CATALOGUE

IVAR E·SAT

IVAR

HYDRONIC COMPONENTS & SYSTEMS

HYDRONIC SOLUTIONS FOR EVERY NEED

IVAR designs, develops and manufactures **highly energy-efficient heating and plumbing systems**. We have over 10,000 catalogue items - mass-produced products and unique items - in addition to customised systems and combinations of complex products.
The continuous implementation of projects under the **Industry 4.0** initiative and **lean production** have allowed us to take full advantage of new technological and IT innovations in order to improve our **manufacturing efficiency**, eliminate waste and streamline all processes.
The Group's international presence is provided by its **branches in various countries** (including Belgium, China, the United Kingdom, the Czech Republic, Romania, Slovakia, Spain, the United States and Tunisia), but the headquarters and production remain **IN ITALY**, with our **zero environmental impact facility**.

01
SUSTAINABILITY

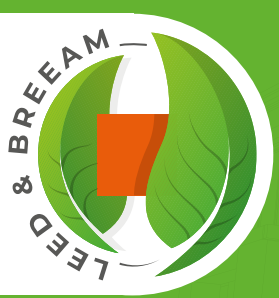
Respect and protection of the environment are the strategic lever for innovation and product development.

02
INNOVATION

The search for production efficiency results in projects related to industry 4.0 and in the implementation of Continual Improvement Program.

03
TRAINING

Sharing our experience and know-how has always been the towering pillar of our company culture.



Among the first manufacturers of plumbing components and systems in Italy, we have mapped all our products to select those **THAT ALLOW DESIGNERS TO BEST RESPOND TO THE SPECIFIC REQUIREMENTS** of the two protocols.

LEED | *Leadership in Energy and Environmental Design*
It is the certification system for sustainable buildings and is recognized worldwide as a way to achieve the goals of sustainability and leadership developed by USGBC.

BREEAM | *Building Research Establishment Environmental Assessment Method*
It is a globally recognized suite of validation and certification systems for a sustainably built environment, developed by BRE. BREEAM certified buildings have helped to improve asset performance at every stage, from design to construction, use and renovation.

LINEA ARANCIO
TECHNICAL SUPPORT

LINEA ARANCIO is the direct line designed by IVAR to get in touch with professionals in an easy and fast way. Our technical advice team can always suggests the best solutions for your needs.

SOLUTIONS RESEARCH

ACCURATE QUOTATION

SUPPORT BEFORE, DURING AND AFTER INSTALLATION

TRAINING

BIM

IVAR CLOUD

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HIUs (Heat Interface Units), are key components of modern centralised heating and cooling systems. Through configurations which generally provide for the use of one or more heat exchangers, these units function as the point of connection between the centralised distribution (primary) system and the heating and/or cooling system of each individual residential unit (secondary system). What's more, depending on their technical specifications, HIUs can also handle production of domestic hot water (DHW) on the secondary side. There are indeed a range of different types of HIU, which are referred to on the basis of the number and function of the heat exchangers:

No heat exchanger

EQUICOMPACT

These HIUs are essentially metering modules. Indeed, without heat exchangers, the water circulating on the primary side (both for climate control and for DHW) is the same water that is circulating on the secondary side, that is, there is no separation of the circuits. Nevertheless, these units provide the point of connection between the centralised distribution and the individual residential unit, with the possibility of incorporating heat meters and flow meters for correct recording of consumption, as well as zone valves and other accessories required for system operation.

Heat exchanger for climate control and for production of DHW via storage tank

E-SAT MONO B
(heating heat exchanger)

These HIUs can be used in systems without summer climate control (cooling), such as in centralised systems where only domestic hot water is distributed. A heat exchanger creates a separation between the primary boiler circuit and the secondary circuit inside the apartment. The latter circuit is dedicated to both climate control and production of domestic hot water via a storage tank. A circulation pump keeps the water moving in the secondary circuit and, when necessary, a priority valve diverts it towards the coil inside the storage tank to raise the temperature of the domestic hot water it holds.

Heat exchanger for DHW production only

E-SAT MONO HL
(DHW heat exchanger)

These heat interface units can also be used with centralised systems which distribute only domestic hot water (without summer climate control). In these units, a heat exchanger is used to instantaneously produce DHW thanks to the centralised technical water. The same technical water is also that which circulates in the apartment's heating circuit, which is therefore not separate from the centralised water. Versions are available for heating at high temperature (with or without booster pump), low temperature, or mixed high and low temperature.

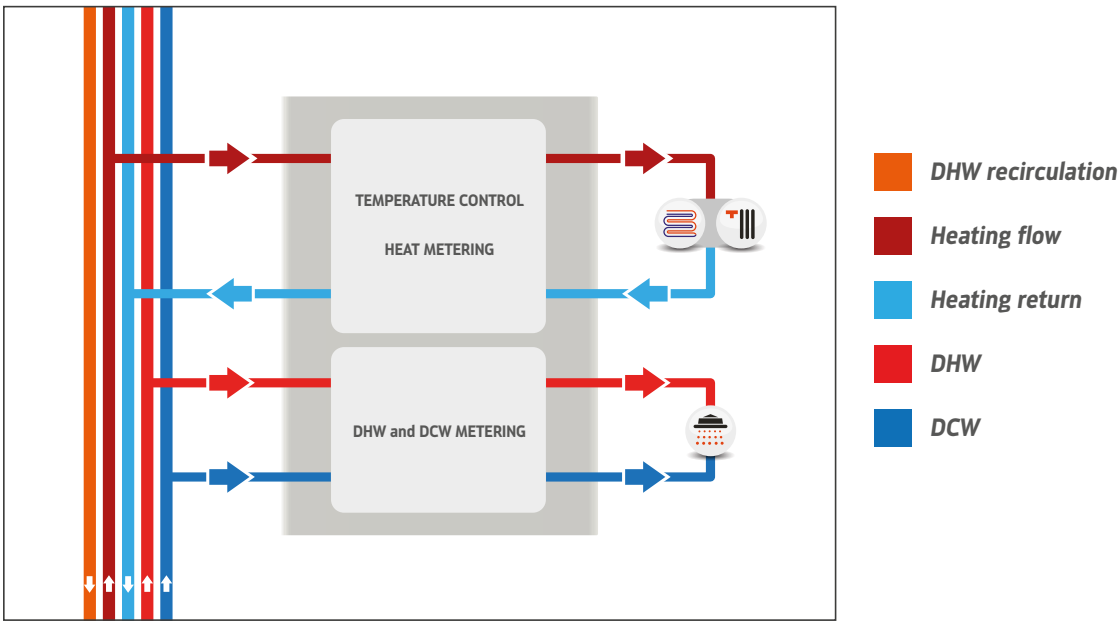
Dual heat exchanger, both for climate control and for DHW

