FLUE SYSTEMS MANUAL FOR ROOM SEALED BOILERS

March 2000

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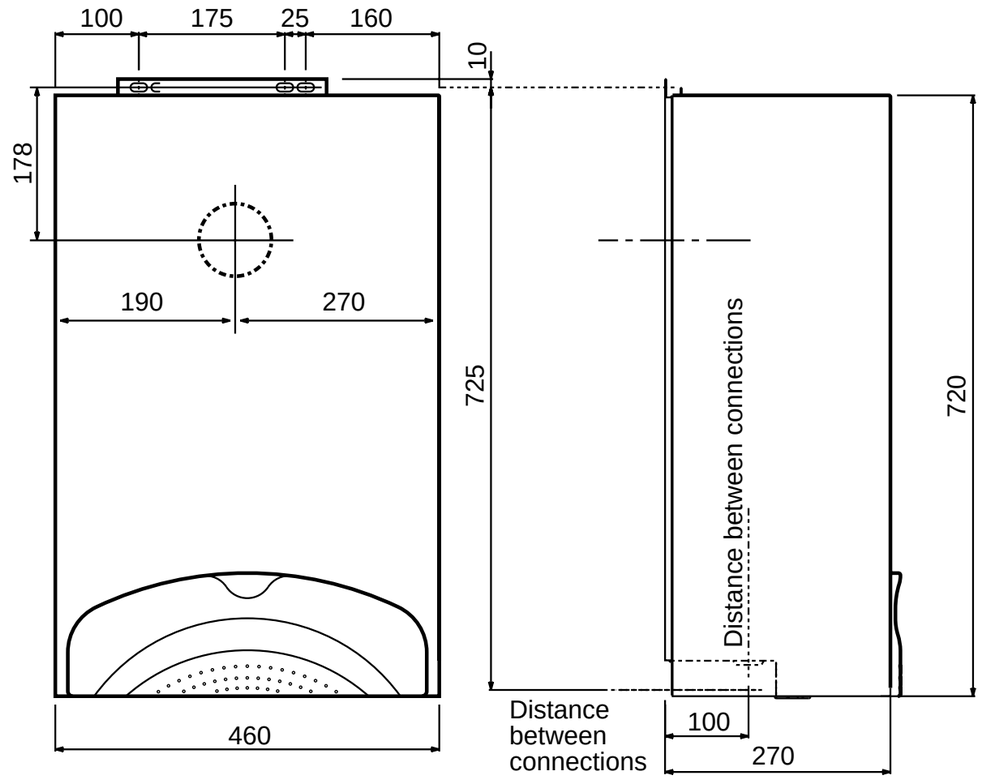
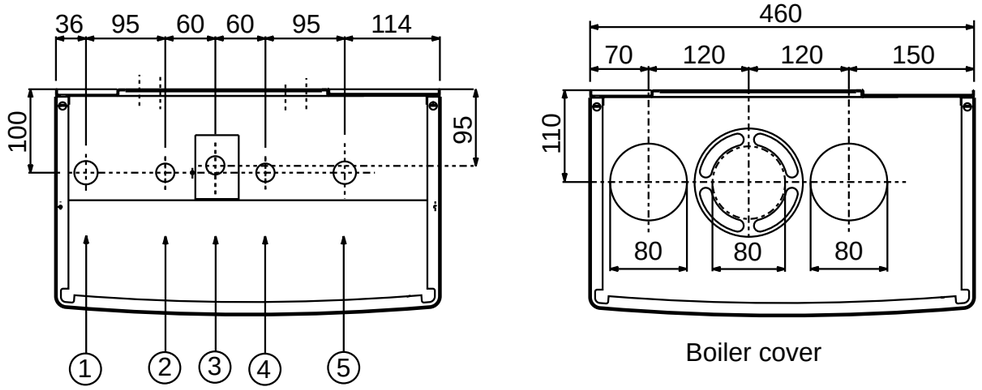
1. Boiler connections and dimensional drawings

Domina 80





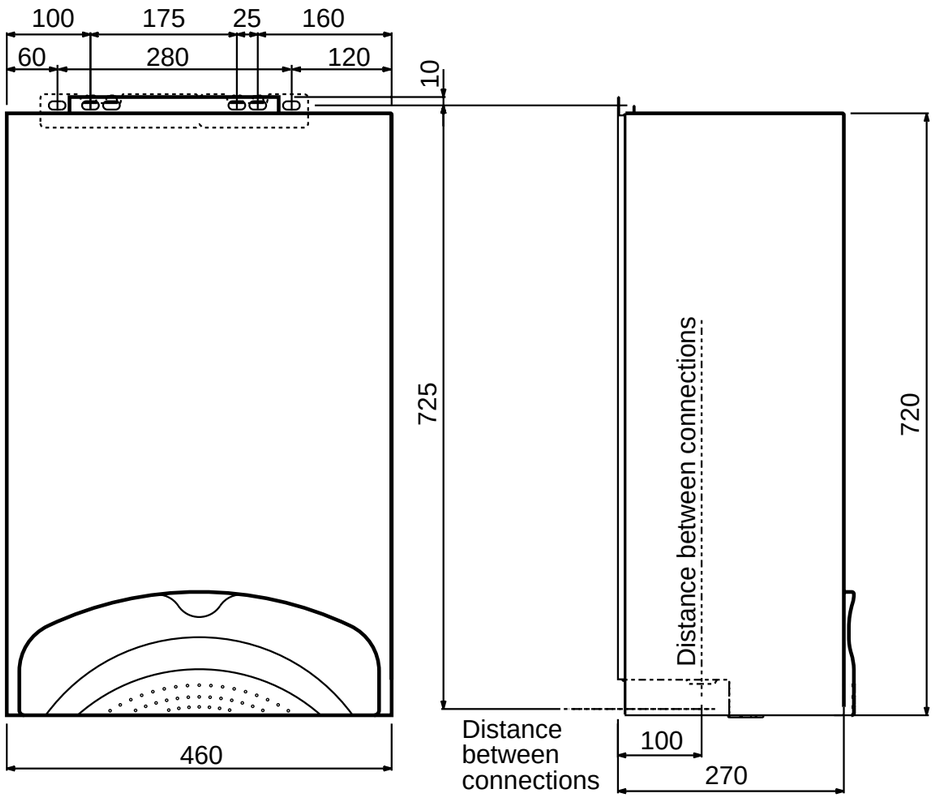
Boiler connections

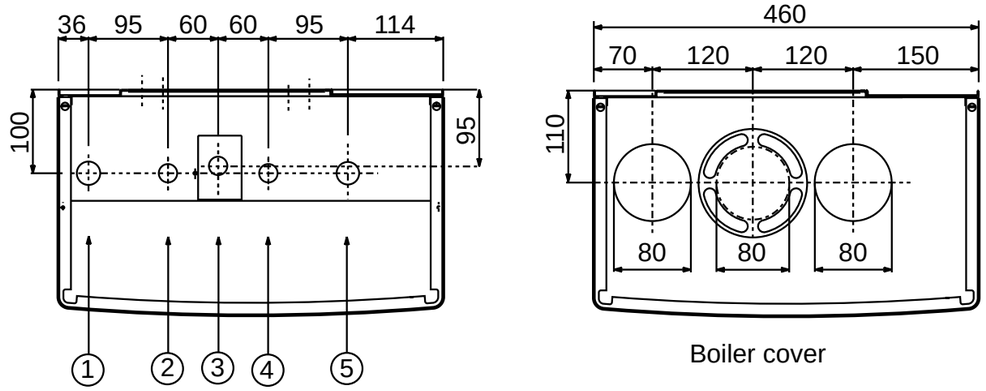
Boiler cover

Key

- ***1*** *22 mm central heating flow outlet*
- ***2*** *15 mm domestic hot water flow outlet*
- ***3*** *15 mm gas inlet - supply to be a minimum of 22mm*
- ***4*** *15 mm domestic cold water inlet*
- ***5*** *22 mm central heating return inlet*

