TEST REPORT N° TIQG-19-009

Standards references	**EN 15502-1:2012 + A1:2015** **EN 15502-2-1:2012 + A1:2016**
Laboratory name	**IMQ Spa** **Via dell'Industria 55, 31020 Zoppè - San Vendemiano** **Tel. (+39) 0438 470255 / 778358**
Testing location	IMQ Spa Via dell'Industria 55, 31020 Zoppè - San Vendemiano Tel. (+39) 0438 470255 / 778358
Applicant	**ONMETAL DOKUM SAN. VE TIC. LTD. STI.**
Applicant's address	İkitelli O.S.B. 17. Cad. No:5 34306 Başakşehir/ İstanbul - TURKEY
Manufacturer	**ONMETAL DOKUM SAN. VE TIC. LTD. STI.**
Factory's address	Organize Sanayi Bölgesi Mah. 4. Cad. No:3 Süloğlu/ Edirne - TURKEY
Type of appliance tested	**Floor standing boiler**
Trade mark	**RIMA**
Model	**ONGAS 303** **ONGAS 304** **ONGAS 304 PLUS** **ONGAS 305** **ONGAS 306** **ONGAS 307**
Sampling method	Chosen by the manufacturer
Gas category	See enclosure
Installation type	B23 - C63
Date of issue	2019/10/03
Total number of pages	88 pages
N° of enclosures	1 enclosure
Compilated by	B. Biricik
Approved by	G. Granzotto
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Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
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Note Generali
General Note

- Le incertezze di misura dichiarate in questo documento sono state espresse come incertezza estesa ottenuta moltiplicando l'incertezza tipo composta per un fattore di copertura k=2 corrispondente ad un livello di fiducia di circa il 95%.
  Vedi allegato n°1 per incertezze strumentali
  The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%. See enclosure n°1 for the equipment uncertainty

- I campioni oggetto delle prove sono stati prelevati e consegnati dal fabbricante.
  The samples tested have been taken and delivered by the manufacuter.

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
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Elenco prove
Test list

Standard: EN 15502-1:2012 + A1:2015
EN 15502-2-1:2012 + A:2016

Clause	Test
8.2.1	Soundness of the gas circuit
9.2 - 9.3	USEFUL EFFICIENCIES
8.4.1	Nominal heat input
8.12.3.1	Carbon monoxide - Incomplete combustion
8.12.3.2	Carbon monoxide - Supplementary test for fan assisted bollers
8.12.3.3	Carbon monoxide - Flame Lift
8.4.3	Ignition rate
8.5	Limiting temperatures
8.6	Ignition, cross lighting, flame stability
8.7	Reduction of the gas pressure
8.11.4	Control devices
8.11.5	Ignition devices
8.11.6	Flame supervision device
8.11.8	Thermostats and water temperature limiting devices
8.11.101	Air proving device
8.12.4	Sooting
8.12.5	Carbon monoxide - Supplementary test for low temperature boilers and condensing boilers
8.16	Temperature of combustion products
10	Electric auxiliary energy

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
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ONGAS 303

Dati nominali
Nominal data

Brand name	RIMA	
Model	ONGAS 303	
Installation type admitted	B23 - C63 - C13x - C33x	
Registration number	Prototype	
Burner adjusting	Modulating	
Flame surveillance	Ionization	
Ignition type	Electronic	
Heating circuit		
Max temperature of heating water	110,0	°C
Max pressure of heating water (PMS)	6,0	bar
Heating water circulation	Forced	
Pressure class	3	
Electrical nominal data		
Input voltage	230	V
Frequency	50	Hz
Electrical power	160	W
Protection level against moistness and water inlet	-----	

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ONGAS 303

Dati tecnici

Technical data

Nominal heat INPUT				
Maximum		kW	65,0	
Minimum		kW	15,0	
Nominal heat OUTPUT				
Maximum		kW	62,0	
Minimum		kW	14,1	
Efficiency				
Maximum heat input	(80-60°C)	%	96,2	
Minimum heat input	(80-60°C)	%	93,7	
Maximum heat input	(50-30°C)	%	106,4	
Minimum heat input	(50-30°C)	%	107,1	
Partial load return 30°C (direct method)		%	105,8	
Fan speed			MAX	MIN
G20		rpm	4950	1300
CO2 content				
			MAX	MIN
G20		%	9,70	9,50

EN 15502-1:2012 + A1:2015
EN 15502-2-1:2012 + A1:2016
Rev.2

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ONGAS 303

Configurazione camini
Flue instalation configuration

Flue installation

Installation type		B23 -C63-C13x-C33x
Diameter of air inlet ducts	mm	50,0
Diameter of evacuation ducts	mm	80,0
Maximum Δp pressure ducts	Pa	260

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ONGAS 303

BOILERS WITH PNEUMATIC AIR/GAS RATIO CONTROL — Test with water temperature: x 80 °C / 60 °C; 50 °C / 30 °C

8.4.1 Nominal heat input

8.12.2 Carbon monoxide - Limit conditions

8.12.3 Carbon monoxide - Special conditions

Gas group	2E		N° injectors	-----		Installation type	B23	
Reference gas	G20		Injectors diameter	-----	mm	Type of ducts	seperated	
Nominal supply pressure	20,0	mbar	Gas diaphragm	-----	mm	Evacuation ducts diameter	80	mm
			Diameter pilot burner injector	-----	marking	Air inlet ducts diameter	50	mm

Test n°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Test date																	
Ambient temperature	°C	24,8	24,9							24,8	24,9					24,8	24,9
Ambient air speed	m/s	0,18	0,18							0,19	0,18					0,18	0,17
Evacuation duct length	m	1,0	1,0							1,0	1,0					1,0	1,0
Air inlet duct length	m	-----	-----							-----	-----					-----	-----
Δp pressure ducts	Pa																
Test gas		G20	G20	G20	G20	G20	G20	G20	G20	G21	G21	G20	G20	G20	G20	G231	G20
Gas supply pressure	mbar	20,3	20,0													17,0	20,0
Gas meter pressure	mbar	20,4	21,7													17,2	20,3
Fan speed	g/min	4950	1300														2700
Reference gas "Net calorific value"	MJ/m^3	34,02	34,02	34,02	34,02	34,02	34,02	34,02	34,02	40,91	40,91	34,02	34,02	34,02	34,02	28,91	34,02
Used gas "Net calorific value"	MJ/m^3	34,46	34,46							40,91	40,91					31,46	34,46
Reference gas density		0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,687	0,687	0,555	0,555	0,555	0,555	0,617	0,555
Used gas density		0,572	0,572							0,687	0,687					0,586	0,572
Atmospheric pressure	mbar	1013	1013														1013
Gas temperature	°C	25,6	25,8														25,9
Gas meter type a=wet, s=dry		s	s														s
Combustion air temperature	°C	24,8	24,9														24,9
Correction under reference conditions		1,0254	1,0265														1,0250
Meter correction		0,993	0,995														0,991
Gas volume	dm^3	170,0	41,5														150,0
Time	s	92,5	96,1														96,5
Measured heat input	**kW**	**63,67**	**15,00**														**53,74**
Measured heat input uncertainty	kW																
Nominal heat input	**kW**	**65,00**	**15,00**	**65,00**	**15,00**	**65,00**	**15,00**	**65,00**	**15,00**	**65,00**	**15,00**	**65,00**	**15,00**	**65,00**	**15,00**	**15,00**	**55,00**
Deviation		-2,05%	0,01%														-2,30%
Deviation with uncertainty		-2,05%	0,01%														-2,30%
Allowed deviation		±5%	±5%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	< 0
Flue gas temperature	°C	85,0	65,0							74,5	65,2					64,3	
CO2 measured	%	9,7	9,5	10,2	10,0					10,5	10,3	9,6	9,2	10,0	9,0	8,5	
CO measured	ppm	88	13	192	11					190	11	80	13	135	13	15	
CO in dry air-free products combustion products	**ppm**	**106**	**16**	**220**	**13**					**221**	**13**	**98**	**17**	**158**	**17**	**20**	
CO uncertainty	ppm	30	30	30	30					30	30	30	30	30	30	30	
Limit	ppm	-----	-----	1000	1000	1000	1000	1000	1000	2000	2000	2000	2000	2000	2000	2000	-----

Test n°	Pt	Description
1	8.4.1	Maximum heat input
2	8.4.1	Minimum heat input
3	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmax
4	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmin
5	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmax
6	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmin
7	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmax
8	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmin
9	8.12.3.1	Incomplete combustion - Qmax
10	8.12.3.1	Incomplete combustion - Qmin
11	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmax
12	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmin
13	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmax
14	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmin
15	8.12.3.3	Flame lift limit gas
16	8.4.3	Ignition rate

General note:	*The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.* *See enclosure n°1 for the equipment uncertainty*

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9.2 - 9.3 USEFUL EFFICIENCIES

Maximum heat input	65,0	kW
Minimum heat input	15,0	kW
Average heat input	40,0	kW
Range rated	yes	
Type of boiler	condensing	

Maximum heat output	65,0	kW
Minimum heat output	15,0	kW
Average heat output	40,0	kW

Type of gas	G20	
Installation type	B23	
Evacuation duct diameter	80	mm
Air inlet duct diameter	50	mm
Evacuation duct length	0,5	m
Air inlet duct length	0,5	m
Diaphragm diameter	-----	mm

Parameter for partial load test		
Method	direct	
Operating mode	1,0	
Conditions	3,0	
T_{ON}	480,0	sec
T_{OFF}	120,0	sec

Test n°			1	2	3	4	5	6
Ambient temperature		°C	22,8	22,9	22,7	22,5	22,4	22,7
Specific humidity		g/kg	9,7	9,7	9,7	9,7	9,7	9,7
Atmospheric pressure	(Pa)	mbar	1009	1009	1009	1009	1009	1009
Net calorific value of used gas	(Hi)	MJ/m³ st	34,02	34,02	34,02	34,02	34,02	34,02
Gas meter pressure	(Pg)	mbar	21,7	20,5	21,3	21,6	20,5	20,5
Gas temperature	(Tg)	°C	22,1	22,0	22,3	22,2	22,5	22,6
Gas meter correction			0,994	0,997	0,994	0,988	0,997	0,998
Gas volume		l	1160,0	264,3	710,0	1170,0	271,1	215,4
Time		s	601,7	604,4	605,4	601,4	605,5	600,0
Measured heat input		kW	64,73	14,72	39,33	64,90	15,04	12,07
Loss at test bench	(Dp)	kJ	0,0	0,0	0,0	0,0	0,0	0,0
Water rate		kg/h	2696,6	600,3	1618,5	2988,9	690,5	1594,6
Return temperature		°C	60,1	59,8	59,7	30,0	30,0	30,1
Flow temperature		°C	80,3	79,9	80,0	49,9	50,1	37,0
ΔT measured			20,2	20,1	20,3	19,9	20,1	6,9
Power issued to water		kW	62,26	13,79	37,56	69,02	16,11	12,77
Water efficiency		%	**96,2**	**93,7**	**95,5**	**106,4**	**107,1**	**105,8**

Test n° 1	Maximum heat input	80-60°C
Test n° 2	Minimum heat input	80-60°C
Test n° 3	Average heat input	80-60°C
Test n° 4	Maximum heat input	50-30°C
Test n° 5	Minimum heat input	50-30°C
Test n° 6	Partial load (30%) return	30°C

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

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8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.2 Supervision of the combustion air rate or the combustion products rate

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	80/50	mm
Evacuation duct length	1,0	m
Air inlet duct length	-----	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	x
Start up supervision	

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,9%	9,7%
CO2 MIN	9,5%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	0	5,9	71	**141**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	0	7,3	30	**48**	**2000**
					2000
					2000
					2000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	>900	9,3	19	**24**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	>900	7,5	30	**47**	**2000**
					2000
					2000
					2000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

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ONGAS 303

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio

a) Adjust the CO2 at Qmax to the MAX CO2 value and at Qmin at MIN CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	80/50	mm
Evacuation duct length	1,0	m
Air inlet duct length	-----	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	x
Start up supervision	

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,9%	9,7%
CO2 MIN	9,5%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	0	8,5	42	**58**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	0	7,8	49	**74**	**2000**
					2000
					2000
					2000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	>900	8,2	47	**67**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	>900	8,2	52	**74**	**2000**
					2000
					2000
					2000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

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8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio
b) Adjust the CO2 at Qmax to the MIN CO2 value and at Qmin at MAX CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	80/50	mm
Evacuation duct length	1,0	m
Air inlet duct length	-----	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	x
Start up supervision	

