

**Expertise on Dimensions of Chimneys Based on EN 13384-2**

Date 2/2/2013

**Design of Plant - "Σύντομη περιγραφή έργου"**

Number of Chimney Entries	1	
...at Chimney Entry 1	3 Appliances	
Chimney	House Chimney	
Position/Run	Outside at Building	
Fresh Air Supply	Raumluft (Dependent on Room Air)	
Air Supplied by	From Installaion Room B1, B2	
Sections	Connector: 1, Chimn	
Outlet	Open Outlet Zeta = 0	

**Environment**

Installation Site	"Περιοχή έργου"	
Geodetic Height	350 m	
Safety Factor SE	1,2	
Correction Factor SH	0,5	
Ambient Air Temperatures (Standards)		
At top Outlet	-1	(Temperature Requirement)
Outside Area	- °C	(Temperature Requirement)
In Unheated Areas	0	(Temperature Requirement)
In Heated Areas	20	(Temperature Requirement)
Ambient Air	°C	(Pressure Requirement)

**Appliances 1...3**

Category	Gas Condensing Appliance	
Manufacturer, Model	"Επιλογή κατασκευαστή λέβητα συμπίκνωσης" "Επιλογή μοντέλου λέβητα συμπίκνωσης"	
Fuel	Natural Gas	
	<b>High Fire</b>	<b>Low Fire</b>
Nominal Output (Net)	35 kW	10 kW
Nominal Output (Gross)	36,06 kW	10,42 kW
CO2 Level	9 %	8,4 %
Mass Flow	20,64 g/s	6,12 g/s
Temperature	68 °C	63 °C
Maximum Feed Pressure	130 Pa	15 Pa
Appliance Outlet	Round 80 mm	
Kind of Connection	Reduction Conic 60°	
Required Air (Factor Beta)	0,9	
<b>Non-Return Valve</b>		
Manufacturer, Model	Almeva (CH) Clapet Almeva 80 mm	
Required Pressure	Dynamically By Characteristic	

**Installation Room for Appliances 1...3**

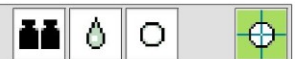
Category	Installation Room
Fresh Air	Windows, Opening from Outside
Extract Air	None

**Connector Section 5 - Construction**

Category	Connector		
Manufacturer, Model	Almeva East Europe STARR PPH		
Cross Section	Round 153 mm (DN 160)		
Layers	Material	Thickness	Thermal Cond.
	Polypropylen h	3,5 mm	0,22 W/mK
Rugosity	1 mm		
Product Classification	EN 14471 - T120 H1 O W 2 O20 I D L		
Registrations	CE-0036-CPD-9165-001 ()		

**Connector Section 4 - Construction**

Category	Connector		
Manufacturer, Model	Almeva East Europe CAS PPH		
Cross Section	Round 153 mm (DN 160)		
Layers	Material	Thickness	Thermal Cond.
	Polypropylen h	3,5 mm	0,22 W/mK
Rugosity	1 mm		
Product Classification	EN 14471 - T120 H1 O W 2 O20 I D L		
Registrations	CE-0036-CPD-9165-001 ()		

**Connector Section 3 - Construction**

Category	Connector		
Manufacturer, Model	Almeva East Europe STARR PPH		
Cross Section	Round 76 mm (DN 80)		
Layers	Material	Thickness	Thermal Cond.
	Polypropylen h	2 mm	0,22 W/mK
Rugosity	1 mm		
Product Classification	EN 14471 - T120 H1 O W 2 O20 I D L		
Registrations	CE-0036-CPD-9165-001 ()		

### Connector Section 5 - Geometrie



Resistances	None
Effective Height	0,2 m
Drawn Length	1,5 m
Portion in outside areas	0 %
Portion in unheated areas	0 %
Portion in heated areas	100 %

### Connector Section 4 - Geometrie



Resistances	None
Effective Height	0,1 m
Drawn Length	1 m
Portion in outside areas	0 %
Portion in unheated areas	0 %
Portion in heated areas	100 %

### Connector Sections 1...3 - Geometrie



Resistances	None
Effective Height	0,2 m
Drawn Length	1,5 m
Portion in outside areas	0 %
Portion in unheated areas	0 %
Portion in heated areas	100 %

### Chimney - Construction



Category	Chimney with Flue						
Manufacturer, Model	Almeva East Europe S...						
Cross Section	Round 153 mm (DN 160)						
Layers	<table><thead><tr><th>Material</th><th>Thickness</th><th>Thermal Cond.</th></tr></thead><tbody><tr><td>Polypropylen h...</td><td>3,5 mm</td><td>0,22 W/mK</td></tr></tbody></table>	Material	Thickness	Thermal Cond.	Polypropylen h...	3,5 mm	0,22 W/mK
Material	Thickness	Thermal Cond.					
Polypropylen h...	3,5 mm	0,22 W/mK					
Rugosity	1 mm						
Gap	Still Air Layer without D-r. (20 mm)						
Cross Section	Square 150 mm						
Thermal Resistance	0,12 m <sup>2</sup> K/W						
Thickness	115 mm						
Inner Wall Material	Block with High length						
Rugosity	5 mm						
Product Classification	EN 15287 - T120 H1 O W 2 O20 I D L						
Chimney Classification	EN 15287 - T120 H1 W 2 O00 L90 (R0,48)						
Registrations	EN 15287-2:20036-CFD-9165-001 ()						

