MODULENS O® PRO

FLOOR-MOUNTED CONDENSING OIL BOILERS, 46.5 TO 122.4 KW



PFC 45/60



PFC 90/120

- **PFC 45, 60**
  single body: for heating only

- **PFC 90, 120**
  double body: for heating only

Heating only

Condensing

Domestic oil

OPERATING CONDITIONS

boiler

Max. working temperature: 90°C
Safety thermostat: 105°C
Max. working pressure: 4 bar
Power supply: 230 V/50 Hz
International Protection marking: IP 21

homologations

B_{23p}, B_{23}

The MODULENS O® Pro boilers range comprises single body models (PFC 45/60) or double body models (PFC 90/120) for heating only. MODULENS O® Pro boilers are delivered with a DIEMATIC EVOLUTION control panel, which according to the connected options can be used to control and regulate up to 3 heating circuits based on the outdoor temperature + 1 DHW circuit. It can also provide optimised management of combined systems and be used to control 2 to 7 boilers in cascade configuration (see page 13).

The flue gas connection configuration types are B_{23} or B_{23P}.

CE identification no.: 1312CN5691

De Dietrich
SUSTAINABLE COMFORT®

PRESENTATION OF THE RANGE

MODULENS O® Pro range PFC boilers are new, high-output boilers supplementing the **AFC 18, 24 and 30** domestic boilers range.
They have an innovative design, and a new aesthetic, with a sleek finish. They are particularly compact, easy to install and maintain.
PFC… boilers are factory tested and delivered assembled.

A host of equipment, such as automatic air vent, PPS flue gas discharge pipe on PFC 45/60 (Ø 110 mm) and flue gas manifold on PFC 90/120 (Ø 160 mm), flue gas connectors with measuring ports, mains connection cable, heating pump connector and signalling connector, and a condensates draining siphon.

Multiple options to ensure these boilers are as easy to set up as possible:
- low-loss header, condensate neutralisation tank, etc.

Easier set-up and maintenance: orifices for bearing bars (on PFC 45/60 only), bracket for vertically positioning the burner during maintenance, combustion chamber bottom opening for rinsing, cleaning brushes supplied, adjustable feet. PFC 60 and PFC 120 come with a built-in step to facilitate access to the burner during maintenance. PFC 90/120 are equipped with wheels to facilitate positioning the boiler during installation. PFC 90/120 are equipped with a hydraulic connection kit including flow/return valves and a filling valve.

ENHANCED PERFORMANCE

- Annual efficiency up to 105%
- Low space requirement: Width 600 mm/Depth 680 mm for PFC 45/60
- Low polluting emissions

MODULENS O® PRO	NOX* (MG/KWH)
45	112
60	80
90	112
120	80

* As per EN 15034, oil nitrogen content: 91 mg/kWh, CO_2: 12 %

ADVANTAGES

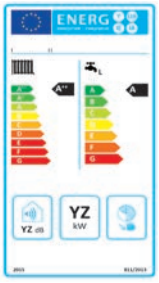
- Boilers featuring aesthetics typical of the brand, with a particularly compact and robust modular frame design (double body for PFC 90/120). The PFC boilers range can be connected to our independent tanks for DHW production.
- **A monobloc stainless steel heat exchanger** featuring thick walls for high corrosion resistance, with vertical circuit with triple flue gas pathway and a large-sized combustion chamber,
- Aluminium combustion chamber door with flame viewer,
- **Boiler power perfectly adapted to actual requirements** thanks to the all-new design EcoNOx oil burner, with 59 to 100 % output modulation, positioned vertically and controlled by the DIEMATIC EVOLUTION control system (see p. 10). Its low CO and NOx emissions ensure optimum environmental protection,
- **DIEMATIC EVOLUTION**: suitable for all installation situations, even the most complex; in its original configuration, it can be used to control and regulate 2 direct circuits and up to 2 circuits with mixing valve (by adding 2 optional flow sensors). Add a PCB + sensor to be able to actuate a 3rd circuit with mixing valve. A DHW sensor can be fitted to enable priority regulation of a DHW circuit. It is specially designed to allow optimisation of combined systems. This control panel can also be used to control an installation in cascade configuration. It is possible to connect 3 circuits to each of the boilers in the cascade. With an external controler cabinet, the boiler temperature can be controlled by means of a 0-10V input fitted on this panel as standard.

ECO SOLUTIONS
Eco-conception by De Dietrich

De Dietrich ECO-SOLUTIONS give you the latest generation of multi-energy products and systems: simpler, more efficient and more economical to guarantee your comfort and protect the environment.

The energy label associated with the ECO-SOLUTIONS label indicates the product performance.

www.dedietrich-heating.com



MODELS AVAILABLE

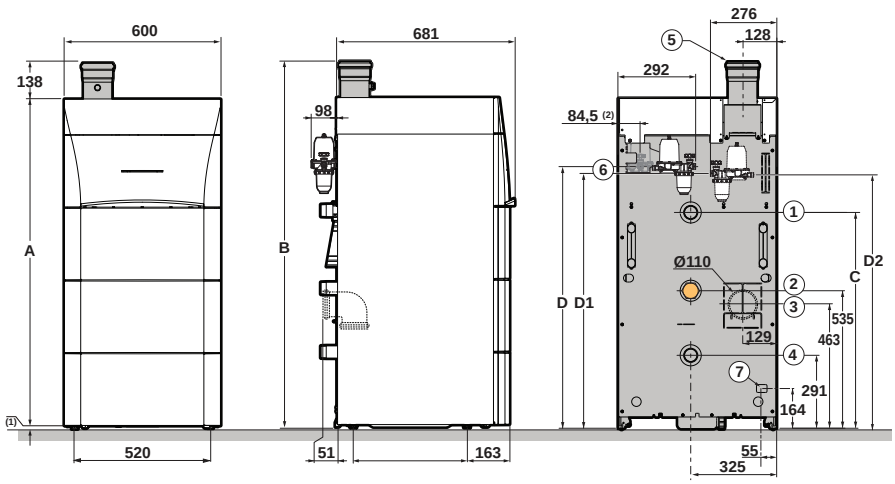
BOILER		MODEL	USEFUL OUTPUT IN HEATING MODE AT 50/30°C (KW)	USEFUL OUTPUT IN DHW MODE AT 80/60°C (KW)
PROJECT				
A  AFC_Q0033	Single body: for heating only	PFC 45	29/46.5	27.4/44.5
A  AFC_Q0033		PFC 60	37.9/58.8	35.9/56.4
 AFC_Q0028	Double body: for heating only	PFC 90	57.8/92.5	54.6/88.6
 AFC_Q0028		PFC 120	75.6/117.6	71 .7/114.7

ENERGY LABELLING

Each **MODULENS O® Pro PFC 45/60 boiler** is supplied with its energy label. This contains a host of information: energy efficiency, annual energy consumption, name of manufacturer, noise level…
By combining your boiler with for example a solar system, a DHW storage tank, a control system or even another generator…, you can improve the performance of your installation and generate a "System" label corresponding to your installation:
visit our site "www.dedietrich-heating.com"

MAIN DIMENSIONS (MM AND INCHES)

PFC 45/60

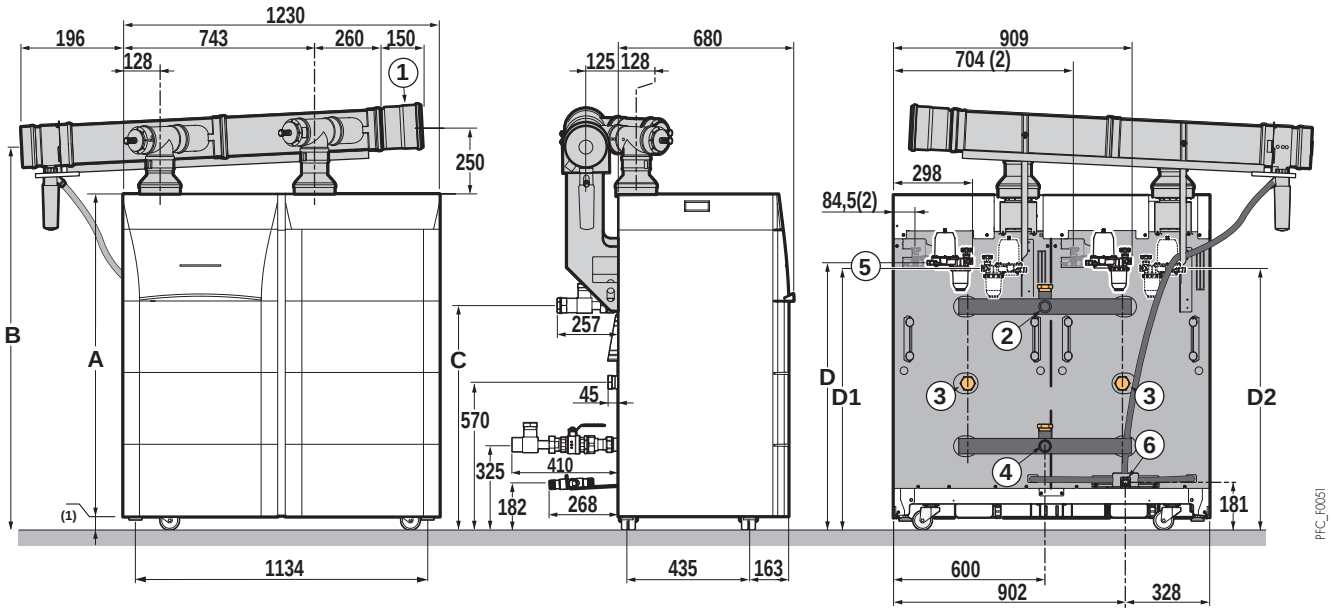


DIMENSIONS (IN MM)	A	B	C	D	D1	D2
PFC 45	1266	1404	833	1066	1006	976
PFC 60	1545	1683	1013	1345	1285	1226

KEY

① Heating flow G1"1/2
② Heating return (second return for radiators circuit or tank filling) G1"1/2
③ Flue gas bottom connection (optional) Ø 110 mm
④ Heating return (main return) G1"1/2
⑤ Flue gas connection Ø 110 mm
⑥ Oil supply G3/8
⑦ Condensate discharge
(1) Adjustable feet, from 0 to 20 mm
(2) If fitting the oil filter with deaerator inside the casing

PFC 90/120



Dimensions (in mm)	A	B	C	D	D1	D2
PFC 90	1300	1513	868	1101	1041	1002
PFC 120	1579	1792	988	1380	1320	1281

KEY

① Flue gas duct adapter Ø 150 -160 mm
② Heating flow G1"1/2
③ Heating return (second return for radiators circuit or tank filling) G1"1/2
④ Heating return (main return) G1"1/2
⑤ Oil supply G3/8"
⑥ Condensate discharge
(1) Adjustable feet, from 0 to 20 mm
(2) If fitting the oil filter with deaerator inside the casing