Modena 80





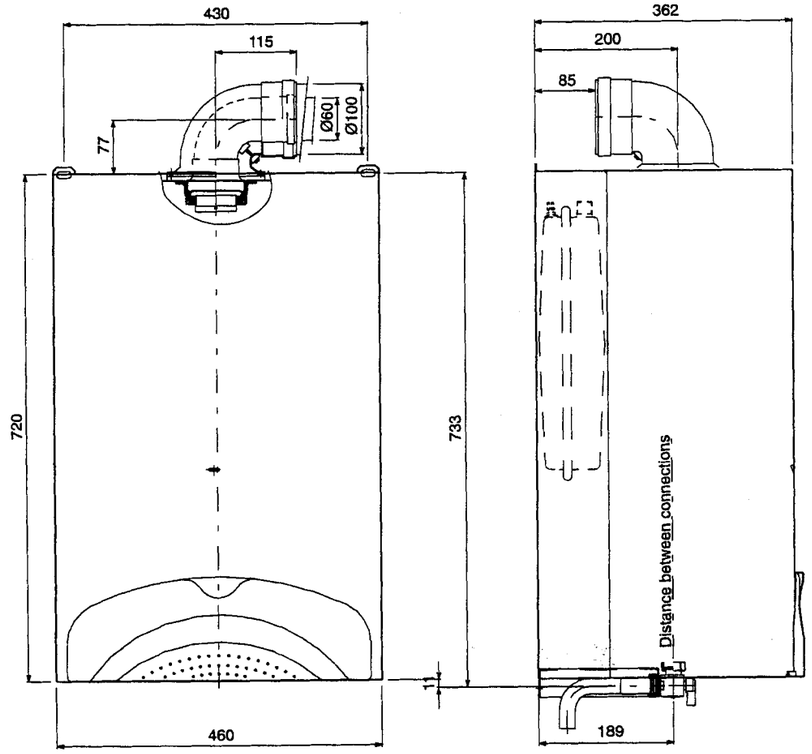
Boiler connections

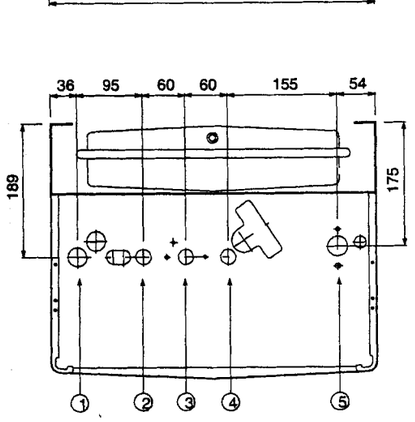
Boiler cover

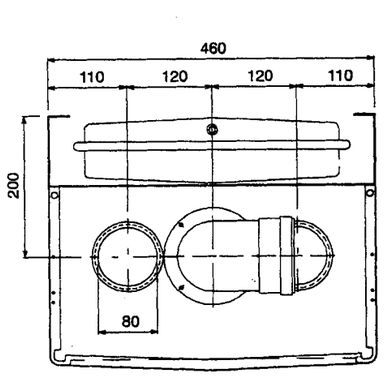
Key

- ***1*** *22 mm central heating flow outlet*
- ***2*** *15 mm domestic hot water flow outlet*
- ***3*** *15 mm gas inlet - supply to be a minimum of 22mm*
- ***4*** *15 mm domestic cold water inlet*
- ***5*** *22 mm central heating return inlet*

Modena 102





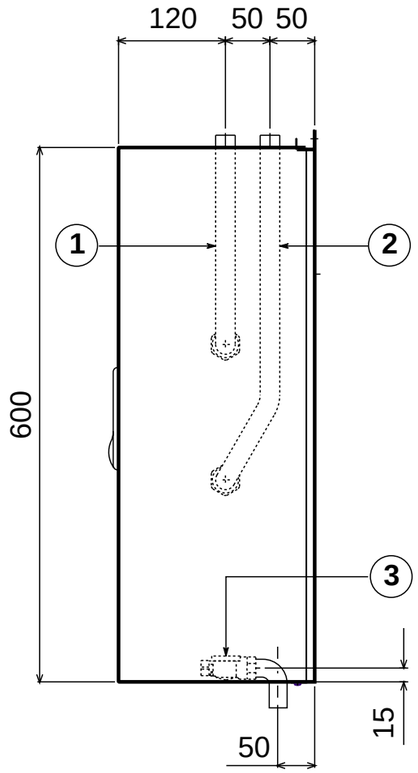


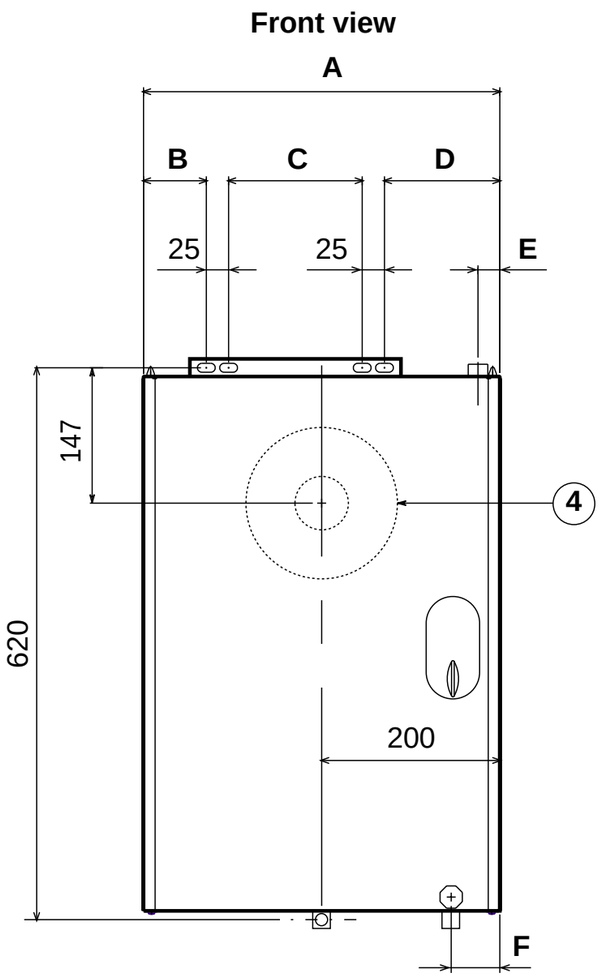
Boiler connections

Key

1 *22 mm central heating flow outlet*
2 *15 mm domestic hot water flow outlet*
3 *15 mm gas inlet - supply to be a minimum of 22mm*
4 *15 mm domestic cold water inlet*
5 *22 mm central heating return inlet*