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,9%	9,7%
CO2 MIN	9,5%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	0	10,0	22	**26**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	0	8,4	31	**43**	**2000**
					2000
					2000
					2000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	>900	8,6	32	**44**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
	>900	7,8	26	**39**	**2000**
					2000
					2000
					2000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

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ONGAS 303

8.13 NOx EMISSION - (NITROGEN OXIDE - 20°C - Proportional moistness 10gH2O/kg air)
8.13.2.5 / 8.13.2.6 Modulating boiler

Maximum heat input	Qn	65,0	kW
Minimum heat input	Qr	15,0	kW
Average heat input	Qa	40,0	kW
Range rated		yes	
Type of gas		G20	
Installation type		B23	
Diameter of pipe (outlet-inlet)		80	mm
Length of drain pipe		0,5	m
Direction		-----	
Diaphragm diameter		-----	mm
Ambient temperature	T_{amb}	21,9	°C
Atmospheric pressure	P_{atm}	1009	mbar
Specific humidity		9,46	g/kg

						Qr
Partial heat input Qpi in % of Qn			70%	60%	40%	38%
Partial heat input	Qpi	kW	28,0	24,0	16,0	15,0
Pondering factor	Fpi		0,15	0,25	0,30	0,30
Fan speed		g/min	2850	2450	1650	1600
Measured heat input		kW	28,7	24,5	16,3	15,4
Inlet temperature		°C	48,0	44,0	36,0	35,0
CO_2 measured		%	9,2	9,1	9,0	9,0
CO measured		ppm	50	46	26	20
COc (0% 0_2)		ppm	64	59	34	26
NOx measured		ppm	18	12	8	8
NOx adjusted		mg/kWh	40,38	27,22	18,35	18,35
NOx total		mg/kWh	23,87			
NOx adjusted		mg/kWh	**22,18**			
NOx class assigned			**5**			

NOx class		**1**	**2**	**3**	**4**	**5**
NOx limit	mg/kWh	**260**	**200**	**150**	**100**	**70**

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ONGAS 303

OUTPUT MASS

		Volume of the mass of the combustion products at 15 °C	V_{CO2}: Carbon dioxide created by the combustion of 1 m^3 of gas with air	V_{H2O}: water steam created by the combustion of 1 m^3 of gas with air	CO_2 measured	Output volume of the referring gas at the output heat indicated by the manufacturer at 15 °C and 1013,25 mbar under root adjusted also to the meter	**Mf: Combustion products output mass**
	Measure unit	kg/m^3	m^3/m^3	m^3/m^3	%	m^3/h	**g/sec**
MAX HEAT INPUT	65,0 kW						
G20		1,19	1	2	9,7	6,878	**28,01**
G25		1,19	0,86	1,72	-----	8,000	**-----**
G30		1,19	4	5	-----	2,016	**-----**
G31		1,19	3	4	-----	2,659	**-----**
MIN HEAT INPUT	15,0 kW						
G20		1,19	1	2	9,5	1,587	**6,58**
G25		1,19	0,86	1,72	-----	1,846	**-----**
G30		1,19	4	5	-----	0,465	**-----**
G31		1,19	3	4	-----	0,614	**-----**

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ONGAS 303

8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

		Ignition	CO_2 %	CO [ppm]	CO [ppm] in air and water free products of combustion	Limit [ppm]
8.6.3	**Special flue conditions** Tests at nominal and minimum heat input					
	Reference gas used G20					
8.6.3.104 8.12.3.101.3	Type C4 Shortest ducts specified by the manufacturer					
	Suction of 0,5mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
8.6.3.105 8.12.3.101.4	Type C5 Shortest ducts specified by the manufacturer					
	Suction of 2,0mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
	Type C6					
8.6.3.106	Suction of 0,5mbar applied to the combustion products outlet	✓				
8.12.3.101.5	10% of the combustion products are recircurlated in the air supply					
	Maximum heat input		10,6	390	430	2000
	Minimum heat input (only for gas/air ratio controls)		10,2	30	34	2000
	Intervention of APS before CO concentration exceed 2000ppm		-----	-----	-----	2000
	APS switch off at ----- Pa					

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

Manufacturer	**ON METAL DOKUM SAN. VE TIC**
Model	**ONGAS 303…307**
Test report n°	**TIQG-19-009**

ONGAS 303

8.5 LIMITING TEMPERATURES

	Measured	Limit
8.5 Limiting temperatures		
8.5.1 Reference gas - Nominal heat input Control thermostat set at maximum The temperature are measured when thermal equilibrium is reached		
Ambient temperature	22,0 °C	
8.5.2 Adjusting, control and safety devices		
Gas valve	32,0 °C	70 °C
Electronic PCB	35,0 °C	60 °C
Knobs		
Metal	----- K	35 K
Glass and ceramics	----- K	45 K
Plastic	4,0 K	60 K
8.5.3 Side walls, front and top surface		
Side wall	9,0 K	80 K
Front surface	8,0 K	80 K
Top surface	7,0 K	80 K
8.5.4 Test panels and floor		
Floor	x K	80 K *
Right panel	2,0 K	80 K *
Left panel	2,0 K	80 K *
Back panel	3,0 K	80 K *
* if temperature rise is between 60 K and 80 K the manufacturer shall supply a protection		
8.5.101 External temperature of the ducts The temperature are measured after 30 min		
External temperature of the ducts	42,0 K	60 K

ONGAS 303

10 ELECTRIC AUXILIARY ENERGY

	Unit	Measured
10.2 The system boundary cotains all electrical components between the manual shut-off device and the flue outlet of the combustion circuit, <u>including the circulation pump.</u>		
10.3 Auxiliary energy at nominal heat input Test conditions as pt. 9.2.2 The external hydraulic resistance is adjusted in such a way that is 0,15 bar at 20 K temperature difference		
Measured auxiliary energy	kW	0,1880
10.4 Auxiliary energy at part load Test conditions as pt. 9.2.2 and 9.3.2		
Measured auxiliary energy	kW	0,0306
10.5 Auxiliary energy at stand-by Power input measured during operation in stand-by		
Measured auxiliary energy	kW	0,0037

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
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ONGAS 304

Dati nominali
Nominal data

Brand name	RIMA
Model	ONGAS 304
Installation type admitted	B23-C63
Registration number	Prototype
Burner adjusting	Modulating
Flame surveillance	Ionization
Ignition type	Electronic
Heating circuit	
Max temperature of heating water	110,0 °C
Max pressure of heating water (PMS)	6,0 bar
Heating water circulation	Forced
Pressure class	3
Electrical nominal data	
Input voltage	230 V
Frequency	50 Hz
Electrical power	190 W
Protection level against moistness and water inlet	-----

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 304

Dati tecnici
Technical data

Nominal heat INPUT				
Maximum		kW	90,0	
Minimum		kW	20,0	
Nominal heat OUTPUT				
Maximum		kW	87,8	
Minimum		kW	18,9	
Efficiency				
Maximum heat input	(80-60°C)	%	97,6	
Minimum heat input	(80-60°C)	%	94,7	
Maximum heat input	(50-30°C)	%	104,8	
Minimum heat input	(50-30°C)	%	108,3	
Partial load return 30°C (direct method)		%	105,3	
Fan speed			MAX	MIN
G20		rpm	6200	1500
CO2 content				
			MAX	MIN
G20		%	9,60	9,10

EN 15502-1:2012 + A1:2015
EN 15502-2-1:2012 + A1:2016
Rev.2

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
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ONGAS 304

Configurazione camini
Flue instalation configuration

Flue installation

Installation type		B23-C63
Diameter of air inlet ducts	mm	80,0
Diameter of evacuation ducts	mm	100,0
Maximum Δp pressure ducts	Pa	260

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
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ONGAS 304

BOILERS WITH PNEUMATIC AIR/GAS RATIO CONTROL — Test with water temperature: x 80 °C / 60 °C; 50 °C / 30 °C

8.4.1 Nominal heat input
8.12.2 Carbon monoxide - Limit conditions
8.12.3 Carbon monoxide - Special conditions

Gas group	2E	N° injectors	-----		Installation type	B23	
Reference gas	G20	Injectors diameter	-----	mm	Type of ducts	seperated	
Nominal supply pressure	20,0 mbar	Gas diaphragm	-----	mm	Evacuation ducts diameter	100	mm
		Diameter pilot burner injector	-----	marking	Air inlet ducts diameter	80	mm

Test n°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Test date																	
Ambient temperature	°C	23,1	22,9							23,1	22,9					23,1	23,0
Ambient air speed	m/s	0,18	0,19							0,19	0,18					0,18	0,18
Evacuation duct length	m	0,5	0,5							0,5	0,5					1,0	1,0
Air inlet duct length	m	-----	-----							-----	-----					-----	-----
Δp pressure ducts	Pa																
Test gas		G20	G20	G20	G20	G20	G20	G20	G20	G21	G21	G20	G20	G20	G20	G231	G20
Gas supply pressure	mbar	20,0	20,0													17,0	
Gas meter pressure	mbar	26,0	21,0													18,0	
Fan speed	g/min	6200	1500													1500	
Reference gas "Net calorific value"	MJ/m^3	34,02	34,02	34,02	34,02	34,02	34,02	34,02	34,02	40,91	40,91	34,02	34,02	34,02	34,02	28,91	34,02
Used gas "Net calorific value"	MJ/m^3	34,02	34,02							40,91	40,91					28,91	
Reference gas density		0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,687	0,687	0,555	0,555	0,555	0,555	0,617	0,555
Used gas density		0,555	0,555							0,687	0,687					0,617	
Atmospheric pressure	mbar	1011	1011													1011	
Gas temperature	°C	22,1	22,9													22,8	
Gas meter type a=wet, s=dry		s	s													s	
Combustion air temperature	°C	60,6	56,3													x	
Correction under reference conditions		1,0116	1,0059													0,9694	
Meter correction		0,993	0,994													0,994	
Gas volume	dm^3	480,0	110,0													110,0	
Time	s	181,4	184,8													194,2	
Measured heat input	**kW**	**90,42**	**20,26**													**16,33**	
Measured heat input uncertainty	kW																
Nominal heat input	**kW**	**90,00**	**20,00**	**90,00**	**20,00**	**90,00**	**20,00**	**90,00**	**20,00**	**90,00**	**20,00**	**90,00**	**20,00**	**90,00**	**20,00**	**20,00**	
Deviation		0,47%	1,30%													-18,35%	
Deviation with uncertainty		0,47%	1,30%													-18,35%	
Allowed deviation		±5%	±5%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	< 0
Flue gas temperature	°C	84,0	41,0														
CO2 measured	%	9,6	9,1							10,8		9,4	9,1	9,6	9,1	7,4	
CO measured	ppm	140	16							305		84	16	140	14	8	
CO in dry air-free products combustion products	**ppm**	**171**	**21**							**345**		**105**	**21**	**171**	**18**	**12**	
CO uncertainty	ppm	30	30									30	30	30	30	30	
Limit	ppm	-----	-----	1000	1000	1000	1000	1000	1000	2000	2000	2000	2000	2000	2000	2000	-----

Test n°	Pt	Description
1	8.4.1	Maximum heat input
2	8.4.1	Minimum heat input
3	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmax
4	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmin
5	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmax
6	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmin
7	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmax
8	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmin
9	8.12.3.1	Incomplete combustion - Qmax
10	8.12.3.1	Incomplete combustion - Qmin
11	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmax
12	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmin
13	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmax
14	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmin
15	8.12.3.3	Flame lift limit gas
16	8.4.3	Ignition rate

General note:	*The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.* *See enclosure n°1 for the equipment uncertainty*

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 304

9.2 - 9.3 USEFUL EFFICIENCIES

Maximum heat input	90,0	kW
Minimum heat input	20,0	kW
Average heat input	55,0	kW
Range rated	yes	
Type of boiler	condensing	

Maximum heat output	90,0	kW
Minimum heat output	20,0	kW
Average heat output	55,0	kW

Type of gas	G20	
Installation type	B23	
Evacuation duct diameter	100	mm
Air inlet duct diameter	80	mm
Evacuation duct length	0,5	m
Air inlet duct length	-----	m
Diaphragm diameter	-----	mm

Parameter for partial load test		
Method	direct	
Operating mode	1,0	
Conditions	3,0	
T_{ON}	495,0	sec
T_{OFF}	105,0	sec