TECHNICAL SPECIFICATIONS
OF THE BOILERS

TECHNICAL SPECIFICATIONS AND PERFORMANCES

Boiler type: condensing
Burner: built-in blown
Energy used: oil
Combustion evacuation: chimney
Min. average operating temperature (min. op.): 20 °C
Max. average operating temperature (max. op.): 85 °C
Max. working temperature: 90°C

Max. operating pressure: 4 bar
Settable thermostat: from 30 to 85 °C
Safety thermostat: 105°C
Homologation: B_{23}, B_{23P}
"CE certificate" ref.: CE-1312CN5691
International Protection marking: IP 21

MODEL

			45	60	90	120
Useful output	- nominal determined at Q_{nom} (2)	kW	44.5	58.4	88.6	116.5
	- intermediate at 30 % Q_{nom} (2)	kW	14	18.4	27.3	36.6
Nominal output (Pn) at 50/30°C		kW	46.5	58.8	92.5	121 .5
Efficiency in % LHV, load…% and water temp …%	- 100 % Pn, at ave. temp. 70°C	%	98.2	98.1	98.1	98.0
	- 30 % Pn, at ave. temp. 30°C	%	102.9	102.8	102.8	102.7
Seasonal energy efficiency: Product SEE (without control system)		%	90	90	-	-
Seasonal energy efficiency: Product SEE (with outdoor temperature sensor provided)		%	92	92	-	-
Useful efficiency at …% of the nominal heat output	- 100 %: Eta 4	%	-	-	91 .7	91 .6
	- 30 %: Eta 1	%	-	-	96.1	96.0
Nominal output range at	- 50/30 °C	kW	29.0-46.5	37.9-58.8	57.8-92.5	75.6-121 .6
	- 80/60 °C	kW	27.4-44.5	35.9-56.4	54.6-88.6	71 .7-116.5
Water content		l	52	65	109	135
Shutdown losses at Δt = 30K		W	128	150	245	285
Electrical output of auxiliaries (exc. circulating pump) at Q_{nom}		W	320	440	598	764
Electrical output of auxiliaries in standby		W	9	9	14	14
Pressure available at nozzle		Pa	46	77	35	57
Weight (empty)		kg	155	175	340	380

Values at nominal output (top of range output) and CO_2 = 12 % with oil.
(2) Qnom = nominal heat flow rate

TYPE OF OIL USABLE

	MAXIMUM VISCOSITY
NRD Non-road diesel which can contain up to 7 % **EMAG** (1)	6 mm^2/s at 20 °C
Standard oil	6 mm^2/s at 20 °C
Low-sulphur content oil	6 mm^2/s at 20 °C
Bio-oil B10 Mix of low-sulfur content oil (<50 mg/kg) with 5.9 to 10.9 % added **EMAG** (by volume)(1)	6 mm^2/s at 20 °C
Bio-oil B5 (or Bio 5) Mix of low-sulfur content oil (<50 mg/kg) with 5.9 to 10.9 % added **EMAG** (by volume) (1)	6 mm^2/s at 20 °C

(1) Liquid oil products - Methyl ester fatty acids used as a heating fuel.

REFERENCE SCALE FOR THE SYSTEM ENERGY LABEL (PFC 45 AND 60)

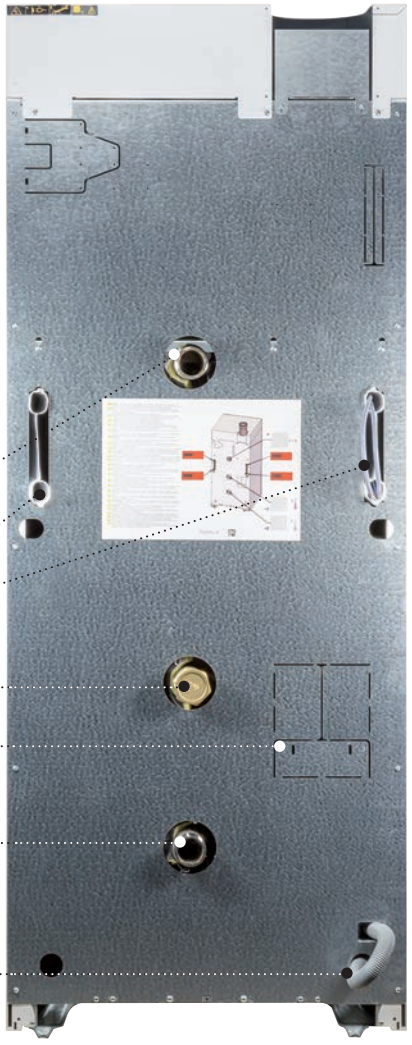


The scale valid for the MODULENS O® PRO system energy label is given opposite, to be able to situate the product and its energy performances (the scale excluding the generator system would be from A++ at G in heating).

DESCRIPTION

PFC 45





DESCRIPTION

PFC 45
(fascia removed)



CLOSE-UP OF STEP BUILT INTO PFC 60 AND PFC 120

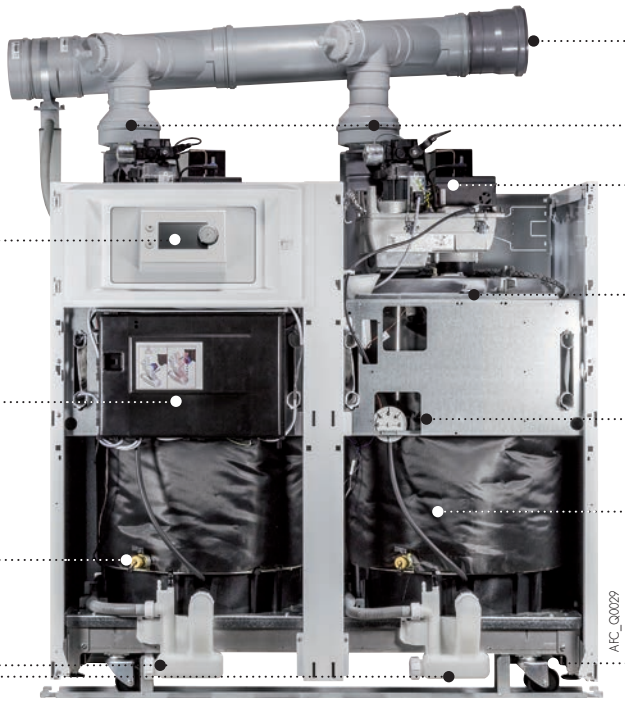


AFC_Q0037

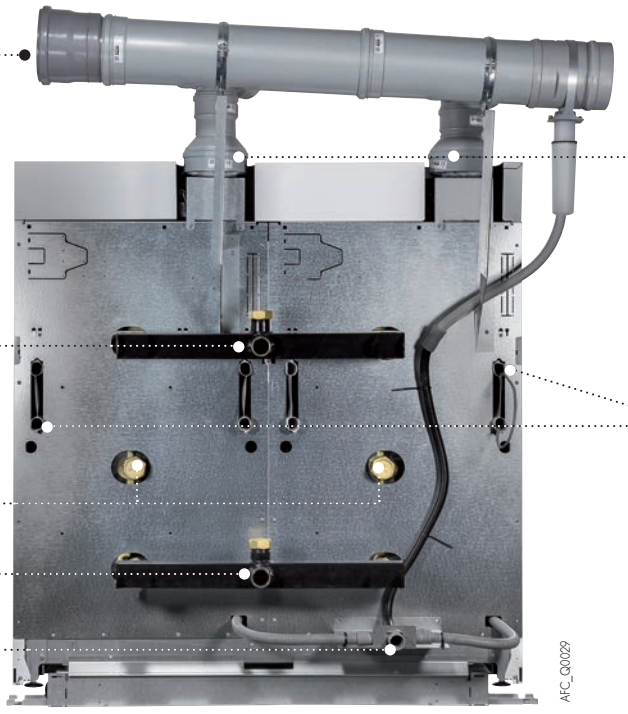


DESCRIPTION

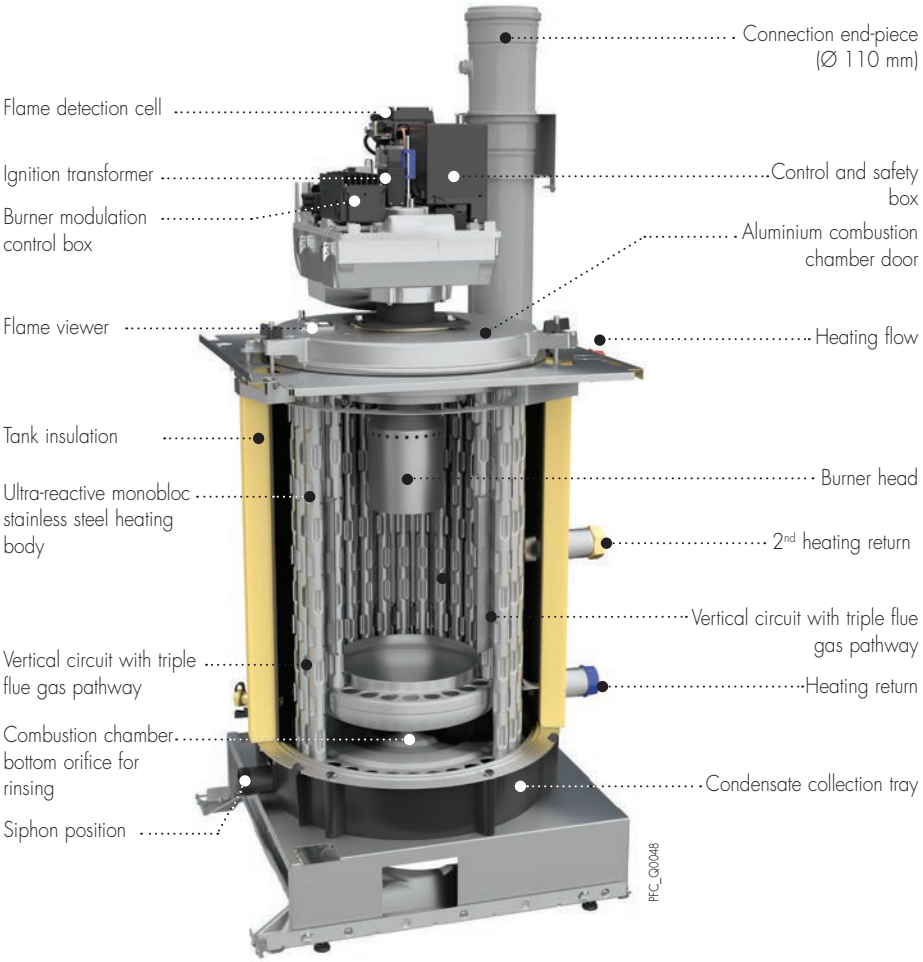
PFC 90
(fascias removed)



