

Installation instructions for Convotherm 4 - Gas conversion for gas appliances - CE

1. Important information

- The appliance uses a fully pre-mixed forced-air burner.
- An exhaust gas analyser must be used for adjusting the appliance.
- The specified CO₂ values must be adjusted and checked at the minimum and maximum fan speeds.
- The appliances can be configured for the following gas types:

The table below lists the possible gas data (as per CE) at 15°C and 1013 mbar dry:

Gas type and symbol		Natural gas 2H (E) G20	Natural gas 2L (LL) G25	Liquefied gas 3B/P G30/G31	Propane 3P G31
Supply flow pressure [mbar]		20 (17 - 25)	20/25 (18 - 30)	29/37/50 (25 - 57.5)	29/37/50 (25 - 57.5)
Wobbe index					
Lower W _u	[MJ/m ³]	45.7 (36.8 - 49.6)	37.4 (30.9 - 40.5)	80.6 (68.1 - 80.6)	70.7 (68.1 - 70.7)
Upper W _o	[MJ/m ³]	50.7 (40.9 - 54.7)	41.5 (34.4 - 44.8)	87.3 (72.9 - 87.3)	76.8 (72.9 - 76.8)
Lower calorific value					
H _i	[MJ/m ³]	34	29.3	116.1	88
H _i	[MJ/kg]	-	-	45.7	46.3
Higher calorific value					
H _s	[MJ/m ³]	37.8	32.5	125.8	95.7
H _s	[MJ/kg]	-	-	49.5	50.4

General

- These instructions are intended solely for an authorized customer service engineer.
- Inform the customer of important points relating to operation and safety.

Intended use

This instruction manual describes the steps to be carried out on the combi steamer when performing a gas conversion.

Using this manual

Follow the instructions below:

- Read in full the Safety chapter and chapters that relate to your work.
- Read the entire instruction manual before starting the gas conversion, and perform every single step carefully and precisely.
- Always keep this instruction manual to hand for reference.

Necessary additional instructions

These instructions are a supplement to the user and installation manuals and the servicing documentation for your appliance and must only be used in conjunction with these documents. Please refer to the manuals for technical data, intended use, design and operation and safety information.

Escaping gas

DANGER

Risk of explosion from escaping gas

Escaping gas can ignite and cause an explosion.

- ▶ Make sure that any work on gas components is performed solely by qualified gas installation engineers from an authorized service company.
- ▶ Make certain that the gas supply is disconnected before starting work on the gas installation.
- ▶ After any work carried out on gas components, always test every connection and supply point to the gas components to ensure they are gas tight. Ensure that all the specified points inside and outside the appliance are gas tight before putting the combi steamer back into operation.

Live parts

WARNING

Risk of electric shock from live parts and loose cables

When the safety cover is open, there is a risk of electric shock from touching live parts.

- ▶ Make sure that any work on the electrical system is performed solely by a qualified electrician from an authorized service company.
- ▶ Before removing the safety covers:
 - Switch off all connections to the power supply.
 - Take protective measures at every power switch to ensure that the power cannot be switched on again.
 - If the appliance has previously been connected to the electricity supply, wait 15 minutes to allow the DC bus capacitors to discharge.
 - Make sure that the appliance is de-energized.
- ▶ Make sure that the electrical connections are intact and connected securely before putting the appliance into use.
- ▶ Before putting the appliance into use, make sure that the appliance, including all metallic fittings, is connected to an equipotential bonding system.

Sharp-edged sheet-metal parts

WARNING

Risk of cuts from sharp-edged sheet-metal parts

Working with or behind sharp-edged sheet-metal parts may result in cuts to hands.

- ▶ Exercise caution.
- ▶ Wear personal protective equipment.

Materials required

You will need the following materials:

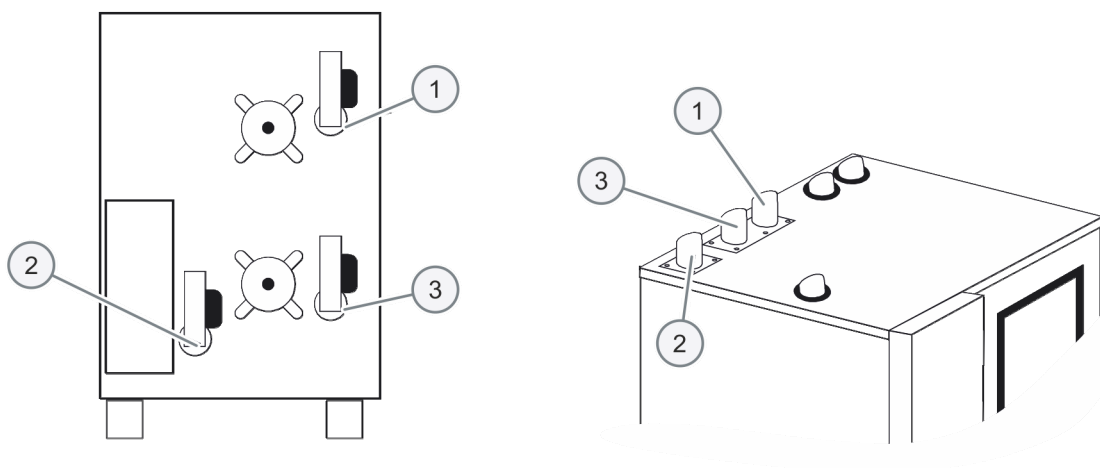
- Exhaust gas measuring equipment (with CO and CO₂ sensor)
- Medium-sized screwdriver
- TX25 and TX40 Torx wrenches
- Leak detector spray or gas detector
- Threadlock

