

Ferrol

ECONCEPT 51-101-51A

Premix condensing heating modules
for cascading systems



mod. 51A



mod. 51-101

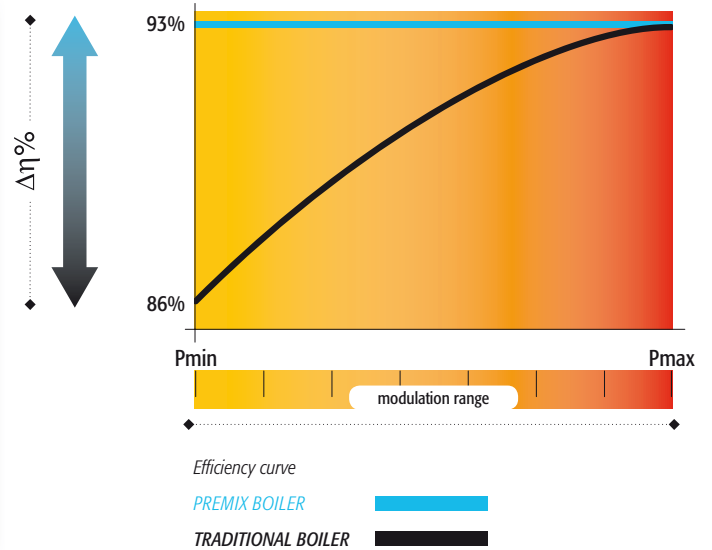
FERROLI condensing modules: top performances and lowest emissions

ECONCEPT 51-101-51A are high efficiency condensing generators, with extremely low polluting emissions, operating with natural gas or LPG. Each component has been studied in order to reach the maximum yield. The boilers are indeed **certified as 4 stars efficiency according to Directive 92/42 EEC** and **class 5 for Nox emissions according to Directive EN 297/A5**.

The generators keep unchanged the peculiar operating simplicity and reliability of FERROLI condensing products, thanks to FERROLI's long experience in the european market.

With **ECONCEPT 51-101-51A**, FERROLI fulfilled these three requirements, offering flexible and compact generators, enabling planning and carrying out of even elaborate circuits.





REVERSE FLAME CERAMIC BURNERS

ECONCEPT 51-101-51A feature premix **ceramic burners** with reverse micro-flames. Each burner is made up of six plates fastened via a special gasket to a metal frame capable of absorbing thermal expansion. These burners release **very low polluting emissions, in terms of both NO_x (class 5 according to EN 297/A5) and CO**. In the reality the NO_x emissions of **ECONCEPT 51-101-51A** are below 35 mg/kWh, which represent 50% of the emissions allowed by class 5. Besides small impact on the environment, this very small emission of polluting particles keeps the exchanger clean for a longer time, reducing to minimum the need of maintenance intervention.

HEAT EXCHANGERS

The highly efficient FERROLI fin and tubes aluminium heat exchanger, designed at our state-of-the-art research and development facility, yields efficiency values among the highest, reaching 109%. It is set out to ensure effective condensation of water vapour in the flue gas. The aluminium heat exchanger is designed to maintain its high performance characteristics over time, and is proven in long-life service – the optimum balance of highest efficiency and longest life.



ECONCEPT 51-101

Premix condensing gas generator, for indoor installation or outdoor in unsheltered place, featuring 4 stars efficiency according to Directive 92/42 EEC and class 5 emissions according to EN 297.

Modular structure consisting in a completely insulated vertical cabinet, available in painted steel (model 101) or satin stainless steel AISI 316 (model 101i), including a double combustion group for model 101 and single combustion group for model 51. Each combustion group consists in a aluminium heat exchanger and a pre-mix ceramic burner.

Already fit for side-by-side modular installation through master-slave connection, with no need of additional electronic controllers. Modulation of the cascade output is permanently monitored, from a minimum level corresponding to the single combustion unit's output up to the sum of maximum outputs of all the combustion units in the cascade system.

Continuous modulation of output from 11,2 kW to 48,8 kW for the single module ECONCEPT 51 (up to 97,6 kW for Econcept 101) and from 11,2 kW to 97,6 kW x n (where "n" is meant as the quantity of modules in the cascade) in case of installation of a cascade of ECONCEPT 101. Supplied with flow and return insulated hydraulic manifolds, in galvanised steel, DN 40; gas collector DN 50 and condensing discharge collector, in plastic material, 40 mm diameter.

Each combustion group is equipped with a 3-ways on-off relief valve, for maintenance operations and pump with 3 settable speeds and anti-blocking system. Possible interface to a personal computer through connection on control board.