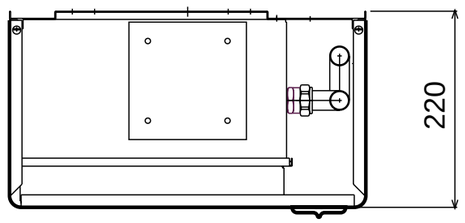
Sigma





Key

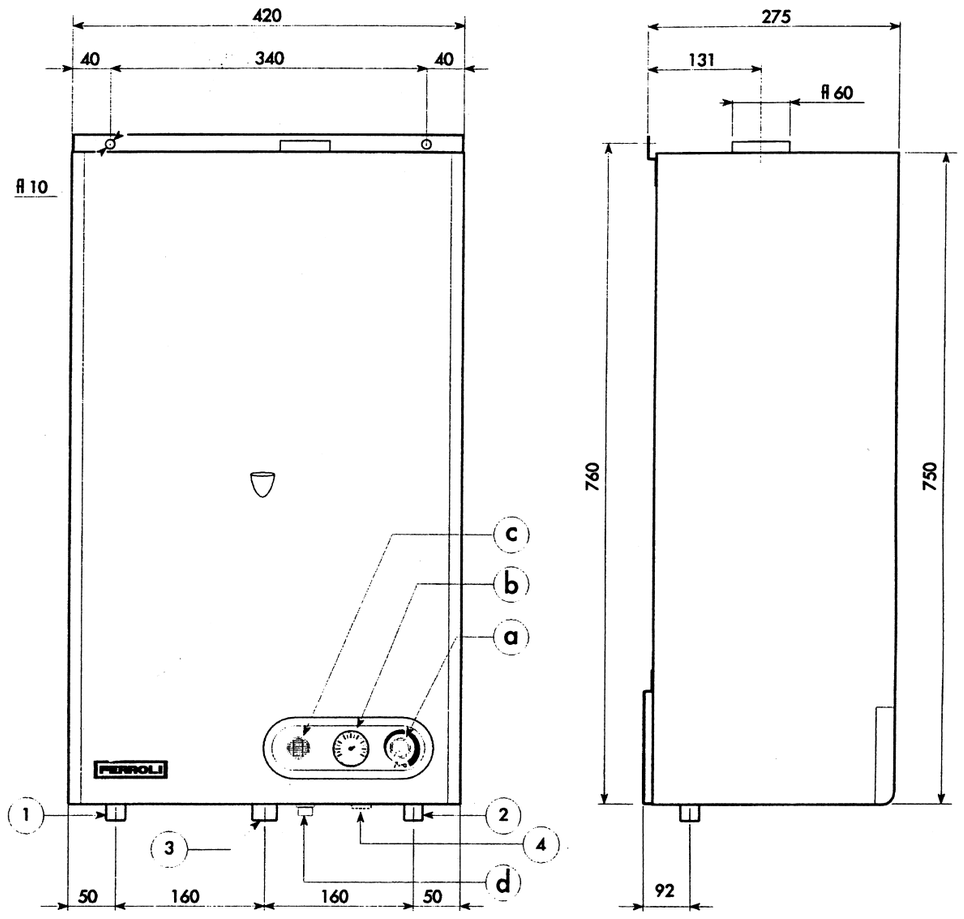
1 *Ø 22 mm flow outlet*
2 *Ø 22 mm return*
3 *Ø 15 mm gas inlet - supply to be a minimum of 22mm*
4 *Rear air inlet/flue outlet*

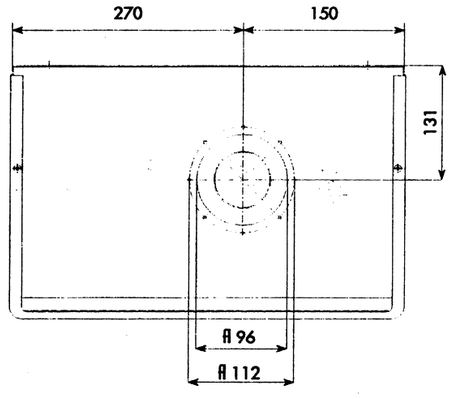


Top view

Model	A mm	B mm	C mm	D mm	E mm	F mm
Sigma 30-40	320	53	85	132	35	60
Sigma 50-60	400	70	150	130	30	55

Tempra

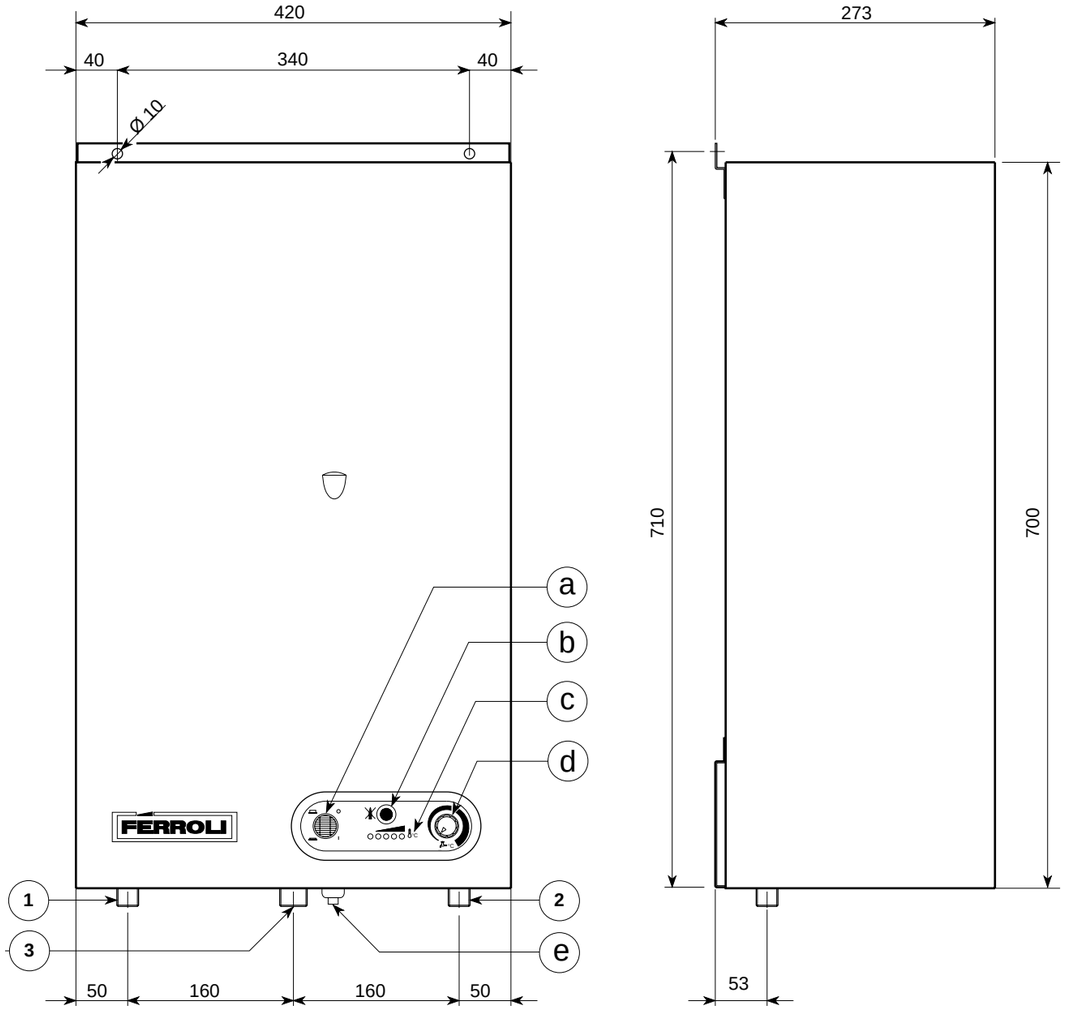


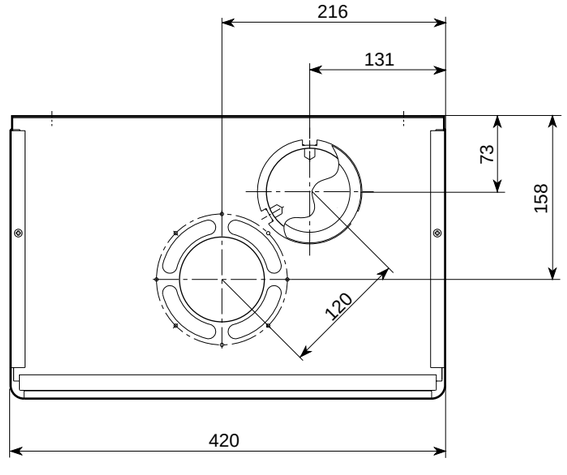


Key

- ***1*** *Central Heating return inlet*
- ***2*** *Gas supply*
- ***3*** *Central Heating flow outlet*
- ***3*** *Outlet pressure relief valve*
- ***a*** *C.H. boiler thermostat*
- ***b*** *Pressure gauges*
- ***c*** *Main switch*
- ***d*** *Overheat cut-off thermostat (reset)*