Requirements

Check that the following requirements have been met:

- The appliance has cooled down.
- The appliance has been disconnected from the power supply and protective measures taken to ensure the power cannot be switched on again.
- The gas supply has been shut off.
- The left-hand side panel has been removed.

Burner and exhaust gas pipe arrangement



Item	Name
1	Convection burner 1
2	Boiler burner
3	Convection burner 2 (only for 20.10 / 20.20)

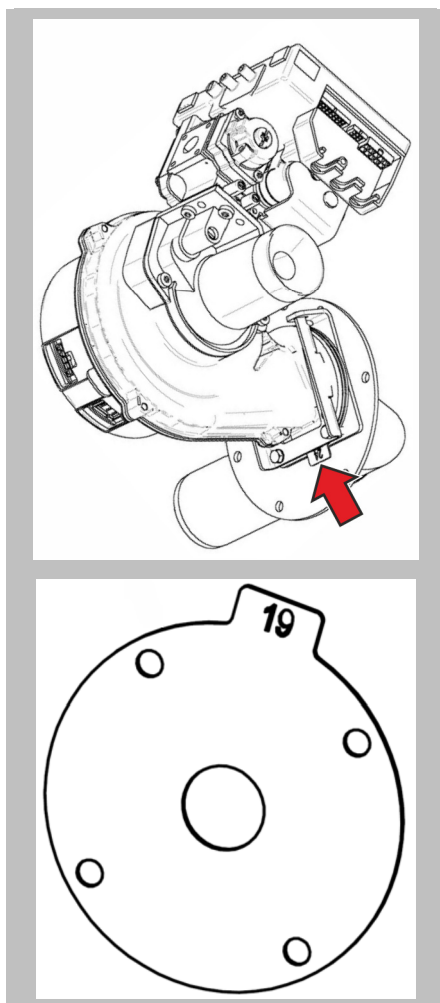
2. Gas conversion procedure

Notice

All the burners in the appliance must be adjusted to the same gas type.

Step 1: checking the air orifice plate

1.



A numerical code (= Ø of air orifice plate) is located on the burner flange, behind the fan.
This numerical code must match the figure specified in the following table.

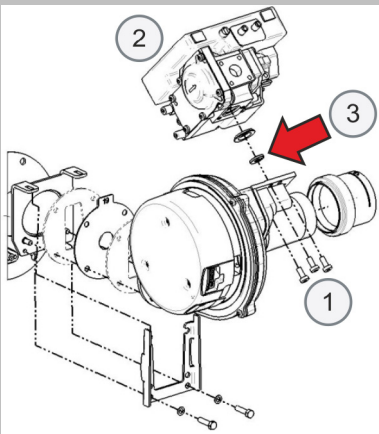
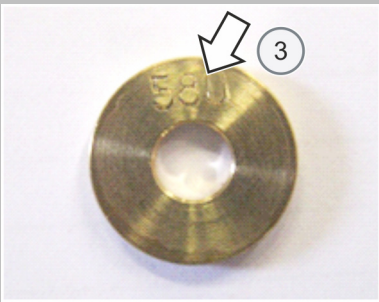
Please note:


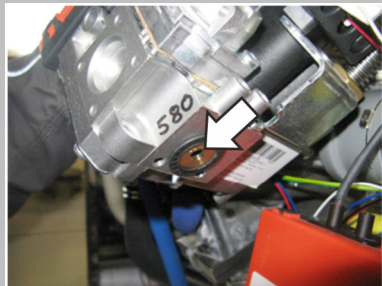
If the numerical code does not match the specifications in the following table, please contact the manufacturer.

Numerical code on air orifice plate

Unit type	Convection burner 1 Convection burner 2	Boiler burner
6.10	16	16
6.20	19	19
10.10	18	18
10.20	22	25
12.20	22	25
20.10	18	25
20.20	22	25

Step 2: checking the gas orifice plate

1.  Cut off the gas supply and disconnect the appliance from the electricity supply.
2. Use a TX25 Torx wrench to remove the three screws from the gas valve (1).
3. Take off the gas valve/burner control unit (2).
4.  Example of a gas orifice plate (3)
Check the size of the gas orifice against the table below (the numerical code of the gas orifice is stamped on the plate) and replace the gas orifice plate if necessary (3).