E-SAT DUAL

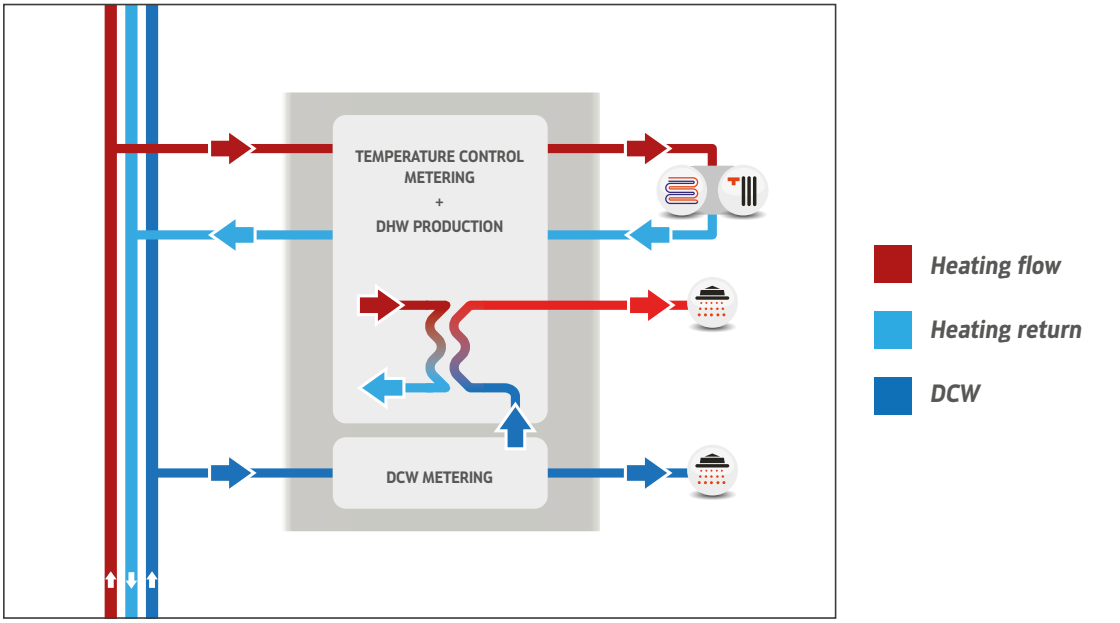
These heat interface units are also known as “separated water” units, since the dual heat exchanger creates complete separation of the primary and secondary side water.
The two heat exchangers allow the production of DHW and water for heating (and, where applicable, for cooling).

Using HIUs offers many benefits:

1. Flexibility: with the ability to provide heating, DHW and, where applicable, cooling from a single unit, HIUs offer a versatile solution suited to a huge range of living requirements.
2. Reduced installation costs: eliminating the need for boilers or other individual heating systems in each unit significantly reduces installation costs and complexity.
3. Ease of maintenance: having a centralised system means maintenance is concentrated on the main network and the central unit, reducing inconvenience and frequent maintenance work in the individual residential units. In addition, HIUs are designed for a longer service life with minimal maintenance: as with any mechanical device, it is sufficient to carry out some simple periodic inspections in order to guarantee that they function optimally. Finally, in the case of the dual heat exchanger versions, maintenance of the system inside the apartment is completely independent of that of the centralised network.
4. Safety: while a traditional boiler produces heat by burning gas or other fuels, an HIU receives heat from an external source (centralised system) and transfers it to the residential unit. As a consequence, HIUs reduce the risk of accidents due to gas leaks.
5. Simplification of the distribution system: in systems with centralised DHW production and utility modules, five distribution pipes are required, while in HIU systems, three distribution pipes are sufficient.



In a distribution layout for utility modules, at least five pipes are required.



In a distribution layout for heat interface units, three pipes are required.

6. Reduced risk of Legionella proliferation: in HIUs with delocalised production of DHW, the risk of Legionella proliferation is reduced since centralised hot water storage is eliminated. Instantaneous production via plate heat exchangers significantly reduces the risk of bacterial proliferation and also makes it unnecessary to use expensive thermal shock processes on the storage tanks. A further benefit is therefore energy savings.
7. Use in variable flow rate systems: the ability to modulate the primary flow rate via a two-way valve allows the heat exchange to be optimised, reducing the return temperatures. This condition allows use in modern variable flow rate systems served by condensing boilers or district heating, for which the return temperature is the key element for achieving energy efficiency.

In the current context, where sustainability and reducing the impact on the environment have become priorities, HIUs offer major benefits by maximising the efficiency of energy use and reducing waste. First and foremost, being able to specifically manage the heat demand of each individual residential unit offers better system optimisation (for example, the flow temperature to residential units with different solar exposure or different terminal systems, such as radiators or radiant systems). Secondly, as they are connected to a centralised generation system, HIUs can make use of renewable energy sources (such as solar thermal, ground-source, district heating networks or biomass systems) or cogeneration systems, which are more efficient and produce lower emissions compared to traditional individual heating systems. Moreover, in some situations centralised heating systems can recover the excess heat from industrial processes or other sources, reducing the unused heat sent into the environment and limiting thermal pollution. Finally, thanks to their robust construction and centralised maintenance, HIUs tend to have a longer service life compared to individual systems, contributing to reduced refuse production and reduced use of resources due to frequent replacements.
For all these reasons, Heat Interface Units represent the next frontier in energy efficiency and in the centralised management of heating and cooling. The expansion of this product range in IVAR's offering highlights our commitment to sustainable and efficient solutions, offering our customers an advanced and reliable option for their heat requirements.

IVAR's Heat Interface Units feature components which increase the performance quality of the system, offering benefits in terms of performance, installation and maintenance.
Some components are optional and contribute to offering new functions to the product, where required. Illustrated in the following paragraphs are the most significant components and the benefits they can offer.

PLATE HEAT EXCHANGER

E-SAT systems are equipped with one or two plate heat exchangers depending on the model used.
The first heat exchanger is used for instantaneous production of DHW, while the second is used for the heating (or cooling) service inside the residence.
The use of one plate heat exchanger for the delocalised production of hot water offers various benefits compared to a traditional system with centralised DHW production:

1. Limited risk of Legionella proliferation: rather than being stored in tanks where the risk of bacterial growth is higher, the hot water is produced instantaneously on demand
2. Simplified distribution: compared to systems with centralised DHW production which require three-pipe distribution (hot water, cold water and recirculation), in systems with delocalised production only the cold water line is required.
3. Reduced heat loss: eliminating the DHW and relative recirculation lines provides a significant reduction in heat loss due to the transport of hot water. Recirculation can be performed inside the apartment where necessary, but only if required.
4. Lack of thermal disinfection cycles: as the DHW production is instantaneous, it is not necessary to perform thermal disinfection cycles in centralised storage tanks and along the recirculation columns; this also provides significant energy and monetary savings, given how energy-hungry these treatments are.

The second heat exchanger, where present, is used for the heating (or cooling) service in the residential unit. In this case, a two-way valve on the primary regulates the primary water flow and therefore the heat exchange for the purposes of obtaining water at the correct temperature for distribution to the heating system at the outlet of the secondary side of the heat exchanger.
The use of a separate water system for climate control too offers the benefit of physically separating the residential system of each individual apartment from the main distribution network. In this manner, the components inside the residual unit are not subject to the pressure of the entire column which can be particularly high for multi-storey buildings. Moreover, any maintenance activities in an apartment can be performed without interfering with the rest of the system.
The heat exchangers in the HIUs can be of different types both in terms of their internal geometry, size and number of plates. It is recommended to contact our technical advice service Linea Arancio which will help you select the solution which best meets the requirement of the system.