Outdoor temperature compensation on CH flow temperature, via connection of outdoor probe.

Direct handling of CH and DHW pumps, CH flow sensor and DHW tank probe.

0-10V output from electronic board for remote handling of CH flow temperature.

Heating operating pressure 6 bar (max) - 0,8 bar (min).

Safety thermostat set at 100°C, temperature probes for CH flow and return, water pressure switch set to 0,8 bar are installed on each combustion group. Antifreeze protection for heating circuit set to 6°C.

Electric protection rating IPX5D.



MOD. 51-101 GALVANISED STEEL
MOD. 51 I - 101 I SATIN AISI 316 STAINLESS STEEL

3 WAYS DRAIN AND SHUT-OFF COCK



ECONCEPT 51A

Premix condensing gas generator, featuring 4 stars efficiency according to Directive 92/42 EEC and class 5 emissions according to EN 297.

Already fit for side-by-side modular installation through master-slave connection, with no need of additional electronic controllers. Modulation of the cascade output is permanently monitored, from a minimum level corresponding to the single combustion unit's output up to the sum of maximum outputs of all the combustion units in the cascade system itself.

Continuous modulation of output from 11,2 kW to 48,8 kW for the single module and from 11,2 kW to 48,8 kW x n (where "n" is meant as the quantity of modules in the cascade) in case of a cascade installation.

Pump with 3 settable speeds and anti-blocking system.

Hydraulic circuit of generator is suitable for connection to a free-standing DHW storage tank.

Possible interface to a personal computer connection on control board.

Outdoor temperature compensation on CH flow temperature, via connection of outdoor probe.

0-10V output from electronic board for remote handling of CH flow temperature or for remote handling of output of the single generator or the cascade system.

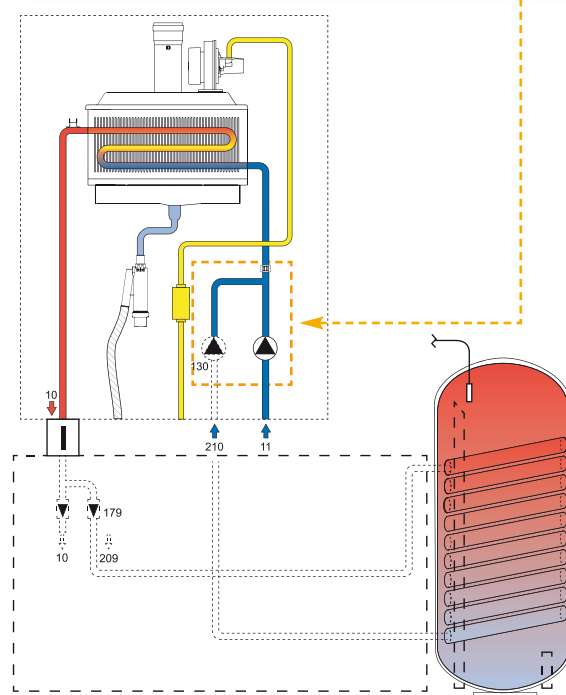
The generators' electronic board can manage 2 direct heating circuits or a direct circuit and a DHW tank. Monitoring of CH flow temperature in a secondary circuit after an hydraulic separator, by means of an CH flow probe (optional).

Heating operating pressure 6 bar (max) - 0,8 bar (min).

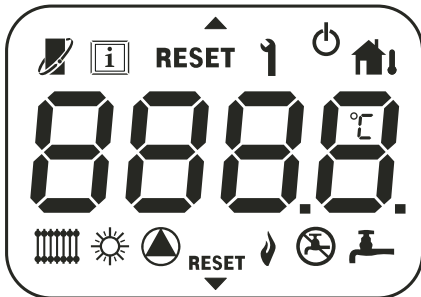
Safety thermostat set at 100°C, temperature probes for CH flow and return, water pressure switch set to 0,8 bar are installed on each combustion group.

Antifreeze protection for heating circuit set to 6°C.

Electric protection rating IPX5D.



EXAMPLE OF CONNECTION TO A DHW STORAGE WITH NTC PROBE MANAGED DIRECTLY BY BOILER'S ELECTRONIC BOARD



Key

- 1 Display
- 2 Central heating flow temperature
- 3 Domestic hot water flow temperature
- 4 Summer/Winter mode
- 5 On/Off
- 6 Reset parameters
- 7 Economy/Comfort mode

- Remote timer control connected
- Information
- RESET** Reset generator
- Fault
- Generator off
- Temperature compensation mode
- Central heating mode
- Pump on
- Burner on
- Economy mode
- Domestic hot water operation
- 8888** Boiler's parameters
- Domestic hot water mode

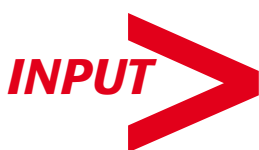
Each **ECONCEPT 51-101** module is fitted with a friendly multi-function display panel, which controls all basic parameters and is easy to operate. Electronic can manage one (mod. 51) or two (mod. 101) combustion units. It handles the central heating pump plus a second pump or diverting selector valve for the hot water storage cylinder. In addition, it manages the signals coming from the central heating, domestic hot water storage and outside temperature probes, and the 0-10 remote control signal.

