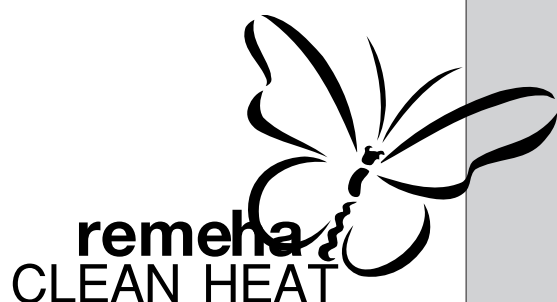


remeha W40/60-m ECO

Installation and maintenance instructions

High-efficiency
condensing boiler
for free standing (frame
mounted) or wall
mounted installation

Suitable for room sealed
fanned flue or open flue
fan assisted operation



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PREFACE

These technical instructions contain useful and important information for the correct operation and maintenance of the remeha central heating boiler, models W40/60-m ECO.

Furthermore, important instructions are given to ensure safe and trouble free boiler operation.

Read these instructions carefully before putting the boiler into operation, familiarize yourself with its operation and control and strictly observe the instructions given.

If you have any questions, or if you need more information about specific subjects relating to this boiler, please do not hesitate to contact us.

The data published in these technical instructions is based on the latest information and is subject to revisions.

We reserve the right to modify the design and/or configuration of our products at any moment without being obliged to adjust earlier supplies accordingly.

1. GENERAL DESCRIPTION OF THE BOILER

The remeha W40/60-m ECO is a condensing boiler which may be installed free standing on a frame or wall mounted on a bracket. The boiler is suitable for room sealed fanned flue or open flue fan assisted applications. The boiler is designed for central heating and indirect hot water supply at working pressures not exceeding 3 bar. It should be installed on a pumped water circulation system and is suitable for both open and unvented system operation.

The remeha W40/60-m ECO is fitted with a top mounted premix gas burner firing downwards into an aluminium heat exchanger. The application of the premix burner, with its carefully controlled gas/air ratio, water heating efficiencies of 110.4% (NCV) are obtained in the condensing mode with very low CO and NO_x emissions. A condensate collector and a siphon for the condensate drain is fitted at the bottom of the boiler.

Quick connect latches on the air box cover make the unit easy to service and maintain.

The remeha W40/60-m ECO can be easily programmed and controlled using the built in microprocessor. Actual and set values can be checked from the read-out display. Gas and water connections are sited at the bottom of the boiler whilst combustion air inlet and flue discharge connections are located at the top of the casing.

For multiple boiler applications refer to the Technical Information "Multiple units".

The boiler meets the requirements of the EC regulations of the directives:

- 90-m/396/EEC Gas appliances directive
- 92/42/EEC Efficiency directive
- 73/23/EEC Electrical low voltage directive
- 89/392/EEC Machinery directive
- 89/336/EEC E.M.C. directive

W40-m ECO - PIN-number: 63/AO/6520.

W60-m ECO - PIN-number: 63/AP/6520.

For further advice or information contact Broag Ltd.

2. CONSTRUCTION

A DC fan has been mounted on the combustion air supply side, which guarantees the supply of the correct quantity of combustion air. Gas injection takes place in a special mixing section at the inlet of the fan.

As a result, the optimum mixture of gas and air is achieved in the fan. A pre-mix burner, placed in the top of the appliance, guarantees optimum combustion.

The remeha W40/60-m ECO heat exchanger is manufactured in aluminium, and equipped with conducting panels for optimum heat transfer.

At the bottom of the appliance, a condensate collector tray and a siphon are responsible for discharging condensed water.

The closed air box increases safety, and facilitates installation in practically any room.

Through the use of microprocessor technology, the remeha W40/60-m ECO is simple to set and control.

Display windows make it possible to check the current and target settings.

The gas and water connections are clearly mounted on the underside of the appliance. The combustion air supply and flue gas discharge are mounted on the top of the boiler (100 mm I/D socket).

By using quick connect latches on the air box cover (no screws), the appliance is also easy to service and maintain.

3. TECHNICAL DATA AND DIMENSIONS

3.1 Dimensions

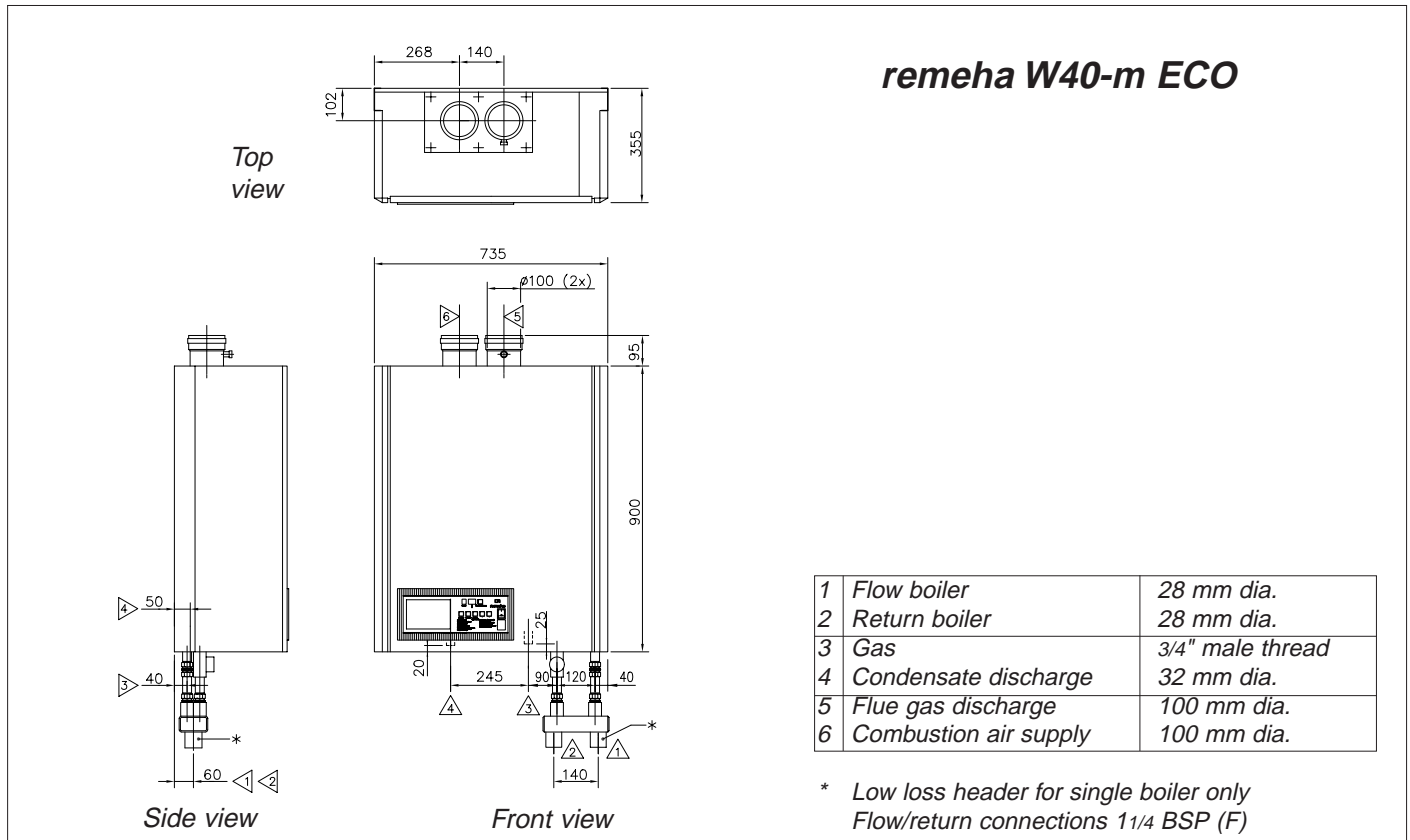


Fig. 01 remeha W40-m ECO

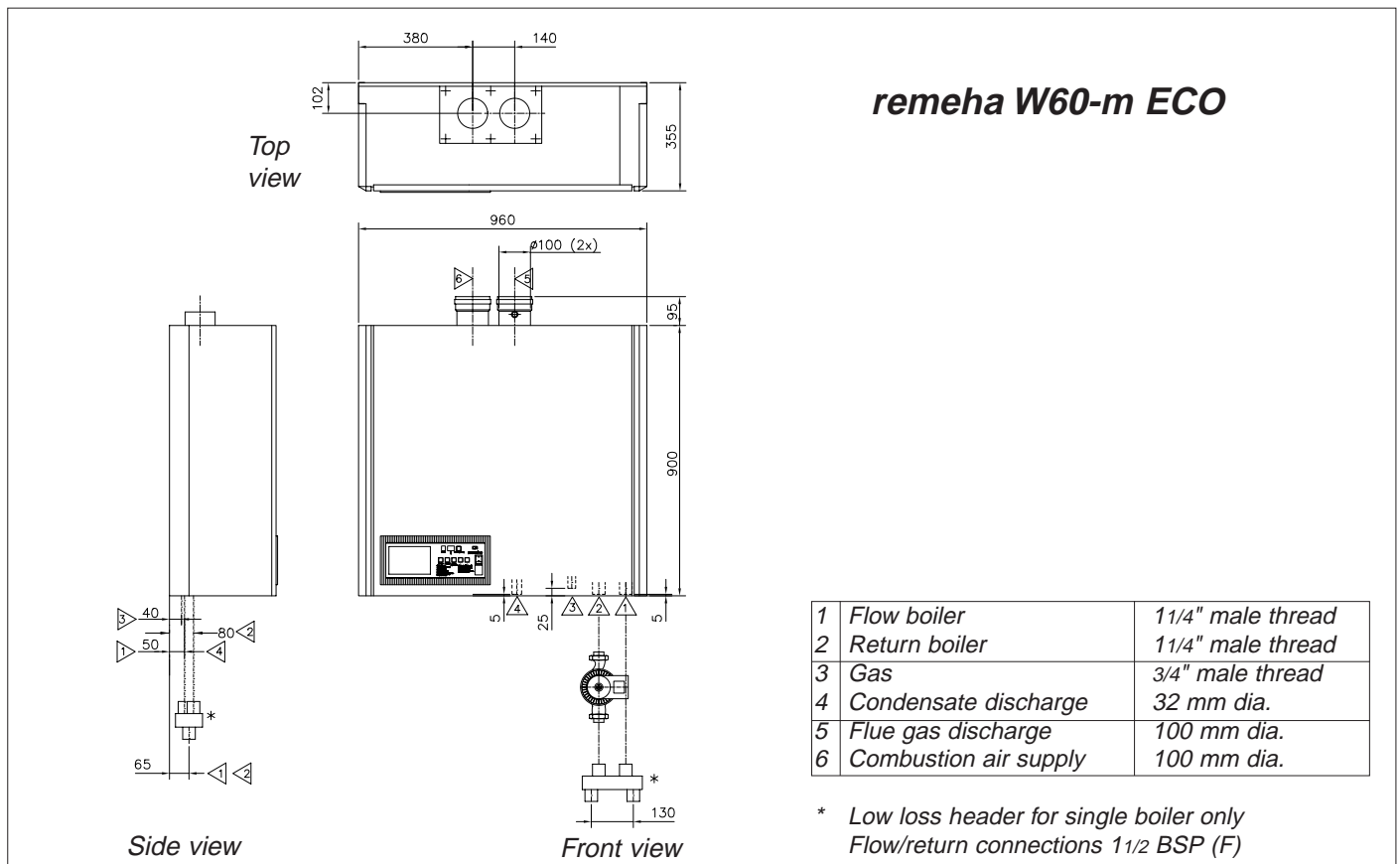


Fig. 02 remeha W60-m ECO

3.2 Technical data

Boiler type		remeha W40-m ECO	remeha W60-m ECO
Load control: adjustable		modulating high - low on - off	modulating high - low on - off
Output (80/60°C) - min.	kW	12,4	18.2
- max.	kW	41.0	60.5
(40/30°C) - min.	kW	14.0	20.3
- max.	kW	44.3	66.4
Input (GCV) - min.	kW	14.1	20.7
- max	kW	47.0	69.0
Input (NCV) - min.	kW	12.7	18.6
- max	kW	42.3	62.1
Category		II _{2H 3P}	II _{2H 3P}
Inlet pressure gas	mbar	17 - 30	17 - 30
Gasrate (natural gas)	m³/h	1.3 - 4.5	2.0 - 6.6
NOx emission	mg/kWh	51	18
	ppm	29	10
Residual fan duty	mbar	0,8	0,8
Mass flue rate	kg/h	71	104
Appliance (flue) type		B23, C13, C33, C43, C53, C63	B23, C13, C33, C43, C53, C63
Main supply	V/Hz	240/50	240/50
Electric rating	VA	150	100
Fuse rating	A	2	2
Isolation class	IP	20	20
Watertemperature - max.	°C	100	100
- control	°C	20 - 90	20 - 90
Operating pressure - min.	bar	0.3	0.3
- max.	bar	3	3
Water contents	ltr	5	6
Waterresistance (ΔT = 10°C)	mbar	400	900
Residual pump duty (ΔT = 20°C)	mbar	350	not applicable
Assembly weight	kg	67	75

3.3 Delivery package

- circulation pump
- low loss header
- pressure gauge
- filling and drain cock
- air supply fan
- electronic control and protection equipment: 24V
- interface for **rematic®** weather-compensated boiler control
- temperature regulation: adjustable from 20 to 90°C
- differential air pressure switch
- low-water protection via temperature sensors
- aluminium heat exchanger
- red spray-coated sheet steel casing
- pump switch

- frost protection
- easy-to-read control panel with display
- siphon trap
- hanging bracket
- automatic vent.

Accessories

- conversion set for propane
- connection set for calorifier
- outdoor temperature sensor
- modulating **rematic®** weather-compensated boiler control
- interface for modulating room control (Honeywell Chronotherm Modulation).

4. EFFICIENCY INFORMATION

4.1 Annual efficiency

a. 103.3% (NCV), 93.0% (GCV) at an average water temperature of 45°C (55/35°C).

4.2 Heat to water efficiency

- a. Up to 99.0% (NCV), 89.1% (GCV) at an average water temperature of 76.5°C.
b. Up to 110.4% (NCV), 99.4% (GCV) at an average water temperature of 45°C.

5. INSTALLATION APPLICATIONS

5.1 General

The boiler may be used with a fully pumped sealed or open vented central heating system and pumped heating combined with pumped indirect domestic hot water supply systems.

The remeha W40/60-m ECO is not suitable for systems which include any gravity circulation, bathroom installations or connection to unlined brick chimneys.

5.1.1 Installation of single boilers

The low noise level emission of 48 dBA measured at 1 m from the boiler makes the remeha W40/60-m ECO ideal for installation as a single boiler in large domestic dwellings and smaller commercial premises.

The single boiler should be supplied with a header (available from Broag).