### Chimney - Geometrie



Resistances	None
Effective Height	20 m
Drawn Length	20 m

### Chimney - Course (Outside at Building)



Length in outside areas	20 m
Length in unheated areas	0 m
Length in heated areas	0 m
Height above Shaft	0,4 m
Building Contact	None
<b>Additional Insulation</b>	
Outside Area	No
In Unheated Areas	canceled

### Outlet Resistance



Outlet Resistance Zeta      Open Outlet  
0

### Entries 2 and 3



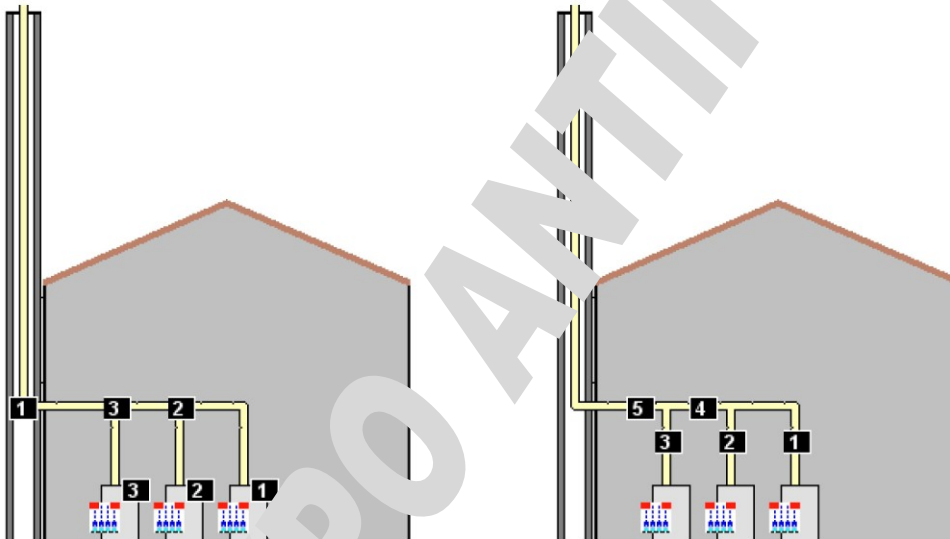
Resistance      Tee-Shoe 87 °

### Entry 1



Resistance      L-Bow      87 °

### Schematic Representation of the Plant



Numbering  
Appliances and Entries

Numbering  
Sections of Chimney

### Total Result



Mode      Planned With Positive Pressure, Wet

#### Appliance:

	1	2	3
All appl. at nom. Output (a)	+++	+++	+++
All appl. at min. Output (b)	+++	+++	+++
Only Appl. 1 at Nom. Output (c)	+++		
Only one Appl. At Min. Output (d)	+++		
Reflux at Nom. Output	+	+	+

#### Chimney:

Temperature Requirement      +



All the mentioned conditions for the check of the function of the chimney are fulfilled. Therefore,, the chimney is able to work from an arithmetical point of view.

### Detailed Results - Pressure Requirements (Mass Flows)



**Pressure Requirement (a)** All heating appliances are simultaneously in operation with maximum thermal input (nom. output).

Mass Flow (g/s)	mwc	mw	mwc - mw	
Appliance 3	20,6	20,6	0	+++
Appliance 2	20,6	20,6	0	+++
Appliance 1	20,6	20,6	0	++

**Pressure Requirement (b)** All heating appliances are simultaneously in operation with lowest stationary thermal input (min. output).

Mass Flow (g/s)	mwc	mw	mwc - mw	
Appliance 3	6,1	6,1	0	+++
Appliance 2	6,1	6,1	0	+++
Appliance 1	6,1	6,1	0	+++

**Pressure Requirement (c)** Only one heating appliance is in operation with maximum thermal input (nom. output). All other ones are out of operation.

Mass Flow (g/s)	mwc	mw	mwc - mw	
Appliance 3	20,6	20,6	0	+++
Appliance 2	20,6	20,6	0	+++
Appliance 1	20,6	20,6	0	+++

**Pressure Requirement (d)** Only a heating appliance with lowest stationary nominal output (min. output) is in operation. All other ones are out of operation.

Mass Flow (g/s)	mwc	mw	mwc - mw	
Appliance 3	6,1	6,1	0	+++
Appliance 2	6,1	6,1	0	+++
Appliance 1	6,1	6,1	0	+++

### Detailed Results - Reflux at Nom. Output



**Reflux at Nom. Output** All heating appliances, except one, are in operation with maximum thermal input. At the inlet behind this heating appliance, no positive pressure must occur if no none-return-valve is available.

Appliance	Pressure (Pa)	Non-Return Valve?	
Appliance 3 (Entry 3)	-1,1	Pos. Press.!	Yes +
Appliance 2 (Entry 2)	4,9	Pos. Press.!	Yes +
Appliance 1 (Entry 2)	2,0	Pos. Press.!	Yes +

### Detailed Results - Temperature Requirement



**Temperature Requirement** Test concerning ice accretion: The upper inside wall temperature % % must not fall below the freezing point % %.

Temperature (°C)	t <sub>iob</sub>	t <sub>g</sub>	t <sub>iob</sub> -t <sub>g</sub>	
Section 1	7,1	0	7,1	+

#### Hints

The dimensioning of the chimney is not according to standard EN 13384-2 if at least one of the following conditions is true:

>>> The chimney is driven as planned with positive pressure.

The dimensioning is explicitly carried out according to a dimensioning-technological expert opinion on the basis of the indicated norm under supplementary consideration of generally known physical contexts and relevant technological guidelines.

As None Return Valves will effect appliances, the producer of the appliance has to agree to the use of the None Return Valve for this appliance.