0-10 VOLTS SIGNAL

Remote adjustment of inlet temperature or output (max absorption (0,1 mA)

NTC OUTDOOR PROBE

(range between -30°C and 70°C)



NTC HEATING CIRCUIT SENSOR

(range between 5°C and 125°C)

NTC DHW TANK PROBE

(range between 5°C and 125°C)

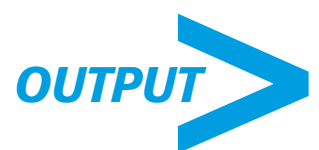


POWER SUPPLY CH PUMP

230 Vac - 50 Hz

POWER SUPPLY PUMP / 3-WAYS VALVE

230 Vac - 50 Hz

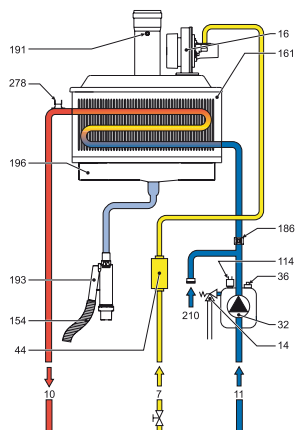


FREE CONTACT BURNER ON SIGNAL

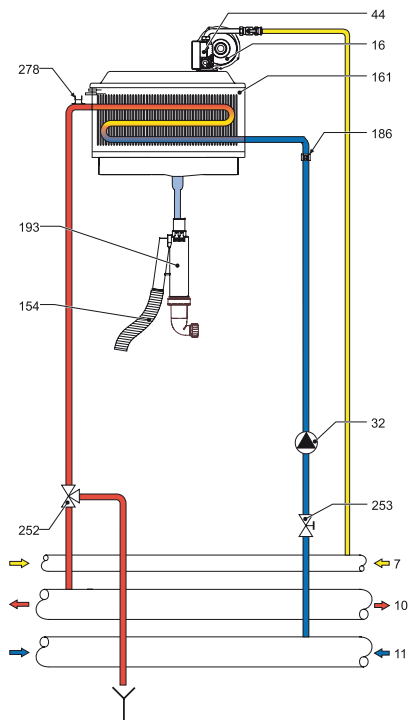
FREE CONTACT ANOMALY SIGNAL

Technical datas

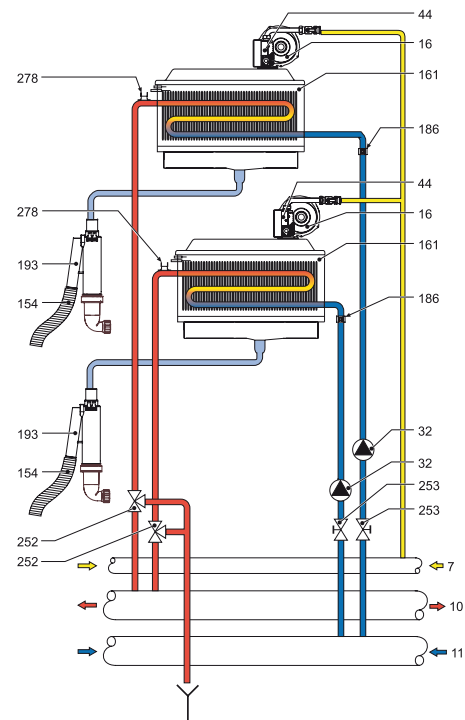
ECONCEPT 51A



ECONCEPT 51

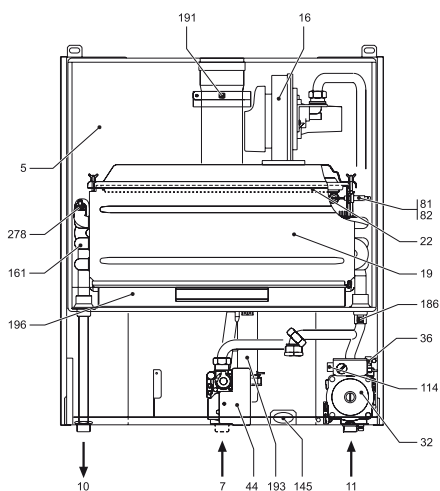


ECONCEPT 101

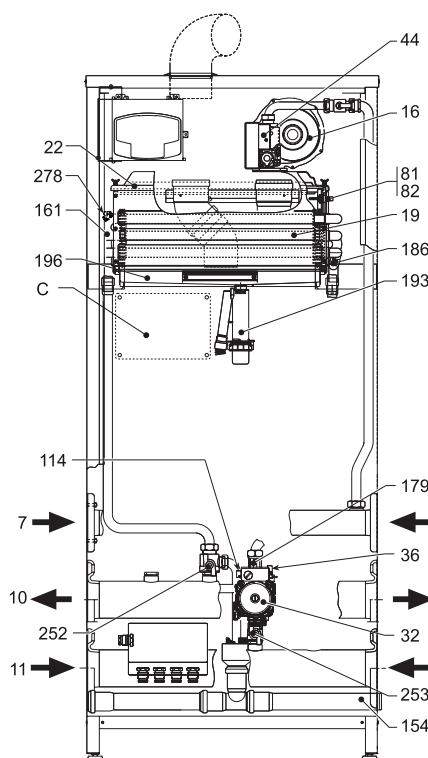


5 Sealed combustion chamber **7** Gas inlet **10** System delivery **11** System return **14** Safety valve **16** Fan **19** Combustion chamber **22** Burner **32** Heating circulating pump **36** Automatic air vent **44** Gas valve **81** Ignition electrode **82** Detection electrode **114** Water pressure switch **145** Pressure gauge **154** Condensate drain pipe **161** Condensing heat Exchanger **186** Return sensor **191** Fume temperature sensor **193** Trap **196** Condensate tray **210** Hot water tank return **252** Three-way drain and shut-off cock **253** Shut-off cock **278** Double sensor (Safety + Heating)