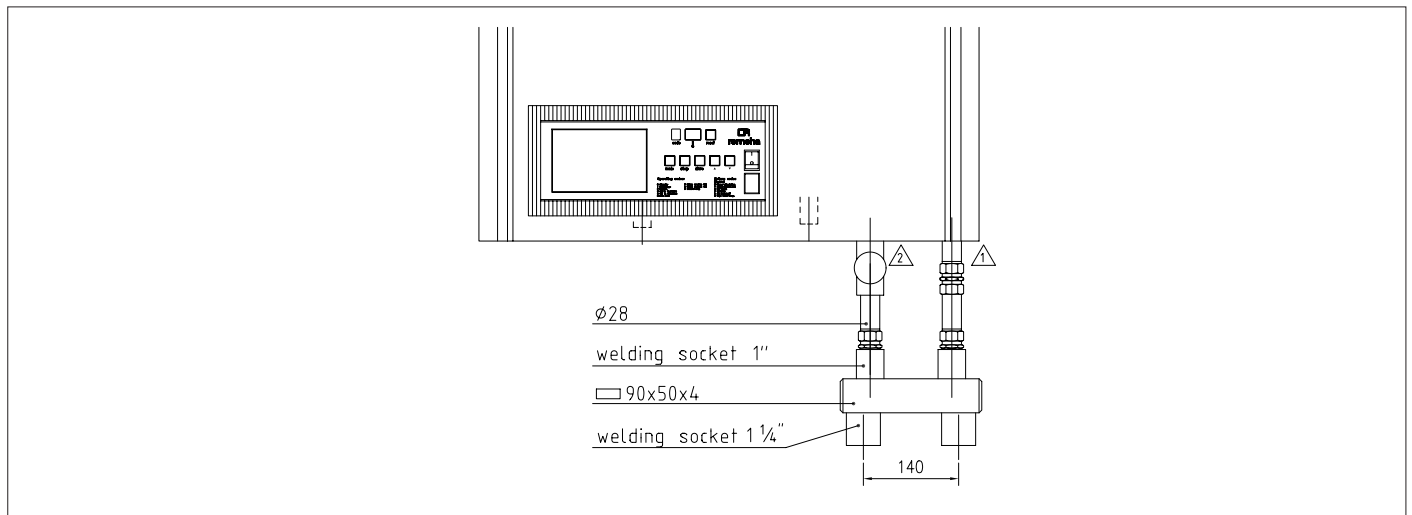


Fig. 03 Header dimensions remeha W40-m ECO

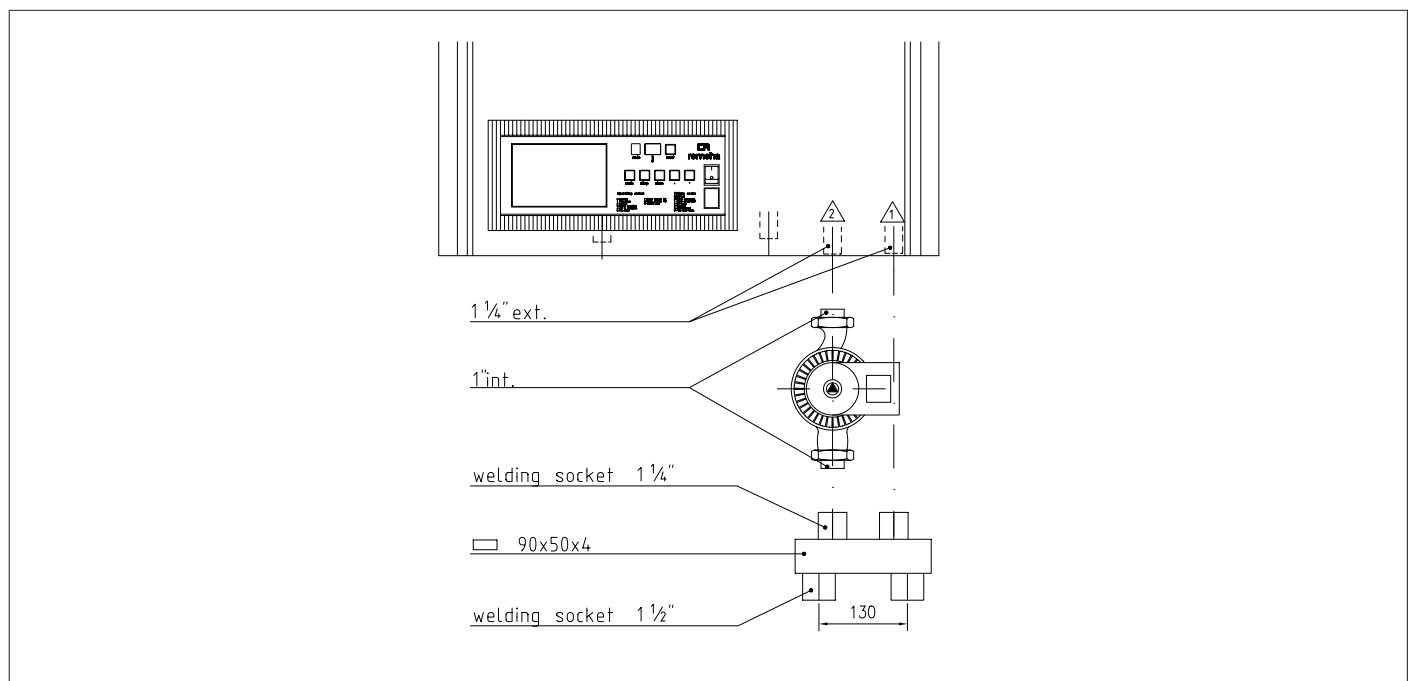


Fig. 04 Header dimensions remeha W60-m ECO

5.1.2 Installation of multiple boilers

Multiple boilers are ideally suited for use in larger commercial buildings and offer a wide variety of application possibilities (see principle drawing).

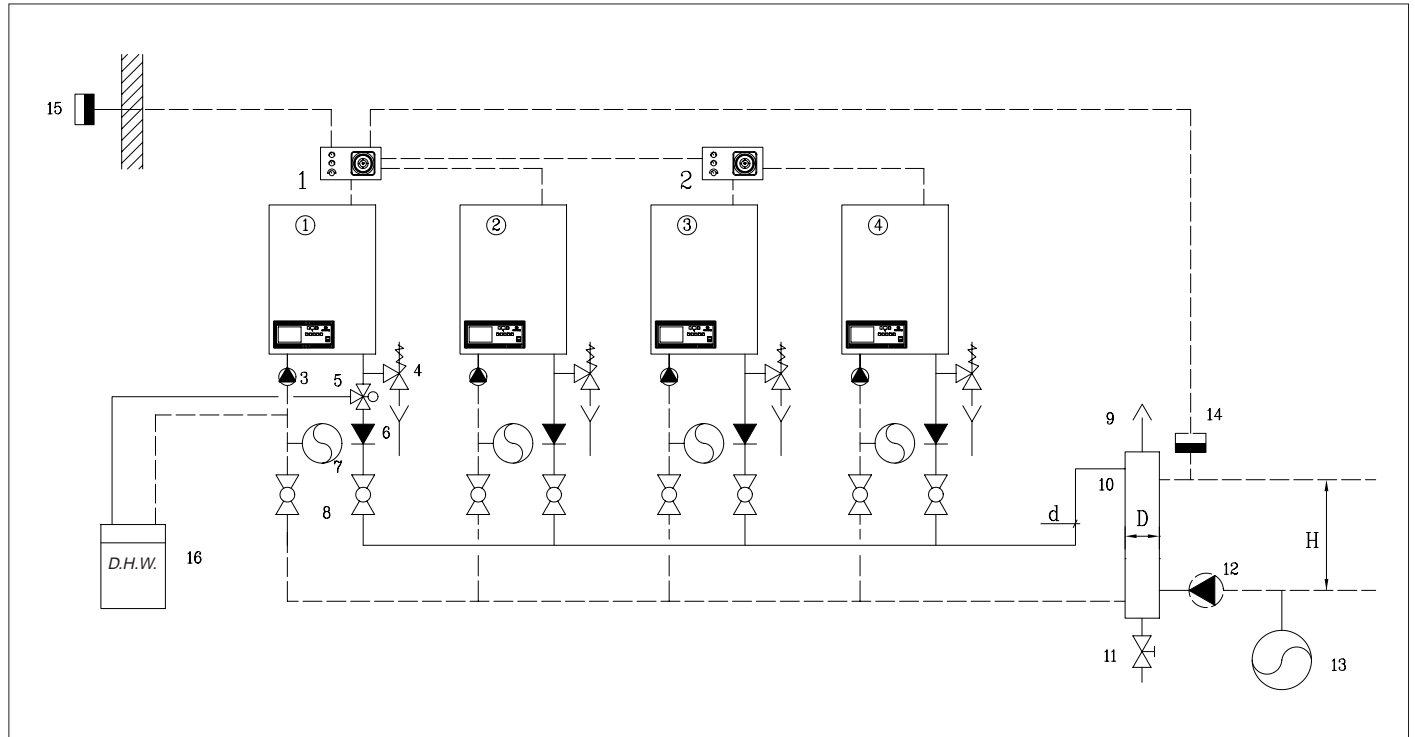


Fig. 05 Principle drawing multiple boilers

Table

1. **rematic®** 4-step weather compensator (Master)
Step 1 till 4
2. **rematic®** 4-step modular controller (Slave)
Step 5 till 8
3. Pump (to be set at position 1)
4. Safety valve
5. Three-way valve, 230 V (D.H.W.)
6. Non-return valve
7. Expansion vessel (if required)
8. Manual isolating valve
9. Automatic vent
10. Open header (neutral header)
11. Drain cock
12. Installation pump
13. Installation expansion vessel
14. Flow sensor
15. Outdoor sensor
16. D.H.W. storage

For further advice or information refer to the Technical Information "Multiple Units".
Contact Broag Ltd.

remeha W40-m ECO

No. of units	'd'	'D'	H
2	32	80	250
3	38	100	250
4	50	125	300

remeha W60-m ECO

No. of units	'd'	'D'	H
2	50	100	300
3	63	125	400
4	63	150	500

6. BOILER LAYOUT

6.1 Equipment diagram

1. Air supply
2. Flue gas discharge
3. Measure point O_2/CO_2
4. Air box
5. Slide connector
6. Differential air pressure switch
7. Spring loaded damper
8. Gas injector (behind fan)
9. Fan
10. Automatic vent
11. Burner
12. Ignition/ionisation probe
13. Sight glass
14. Manual air vent
15. Gas combi-block
16. Heat exchanger
17. Flow temperature sensor
18. Inspection cover
19. Return temperature sensor
20. Condense collector
21. Instrument panel
22. Electrical connection strip (X15)
23. Facility for incorporating a **rematic**® weather compensated boiler control
24. Condensate discharge
25. Setting keys
26. Read-out display and reset key
27. Burner switch
28. Interface for **rematic**® weather compensated boiler control
29. Gas connection
30. Pump (only W40-m ECO)
31. Pressure gauge
32. Filling and drain cock
33. Return connection
34. Electrical connection pump and three-way valve
35. Flow connection

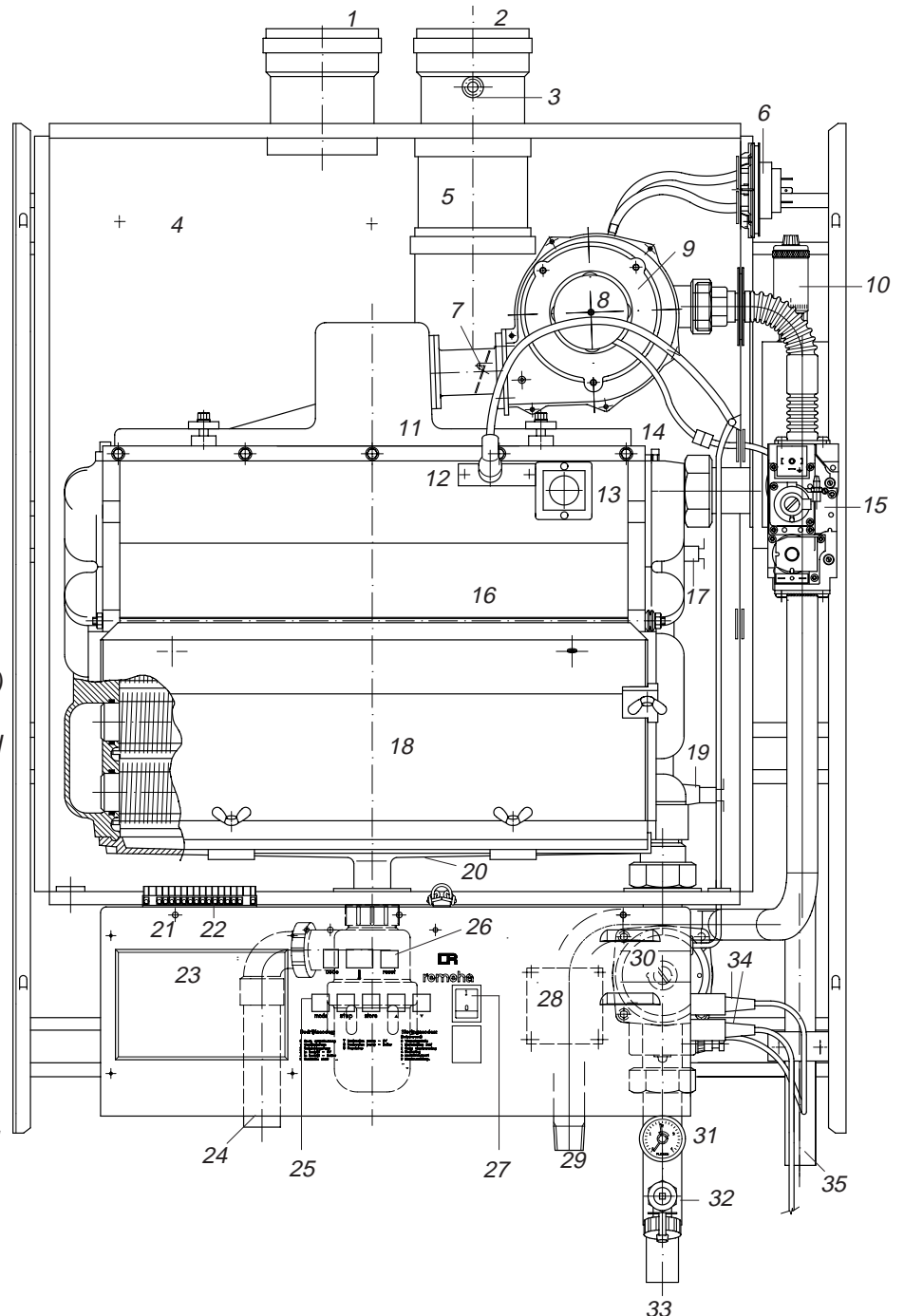


Fig. 06 Boiler layout remeha W40-m ECO

6.2 Operating principle

The appliance is equipped with a closed air box. Via a fan, air is drawn in. On the intake side of the fan, an intake unit has been mounted where the gas is injected. Depending on the settings and the ambient temperatures measured by the temperature sensors, the fan speed is regulated. The gas/air ratio control adjusts the quantity of gas to the quantity of air. The gas/air mixture is achieved in the fan, and then transported to the burner.

Following combustion, the hot flue gases are conducted via the aluminium heat exchanger. At the heat exchanger, the flue gases give off heat to the central heating water in the heat exchanger. The water vapour in the flue gases condenses against the finned pipes at the base. The heat released during this condensation process (the so-called latent or condensation heat) is also transferred to the central heating water. The condensed water thus formed is discharged via a siphon at the base of the heat exchanger.

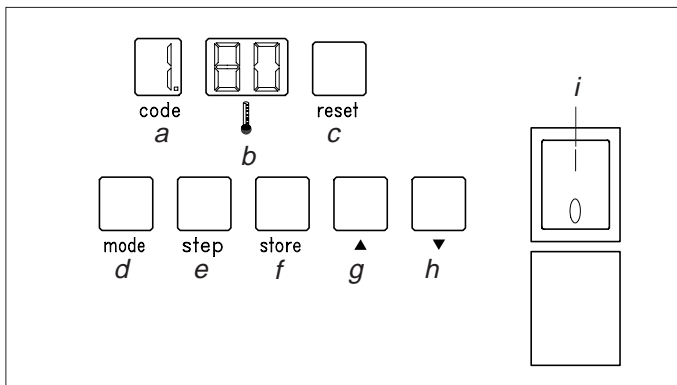


Fig. 07 Control panel

6.3 Control panel

The remeha W40/60-m ECO is equipped with an advanced control system comprising:

- a. an automatic microprocessor control system
- b. a control panel with setting keys and read-out display.

Various values can be set and read, using the setting keyboard and read-out displays.

The two levels for setting and read-out are:

- user level - free access
- service level - access by service code.

The control panel accommodates the following components (fig. 07):

a. 'code'-display

- display of: - operating mode 1 digit
- setting mode 1 digit and dot
- read-out mode 1 digit and blinking dot

in service level:

- speed mode 1 half digits
- failure mode 1 blinking digit

b. temperature display (°C)

- display of: - temperatures
- settings
- malfunctions

c. 'reset'-key:

- to reset after a malfunction

d. 'mode'-key:

- key to select the required mode

e. 'step'-key:

- key to select the required program within the selected mode

f. 'store'-key:

- key to save the settings

g. '▲'-key

- to select a higher setting

h. '▼'-key:

- to select a lower setting

i. burner switch:

- to switch the boiler on/off.