PFC 90
(rear view)

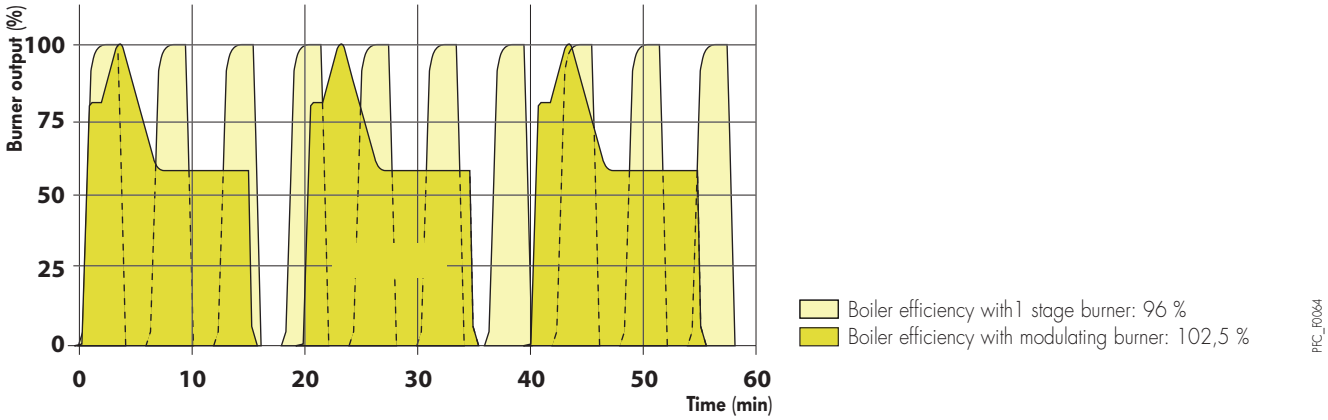


CLOSE-UP OF MONOBLOC STAINLESS STEEL HEAT EXCHANGER



The **all-new design burner features a wide modulation range** (from 59 to 100 %), and is controlled via a BUS connected to the boiler.
The optimised combustion system also reduces CO and NOx emissions and electrical consumption, providing a **6 to 8 % gain in useful efficiency at 50/30 °C** over a 1-stage burner.

EXAMPLE: for a heating requirement with a load rate of 50% of the burner output. For a one-hour period, with a PFC boiler



Over one hour, the PFC's modulating burner will start only 3 times to supply the necessary output. Within the same time, a conventional 1-stage burner would have started 10 times.

THE DIEMATIC EVOLUTION CONTROL PANEL

The DIEMATIC EVOLUTION control panel is a highly advanced panel with new ergonomic controls, with a built-in programmable electronic control system as standard which modulates the boiler temperature by acting on the **modulating burner**, based on the outdoor temperature and possibly the room temperature if an interactive remote control (supplied as an option) is connected.

As standard, the **DIEMATIC EVOLUTION** is able to automatically run a central heating system with two direct circuits without mixing valve and 1 circuit with mixing valve (however the flow sensor - package AD199 - must be ordered separately).

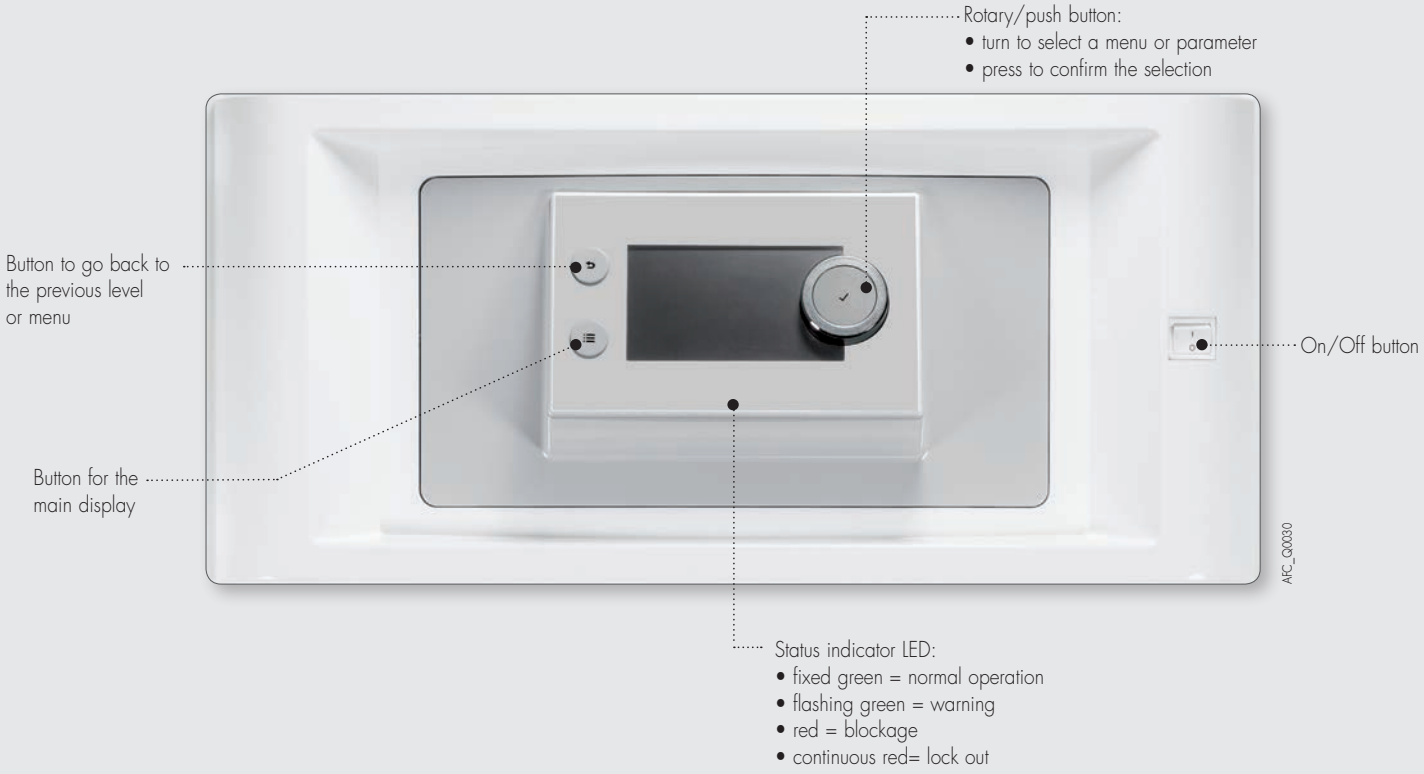
Hence by connecting 1 more "PCB + sensor for 1 valve circuit" option (package AD249), it will be possible to control up to 3 circuits in total, and each of these circuits can be equipped with a remote control (optional)

Connecting a domestic hot water sensor can be used to program and regulate a DHW circuit (package AD212 - option).

This control system has been specifically developed to enable **optimal management of systems combining different heating generators** (boiler + heat pump or + solar system…). It allows the installer to configure the entire heating system, no matter how complex.

For larger installations, it is also possible to connect from 2 up to 7 boilers in cascade configuration.

The **DIEMATIC EVOLUTION** panel will then be used as the master for the installation, with the slave boilers equipped with the same control panel. To connect more than the 3 circuits available on the master boiler. We can connect 3 other circuits to the other boilers in the cascade.



DIEMATIC EVOLUTION CONTROL PANEL OPTIONS



SENSOR FOR DOMESTIC HOT WATER (LENGTH 5 M) - PACKAGE AD212

It is used to regulate with temperature priority and program domestic hot water production via an accumulator tank.



FLOW SENSOR DOWNSTREAM OF VALVE (LENGTH 2.5 M) - PACKAGE AD199

This sensor is necessary for connecting the 1st circuit with mixing valve on a boiler equipped with the DIEMATIC EVOLUTION control panel.



PCB + SENSOR FOR 1 MIXING VALVE - PACKAGE AD249

It is used to control a mixing valve with an electromechanical or electrothermal motor. The board is installed in the DIEMATIC EVOLUTION panel, and is connected using plug-in connectors. DIEMATIC EVOLUTION can house 1 "PCB + sensor" option, enabling it to control 1 additional mixing valve.

DIEMATIC EVOLUTION

CONTROL PANEL OPTIONS



SMART TC° CONNECTED ROOM THERMOSTAT (WIRED R-BUS) - PACKAGE AD324

The SMART TC° connected room thermostat is designed to be connected to our MODULENS O PRO boilers using an R-BUS cable. It is used to remote control the heating and domestic hot water via a free to download application easy for the user to learn, with the option of enabling a professional to access their installation.



WIRED PROGRAMMABLE ROOM THERMOSTAT - PACKAGE AD137
WIRELESS PROGRAMMABLE ROOM THERMOSTAT - PACKAGE AD200
NON-PROGRAMMABLE ROOM THERMOSTAT - PACKAGE AD140

These thermostats enable weekly programming and regulation of the heating by acting on the burner according to various operating modes:
AUTOMATIC: depending on the programming.
PERMANENT: at a set temperature .
HOLIDAY: the "wireless" version is delivered with a receiver box to be mounted on the wall close to the boiler.
The non-programmable thermostat is used to regulate the room temperature based on the set point, by acting on the burner.



SENSOR FOR BUFFER TANK (LENGTH 5 M) - PACKAGE AD250

Comprises 1 sensor for managing a buffer tank with a boiler equipped with a DIEMATIC EVOLUTION control panel



S-BUS CABLE WITH PLUGS, 1.5 M - PACKAGE AD308
S-BUS CABLE WITH PLUGS, 12 M - PACKAGE AD309
S-BUS CABLE WITH PLUGS, 20 M - PACKAGE AD310

Used to connect boilers in cascade installations.



S-BUS TERMINATIONS - PACKAGE AD321



DIEMATIC VM EVOLUTION CONTROL SYSTEM (WALL-MOUNTED) - PACKAGE AD315

The VM DIEMATIC EVOLUTION electronic control system, built into a wall unit, is used to control and regulate 3 heating circuits and 2 DHW circuits; each of the heating circuits can be a direct circuit or a circuit with a 3-way motorised mixing valve. It is possible to link together up to 8* DIEMATIC VM EVOLUTION control systems, thereby creating numerous combinations, regardless of the installation type. VM DIEMATIC VM EVOLUTION can be used in relation with one generator equipped with DIEMATIC EVOLUTION
* 1 "master" control system + 7 "slave" control systems.