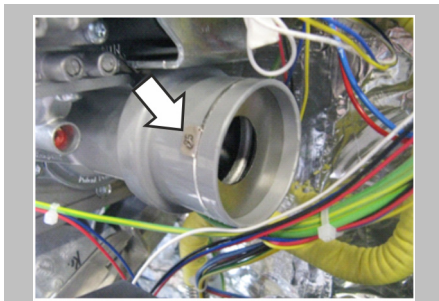
5.		Fitting the gas valve/burner control unit with gasket and orifice plate
5.a		Place the new gasket flush against the mounting face.
5.b		Insert the orifice plate horizontally until it rests against the mounting face.
5.c		Refit the three screws.

Numerical code = Ø of gas orifice plate

Unit type GB + GS	Natural gas 2H (E) G20		Natural gas 2L (LL) G25		Propane 3P G31		Liquefied gas 3B/P G30/31	
	HL	DE	HL	DE	HL	DE	HL	DE
6.10	470	470	550	550	340	340	340	340
6.20	490	520	550	620	400	430	400	430
10.10	580	580	620	620	430	430	430	430
10.20	600	600	660	660	430	430	430	430
12.20	600	600	660	660	430	430	430	430
20.10	580	600	620	660	430	430	430	430
20.20	600	600	660	660	430	430	430	430

Step 3: testing the air intake line

1.



Check the orifices in the air intake line (see table).

Unit type	Convection burner 1 Convection burner 2	Boiler burner
6.10	19	19
6.20	19	25
10.10	25	25
10.20	33*	33*
12.20	33*	33*
20.10	25	33*
20.20	33*	33*

* = built into an air intake line consisting of two bends and a hose section.

Step 4: gas leak test

1.

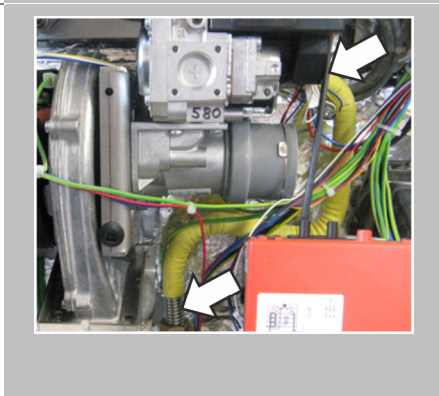


Re-open the gas supply.

2.


Switch on the combi steamer.
Wait until the appliance is ready for use.

3.



Check that all the gas pipes, connections and protective caps are gas tight, from the appliance gas-supply connection point through to the gas control valves.

Please note:

Use a gas detector or leak detector spray for this purpose.
Follow the guidance on the safety data sheet for the leak detector spray.




Danger:

Explosion hazard in case of leaks.

Caution, Fire hazard:

Do not spray any leak detector spray onto electrical or electronic components. Check that the air intake line is installed correctly.

Step 5: setting the gas type

		easyDial																								
1.		Open the Service program for Customer Services. To do this, press and hold for 3 seconds all three buttons at once for "Temperature", "Core temperature" and "Time".																								
2.		Use the C-Dial to select the service value c36 .																								
3.		Press the 'Time' button to confirm.																								
4.		Use the C-Dial to select the value for the gas type you require. <table><tr><td>0</td><td>Natural gas 2H (E)</td></tr><tr><td>1</td><td>Natural gas 2L (LL)</td></tr><tr><td>2</td><td>Liquefied gas 3B/P</td></tr><tr><td>3</td><td>Propane 3P</td></tr><tr><td>4</td><td>Natural gas (USA)</td></tr><tr><td>5</td><td>Propane (USA)</td></tr><tr><td>6</td><td>Natural gas (AUS/NZ)</td></tr><tr><td>7</td><td>Propane (AUS/NZ)</td></tr><tr><td>8</td><td>Natural gas 13A (JPN)</td></tr><tr><td>9</td><td>Propane (JPN)</td></tr><tr><td>10</td><td>Natural gas (KOR)</td></tr><tr><td>11</td><td>Propane (KOR)</td></tr></table>	0	Natural gas 2H (E)	1	Natural gas 2L (LL)	2	Liquefied gas 3B/P	3	Propane 3P	4	Natural gas (USA)	5	Propane (USA)	6	Natural gas (AUS/NZ)	7	Propane (AUS/NZ)	8	Natural gas 13A (JPN)	9	Propane (JPN)	10	Natural gas (KOR)	11	Propane (KOR)
0	Natural gas 2H (E)																									
1	Natural gas 2L (LL)																									
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3	Propane 3P																									
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5	Propane (USA)																									
6	Natural gas (AUS/NZ)																									
7	Propane (AUS/NZ)																									
8	Natural gas 13A (JPN)																									
9	Propane (JPN)																									
10	Natural gas (KOR)																									
11	Propane (KOR)																									
5.		Press the 'Time' button to confirm.																								