Talent





Key

- ***1*** *Domestic hot water outlet - 15mm*
- ***2*** *Domestic cold water inlet - 15mm*
- ***3*** *Gas supply - 22mm*
- ***a*** *Main electrical switch*
- ***b*** *Lock out indicator*
- ***c*** *LED - Power on (green)*
  LEDs - Temperature level (yellow)
- ***d*** *Water temperature control knob (40°C - 55°C)*
- ***e*** *Overheat cut-off thermostat 90°C*

2. Flue systems

• General flue connection notices and terminal positions

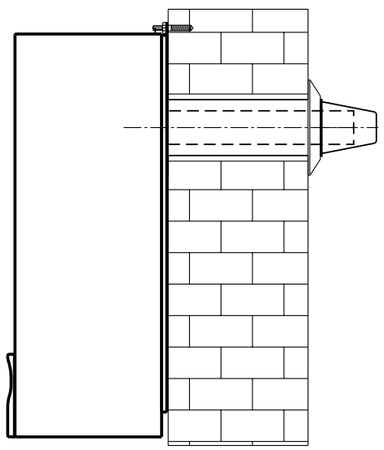
The Modena 80, Modena 102, Domina 80, Sigma 30-40-50-60 and Tempra wall hung boilers and the Talent water heater are room-sealed appliances with a fan down-stream of the combustion chamber.

For this kind of appliance the flue discharge can be run directly out from the building or to single/ collective flues, by means of separate or concentric flue and air inlet pipes.

For different boiler models, a selection of fittings are available for the connection of concentric or separate pipes, as shown in the table below:

- Connection for two pipe system → Domina 80, Modena 80, Modena 102, Tempra, Sigma, Talent
- Connection for concentric system → Domina 80, Modena 80, Modena 102, Tempra, Sigma, Talent
- Bend for concentric pipe → Domina 80, Modena 80, Modena 102, Tempra, Sigma, Talent

The Sigma 30-40-50-60 and Domina 80 boilers can also be flued directly through the wall from the back and within the boiler casing (diameter 100/60 mm), see diagram opposite.

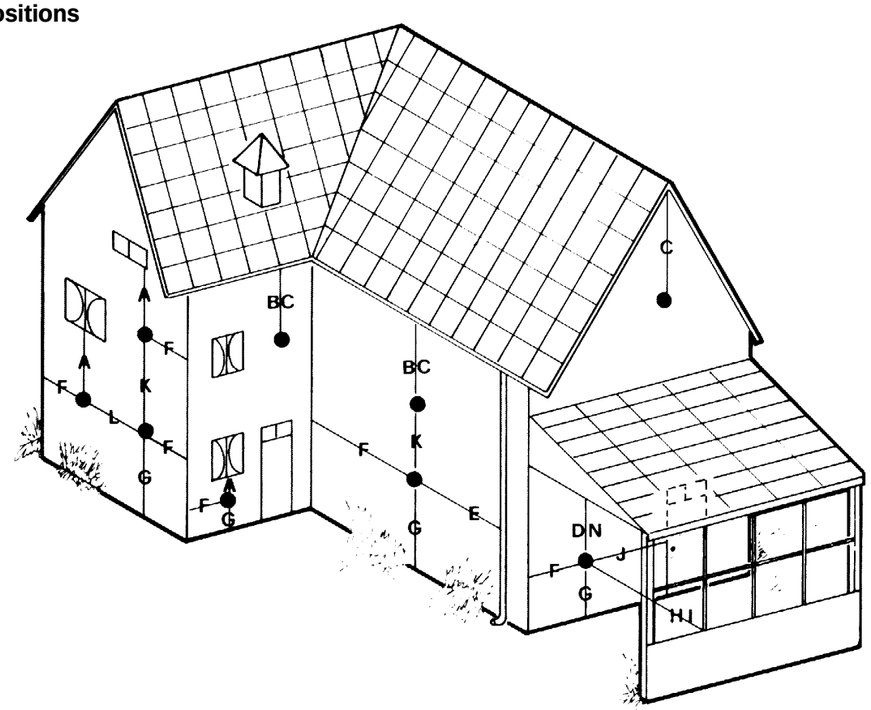


The choice of the system and installation of the flue must be made in line with good practice, as well as the national and local standards.

It is absolutely essential to ensure that products of combustion discharging from the terminal cannot re-enter the building, or enter any adjacent building, through ventilators, windows, doors, natural air infiltration or forced ventilation/air conditioning.

It is necessary to comply with the instructions and details listed below when siting the flue outlet:

Terminal Positions



POSITION	MINIMUM SPACING	mm
A	Directly below an openable window, air vent, or any other ventilation opening	300
B	Below gutters, soil pipes or drainpipes	75
C	Below eaves	100
D	Below a balcony	100
E	From vertical drainpipes or soilpipes	75
F	From internal or external corners	100
G	Above adjacent ground or balcony level	100
H	From a surface facing the terminal	600
I	Facing another terminal	1,200
J	From opening (door/window) in carport into dwelling	1,200
K	Vertically from a terminal on the same wall	300
L	Horizontally from a terminal on the same wall	300
N	Below carport	600

Where the flue is less than 2m from the floor a suitable terminal guard must be fitted.

2.1 Concentric flue systems (100mm and 125mm ø)

• Determining maximum flue length

Table 1 below shows the maximum flue lengths available for FÉRROLI boilers with concentric systems.
Please refer to table 2 for bend and roof terminal reductions.

Table 1

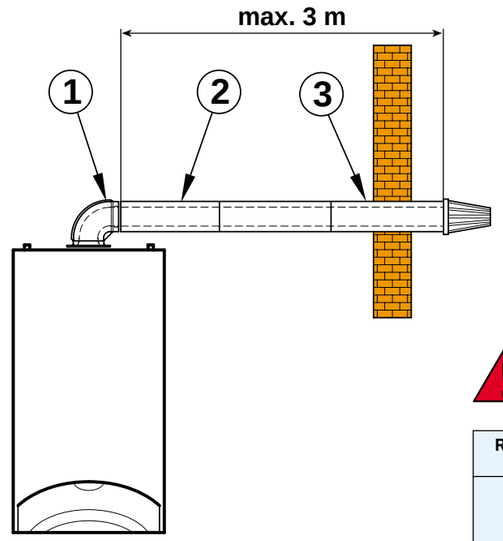
Maximum flue length permissible	100 mm concentric		125 mm concentric	
	Vertical	Horizontal*	Vertical	Horizontal*
Tempra	4 m	3 m	5 m	5 m
Domina 80 - Modena 80 - Modena 102	4 m	3 m	5 m	5 m
Sigma 30-40-50-60	4 m	3 m	5 m	5 m
Talent	4 m	3 m	5 m	5 m

*For horizontal flueing, the reduction for appliance bend is included in the calculation.

Table 2

Reduction for bend and roof terminals	
100 mm concentric bend 90°	1 m
100 mm concentric bend 45°	0,5 m
100 mm concentric vertical flue terminal	1 m
125 mm concentric bend 90°	0,5 m
125 mm concentric bend 45°	0,25 m
125 mm concentric vertical flue terminal	1 m

Example of concentric flue Ø 100 with appliance bend.

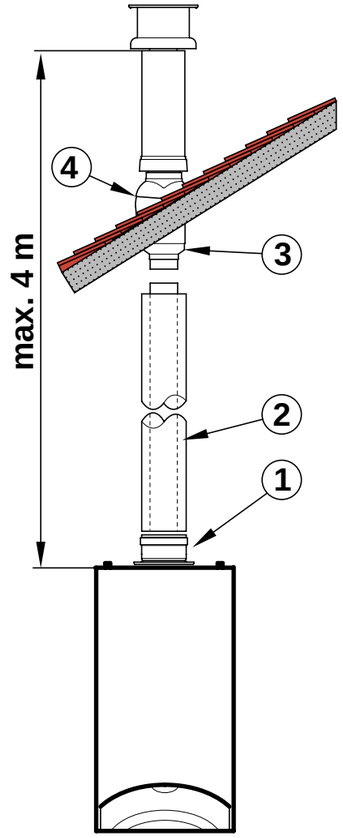


DOMINA 80
MODENA 80
MODENA 102
SIGMA
TEMPRA
TALENT

Attention: if the concentric flue length is shorter than 1 metre insert the restrictor Ø 50. The flue must have an inclination downward, away from the boiler equal to 3%.