Test n°			1	2	3	4	5	6
Ambient temperature		°C	23,3	23,3	23,3	23,2	23,2	23,0
Specific humidity		g/kg	9,8	9,8	9,8	9,8	9,8	9,8
Atmospheric pressure	(Pa)	mbar	1011	1011	1011	1011	1011	1011
Net calorific value of used gas	(Hi)	MJ/m³ st	34,02	34,02	34,02	34,02	34,02	34,02
Gas meter pressure	(Pg)	mbar	25,7	21,1	23,4	26,0	21,0	21,5
Gas temperature	(Tg)	°C	22,7	22,8	22,7	22,7	22,5	22,4
Gas meter correction			0,994	0,994	0,996	0,993	0,994	0,997
Gas volume		l	1620,0	360,0	960,0	1600,0	360,0	290,0
Time		s	602,9	609,7	601,0	601,1	599,2	602,2
Measured heat input		kW	90,55	19,80	53,82	89,63	20,17	16,23
Loss at test bench	(Dp)	kJ	0,0	0,0	0,0	0,0	0,0	0,0
Water rate		kg/h	3826,0	816,2	2240,7	3986,8	936,5	2164,1
Return temperature		°C	60,2	60,0	59,8	29,9	30,0	30,3
Flow temperature		°C	80,4	80,1	80,0	50,2	50,1	37,1
ΔT measured			20,2	20,1	20,2	20,3	20,1	6,8
Power issued to water		kW	88,33	18,75	51,74	93,92	21,84	17,07
Water efficiency		%	**97,6**	**94,7**	**96,1**	**104,8**	**108,3**	**105,3**

Test n° 1	Maximum heat input	80-60°C
Test n° 2	Minimum heat input	80-60°C
Test n° 3	Average heat input	80-60°C
Test n° 4	Maximum heat input	50-30°C
Test n° 5	Minimum heat input	50-30°C
Test n° 6	Partial load (30%) return	30°C

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
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ONGAS 304

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.2 Supervision of the combustion air rate or the combustion products rate

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	100/80	mm
Evacuation duct length	0,5	m
Air inlet duct length	0,5	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,8%	9,3%
CO2 MIN	9,4%	8,9%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,1	16	**21**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,7	44	**59**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,7	23	**28**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,5	78	**96**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

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ONGAS 304

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio
a) Adjust the CO2 at Qmax to the MAX CO2 value and at Qmin at MIN CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	100/80	mm
Evacuation duct length	0,5	m
Air inlet duct length	0,5	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,8%	9,3%
CO2 MIN	9,4%	8,9%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		10,6	459	**507**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,7	345	**416**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,5	732	**902**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,3	497	**701**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

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ONGAS 304

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio

b) Adjust the CO2 at Qmax to the MIN CO2 value and at Qmin at MAX CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	100/80	mm
Evacuation duct length	0,5	m
Air inlet duct length	0,5	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,8%	9,3%
CO2 MIN	9,4%	8,9%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,7	695	**838**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,5	298	**367**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,4	670	**834**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		7,9	395	**585**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 304

8.13 NOx EMISSION - (NITROGEN OXIDE - 20°C - Proportional moistness 10gH2O/kg air)
8.13.2.5 / 8.13.2.6 Modulating boiler

Maximum heat input	Qn	90,0	kW
Minimum heat input	Qr	20,0	kW
Average heat input	Qa	55,0	kW
Range rated		yes	
Type of gas		G20	
Installation type		B23	
Diameter of pipe (outlet-inlet)		100-80	mm
Length of drain pipe		0,5	m
Direction		-----	
Diaphragm diameter		-----	mm
Ambient temperature	T_{amb}	20,9	°C
Atmospheric pressure	P_{atm}	1011	mbar
Specific humidity		9,5	g/kg

						Qr
Partial heat input Qpi in % of Qn			70%	60%	40%	36%
Partial heat input	Qpi	kW	38,5	33,0	22,0	20,0
Pondering factor	Fpi		0,15	0,25	0,30	0,30
Fan speed		g/min	2800	2450	1700	1500
Measured heat input		kW	38,2	33,3	22,4	20,3
Inlet temperature		°C	48,0	44,0	36,0	34,5
CO_2 measured		%	9,5	9,4	9,1	9,1
CO measured		ppm	32	30	20	18
COc (0% 0_2)		ppm	39	37	26	23
NOx measured		ppm	19	18	8	8
NOx adjusted		mg/kWh	41,28	39,52	18,14	18,14
NOx total		mg/kWh	26,96			
NOx adjusted		mg/kWh	**26,10**			
NOx class assigned			**5**			

NOx class		**1**	**2**	**3**	**4**	**5**
NOx limit	mg/kWh	**260**	**200**	**150**	**100**	**70**

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 304

OUTPUT MASS

		Volume of the mass of the combustion products at 15 °C	V_{CO2}: Carbon dioxide created by the combustion of 1 m^3 of gas with air	V_{H2O}: water steam created by the combustion of 1 m^3 of gas with air	CO_2 measured	Output volume of the referring gas at the output heat indicated by the manufacturer at 15 °C and 1013,25 mbar under root adjusted also to the meter	**Mf: Combustion products output mass**
	Measure unit	kg/m^3	m^3/m^3	m^3/m^3	%	m^3/h	**g/sec**
MAX HEAT INPUT	90,0 kW						
G20		1,19	1	2	9,6	9,524	**39,12**
G25		1,19	0,86	1,72	-----	11,077	**-----**
G30		1,19	4	5	-----	2,791	**-----**
G31		1,19	3	4	-----	3,682	**-----**
MIN HEAT INPUT	20,0 kW						
G20		1,19	1	2	9,1	2,116	**9,09**
G25		1,19	0,86	1,72	-----	2,462	**-----**
G30		1,19	4	5	-----	0,620	**-----**
G31		1,19	3	4	-----	0,818	**-----**

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
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ONGAS 304

8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

		Ignition	CO_2 %	CO [ppm]	CO [ppm] in air and water free products of combustion	Limit [ppm]
8.6.3	**Special flue conditions** Tests at nominal and minimum heat input					
	Reference gas used G20					
8.6.3.104 8.12.3.101.3	Type C4 Shortest ducts specified by the manufacturer					
	Suction of 0,5mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
8.6.3.105 8.12.3.101.4	Type C5 Shortest ducts specified by the manufacturer					
	Suction of 2,0mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
	Type C6					
8.6.3.106	Suction of 0,5mbar applied to the combustion products outlet	✓				
8.12.3.101.5	10% of the combustion products are recircurlated in the air supply					
	Maximum heat input		10,7	360	394	2000
	Minimum heat input (only for gas/air ratio controls)		10,3	24	27	2000
	Intervention of APS before CO concentration exceed 2000ppm		-----	-----	-----	2000
	APS switch off at ----- Pa					

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 304PLUS

Dati nominali

Nominal data

Brand name	RIMA
Model	ONGAS 304Plus
Installation type admitted	B23-C63
Registration number	Prototype
Burner adjusting	Modulating
Flame surveillance	Ionization
Ignition type	Electronic

Heating circuit

Max temperature of heating water	110,0 °C
Max pressure of heating water (PMS)	6,0 bar
Heating water circulation	Forced
Pressure class	3

Electrical nominal data

Input voltage	230 V
Frequency	50 Hz
Electrical power	188 W
Protection level against moistness and water inlet	-----

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 304PLUS

Dati tecnici

Technical data

Nominal heat INPUT				
Maximum		kW	110,0	
Minimum		kW	20,0	
Nominal heat OUTPUT				
Maximum		kW	107,0	
Minimum		kW	19,5	
Efficiency				
Maximum heat input	(80-60°C)	%	97,3	
Minimum heat input	(80-60°C)	%	97,7	
Maximum heat input	(50-30°C)	%	106,2	
Minimum heat input	(50-30°C)	%	109,9	
Partial load return 30°C (direct method)		%	103,0	
Fan speed			MAX	MIN
G20		rpm	5500	1100
CO2 content				
			MAX	MIN
G20		%	9,80	9,70

EN 15502-1:2012 + A1:2015
EN 15502-2-1:2012 + A1:2016
Rev.2

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 304PLUS

Configurazione camini
Flue instalation configuration

Flue installation

Installation type		B23-C63
Diameter of air inlet ducts	mm	60,0
Diameter of evacuation ducts	mm	100,0

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 304PLUS

BOILERS WITH PNEUMATIC AIR/GAS RATIO CONTROL — Test with water temperature: x 80 °C / 60 °C; 50 °C / 30 °C

8.4.1 Nominal heat input

8.12.2 Carbon monoxide - Limit conditions

8.12.3 Carbon monoxide - Special conditions

Gas group	2E	N° injectors	-----		Installation type	B23	
Reference gas	G20	Injectors diameter	-----	mm	Type of ducts	seperated	
Nominal supply pressure	20,0 mbar	Gas diaphragm	-----	mm	Evacuation ducts diameter	100	mm
		Diameter pilot burner injector	-----	marking	Air inlet ducts diameter	60	mm

Test n°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ambient temperature	°C	21,9	21,9														
Ambient air speed	m/s	0,18	0,18														
Evacuation duct length	m	1,0	1,0														
Air inlet duct length	m	1,0	1,0														
Test gas		G20	G20	G20	G20	G20	G20	G20	G20	G21	G21	G20	G20	G20	G20	G231	G20
Gas supply pressure	mbar	20,0	20,0													17,0	20,0
Gas meter pressure	mbar	19,6	21,6													17,2	20,3
Fan speed	g/min	5500	1100														1700
Reference gas "Net calorific value"	MJ/m^3	34,02	34,02	34,02	34,02	34,02	34,02	34,02	34,02	40,91	40,91	34,02	34,02	34,02	34,02	28,91	34,02
Used gas "Net calorific value"	MJ/m^3	34,10	34,10														34,10
Reference gas density		0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,687	0,687	0,555	0,555	0,555	0,555	0,617	0,555
Used gas density		0,572	0,572														0,572
Atmospheric pressure	mbar	1014	1014														1012
Gas temperature	°C	21,9	21,9														26,0
Gas meter type a=wet, s=dry		s	s														s
Combustion air temperature	°C	21,9	21,9														26,0
Correction under reference conditions		1,0260	1,0279														1,0267
Meter correction		0,993	0,995														0,994
Gas volume	dm^3	150,0	50,0														70,0
Time	s	46,7	84,3														71,3
Measured heat input	**kW**	**111,35**	**20,65**														**34,09**
Measured heat input uncertainty	kW																
Nominal heat input	**kW**	**110,00**	**20,00**	**110,00**	**20,00**	**110,00**	**20,00**	**110,00**	**20,00**	**110,00**	**20,00**	**110,00**	**20,00**	**110,00**	**20,00**	**20,00**	**34,00**
Deviation		1,23%	3,25%														0,25%
Deviation with uncertainty		1,23%	3,25%														0,25%
Allowed deviation		±5%	±5%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	< 0
Flue gas temperature	°C	85,0	42,3														
CO2 measured	%	9,8	9,7	9,9	10,3					10,5	10,5					7,4	
CO measured	ppm	187	6	156	9					271	48					6	
CO in dry air-free products combustion products	**ppm**	**223**	**7**	**184**	**10**					**315**	**56**					**9**	
CO uncertainty	ppm	30	30	30	30					30	30					30	
Limit	ppm	-----	-----	1000	1000	1000	1000	1000	1000	2000	2000	2000	2000	2000	2000	2000	-----

Test n°	Pt	Description
1	8.4.1	Maximum heat input
2	8.4.1	Minimum heat input
3	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmax
4	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmin
5	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmax
6	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmin
7	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmax
8	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmin
9	8.12.3.1	Incomplete combustion - Qmax
10	8.12.3.1	Incomplete combustion - Qmin
11	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmax
12	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmin
13	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmax
14	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmin
15	8.12.3.3	Flame lift limit gas
16	8.4.3	Ignition rate

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 304PLUS

9.2 - 9.3 USEFUL EFFICIENCIES

Maximum heat input	110,0	kW
Minimum heat input	20,0	kW
Average heat input	65,0	kW
Range rated	yes	
Type of boiler	condensing	

Maximum heat output	110,0	kW
Minimum heat output	20,0	kW
Average heat output	65,0	kW

Type of gas	G20	
Installation type	B23	
Evacuation duct diameter	100	mm
Air inlet duct diameter	60	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m
Diaphragm diameter	-----	mm

Parameter for partial load test		
Method	direct	
Operating mode	1,0	
Conditions	2,0	
T_{ON}	600,0	sec
T_{OFF}	0,0	sec