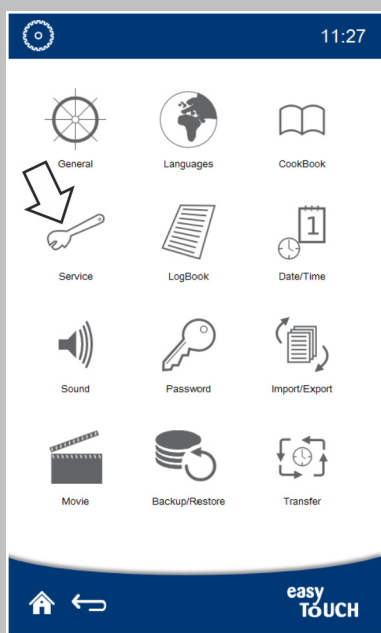
easyTouch

1.



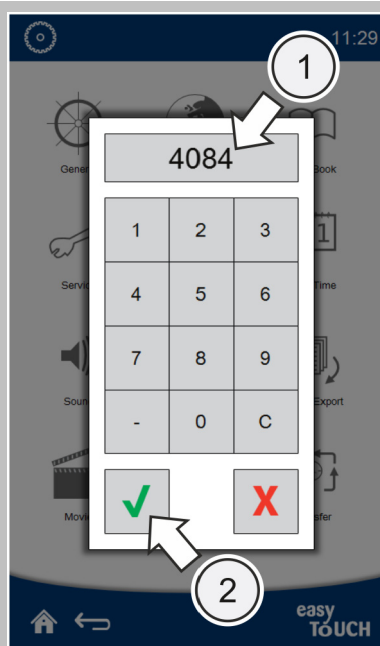
Open the Service program for Customer Services.
To do this, press the 'Settings' button on the home page.

2.



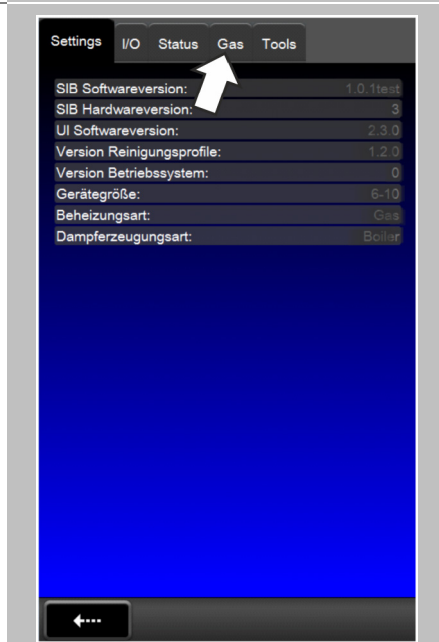
Press the 'Service' button on the 'Settings' page.

3.



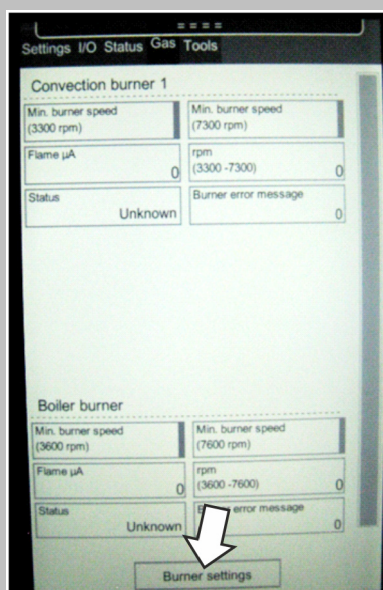
Enter (1) and confirm (2) the password for the Service menu.

4.



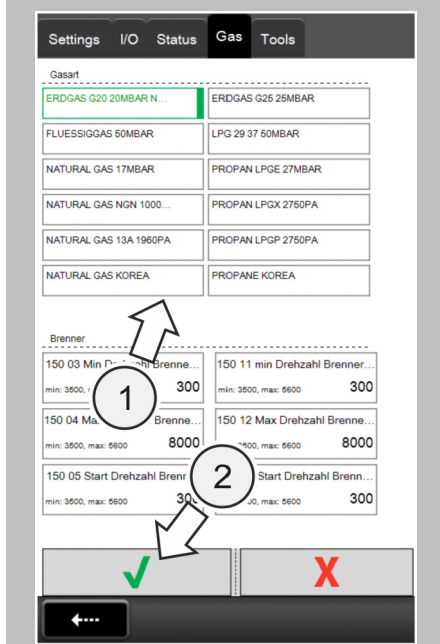
Press the 'Gas' button.

5.



Press the 'Burner settings' button

6.