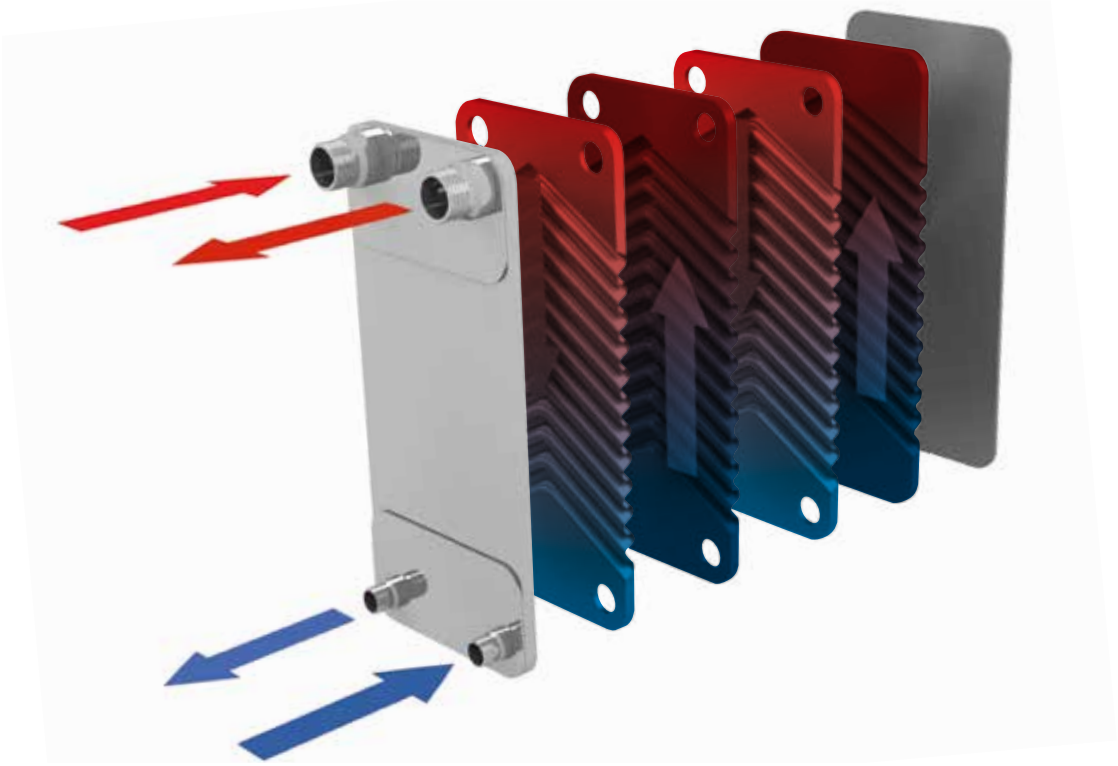
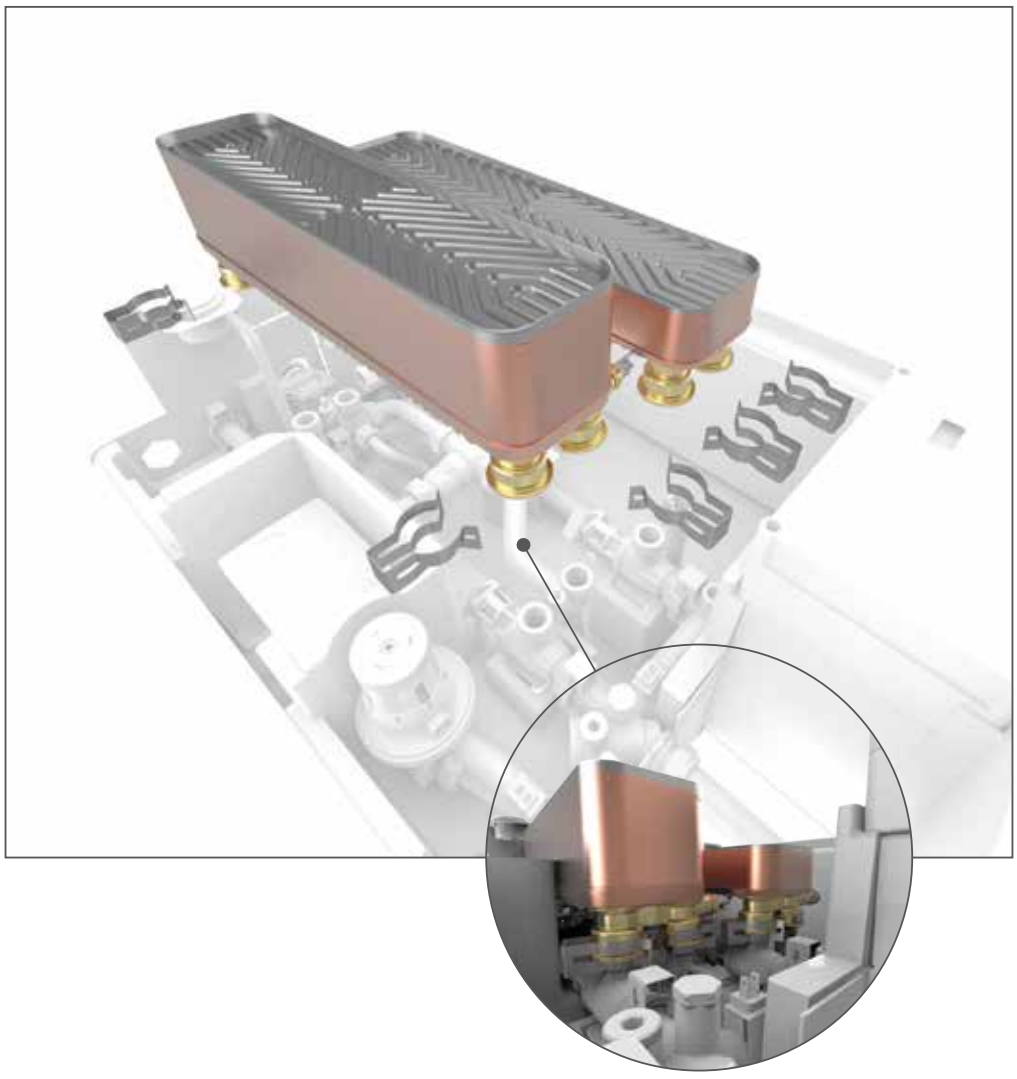