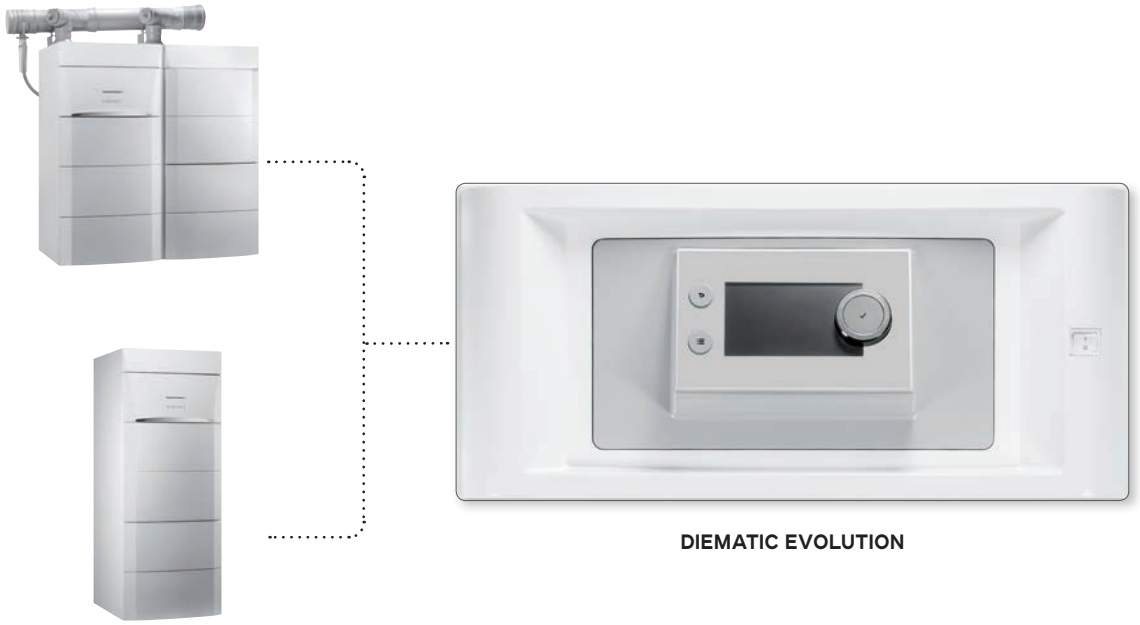
BUS CONNECTION CABLE (12 M LONG) - PACKAGE AD134

It provides the link between the wall-mounted VM DIEMATIC iSystem control system and the boiler's DIEMATIC panel.

CHOICE OF **CONTROL PANEL**

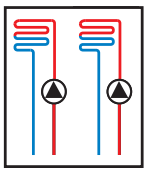
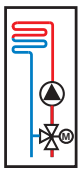
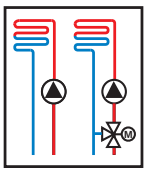
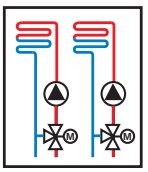
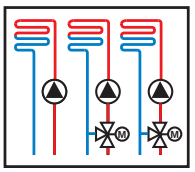
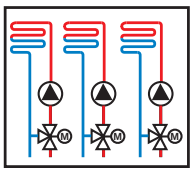
DIEMATIC EVOLUTION

INSTALLATION WITH ONLY 1 BOILER



DIEMATIC EVOLUTION

FOR REGULATING ONE CIRCUIT

2 x direct	valve	direct + 1 valve	2 x valve	direct + 2 x with valve	3 x with valve
					
OPTIONS					
as standard	1 flow sensor AD199 	1 flow sensor AD199 	2 flow sensors AD199 	1 flow sensor AD199  + 1 PCB AD249 	2 flow sensors AD199  + 1 PCB AD249 

DHW PRODUCTION

The DIEMATIC EVOLUTION control panel includes the "priority DHW" function, and so can be supplemented by 1 or 2 DHW sensors - package AD212 for controlling one or 2 independent tanks.

CASCADE INSTALLATION OF 2 BOILERS





DIEMATIC EVOLUTION

DIEMATIC EVOLUTION CONTROL PANEL FOR THE 1ST BOILER IN THE CASCADE (MASTER BOILER) AND FOR EACH OF THE SLAVE BOILERS.



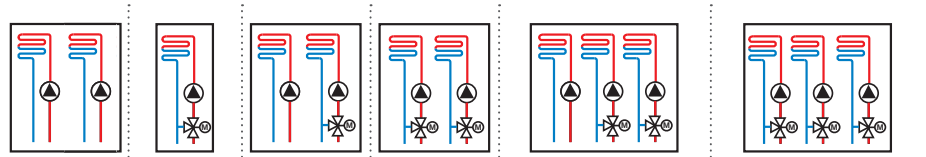
Boiler 1 PFC…
with DIEMATIC EVOLUTION panel (master)

BUS



Slave boilers 2 PFC…
with DIEMATIC EVOLUTION panel

To connect more than 3 heating circuits to a cascade installation, the additional circuits will need to be connected to one of the slave boilers in the cascade (see example of hydraulic diagram on pages 22 and 24).



2 x direct	valve	direct + 1 valve	2 x valve	direct + 2 x with valve	3 x with valve
OPTIONS					
as standard	1 flow sensor AD199	1 flow sensor AD199	2 flow sensors AD199	1 flow sensor AD199 + 1 PCB AD249	2 flow sensors AD199 + 1 PCB AD249

Management of circuits 4, 5 and 6, if applicable (see above)

BOILER OPTIONS



BLC_Q0001A / BPB_Q0001A/RSB_Q0004A

DOMESTIC HOT WATER PREPARATION

The De Dietrich independent tanks in the B… series, with a capacity of 150 to 3000 litres, enable production of domestic hot water for individual and collective housing, and industrial and commercial premises. The specifications and performance of these tanks are given in the price catalogue and respective technical brochures.


MCA_Q0138

LOW-LOSS HEADER - 60/60 - PACKAGE GV45
- 80/60 - PACKAGE GV46

For any installations with several circuits or for cascade installations, the use of a low-loss header is strongly recommended. The headers are provided with insulation and fitted with a wall-mounting bracket and an accessories kit comprising a plug, an air vent and a drain valve.


GTUC120_Q0003 + GTUC120_Q0001

CONDENSATES NEUTRALISATION STATION - PACKAGE FM155

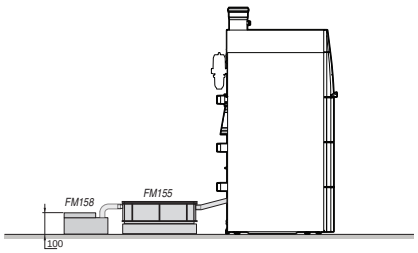
Supplied with a charcoal (0.5 kg) and marble granules (5 kg) filter. There must be a gravitational condensate flow between the boiler and station.

CARBON (0.5 KG) AND MARBLE GRANULES (5 KG) FILTER REFILL FOR NEUTRALISATION STATION - PACKAGE FM156

LIFT PUMP FOR NEUTRALISATION STATION - PACKAGE FM158

There must be a gravitational condensate flow between the boiler and neutralisation station.

installation diagram

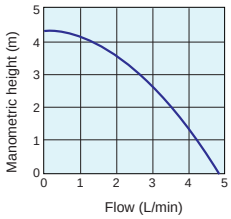


PFC_F0025

PFC

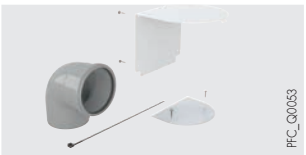
STATION BASE
height 50 mm
to be created

specifications of lift pump (package FM158)



GTUC120_F0007A

Since the condensate produced by oil combustion is acidic (pH 2), it is strongly recommended to install a station for neutralising the condensate before discharging it into the wastewater network (possibly obligatory depending on the region). During the annual maintenance operations, you must in particular check the effectiveness of the granules via a pH measurement: the charcoal and granules filter must be replaced once the pH drops below 6.5.


PFC_Q0053

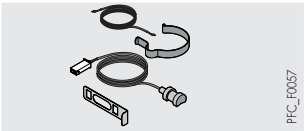
REAR OUTLET KIT FOR PFC 45/60 - PACKAGE MV102

For a PFC 45/60 chimney connection, this kit enables the flue gas connection to the rear of the boiler (marked 3 on the dimensional diagrams on page 4). It comprises a flue gas connection elbow and a blanking plate for the boiler top panel. It is fitted after removing the existing flue gas discharge tube and air supply pipe.


PFC_Q0052

SECOND RETURN HYDRAULIC MANIFOLD KIT FOR PFC 90/120 - PACKAGE MV134

The kit comprises: a stop valve for each return (x2), an insulating shell for the manifold and insulating sleeves on each return.


PFC_F0057

CABLE FOR MODULATING PUMP - PACKAGE MV147

Pump not supplied, controlled by PWM signal.


PAC_Q9119

NON-RETURN VALVE Ø 110 MM FOR PFC 45/60 CASCADE - PACKAGE MV136

BOILER OPTIONS

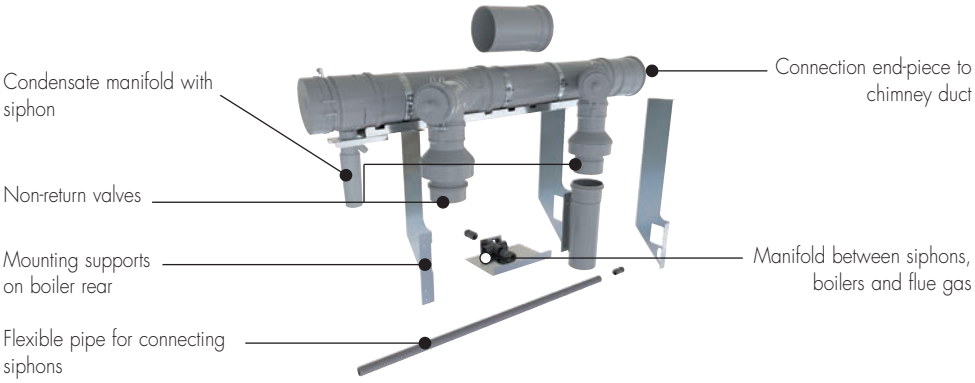


NON-RETURN VALVE Ø 100 MM FOR PFC 45/60 CASCADE - PACKAGE MV145



FLUE SYSTEM FOR PFC 45/60 CASCADE - PACKAGE MV146

Set of flue gas ducts enabling 2 PFC 45 or 60 boilers to be connected in cascade. The set comprises: 2 non-return valves, a condensate manifold with flexible pipe, a connection end-piece to the chimney duct, metal supports to be mounted on the rear part of the boilers.