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Concentric bend 60/100	—
2	2	Concentric extension 60/100	2,0 m
3	1	Concentric flue 60/100	1,0 m

Example of concentric flue Ø 100 with vertical outlet flue.



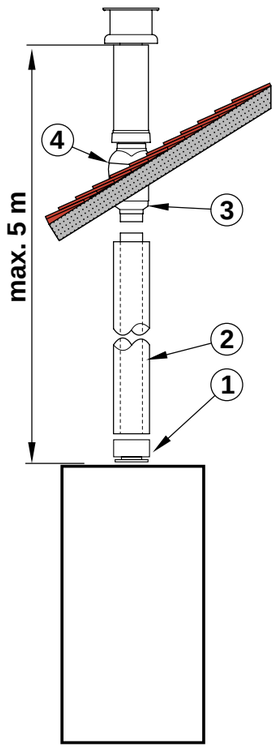
DOMINA 80
MODENA 80
MODENA 102
SIGMA
TEMPRA
TALENT

Attention: if the concentric flue length is shorter than 1 metre insert the restrictor Ø 50

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Connection for concentric pipe	—
2	3	Vertical concentric extension	3,0 m
3	1	Concentric roof terminal	1,0 m
4	1	Roof tile outlet flue	—

Férroli pursues a policy of continuous product improvement and reserves the right to alter specifications and design without prior notice.

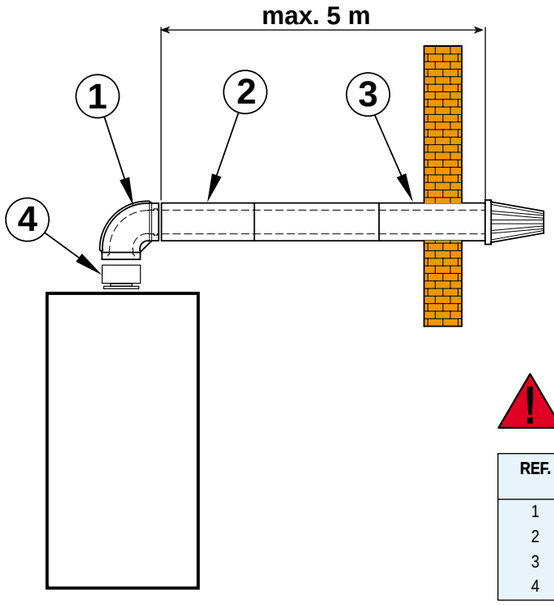
Example of concentric flue Ø 125 with vertical outlet flue



DOMINA 80
MODENA 80
MODENA 102
SIGMA
TEMPRA
TALENT

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Connection for concentric pipe	—
2	4	Vertical concentric extension	4,0 m
3	1	Concentric roof terminal	1,0 m
4	1	Roof tile outlet flue	—

Example of concentric flue Ø 125 with appliance bend



DOMINA 80
MODENA 80
MODENA 102
SIGMA
TEMPRA
TALENT

Attention: the flue must have an inclination downward away from the boiler equal to 3%.

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Concentric bend 80/125	—
2	2	Concentric extension 80/125	2,0 m
3	1	Concentric pipe 80/125	1,0 m
4	1	Connection for 125/80	—

2.2 Two pipe flue system (80mm Ø)

To determine the maximum flue length of flue and air pipe permissible.

The calculation is based on a standard reference resistance of 1 metre x 80 mm Ø horizontal air intake pipe.

For every configuration of the two-pipe system all components will have a resistance factor based upon this reference. (i.e. a 90˚ bend fitted in the exhaust line would attract a resistance factor equivalent to 2.5 metres of horizontal 80mm pipe.)

This is expressed as X metres

Each boiler will have a maximum equivalent length of flue/air pipe and this is shown in the table as N metres.

Therefore when calculating the proposed flue run the equivalent resistance of every length of pipe and every bend, whether air intake or flue discharge is added together to give an actual total flue length.

The final figure calculated must not exceed the permitted maximum length (N metres) for each boiler type.

Calculation Routine

1. Identify all the components needed to complete the proposed flue/air pipe run.
2. Calculate the sum of all the equivalent lengths.
3. For boilers which may require a flue restrictor, refer to table D1 to ascertain the correct size and add this resistance to your total.
4. Check and verify that the total flue/air pipe length (flow resistance) does not exceed the permitted maximum for the boiler type (table M1)

IMPORTANT!
Resistance factors apply to standard Férroli components only.

The values for condensing boilers will be different.

FÉRROLI wall Hung Boilers: Max LENGTH for flue systems

First table below shows the maximum flue lengths available for FÉRROLI boilers with the different flue options (concentrics and 2 pipe systems). For correct calculation refer to the reductions for bend and pipe positioning listed on second table.

TAB. M1 - MAXIMUM FLUE LENGTH PERMISSIBLE 80MM 2 PIPE SYSTEM 'X' DIMENSION	
Domina 80 - Modena 80	48 m
Sigma	40 m
Talent	38 m
Tempra	55 m

TAB. D1-RESTRICTOR CALCULATION FOR DOMINA 80 - MODENA 80/102 'N' DIMENSION			
Total flow resistance of flue system		**Restrictor Size**	**Restrictor reduction**
minimum	maximum	mm	
0 mm	13 mm	45	35 m
13 mm	23 mm	47	25 m
23 mm	38 mm	50	10 m
38 mm	48 mm	no restrictor	0 m

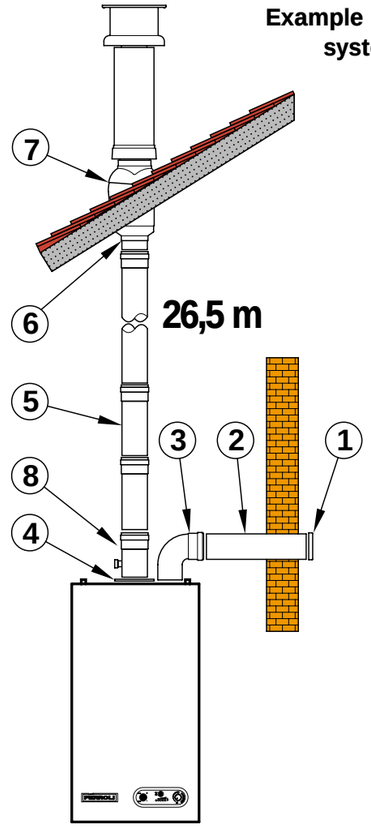
Choice of the restrictor with separate pipes:

1 Calculate the total flow resistance of the air and flue pipes in equivalent m/air.

2 From the table D1 shown above to choose the most suitable restrictor for the flow resistance calculated.

3 To complete the calculation, add the diaphragm flow resistance to the total flow resistance of the pipes, check that total is less than maximum permitted in table M1.