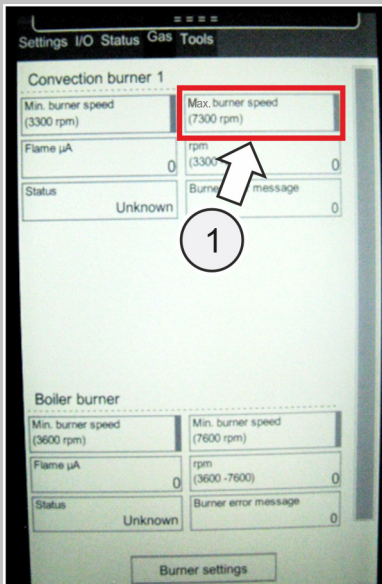


In the 'Gas' tab, select the gas type (1) you require and confirm (2).

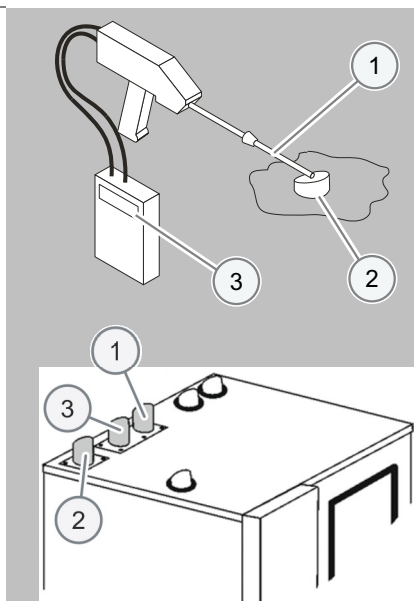
The fan speeds are now set.

Step 6: Setting the exhaust gas values at maximum speed

Steps 6, 7 and 8 below must be performed for every burner in the appliances.

1.		Start the Burner at maximum speed.
		easyDial
2.a		<p>Use the C-Dial to select the relevant service values</p> <ul style="list-style-type: none"> d30 = convection burner 1, max. speed d32 = convection burner 2, max. speed d34 = boiler burner, max. speed
2.b		Press the 'Time' button to confirm the service value.
		easyTouch
2.a		<p>In the 'Gas' tab, select the 'Max. burner speed' (1) button for the relevant burner.</p> <p>Press the button again to switch off the burner.</p>
3.		After the burner ignites, the speed is increased automatically to the maximum speed.
4.		Perform a leak test at all points previously opened on the gas valve and at the connections to the burner fan and burner to ensure they are gas tight.

5.



Guide the measuring sensor of the exhaust gas meter (1) into the exhaust outlet (2) for the burner to be measured.
 If the meter indicates approx. 21% O₂ or nothing at all, then the sensor is inside the wrong exhaust outlet.

- | | | |
|---|----|------------------------------|
| 1 | C1 | Convection burner 1 (top) |
| 2 | DE | Boiler burner |
| 3 | C2 | Convection burner 2 (bottom) |

6.

Measure the exhaust gas values for at least one minute.
 Follow the operating instructions for the meter when taking the readings.

7.

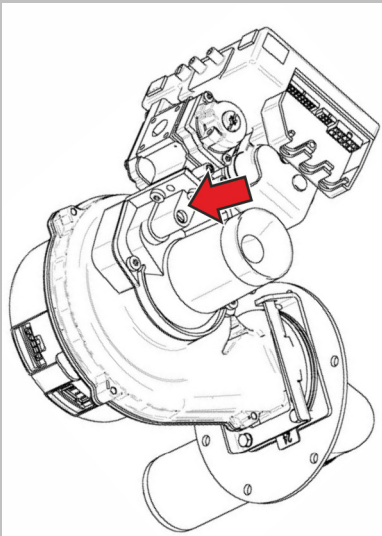
Check the CO, O₂ and Lambda or CO₂ readings on the exhaust gas meter (3) against the values in the following table (exhaust gas values at maximum speed).

Please note:

If the CO value > 500 ppm, shut down the appliance and check why the CO value is so high.

Gas type	Lambda	O ₂	CO ₂
Natural gas 2H (E)	1.2 - 1.3	3.5 - 4.8%	9.1 - 9.7%
Natural gas 2L (LL)	1.2 - 1.3	3.5 - 4.8 %	8.9 - 9.5%
LPG propane 3P	1.2 - 1.3	3.5 - 4.8%	10.6 - 11.4%
LPG propane/butane 3B/P	1.18 - 1.23	3.2 - 3.9%	11.3 - 11.9%

8.

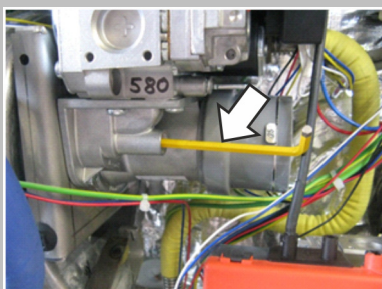


If the exhaust gas value differs considerably from the target value, use the screw on the Venturi valve (Torx 25 or size 4 hexagon socket) to adjust the exhaust gas reading to the required value.

If the exhaust gas value is close to the target value, the MIN speed should be adjusted first.

