1020	60	1232	115	1442	170	1648
10	1039	65	1252	120	1461	175	1666
15	1058	70	1271	125	1480	180	1685
20	1078	75	1290	130	1498	185	1703
25	1097	80	1309	135	1515	190	1722
30	1117	85	1328	140	1536	195	1740

ELECTRIC CONNECTION OF THE CONTROLLER

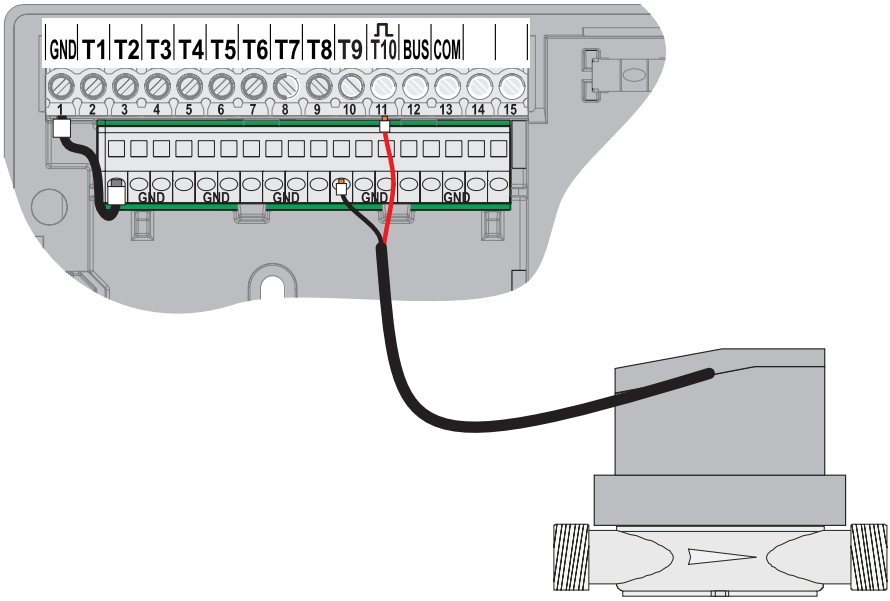
Every heating controller project must be based on calculations and plans that are exclusively your own and pursuant to the regulations in force. Images and texts in these manuals serve as examples and the issuer does not assume any responsibility for them. Issuer liability for unprofessional, false or incorrect information or consequential damage is explicitly excluded. We reserve the right to technical errors or changes without giving prior notice.

Installation of controller devices shall be done by a qualified technician or an authorized organization. Prior to any intervention into the wiring, make sure that the main switch is switched off. Low voltage installation regulations IEC 60364 and VDE 0100, statutory provisions for accident prevention, statutory provisions for environmental protection and other national rules shall be observed. Before you open the housing, make sure that all poles of electrical supply had been disconnected. Failure to follow these instructions can lead to serious injuries, such as burns or even threat to human life. The controller must be connected via switch for all poles. Spacing at switch's open contacts shall be at least 3 mm.
All low voltage connections, such as connections of temperature sensors, must be placed separately from power supply connections. All temperature sensor connections shall be placed into the left field and all power supply connections shall be placed in the right field of the controller. Relay R0 and X0 is semi conductive and it is used for fan RPM regulation and feeder regulation.



CONNECTION OF FLOW METER

Flow meter should be connected on return pipe and connected to connection 11 (T10) and GND. At installation check also installation manual of flow meter. When flow meter is connected, activation is needed with parameters in group W.



CONNECTION OF TEMPERATURE SENSORS

Immersion sensor
Immersion sensor is intended to be installed into immersion tube in boiler, heat accumulator, d. h. w. storage tank, solar collectors or elsewhere. Ensure proper contact between sensor and tube. Secure the sensor with a fastener or a screw.

Surface sensor
Install the surface sensor onto the stand-pipe above the bypass pump or after the mixing valve. Clean the selected spot on the pipe first. Place the sensor onto the cleaned spot and secure it with the enclosed clip spring.

Outdoor temperature sensor
Install the outdoor temperature sensor onto the facade facing north or north-west, approximately 2 m above ground. Installation above the windows, vents or on the facade facing south is not allowed. First remove the protective cover and unscrew two screws from the cover. Use the enclosed wall screw to fix the sensor to the selected spot. Feed the cable into the sensor through cable inlet at the bottom side and connect it.