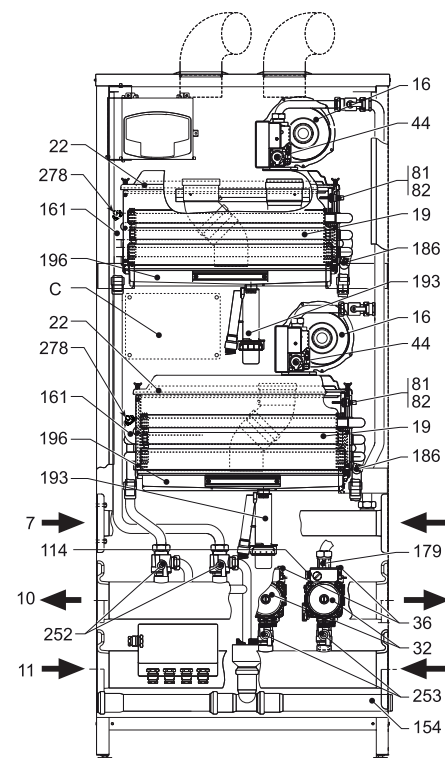
ECONCEPT 51A



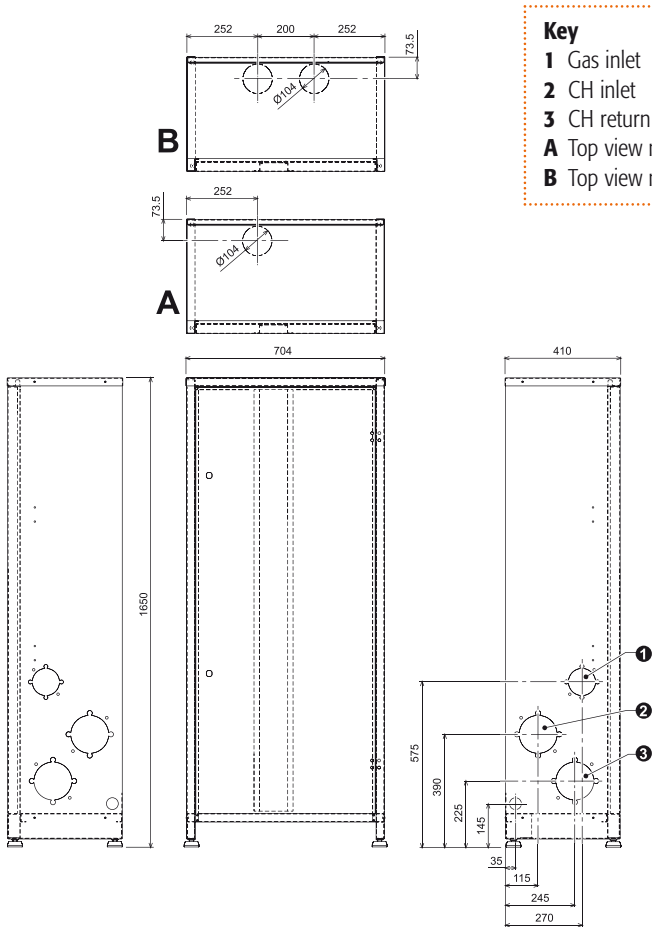
ECONCEPT 51



ECONCEPT 101



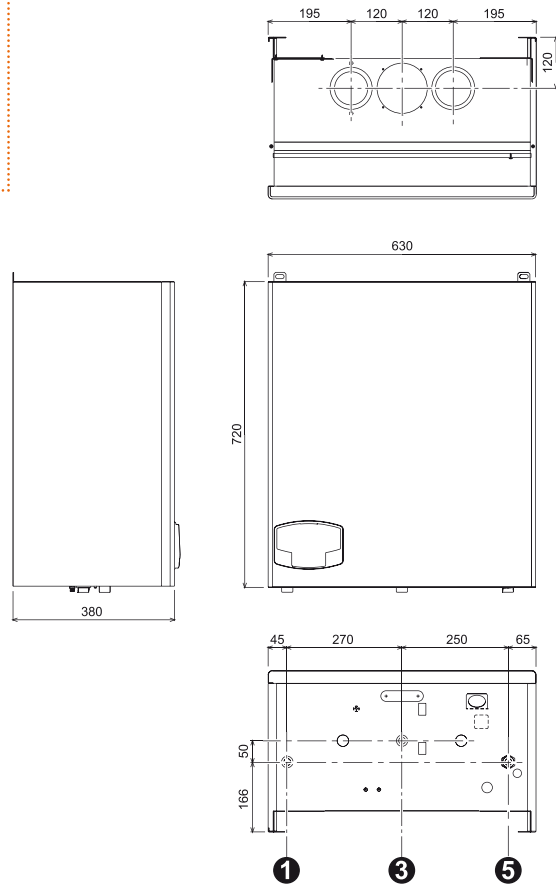
DIMENSIONS ECONCEPT 51-101



Key

- 1 Gas inlet
- 2 CH inlet
- 3 CH return
- A Top view mod. 51 - 51i
- B Top view mod. 101 - 101i