Test n°			1	2	3	4	5	6
Ambient temperature		°C	24,2	25,3	24,3	23,0	24,5	22,3
Specific humidity		g/kg	6,3	6,9	7,0	7,3	6,0	6,4
Atmospheric pressure	(Pa)	mbar	1015	1019	1020	1020	1020	1021
Net calorific value of used gas	(Hi)	MJ/m^3 st	34,10	34,10	34,10	34,10	34,10	34,10
Gas meter pressure	(Pg)	mbar	24,3	27,5	26,1	24,5	27,5	29,5
Gas temperature	(Tg)	°C	24,2	24,5	24,3	22,5	22,8	21,8
Gas meter correction			0,993	0,993	0,994	0,993	0,995	0,995
Gas volume		l	1470,0	440,0	1130,0	1910,0	370,0	330,0
Time		s	458,9	783,6	599,8	602,5	642,1	607,2
Measured heat input		kW	107,79	19,01	63,87	107,87	19,68	18,67
Loss at test bench	(Dp)	kJ	0,0	0,0	0,0	0,0	0,0	0,0
Water rate		kg/h	4653,2	818,1	2740,3	4765,1	931,7	4700,7
Return temperature		°C	60,1	60,8	60,4	30,1	29,7	30,1
Flow temperature		°C	79,5	80,3	80,4	50,8	49,6	33,6
ΔT measured			19,4	19,5	20,0	20,6	19,9	3,5
Power issued to water		kW	104,81	18,57	63,79	114,20	21,57	19,19
Water efficiency		%	**97,3**	**97,7**	**99,9**	**106,1**	**109,9**	**103,0**
Water efficiency uncertainty		%	1,8	1,8	1,8	1,8	1,8	1,8

Test n° 1	Maximum heat input	80-60°C
Test n° 2	Minimum heat input	80-60°C
Test n° 3	Average heat input	80-60°C
Test n° 4	Maximum heat input	50-30°C
Test n° 5	Minimum heat input	50-30°C
Test n° 6	Partial load (30%) return	30°C

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
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ONGAS 304PLUS

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.2 Supervision of the combustion air rate or the combustion products rate

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	100/60	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	10,0%	9,6%
CO2 MIN	9,7%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		10,7	270	**295**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,7	27	**33**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		11,2	114	**119**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,8	54	**64**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

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ONGAS 304PLUS

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio
a) Adjust the CO2 at Qmax to the MAX CO2 value and at Qmin at MIN CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	100/60	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	10,0%	9,6%
CO2 MIN	9,7%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		10,9	477	**512**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,9	370	**437**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,7	750	**909**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,5	510	**702**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

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ONGAS 304PLUS

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio

b) Adjust the CO2 at Qmax to the MIN CO2 value and at Qmin at MAX CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	100/60	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	10,0%	9,6%
CO2 MIN	9,7%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,9	734	**866**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,6	324	**395**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,6	684	**838**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,0	420	**614**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

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ONGAS 304PLUS

8.13 NOx EMISSION - (NITROGEN OXIDE - 20°C - Proportional moistness 10gH2O/kg air)
8.13.2.5 / 8.13.2.6 Modulating boiler

Maximum heat input	Qn	110,0	kW
Minimum heat input	Qr	20,0	kW
Average heat input	Qa	65,0	kW
Range rated		yes	
Type of gas		G20	
Installation type		B23	
Diameter of pipe (outlet-inlet)		100-60	mm
Length of drain pipe		0,5	m
Direction		-----	
Diaphragm diameter		-----	mm
Ambient temperature	T_{amb}	20,9	°C
Atmospheric pressure	P_{atm}	1011	mbar
Specific humidity		6,1	g/kg

						Qr
Partial heat input Qpi in % of Qn			70%	60%	40%	31%
Partial heat input	Qpi	kW	45,5	39,0	26,0	20,0
Pondering factor	Fpi		0,15	0,25	0,30	0,30
Fan speed		g/min	2800	2450	1700	1500
Measured heat input		kW	38,2	33,3	22,4	20,3
Inlet temperature		°C	48,0	44,0	36,0	32,3
CO_2 measured		%	9,4	9,3	9,1	9,0
CO measured		ppm	32	30	20	18
COc (0% 0_2)		ppm	40	38	26	23
NOx measured		ppm	17	18	8	8
NOx adjusted		mg/kWh	37,33	39,95	18,14	18,35
NOx total		mg/kWh	26,53			
NOx adjusted		mg/kWh	**25,08**			
NOx class assigned			**5**			

NOx class		**1**	**2**	**3**	**4**	**5**
NOx limit	mg/kWh	**260**	**200**	**150**	**100**	**70**

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ONGAS 304PLUS

OUTPUT MASS

		Volume of the mass of the combustion products at 15 °C	V_{CO2}: Carbon dioxide created by the combustion of 1 m^3 of gas with air	V_{H2O}: water steam created by the combustion of 1 m^3 of gas with air	CO_2 measured	Output volume of the referring gas at the output heat indicated by the manufacturer at 15 °C and 1013,25 mbar under root adjusted also to the meter	**Mf: Combustion products output mass**
	Measure unit	kg/m^3	m^3/m^3	m^3/m^3	%	m^3/h	**g/sec**
MAX HEAT INPUT	110,0 kW						
G20		1,19	1	2	9,8	11,640	**47,00**
G25		1,19	0,86	1,72	-----	13,538	**-----**
G30		1,19	4	5	-----	3,411	**-----**
G31		1,19	3	4	-----	4,500	**-----**
MIN HEAT INPUT	20,0 kW						
G20		1,19	1	2	9,7	2,116	**8,62**
G25		1,19	0,86	1,72	-----	2,462	**-----**
G30		1,19	4	5	-----	0,620	**-----**
G31		1,19	3	4	-----	0,818	**-----**

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
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ONGAS 304PLUS

8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

		Ignition	CO_2 %	CO [ppm]	CO [ppm] in air and water free products of combustion	Limit [ppm]
8.6.3	**Special flue conditions** Tests at nominal and minimum heat input					
	Reference gas used G20					
8.6.3.104 8.12.3.101.3	Type C4 Shortest ducts specified by the manufacturer Suction of 0,5mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
8.6.3.105 8.12.3.101.4	Type C5 Shortest ducts specified by the manufacturer Suction of 2,0mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
	Type C6					
8.6.3.106	Suction of 0,5mbar applied to the combustion products outlet	✓				
8.12.3.101.5	10% of the combustion products are recircurlated in the air supply					
	Maximum heat input		10,8	340	368	2000
	Minimum heat input (only for gas/air ratio controls)		10,5	19	21	2000
	Intervention of APS before CO concentration exceed 2000ppm		-----	-----	-----	2000
	APS switch off at ----- Pa					

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 305

Dati nominali
Nominal data

Brand name	RIMA
Model	ONGAS 305
Installation type admitted	B23-C63
Registration number	Prototype
Burner adjusting	Modulating
Flame surveillance	Ionization
Ignition type	Electronic

Heating circuit

Max temperature of heating water	110,0 °C
Max pressure of heating water (PMS)	6,0 bar
Heating water circulation	Forced
Pressure class	3

Electrical nominal data

Input voltage	230 V
Frequency	50 Hz
Electrical power	188 W
Protection level against moistness and water inlet	-----

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
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ONGAS 305

Dati tecnici
Technical data

Nominal heat INPUT				
Maximum		kW	119,0	
Minimum		kW	19,0	
Efficiency				
Maximum heat input	(80-60°C)	%	96,4	
Minimum heat input	(80-60°C)	%	94,8	
Maximum heat input	(50-30°C)	%	104,3	
Minimum heat input	(50-30°C)	%	108,0	
Partial load return 30°C (direct method)		%	105,7	
Injectors identification			MAX	MIN
G20		marking	5300	1000
Injectors pressure				
			MAX	MIN
G20		%	9,70	9,20

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
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ONGAS 305

Configurazione camini
Flue instalation configuration

Flue installation

Installation type		B23-C63
Diameter of air inlet ducts	mm	80,0
Diameter of evacuation ducts	mm	115,0

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 305

BOILERS WITH PNEUMATIC AIR/GAS RATIO CONTROL — Test with water temperature: x 80 °C / 60 °C; 50 °C / 30 °C

8.4.1 Nominal heat input
8.12.2 Carbon monoxide - Limit conditions
8.12.3 Carbon monoxide - Special conditions

Gas group	2E	N° injectors	-----		Installation type	B23	
Reference gas	G20	Injectors diameter	-----	mm	Type of ducts	seperated	
Nominal supply pressure	20,0 mbar	Gas diaphragm	-----	mm	Evacuation ducts diameter	115	mm
		Diameter pilot burner injector	-----	marking	Air inlet ducts diameter	80	mm

Test n°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ambient temperature	°C	26,3	26,3														
Ambient air speed	m/s	0,18	0,19														
Evacuation duct length	m	1,0	1,0														
Air inlet duct length	m	1,0	1,0														
Test gas		G20	G20	G20	G20	G20	G20	G20	G20	G21	G21	G20	G20	G20	G20	G231	G20
Gas supply pressure	mbar	20,0	20,0														20,0
Gas meter pressure	mbar	25,0	28,9														27,2
Fan speed	g/min	5300	1000														2700
Reference gas "Net calorific value"	MJ/m^3	34,02	34,02	34,02	34,02	34,02	34,02	34,02	34,02	40,91	40,91	34,02	34,02	34,02	34,02	28,91	34,02
Used gas "Net calorific value"	MJ/m^3	34,10	34,10														34,10
Reference gas density		0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,687	0,687	0,555	0,555	0,555	0,555	0,617	0,555
Used gas density		0,555	0,555														0,556
Atmospheric pressure	mbar	1018	1018														1018
Gas temperature	°C	24,5	24,1														23,7
Gas meter type a=wet, s=dry		s	s														s
Combustion air temperature	°C	26,3	26,3														26,5
Correction under reference conditions		1,0190	1,0235														1,0237
Meter correction		0,993	0,995														0,994
Gas volume	dm^3	300,0	100,0														100,0
Time	s	87,4	190,2														56,6
Measured heat input	**kW**	**118,16**	**18,22**														**61,16**
Measured heat input uncertainty	kW																
Nominal heat input	**kW**	**119,00**	**19,00**	**119,00**	**19,00**	**119,00**	**19,00**	**119,00**	**19,00**	**119,00**	**19,00**	**119,00**	**19,00**	**119,00**	**19,00**	**19,00**	**60,00**
Deviation		-0,71%	-4,13%														1,94%
Deviation with uncertainty		-0,71%	-4,13%														1,94%
Allowed deviation		±5%	±5%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	< 0
Flue gas temperature	°C	72,1	49,1														
CO2 measured	%	9,7	9,2	10,0	9,7					10,7	10,5					7,6	
CO measured	ppm	105	24	173	23					293	148					38	
CO in dry air-free products combustion products	**ppm**	**127**	**31**	**202**	**28**					**334**	**172**					**58**	
CO uncertainty	ppm	30	30	30	30					30	30					30	
Limit	ppm	-----	-----	1000	1000	1000	1000	1000	1000	2000	2000	2000	2000	2000	2000	2000	-----

Test n°	Pt	Description
1	8.4.1	Maximum heat input
2	8.4.1	Minimum heat input
3	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmax
4	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmin
5	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmax
6	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmin
7	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmax
8	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmin
9	8.12.3.1	Incomplete combustion - Qmax
10	8.12.3.1	Incomplete combustion - Qmin
11	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmax
12	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmin
13	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmax
14	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmin
15	8.12.3.3	Flame lift limit gas
16	8.4.3	Ignition rate

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

IMQ TURKEY

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 305

9.2 - 9.3 USEFUL EFFICIENCIES

Maximum heat input	119,0	kW
Minimum heat input	19,0	kW
Average heat input	69,0	kW
Range rated	yes	
Type of boiler	condensing	

Maximum heat output	119,0	kW
Minimum heat output	19,0	kW
Average heat output	69,0	kW

Type of gas	G20	
Installation type	B23	
Evacuation duct diameter	115	mm
Air inlet duct diameter	80	mm
Evacuation duct length	0,5	m
Air inlet duct length	0,5	m
Diaphragm diameter	-----	mm

Parameter for partial load test		
Method	direct	
Operating mode	1,0	
Conditions	4,0	
T_{ON}	20,0	sec
T_{OFF}	580,0	sec