Please note:



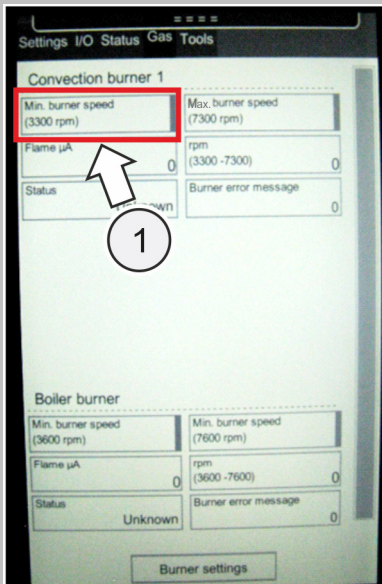
- In order to increase the O₂ value and lower the CO₂ value, turn clockwise.
- In order to lower the O₂ value and increase the CO₂ value, turn counterclockwise.
- All readings should be taken when the appliance is hot (i.e. the appliance has been running for at least 10 minutes after switching on from cold, or for at least 5 minutes after switching a warm appliance back on)

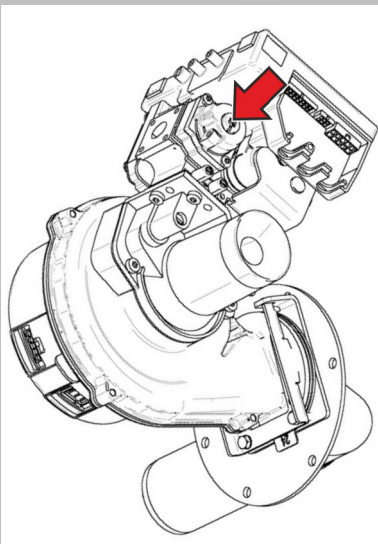


9.

Make a record of the O₂ and CO₂ readings.

Step 7: Setting the exhaust gas values at minimum speed

1.		Start the Burner at minimum speed.
		easyDial
2.a		Select the relevant Service values <ul style="list-style-type: none"> ▪ d29 = convection burner 1, min. speed ▪ d31 = convection burner 2, min. speed ▪ d33 = boiler burner, min. speed
2.b		Press the 'Time' button to confirm the service value.
		easyTouch
2.a		In the 'Gas' tab, select the 'Min. burner speed' (1) button for the relevant burner. Press the button again to switch off the burner.

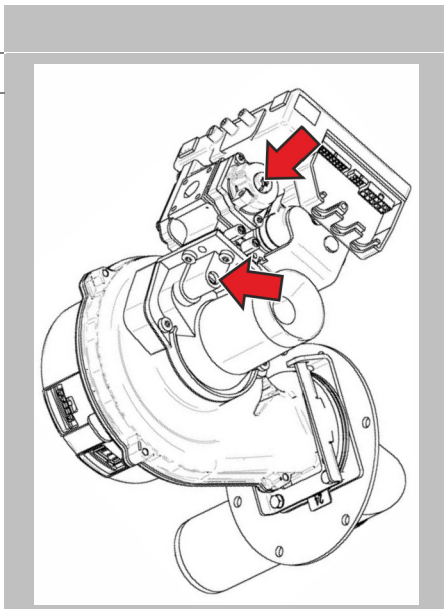
3.		<p>Please note:</p> <p>The measurements should be taken when the appliance is hot (i.e. the appliance has been running either for at least 10 minutes after switching on from cold or for at least 5 minutes after switching a warm appliance back on).</p>																				
4.		<p>Measure the exhaust gas values for at least one minute.</p> <p>Follow the operating instructions for the meter when taking the readings.</p>																				
5.		<p>Check the CO, O₂ and Lambda or CO₂ readings on the exhaust gas meter (3) against the values in the following table (exhaust gas values at maximum speed).</p> <p>Please note:</p> <p>If the CO value > 500 ppm, shut down the appliance and check why the CO value is so high.</p> <table><tr><th>Gas type</th><th>Lambda</th><th>O₂</th><th>CO₂</th></tr><tr><td>Natural gas 2H (E)</td><td>1.25 - 1.35</td><td>4.2 - 5.4%</td><td>8.7 - 9.3%</td></tr><tr><td>Natural gas 2L (LL)</td><td>1.25 - 1.35</td><td>4.2 - 5.4 %</td><td>7.7 - 8.3%</td></tr><tr><td>LPG propane 3P</td><td>1.25 - 1.35</td><td>4.2 - 5.4%</td><td>10.2 - 11.0%</td></tr><tr><td>LPG propane/butane 3B/P</td><td>1.24 - 1.28</td><td>4.1 - 4.6%</td><td>10.8 - 11.2%</td></tr></table>	Gas type	Lambda	O ₂	CO ₂	Natural gas 2H (E)	1.25 - 1.35	4.2 - 5.4%	8.7 - 9.3%	Natural gas 2L (LL)	1.25 - 1.35	4.2 - 5.4 %	7.7 - 8.3%	LPG propane 3P	1.25 - 1.35	4.2 - 5.4%	10.2 - 11.0%	LPG propane/butane 3B/P	1.24 - 1.28	4.1 - 4.6%	10.8 - 11.2%
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LPG propane/butane 3B/P	1.24 - 1.28	4.1 - 4.6%	10.8 - 11.2%																			
6.		<p>Remove the protective cap (TX40).</p> <p>Set the desired exhaust gas value with the screw on the gas valve.</p> <p>Please note:</p> <ul style="list-style-type: none">▪ In order to increase the CO₂ value or lower the O₂ value or Lambda value, turn clockwise.▪ In order to lower the CO₂ value or increase the O₂ value or Lambda value, turn anticlockwise.▪ The readings measured at minimum speed must differ significantly from the readings at maximum speed:<ul style="list-style-type: none">▪ Lambda must be at least 0.04 higher▪ O₂ must be at least 0.6% higher▪ CO₂ must be at least 0.3% lower																				
7.		<p>Make a record of the O₂ and CO₂ readings.</p>																				