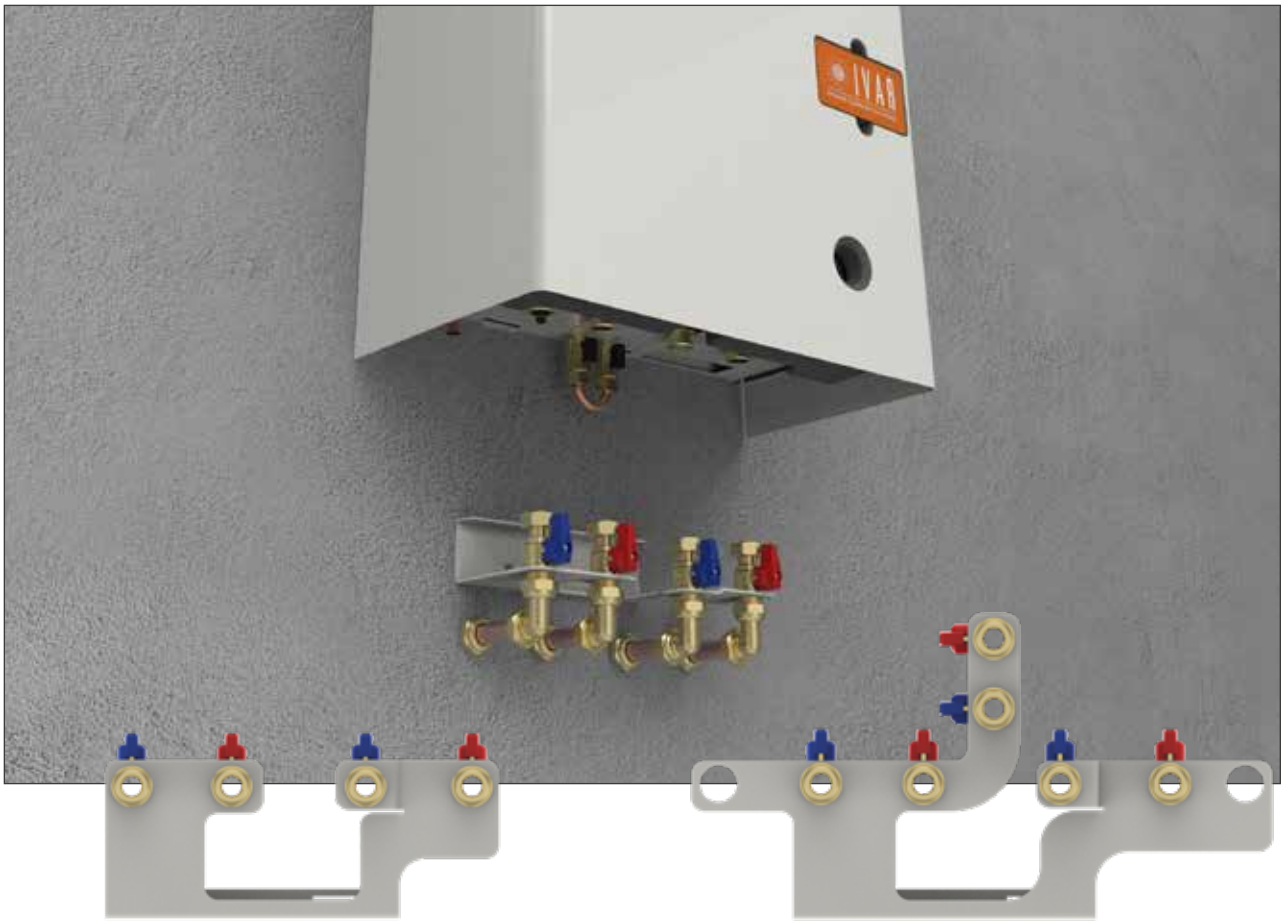
Plate heat exchangers consist of a series of stacked plates. The two fluids, primary and secondary, circulate alternately in the spaces between these plates. The shape and layout of the plates is designed to minimise turbulence and guide the two fluids in such a way that their paths represent a counterflow as much as possible.
With the exception of the HC version for heating/cooling, IVAR's E-SAT solutions have the heat exchangers positioned frontally with respect to the terminal. This facilitates any maintenance operations, guaranteeing easy access to the component if it requires dismantling for replacement or cleaning. Moreover, the heat exchanger is coupled to the brass components via a solid clip system which ensures ease of removal, given that nuts and the relative retention clips do not need to be unscrewed.



Detail of the clip coupling system

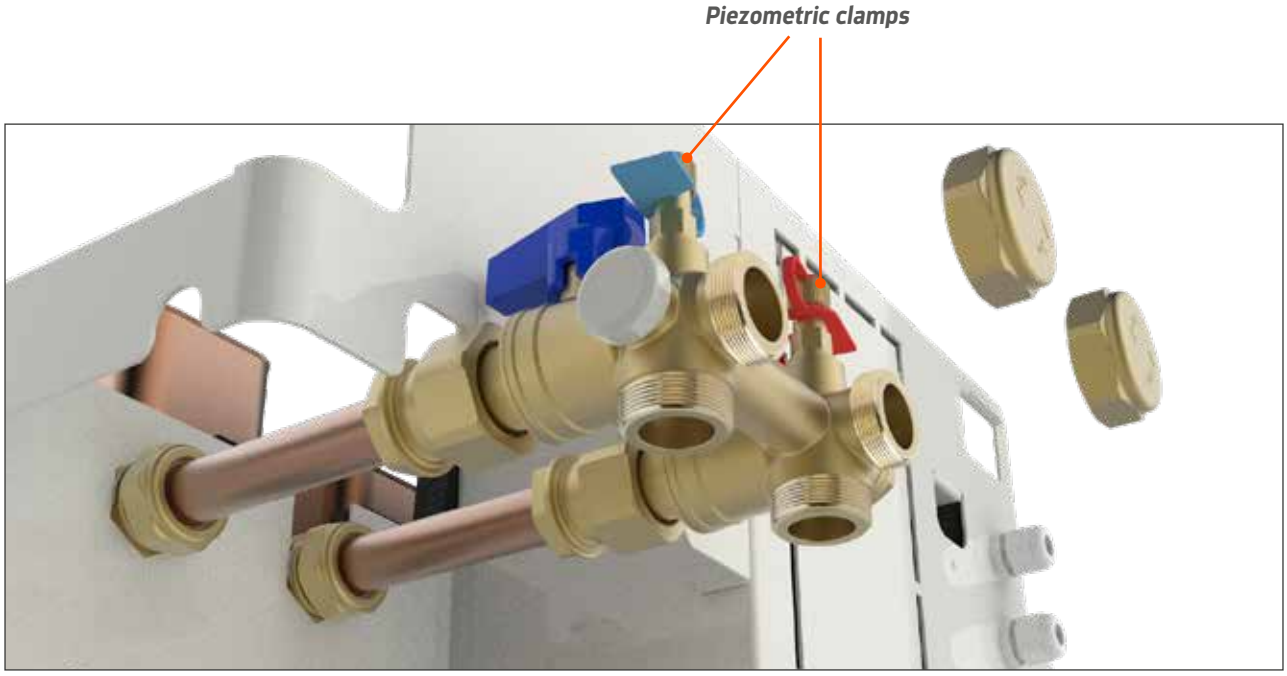
CONNECTION JIG

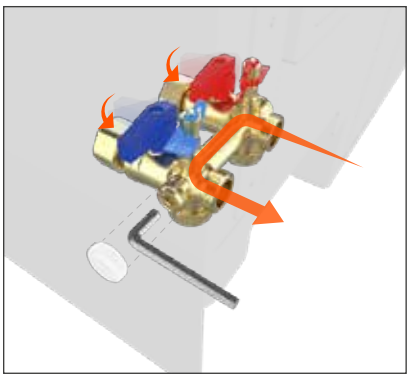
With the exception of the E-SAT DUAL HC version, The E-SAT solutions feature a connection jig with pre-installed ball valves for connection to the secondary fittings of the terminal and the domestic cold water inlet.
This jig is available in versions with fittings from below or elbow fittings for pipes coming from the wall.