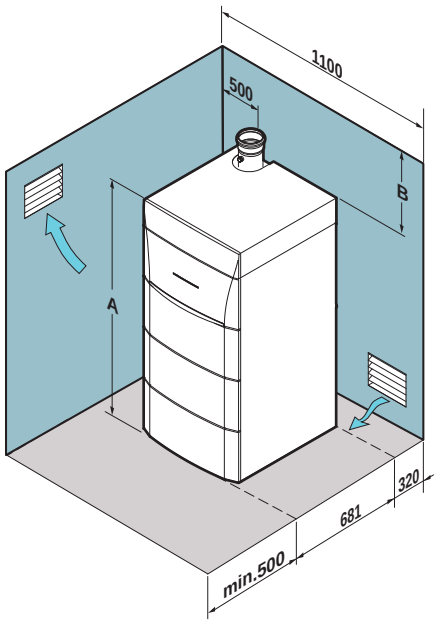
STATUTORY GUIDELINES FOR INSTALLATION AND MAINTENANCE

Installation and maintenance of the appliance, in both residential buildings and establishments open to the general public, must be performed by a qualified professional in accordance with the relevant statutory guidelines and good industrial practice.

INSTALLATION IN BOILER ROOM

The dimensions given are the minimum recommended to ensure sufficient access around the boiler. Note: To facilitate sweeping of the boiler heating body flue gas outlet, we recommend favouring accessibility on the boiler fascia. The PFCs will be installed in a frost-protected ventilated room as per the heating system installation rules defined in the prevailing standards. PFC 90/120 with useful output > 70 kW will be installed in dedicated boiler rooms, outside of inhabited areas.

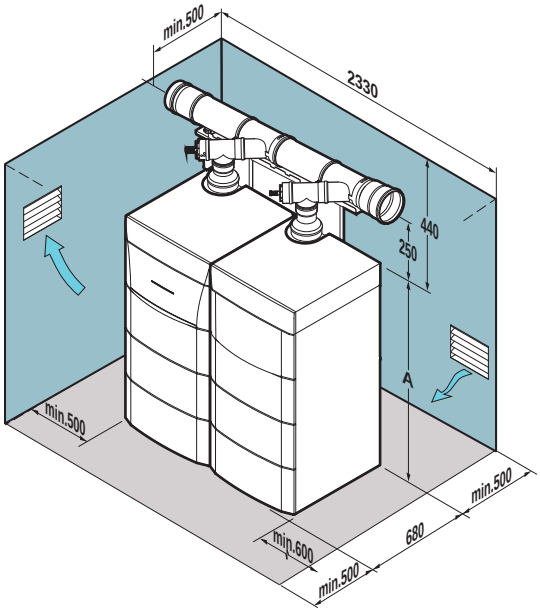
• PFC 45 AND 60



PFC_F0002

	PFC 45	PFC 60
A (mm)	1265	1545
B (mm)	345	440

• PFC 90 AND 120



PFC_F0004

	PFC 90	PFC 120
A (mm)	1300	1579

In order to avoid damage to the boilers, it is necessary to prevent the contamination of combustion air by chlorine and/or fluorine compounds, which are particularly corrosive.
These compounds are present, for example, in aerosol sprays, paints, solvents, cleaning products, washing products, detergents, glues, road grit, etc.
The following must therefore be ensured:
- Prevent the intake of air expelled by premises using such products: hairdressing salons, dry cleaners, industrial premises (solvents), premises containing refrigeration systems (risk of refrigerant leakage), etc.
- Avoid storing such products close to boilers.

We would like to underline that, should the boiler and/or peripheral equipment be corroded by chlorine and/or fluorine compounds, the contractual guarantee will be invalidated.

VENTILATION

The air inlets will be laid out, in relation to the top ventilation orifices, such that air renewal extends over the entire volume of the boiler room.

• PFC 45/60 (useful output ‹ 70 kW)
The minimum cross-sections and fresh air supply and air discharge locations are defined in the prevailing standards.

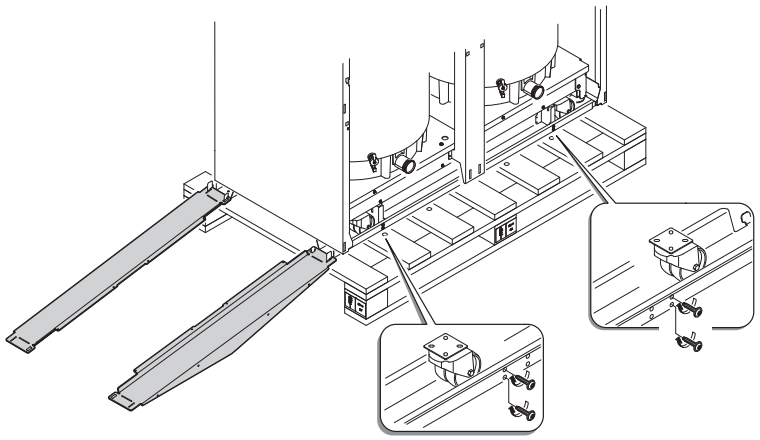
• PFC 90/120 (useful output ‹ 70 kW)
Room ventilation: With a type B_{23} chimney connection, the room ventilation cross-section (at the combustion air intake) must comply with prevailing standard.

BURNER RECOMMENDATIONS RELATING TO ALTITUDE

As burner output decreases with altitude, it may be necessary to adjust the burner settings and downgrade the boiler output.
Influence of altitude on burner output:
• PFC 45 and 90: no influence.
• PFC 60 and 120: no influence up to 2600 m*, then the output decreases by 0.6 kW in 100 m steps.
* Altitude determined at a combustion air temperature of 20 °C and atmospheric pressure of 1013 mbar at 0 m.

INSTALLATION

If possible, the boiler's protective packaging must only be removed once the boiler has reached its final installation location. Without packaging, the **PFC 45/60** boiler measures 60 cm in width, and can fit through all standard doors. The weight of the boiler exceeds the maximum weight which can be handled by one person; use of lifting equipment is recommended. To facilitate fitting the **PFC 90/120** boiler, it is equipped with wheels built into the chassis and with unloading ramps.



PFC_F0001

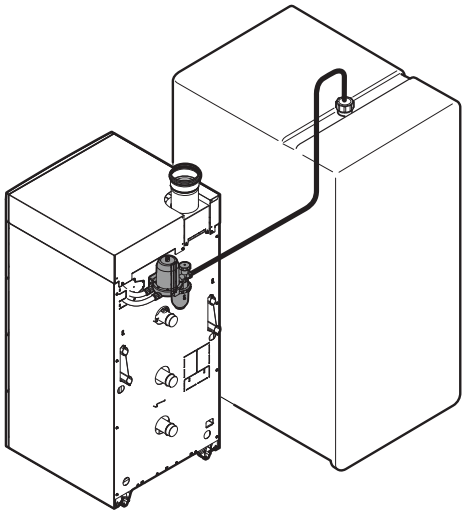
ELECTRICAL CONNECTION

It must comply with prevailing standards. The boiler must be supplied via an electrical circuit which includes an omnipolar switch with an opening gap of > 3 mm. Protect the network connection using a 6A fuse. Respect the polarities shown on the terminals: live (L), neutral (N) and earth. To help maintain the frost protection and anti-sticking functions of the pumps, we recommend that the boiler is not powered off using the mains switch. Depending on the quality of the power supply network, we recommend using an isolation transformer.

REMARKS:
• the sensor cables must be separated from the 230 V circuits by at least 10 cm,
• to help maintain the frost protection and anti-blocking functions of the pumps, we recommend that the boiler is not powered off using the mains switch.

OIL CONNECTION

The applicable regulations and provisions must be complied with. In every case, a single-tube system must be used, and the oil filter fitted with the deaerator and stop valve (supplied with the boiler). The vacuum pressure for the oil supply must be less than 0.035 MPa (0.35 bar). The domestic oil with an organic mix. The latter must not exceed 10 %. For the length and diameter of the oil pipes, please refer to the manual supplied with the filter package.



PFC_F0008

HYDRAULIC CONNECTIONS

IMPORTANT: Condensing boilers are based on the principle of recovering the energy contained in the steam from the flue gases (latent heat of vaporisation). Accordingly, to achieve an optimum annual operating efficiency, the heating surfaces must be sized so as to obtain low return temperatures, below the dewpoint (for example, underfloor heating, low temperature radiators, etc.). This must be ensured throughout the heating period. The boiler is equipped with two heating returns in order to separate the returns according to their temperatures. Hence the PFC boiler heating body will be irrigated and optimised to best harness the energy exchange performance of the flue gas to the heating water. At the boiler outlet, install a safety unit comprising: bleed valve and pressure gauge, before any isolation valve.

MINIMUM WATER FLOW RATE

The boiler's modulating control system limits the maximum temperature difference between the heating flow and return, as well as the boiler's rate of temperature increase. So a minimum flow rate is not required.

CONNECTION TO THE HEATING CIRCUIT

The PFC boiler must only be used in closed circuit heating systems. Before final filling, new installations must be cleaned to remove debris (copper, caulking, soldering flux) resulting from the set-up of the distribution networks and transmitters to prevent any deposits which could lead to malfunctions (noises in the installation, chemical reaction between the metals). If a new boiler is set up in a renovated boiler room, it is strongly recommended that the installation is cleaned-flushed before it is fitted. It may be necessary to install appropriate filters in some cases (see the BOILER ROOM EQUIPMENT leaflet). After such interventions, particular attention must be paid to the quality of the water used to fill the installation to ensure the new boiler can achieve the expected performances.

REQUIREMENTS RELATING TO HEATING WATER

		INITIAL COMMISSIONING	CONCENTRATION (BACK-UP)
Degree of acidity (untreated water)	pH	6.5 - 8.5	6.5 - 8.5
Degree of acidity (treated water)	pH	7.0 - 9.0	7.0 - 9.0
Conductivity at 25°C	µS/cm	≤ 500	≤ 500
Chlorides	mg/litre	≤ 50	≤ 50
Other components	mg/litre	< 1	< 1
Total water hardness	°f	5 - 35	≤ 15
	°dH	2.8 - 20.0	≤ 8.5
	mmol/litre (1)	0.5 - 3.5	< 1.5

water treatment:

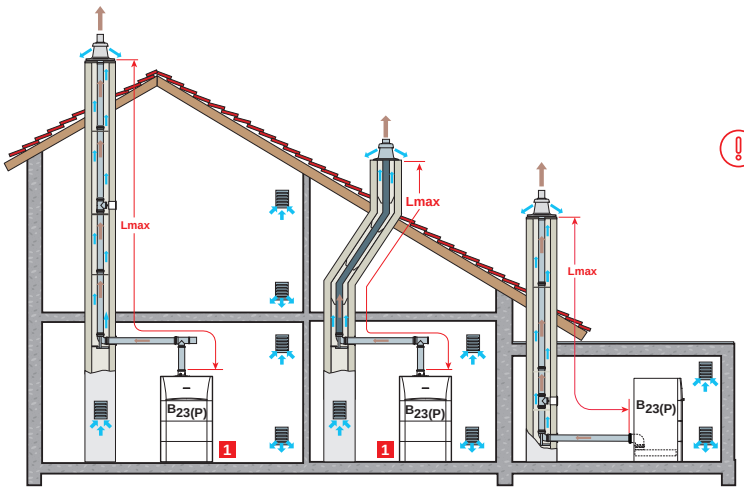
If, however, it is necessary to have the water treated to ensure it respects the filling water quality requirements, please consult: the prevailing standards. Contact a water treatment specialist who should be able to ensure that the water quality complies with the mix of materials present in the installation, taking all of its components into account.