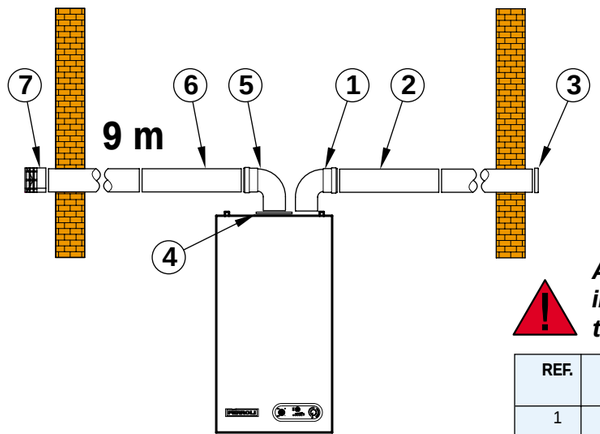
Example of roof flue outlet and wall air inlet with 2 pipe system maximum total flue length: 38 metres



TALENT

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Air wall terminal	2,0 m
2	1	Horizontal air pipe	1,0 m
3	1	Air bend 80 mm R/D = 0,75	1,5 m
4	1	Air inlet closing flange	—
5	26,5	Vertical flue 80 mm	26,5 m
6	1	Roof terminal only for flue	4,0 m
7	1	Roof tile outlet flue	—
8	1	Condensate outlet	3,0 m
			TOTAL 38,0 m

Example of wall inlet/outlet with 2 pipe system Maximum total flue length: 38 metres

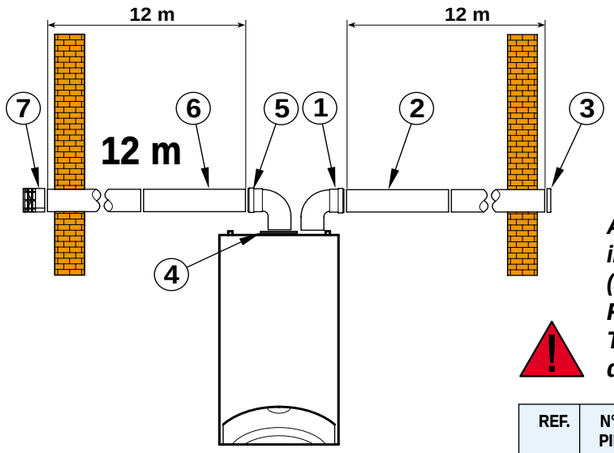


TALENT

Attention: the air and flue pipes must have an inclination downward away from boiler equal to 3%.

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Air bend 80 mm R/D = 0,75	1,5 m
2	9	Horizontal air pipe	9,0 m
3	1	Air wall terminal	2,0 m
4	1	Air inlet closing flange	—
5	1	Flue bend 80 mm R/D = 0,75	2,5 m
6	9	Horizontal flue	18,0 m
7	1	Air wall terminal outlet flue	5,0 m
			TOTAL 38,0 m

Example of wall inlet/outlet with 2 pipe system maximum total flue length: 48 metres

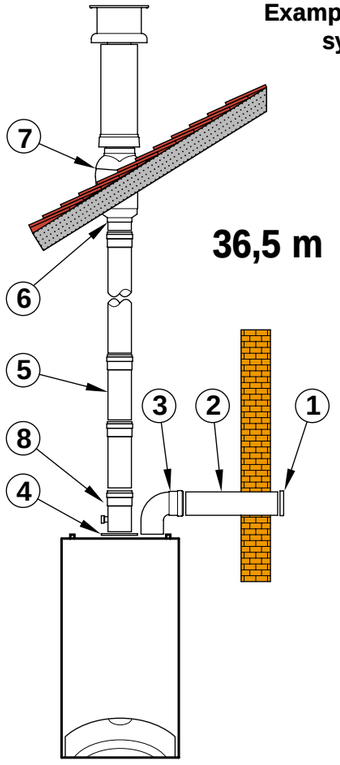


DOMINA 80 - MODENA 80/102

Attention: flow resistance (reduction) equivalent included between 38 and 48 (see table D1)
Remove the flue restrictor.
The flue and air pipes must have an inclination downward away from boiler equal to 3%.

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Air bend 80 mm R/D = 0,75	1,5 m
2	12	Horizontal air pipe	12,0 m
3	1	Air wall terminal	2,0 m
4	1	Air inlet closing flange	—
5	1	Flue bend 80 mm R/D = 0,75	2,5 m
6	12	Horizontal flue	24,0 m
7	1	Air wall terminal outlet flue	5,0 m
			TOTAL 47,0 m

Example of roof flue outlet and wall air inlet with 2 pipe system maximum total flue length: 48 metres

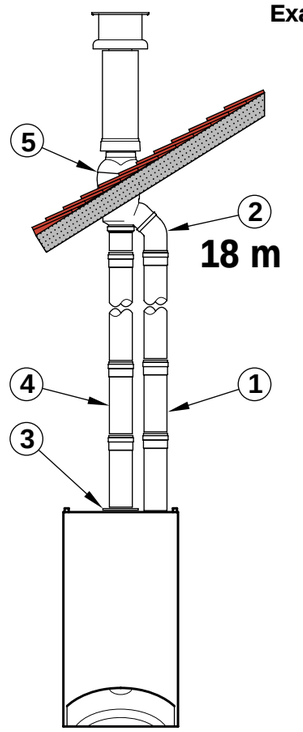


DOMINA 80 - MODENA 80/102

Flow resistance (reduction) equivalent included between 38 and 48 (see table D1)
Remove the flue restrictor.

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Air wall terminal	2,0 m
2	1	Horizontal air pipe	1,0 m
3	1	Air bend 80 mm R/D = 0,75	1,5 m
4	1	Air inlet closing flange	—
5	36,5	Vertical flue 80 mm	36,5 m
6	1	Roof terminal only for flue	4,0 m
7	1	Roof tile outlet flue	—
8	1	Condensate outlet	3,0 m
			TOTAL 48,0 m

Example of roof inlet/outlet with 2 pipe system maximum total flue length: 48 metres

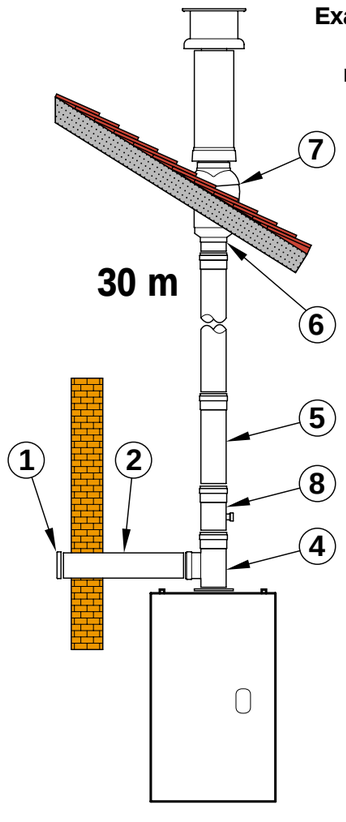


DOMINA 80 - MODENA 80/102

Attention: example of maximum length guaranteed by the fan. In these conditions it is necessary to insulate the flue+air pipe to protect the boiler from condensation.
Flow resistance (reduction) equivalent is applicable between 38 and 48 (see table D1) Remove the flue restrictor.

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	18	Vertical air pipe 80 mm	18,0 m
2	1	Roof air-flue terminal	12,0 m
3	1	Air inlet closing flange	—
4	18	Vertical flue 80 mm	18,0 m
5	1	Roof tile outlet flue	—
			TOTAL 48,0 m

Example of concentric roof flue outlet and wall air inlet with 2 pipe system maximum total flue length: 40 metres

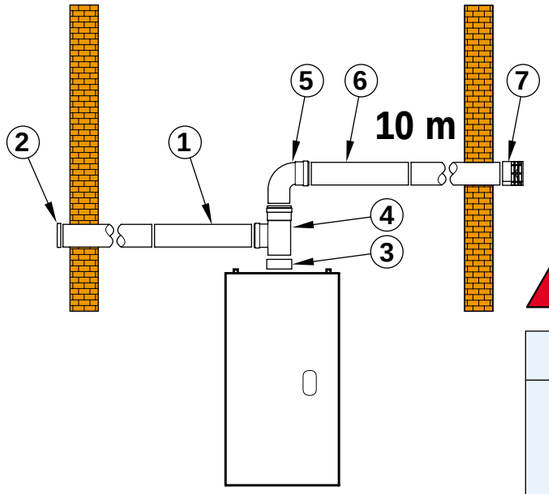


SIGMA

Warning: Rear exit with air/flue T separator is not allowed.