Room temperature sensor
Install the room temperature sensor onto an indoor wall in a living area, where is not sunlit and enough distant from sources of heat and wind. Remove the cover and screw the base onto the selected spot approximately 1.5 meters above ground. You can also install it onto wall box or directly onto a wall. A 2-wire signal cable is required for electrical connection. If there are thermostatic valves installed onto radiators in the room, where room unit is located, the thermostatic valves have to be fully opened. If room sensor is connected to terminal T8, the required parameter setting is S1.4=1.

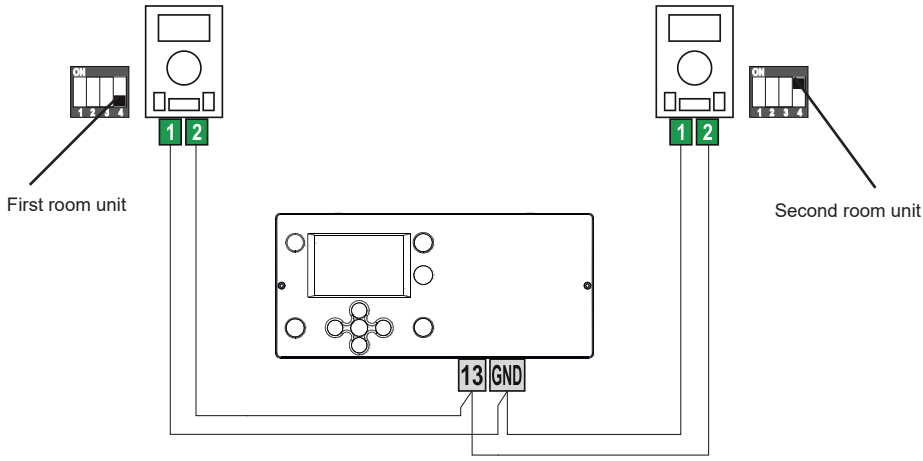
ROOM UNIT DD2+

The KPD controllers enable connection of DD2+ room unit which measures room temperature and enables the setting of requested day and night temperature, as well as selection of operation mode.

Setting of coding switches on room unit DD2+:

	Required setting.
	Room unit is controlling heating circuit.
	Room unit is not controlling heating circuit.
	*Not in use.*
	*Not in use.*
	First room unit.
	Second room unit.

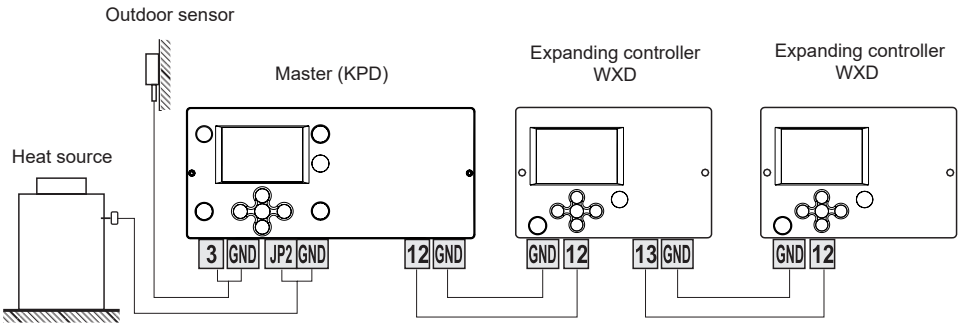
Scheme for connecting room unit DD2+:



BUS CONNECTION

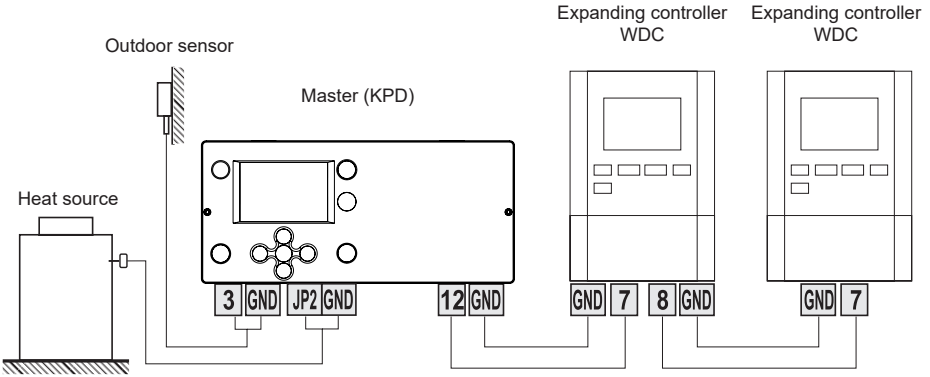
With BUS connection any number of WXD controllers can be connected to network with KPD. Master KPD controls heating source (boiler), other control heating circuits.