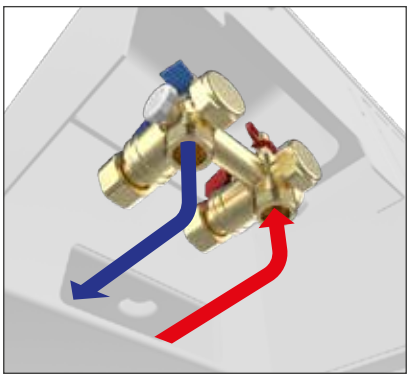
FLUSHING BYPASS

At the point of connection to the generator, the inlet to IVAR heat interface units features a flushing bypass. This component is particularly useful for some preliminary system commissioning and maintenance operations.
It is an H valve with a bypass which can be opened or closed. downline of this valve, there are two shut-off valves on the flow and return branches connecting to the generator.
By opening the bypass and closing the two shut-off valves, it is possible to perform a preliminary flush of the entire system, preventing impurities and dirt from entering the HIU and potentially damaging or clogging critical components such as the plate heat exchangers, motorised two-way valves, circulation pumps (for HIUs with direct heating), etc.
Once the flushing is complete, it is possible to close the bypass, open the shut-off valves and proceed with filling the HIU (and the rest of the heating system where required).
The flow bypass also features the possibility to connect to piezometric ports through which the differential pressure at the ends of the HIU can be measured so the necessary calibration for system balancing can be performed.
Another technical detail is the dual inlet connection: the bypass indeed features two fittings, one at the top and one on the rear. In this manner the connection to the primary circuit can be made either from the top or from the bottom, making use of the window opening on the lower part of the frame, which allows connection lines coming from below to be run along the base of the frame.

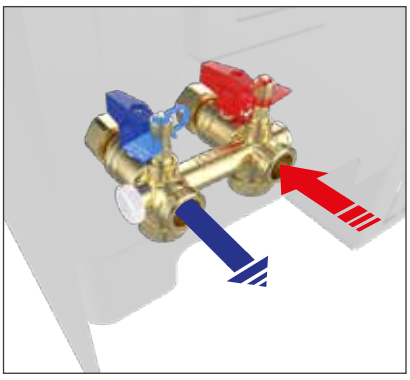




Flushing bypass opening with closure of the shut-off valves



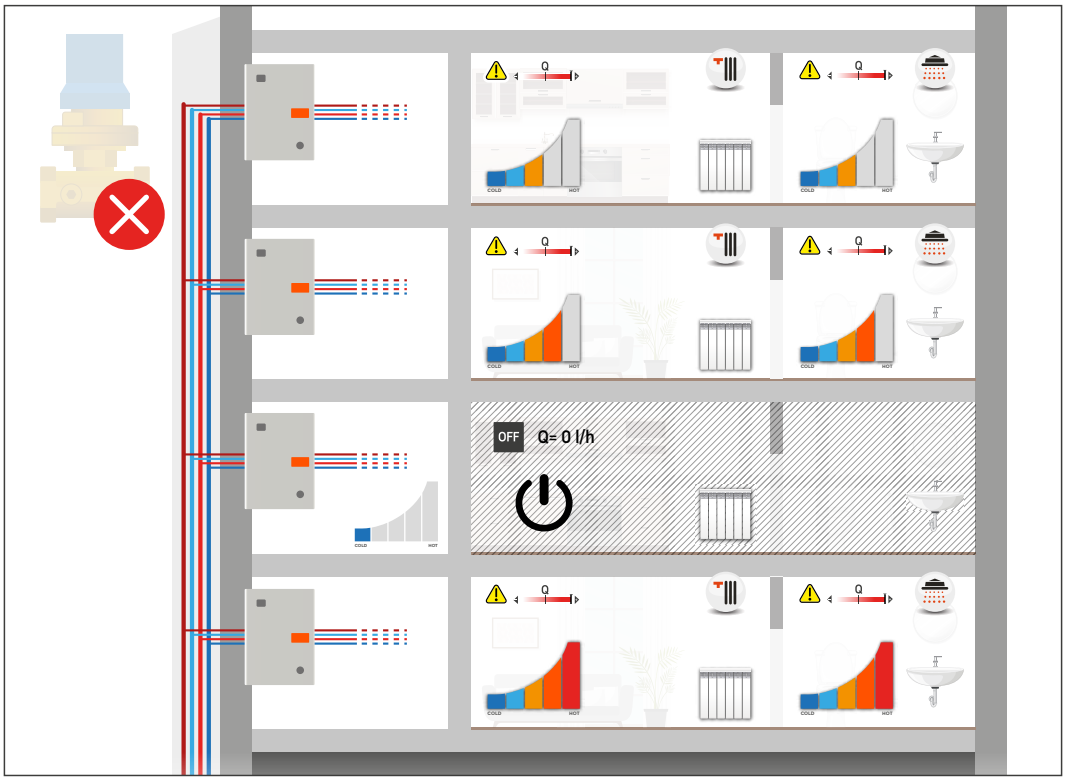
Connection of primary flow and return lines from below.