6.4 Control system

6.4.1 General

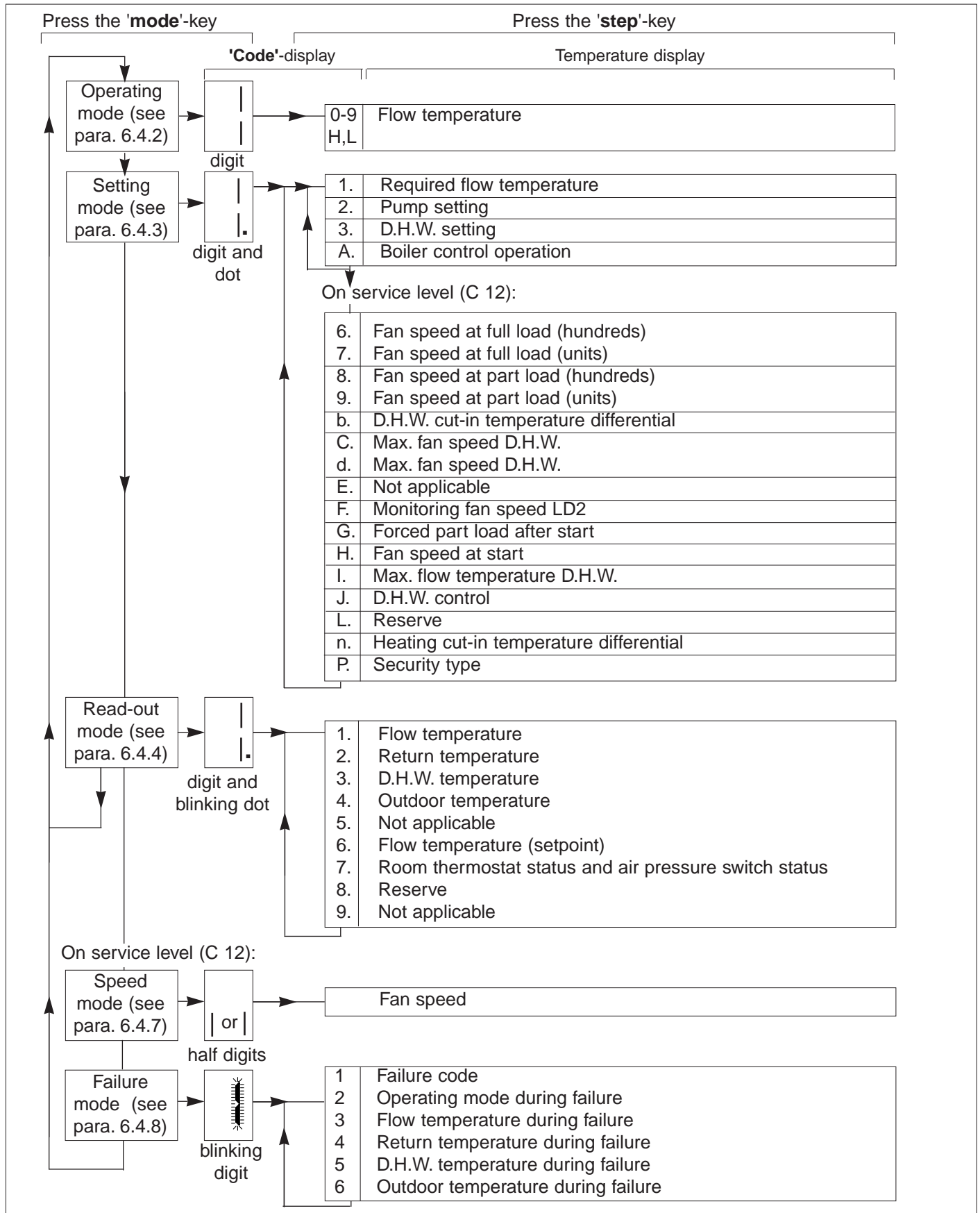


Fig. 08 Flow diagram microprocessor

6.4.2 Operating mode

During operation the '**code**'-display shows the status (position in cycle) of the boiler, while the temperature displays indicates the measured water temperature.

The digits in the '**code**'-display have the following meaning:

- [0] Standby; there is no heat demand from the heating or hot water controls.
- [1] Pre-purging; before start-up, the boiler is purged for 0,3 seconds. When the heat demand has been met, the fan continues to operate for another 10 seconds.
- [2] Ignition: ignition is activated for 2.4 seconds while the gas valve is opened.
- [3] Central heating mode; the boiler operates in the central heating mode.
- [4] D.H.W. operation: the boiler operates when the three-way valve serving the calorifier is actuated by a demand from the D.H.W. temperature sensor.
- [5] Waiting mode; the fan runs and the boiler waits until this has been proved or waits until the three-way valve has returned to the central heating position.
- [7] Continued pump operation in the central heating mode: after heat demand is met, the pump continues to operate for the time selected (if continuous pump operation has not been selected).
- [8] Continued pump operation in the D.H.W. mode; after D.H.W. demand is met, the three-way valve will be energized for another 5 minutes and the pump keeps running.
- [9] Control stop
 - flow temperature > 95°C
 - flow temperature > setpoint +5°C
 - return temperature > max. flow temp. -10°C
 - rise in flow temperature exceeded.
- [H] Forced full load.
- [L] Forced part load.

6.4.3 Setting mode (with dot)

Various settings can be changed as required in the setting mode.

a. on user level

- Select the setting mode by pressing the 'mode'-key until **1.** appears in the 'code' read-out display.
- Now select the required code, using the 'step'-key.

Code	Description	Setting	Preset
1.	Required flow temperature	- 20 - 90 °C	80
2.	Pump setting	- 00 pump operation 10 sec. 01 - 15 pump operation in minutes 99 continuous pump operation	05
3.	D.H.W. setting	- 20 - 65 °C (with sensor)	65
A.	Boiler control operation (X = don't care)	- 1X central heating modulating (or on/off) - 2X central heating high/low - X0 central heating off, D.H.W. off - X1 central heating on, D.H.W. on - X2 central heating on, D.H.W. off - X3 central heating off, D.H.W. on	11

b. on service level for the heating contractor

- Select the service code **C 12** (see para. 6.4.9)
- Select the setting mode by pressing the 'mode'-key until **1.** appears in the 'code'-read-out display.
- Now select the required code, using the 'step'-key.

Code	Description	Setting	Preset
6.	Fan speed at full load	- 10 - 60 hundreds	49
7.	Fan speed at full load	- 00 - 99 units	00
8.	Fan speed at part load	- 10 - 60 hundreds	30
9.	Fan speed at part load	- 00 - 99 units	00
b.	D.H.W. cut-in temp. differential	- 01 - 05 °C 06 = 10 °C 07 = 15 °C 08 = 20 °C	05
C.	Max. fan speed D.H.W.	- 10 - 60 hundreds	49
d.	Max. fan speed D.H.W.	- 00 - 99 units	00
E.	Reserve		
F.	Monitoring fan speed LD2	- May not be changed !!!	45
G.	Forced part load after start	- 00 - 15 minuten	00
H.	Fan speed at start	- May not be changed !!!	35
I.	Max. flow temperature at D.H.W.	- 70 - 90 °C	80
J.	D.H.W. control	- 00 three-way valve - 01 D.H.W. pump - 02 inverted three-way valve	00
n.	Heating cut-in temp differential	- 05 - 20 °C	10
P.	Security type	- May not be changed !!!	14

6.4.4 Read-out mode (with blinking dot)

Various values can be read in the read-out mode.

On user level.

- Select the read-out mode by pressing the '**mode**'-key until **1.** (blinking dot) appears in the '**code**'-display.
- Now select the required code, using the '**step**'-key.

Code	Description	Read-out (example)
1.	Flow temperature	- 80
2.	Return temperature	- 70
3.	D.H.W. temperature	- 65 (with sensor)
4.	Outdoor temperature	- 05 (with sensor)
5.	Not applicable	- 40
6.	Flow temperature set point	
7.	Room thermostat status and air pressure switch status	- 0 open 1 closed
		- 0 open 1 closed
8.	Flow sensor temperature	- 80

6.4.5 Forced 'HIGH' mode

By pressing the '**mode**' and '**▲**' key simultaneously in operating mode, the appliance will burn at maximum power.

The flow temperature, however, cannot exceed the pre-set maximum, in order to protect the appliance and the installation.

By pressing the '**▲**' and '**▼**' keys simultaneously, the appliance will return to operating mode, or will switch to that mode automatically after 15 minutes.

6.4.6 Forced 'LOW' mode

By pressing the '**mode**' and '**▼**' key simultaneously in operating mode, the appliance will burn at minimum power.

The flow temperature, however, cannot exceed the pre-set maximum, in order to protect the appliance and the installation.

By pressing the '**▲**' and '**▼**' keys simultaneously, the appliance will return to operating mode, or will switch to that mode automatically after 15 minutes.

6.4.7 Speed mode (half digits)

(On service level for the heating contractor.)

The fan speed can be read in parts in the speed mode.


- Select the service code **C 12** (see para. 6.4.9).
- Now select the fan speed code, using the '**mode**'-key (half digits).

Code	Description	Example 4900 r/m
I	Fan speed	- 49 hundreds
I	Fan speed	- 00 units

6.4.8 Failure mode (blinking 'code' display) Only for the heating contractor.

Malfunctions of the boiler control occurring during operation are shown on the read-out displays (see failure table in chapter 11). The latest failure is stored in the microprocessor memory and can be read at service level, code **C 12** (see para. 6.4.9).

- Press the '**mode**'-key until the digit **1** (blinking) appears in the '**code**'-display.
- Press the '**step**'-key for the required code.

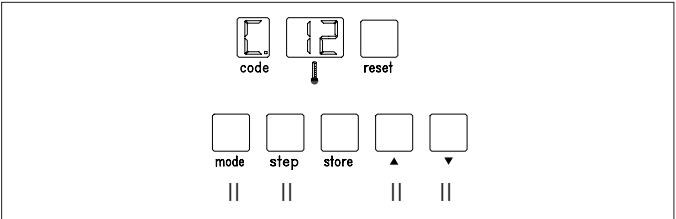
Code		Description
1	37	Display of failure code (chapter 11)
2	03	Operating mode during failure (para. 6.4.2)
3	53	Flow temperature during failure
4	40	Return temperature during failure
5	60	D.H.W. temperature during failure
6	10	Outdoor temperature during failure

Example:
The return temperature sensor has failed during central heating operation at a flow temperature of 53°C, a return temperature of 40°C, a D.H.W. temperature of 60°C and an outdoor temperature of 10°C.

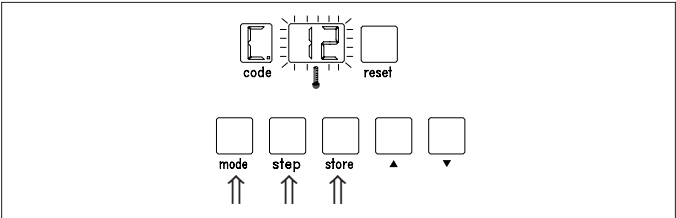
6.4.9 Service code Only for the heating contractor.

To avoid incorrect settings several operation levels have protection codes. For service purposes you can program code **C 12**.

- Press the '**mode**'- and '**step**'-keys simultaneously and the '**code**'-display now shows **C**.
- Holding both keys pressed, set the temperature display to **12**, using the '**▲**'- and '**▼**'-keys.



- Keep both keys pressed and press the '**store**'-key. The temperature display is blinking to acknowledge your access to the service setting.



- Press the '**store**'-key to store the service code (the temperature display will blink twice for acknowledgment).
- Release the '**mode**' and '**step**' keys.

You are in the service mode and are able to change settings and to read out values.


After using the service code you have to delete the service code by pressing the '**reset**'-key once or after 10 minutes when no further alterations have been made the service code will delete automatically.

6.4.10 User settings

The user can set the following parameters to the required values.

1. Flow temperature (basic setting 80°C).


- Press the '**mode**'-key until the digit **1.** (with dot) appears in the '**code**'-display.
- The set value **80** is shown in the temperature display.
- Now set the required flow temperature, using the '**▲**'- and '**▼**'-keys.

Code		Description
1.	70	Required flow temperature

- Press the '**store**'-key to store the new value (value will blink twice).
- Press the '**mode**'-key until the digit without dot appears in the '**code**'-display.

2. Pump switching (basic setting: pump continues to operate for 5 minutes)


- Press the '**mode**'-key until the digit **1.** (with dot) appears in the '**code**'-display.
- Press the '**step**'-key until the digit **2.** appears in the '**code**'-display.
- Set the required value, using the '**▲**'- and '**▼**'-keys.

Code		Description
2.	00	Pump continues to operate for 10 sec.
2.	XX	Pump continues to operate for 1 - 15 min. (example: XX = 05)
2.	99	Continuous pump operation

- Press the '**store**'-key to store the new value (value will blink twice).
- Press the '**mode**'-key until the digit without dot appears in the '**code**'-display.

3. D.H.W. setting (basic setting 65°C). Only with sensor.

- Press the '**mode**'-key until the digit **1.** (with dot) appears in the '**code**'-display.
- Press the '**step**'-key until the digit **3.** appears in the '**code**'-display.
- Set the required value, using the '**▲**'- and '**▼**'-keys.

Code		Description
3.	65	required temperature

- Press the '**store**'-key to store the new value (value will blink twice).
- Press the '**reset**'-key to return into the operating mode.

Operation is as follows:

Imagine: the setpoint for D.H.W. temperature has been preset at 65°C, the D.H.W. cut-in temperature differential at 5°C, and the maximum flow temperature during D.H.W. operation at 80°C (factory settings).

The appliance will modulate at the preset maximum flow temperature during D.H.W. operation, and will shut down at a D.H.W. temperature of 70°C (preset value +5°C).

The appliance will cut back in at a D.H.W. temperature of 65°C (preset D.H.W. temperature +5°C - D.H.W. cut-in temperature differential).

Both the D.H.W. cut-in differential and the maximum flow temperature during D.H.W. operation can only be set via the service menu (para. 10.3.9 and 10.3.10).

7. INSTALLATION INSTRUCTIONS

7.1 General

All gas appliances must, by law, be installed by competent persons (e.g. Corgi). Failure to install appliances correctly could lead to prosecution. It is in your own interest and that of safety to ensure that the law is complied with.

The following instructions must be adhered to when the remeha W40/60-m ECO is installed:

Gas Safety (Installation and Use) Regulations 1984 (as amended).

Current I.E.E. Regulations for electrical installations

Local building regulations.

The Building Standards (Scotland) (Consolidation) Regulations, by-laws of the local water undertaking.

Health and Safety Document No 635 'The Electricity at Work Regulations 1989'.

The requirements of Guidance Note PM 5 issued by the Health & Safety Executive 'Automatically controlled steam and hot water boilers'.

Depending on the type and size of installation i.e. large domestic or commercial the requirements of the following publications should be complied with:

Domestic: BS 5449, BS 5546, BS 6644, BS 6891, CP 3006 and BG DM2.

Commercial: BS 6644, BS 6700, BS 6880 Pts 1, 2 and 3, CP 342.2 IM2, IM5, IM11, IM16 and IM22.

Manufacturers Instructions must NOT be taken as overriding statutory obligations.

Important:

The remeha W40/60-m ECO is a certified appliance and must not be modified or installed in any way contrary to these "Installation and Maintenance Instructions".

7.2 Location

The remeha W40/60-m ECO may be mounted free standing (on a frame supplied) or wall mounted (on a bracket supplied). The floor should be level and strong enough to support the weight of the boilers full of water. The wall should be sound and flat and capable of supporting the weight of the boiler full of water.

The following minimum clearances are required:

Front: 450 mm

Sides: 50 mm

Bottom: 250 mm

Top: 400 mm.