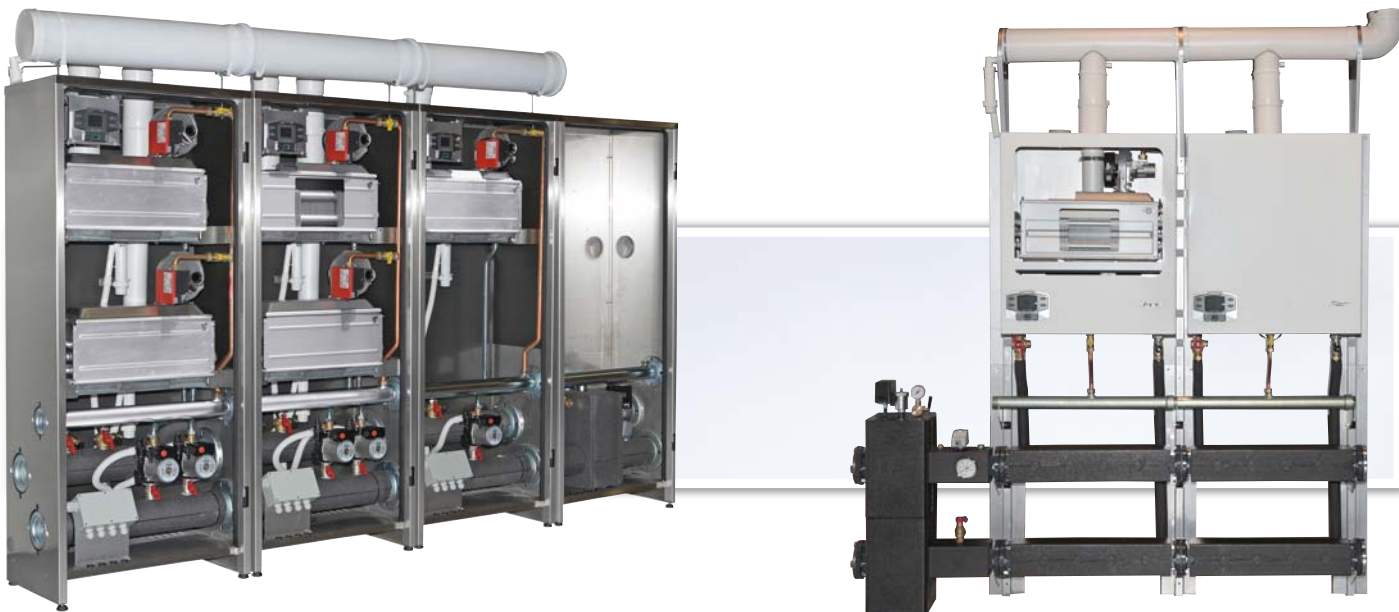
DIMENSIONS ECONCEPT 51A



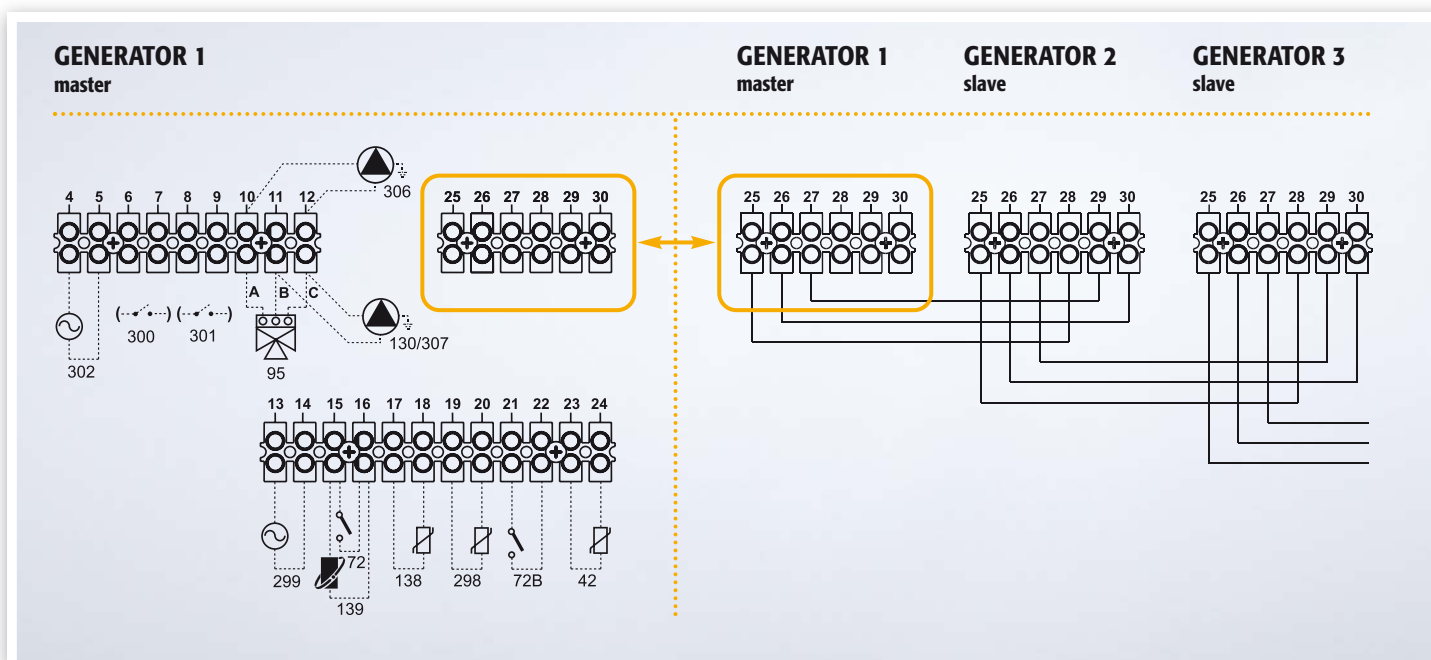
ECONCEPT		51	101	51A
Heating thermal input	max kW	49,8	99,6	49,8
	min kW	11,2	11,2	11,2
Heating thermal output (80-60°C)	max kW	48,8	97,6	48,8
	min kW	11,0	11,0	11,0
Heating thermal output (50-30°C)	max kW	53,0	106,0	53,0
	min kW	12,0	12,0	12,0
Operating pressure	max bar	6,0	6,0	6,0
	min bar	0,8	0,8	0,8
Water circuit content	l	10	12,8	10
Max outlet temperature	°C	95,0	95,0	95,0
Index of protection	IP	X5D	X5D	X5D
Power supply voltage	V/Hz	230/50	230/50	230/50
Power input	W	190	380	190
Empty weight	kg	124,0	150,0	124,0
Efficiency (80-60°C)	Pmax %	98,0	98,0	98,0
	Pmin %	98,5	98,5	98,5
Efficiency (50-30°C)	Pmax %	106,4	106,4	106,4
	Pmin %	107,5	107,5	107,5
Efficiency 30% (30°C)	%	109,0	109,0	109,0
NOx class		5	5	5