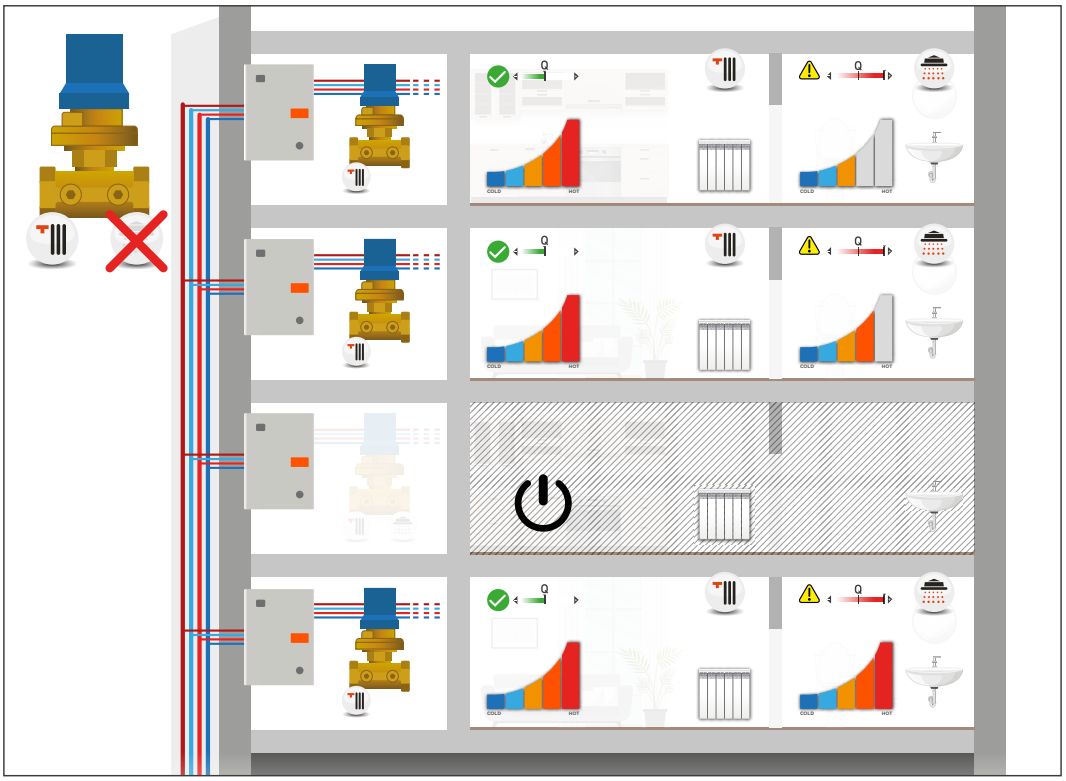
Connection of primary flow and return lines from above

DIFFERENTIAL PRESSURE REGULATOR

E-SAT systems can be equipped with an Equifluid differential pressure regulator. This is a device which keeps the pressure differential between two points of a fluid circuit constant by absorbing any pressure variations which may be generated due to variations in flow rate along the different branches of the system.
Current centralised systems are of variable flow rate type: this means that the total flow rate circulating in the system changes on the basis of the different demand from the individual terminal devices. As a consequence, a static balancing system, regulated to satisfy the maximum load conditions, would be inefficient. For this reason, the use of a differential pressure regulator on the HIUs is the optimal solution for dynamically balancing the system: even if the flow rate changes upline or downline of each terminal device, the pressure variations which could lead to undesired excess or reduced flow rate on the individual HIUs are offset by the differential pressure regulator. The use of a differential pressure regulator also allows the two-way regulation valves to work under optimum conditions, since any overpressure could prevent correct closure, as well as leading to noise and unstable regulation.
Equifluid is available in two adjustment ranges: 50 to 300 mbar, or 250 to 600 mbar.
The device can be installed in two different positions: either on the return of the primary circuit which feeds the entire HIU, or on the return of the primary circuit for the heating branch only. In the first case, the entire HIU will always be dynamically balanced both in heating mode and in DHW production mode. In the second case, on the other hand, the HIU will be balanced only in heating mode. In this situation, without the differential pressure regulator, pressure losses are reduced on the primary side for DHW production, and therefore greater flow rate and power is supplied. Any HIUs with simultaneous DHW production demand may be temporarily unbalanced but they will be offset by the greater available power.



In the case of E-SAT without differential pressure regulator, the individual terminal devices may be subject to imbalances. The internal regulation of the HIU will try to satisfy the sole flow temperature requirement (both for heating and for DHW production). The result is that some terminal devices may not reach the setpoint temperature or have too much flow rate (and therefore power) available, with the risk of fluctuations in the regulation. For this reason, these solutions are recommended for systems which are not particularly large. Alternatively, it is possible to specify suitable balancing systems external to the HIUs, along the main distribution and branch lines.

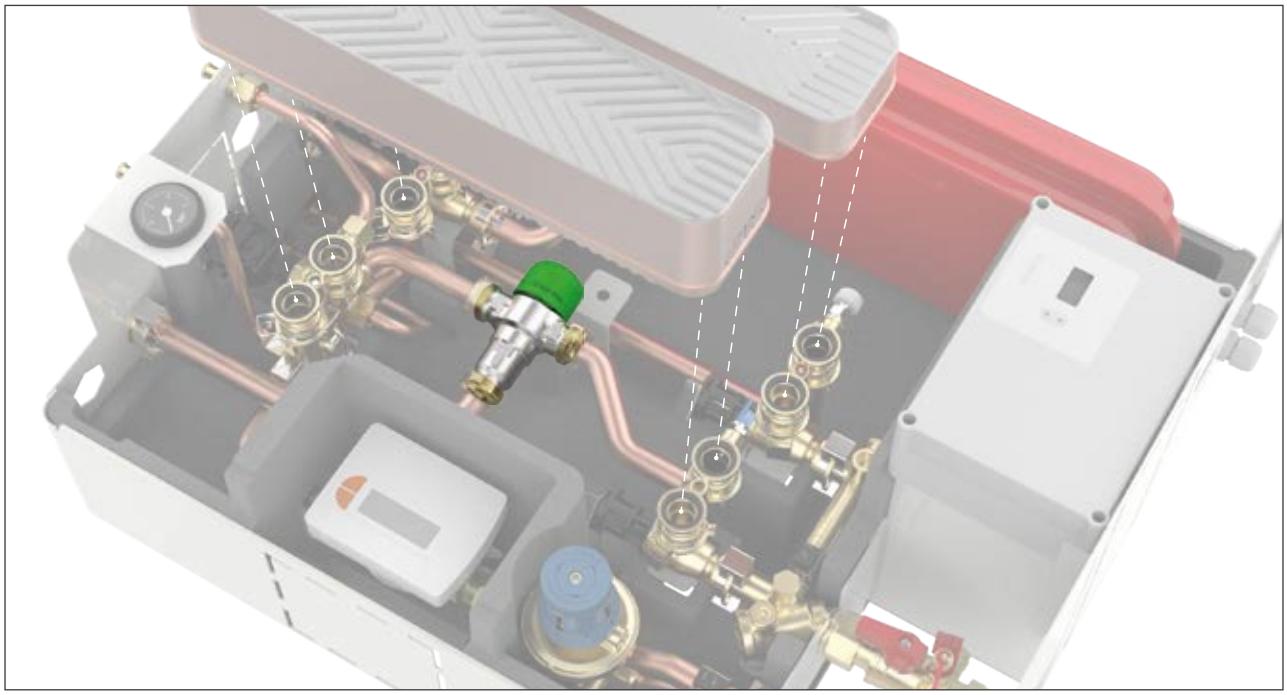


For E-SAT models with differential pressure regulator operating only on the heating primary, clearly the system is balanced only for the heating. If there is DHW demand from one of the apartments, the water on the primary flows through the heat exchanger dedicated to DHW production, with the benefit of having no pressure losses introduced by the differential pressure regulator. Typically, this guarantees a greater flow rate (and therefore power) to the heat exchanger, as long as this flow rate is effectively available on the primary side. If there is DHW demand from multiple apartments simultaneously, there may be a hydraulic imbalance affecting the most problematic terminal devices, leading to the risk that the correct DHW production temperature would not be reached. As in the previous case, installing the differential pressure regulator to operate only on the heating primary is a solution recommended in systems which are not particularly large.