Important: Outdoor and boiler temperature sensors need to be connected to the master.



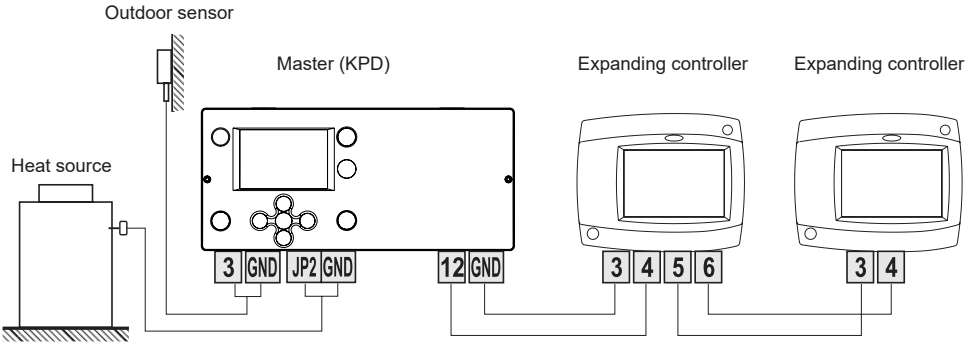
BUS CONNECTION TO WDC CONTROLLERS

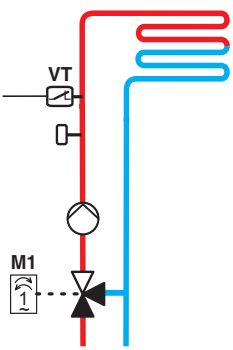
With BUS connection any number of WDC controllers can be connected to network with KPD. Master KPD controls heating source (boiler), others control heating circuits.
Important: Outdoor and boiler temperature sensors need to be connected to the master.



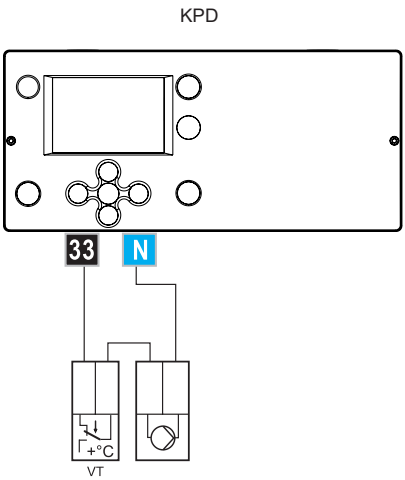
BUS CONNECTION TO CMP25-2 CONTROLLERS

With BUS connection any number of CMP25-2 controllers can be connected to network with KPD. Master KPD controls heating source (boiler), others control heating circuits.
Important: Outdoor and boiler temperature sensors need to be connected to the master.

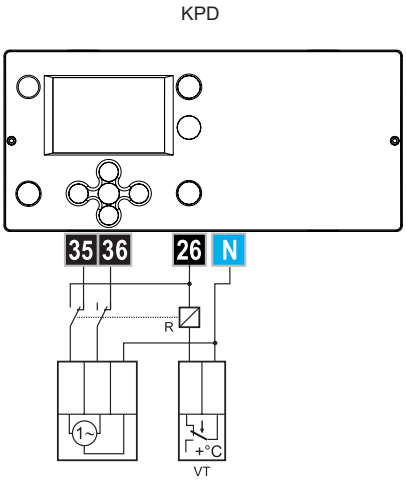




In the case of floor or wall heating, a safety limiter VT should be installed.
Use a (capillary) tube-wall, surface or an immersion thermostat with a switching contact. Install it above the stand-pipe sensor. Set the maximum allowed stand-pipe temperature for floor heating (usually between 40 °C and 60 °C) or the temperature which is at least 5 °C higher as the set maximum allowed stand-pipe temperature on the controller - parameters 2.6.



Example 1: Exceeding the safety limiter temperature will deactivate.



Example 2: Exceeding the safety limiter temperature will close the mixing valve.

Legend: VT - safety limiter

EMISSION MEASUREMENT

Emissions in the boiler is measured to correct the existing boiler settings if needed for optimized combustion. Conditions that affect the combustion efficiency may be distinguished according to the chimney to which the boiler is connected and the quality of the fuel used.