CONDENSATE DISCHARGE

The siphon must be connected to the wastewater drainage system. The connector must be removable, and the flow of condensates must be visible. The connectors and pipes must be made from corrosion-resistant material. A condensate neutralisation system is available as an option (package FM155, see page 14).

FLUE GAS CONNECTION

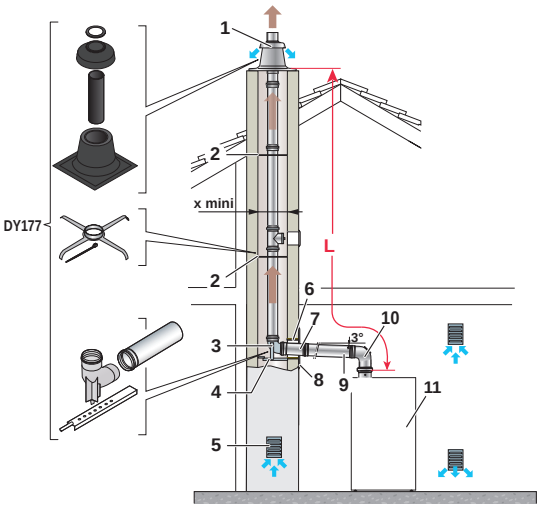
For information on how to set up the flue gas connection ducts and the installation rules, see the De Dietrich "flue system" brochure.



B_{23} and B_{23P} type rigid connection. Use package DY177.
B_{23} and B_{23P} type flexible connection. Use package DY888.

IMPORTANT
The flue gas configurations have to be conform to prevailing standards.

• PFC45/60 (Ø 110 mm)



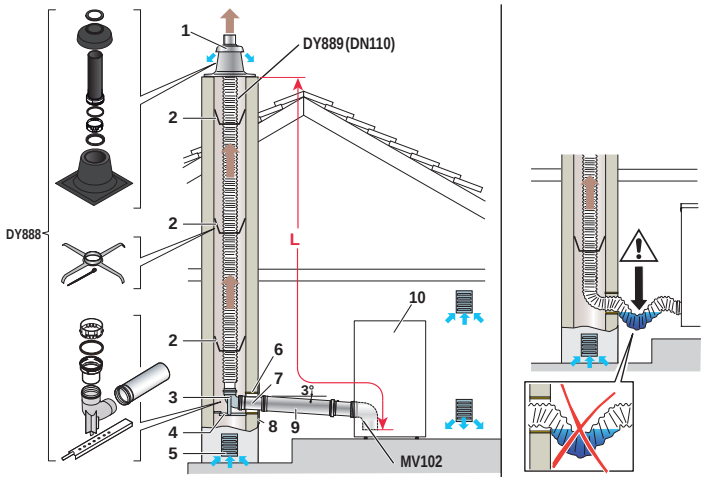
		Ø 110
X min.	⊠ mm	170
	Ø mm	190

KEY

1 Terminal with flashing
2 centring stars
3 87° elbow
4 Support rail
5 Ventilation grille (optional)
6 Sleeve - Ø 124 - Length 0.5 m (Option DY753)
7 Extension Ø 110 - Length 0.5 m
8 Finishing plate (Option DY879)
9 Extension Ø 110 (optional)
10 87° elbow
11 Boiler

PFC_F0005

IMPORTANT
The maximum lengths (L_{max}) shown in the table are valid for ducts with horizontal sections not exceeding one metre in total. For each additional horizontal metre of duct, you must apply a multiplier of 1.2 when calculating the total length L. The total length L is calculated by adding the flue gas pipe lengths and the equivalent lengths of the other components.
Always make sure that L is less than L_{max}.



maximum length in metres L_{max} (m)

	Ø 110 mm RIGID	Ø 110 mm FLEXIBLE
Lmax (m)	35	30

equivalent lengths of PP ducts (m)

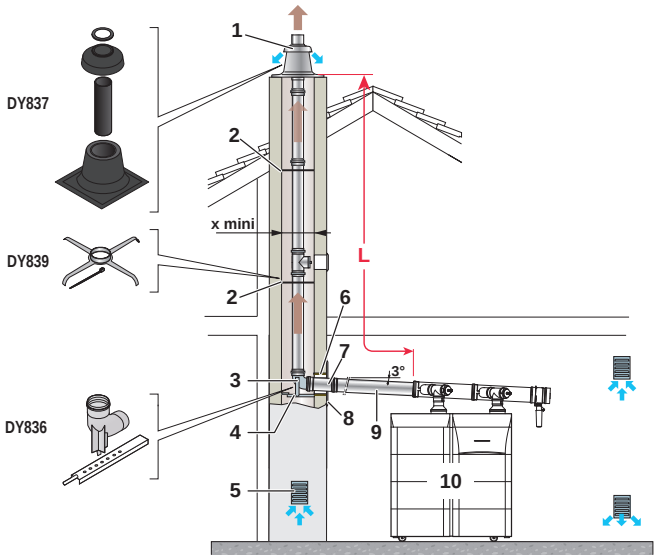
	Ø 110 mm
87° elbow	2
45° elbow	1.5
Straight inspection tube	0.5
87° inspection elbow	2

KEY

1 Terminal with flashing
2 centring stars
3 87° elbow
4 Support rail
5 Ventilation grille (optional)
6 Sleeve - Ø 124 mm - Length 0.5 m (Option DY753)
7 Extension Ø 110 mm - Length 0.5 m
8 Finishing plate (Option DY879)
9 Extension Ø 110 mm (optional)
10 Boiler + Option MV102

PFC_F0007

· PFC 90/120 (ø 160 mm)



B23P type rigid connection.
Use packages DY837, DY 839 and DY836.

		Ø 160
X min.	▱ mm	220
	Ø mm	240

maximum length in metres L_{max} (m)

	Ø 160 mm RIGID
Lmax (m)	35

equivalent lengths of PP ducts (m)

	Ø 160 mm
87° elbow	5
45° elbow	1.4
Straight inspection tube	0.9
87° inspection elbow	5

KEY

1 Terminal with flashing
2 centring stars
3 87° elbow
4 Support rail
5 Ventilation grille (optional)
6 Sleeve - Ø 164 mm - Length 0.5 m (option DY773)
7 Extension Ø 160 mm - Length 0.5 m
8 Finishing plate (option DY838)
9 Extension Ø 160 mm (optional)
10 Boiler

PFC_FC006

CAUTION
only factory components are permitted for connection to the boiler and for the terminal

IMPORTANT
The maximum lengths (L_{max}) shown in the table are valid for ducts with horizontal sections not exceeding one metre in total. For each additional horizontal metre of duct, you must apply a multiplier of 1.2 when calculating the total length L. The total length L is calculated by adding the flue gas pipe lengths and the equivalent lengths of the other components.
Always make sure that L is less than L_{max}.

INSTALLATION EXAMPLES

The examples shown below cannot include all of the possible installation scenarios that may be encountered. They are intended to draw attention to the basic rules to be respected. A number of safety and control components (including some built into PFC boilers as standard) are shown, though ultimate responsibility for providing the final safety and control components in the boiler room, based on its individual requirements, lies with the installers, consultant engineers and design offices. In every case, it is important to comply with the applicable regulations and adhere to good industrial practice.

CAUTION: When connecting on the domestic hot water side, if the distribution pipes are made from copper, a sleeve made from steel, cast iron or any other insulating material must be placed between the hot water outlet and these pipes in order to prevent any corrosion phenomena on the connections.

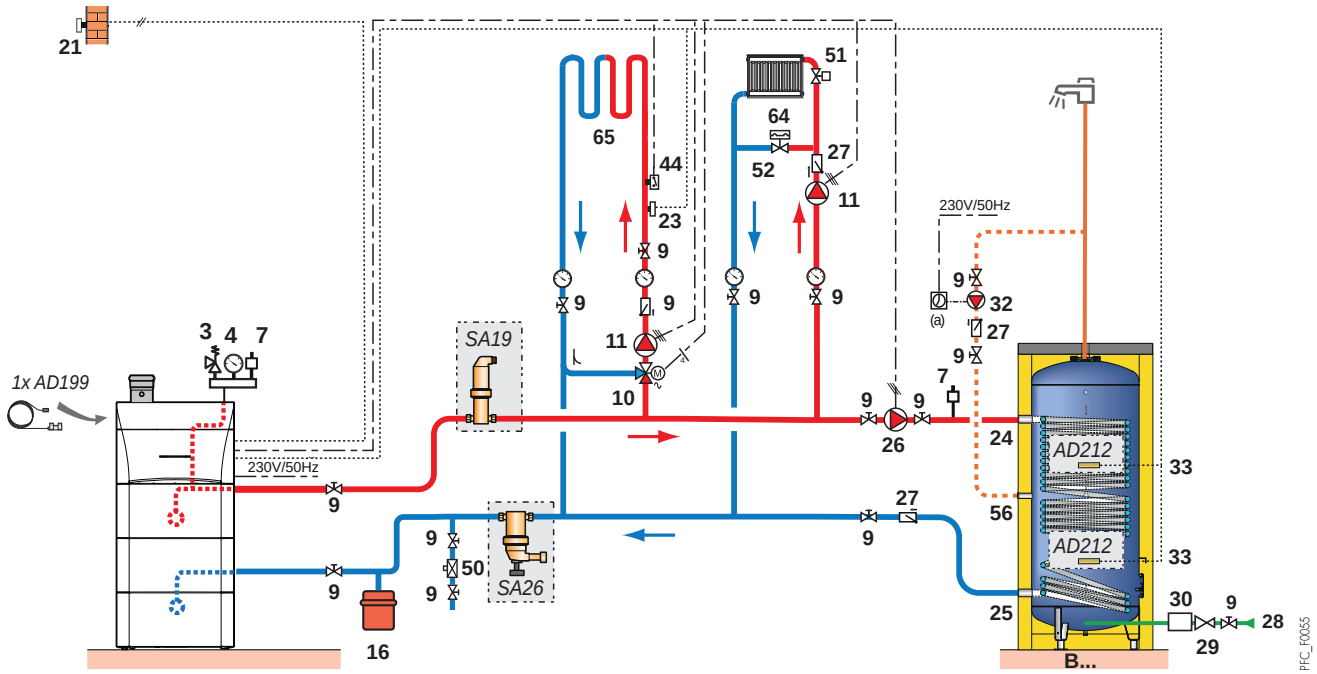
INSTALLING A PFC 45/60

with 1 direct circuit (radiator), 1 circuit with mixing valve and a DHW circuit with independent tank.