Cascade operation

Generators of range **ECONCEPT 51-101-51A** have been developed for modular application, thus building a unique generator that can reach an output of about 500 kW (250 kW for wall-hung models 51A). Electronic boards of single generators are studied for an efficient operation in cascade installations, offering in this configuration a modulation range from a minimum output of 11 kW to a maximum of 500 kW (or 250 kW for WHB). The **ECONCEPT 51-101** modules are supplied without expansion vessels: they must be suitably sized according to the number of modules in the installation and according to the current law requirements.



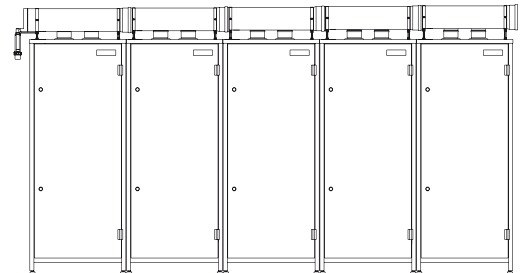
ECONCEPT 51-101-51A are equipped with a new electronic board featuring built-in cascade management. MASTER/SLAVE logic of electronic board allows the connection of more generators without using an additional cascade controller. It is enough a simple 3-wires connection (like in the picture below) between the generator's wirings. In such a way the cascade will operate as a single boiler. All the accessories of the heating circuit will be connected only to the master generator, with no need of doubling on the other modules.



On **ECONCEPT 51-101** hydraulic flow and return manifolds are already installed and are insulated and flanged for an easy and precise bolting between the modules. Each generator is supplied as a standard with a set of blind flanges, enabling connection with the central heating circuit through hydraulic separator. By-pass bends between flow and return manifolds are available upon demand as optionals. In order to connect more modules in cascade to a unique flue duct, optional flues collectors are available, for a maximum configuration of 5 modules in one cascade. Their diameter depends on the thermal output of the installation made.

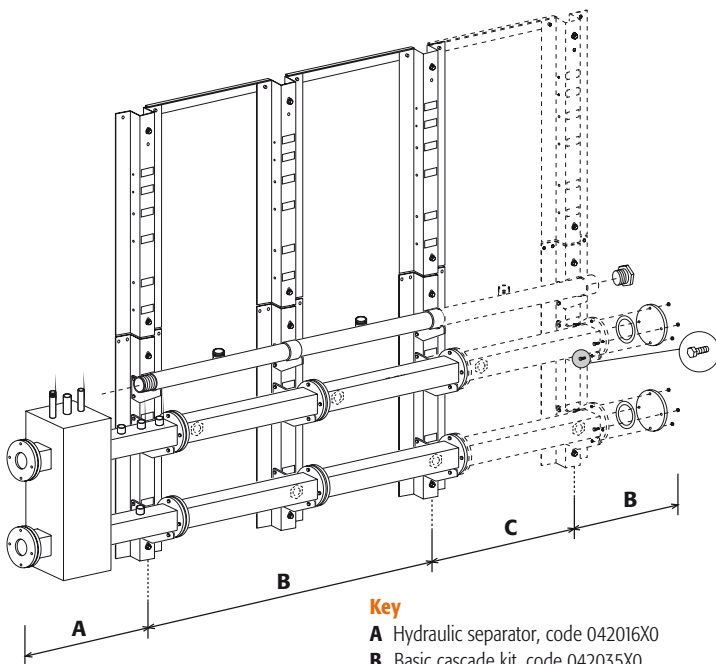


THERMAL INPUT UNTIL kW	FLUES COLLECTORS Ø mm
150	125
300	160
500	200

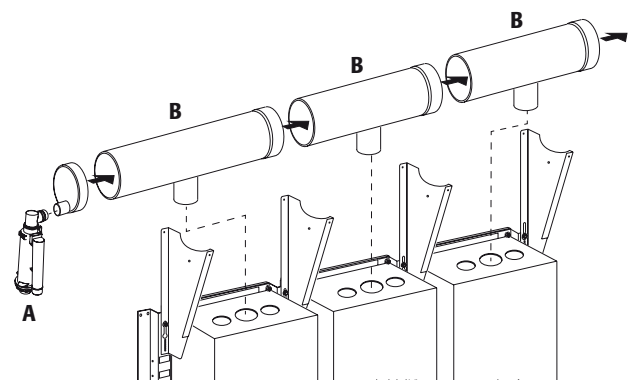


For **ECONCEPT 51A**, boiler bearing frames for cascade, hydraulic and flues accessories are available on demand, in order to facilitate the installation of a complete set of CH flow-return manifolds, gas feed, flues collector and circuit hydraulic separator.