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	1	Air wall terminal	2,0 m
2	1	Horizontal air pipe	1,0 m
4	1	Air/flue T separator	—
5	30	Vertical flue 80 mm	30,0 m
6	1	Roof terminal only for flue	4,0 m
7	1	Roof tile outlet flue	—
8	1	Condensate outlet	3,0 m
			TOTAL 40,0 m

Example of horizontal inlet/outlet with 2 pipe system
Maximum total flue length: 40 metres



SIGMA

Warning: Rear exit with air/flue T separator is not permitted.

Attention: the air and flue pipes must have an inclination downward away from boiler equal to 3%.

REF.	N° OF PIECES	DESCRIPTION	LENGTH OR REDUCTION
1	10	Horizontal air pipe	10,0 m
2	1	Air wall terminal	2,0 m
3	1	Connection for concentric pipe	—
4	1	Air/flue T separator	—
5	1	Flue bend 80 mm R/D = 0,75	2,5 m
6	10	Horizontal flue	20,0 m
7	1	Air wall terminal outlet flue	5,0 m
			TOTAL 39,5 m

2.3 Collective flue systems

• Minimum cross section for flue gas discharge pipes for collective systems

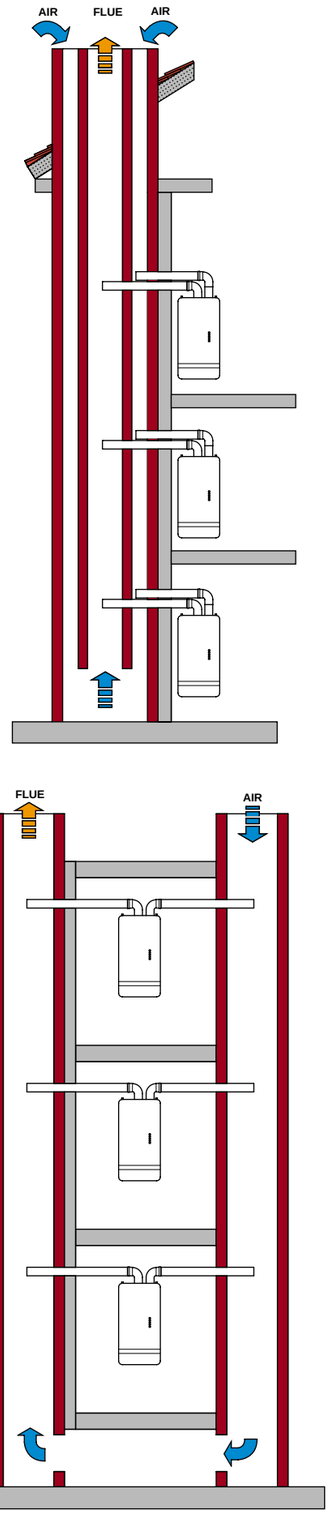
The values in these tables are valid only for FÉRROLI room-sealed compartment, fanned flue boilers.

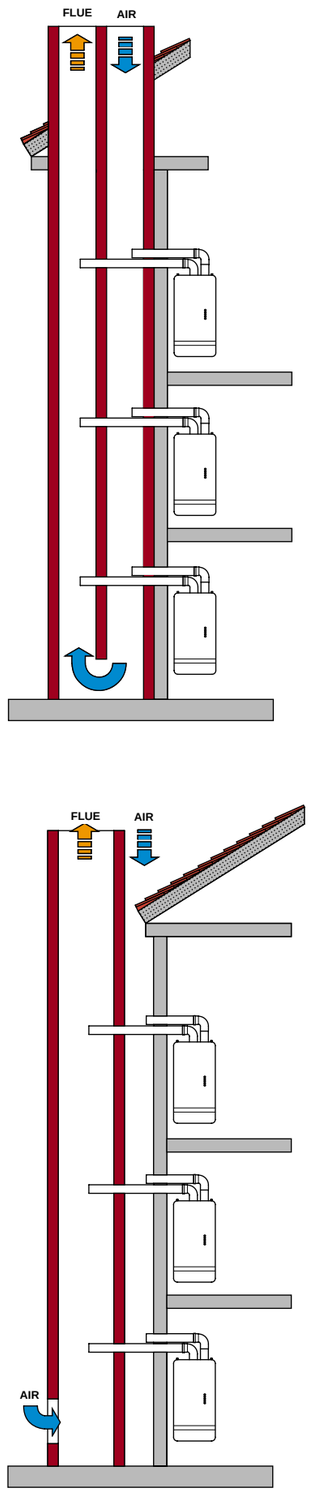
No. units connected	Square section concrete pipes (Fe.)	Round section metal pipes (Fe.)
2	150	150
3	200	200
4	250	250
5	350	315
6	450	380
7	550	440
8	650	505
9	700	565
10	750	630
11	800	660
12	850	720
13	900	780
14	950	840
15	1000	900
16	1050	910
17	1100	970
18	1150	1025
19	1200	1085
20	1250	1140

MINIMUM CROSS SECTIONS FOR AIR INTAKE PIPES	
CONCENTRIC PIPES	Aa = FROM 2.5 TO 3.5 TIMES THE Fe CROSS SECTION
PARALLEL PIPES	Aa = FROM 2 TO 3 TIMES THE Fe CROSS SECTION
Aa	AIR INLET PIPE INTERNAL CROSS SECTION
Fe	FLUE GAS EVACUATION PIPE INTERNAL CROSS SECTION

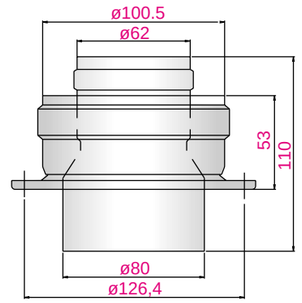
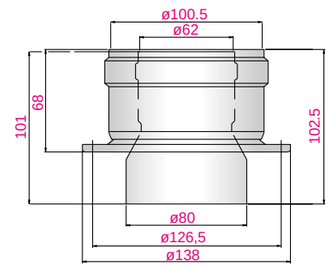
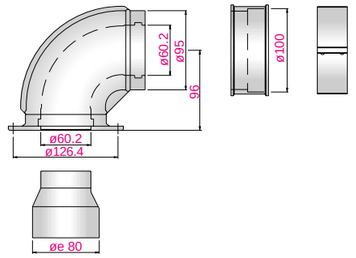
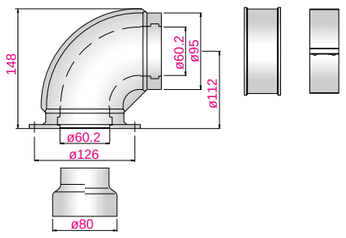
Components not supplied by Férroli Ltd. are permitted providing the performance and design details are submitted to Férroli R & D for approval.

The diagram below shows applications into collective flue systems





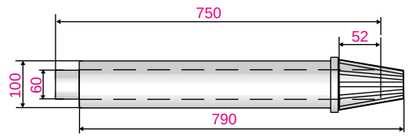
3. Accessories for flue systems

• Accessories for concentric systems	FOR BOILERS:
 Connection for concentric pipe Ø 100/60 mm. **Code: 823064**	**TALENT** **TEMPRA**
 Connection for concentric pipe Ø 100/60 mm. **Code: 823074**	**DOMINA 80** **MODENA 80/102**
 Concentric bend 90°, rotation 360° in steps of 45°, Ø 100/60 mm, with flange. **Code: 823034**	**TALENT**
 Concentric bend 90°, rotation 360° in steps of 45°, Ø 100/60 mm, with flange. **Modena/Domina: 823044** **Sigma: 823045**	**DOMINA 80** **MODENA 80/102** **SIGMA 30-60**

• Accessories for concentric systems

FOR BOILERS

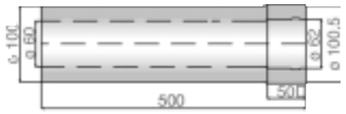
Internal aluminium concentric pipe Ø 60 mm,
external Ø 100 mm, complete with terminal and wall gaskets.
Plastic external white coloured, L = 750mm.