DHW production management with a B... tank.

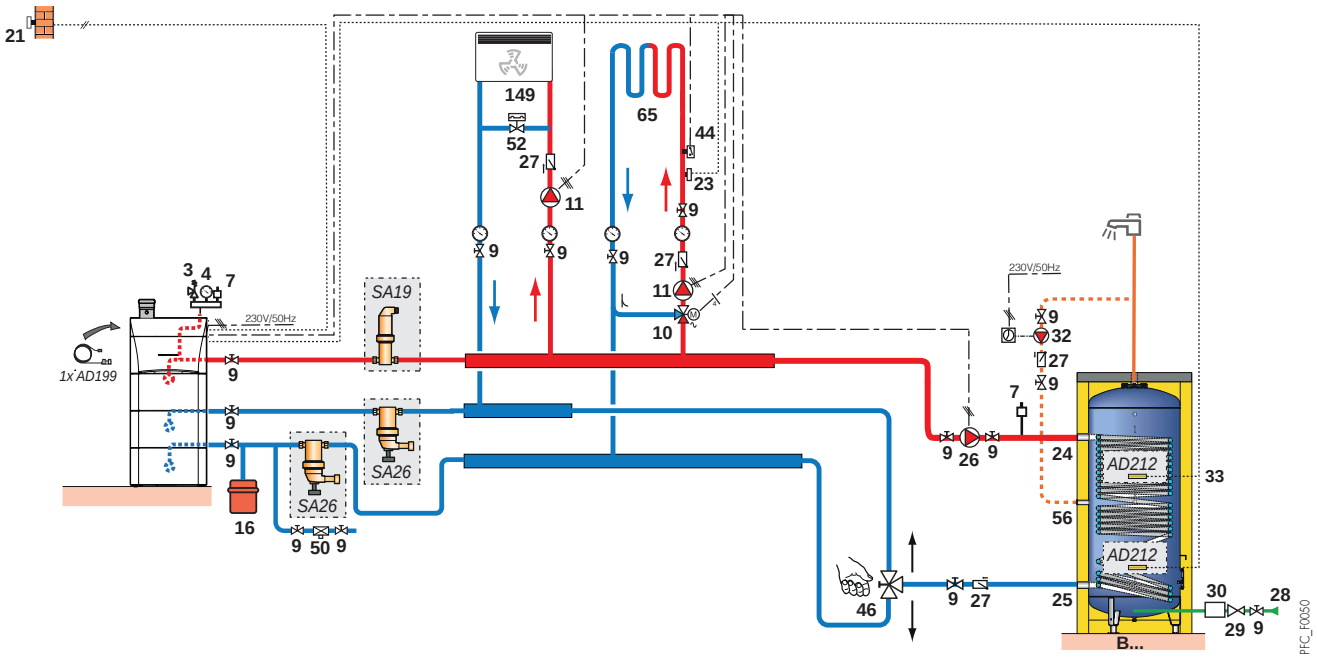
DHW production with a B... tank is managed by 2 temperature sensors:

- A high temperature sensor ensures the DHW temperature at the tank outlet.
- A low temperature sensor controls the boiler supplying the tank. Hence this enables the boiler to be restarted if need be, and ensures the condensation is used for high-performance DHW production.



INSTALLING A PFC 45/60

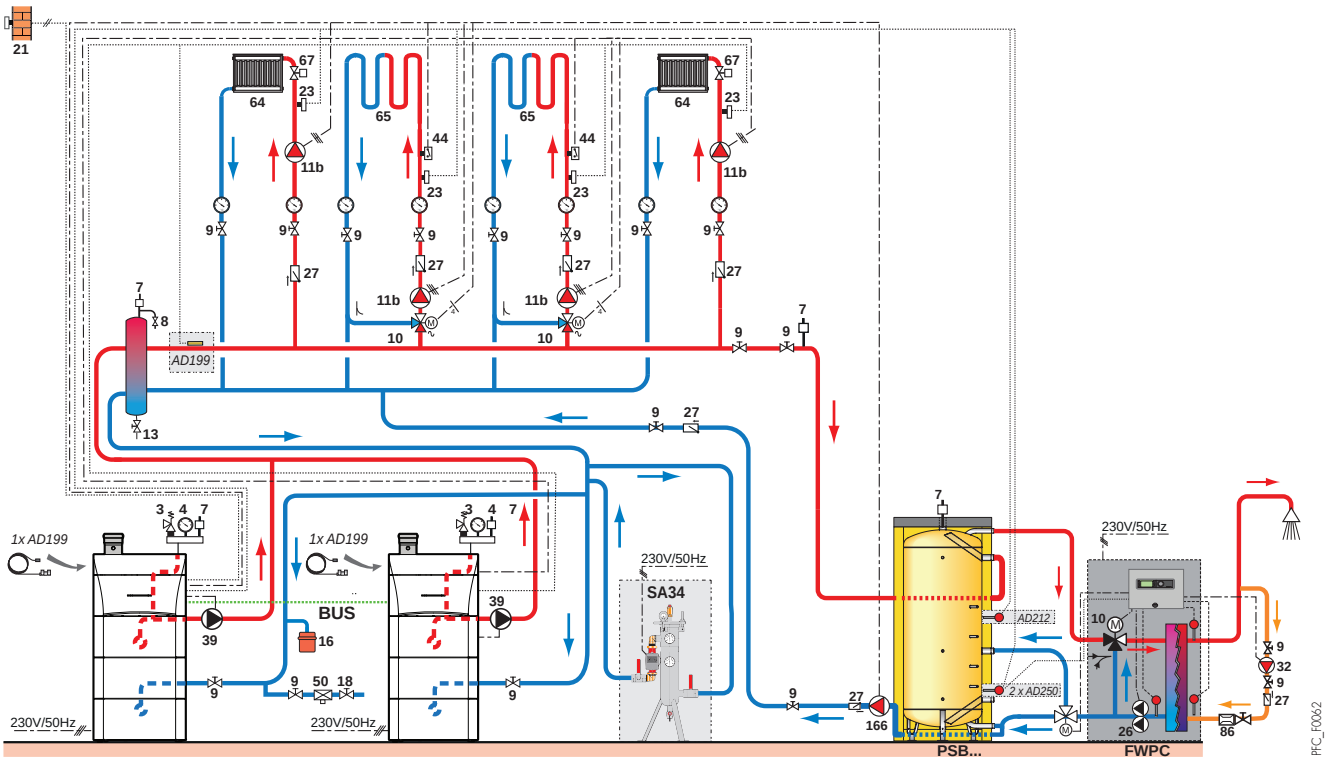
with 1 direct circuit (with convection fans), 1 circuit with mixing valve and a DHW circuit with independent tank.



KEY: see page 24

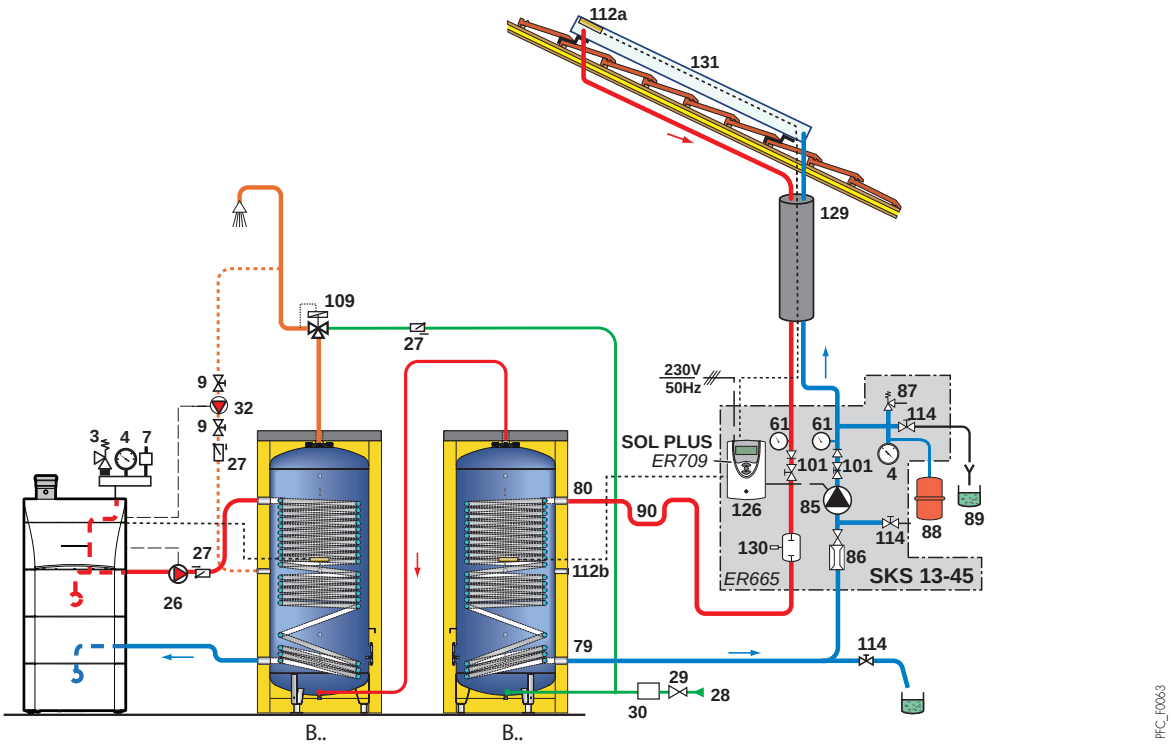
INSTALLING TWO PFC 45/60

2 PFC 45/60 boilers fitted in cascade configuration with 2 pumps and one low-loss header. Each of the boilers controlling: 1 radiator circuit and 1 circuit with mixing valve, and one circuit with an instantaneous domestic hot water tank



INSTALLING A PFC...