7.3 Dimensions of wall mounting bracket

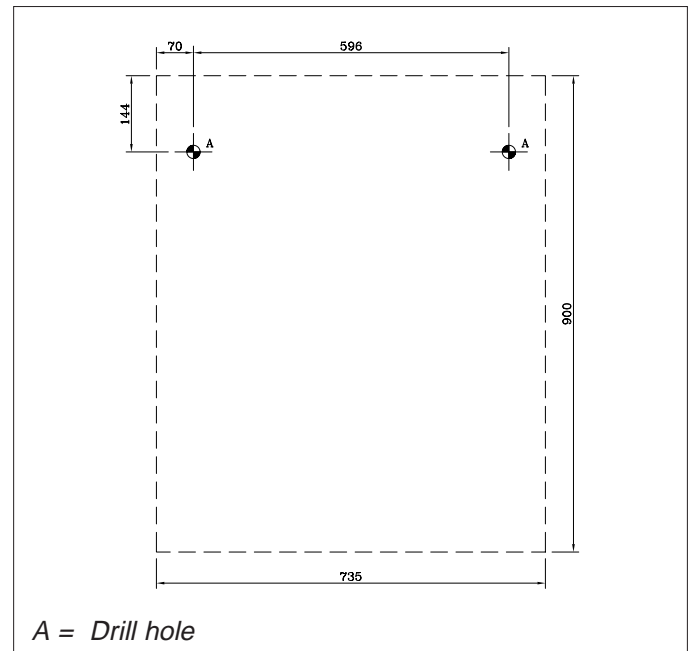


Fig. 09 Template for wall bracket remeha W40-m ECO

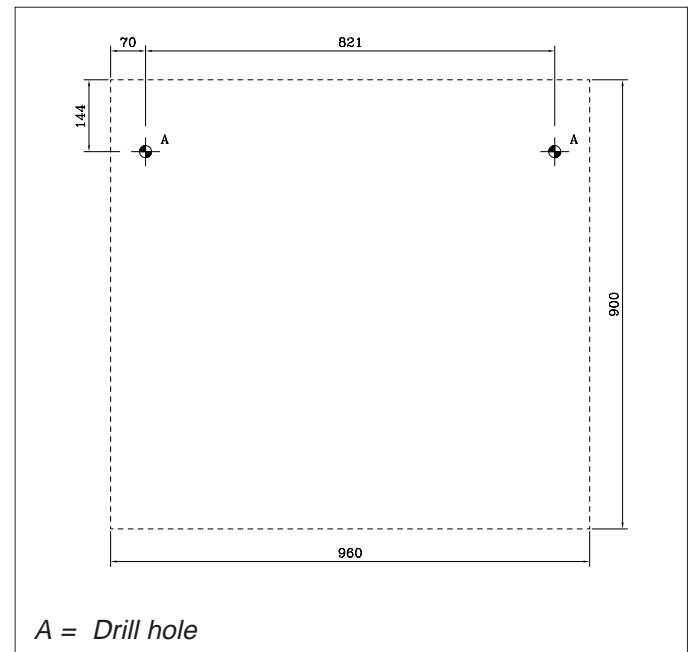


Fig. 10 Template for wall bracket remeha W60-m ECO

7.4 Ventilation requirements

a. Open flue installations

The requirements for high and low level ventilation openings which **MUST** be provided are contained in detail within BS 6644.

Openings must be permanent, communicate direct to outside and be positioned so as to avoid blockage, flooding or high velocity draughts within the boilerhouse. The minimum free area of openings are shown in the table:

Total input rating of boilers	Position of air vents	Minimum air vent area (direct from outside)
up to 2 MW	High level	270 cm ² plus 25 cm ² per kW in excess of 60 kW total input
up to 2 MW	Low level	540 cm ² plus 4.5 cm ² per kW in excess of 60 kW total input

These recommendations are considered to be adequate unless plant is to be operated at, or near, maximum output during summer months when additional ventilation may be required.

b. Room sealed installations

Boilers require no air for combustion but air may be required to ventilate the boiler house and remove any excess heat generated by auxiliary equipment. BS 6644 requires that boiler house temperatures shall not exceed:

- at floor level (or 100 mm above floor level) 25°C
- at mid level (1.5 m above floor level) 30°C
- at ceiling level (or 100 mm below ceiling level) 40°C.

7.5 Flue gas discharge and air supply

7.5.1 General

The remeha W40/60-m ECO is suitable for room sealed fanned flue or open flue fan assisted operation.

Separate flue discharge and combustion air inlet connections are located on top of the appliance.

These are sealed with dust caps which **MUST** be removed just before the flue discharge and any air supply ducts are fitted.

The boiler, in either single or multiple configurations is suitable for operation with a wide variety of flue systems (see section 7.5.2). Any horizontal runs of flue ducting **MUST** slope back towards the boiler. Horizontal runs of air ducting **MUST** slope towards the outside supply opening. The flue duct termination must be located such that when exposed to wind it will remain under suction when the appliance is out of operation.

The flue should be constructed from single walled aluminium or stainless steel (316) and any air supply ducts from either single walled aluminium, stainless steel or plastic. All seams and joints in the flue shall be air and watertight. When room sealed applications are adopted all seams and joints in the air supply ductwork must be airtight.

Purpose designed flue and air systems for all applications are available from: - Rite-Vent Ltd

Crowther Industrial Estate
Washington NE 38 OAB

Tel.no.: 0191 - 4161150

Fax.no.: 0191 - 4151263

or

- Selkirk Manufacturing Ltd

Bassett House

High Street

Banstead SM7 2LZ

Tel.no.: 01737 - 353388

Fax.no.: 01737 - 362501.

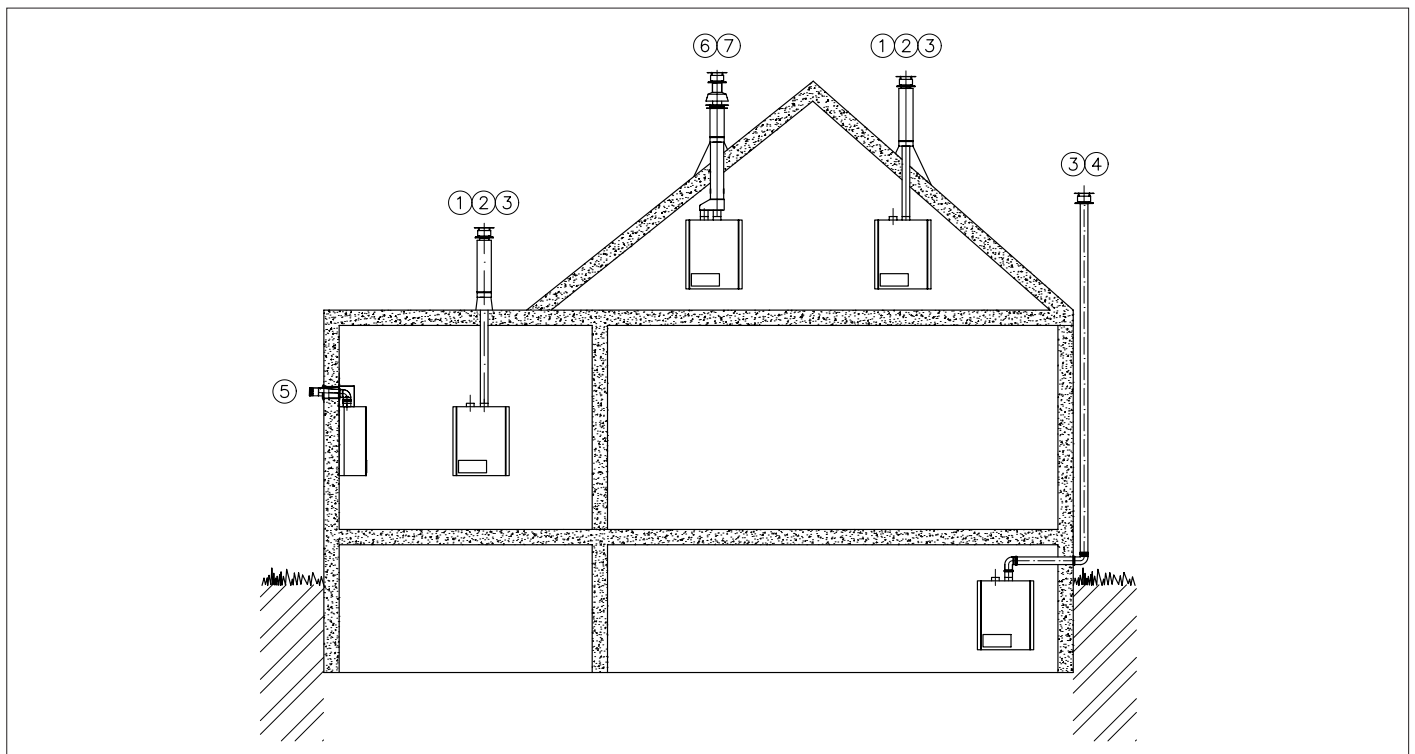


Fig. 11 Flue gas discharge and air supply

7.5.2 Single boiler, non room sealed applications

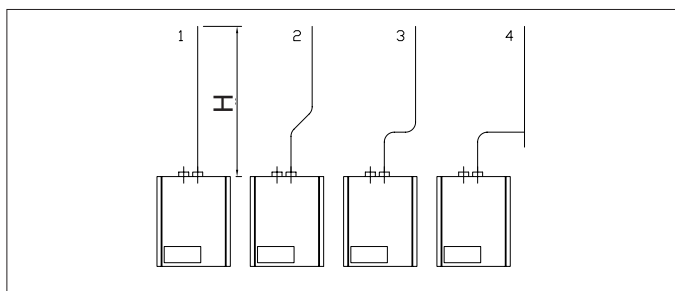


Fig. 12 Examples of flue gas discharge duct, single boiler, non room sealed applications.

Construction of flue gas discharge duct

- 1 = flue gas discharge duct without bends
- 2 = flue gas discharge duct with two 45° bends
- 3 = flue gas discharge duct with two 90° bends
- 4 = flue gas discharge duct with T inlet and 90° bend, or flue gas discharge duct with two 45° bends

remeha W40-m ECO

D (in mm) Ø	Min. and max. allowable lengths of the flue gas discharge piping 'H' in m							
	Outlet without Terminal 'free outlet'				Outlet with Terminal			
	1	2	3	4	1	2	3	4
80	26	23	13	10	24	21	11	8
100	40	40	40	40	40	40	40	40

Lengths over 40 metres: consult Broag Ltd.

NB: deduct 2 metres of piping length for each 90° bend.

remeha W60-m ECO

D (in mm) Ø	Min. and max. allowable lengths of the flue gas discharge piping 'H' in m							
	Outlet without Terminal 'free outlet'				Outlet with Terminal			
	1	2	3	4	1	2	3	4
80	9	7	-	-	7	5	-	-
100	36	34	22	18	34	32	20	16

Lengths over 40 metres: consult Broag Ltd.

NB: deduct 2 metres of piping length for each 90° bend.

7.5.3 Single boiler, room sealed applications

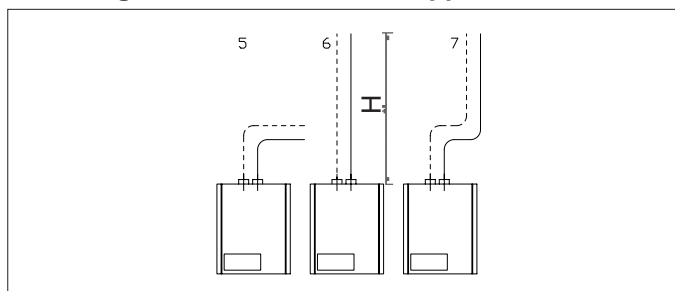


Fig. 13 Examples of flue gas discharge duct, single boiler, room sealed applications.

Construction of flue gas discharge duct

5 = air supply and flue gas discharge piping horizontally

6 = air supply and flue gas discharge piping without bends

7 = air supply and flue gas discharge piping with two 90° bends

remeha W40-m ECO

D (in mm)	Min. and max. allowable total lengths of the flue gas discharge and air supply piping 'H' in m together		
Ø	5 ^{*)}	6 ^{*)}	7 ^{*)}
80	2	7	-
100	30	20	20

^{*)} Lengths over 20 metres: consult Broag Ltd.

NB: deduct 2 metres of piping length for each 90° bend.

remeha W60-m ECO

D (in mm)	Min. and max. allowable total lengths of the flue gas discharge and air supply piping 'H' in m		
Ø	5 ^{*)}	6 ^{*)}	7 ^{*)}
100	6	16	-
110 *	20	20	18

^{*)} Lengths over 20 metres: consult Broag Ltd.

NB: deduct 2 metres of piping length for each 90° bend.

* = Concentric outlet Ø 100 mm.

7.5.4 Cascade configurations

For flue gas-side and air-side connections for multiple boilers in cascade configuration, refer to our specific documentation on that subject.

7.6 Installation details

7.6.1 Condensate discharge

Discharge the condensate directly into a drain. Only use synthetic material for the connecting piping, because of the acidity (pH 3 - 5). Fill the siphon with water after fitting. With an open connection to the drain (*see fig. 14*). The discharge piping shall slope at least 30 mm/m. It is not permitted to discharge condensate into a gutter, because of the risk of freezing.

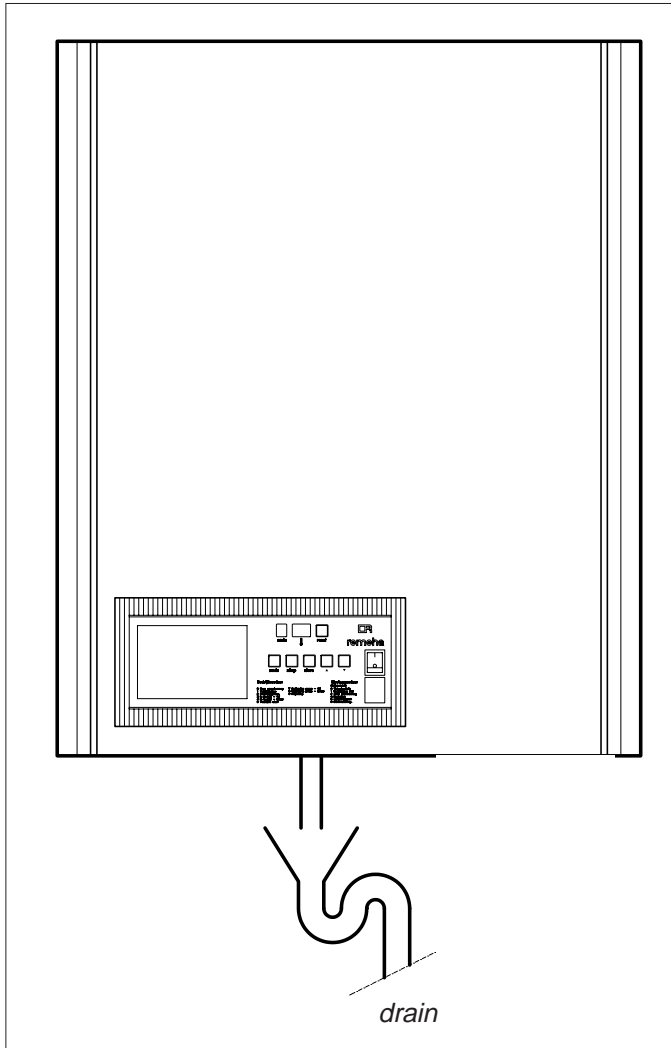


Fig. 14 Condensate discharge drain

7.6.2 Cold feed and expansion tank height for open vented systems

The cold feed and expansion tank heights for all open vented systems must comply with the requirements laid down in the Health and Safety Executive publication PM5. For the remeha W40/60-m ECO installations this requirement is met providing the tank height is at least 3 meters above the highest circulating point of the system (*see para. 7.7.2, fig. 15*).

7.6.3 Water treatment

Water treatment of all systems, but in particular open vented systems used with the remeha W40/60-m ECO, is considered necessary good practice in order to:

- avoid metallic corrosion within the system
- avoid sludge and scale information
- reduce to a minimum the risk of microbiological contamination of the system
- minimise chemical action and changes which take place over a period of time when system water is untreated.