The E-SAT version with differential pressure regulator on the primary (including both heating and DHW) is the most complete version, which guarantees dynamic balancing in both HIU operating conditions. The system is always balanced with the correct flow rates for the individual terminal devices.

TEMPERATURE LIMITER AND/OR SOLENOID VALVE

The production temperature of the domestic hot water is regulated by a stepper actuator which modulates the flow rate on the primary circuit in order to obtain the set temperature at the outlet.
Any problems on the actuator or sudden power cut during DHW draw may compromise the effectiveness of the regulation but, above all, could generate overtemperatures liable to cause user burns and injuries. For this reason, it is possible to insert a thermostatic mixer with temperature limiting function in the HIUs.
Alternatively, it is possible to order a version with solenoid valve on the primary circuit: if the temperature limit set for the DHW is exceeded or if there is no supply voltage, it interrupts the flow of water on the primary, restoring safe conditions.



Detail of thermostatic mixer

Detail of solenoid valve

METAL COVER

All HIUs are equipped with a rigid insulating cover which reduces heat losses from the pipes and components through which the heating fluid travels. This insulation provides the HIUs with a pleasing aesthetic impact which can be further improved with an optional metal cover which provides the entire installation with the appearance of a wall-mounted boiler.
The metal cover also features dedicated windows for programming the regulator and viewing consumption figures.

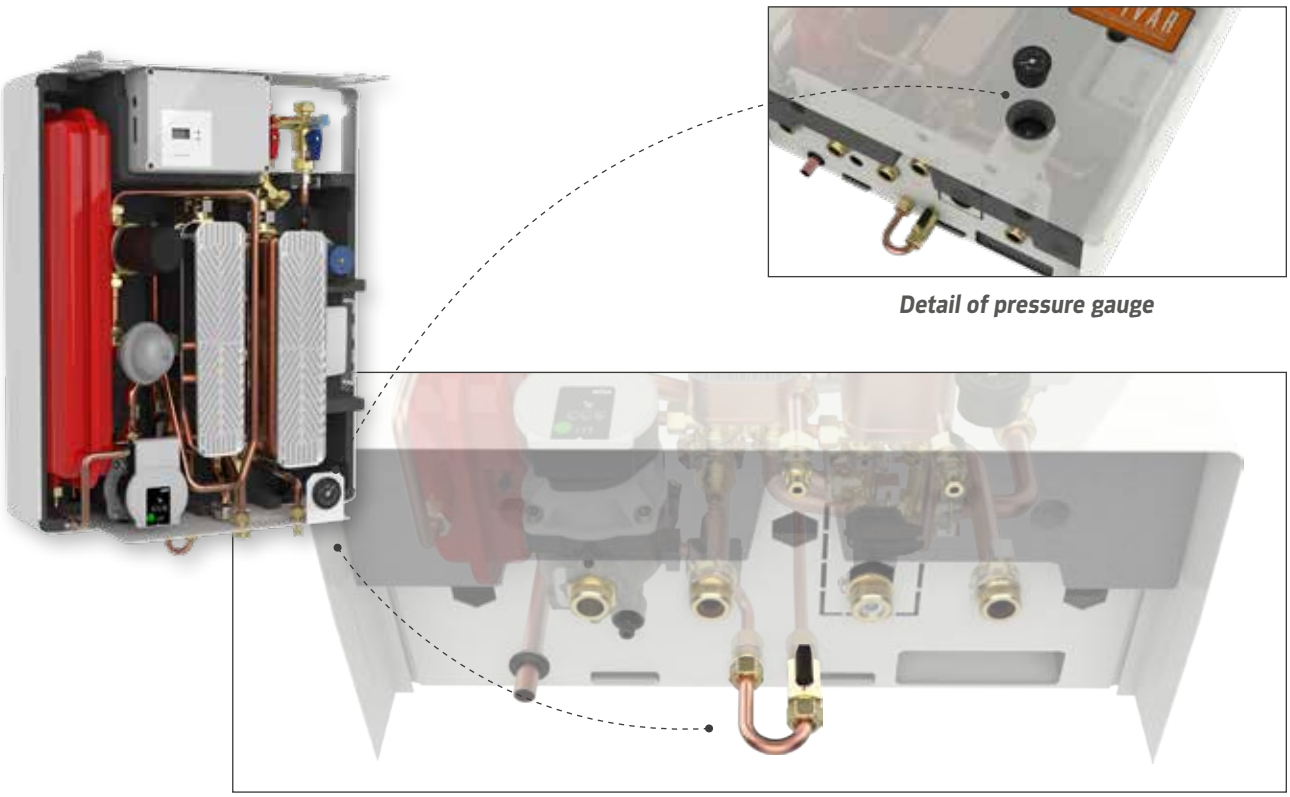
MANUAL FILLING/AUTOMATIC FILLING

In separated water E-SAT versions, the secondary heating/cooling circuits must be filled. For this reason, the HIUs are equipped with a filling system which takes water directly from the mains water (DCW) connection and which can be either manual or automatic.
In the manual version, two variants are available for filling:

- A solution including a CAb type disconnector which prevents backflow between the internal circuit downline of the HIUs and the centralised mains DCW network. The use of a CAb type disconnector provides adequate anti-pollution protection when filling heating systems without additives in accordance with European standard EN 1717.
- A solution including copper pipe with a shut-off valve and a check valve. When filling, or in the event of pressure drops (as can occur in traditional systems with boiler), it is possible to open the shut-off valve and proceed with system filling.