Code: 8231048

ALL MODELS

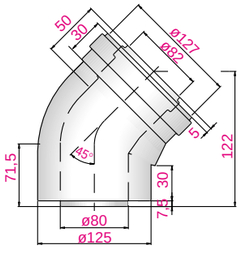
Concentric extension male/female internal Ø 60 mm in aluminium,
external Ø 100 complete with gaskets.



80 mm Code: 823131
100 mm Code: 823134
125 mm Code: 823137

ALL MODELS

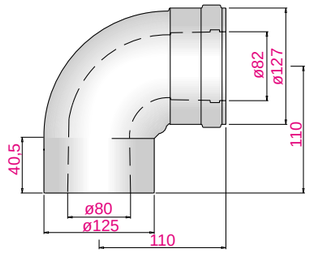
Concentric bend 45°, complete with gaskets.



80 mm Code: 23151
100 mm Code: 23154
125 mm Code: 23157

ALL MODELS

Concentric bend 90°, complete with gaskets



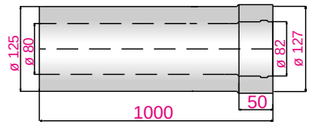
80 mm Code: 823161
100 mm Code: 823164
125 mm Code: 823167

ALL MODELS

• Accessories for concentric systems

FOR BOILERS:

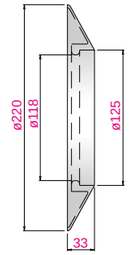
Concentric extension male/female internal Ø 60 mm in aluminium,
external Ø 100 complete with gaskets.



80 mm Code: 823141
100 mm Code: 823144
125 mm Code: 823147

ALL MODELS

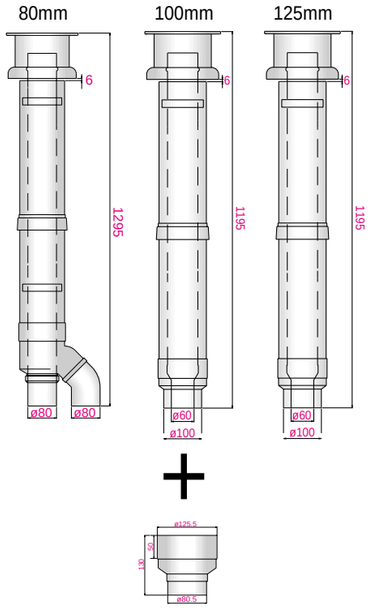
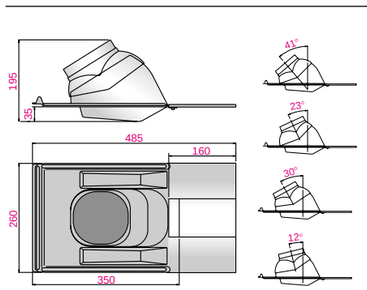
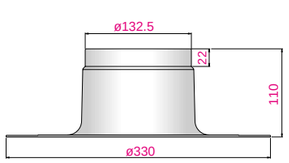
Silicone wall gasket ø 125 mm



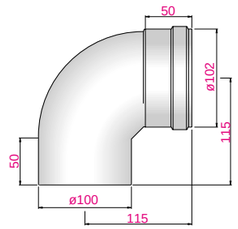
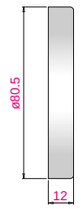
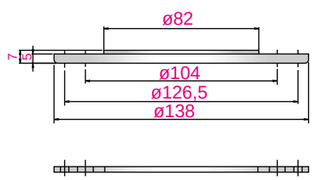
80 mm Code: 823331
100 mm Code: 823334
125 mm Code: 823337

ALL MODELS

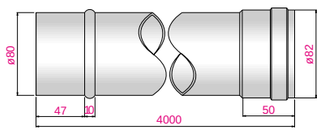
• ACCESSORIES FOR CONCENTRIC APPLICATIONS

	POSITIONING O = HORIZONTAL V = VERTICAL	TYPE OF BOILER	REDUCTION AIR	REDUCTION FLUE
 Flue outlet air inlet for concentric system				
80mm				
Pitch Code: 823261	**V**	**STAND.**		**12**
Flat Code: 823281	**V**	**CONDEN.**		**12**
100mm				
Pitch Code: 823234	**V**	**STAND.**		**4**
Flat Code: 823284	**V**	**CONDEN.**		**4**
125mm				
Pitch Code: 823267	**V**	**STAND.**		**4**
Flat Code: 823287	**V**	**CONDEN.**		**4**
 Roof tile outlet flue for sloping roofs in plastic material included in kits **Pitched Roof Kit** **80 mm 823261** **100 mm 823264** **125 mm 823267**				
 Outlet flue support for flat roof included in kits **Flat Roof Kit** **80 mm 823261** **100 mm 823264** **125 mm 823267**				

• ACCESSORIES FOR TWO PIPE SYSTEMS

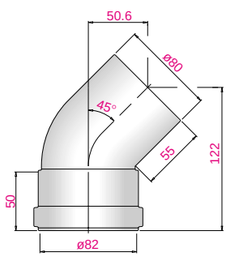
	POSITIONING O = HORIZONTAL V = VERTICAL	TYPE OF BOILER	REDUCTION AIR	REDUCTION FLUE
 Male-female bend 90° Ø 100	**O / V**	**STAND.**	**0,8**	**1,3**
	O / V	**CONDEN.**	**0,8**	**1**
Code: 823164				
 Air inlet terminal of Ø 80 mm	**O**	**STAND.**	**2**	**—**
	O	**CONDEN.**	**2**	**—**
Code: 823211				
 Separate outlet flue kit 80/80	**V**	**STAND.**	**0**	**0**
	V	**CONDEN.**	**—**	**—**
Model: TALENT / TEMPRA **Code: 823091**				

• ACCESSORIES FOR TWO PIPE SYSTEMS	POSITIONING O = HORIZONTAL V = VERTICAL	TYPE OF BOILER	REDUCTION AIR	REDUCTION FLUE
Male-female flue pipe Ø 80 mm	O	STAND.	1	2
	O	CONDEN.	1	1,6
	V	STAND.	1	1
	V	CONDEN.	1	1,6



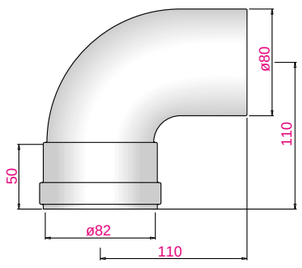
500 mm Code: 823131
1000 mm Code: 823141

Male-female bend 45° Ø 80 mm	O / V	STAND.	1,2	2,2
	O / V	CONDEN.	1,2	1,8



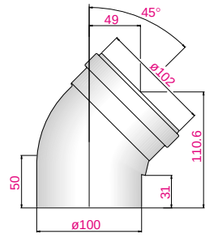
Code: 823151

Male-female bend 90° Ø 80 mm	O / V	STAND.	1,5	2,5
	O / V	CONDEN.	1,5	2



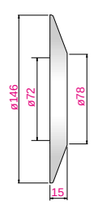
Code: 823161

• ACCESSORIES FOR TWO PIPE SYSTEMS	POSITIONING O = HORIZONTAL V = VERTICAL	TYPE OF BOILER	REDUCTION AIR	REDUCTION FLUE
Outlet two pipe flues 80/80 male-female bend 45° Ø 100 mm.	O / V	STAND.	0,6	1
	O / V	CONDEN.	0,6	0,8

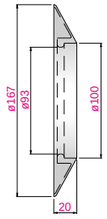


Code: 823154

Silicone wall gasket



80mm
Code: 823331



100mm
Code: 823334

NOTES

NOTES