The boiler contains an aluminium heat exchanger and the system will also contain a variety of metals. Ferrous metals - cast iron and steel, and non-ferrous metals - copper, brass and gunmetal, may be present, so it is essential that treatment is suitable for all of them. Suitable chemicals and the extent of treatment should be discussed with specialist manufacturers prior to any work commencing. The specification of new systems and general condition of older existing systems must be carefully considered. The removal of debris, flux residue, grease, metal, swarf etc. from new systems, and any black magnetic iron oxide sludge and other corrosive residue from old systems is essential.

Most important

Water treatment must not allow the system water to exceed a pH of 9.

The boiler must be isolated from the system when using chemicals to clean the system prior to use.

For information on water treatment we advise direct contact with either:

Fernox Manufacturing Company Ltd.
 Britannia Works
 Clavering
 Essex, CB1L 4QZ
 Tel No: 0799 550811

or:
 Sentinel
 Grace Dearborn Ltd
 Widnes
 Cheshire WA8 8UD
 Tel No: 051 495 1861.

7.6.4 Safety valve

A safety valve should be fitted in the flow pipe between the boiler and any isolating valves but in any case within 0.5 m of the appliance. The safety valve should be sized according to the requirements given in the current edition of BS 6644.

7.6.5 Circulation pump

The remeha W40-m ECO is equipped with a circulation pump, manufactured by Wilo, model RS 25/70 r.

The running power of this circulation pump is:

95 W (position 1) at 2400 rpm.

The pump is adjusted at position 1.

Note:

Pump positions 2, 3 and 4 cannot be used because the pressure head is too low. This may lead to temperature faults.

The remeha W60-m ECO is supplied with a circulation pump, manufactured by Wilo, model RS 30/80 and a L.L.H. header (see fig. 04).

The microprocessor programme allows a choice as to whether the pump operates continuously or whether there is a pump over-run of 1 - 15 minutes after the boiler ceases firing.

Both pumps have been selected based on a primary circulation of $15^{\circ}\text{C } \Delta t$.

7.7 D.H.W. application

An indirect calorifier can be connected to the remeha W40/60-m ECO in accordance with the schematic sketch shown (fig. 15 and 16) and the wiring diagram in para. 8.10.

7.7.1 D.H.W. control

The remeha W40/60-m ECO is supplied as standard with a D.H.W. control suitable for activating a 230 V spring loaded three-way valve. The three-way valve is de-energized in the central heating position.

The control features priority D.H.W., which means that when heat demand comes simultaneously from both the D.H.W. and the central heating, the D.H.W. takes precedence and is available 24 hours a day completely independent of the heating control.

When the D.H.W. demand has been met, the circulation pump will continue to operate in the D.H.W. position for approximately 5 minutes, if no heat demand.

The D.H.W. temperature can be controlled by:

- a. thermostat (24 V)
- b. temperature sensor

For starting up the D.H.W. see para. 10.3.7 - 10.3.11.

Notes:

- To avoid uncontrolled flow in the central heating circuit, the D.H.W. return piping must never be connected to the central heating circuit, but should always be connected directly to the return piping on the remeha W40/60-m ECO.
- Fit the calorifier in accordance to the local authority requirements.

7.7.2 Schematic sketch of connections

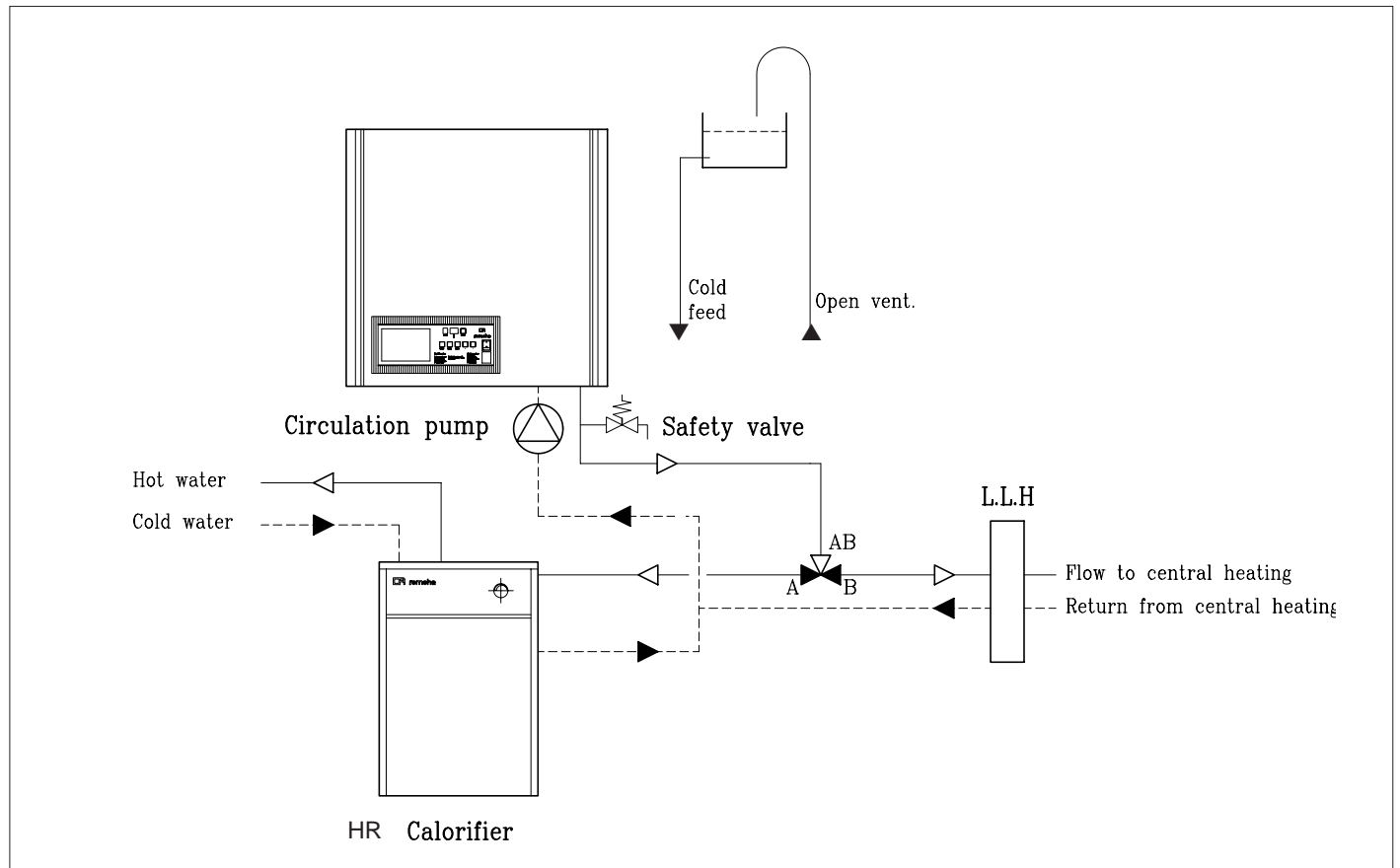


Fig. 15 Schematic sketch of an open system

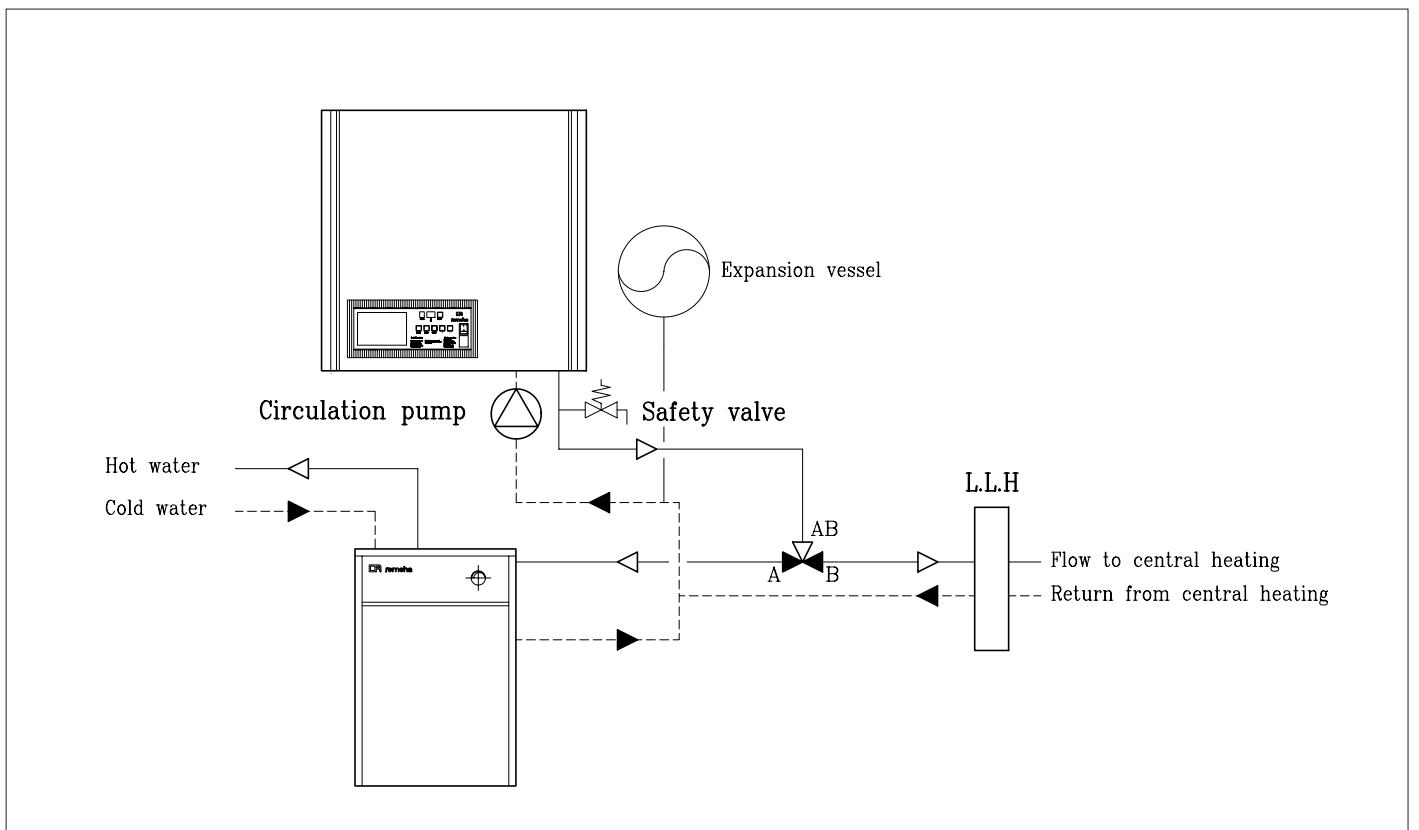


Fig. 16 Schematic sketch of a sealed system

8. ELECTRICAL INSTALLATION

8.1 General

The remeha W40/60-m ECO is equipped with electronic control and safety equipment, and flame ionisation control. A microprocessor is at the heart of the remeha W40/60-m ECO.

The boiler is pre-wired as shown in the wiring diagram in para. 8.10. All controls on the boiler are 24V.

8.2 Electrical supply

The remeha W40/60-m ECO must have a permanent 240V-50Hz single phase supply.

8.3 Connection to the control system

8.3.1 Modulating control

Using a modulating control, the modulating character of the boiler is used to the optimum level. The control continuously demands a flow temperature from the boiler, on the basis of the room and/or outdoor temperature, and the boiler then modulates at this temperature.

As a result, the number of operating hours increases and the number of start-ups is drastically reduced. In combination with the gas/air ratio control, on balance this means a higher yield and lower maintenance costs.

Two types of modulating controls can be connected:

1. Modulating weather-compensated boiler control.
2. Modulating room control.

The communication between the modulating control and the protection system is always via an interface PCB.

The appliance is equipped as standard with an interface for one of the **rematic**[®] modulating weather-compensated controls: SR 5240 C1, 2945 C1 UMU and 2945 C1 MUMU.

When using a modulating room control (Honeywell Chronotherm Modulation), the interface must be exchanged.

Installation and connection

- 1a. **rematic**[®] SR 5240 C1 (no possibility for post-regulation of central heating groups)

Installation in the boiler or in a reference room. In the latter case, room compensation can be applied. Connection via a two-core cable to plug K2 in the instrument box.

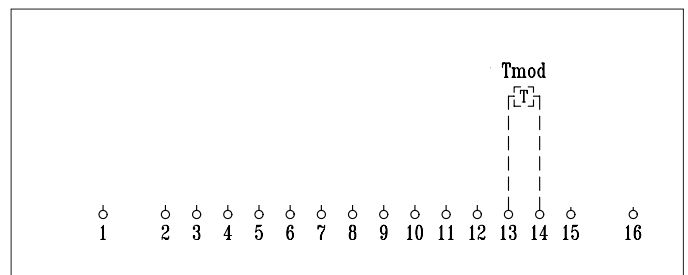
- 1b. **rematic**[®] 2945 C1 UMU (in addition to weather-compensated pre-regulation of the boiler, also control of one mixed and one unmixed central heating group) and **rematic**[®] 2945 C1 MUMU (in addition to weather-compensated pre-regulation of the boiler, control of two mixed central heating groups).

Installation in the boiler. Connection via the **rematic**[®] adapter supplied.

2. Honeywell Chronotherm Modulation.

Installation in the reference room. Connection via a two-core cable on terminals 13 and 14 of the X15 16-pole wire connector.

The standard interface should be exchanged.



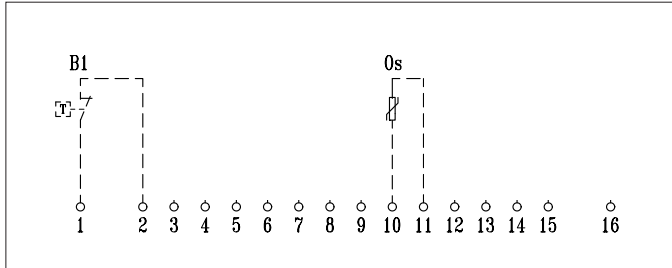
For detailed information: see the documentation relating to the control in question.

8.3.2 Room thermostat 24V

The remeha W40/60-m ECO is suitable for a 2- or 4-wire standard room thermostat.

Proceed as follows:

- a. Connect the room thermostat to terminals 1 and 2 of the 16-pole wire connector.



- b. Set the anticipated current of the room thermostat at 0.11 A.

8.3.3 Room thermostat in combination with an outdoor temperature sensor

In order to use the modulating operation of the appliance throughout the entire heating season using a room thermostat, it is possible to install an outdoor temperature sensor (OS). Connect the wires to terminals 10 and 11 of the 16-pole wire connector. The earth slider should be connected to the earth lip on the instrument panel. The appliance will now modulate at a flow temperature relative to the outdoor temperature (see stoking line graph para. 10.3.3) in the event of heat demand (from the room thermostat).

Installation of the outdoor temperature sensor

Fit the outdoor sensor on a north or northwest facing wall, at a height of at least 2.5 metres from ground level. Do not install close to windows, doors or air vents, kitchen extractor, etc. and make sure the sensor is protected from direct sunlight.

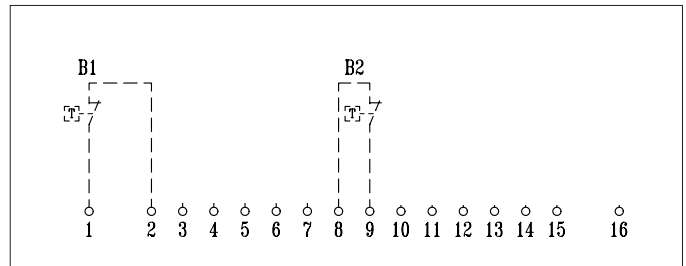
Lay the cable to the boiler. The cable is supplied in a standard 15 metre length, and may not be extended. If the cable is extended, problem-free operation cannot be guaranteed.

8.3.4 Two-stage external weather compensator

The remeha W40/60-m ECO can be connected to a two-stage external weather-compensator. The boiler can run on high/low.

Proceed as follows:

- a. Connect the first stage (low) to terminals 1 and 2 of the 16-pole wire connector and the second stage (low/high) to terminals 8 and 9.