Step 8: repetition of steps 6 and 7

Repeat steps 6 and 7 until the values are set correctly.

Step 9: sealing the gas setting

- | | | |
|----|--|--|
| 1. | | Fit the protective cap on the gas valve. |
| 2. | | Seal the protective cap with Threadlock. |
| 3. | | Seal the Venturi valve screws with Threadlock. |

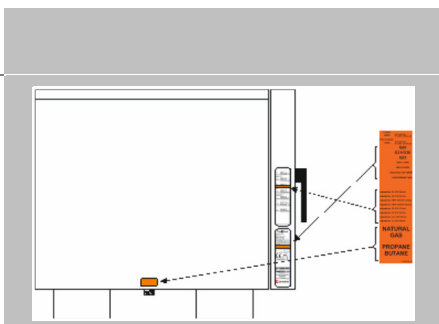


Step 10: additional burners

Repeat this procedure for all additional burners in the appliance.

Step 11: Updating the appliance labelling

- | | | |
|----|--|--|
| 1. | | Clean the surfaces on the appliance before attaching the adhesive label. |
| 2. | | Affix the correct specification for the gas type on the appliance type plate (part no. 6056508). |



3. Service values for the gas adjustment

Burner operation, easyDial

d29	Start convection burner 1, minimum speed	(MIN)
d30	Start convection burner 1, maximum speed	(MAX)
d31	Start convection burner 2, minimum speed	(MIN)
d32	Start convection burner 2, maximum speed	(MAX)
d33	Start boiler burner, minimum speed	(MIN)
d34	Start boiler burner, maximum speed	(MAX)

Setting the gas type, easyDial

c36	0	Natural gas 2H (E)
c36	1	Natural gas 2L (LL)
c36	2	Liquefied gas 3B/P
c36	3	Propane 3P
c36	4	Natural gas (USA)
c36	5	Propane (USA)
c36	6	Natural gas (AUS/NZ)
c36	7	Propane (AUS/NZ)
c36	8	Natural gas 13A (JPN)
c36	9	Propane (JPN)
c36	10	Natural gas (KOR)
c36	11	Propane 29 (KOR)

Checking the fan speed on easyDial

c37	Convection burner fan, minimum speed	(MIN)
c38	Convection burner fan, start speed	(START)
c39	Convection burner fan, maximum speed	(MAX)
c40	Boiler burner fan, minimum speed	(MIN)
c41	Boiler burner fan, start speed	(START)
c42	Boiler burner fan, maximum speed	(MAX)

Basic settings (after replacing the gas valve/venturi tube)

Gas valve Turn the adjusting screw all the way in and then turn it counterclockwise one and a half turns.

Venturi Turn the screw in so that it is approx. 12 mm from the top.



Settings (summary)