Test n°			1	2	3	4	5	6
Ambient temperature		°C	23,4	23,5	23,5	23,6	23,6	23,3
Specific humidity		g/kg	9,9	9,9	9,9	9,9	9,9	9,9
Atmospheric pressure	(Pa)	mbar	1009	1009	1009	1009	1009	1009
Net calorific value of used gas	(Hi)	MJ/m^3 st	34,02	34,02	34,02	34,02	34,02	34,02
Gas meter pressure	(Pg)	mbar	29,9	21,0	22,6	30,3	21,4	20,6
Gas temperature	(Tg)	°C	23,0	22,9	22,9	23,0	23,2	22,9
Gas meter correction			0,998	0,995	0,999	0,998	0,994	0,994
Gas volume		l	1990,0	350,0	1200,0	2060,0	360,0	387,9
Time		s	601,5	616,5	599,8	602,1	613,8	600,6
Measured heat input		kW	112,07	19,01	67,40	115,99	19,62	21,61
Loss at test bench	(Dp)	kJ	0,0	0,0	0,0	0,0	0,0	0,0
Water rate		kg/h	4655,1	792,6	2818,8	5265,9	904,0	2852,2
Return temperature		°C	59,6	59,9	60,0	30,1	30,2	30,4
Flow temperature		°C	79,9	79,8	80,1	49,9	50,4	37,3
ΔT measured			20,3	19,9	20,1	19,8	20,2	6,9
Power issued to water		kW	108,04	18,03	64,76	120,99	21,19	22,83
Water efficiency		%	**96,4**	**94,8**	**96,1**	**104,3**	**108,0**	**105,7**

Test n° 1	Maximum heat input	80-60°C
Test n° 2	Minimum heat input	80-60°C
Test n° 3	Average heat input	80-60°C
Test n° 4	Maximum heat input	50-30°C
Test n° 5	Minimum heat input	50-30°C
Test n° 6	Partial load (30%) return	30°C

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 305

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.2 Supervision of the combustion air rate or the combustion products rate

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	115/80	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,9%	9,5%
CO2 MIN	9,7%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		10,3	144	**163**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		4,1	37	**105**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		5,3	160	**353**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		5,9	246	**488**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 305

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio

a) Adjust the CO2 at Qmax to the MAX CO2 value and at Qmin at MIN CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	115/80	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	x
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,9%	9,5%
CO2 MIN	9,7%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		11,2	682	**716**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		4,8	35	**86**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

	Maximum heat input					
	Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
*			11,3	1813	**1877**	**2000**
						2000
						2000
						2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		5,8	96	**194**	**1000**
					1000
					1000
					1000

* Continuous supervision is applied in this measurement

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 305

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio
b) Adjust the CO2 at Qmax to the MIN CO2 value and at Qmin at MAX CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	115/80	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,9%	9,5%
CO2 MIN	9,7%	9,3%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,9	125	**148**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,1	316	**606**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		5,9	127	**252**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		5,4	43	**93**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 305

8.13 NOx EMISSION - (NITROGEN OXIDE - 20°C - Proportional moistness 10gH2O/kg air)
8.13.2.5 / 8.13.2.6 Modulating boiler

Maximum heat input	Qn	119,0	kW
Minimum heat input	Qr	19,0	kW
Average heat input	Qa	69,0	kW
Range rated		yes	
Type of gas		G20	
Installation type		B23	
Diameter of pipe (outlet-inlet)		115-80	mm
Length of drain pipe		0,5	m
Direction		-----	
Diaphragm diameter		-----	mm
Ambient temperature	T_{amb}	22,9	°C
Atmospheric pressure	P_{atm}	1009	mbar
Specific humidity		10,24	g/kg

						Qr
Partial heat input Qpi in % of Qn			70%	60%	40%	28%
Partial heat input	Qpi	kW	48,3	41,4	27,6	19,0
Pondering factor	Fpi		0,15	0,25	0,30	0,30
Fan speed		g/min	2400	2050	1350	1300
Measured heat input		kW	49,3	41,5	28,1	19,5
Inlet temperature		°C	48,0	44,0	36,0	31,0
CO_2 measured		%	9,6	9,5	9,3	9,1
CO measured		ppm	52	40	24	10
COc (0% 0_2)		ppm	63	49	30	13
NOx measured		ppm	24	18	8	5
NOx adjusted		mg/kWh	51,60	39,11	17,75	11,34
NOx total		mg/kWh	26,24			
NOx adjusted		mg/kWh	**23,82**			
NOx class assigned			**5**			

NOx class		**1**	**2**	**3**	**4**	**5**
NOx limit	mg/kWh	**260**	**200**	**150**	**100**	**70**

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 305

OUTPUT MASS

		Volume of the mass of the combustion products at 15 °C	V_{CO2}: Carbon dioxide created by the combustion of 1 m^3 of gas with air	V_{H2O}: water steam created by the combustion of 1 m^3 of gas with air	CO_2 measured	Output volume of the referring gas at the output heat indicated by the manufacturer at 15 °C and 1013,25 mbar under root adjusted also to the meter	**Mf: Combustion products output mass**
	Measure unit	kg/m^3	m^3/m^3	m^3/m^3	%	m^3/h	**g/sec**
MAX HEAT INPUT	119,0 kW						
G20		1,19	1	2	9,7	12,593	**51,28**
G25		1,19	0,86	1,72		14,646	**#DIV/0!**
G30		1,19	4	5		3,690	**#DIV/0!**
G31		1,19	3	4		4,868	**#DIV/0!**
MIN HEAT INPUT	19,0 kW						
G20		1,19	1	2	9,2	2,011	**8,56**
G25		1,19	0,86	1,72		2,338	**#DIV/0!**
G30		1,19	4	5		0,589	**#DIV/0!**
G31		1,19	3	4		0,777	**#DIV/0!**

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 305

8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

		Ignition	CO_2 %	CO [ppm]	CO [ppm] in air and water free products of combustion	Limit [ppm]
8.6.3	**Special flue conditions** Tests at nominal and minimum heat input					
	Reference gas used G20					
8.6.3.104 8.12.3.101.3	Type C4 Shortest ducts specified by the manufacturer Suction of 0,5mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
8.6.3.105 8.12.3.101.4	Type C5 Shortest ducts specified by the manufacturer Suction of 2,0mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
	Type C6					
8.6.3.106	Suction of 0,5mbar applied to the combustion products outlet	✓				
8.12.3.101.5	10% of the combustion products are recircurlated in the air supply					
	Maximum heat input		10,9	300	322	2000
	Minimum heat input (only for gas/air ratio controls)		10,8	14	15	2000
	Intervention of APS before CO concentration exceed 2000ppm		-----	-----	-----	2000
	APS switch off at ----- Pa					

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 306

Dati nominali
Nominal data

Brand name	RIMA	
Model	ONGAS 306	
Installation type admitted	B23-C63	
Registration number	Prototype	
Burner adjusting	Modulating	
Flame surveillance	Ionization	
Ignition type	Electronic	
Heating circuit		
Max temperature of heating water	110,0	°C
Max pressure of heating water (PMS)	6,0	bar
Heating water circulation	Forced	
Pressure class	3	
Electrical nominal data		
Input voltage	230	V
Frequency	50	Hz
Electrical power	188	W
Protection level against moistness and water inlet	-----	

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 306

Dati tecnici
Technical data

Nominal heat INPUT				
Maximum		kW	148,0	
Minimum		kW	34,0	
Efficiency				
Maximum heat input	(80-60°C)	%	96,0	
Minimum heat input	(80-60°C)	%	96,2	
Maximum heat input	(50-30°C)	%	103,8	
Minimum heat input	(50-30°C)	%	109,4	
Partial load return 30°C (direct method)		%	106,1	
Fan speed			MAX	MIN
G20		rpm	5950	1400
CO2 content				
			MAX	MIN
G20		%	9,40	9,80

EN 15502-1:2012 + A1:2015
EN 15502-2-1:2012 + A1:2016
Rev.2

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 306

Configurazione camini
Flue instalation configuration

Flue installation

Installation type		B23-C63
Diameter of air inlet ducts	mm	115,0
Diameter of evacuation ducts	mm	130,0

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 306

BOILERS WITH PNEUMATIC AIR/GAS RATIO CONTROL — Test with water temperature: x 80 °C / 60 °C; 50 °C / 30 °C

8.4.1 Nominal heat input
8.12.2 Carbon monoxide - Limit conditions
8.12.3 Carbon monoxide - Special conditions

Gas group	2E		N° injectors	-----		Installation type	B23	
Reference gas	G20		Injectors diameter	-----	mm	Type of ducts	seperated	
Nominal supply pressure	20,0	mbar	Gas diaphragm	-----	mm	Evacuation ducts diameter	130	mm
			Diameter pilot burner injector	-----	marking	Air inlet ducts diameter	115	mm

Test n°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ambient temperature	°C	24,1	24,5														
Ambient air speed	m/s	0,18	0,19														
Evacuation duct length	m	1,0	1,0														
Air inlet duct length	m	1,0	1,0														
Test gas		G20	G20	G20	G20	G20	G20	G20	G20	G21	G21	G20	G20	G20	G20	G231	G20
Gas supply pressure	mbar	20,0	20,0													17,0	20,0
Gas meter pressure	mbar	23,5	28,0													17,2	24,8
Fan speed	g/min	5950	1400														2700
Reference gas "Net calorific value"	MJ/m^3	34,02	34,02	34,02	34,02	34,02	34,02	34,02	34,02	40,91	40,91	34,02	34,02	34,02	34,02	28,91	34,02
Used gas "Net calorific value"	MJ/m^3	34,10	34,10														34,10
Reference gas density		0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,687	0,687	0,555	0,555	0,555	0,555	0,617	0,555
Used gas density		0,555	0,555														0,555
Atmospheric pressure	mbar	1007	1007														1007
Gas temperature	°C	22,8	22,2														22,5
Gas meter type a=wet, s=dry		s	s														s
Combustion air temperature	°C	24,1	24,1														24,1
Correction under reference conditions		1,0167	1,0222														1,0184
Meter correction		0,993	0,995														0,994
Gas volume	dm^3	220,0	100,0														100,0
Time	s	50,8	105,1														44,2
Measured heat input	**kW**	**148,77**	**32,94**														**77,94**
Measured heat input uncertainty	kW																
Nominal heat input	**kW**	**148,00**	**34,00**	**148,00**	**34,00**	**148,00**	**34,00**	**148,00**	**34,00**	**148,00**	**34,00**	**148,00**	**34,00**	**148,00**	**34,00**	**34,00**	**78,00**
Deviation		0,52%	-3,13%														-0,08%
Deviation with uncertainty		0,52%	-3,13%														-0,08%
Allowed deviation		±5%	±5%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	< 0
Flue gas temperature	°C	59,1	55,0														
CO2 measured	%	9,4	9,8		10,3					10,3	11,6					7,0	
CO measured	ppm	73	10		15					693	270					550	
CO in dry air-free products combustion products	**ppm**	**91**	**12**		**17**					**818**	**284**					**900**	
CO uncertainty	ppm	30	30		30					30	30					30	
Limit	ppm	-----	-----	1000	1000	1000	1000	1000	1000	2000	2000	2000	2000	2000	2000	2000	-----

Test n°	Pt	Description
1	8.4.1	Maximum heat input
2	8.4.1	Minimum heat input
3	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmax
4	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmin
5	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmax
6	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmin
7	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmax
8	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmin
9	8.12.3.1	Incomplete combustion - Qmax
10	8.12.3.1	Incomplete combustion - Qmin
11	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmax
12	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmin
13	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmax
14	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmin
15	8.12.3.3	Flame lift limit gas
16	8.4.3	Ignition rate

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 306

9.2 - 9.3 USEFUL EFFICIENCIES

Maximum heat input	148,0	kW
Minimum heat input	34,0	kW
Average heat input	91,0	kW
Range rated	yes	
Type of boiler	condensing	

Maximum heat output	148,0	kW
Minimum heat output	34,0	kW
Average heat output	91,0	kW

Type of gas	G20	
Installation type	B23	
Evacuation duct diameter	130	mm
Air inlet duct diameter	115	mm
Evacuation duct length	0,5	m
Air inlet duct length	0,5	m
Diaphragm diameter	-----	mm

Parameter for partial load test		
Method	direct	
Operating mode	1,0	
Conditions	3,0	
T_{ON}	482,0	sec
T_{OFF}	118,0	sec