The construction of the boiler and the default settings provide good functioning in optimal conditions, which may, depending on the factors outlined above vary if suspected malfunction it is important to measure emissions and if necessary to correct the parameters, to ensure good operation of the boiler.

Hot to prepare the boiler for measurement

To measure emissions in flue gasses you need the hole in the pipe (usually a hole with a diameter of approx. 10 ÷ 12 mm) into which a probe is inserted to measure the flue gas. This hole should be located in the middle of the flue pipe and a minimum of 20 cm away from the first turn or exit from the boiler (the hole should be as close to the exit of the boiler and should be located in part of vertical pipes).
In the boiler measurement is performed at 75 % power. This is done so that the controller button  »chimney man« is pressed. The regulator maintains the boiler capacity at 75 % so as to enable operation of the boiler without shutdown. It is necessary from the start-up until the moment when the conditions are suitable for measuring to
wait at least 15 minutes. The boiler temperature has to reach 60 ° C. Then the boiler is heated to the optimal temperature, combustion conditions are stabilized and you may begin with measuring emissions. Before you begin measuring you needed to run the flue gas analyser and complete the calibration (some models do not allow the measurement before the calibration has not been finished).
Insert the analyser probe in the flue gas pipes and wait 2 ÷ 3 minutes to start showing the actual measured value.

Important data on analyser

Different models analysers can display different information. For the analysis of the flue gas and the correction of parameters in the boiler is important to check residual oxygen (O) and the flue gas temperature. Also useful will be an indication of emissions (CO), and combustion efficiency (ETA).

Analyse of gasses and parameter correction

When analysing we check the data about residual oxygen (O2). Optimal value of residual oxygen should be between 9-10 %.
If you have higher values of residual oxygen you need to lower the parameter S6.20. If you have lower values of residual oxygen you need to increase the parameter S6.20.

In the analysis you should not be fooled by fluctuations in the value of residual oxygen in the combustion account the pellet quite normal. Movement of the monitor for a minute and then carry out the necessary correction parameters. As appropriate value is the median value, with movements in the value of the residual oxygen. The possible correction of parameters should be gradual by 1 point or 1 %. During the correction parameter proceed with an analysis of the flue gases and track the change in value.

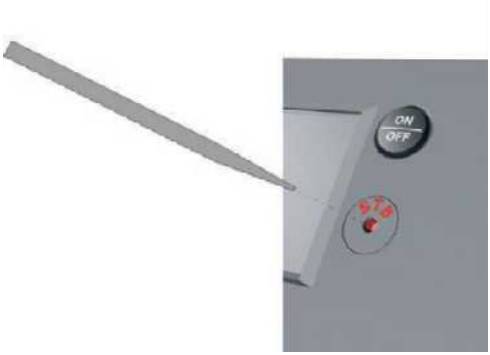
Function of the measurement in the controller will be automatically deactivated after 45 minutes if you press again the button .

TEST OF SAFETY TEMPERATURE LIMITER STB

Press and hold key or 5 seconds to activate safety temperature limiter test. Controller activates boiler or system's heat source and switches off all other outputs. Boiler is warming up on temperature 115 °C, i.e. to the temperature 110 ± 2 °C when the safety temperature limiter STB shall activate. Safety limiter test will automatically expire if safety limiter has activated or if heat source temperature has exceeded 115 °C or in 45 minutes after the test has been started. To stop safety limiter test at any time press key .

Activated safety temperature limiter is indicated with red illuminated ring around STB.

Activated safety temperature limiter needs to be reset before continuing with the system operation. To reset it, wait for the heat source temperature to drop below 100 °C and then press with appropriate tool into the hole of STB.



STB test is stored into task memory. STB test is marked as **STB test start**, if test is OK, the test is marked as **STB test ok**.

If STB test was not OK it is marked as error **STB test error**. n these case the cause has to be removed first, then the error has to be confirmed and test repeated. Reading of errors is described on page 21.

Successful STB test is a must for start of a boiler.