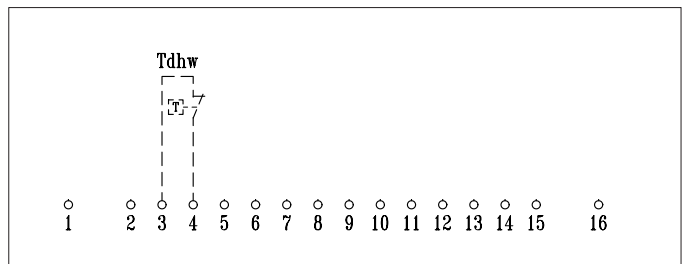
- b. Set the internal control to high/low (see para 10.3.6).

8.3.5 D.H.W. control

The D.H.W. can be connected in two different ways: Either with a standard D.H.W. thermostat (Tdhw) or with a Remeha temperature sensor (Sdhw). The installation procedure is as follows:

A. Installation with a D.H.W. thermostat

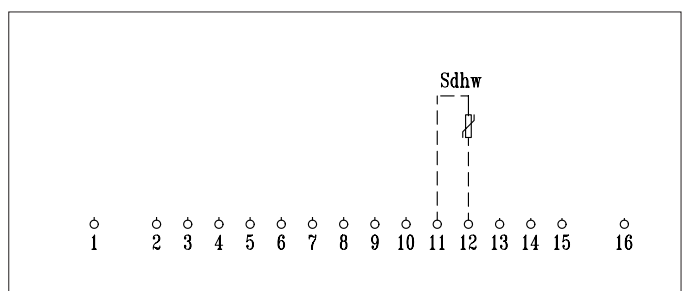
- a. Connect the D.H.W. thermostat to terminals 3 and 4 of the 16-pole wire connector.



- b. Connect the three-way valve (230V) to the Euro-connector at the side of the terminal box.
- c. Set the D.H.W. control (see para. 10.3.7 - 10.3.11).

B. Installation with a D.H.W. sensor

- a. Connect the D.H.W. sensor to 11 and 12 of the 16-pole wire connector. Connections may be interchanged.



- b. Connect the three-way valve (230V) to the Euro-connector at the side of the terminal box.
- c. Set the D.H.W. control (see para. 10.3.7 - 10.3.11).

8.3.6 Frost protection

Install the boiler in a frost-free room. If the temperature of the central heating water drops too low, the built-in frost protection is activated.

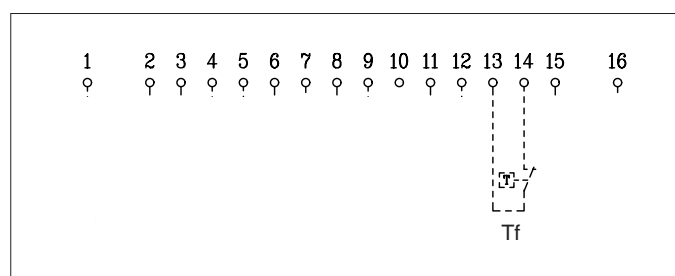
Water temperature:

- below 7°C - circulation pump is switched on;
- below 3°C - boiler is switched on;
- higher than 10°C - boiler and circulation pump are switched off.

Attention:

This is only a protection of the boiler.

It is recommended to install a frost thermostat (Tf) in frost-sensitive rooms and connect it to terminals 13 and 14 of the 16-pole wire connector.

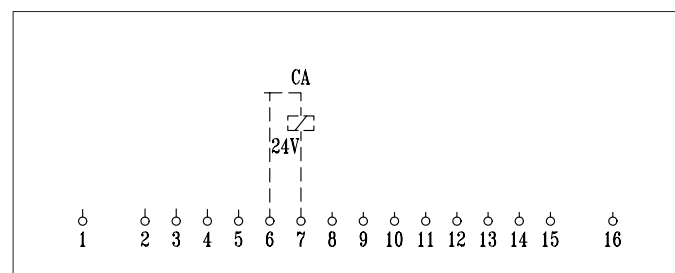


When the frost thermostat cuts in, the circulation pump will also be switched on.

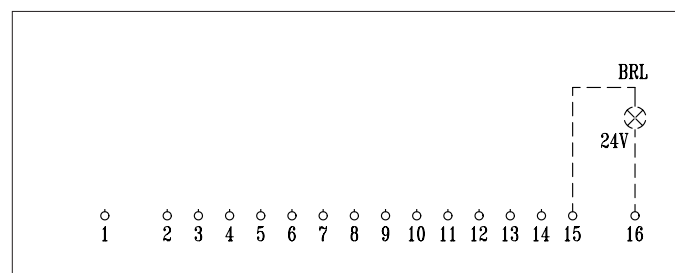
The frost protection can be connected parallel to the modulating room control.

8.3.7 Signals

The boiler is supplied with remote alarm and boiler run signalling facility. The alarm signal operates via terminals 6 and 7 and whilst the boiler is operational a 24V AC signal (power 4 VA) is available to energise a relay. In case of failure of any electrical interlock or mains failure the 24V supply will be switched off. The alarm, which is de-activated whilst there is a power supply from the relay during normal operation, is now activated by the failure of this supply.



The boiler run light is operated via terminals 15 and 16 which can also provide a 24V (4VA power) supply to a relay. The light is illuminated at the start of the pre-purge (code 1) and goes out on closure of the gas valve (code 7 or 8).



8.4 Water temperature control

The remeha W40/60-m ECO is supplied with an electronic temperature control (basic setting 80°C) with flow and return temperature sensors. The flow temperature can be adjusted between 20 and 90°C.

8.5 Low-water protection

The remeha W40/60-m ECO is supplied with a low-water protection device.

Protection is provided in this appliance on the basis of temperature measurement. By modulating back at the moment that the water flow threatens to fall too low, the appliance is kept operating for as long as possible. In the event of low flow, the appliance is switched off.

8.6 High limit temperature protection

The high limit temperature protection device switches off and locks out the boiler when the water temperature is too high (100°C). When the malfunction is corrected, the boiler can be restarted by using the 'reset'-key on the control panel.

8.7 Differential air pressure switch (LD2)

At the start of a heat demand, the appliance first checks whether the LD2 is open. If so, the fan switches to a monitoring speed, and waits until the LD2 is closed. Subsequently, the LD2 function will no longer be active.

8.8 Control box

Manufacture:	Gasmodul
Model:	MCBA 1460 D - V.2.0
Supply voltage:	240 V/50 Hz
Electrical rating:	10 VA
Pre-purge time:	0,3 seconds
Post-purge time:	10 seconds
Safety time:	3 seconds
Anti-hunting time:	150 seconds
Pump operation in central heating mode continued for:	1 - 15 minutes
Pump operation in D.H.W. mode continued for:	5 minutes

8.9 Fuse specification

Fuse: F1	3.15 A T
F2	3.15 A T
F3	2 A F (sand-filled)

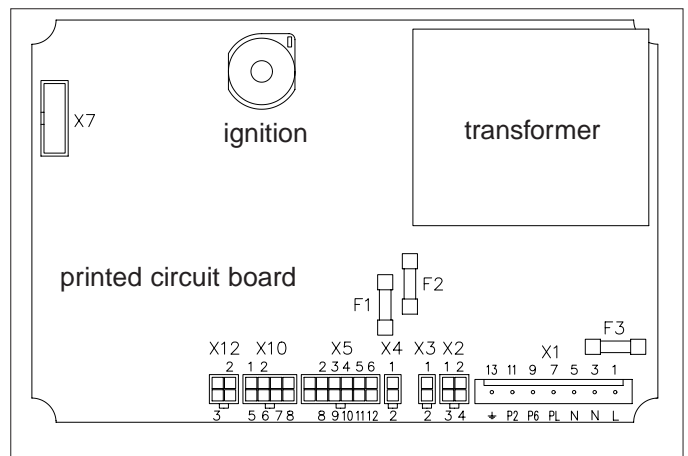


Fig. 17 Gasmodul control box

There is a glass type fuse F4 - 2 A T in the socket.

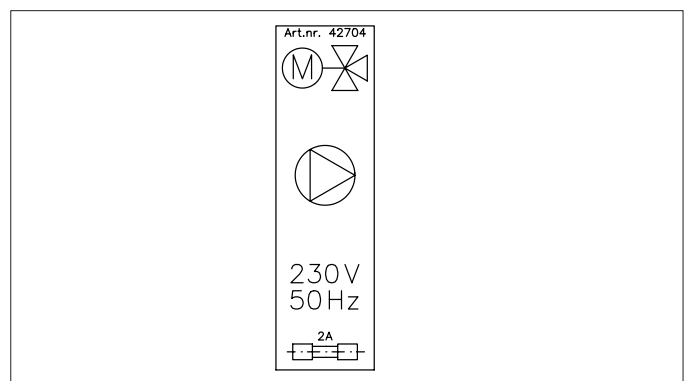


Fig. 18 Sticker on socket

8.10 Electrical wiring diagram

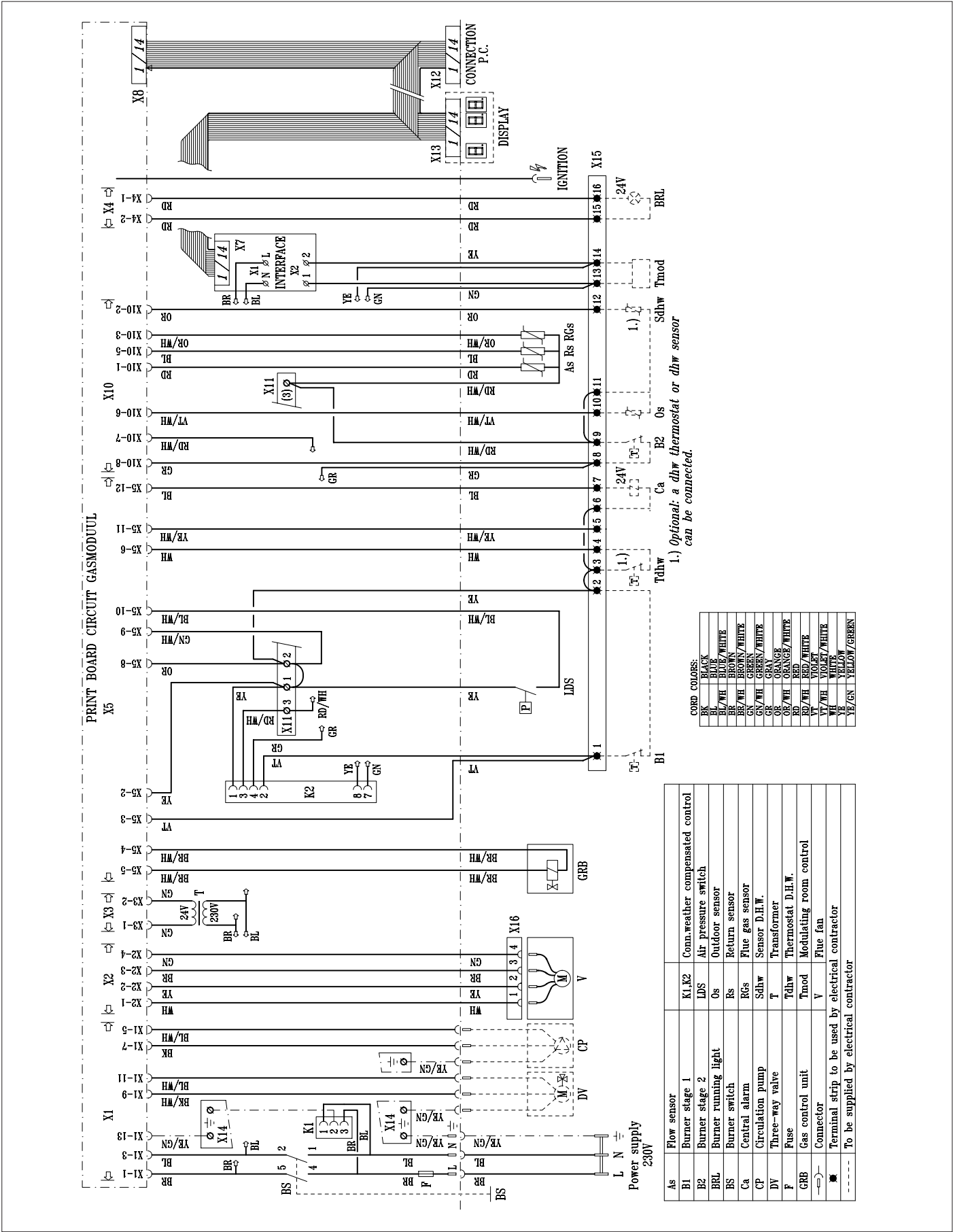


Fig. 19 Electrical wiring diagram

9. INSTALLATION INSTRUCTIONS FOR THE GAS INSTALLER

9.1 Gas connection

The boiler is suitable for firing on natural gas and propane.

Category II_{2H} 3P.

Connect the boiler to the incoming gas in accordance with the requirements of the Gas supply company. Install the main gas cock near the boiler. The gas connection is located at the bottom of the boiler (*see fig. 6, para. 6.1, item 29*). Fit a gas filter in the gas supply piping to avoid fouling of the gas control unit.

9.2 Gas pressures

The required initial inlet pressure is 17-30 mbar. The burner pressure has been factory-set but must be checked and re-adjusted to site conditions by an approved engineer. Consult our Technical Sales Department for other types of natural gas.

9.3 Gas/air ratio control

The boiler is equipped with a gas/air ratio control.

The purpose of this control is to keep the ratio between gas and air quantities in the burner within safe limits, at varying loads. This ensures clean and reliable combustion over the entire load range.

The air flow is controlled by the differential pressure across the fan.

The gas flow will be adjusted proportionally according to changes in the air flow.

The ratio between gas and air flow can be adjusted to suit the installation (*see para. 10.1*).

10. COMMISSIONING

10.1 Initial lighting

1. Check that the electric power to the boiler is switched off.
2. Remove the front panel and the two side panels.
3. Check that the gas supply is correctly fitted.
4. Check that the electrical connections are correct.
5. Open the cap of the automatic air vent (*fig. 6, no 10*).
6. Fill the boiler and the installation with water and check the water pressure (recommended 1.5 bar).
7. Only remeha W40-m ECO: Check the pump; this may be stuck. If necessary, release with a screwdriver.
8. If necessary, vent the heat exchanger; the manual air vent is mounted inside the air box (*fig. 06, no. 14*).
Only remeha W40-m ECO: Also remember the built-in circulation pump. This should be vented separately.
9. Vent the installation.
10. Fill the siphon with water.
11. Check the flue and the air inlet ducting.
12. Open the gas cock and vent the piping.
13. Switch the electric power switch on ('1').
14. Set the room thermostat or external boiler controls to call for heat or over-ride.
15. Switch on the boiler burner switch ('1').
16. The following run sequence will show in the 'code'-display:
 - 5 = Check air transport: after checking the air pressure switch in rest mode, the fan will turn, and the appliance will wait until air transport is sufficient, or until the three-way valve has been bypassed, in the event of heat demand.
 - 1 = Pre-ventilation: 0.3 seconds (post-ventilation: following operation of the appliance, post-ventilation will be carried out for 10 seconds).
 - 2 = Ignition: for 2.4 seconds ignition will be switched on and the gas valve opened, thus igniting the burner.
 - 3 = Appliance in central heating operation.
 - 4 = Appliance in boiler operation; the three-way valve to the boiler or the boiler pump has been activated.

The following operating situations are now possible:

16a. Modulating operation:

The appliance will modulate at the flow temperature requested by the modulating regulator (see also 'Note' under 16c).

16b. High/low operation: The appliance is operating at part-load or full-load depending on the heat demand.

16c. On/off operation: The appliance will modulate between minimum and maximum load on the basis of the flow temperature preset on the appliance.