Test n°			1	2	3	4	5	6
Ambient temperature		°C	23,8	23,7	23,8	23,5	23,1	23,4
Specific humidity		g/kg	10,1	10,1	10,1	10,1	10,1	10,1
Atmospheric pressure	(Pa)	mbar	1011	1011	1011	1011	1011	1011
Net calorific value of used gas	(Hi)	MJ/m^3 st	34,02	34,02	34,02	34,02	34,02	34,02
Gas meter pressure	(Pg)	mbar	36,0	21,7	26,5	36,0	20,5	22,4
Gas temperature	(Tg)	°C	22,8	23,0	22,9	22,8	22,7	22,4
Gas meter correction			1,002	0,993	0,993	1,000	0,993	0,993
Gas volume		l	2520,0	570,0	1590,0	2540,0	580,0	471,1
Time		s	599,9	602,1	601,3	603,7	607,6	600,2
Measured heat input		kW	114,07	31,72	89,04	144,00	31,98	26,37
Loss at test bench	(Dp)	kJ	0,0	0,0	0,0	0,0	0,0	0,0
Water rate		kg/h	6143,7	1362,1	3649,6	6345,6	1500,5	3600,5
Return temperature		°C	60,4	60,1	59,4	30,1	29,9	30,1
Flow temperature		°C	80,1	79,7	79,8	50,4	50,0	36,8
ΔT measured			19,7	19,6	20,4	20,3	20,1	6,7
Power issued to water		kW	138,31	30,51	85,13	149,48	35,00	27,99
Water efficiency		%	**96,0**	**96,2**	**95,6**	**103,8**	**109,4**	**106,1**
Water efficiency uncertainty		%						

Test n° 1	Maximum heat input	80-60°C
Test n° 2	Minimum heat input	80-60°C
Test n° 3	Average heat input	80-60°C
Test n° 4	Maximum heat input	50-30°C
Test n° 5	Minimum heat input	50-30°C
Test n° 6	Partial load (30%) return	30°C

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 306

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.2 Supervision of the combustion air rate or the combustion products rate

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	130/115	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,6%	9,2%
CO2 MIN	10,0%	9,6%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		7,2	54	**88**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,2	27	**51**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,6	27	**37**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,2	34	**64**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 306

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio
a) Adjust the CO2 at Qmax to the MAX CO2 value and at Qmin at MIN CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	130/115	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,6%	9,2%
CO2 MIN	10,0%	9,6%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,4	120	**219**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		5,8	107	**216**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,2	36	**46**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,9	18	**24**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
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ONGAS 306

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio
b) Adjust the CO2 at Qmax to the MIN CO2 value and at Qmin at MAX CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	130/115	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	x
Start up supervision	

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,6%	9,2%
CO2 MIN	10,0%	9,6%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		10,7	278	**303**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,3	32	**60**	**2000**
					2000
					2000
					2000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		11,3	1625	**1683**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,0	47	**92**	**2000**
					2000
					2000
					2000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 306

8.13 NOx EMISSION - (NITROGEN OXIDE - 20°C - Proportional moistness 10gH2O/kg air)
8.13.2.5 / 8.13.2.6 Modulating boiler

Maximum heat input	Qn	148,0	kW
Minimum heat input	Qr	34,0	kW
Average heat input	Qa	91,0	kW
Range rated		yes	
Type of gas		G20	
Installation type		B23	
Diameter of pipe (outlet-inlet)		130-115	mm
Length of drain pipe		0,5	m
Direction		-----	
Diaphragm diameter		-----	mm
Ambient temperature	T_{amb}	23,9	°C
Atmospheric pressure	P_{atm}	1011	mbar
Specific humidity		9,56	g/kg

						Qr
Partial heat input Qpi in % of Qn			70%	60%	40%	37%
Partial heat input	Qpi	kW	63,7	54,6	36,4	34,0
Pondering factor	Fpi		0,15	0,25	0,30	0,30
Fan speed		g/min	2400	2050	1350	1300
Measured heat input		kW	65,3	55,0	36,0	33,8
Inlet temperature		°C	48,0	44,0	36,0	34,9
CO_2 measured		%	9,4	9,2	9,2	9,1
CO measured		ppm	50	44	34	30
COc (0% 0_2)		ppm	62	56	43	39
NOx measured		ppm	17	15	7	4
NOx adjusted		mg/kWh	37,33	33,65	15,70	9,07
NOx total		mg/kWh	21,44			
NOx adjusted		mg/kWh	**18,09**			
NOx class assigned			**5**			

NOx class		**1**	**2**	**3**	**4**	**5**
NOx limit	mg/kWh	**260**	**200**	**150**	**100**	**70**

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 306

OUTPUT MASS

		Volume of the mass of the combustion products at 15 °C	V_{CO2}: Carbon dioxide created by the combustion of 1 m^3 of gas with air	V_{H2O}: water steam created by the combustion of 1 m^3 of gas with air	CO_2 measured	Output volume of the referring gas at the output heat indicated by the manufacturer at 15 °C and 1013,25 mbar under root adjusted also to the meter	**Mf: Combustion products output mass**
	Measure unit	kg/m^3	m^3/m^3	m^3/m^3	%	m^3/h	**g/sec**
MAX HEAT INPUT	148,0 kW						
G20		1,19	1	2	9,4	15,661	**65,48**
G25		1,19	0,86	1,72	-----	18,215	**-----**
G30		1,19	4	5	-----	4,590	**-----**
G31		1,19	3	4	-----	6,055	**-----**
MIN HEAT INPUT	34,0 kW						
G20		1,19	1	2	9,8	3,598	**14,53**
G25		1,19	0,86	1,72	-----	4,185	**-----**
G30		1,19	4	5	-----	1,054	**-----**
G31		1,19	3	4	-----	1,391	**-----**

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
Test report n° **TIQG-19-009**

ONGAS 306

8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

		Ignition	CO_2 %	CO [ppm]	CO [ppm] in air and water free products of combustion	Limit [ppm]
8.6.3	**Special flue conditions** Tests at nominal and minimum heat input					
	Reference gas used G20					
8.6.3.104 8.12.3.101.3	Type C4 Shortest ducts specified by the manufacturer Suction of 0,5mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
8.6.3.105 8.12.3.101.4	Type C5 Shortest ducts specified by the manufacturer Suction of 2,0mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
	Type C6					
8.6.3.106	Suction of 0,5mbar applied to the combustion products outlet	✓				
8.12.3.101.5	10% of the combustion products are recircurlated in the air supply					
	Maximum heat input		10,6	340	375	2000
	Minimum heat input (only for gas/air ratio controls)		10,5	30	33	2000
	Intervention of APS before CO concentration exceed 2000ppm		-----	-----	-----	2000
	APS switch off at ----- Pa					

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 307

Dati nominali
Nominal data

Brand name	RIMA
Model	ONGAS 307
Installation type admitted	B23-C63
Registration number	Prototype
Burner adjusting	Modulating
Flame surveillance	Ionization
Ignition type	Electronic

Heating circuit

Max temperature of heating water	110,0 °C
Max pressure of heating water (PMS)	6,0 bar
Heating water circulation	Forced
Pressure class	3

Electrical nominal data

Input voltage	230 V
Frequency	50 Hz
Electrical power	315 W
Protection level against moistness and water inlet	-----

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 307

Dati tecnici
Technical data

Nominal heat INPUT				
Maximum		kW	180,0	
Minimum		kW	38,0	
Efficiency				
Maximum heat input	(80-60°C)	%	95,1	
Minimum heat input	(80-60°C)	%	96,6	
Maximum heat input	(50-30°C)	%	103,7	
Minimum heat input	(50-30°C)	%	109,5	
Partial load return 30°C (direct method)		%	106,6	
Fan speed			MAX	MIN
G20		rpm	5200	900
CO2 content				
			MAX	MIN
G20		%	9,30	9,20

EN 15502-1:2012 + A1:2015
EN 15502-2-1:2012 + A1:2016
Rev.2

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 307

Configurazione camini
Flue instalation configuration

Flue installation

Installation type		B23-C63
Diameter of air inlet ducts	mm	115,0
Diameter of evacuation ducts	mm	150,0

Manufacturer	**ON METAL DOKUM SAN. VE TIC.**
Model	**ONGAS 303…307**
Test report N°	**TIQG-19-009**

ONGAS 307

BOILERS WITH PNEUMATIC AIR/GAS RATIO CONTROL — Test with water temperature: x 80 °C / 60 °C; 50 °C / 30 °C

8.4.1 Nominal heat input
8.12.2 Carbon monoxide - Limit conditions
8.12.3 Carbon monoxide - Special conditions

Gas group	2E	N° injectors	-----		Installation type	B23	
Reference gas	G20	Injectors diameter	-----	mm	Type of ducts	separated	
Nominal supply pressure	20,0 mbar	Gas diaphragm	-----	mm	Evacuation ducts diameter	150	mm
		Diameter pilot burner injector	-----	marking	Air inlet ducts diameter	115	mm

Test n°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ambient temperature	°C	24,1	23,2														
Ambient air speed	m/s	0,19	0,20														
Evacuation duct length	m	1,0	1,0														
Air inlet duct length	m	1,0	1,0														
Test gas		G20	G20	G20	G20	G20	G20	G20	G20	G21	G21	G20	G20	G20	G20	G231	G20
Gas supply pressure	mbar	20,0	20,0													17,0	20,0
Gas meter pressure	mbar	28,4	28,9													17,6	24,8
Fan speed	g/min	5200	900														2700
Reference gas "Net calorific value"	MJ/m^3	34,02	34,02	34,02	34,02	34,02	34,02	34,02	34,02	40,91	40,91	34,02	34,02	34,02	34,02	28,91	34,02
Used gas "Net calorific value"	MJ/m^3	34,10	34,10														34,10
Reference gas density		0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,555	0,687	0,687	0,555	0,555	0,555	0,555	0,617	0,555
Used gas density		0,555	0,555														0,555
Atmospheric pressure	mbar	1007	1007														1007
Gas temperature	°C	21,5	21,5														22,5
Gas meter type a=wet, s=dry		s	s														s
Combustion air temperature	°C	23,5	23,4														24,1
Correction under reference conditions		1,0227	1,0230														1,0184
Meter correction		0,993	0,995														0,994
Gas volume	dm^3	600,0	70,0														100,0
Time	s	112,0	66,2														44,2
Measured heat input	**kW**	**185,08**	**36,63**														**77,94**
Measured heat input uncertainty	kW																
Nominal heat input	**kW**	**180,00**	**38,00**	**180,00**	**38,00**	**180,00**	**38,00**	**180,00**	**38,00**	**180,00**	**38,00**	**180,00**	**38,00**	**180,00**	**38,00**	**38,00**	**78,00**
Deviation		2,82%	-3,61%														-0,08%
Deviation with uncertainty		2,82%	-3,61%														-0,08%
Allowed deviation		±5%	±5%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	< 0
Flue gas temperature	°C	55,6	52,1														
CO2 measured	%	9,3	9,2		10,2					10,4	11,0					7,3	
CO measured	ppm	56	13		12					650	270					568	
CO in dry air-free products combustion products	**ppm**	**70**	**17**		**14**					**763**	**299**					**895**	
CO uncertainty	ppm	30	30		30					30	30					30	
Limit	ppm	-----	-----	1000	1000	1000	1000	1000	1000	2000	2000	2000	2000	2000	2000	2000	-----

Test n°	Pt	Description
1	8.4.1	Maximum heat input
2	8.4.1	Minimum heat input
3	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmax
4	8.12.2.102 b)	"Throttle" maladjustment for CO2 0,5% higher - Qmin
5	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmax
6	8.12.2.102 c)	Offset maladjustment for have +5 Pa - Qmin
7	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmax
8	8.12.2.102 c)	Offset maladjustment for have -5 Pa - Qmin
9	8.12.3.1	Incomplete combustion - Qmax
10	8.12.3.1	Incomplete combustion - Qmin
11	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmax
12	8.12.3.2	Supply electric voltage variation - 85% of nominal voltage - Qmin
13	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmax
14	8.12.3.2	Supply electric voltage variation - 110% of nominal voltage - Qmin
15	8.12.3.3	Flame lift limit gas
16	8.4.3	Ignition rate

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

Manufacturer **ON METAL DOKUM SAN. VE TIC.**

Model **ONGAS 303…307**

Test report N° **TIQG-19-009**

ONGAS 307

9.2 - 9.3 USEFUL EFFICIENCIES

Maximum heat input	180,0	kW
Minimum heat input	38,0	kW
Average heat input	109,0	kW
Range rated	yes	
Type of boiler	condensing	

Maximum heat output	180,0	kW
Minimum heat output	38,0	kW
Average heat output	109,0	kW

Type of gas	G20	
Installation type	B23	
Evacuation duct diameter	150	mm
Air inlet duct diameter	115	mm
Evacuation duct length	0,5	m
Air inlet duct length	0,5	m
Diaphragm diameter	-----	mm

Parameter for partial load test		
Method	direct	
Operating mode	1,0	
Conditions	3,0	
T_{ON}	528,0	sec
T_{OFF}	72,0	sec