Flues collectors - whose diameter is 125 mm - are suitable for modular operation of max. 3 generators. Modular bearing frames are equipped with DN 50 hydraulic manifolds, which fit an installation of max 5 boilers in a cascade.



- Key**
- A** Hydraulic separator, code 042016X0
 - B** Basic cascade kit, code 042035X0
 - C** Cascade extension kit, code 042036X0



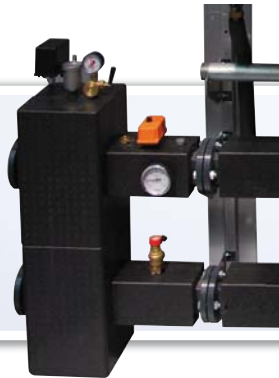
- Key**
- A** Condensing relief for Ø 125 mm ducts, code 041040X0
 - B** Ø 125 mm flues duct, code 041041X0

Hydraulic separator

In combination with the generators, a series of accessories have been developed in order to increase safety standards and completeness of the installation. In particular, it is possible to order the service modules containing the water flow separation device between the primary and secondary loops of the circuit, ready for the installation of the additional safety devices, certified from the Italian ISPESL institution for professional accidents prevention.

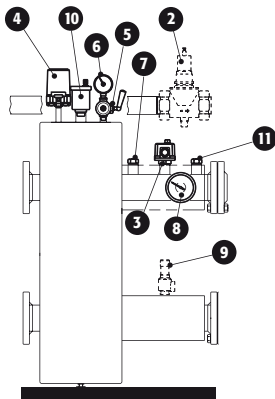


HYDRAULIC SEPARATOR AND SAFETY DEVICES SET FOR ECONCEPT 51A



HYDRAULIC SEPARATOR AND SAFETY DEVICES SET FOR ECONCEPT 51 - 101

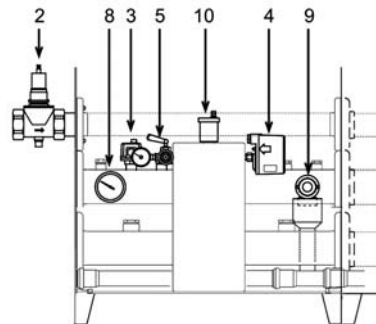
ECONCEPT 51A: COMPONENTS AND SAFETY DEVICES IN THE SEPARATOR KIT



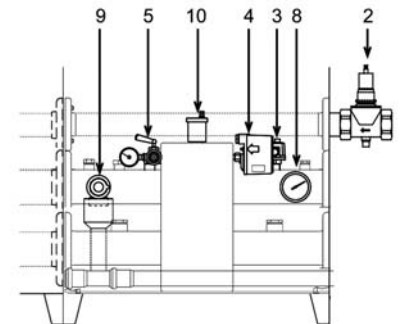
KEY ECONCEPT 51A

1 gas safety valve (not supplied as a standard) **3** safety thermostat
4 water pressure switch **5** 3-ways cock with pressure gauge connection
6 pressure gauge **7** thermowell **8** thermometer **9** safety valve (not supplied as a standard) **10** air bleed valve **11** well for on-off gas valve's probe

ECONCEPT 51-101: COMPONENTS AND SAFETY DEVICES IN THE SEPARATOR KIT



CONNECTIONS ON RIGHT SIDE



CONNECTIONS ON LEFT SIDE

KEY ECONCEPT 51-101

2 gas safety valve (not supplied as a standard) **3** safety thermostat
4 water pressure switch **5** 3-ways cock with pressure gauge connection
8 thermometer **9** safety valve (not supplied as a standard) **10** air bleed valve

OPERATING PRINCIPLES

Hydraulic separator let the hydraulic circuit for **ECONCEPT 51-101** (primary loop) to be independent of the hydraulic circuit of the heating plant (secondary loop), thus offering the following advantages:

- an external pump on primary loop is not necessary. Circulation in the primary loop is carried out by the generators' own pumps only;
- Flow in the primary loop can remain fixed, while on secondary loop can be variable or intermittent;
- No anomalous operating conditions occurs, such as interactions between circuit pumps and pumps inside generators.

As a consequence no unsought variation occurs in flow and head to heating circuits.

- Heating plant's pump can be sized according to the sole requirements of the secondary loop.

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