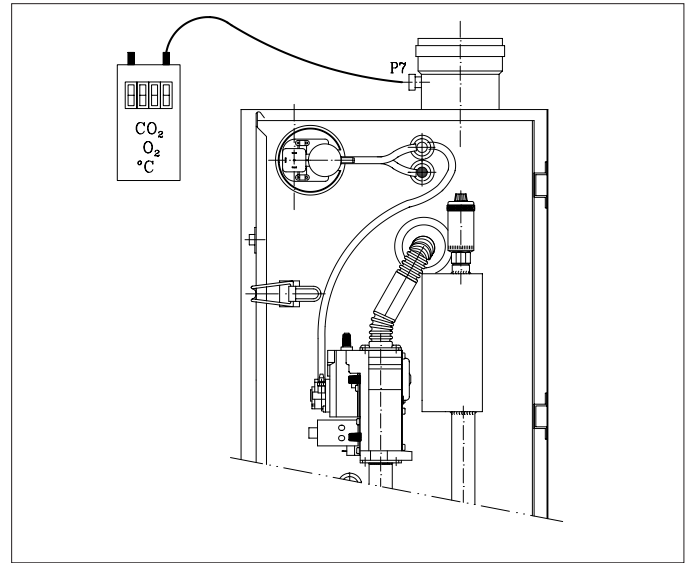


Fig. 20 Measurement points

Note:

Except immediately after the power has been switched on and if the appliance has had no heat demand for more than 2 hours, the appliance will first burn at forced part-load. The factory setting for forced part-load time is 0 minutes. This setting is correct if use is made of modulating regulators (see 16a). For on/off operation, a forced part-load time of 3 minutes is recommended (setting mode, step G, see para. 6.4.1 and 6.4.3).

16d. D.H.W. operation: The warm water production takes precedence. The appliance modulates on the basis of a preset flow temperature (setting range 70 to 90°C).

17a. Check the boiler for correct function in full load and part load.

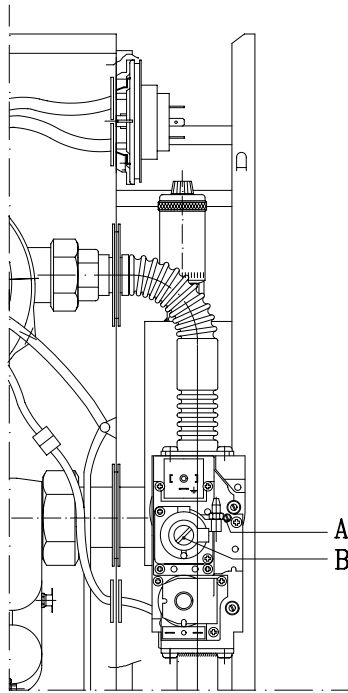
The best way to check whether the gas/air ratio control is functioning correctly, is to measure O_2 in the flue gas discharge pipe P7, see fig. 20 (CO_2 measuring based on O_2 measurement is also possible). Direct measurement of CO_2 can lead to deviation of the reading due to mixing CO_2 in the natural gas.

Proceed as follows:

Connect the measurement equipment (check for air tight).

17b. Run appliance at full-load (forced mode 'HIGH' paragraph 6.4.5).

- Press 'mode' and '▲' keys simultaneously.



A - Setting screw full load
B - Setting screw part load

Fig. 21 Setting screws

- 17c. When full-load speed is reached, you should compare the measured result with the figures in the table below:
- If necessary, correct the gas/air ratio using screw A on the gas combination block (see fig. 21). Check the flame via the inspection opening:
 - the flame should not blow out
 - the burner surface should not glow red.

boiler model	input	fan speed	O ₂	CO ₂
	kW	rpm	%	%
W40-m	12.7	approx. 3000	4.8	9.0
	42.3	approx. 4900	4.8	9.0
W60-m	18.6	approx. 3000	4.8	9.0
	62.1	approx. 4900	4.8	9.0

- 17d. Run the appliance at part-load (forced mode 'LOW', see par. 6.4.6)
- Press the 'mode' and '▼' keys simultaneously.
- 17e. Once the part-load speed is reached, compare the measured result with the table above (see 17c). If necessary, correct the gas to air ratio using screw B on the gas combination block (see fig. 21). Check via the inspection opening:
- the flame (should not blow out)
 - the burner surface (should show a regular flame distribution).
- 17f. Once you have adjusted gas flow in part-load, the setting values for full-load should be checked. These values are subject to minimal variations; if necessary, correct the values and repeat this process from point 17b onwards, as often as is necessary, until the desired effect is achieved.
- 17g. Remove the measurement connections. Close the measurement openings. Fit the boiler panels.
18. Heat the installation up to 80°C and shut-off the boiler.
19. Vent the piping and check the water pressure.
20. Set the room thermostat or weather compensator at the required value.
21. The boiler is now ready for use.

Note:

The remeha W40/60-m ECO is supplied with a number of basic settings:

- burner control
 - on/off or modulating
- flow temperature
 - 80°C
- post-running time pump
 - 5 minutes
- D.H.W. control
 - operating
- D.H.W. temperature
 - 65°C
- D.H.W. cut-in temperature differential
 - 5°C

If other setting values are required: see alteration of settings, par. 10.3.

10.2 Shut-down

1. Switch off the boiler burner switch ('0').
2. Close the gas cock.
3. Switch the electric power switch off.

Note:

When the boiler is shut-down, it is not protected against frost!

10.3 Settings

10.3.1 General

In this paragraph a number of further setting options are explained briefly. In most cases reference is merely made to the diagram in par. 6.4.1.

10.3.2 Setting the required flow temperature

Setting mode, step 1.

Preset 80°C.

Change setting: see para. 6.4.1 and 6.4.10.

10.3.3 Setting the required flow temperature when using an outdoor sensor

Setting mode, step 1.

If an outdoor temperature sensor is connected, you should input the peak value of the stoking line here, i.e. the required flow temperature at an outdoor temperature of -10°C. The base value of the stoking line is a fixed value of 25°C flow temperature at 20°C outdoor temperature. See the graph below.

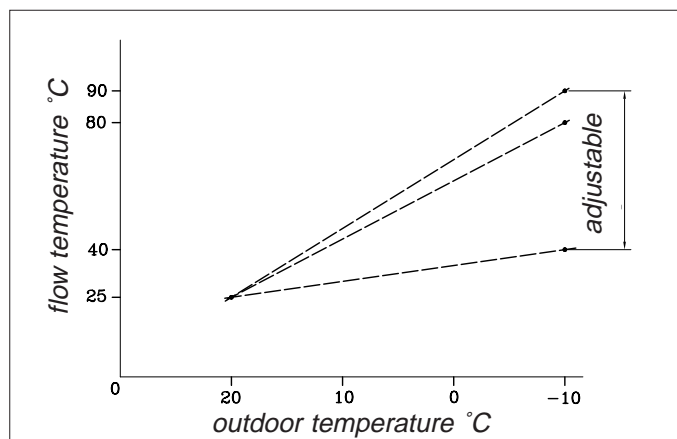


Fig. 22 Stoking line graph

If under certain circumstances the flow temperature according to this stoking line is too low (e.g. restoking following nighttime shutdown), a so-called “booster function” ensures that the flow temperature is raised by 10°C if heat demand (from the room thermostat) continues for longer than 10 minutes. This is repeated every 10 minutes until the room thermostat switches off (or a flow temperature of 80°C is achieved). Once the room thermostat has switched, the required flow temperature will once again fall by 1°C per minute until the stoking line is regained.

10.3.4 Changing the cut-in temperature differential

Setting mode, step n.

Preset 10°C.

Change setting: see para. 6.4.1 and 6.4.3.

10.3.5 Setting the pump control

Setting mode, step 2.

Preset 5 minutes.

Change setting: see para. 6.4.1 and 6.4.10.

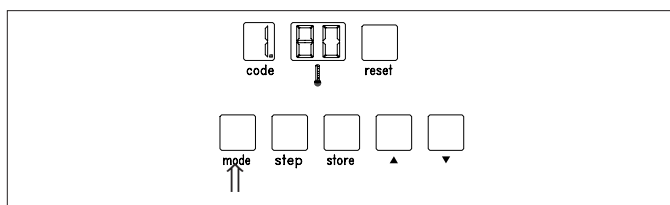
10.3.6 Setting the burner control

Setting mode, step A.

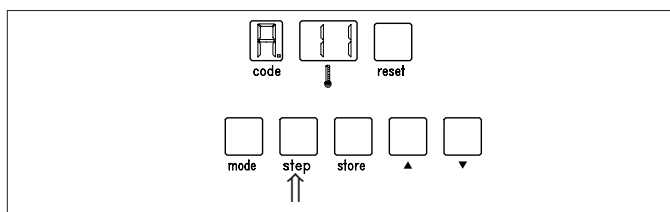
The basic setting is modulating burner control.

To alter burner control, you should carry out the following actions.

- Press the '**mode**' key to call up setting mode. The dot in the 'code' window will light up continuously.

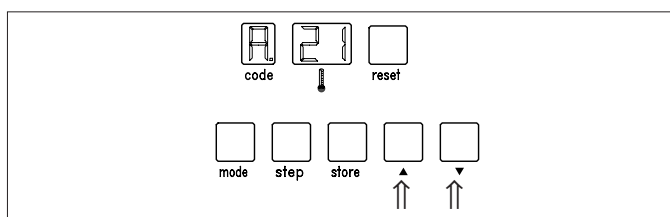


- Press the '**step**' key until the letter **A** appears in the 'code' window. This is the setting for appliance control. The temperature window indicates **11**. This is modulating control, warm water supply 'on'.

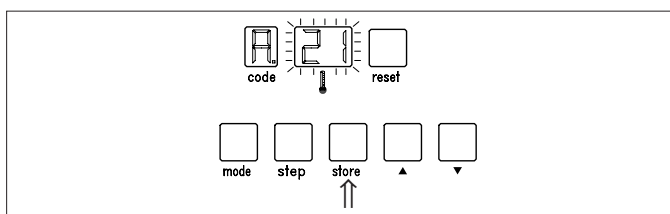


- Change the setting using the '**▲**' and '**▼**'-keys:

Code	ⓘ	Description ('X' = don't care)
A	1 X	central heating modulating
	2 X	central heating high/low ext. input
	X 0	central heating off, D.H.W. off
	X 1	central heating on, D.H.W. on
	X 2	central heating on, D.H.W. off
	X 3	central heating off, D.H.W. on



- Store the new setting in the memory, by pressing the '**store**' key. The temperature window will flash as a sign that the value has been stored.



- Press the '**reset**' key once to return to operating mode.

The burner control has now been set to high/low control.

10.3.7 Setting D.H.W. temperature

Setting mode, step 3.

Setting this value is only important if a remeha D.H.W. sensor is used.

The basic setting is: D.H.W. operation with a D.H.W. temperature of 65°C.

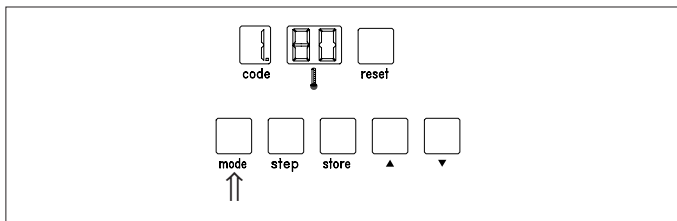
To make alterations, see para. 6.4.1 and 6.4.10.

10.3.8 Switching D.H.W. operation on and off

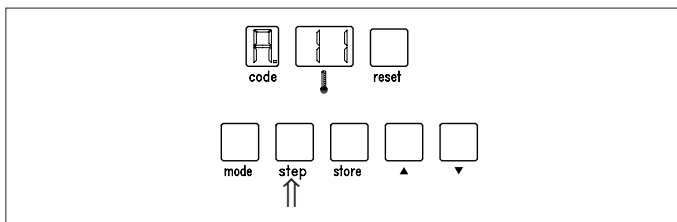
Setting mode, step A.

The basic setting is: boiler operation on. To switch off the D.H.W. function, you should carry out the actions below:

- Using the '**mode**' key, go to setting mode (the dot in the '**code**' display will light up continuously).

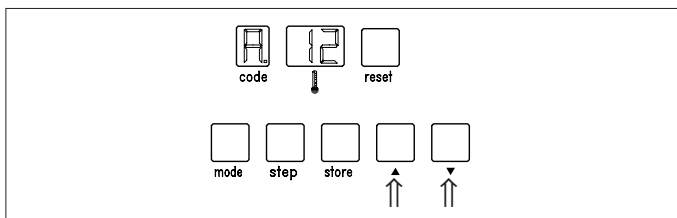


- Press the '**step**' key until the letter **A** appears in the '**code**' display.

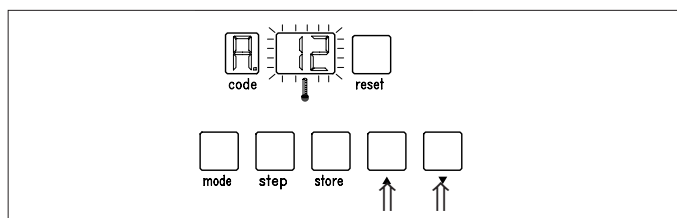


- Change the setting using the '▲' and '▼' keys:

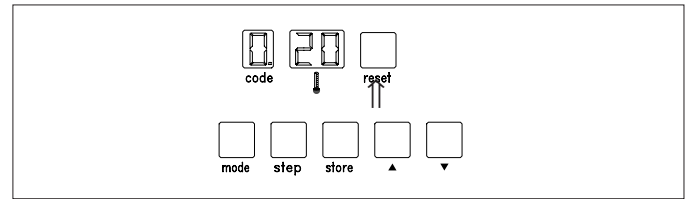
Code	Icon	Description ('X' = don't care)
A	1 X	central heating modulating
	2 X	central heating high/low ext. input
	X 0	central heating off, D.H.W. off
	X 1	central heating on, D.H.W. on
	X 2	central heating on, D.H.W. off
	X 3	central heating off, D.H.W. on



- Store the new setting in the memory by pressing the '**store**' key. The temperature window will flash as a sign that the value has been stored.



- Press the '**reset**' key to return to operating mode.



Note:

In the factory, the control has been set so that the appliance will switch off if the measured D.H.W. temperature is 5°C (preset value) above the preset boiler temperature. The appliance switches back on at a temperature 5°C below the shutoff point, i.e. at the boiler temperature set by yourself. This cut-in temperature differential can be adjusted to a maximum of 20°C. To alter this value, follow the instructions in par. 10.3.9.

If you do not wish to change the value, installation is now finished.

10.3.9 Changing D.H.W. operating cut-in temperature differential (service level)

Setting mode, step b.

Preset 5°C.

Change setting: see para. 6.4.1 and 6.4.3.

Note :

When using a D.H.W. thermostat, the value of the cut-in differential is used as a switch differential for flow temperature in the event of an appliance control stop in D.H.W. operation.

10.3.10 Changing maximum flow temperature during D.H.W. operation (service level)

Setting mode, step I.

Preset 80°C.

Change setting: see para. 6.4.1 and 6.4.3.

10.3.11 Changing three-way valve/boiler pump setting (service level)

Setting mode, step J.

Preset three-way valve.

Change setting: see para. 6.4.1 and 6.4.3.

11. FAULT-FINDING

11.1 General

This chapter differentiates between appliances with the modulating **rematic**® weather-compensated control and appliances controlled in some other way.

In those cases where a modulating room control (Honeywell Chronotherm Modulation with relevant interface) is used, follow par. 11.2.

11.2 Faults in appliances in combination with the **rematic**® weather-compensated boiler control

Carry out the steps listed below in the order given:

1. No figures appear in the appliance display.

Check: - the mains voltage 240 V
- the control box fuses

2. Is there a fault code on the appliance display (figures flashing)?

If yes, continue at par. 11.4.

3. Check the operating mode of the appliance (see par. 6.4.2).

- '0' (no heat demand): continue with point 4.
- '1' to '9', 'H', 'L': try to find the cause of the fault, according to the operating mode shown.

4. Check the operation of the appliance by connecting a wire bridge to the 16-pole wire connector X15 between terminals 1 and 2 (B1).

Does the appliance start up?

Yes, go on to point 5.

No, check the wiring of the wire connector. If the wiring is correct, replace the control box.

5. Open the instrument cupboard. This cupboard contains an interface PCB (see fig. 23) for the modulating **rematic**® control. The PCB also includes two LEDs.

There are now four possibilities:

1. Neither LED is flashing:

Check whether connections L and N of the PCB (screw clamp X1) are being fed 230V.