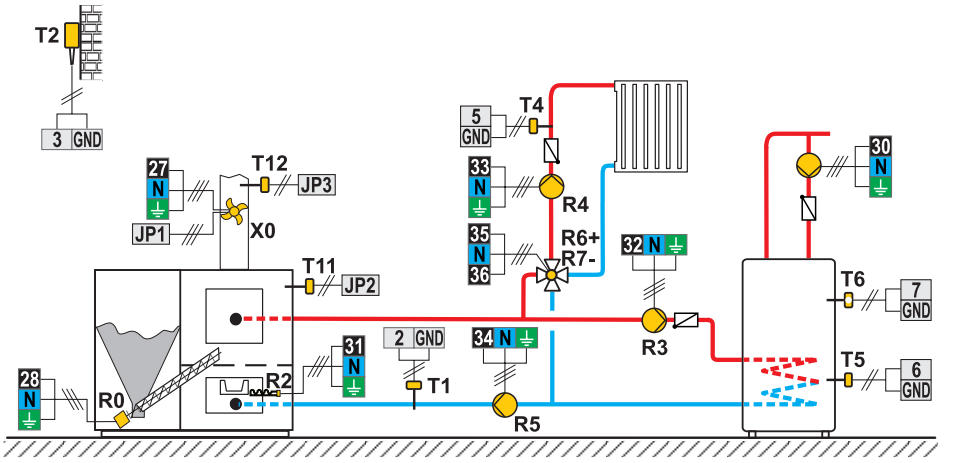
If safety temperature limiter fails to activate at 110 °C ± 2 °C, check if thicker part of capillary has good contact with the sleeve wall or that capillary tube isn't sharp bended or damaged. In other case the safety temperature limiter STB needs to be replaced.

HYDRAULIC CONNECTIONS

IMPORTANT

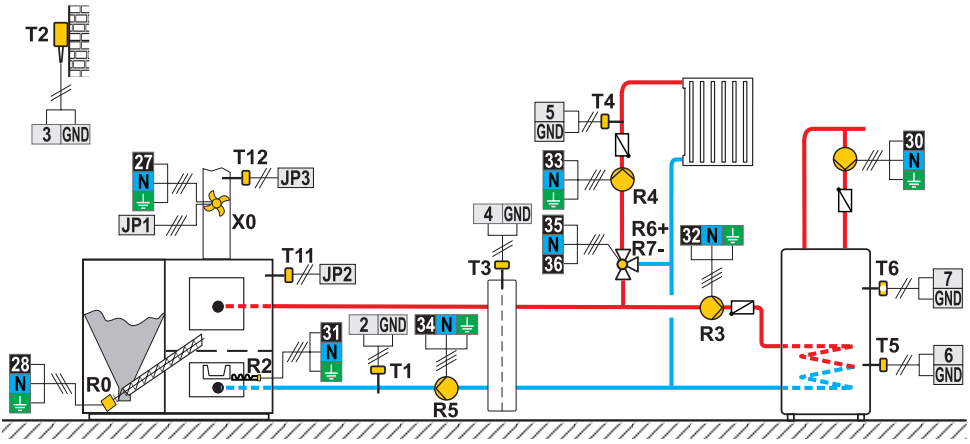
AWARE! Installation schemes show the principle of operation and do not contain all needed safety elements. During installation local laws has to be complied.

Scheme 092
Return regulation, mixing circuit, sanitary water



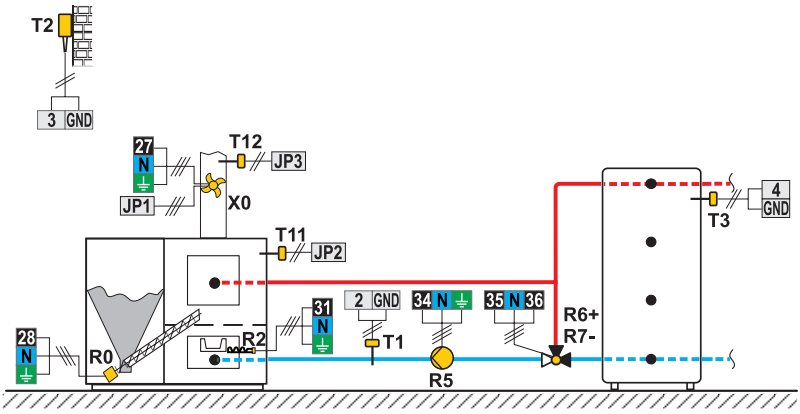
Scheme is not for expanding.