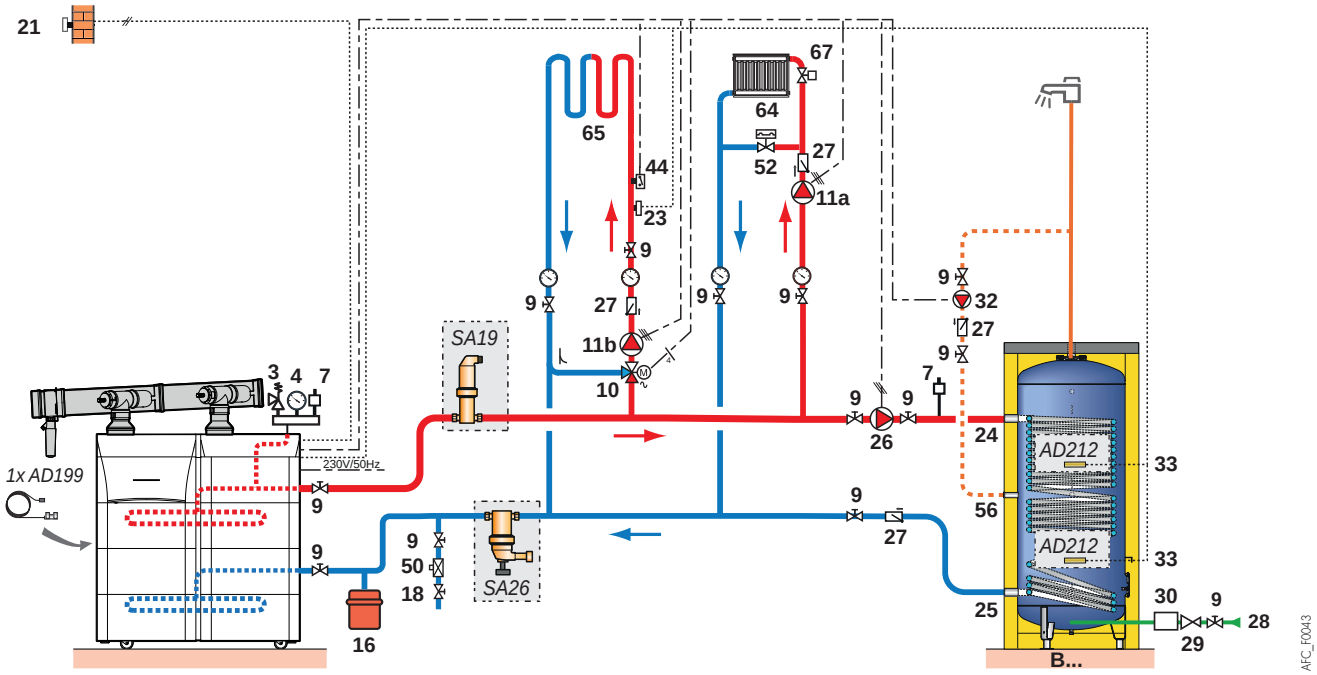
1 PFC boiler combined with a solar installation with a solar tank fitted in series with a back-up tank for DHW production.



KEY: see page 24

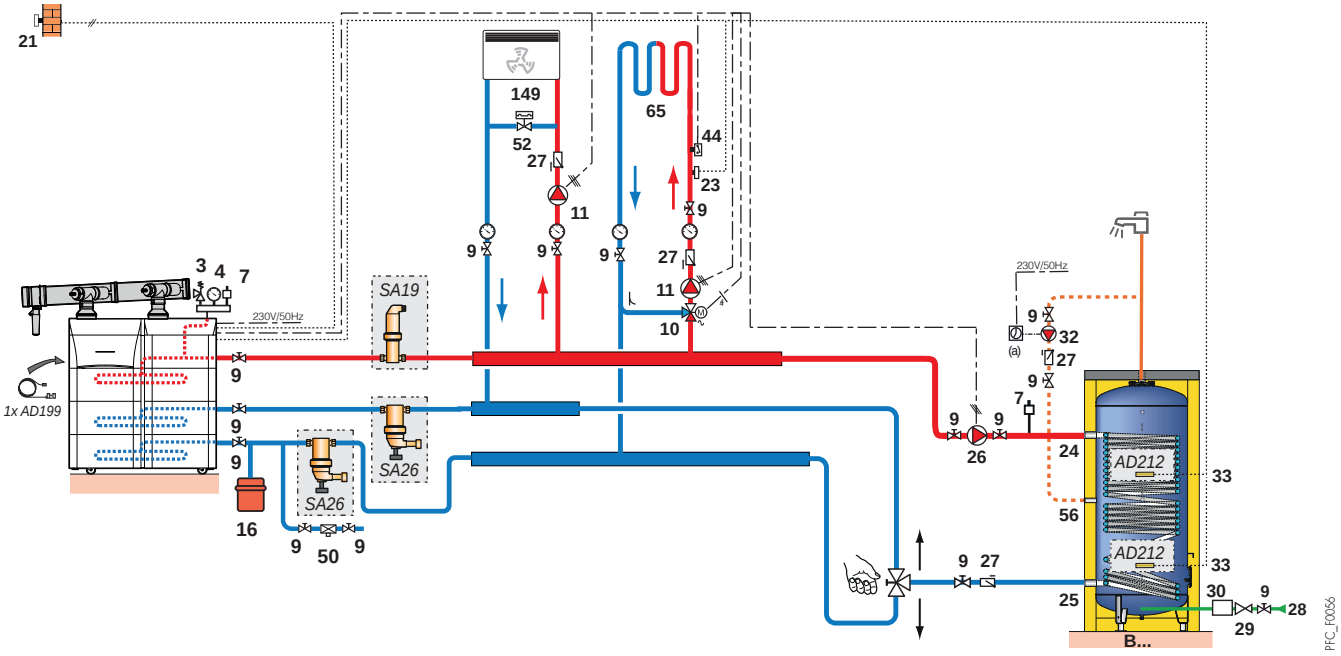
INSTALLING A PFC 90/120

with 1 direct circuit, 1 circuit with mixing valve, 1 DHW tank.



INSTALLING A PFC 90/120

with 1 direct circuit with fan coil (on 2nd boiler returns), 1 circuit with mixing valve, 1 DHW tank.

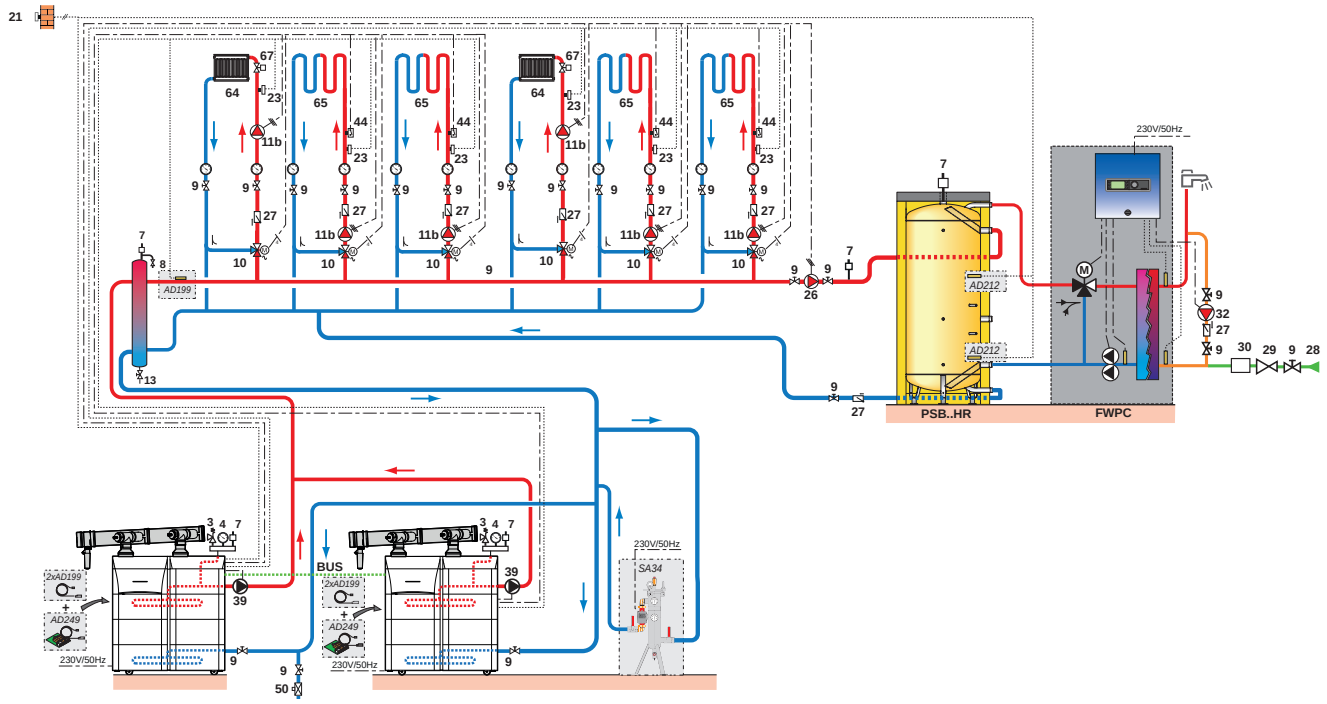


KEY: see page 24

INSTALLATION EXAMPLE

INSTALLING A PFC 90/120

2 boilers in cascade configuration with low-loss header, 6 circuits with mixing valves and one instantaneous domestic hot water tank.



KEY

3	3-bar safety valve
4	Pressure gauge
7	Automatic air vent
8	Manual air vent
9	Isolation valve
11	Electronic heating accelerator
11a	Electronic heating accelerator for direct circuit
11b	Heating accelerator for circuit with mixing valve
13	Flush valve
16	Expansion vessel
18	Heating circuit filling system
21	Outdoor temperature sensor
23	Flow temperature sensor downstream of mixing valve
24	DHW tank exchanger primary inlet
25	DHW tank exchanger primary outlet
26	Booster pump
27	Non-return valve
28	Domestic cold water inlet
29	Pressure reducer
30	Safety unit calibrated and sealed to 7 bar (1)
32	DHW circulation loop pump (optional)
33	DHW temperature sensor
35	Low-loss header
44	65°C limiter thermostat with manual reset for underfloor heating (DTU 65.8, NFP 52-303-1)
46	Three-way directional valve, 2 positions
50	Disconnector
51	Thermostatic valve
56	Domestic hot water circulation loop return
61	Thermometer
64	Radiator circuit (e.g. gentle heating radiators)
65	Low temperature circuit (e.g. underfloor heating)
67	Manual valve
79	Solar exchanger primary outlet
80	Solar exchanger primary inlet
85	Solar primary circuit pump
86	Setting the flow rate
87	Safety valve calibrated to 6 bar
88	Solar circuit expansion vessel
89	Container for solar fluid
90	Anti-thermosiphon loop
101	Non-return ball valve
112b	Solar tank DHW sensor
114	Solar primary circuit filling and draining system
126	Solar control system
130	Manual air vent degasser (Airstop)
166	Buffer tank pump

De Dietrich

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