Test n°			1	2	3	4	5	6
Ambient temperature		°C	22,0	22,0	22,0	21,8	21,9	22,4
Relative humidity		%						
Specific humidity		g/kg	x	x	x	10,0	9,9	9,9
Atmospheric pressure	(Pa)	mbar	1009	1009	1009	1009	1009	1009
Net calorific value of used gas	(Hi)	MJ/m^3 st	34,02	34,02	34,02	34,02	34,02	34,02
Gas meter pressure	(Pg)	mbar	41,5	22,2	20,4	41,8	22,0	21,0
Gas temperature	(Tg)	°C	22,3	22,3	22,5	22,4	22,5	22,1
Gas meter correction			1,006	0,994	0,998	1,006	0,994	0,994
Gas volume		l	3150,0	660,0	1980,0	3210,0	680,0	601,8
Time		s	598,8	599,5	602,6	600,1	606,7	600,3
Measured heat input		kW	182,01	36,94	110,44	185,19	37,58	33,61
Loss at test bench	(Dp)	kJ	0,0	0,0	0,0	0,0	0,0	0,0
Water rate		kg/h	7457,9	1581,1	4574,4	8233,5	1800,3	4539,1
Return temperature		°C	60,1	60,0	59,7	30,1	30,0	30,0
Flow temperature		°C	80,1	79,4	79,6	50,1	49,6	36,8
ΔT measured			20,3	19,7	20,2	20,1	19,7	6,8
Power issued to water		kW	173,04	35,60	105,63	192,04	41,16	35,82
Water efficiency		%	**95,1**	**96,4**	**95,6**	**103,7**	**109,5**	**106,6**
Water efficiency uncertainty		%						

Test n° 1	Maximum heat input	80-60°C
Test n° 2	Minimum heat input	80-60°C
Test n° 3	Average heat input	80-60°C
Test n° 4	Maximum heat input	50-30°C
Test n° 5	Minimum heat input	50-30°C
Test n° 6	Partial load (30%) return	30°C

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

Manufacturer **ON METAL DOKUM SAN. VE TIC.**
Model **ONGAS 303…307**
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ONGAS 307

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.2 Supervision of the combustion air rate or the combustion products rate

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	150/115	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,5%	9,1%
CO2 MIN	9,4%	9,0%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,9	14	**18**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,8	130	**155**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,5	342	**471**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		9,9	28	**33**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

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ONGAS 307

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio
a) Adjust the CO2 at Qmax to the MAX CO2 value and at Qmin at MIN CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	150/115	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	
Start up supervision	x

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,5%	9,1%
CO2 MIN	9,4%	9,0%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,2	128	**242**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		5,8	107	**216**	**1000**
					1000
					1000
					1000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		10,5	27	**30**	**1000**
					1000
					1000
					1000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		8,9	18	**24**	**1000**
					1000
					1000
					1000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					1000
					1000
					1000
					1000

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ONGAS 307

8.11.101 AIR PROVING DEVICE

8.11.101.3 Gas/air ratio controls

8.11.101.3.3 Adjustment of the gas/air ratio
b) Adjust the CO2 at Qmax to the MIN CO2 value and at Qmin at MAX CO2 value

Type of ducts	separated	
Duct diameter (evacuation / air inlet)	150/115	mm
Evacuation duct length	0,2	m
Air inlet duct length	0,2	m

Gas group	2E	
Reference gas	G20	
Nominal supply pressure	20	mbar

Manufacturer choice:

Continuous supervision	x
Start up supervision	

CO2 adjustment stated by the manufacturer:

	Qmax	Qmin
CO2 MAX	9,5%	9,1%
CO2 MIN	9,4%	9,0%

a) Progressive blockage of the air inlet

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		10,7	278	**303**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,3	32	**60**	**2000**
					2000
					2000
					2000

b) Progressive blockage of the combustion products evacuation ducts

Maximum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		11,3	1625	**1683**	**2000**
					2000
					2000
					2000

Minimum heat input					
Blockage	Δp ducts (Pa)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
		6,0	47	**92**	**2000**
					2000
					2000
					2000

c) Progressive reduction of the fan speed

Maximum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

Minimum heat input					
Blockage	Fan voltage (V)	CO2 (%)	CO (ppm)	COc (0% O2) (ppm)	Limit
					2000
					2000
					2000
					2000

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ONGAS 307

8.13 NOx EMISSION - (NITROGEN OXIDE - 20°C - Proportional moistness 10gH2O/kg air)
8.13.2.5 / 8.13.2.6 Modulating boiler

Maximum heat input	Qn	180,0	kW
Minimum heat input	Qr	38,0	kW
Average heat input	Qa	109,0	kW
Range rated		yes	
Type of gas		G20	
Installation type		B23	
Diameter of pipe (outlet-inlet)		150-115	mm
Length of drain pipe		0,5	m
Direction		-----	
Diaphragm diameter		-----	mm
Ambient temperature	T_{amb}	22,4	°C
Atmospheric pressure	P_{atm}	1009	mbar
Specific humidity		10,57	g/kg

						Qr
Partial heat input Qpi in % of Qn			70%	60%	40%	35%
Partial heat input	Qpi	kW	76,3	65,4	43,6	38,0
Pondering factor	Fpi		0,15	0,25	0,30	0,30
Fan speed		g/min	3750	3750	3750	3750
Measured heat input		kW	77,7	65,8	45,1	38,0
Inlet temperature		°C	48,0	44,0	36,0	33,9
CO_2 measured		%	9,7	9,6	9,5	9,2
CO measured		ppm	80	62	34	26
COc (0% 0_2)		ppm	96	76	42	33
NOx measured		ppm	29	25	11	4
NOx adjusted		mg/kWh	61,70	53,75	23,90	8,97
NOx total		mg/kWh	32,55			
NOx adjusted		mg/kWh	**30,69**			
NOx class assigned			**5**			

NOx class		**1**	**2**	**3**	**4**	**5**
NOx limit	mg/kWh	**260**	**200**	**150**	**100**	**70**

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OUTPUT MASS

		Volume of the mass of the combustion products at 15 °C	V_{CO2}: Carbon dioxide created by the combustion of 1 m^3 of gas with air	V_{H2O}: water steam created by the combustion of 1 m^3 of gas with air	CO_2 measured	Output volume of the referring gas at the output heat indicated by the manufacturer at 15 °C and 1013,25 mbar under root adjusted also to the meter	**Mf: Combustion products output mass**
	Measure unit	kg/m^3	m^3/m^3	m^3/m^3	%	m^3/h	**g/sec**
MAX HEAT INPUT	180,0 kW						
G20		1,19	1	2	9,3	19,048	**80,36**
G25		1,19	0,86	1,72	-----	22,154	**-----**
G30		1,19	4	5	-----	5,582	**-----**
G31		1,19	3	4	-----	7,364	**-----**
MIN HEAT INPUT	38,0 kW						
G20		1,19	1	2	9,2	4,021	**17,12**
G25		1,19	0,86	1,72	-----	4,677	**-----**
G30		1,19	4	5	-----	1,178	**-----**
G31		1,19	3	4	-----	1,555	**-----**

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8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

		Ignition	CO_2 %	CO [ppm]	CO [ppm] in air and water free products of combustion	Limit [ppm]
8.6.3	**Special flue conditions** Tests at nominal and minimum heat input					
	Reference gas used G20					
8.6.3.104 8.12.3.101.3	Type C4 Shortest ducts specified by the manufacturer Suction of 0,5mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
8.6.3.105 8.12.3.101.4	Type C5 Shortest ducts specified by the manufacturer Suction of 2,0mbar applied to the combustion products evacuation ducts					
	Maximum heat input	-----	-----	-----	-----	2000
	Minimum heat input	-----	-----	-----	-----	2000
	Type C6					
8.6.3.106	Suction of 0,5mbar applied to the combustion products outlet	✓				
8.12.3.101.5	10% of the combustion products are recircurlated in the air supply					
	Maximum heat input		10,7	340	372	2000
	Minimum heat input (only for gas/air ratio controls)		10,6	22	24	2000
	Intervention of APS before CO concentration exceed 2000ppm		-----	-----	-----	2000
	APS switch off at ----- Pa					

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

ONGAS 307

10 ELECTRIC AUXILIARY ENERGY

	Unit	Measured
10.2 The system boundary cotains all electrical components between the manual shut-off device and the flue outlet of the combustion circuit, including the circulation pump.		
10.3 Auxiliary energy at nominal heat input Test conditions as pt. 9.2.2 The external hydraulic resistance is adjusted in such a way that is 0,15 bar at 20 K temperature difference		
Measured auxiliary energy	kW	0,3150
10.4 Auxiliary energy at part load Test conditions as pt. 9.2.2 and 9.3.2		
Measured auxiliary energy	kW	0,0360
10.5 Auxiliary energy at stand-by Power input measured during operation in stand-by		
Measured auxiliary energy	kW	0,0042

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8.5 LIMITING TEMPERATURES

	Measured	Limit
8.5 Limiting temperatures		
8.5.1 Reference gas - Nominal heat input Control thermostat set at maximum The temperature are measured when thermal equilibrium is reached		
Ambient temperature	24,0 °C	
8.5.2 Adjusting, control and safety devices		
Gas valve	29,0 °C	°C
PCB electronic card	36,0 °C	°C
Venturi	30,0 °C	°C
Knobs		
Metal	----- K	35 K
Glass and ceramics	----- K	45 K
Plastic	5,0 K	60 K
8.5.3 Side walls, front and top surface		
Side wall	10,0 K	80 K
Front surface	9,0 K	80 K
Top surface	8,0 K	80 K
8.5.4 Test panels and floor		
Floor	x K	80 K *
Right panel	4,0 K	80 K *
Left panel	4,0 K	80 K *
Back panel	8,0 K	80 K *
* if temperature rise is between 60 K and 80 K the manufacturer shall supply a protection		
8.5.101 External temperature of the ducts The temperature are measured after 30 min		
External temperature of the ducts	45,0 K	60 K

ONGAS 307

8.11.6 FLAME SUPERVISION DEVICE

8.11.6.2 Automatic burner control system

8.11.6.2.2 Extinction safety time TSE

Reference gas
Normal pressure

The boiler operate for at least 10 min at nominal heat input

Qn: 90,0 kW

Test gas		G20						
Gas inlet pressure	mbar	28,4						
Measured extinction safety time	s	1,00						
Limit	s	3,00	3,00	3,00	3,00	3,00	3,00	3,00

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

8.11.6 FLAME SUPERVISION DEVICE

8.11.6.2 Automatic burner control system

8.11.6.2.1 Ignition safety time TSA

Reference gas
Normal pressure
Extreme conditions of electrical supply

Qn:	90,0	kW
Qignition:	36,0	kW

Test gas		G20						
Gas inlet pressure	mbar	28,4						
Measured ignition safety time	s	1,00						
Limit	s	10,00	10,00	10,00	10,00	10,00	10,00	10,00

General note: *The measurement uncertainties reported in this document have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor K=2 corresponding to a confidence level of about 95%.*
See enclosure n°1 for the equipment uncertainty

8.12.5 Supplementary test for low temperature boilers and condensing boilers

8.12.5 Condensate discharge blockage

Functioning at nominal rate with condensate discharge blocked

Type of gas	G20
Installation type	B23
Diameter of pipe (outlet-inlet)	x
Length of ducts	1,0
Direction	-----
Diaphragm diameter	-----

The boiler shall meet one of the following requirements:

a) the gas supply shut off before the CO concentration exceeds 2000ppm ✓

b) restart is not possible from cold whit condensate discharge blocked that cause a restriction in the flow of combustion products or air for combustion that result in a CO concentration ≥ 1000ppm at equilibrium -----

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8.11.8 THERMOSTATS AND WATER TEMPERATURE LIMITING DEVICES

		Declared value °C	Measured value °C	Difference °C	Limit	
8.11.8.1	**Water control thermostat**					
	a) Maximum setting temperature	85,0	87,0	2,0	± 10	✓
	b) Minimum setting temperature	85,0	86,5	1,5	± 10	✓
	c) Maximum flow temperature	110,0	94,0	-16,0	< 0	✓
8.16.102.1	Nominal working combustion products temperature (test a)	90,0	88,0	-2,0	< 0	✓
8.11.8.2	**Water temperature limiting device**					
8.11.8.2.1	Inadequate water circulation					
	Water rate progressively reduced for temperature increase of 2 K/min					
	No deterioration of the boiler					✓
8.11.8.2.2	Overheating of boilers of pressure classes 1 and 2					
	Test n° 1: Control thermostat out of service					
	Boiler cold water rate progressively reduced for temperature increase of 2 K/min					
	Water temperature measured		-----		110°C	-----
8.16.102.2	Overheat combustion products temperature		-----			
	Safety shutdown					-----
	Test n° 2: Control thermostat out of service Temperature limiter out of service					
	Boiler cold water rate progressively reduced for temperature increase of 2 K/min					
	Water temperature measured		-----		110°C	-----
8.16.102.2	Overheat combustion products temperature		-----			
	Non volatyle lockout					-----