Scheme 092b
Return regulation, hydraulic separator, mixing circuit, sanitary water



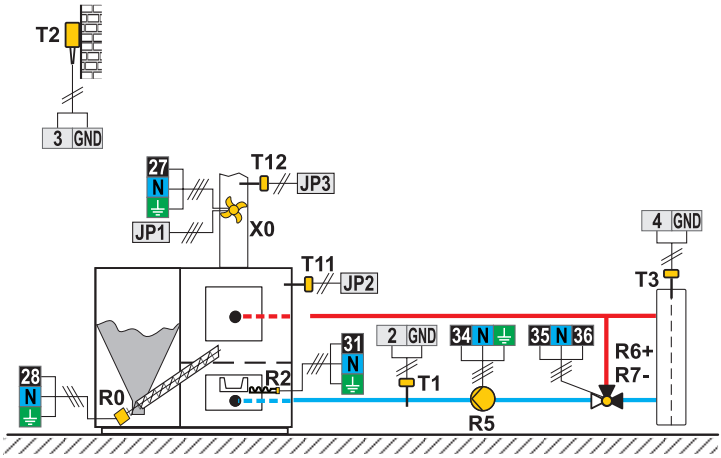
Scheme is not for expanding.

Scheme 093
Return regulation, storage tank



Scheme can be expanded with controllers WXD, WDC, CMP.

Scheme 093b
Return regulation, hydraulic separator



Scheme can be expanded with controllers WXD, WDC, CMP.

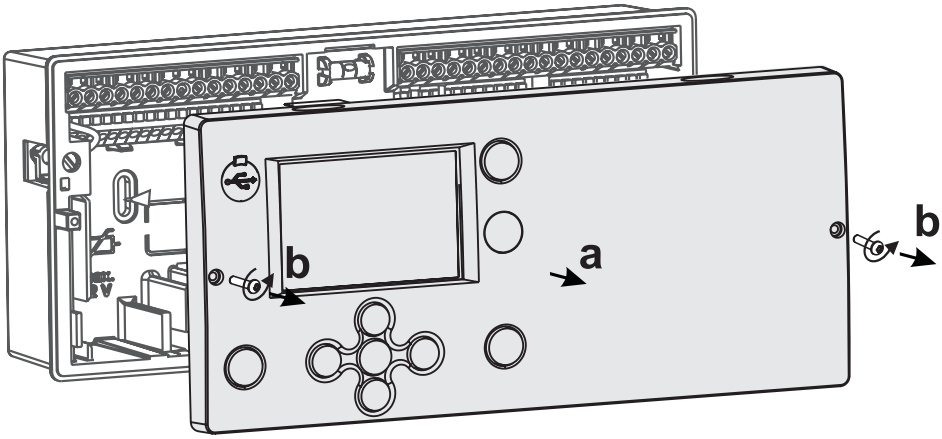
CONTROLLER MALFUNCTION

SENSOR SIMULATION AND CONTROLLER OPERATION TEST

The KPD controllers have a special function installed, which enables simulations of all sensors. With the help of this function, user can test controller operation. This function is intended for the cases of start-up, maintenance or testing of the controller.
Sensor simulation is activated in the following way. First, by pressing ⮌ button select the screen with hydraulic scheme display. Now, press the ⮌ button and hold it for 10 seconds. The controller will switch over to the simulation mode.
Move between sensors by pressing thee ✓ button. With buttons — or + set the temperature value for each selected sensor. The simulated sensor mark will change from T to S.
Simulation operation mode is deactivated by pressing the ⮌ button for 10 seconds or if no button is pressed for more than 5 minutes.

CONTROLLER FAILURE AND SERVICING

In the event of failure or damage to the controller, only the module shall be sent to service. The base should stay mounted without disconnecting the cables.



Demount the controller in the following way:
Loosen the screw (b) and drag the controller module (a) towards yourself. Now replace controller module or send it to the authorized service centre.

Before you start dismounting the controller, make sure the main power supply switch is turned off.

BOILER TECHNICAL DATA

Boiler power	8-25 kW
Efficiency	91,3
Weight of the boiler	
PKO25B	284 kg
Water volume in boiler	85 l
Max. flue gasses temp.	170 °C
Max. boiler temperature	85 °C
Min return water temperature	55 °C
Flus gas connection height	1043 mm
Boiler depth	1000 mm
Boiler width (without hopper)	410 mm
Boiler width (with hopper)	
PKO25B	915 mm
Boiler height	1270 mm
Flue gas connection diameter	120 mm
Outflow/return	1"
Filling pipe	3/4"
Pellet capacity	
PKO25B	135 kg (9 bags)
Pellet consumption MIN/MAX	2,4 / 6,4 kg/h
Allowed fuel	pellets
Max. pressure	3 bar
Required sub-pressure of chimney	0,05 mbar
Exhaust mass flow at nominal heat output	0,014 kg/s
Exhaust mass flow at minimum heat output	0,007 kg/s
Water-side resistance	500 ΔT=10°C
Boiler class	5
Combustion period in hours at QN	13,6h
Fuel type and water content as well as fuel size	Pellet C1; EN 303-5:2012
Filling chamber capacity	107 l
Filling opening dimensions	280 x 350 mm
Auxiliary power requirement at QN	350 W
Auxiliary power requirement at Qmin	5 W
Stand by power	3 W
Cold water temperature for safety heat exchanger	≥6 °C
Pressure of water for safety heat exchanger	6 bar
The noise emission of the boiler	50,3 dB