No.	Size	Burner	Gas type	Intake orifice	Gas orifice	Fan orifice	MIN speed	START speed	MAX speed
1_01	6.10	HL	2H (E)	19	470	16	3500	4000	5600
1_02	6.10	DE	2H (E)	19	470	16	3500	4000	5700
1_03	6.10	HL	2L (LL)	19	550	16	3500	4000	5600
1_04	6.10	DE	2LL	19	550	16	3500	4000	5700
1_05	6.10	HL	3B/P	19	340	16	3500	4000	5600
1_06	6.10	DE	3B/P	19	340	16	3500	4000	5700
1_07	6.10	HL	3P	19	340	16	3500	4000	5600
1_08	6.10	DE	3P	19	340	16	3500	4000	5700
2_01	6.20	HL	2H (E)	19	490	19	4400	5000	7500
2_02	6.20	DE	2H (E)	25	520	19	4500	5000	7300
2_03	6.20	HL	2L (LL)	19	550	19	4400	5000	7500
2_04	6.20	DE	2L (LL)	25	620	19	4500	5000	7300
2_05	6.20	HL	3B/P	19	400	19	4400	5000	7500
2_06	6.20	DE	3B/P	25	430	19	4500	5000	7300
2_07	6.20	HL	3P	19	400	19	4400	5000	7500
2_08	6.20	DE	3P	25	430	19	4500	5000	7300
3_01	10.10	HL	2H (E)	25	580	18	3300	4200	7300
3_02	10.10	DE	2H (E)	25	580	18	3600	4200	7600
3_03	10.10	HL	2L (LL)	25	620	18	3300	4200	7300
3_04	10.10	DE	2L (LL)	25	620	18	3600	4200	7600
3_05	10.10	HL	3B/P	25	430	18	3300	4200	7300
3_06	10.10	DE	3B/P	25	430	18	3600	4200	7600
3_07	10.10	HL	3P	25	430	18	3300	4200	7300
3_08	10.10	DE	3P	25	430	18	3600	4200	7600
4_01	10.20	HL	2H (E)	33	600	22	2800	3800	7700
4_02	10.20	DE	2H (E)	33	600	25	2800	3500	8000
4_03	10.20	HL	2L (LL)	33	660	22	2800	3800	7700
4_04	10.20	DE	2L (LL)	33	660	25	2800	3500	8000
4_05	10.20	HL	3B/P	33	430	22	2800	3800	7700
4_06	10.20	DE	3B/P	33	430	25	2800	3500	8000
4_07	10.20	HL	3P	33	430	22	2800	3800	7700
4_08	10.20	DE	3P	33	430	25	2800	3500	8000

No.	Size	Burner	Gas type	Intake orifice	Gas orifice	Fan orifice	MIN speed	START speed	MAX speed
5_01	12.20	HL	2H (E)	33	600	22	2800	3800	7700
5_02	12.20	DE	2H (E)	33	600	25	2800	3500	8000
5_03	12.20	HL	2L (LL)	33	660	22	2800	3800	7700
5_04	12.20	DE	2L (LL)	33	660	25	2800	3500	8000
5_05	12.20	HL	3B/P	33	430	22	2800	3800	7700
5_06	12.20	DE	3B/P	33	430	25	2800	3500	8000
5_07	12.20	HL	3P	33	430	22	2800	3800	7700
5_08	12.20	DE	3P	33	430	25	2800	3500	8000
6_01	20.10	HL	2H (E)	25	580	18	3300	4200	7300
6_02	20.10	DE	2H (E)	33	600	25	2800	3500	8000
6_03	20.10	HL	2L (LL)	25	620	18	3300	4200	7300
6_04	20.10	DE	2L (LL)	33	660	25	2800	3500	8000
6_05	20.10	HL	3B/P	25	430	18	3300	4200	7300
6_06	20.10	DE	3B/P	33	430	25	2800	3500	8000
6_07	20.10	HL	3P	25	430	18	3300	4200	7300
6_08	20.10	DE	3P	33	430	25	2800	3500	8000
7_01	20.20	HL	2H (E)	33	600	22	2800	3800	7700
7_02	20.20	DE	2H (E)	33	600	25	2800	3500	8000
7_03	20.20	HL	2L (LL)	33	660	22	2800	3800	7700
7_04	20.20	DE	2L (LL)	33	660	25	2800	3500	8000
7_05	20.20	HL	3B/P	33	430	22	2800	3800	7700
7_06	20.20	DE	3B/P	33	430	25	2800	3500	8000
7_07	20.20	HL	3P	33	430	22	2800	3800	7700
7_08	20.20	DE	3P	33	430	25	2800	3500	8000

Burner	Type
HL	Convection
DE	Boiler

4. Form

Please complete the form and send it to convotherm-service@manitowoc.com

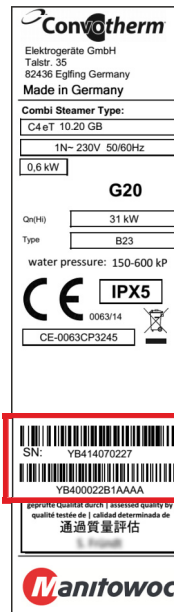
Customer / Site:

Name _____
Address _____
Street _____
Town _____
Postcode _____
Country _____

Data from the type plate:

Serial number _____
Part number _____

This appliance
was converted on: Day: _____ Month: _____ Year: _____
to gas type: _____
using conversion kit
number: _____
by the company: _____
Company address _____



The type plate contains the following information:

- Convotherm logo
- Elektrogeräte GmbH, Talstr. 35, 82436 Eglfing, Germany, Made in Germany
- Combi Steamer Type: C4eT 10.20 GB
- 1N- 230V 50/60Hz
- 0,6 kW
- G20
- On(H): 31 kW
- Type: B23
- water pressure: 150-600 kP
- CE mark and IPX5 protection rating
- 0063/14
- CE-0063CP3245
- Barcode with SN: YB414070227 and YB400022B1AAAA
- Quality assessment text in multiple languages
- Manitowoc logo

The company cited above accepts responsibility for the correct conversion of the appliance to the new gas type.

Contact details of installation engineer / service partner:

Name _____
email _____

Signature:

Location _____
Date _____
Signature _____