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8.11.8 THERMOSTATS AND WATER TEMPERATURE LIMITING DEVICES

	Declared value °C	Measured value °C	Difference °C	Limit	
8.11.8.2.3 Overheating of boilers of pressure classes 3					
Test n° 1: Control thermostat out of service Boiler cold water rate progressively reduced for temperature increase of 2 K/min					
Water temperature measured		90,0		110°C	✓
Safety shutdown					✓
Test n° 2: Control thermostat out of service Temperature limiter out of service Boiler cold water rate progressively reduced for temperature increase of 2 K/min					
Water temperature measured		89,5		110°C	✓
Non volatyle lockout					✓
Test n° 3 (only if temperature exceed 110°C during test n°2): Control thermostat out of service Boiler cold water rate progressively reduced for temperature increase of 2 K/min					
Water temperature measured		-----		110°C	-----
Safety shutdown					-----

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8.16 Temperature of combustion products

8.16 Temperature of combustion products

Maximum temperature of the combustion products measured	85,0 °C
Non volatyle lockout	✓

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8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

	Test Gas	Gas supply pressure mbar	Ambient temperature	Thermal equilibrium
8.6.1 Tests at ambient temperature and at thermal equilibrium				
8.6.2 Limit conditions				
Test n°1 Reference gas Tests at nominal and reduced heat input				
Minimum pressure	G30	25,0	-----	-----
	G30	25,0	-----	-----
	G30	42,5	-----	-----
70% of normal pressure	G20	14,0	✓	✓
	G25	17,5	-----	-----
	G25	14,0	-----	-----
	G20	17,5	-----	-----
	G25.1	17,5	-----	-----
	G2.350	9,1	-----	-----
	G27	14,0	-----	-----
	G230	14,0	-----	-----
Test n°2 Light back limit gas Tests at nominal and reduced heat input				
Minimum pressure	G32	25,0	-----	-----
	G32	25,0	-----	-----
	G32	42,5	-----	-----
	G222	17,0	✓	✓
	G25	20,0	-----	-----
	G25	17,0	-----	-----
	G222	18,0	-----	-----
	G25.1	18,0	-----	-----
	G2.352	10,0	-----	-----
	G2.412	17,0	-----	-----
	G232	17,0	-----	-----
Test for PL	G222	16,0		
Test for RO	G222	15,0		

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

	Test Gas	Gas supply pressure mbar	Ambient temperature	Thermal equilibrium
Test n°3				
Flame lift limit gas				
Tests at nominal and reduced heat input				
Minimum pressure	G31	25,0	-----	-----
	G31	25,0	-----	-----
	G31	42,5	-----	-----
	G23	17,0	✓	✓
	G231	17,0	✓	✓
	G27	20,0	-----	-----
	G271	17,0	-----	-----
	G23	18,0	-----	-----
	G27.1	18,0	-----	-----
	G2.352	10,0	-----	-----
	G2.412	17,0	-----	-----
	G230	17,0	-----	-----
Test for BE	G231	15,0	✓	✓
Test n°4				
Flame lift limit gas				
Maximum pressure	G31	45,0	-----	-----
	G31	45,0	-----	-----
	G31	57,5	-----	-----
	G23	25,0	✓	✓
	G231	30,0	✓	✓
	G27	30,0	-----	-----
	G271	25,0	-----	-----
	G23	33,0	-----	-----
	G27.1	33,0	-----	-----
	G2.352	16,0	-----	-----
	G2.412	23,0	-----	-----
	G230	25,0	-----	-----

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8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

	Test Gas	Gas supply pressure mbar	Result
Test N°5 (only if indirect means of indicating the presence of flame)			
Flame lift limit gas			
Normal pressure	G31	29,0	-----
Thermal equilibrium	G31	37,0	-----
	G31	50,0	-----
CO content < 1000 ppm	G23	20,0	✓
	G231	20,0	✓
	G27	25,0	-----
	G271	20,0	-----
	G23	25,0	-----
	G27.1	25,0	-----
	G2.352	8,0	-----
	G2.412	20,0	-----
	G230	20,0	-----

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8.6 IGNITION, CROSS-LIGHTING, FLAME STABILITY

	Test Gas	Gas supply pressure mbar	Result
8.6.4 Reduction of the gas rate of ignition burner			
Ignition rate reduced to give the minimum energy necessary to keep the gas way to burner open	G30	25,0	-----
	G30	25,0	-----
	G30	42,5	-----
Ignition without damage to the boiler	G20	17,0	✓
	G25	20,0	-----
	G25	17,0	-----
	G20	18,0	-----
	G25.1	18,0	-----
	G2.350	10,0	-----
	G27	17,0	-----
	G230	17,0	-----
8.6.101 <u>Resistance to draught for type B boilers</u>			
Reference gas Nominal heat input	G30	29,0	-----
	G30	37,0	-----
	G30	50,0	-----
Wind of 2m/s at burner level	G20	20,0	✓
	G25	20,0	-----
	G25	25,0	-----
	G20	25,0	-----
	G25.1	25,0	-----
	G2.350	25,0	-----
	G27	8,0	-----
	G230	20,0	-----

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8.2 SOUNDNESS

	cm	cm^3	sec	Measured leakage cm^3/h	Limit cm^3/h	
8.2.1 Soundness of the gas circuit						
Upstream pressure: 50,0 mbar						
Delivery condition	*	*	*	*	140	✓
At the end of the tests	*	*	*	*	140	✓

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	Test Gas	Gas supply pressure mbar	Result
8.7 Reduction of the gas rate pressure			
Reference gas	G30	20,3	-----
The boiler supply pressure is progressively reduced (from 70% of the normal pressure to 0 mbar)	G30	25,9	-----
	G30	35,0	-----
	G20	14,0	✓
No dangerous situation for the user or damage to the boiler	G25	14,0	-----
	G25	17,5	-----
	G20	14,0	-----
	G25.1	17,5	-----
	G2.350	17,5	-----
	G27	5,6	-----
	G230	14,0	-----
8.8 Defective closure of the gas valve			
(only if the gas line is designed such that the gas supply to the ignition burner is taken from between the two main burner gas valves)	G30	29,0	-----
	G30	37,0	-----
Reference gas	G30	50,0	-----
Normal inlet pressure	G20	20,0	-----
	G25	20,0	-----
	G25	25,0	-----
	G20	20,0	-----
	G25.1	25,0	-----
	G2.350	25,0	-----
	G27	8,0	-----
	G230	20,0	-----

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

8.11 ADJUSTMENT, CONTROL AND SAFETY DEVICES

	Test Gas	Gas supply pressure mbar	Result
8.11.4 Control devices			
8.11.4.1 Rotary knob			
Operating torques of a knob shall not exceed 0,6 N.m or 0,017 N.m/mm of knob diameter			✓
8.11.4.2 Push-button			
Force required to open and/or to keep open the closure element shall not exceed 45 N or 0,5 N/mm2 of the are of the button			✓
8.11.5 Ignition devices			
8.11.5.1 Manual ignition device for ignition burner			
Ambient temperature	G30	29,0	-----
Reference gas	G30	37,0	-----
Max temperature which the ignition device is subjected in the boiler	G30	50,0	-----
Voltage varied between 0,85 and 1,1 times the nominal voltage	G20	20,0	-----
	G25	20,0	-----
The ignition device is operated 40 times (with intervals of at least 1,5s)	G25	25,0	-----
	G20	25,0	-----
At least 50% of the manual ignition attempts shall result in correct ignition	G25.1	25,0	-----
	G2.350	8,0	-----
	G27	20,0	-----
	G230	20,0	-----
8.11.5.2 Automatic ignition system for the ignition burner and main burner			
8.11.5.2.1 General Ignition shall be effected within a maximum of 5 automatic ignition attempts			✓
8.11.5.2.2 Ignition			
	G30	29,0	-----
Reference gas	G30	37,0	-----
Normal pressure	G30	50,0	-----
Voltage of 0,85 times the nominal voltage	G20	20,0	✓
	G25	20,0	-----
- 20 ignition attempts (waiting time of 30s) at ambient temperature	G25	25,0	-----
- 20 ignition attempts (waiting time of 30s) at thermal equilibrium	G20	25,0	-----
	G25.1	25,0	-----
	G2.350	8,0	-----
	G27	20,0	-----
	G230	20,0	-----

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8.12.4 SOOTING

	Test Gas	Gas supply pressure mbar	
8.12.4 Sooting			
Functioning with sooting limit gas for:	G30	29	-----
a) 1h in the case of boilers with heat inputs ≤ 70 kW	G30	37	-----
b) 15 min in the case of boilers with heat inputs > 70 kW	G30	50	-----
	G21	20	✓
	G26	25	-----
No soot deposition shall be observed (yellow tipping is acceptable)	G26	20	-----
	G21	25	-----
	G26.1	25	-----
	G2.351	13	-----
	G2.411	20	-----
	G233	20	-----

✓ = Conformity NC = Not in conformity ----- = Not applicable x = Not done

Fine del rapporto di prova
End of test report

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SHORT DESCRIPTION OF THE APPLIANCES

The appliance to test are gas hobs with the following technical characteristics:

Model	Maximum heat input (kW)	Minimum heat input (kW)	Maximum heat output (kW)	Minimum heat output (kW)	Diameter of air inlet duct (mm)	Diameter of evacuation duct (mm)
ONGAS 303	65	15	62	14	50	80
ONGAS 304	90	20	87,8	18,9	80	100
ONGAS 304 PLUS	110	20	107	19,5	60	100
ONGAS 305	119	19	114,7	18	80	115
ONGAS 306	148	34	142,1	32,7	115	130
ONGAS 307	180	38	171,2	36,6	115	150
ONGAS 303/W	65	15	62	14	50	80
ONGAS 304/W	90	20	87,8	18,9	80	100
ONGAS 304/W PLUS	110	20	107	19,5	60	100
ONGAS 305/W	119	19	114,7	18	80	115
ONGAS 306/W	148	34	142,1	32,7	115	130
ONGAS 307/W	180	38	171,2	36,6	115	150

Tests have been performed on the models ONGAS 303, ONGAS 304, ONGAS 304 PLUS, ONGAS 305, ONGAS 306 and ONGAS 307 which covers all the models foreseen.

The appliances are expected to be traded in the following Countries with the relative gas categories:

Country		Category	Gas type	Pressure (mbar)
AL	**ALBANIA**	I2H	G20	20
AT	**AUSTRIA**	I2H	G20	20
BE	**BELGIUM**	I2E(R)	G20	20
BG	**BULGARIA**	I2H	G20	20
CY	**CYPRUS**	I2H	G20	20
HR	**CROATIA**	I2H	G20	20
DK	**DENMARK**	I2H	G20	20
EE	**ESTONIA**	I2H	G20	20
FI	**FINLAND**	I2H	G20	20
FR	**FRANCE**	I2Er	G20/G25	20/25
DE	**GERMANY**	I2E	G20	20
GR	**GREECE**	I2H	G20	20
IE	**IRELAND**	I2H	G20	20
IT	**ITALY**	I2H	G20	20

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LV	**LATVIA**	I2H	G20	20
LT	**LITHUANIA**	I2H	G20	20
LU	**LUXEMBOURG**	I2E	G20	20
NO	**NORWAY**	I2H	G20	20
PL	**POLAND**	I2E	G20	20
PT	**PORTUGAL**	I2H	G20	20
GB	**UNITED KINGDOM**	I2H	G20	20
CZ	**CZECH REPUBLIC**	I2H	G20	20
MK	**REPUBLIC OF MACEDONIA**	I2H	G20	20
RO	**ROMANIA**	I2H I2E	G20 G20	20 20
SK	**SLOVAKIA**	I2H	G20	20
SI	**SLOVENIA**	I2H	G20	20
ES	**SPAIN**	I2H	G20	20
SE	**SWEDEN**	I2H	G20	20
CH	**SWITZERLAND**	I2H	G20	20
TR	**TURKEY**	I2H	G20	20