CONTROLLER TECHNICAL DATA

Dimensions [w x h x d]:	211 x 96 x 52 mm
Controller weight	735 g
Body material	ASA + PC - thermoplastic
Supply voltage	230 V ~ , 50 Hz
Own consumption	5 VA
Cable cross section	0.5 to 0.75 mm^2
Degree of protection	IP20 according to EN 60529
Protection class	I according to EN 60730-1
Temperature control class	III (without room temp. sensor)
	VII (with room temp. sensor)
Permissible ambient temperature	5 °C to +40 °C
Permissible relative humidity max.	85 % Rh at 25 °C
Storage temperature	-20 °C to +65 °C
Relay output	
R0, R1	pot. free, max. 4 (1) A ~, 230 V ~
R2, R3, R4, R5, R6, R7, R8	4 (1) A ~, 230 V ~
Triac output	
R9	1 (1) A ~, 230 V ~
Timer	
Type	7-day program timer
Min. interval	15 minutes
Built-in clock accuracy	± 5 min / year
Software class	A
Data retention	min. 10 years

Technical characteristics - temperature sensors

Type of temperature sensors	Pt1000 or KTY10
Resistance of temperature sensors	
Pt1000	1078 Ohm at 20 °C
KTY10	1900 Ohm at 20 °C
Temperature scope	
Outdoor sensor AF	-25 ÷ 65 °C, IP32
Immersion sensor TF	25 ÷ 150 °C, IP32
Surface sensor VF	0 ÷ 85 °C, IP32
Flue gases sensor CF	20 ÷ 350 °C, IP32
Conductor cross section	0,14 to 0.34 mm^2
Max. cable length	30 m

Exhaust gas mass flow at nominal heat output and lowest heat output in kilograms per hour	Exhaust gas mass flow at nominal load 72 kg/h (0.020 kg/s) Exhaust mass flow at partial load 30 kg/h (0.008 kg/s)
Water-side resistance in mbar	11,0 mbar
Boiler class	(according to EN 303-5:2012) 5
Setting range of the temperature controller in °C	50- 90°C
Minimum return temperature at the boiler inlet in °C	50°C
Required buffer tank size in liters when Qmin > 0.3 Qn	Not applicable / declaration Qmin=10kW / Qn=30kW
Auxiliary energy required in watts	45W at nominal heat output (elmax)
Required stand-by energy in watts	5W in standby mode (PSB)
Electrical connection including device and main switch	230V/50Hz/fused C16A
Boiler operation with fan	Type C boilers with a fan after the combustion chamber or the heat exchanger
Boiler operation in non-condensing mode	NOTICE! The chimney must be approved by the chimney sweeper will! The entire exhaust system - chimney and connection - is in accordance with ÖNORM / DIN EN13384-1 or ÖNORM M 7515 / DIN 4705-1. The exhaust gas temperatures in the cleaned state and the other exhaust gas values are the table in the technical data. Furthermore, the local and legal regulations apply! In accordance with EN 303-5, the entire exhaust system must be designed in such a way that sooting, insufficient delivery pressure and condensation is prevented. In addition Flue gas temperatures can occur in the permitted operating range of the boiler that are less than 160 K above room temperature.
The instructions must contain information on noise emissions, as well as information on how to measure noise and how to reduce noise from the boiler	Airborne sound level dB(A) < 70 In order to avoid transmission of structure-borne noise, the bottom of the boiler must not touch the floor (lift the boiler off the floor and align it horizontally with the adjustable feet).
NOTE Noise measurements should be carried out according to EN 15036-1	
Noise measurements according to EN 15036-1	* enclosed word document
Measures for ventilation devices in the room air network	Combustion air supply at the installation site The system is operated depending on the room air, i.e. the combustion air for operating the boiler is taken from the installation site. Conditions: ▪ Opening to the outside – no impairment of the air flow by weather influences (e.g. snow, Leaves) – Free cross-sectional area, taking into account e.g. B. grilles, slats