No: check the wiring.

Yes: replace the interface PCB.

2. LED B (see fig. 23) is not flashing.

First check the wiring between the appliance and the **rematic**® control.

Then, if necessary, replace the **rematic**® control. If the fault has still not been corrected, replace the interface PCB.

3. LED A (see fig. 23) is not flashing:

Check whether the tape cable connector (X7) is correctly mounted in the interface PCB and in the control box.

Then, if necessary, replace the interface PCB. If the fault has still not been corrected, replace the control box.

4. Both LEDs are flashing. This indicates that the installation is operating correctly.

Check the settings of the **rematic**® control. Refer to the instructions for the control.

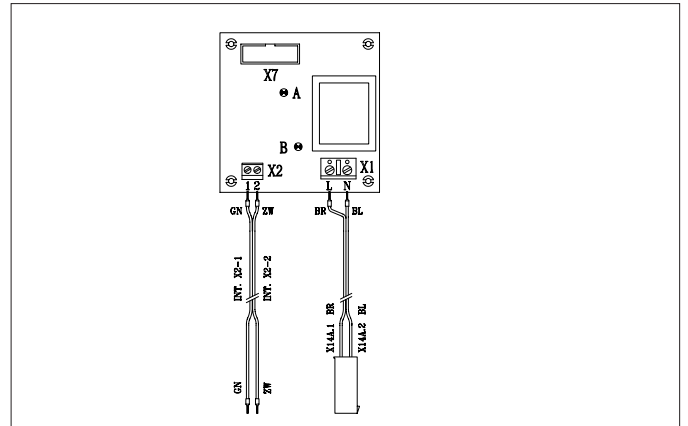


Fig. 23 Interface PCB for modulating **rematic**® control

11.3 Faults in appliances without a modulating **rematic**® weather-compensated boiler control

In the event of faults the following situations may occur:

1. No figures appear on the display.

Check: - mains voltage 240V
- fuses in the control box.

2. The appliance will not start up (no error message):

Check whether the room thermostat or weather-compensated boiler control:

- are correctly connected
- are correctly set
- are faulty.

3. Check the operation of the appliance by connecting a wire bridge to the 16-pole wire connector X15 between terminals 1 and 2 (B1).

Does the appliance start up?

- Yes, continue at par. 11.4

- No, check the wiring of the wire connector. If the wiring is correct, replace the control box.

11.4 Fault codes

In the event of an error message, both the 'code' display and the '⌘' display will flash.


For an explanation of the various fault codes and their possible causes, refer to the table on the next page.

Note:

For a readout of the most recent faults, see par. 6.4.8.

Important:

Before resetting, accurately record the fault code (figures, including flashes and dots) and always pass on this information if you request assistance. The fault code is important for correctly and rapidly tracing the nature of the fault.

	Description	Cause/checkpoints
0 0.	Flame simulation	Check ionisation probe (distance 3 - 4 mm).
0 1.	Short-circuit 24V	Check wiring.
0 2.	No flame or no ionisation (after 3 starts)	<p>a. no ignition spark (visible through inspection glass). Check:</p> <ul style="list-style-type: none"> - connection of ignition cable and spark plug cap. - ignition cable and electrode for breakdown. - electrode distance; must be 3-4 mm. <p>b. ignition spark, but no flame. Check if:</p> <ul style="list-style-type: none"> - gas cock is open. - inlet gas pressure is sufficient. - gas pipe is vented. - gas valve is energized during ignition. - electrode is fitted properly. - the gas/air ratio is not correct (see para. 10.1) - the gas pipe is not clogged or shows an assembly fault. <p>c. flame, but no ionisation.</p>
0 4.	Control fault	Voltage failure when malfunction causes interlock.
0 8.	Air transport	<p>a. Fouling/clogging of the air supply, flue gas discharge or heat exchanger;</p> <p>b. Differential air pressure switch does not function:</p> <ul style="list-style-type: none"> - differential air pressure switch defective. - gas/air connections loose or clogged. - gas/air connections mixed up. - spring loaded damper (fig. 06, pos. 7) does not open.
1 2.	Control fault	Fuse F1 (3.15 AT) defective.
1 8.	Max. water temperature	Flow temperature too high.
1 9.	temperature	Return temperature too high.
2 4.	Temperature sensor fault	<p>a. Flow and return temperature sensors mixed up.</p> <p>b. Flow and return connections mixed up.</p> <p>c. Water flow in D.H.W. mode not correct.</p>
2 5.	Maximum water temperature	<p>Rise in flow temperature too fast.</p> <p>Check:</p> <ul style="list-style-type: none"> - circulation pump (position 1 or 2) - water flow through the unit (sufficient number of radiators opened) - water pressure (0.8 bar min).
2 8.	Fan does not run	<p>Fan defective or improperly fitted (mechanically or electrically).</p> <p>Fuse F2 (3.15 AT) defective.</p> <p>Transformer defective (power on X3?)</p>
2 9.	Fan keeps running	<p>a. electrical connections mixed up.</p> <p>b. electrical connections interrupted.</p>
3 0.	Max. water temp.	Difference between flow and return temperature too high
3 1.	Temp.sensor fault	Short-circuit in flow temperature sensor.
3 2.		Short-circuit in return temperature sensor.
3 6.		Flow temperature sensor defective or not connected.
3 7.		Return temperature sensor defective or not connected.
4 3.	Parameters out of reach	Check the parameter settings.
6 1.	Air transport	<p>Air differential switch does not open:</p> <ul style="list-style-type: none"> - Air differential switch defective - Extreme draft through flue gas discharge duct - Short-circuit in wiring.

Note:

Not mentioned codes refer to internal control errors, requiring the control box to be changed.

12. INSPECTION AND SERVICING INSTRUCTIONS

12.1 General

The remeha W40/60-m ECO is practically maintenance-free. Once a year, the appliance should be checked and if necessary cleaned.

12.2 Inspection

The annual inspection of the remeha W40/60-m ECO can be limited to:

- inspection of the boilers combustion characteristics
- cleaning the siphon
- setting the ignition electrode
- check for leaks (water side, flue gas side and gas side)
- water pressure check.

Checking the boiler combustion characteristics

This can be done by measuring the O₂ level in the flue gas (P7, fig 24). The boiler should be in equilibrium with an average boiler water temperature of approximately 70°C.

The flue gas temperature can also be taken at P7.

This flue gas temperature must not exceed the return water temperature by more than 30°C.

If this check shows the operation of the unit to have deteriorated clean the boiler as detailed in para. 12.3.

boiler model	input (NCV)	fan speed	O ₂	CO ₂
	kW	rpm	%	%
W40-m	12.7	approx. 3000	4.8	9.0
	42.3	approx. 4900	4.8	9.0
W60-m	18.6	approx. 3000	4.8	9.0
	62.1	approx. 4900	4.8	9.0

The above values apply to a closed air box.
See also para. 10.1 for initial settings.

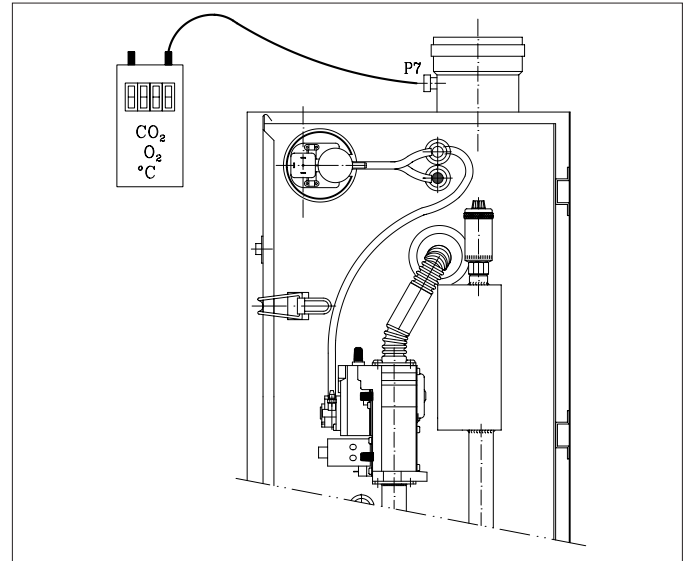


Fig. 24 Measuring points

Cleaning the siphon

Remove the siphon and clean it. Fill the siphon with clean water and fit it.

Setting the ignition electrode

Check the setting of the ignition electrode (3-4 mm).

Water pressure check

The water pressure should be at least 0.8 bar. You are recommended to fill the appliance to approx. 1.5 bar.

12.3 Maintenance

If the appliance is checked for technical combustion problems and the result is that either combustion or heat exchanger are no longer at the optimum level, maintenance should be carried out. This maintenance will consist of:

- cleaning the heat exchanger with a nylon brush or compressed air and possibly rinsing with water
- cleaning the fan
- cleaning the siphon.

Work order (see fig. 26):

- Switch off the appliance via the burner switch on the instrument panel on the front.
- Disconnect the electrical power supply to the appliance.
- Close the cock in the gas pipe to the appliance.
- Remove the front cover and the two side covers.
- Open the catch on the instrument panel and tilt the panel forwards.

Attention:

To prevent a short-circuit in the external connections or in the instrument panel as a result of the unexpected penetration of leak water, you are advised to cover the instrument panel.

- Remove the cover from the air box.
- Remove the pipes (E) from the inlet mixer.
- Open the union nut for the gas pipe in the air box (A).

Remember!!!

To prevent the flexible gas pipe twisting, when slackening and tightening the union nut (A1), the hexagon nut (A2) should be held in place with a spanner, see fig. 25.

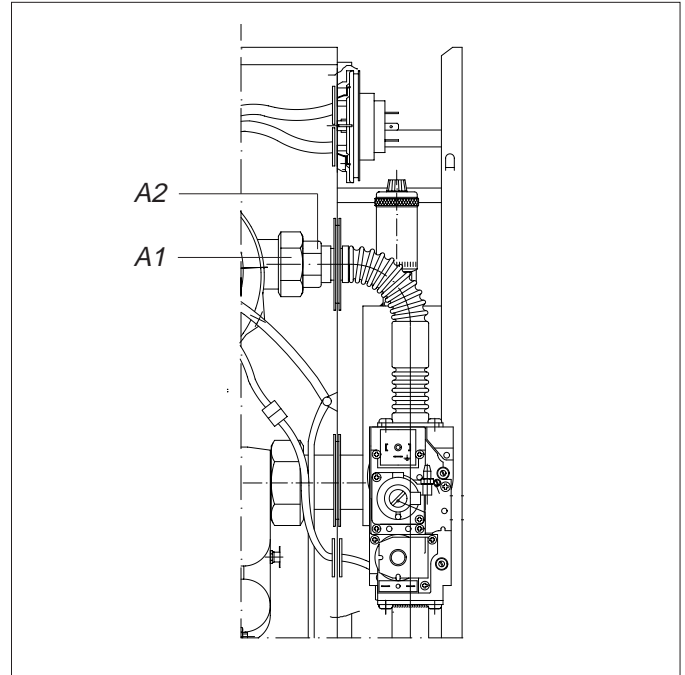


Fig. 25 ((Dis)assembly of the gas pipe

- Remove the bolts from the attachment strips (B). The fastening strips can then be removed.
- Remove the electrical connection from the fan (D).
- Lift the burner from the fan carefully upwards and remove the burner from the appliance.
- Check the burner seal on the heat exchanger. If damaged or hardened, replace the seal (recommended: replace every 3 years).

Attention:

The metal-fibre layer on the burner is susceptible to mechanical damage and should therefore be handled with care. Do not touch with brushes or other sharp objects.

- To inspect/clean the heat exchanger, the hold-down strips (F) on the underside and sides must be removed (brass wing nuts). Also remove the 3 metal screws on the underside of the inspection plate (G).
- Now remove the inspection plate (H).
- If necessary, remove the 3 guide plates (I) between the aluminium finned pipes, in order to clean the finned pipes.

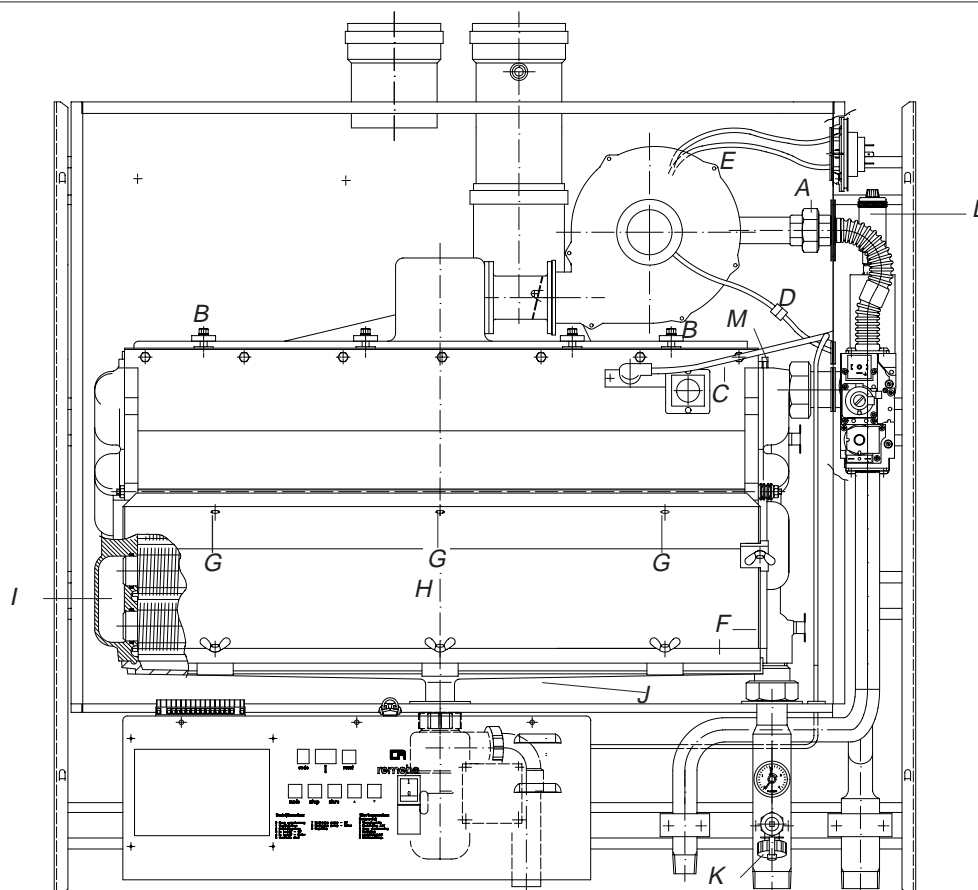


Fig. 26 Servicing points remeha W40/60-m ECO

- To inspect or clean the fan, it must be disconnected from the gas injector.
- Remove the screws at the rear of the fan.
For cleaning purposes, use a plastic brush; remove any loose dust particles from the fan, before reassembling the system.
- Reassemble all parts removed in reverse order.

Attention:

Check that all control hoses are properly fitted following assembly: in the event of incorrect assembly, it is not possible to guarantee the correct setting of the gas/air ratio.

- Check the setting of the ignition electrode (between 3 and 4 mm).
- Restart the appliance.

12.4 Draining and filling

The fill and drain cock is fitted at the bottom of the boiler.

12.5 Venting

The boiler is equipped with an air separator with automatic vent. Give the sealing cap a quarter turn.
A manual vent is fitted top right on the heat exchanger.

- A Union nut
- B Fastening strips
- C Ignition cable
- D Connecting plug
- E Hose connection
- F Hold down strips
- G Metal screws
- H Inspection plate
- I Guide plate
- J Condense collector
- K Filling and drain cock
- L Automatic vent.
- M Manual air vent.

**Broag Ltd.****Head Office**

Remeha house,
Molly Millars Lane,
Wokingham,
Berkshire RG 41 2QP.
Tel. 0118 9786977
Fax 0118 9783434
Email address:
boilers@broag.ltd.uk.

Branch Office

Unit 3, Kestrel Close,
Quarry Hill Industrial Estate,
Ilkeston
Derbyshire DE7 4RD
Tel. 0115 9440778
Fax 0115 9440588

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