Measures for ventilation devices in the room air network	▪ Air lines – for cable lengths over 2 m and for mechanical transport of the perform a flow calculation for the combustion air (Flow speed max. 1 m/s) Standard note ÖNORM H 5170 - Construction and fire protection requirements TRVB H118 - Technical guideline for preventive fire protection Joint operation with air-sucking systems When operating the room air-dependent boiler together with air-sucking systems (e.g. living room ventilation), safety devices are required: ▪ Air pressure switch ▪ Flue gas thermostat ▪ Window tilt drive, window tilt switch NOTICE! Safety devices with responsible chimney sweep / Clarify chimney sweep Recommendation for living room ventilation: Use »intrinsically safe« domestic ventilation with F marking Basically: ▪ negative pressure on the room side max. 8 Pa ▪ Air-sucking systems must not exceed the negative pressure on the room side – if this is exceeded, a safety device (negative pressure monitoring) is required The following also applies to Germany: DiBt-approved vacuum monitoring (e.g. air pressure monitor P4) use, which monitors the maximum negative pressure of 4 Pa at the installation site. In addition, comply with at least one of the following three measures: (Source: §4 MFeuV 2007 / 2010) ▪ Dimension the cross-section of the combustion air opening so that during the boiler operation, the maximum negative pressure is not exceeded (common Operation) ▪ Use safety devices that prevent simultaneous operation (alternating operation) ▪ Monitor flue gas discharge using safety devices (e.g. flue gas thermostat) joint operation A tested safety device (e.g. air pressure monitor) ensures that the pressure conditions are maintained while the boiler and the air-sucking system are in operation. In the event of a fault, the safety device switches off an air-sucking system. Two-way operation. A tested safety device (e.g. flue gas thermostat) ensures that the boiler and the air-sucking system are not operated at the same time, e.g. B. by switching off the power supply

Self-locking and sealing measuring ports	For the emission measurement of the system is in the connecting line between the boiler and Set up a suitable measurement opening for the chimney system. In front of the measurement opening (M) should be at a distance of about twice corresponds to the diameter (D) of the connecting line, there must be a straight inlet section. After the measuring port there is a straight run-out section at a distance of approx corresponds to the simple diameter of the connecting line. The measurement port must be kept closed at all times during operation of the system.
Oral instruction by specialist staff before commissioning	Obligation to inform The person who carries out the activities on the system must read the instructions for use before starting work. Chapter ˝2 is particularly important. Safety instructions. The instructions for use must always be in the vicinity of the firing system. The first start-up must only be carried out by the authorized customer service technician from SELTRON or a suitably trained partner. Commissioning includes training on use (oral instruction), maintenance and cleaning as well as operation and emission regulations.
Measures for proper fuel storage	When storing fuel (storage of pellets), the following standard must be observed: ÖNORM M 7137 Compacts made from natural wood - requirements for pellet storage at the end customer

TECHNICAL INFORMATION AND INSTALLATION INSTRUCTIONS

Necessary delivery pressure in mbar	9-15 mbar
The burning time for the fuel types at nominal heat output / turnover	Burn time at rated output ..... 6 h

DECLARATION OF CONFORMITY

BOILERS PKO are conformed with the following directives:

- LVD: Low Voltage Directive 2014/35/EC,
- EMC: Electromagnetic Compatibility Directive 2014/30/EC,
- RoHS II: Directive on hazardous substances in electrical and electronic equipment, 2011/65/EC.

PRODUCT DESCRIPTION:
Pellet boiler

Type:
PKO25B135

STANDARDS USED:
EN60730-1:2001, EN60730-1:2001/A2:2009, EN60730-2-9:2002,
EN60730-2-11:2008,
EN61000-6-1:2007, EN55014-1:2007, EN12098-1:2002 EN303-5.

CE

DISPOSAL OF OLD ELECTRICAL AND ELECTRONIC EQUIPMENT

Disposal of old electrical and electronic equipment (Applies to European Union Member States and other European countries with separate collection system).

This symbol on the product or its packaging indicates that it should not be disposed as household waste. Product must be submitted at the collection points for waste electrical and electronic equipment (WEEE). With the proper disposal of this product will prevent a negative impact on the environment and human health which could otherwise be caused by its erroneous removal.

Recycling materials reduce consumption of new raw materials. For more information about recycling this product, please contact the relevant departments, waste disposal service or the shop where you bought it.

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Software V1.0r0

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