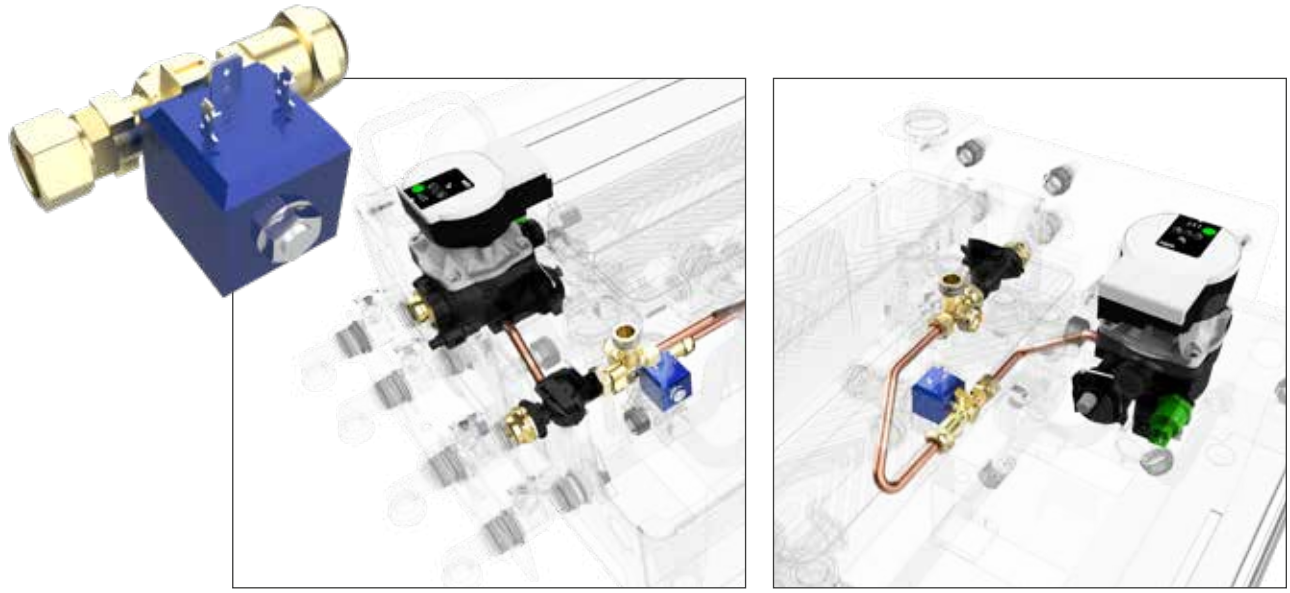
In the manual versions illustrated directly above, the pressure gauge allows you to read the static pressure inside the heating system.
In the automatic version, on the other hand, reading the pressure is performed directly on the HIU's electronic regulator, to which an analogue pressure sensor is connected. As regards shut-off, in the automatic version this is performed via an on/off solenoid valve. It is possible to set the static pressure value required inside the system: if the pressure goes below this value, the electronic regulator opens the solenoid valve to allow filling.
Both in the manual and the automatic versions, the HIUs nevertheless include a safety valve calibrated at 3 bar, which protects the system in the event of overpressure, discharging excess pressure.

Manual filling with CAb type disconnector



Detail of pressure gauge

Simple manual filling



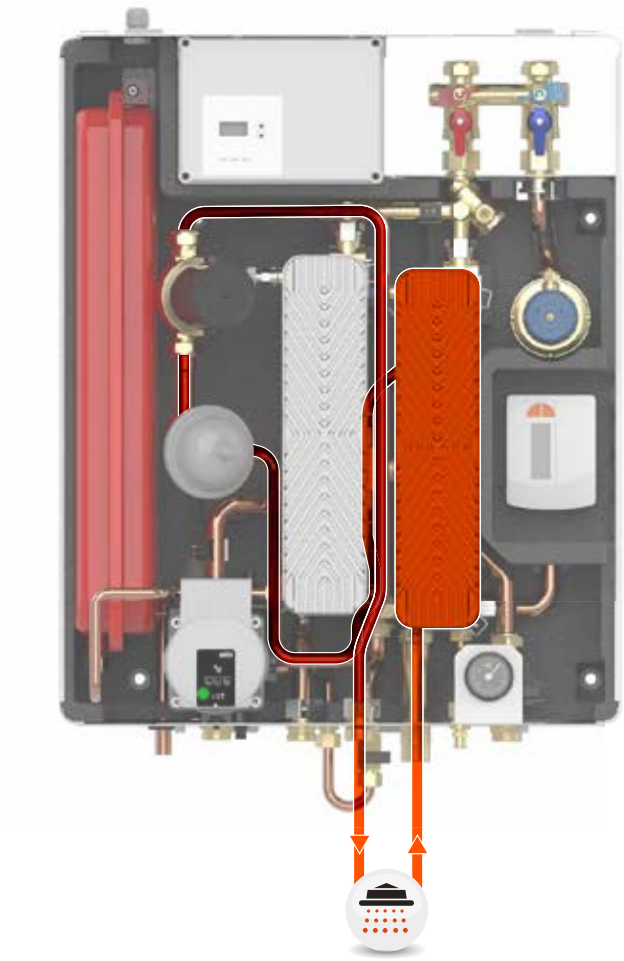
Automatic filling

RECIRCULATION CIRCUIT

Standard UNI 9182 specifies that a sanitary DHW distribution system must supply water at all take-off points, at the correct pressure and temperature, within 30 seconds. For this reason, particularly in centralised DHW distribution systems, it is often necessary to implement a recirculation circuit: this is a closed loop which ideally starts at the generator and arrives close to the terminal devices, using the normal DHW distribution network, then returning to the generator via what is termed the recirculation network. This loop has the purpose of keeping DHW moving and at the correct temperature, so that it is quickly available at the terminals when required. Recirculation increases the comfort for users of the system, and at the same time guarantees the best water hygiene conditions, reducing the risk of proliferation of bacteria such as legionella. According to the standard, there are nevertheless cases in which, although the time required for water to reach temperature exceeds 30 seconds, it is not necessary to implement a recirculation circuit. For example, with independent systems for residential or similar use with instantaneous DHW production with power of below 35 kW, without storage tank, or with storage tank of capacity not exceeding 100 litres, or in any case with storage tanks equipped with integrated systems for maintaining the design temperature in the tank itself (e.g. electric heating element). Nevertheless, in these residential contexts which do not have a mandatory recirculation requirement it is often implemented regardless, particularly for high-end residences, precisely for the benefits it provides in terms of comfort. For this reason, in HIUs with instantaneous DHW production, it is possible to specify a dedicated recirculation kit: this is composed of a circulation pump suitable for use with potable water, to keep the water moving, and an additional inlet connection with shut-off valve on the HIU to close the recirculation loop.
The system is managed directly by the electronic controller by which it is possible to choose from three operating modes:

1. Return temperature: the recirculation pump activates only if the return temperature from the recirculation circuit falls below a set value.
2. Time bands: the recirculation pump operates only within time bands set by the user.
3. Time bands + return temperature: the recirculation pump activates only if the return temperature from the recirculation circuit falls below a set value and it is within the time bands set by the user.

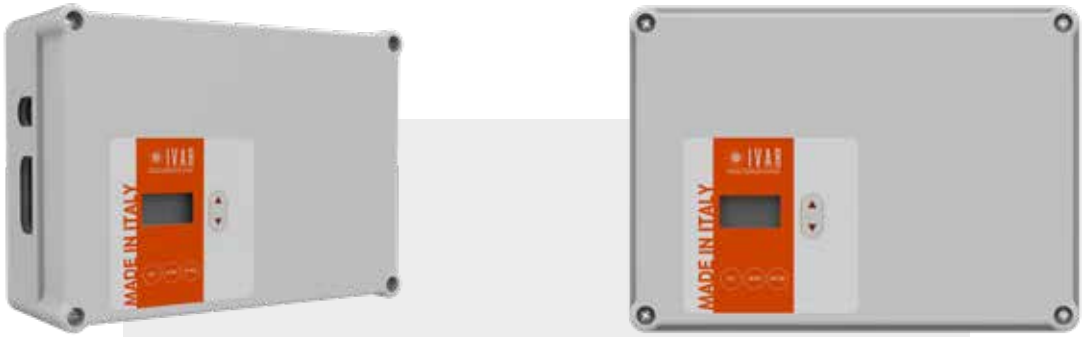
On activation of the recirculation circuit, the pump is started up and the stepper actuator opened on the primary circuit so that the water circulating through the recirculation loop can be heated via the plate heat exchanger.

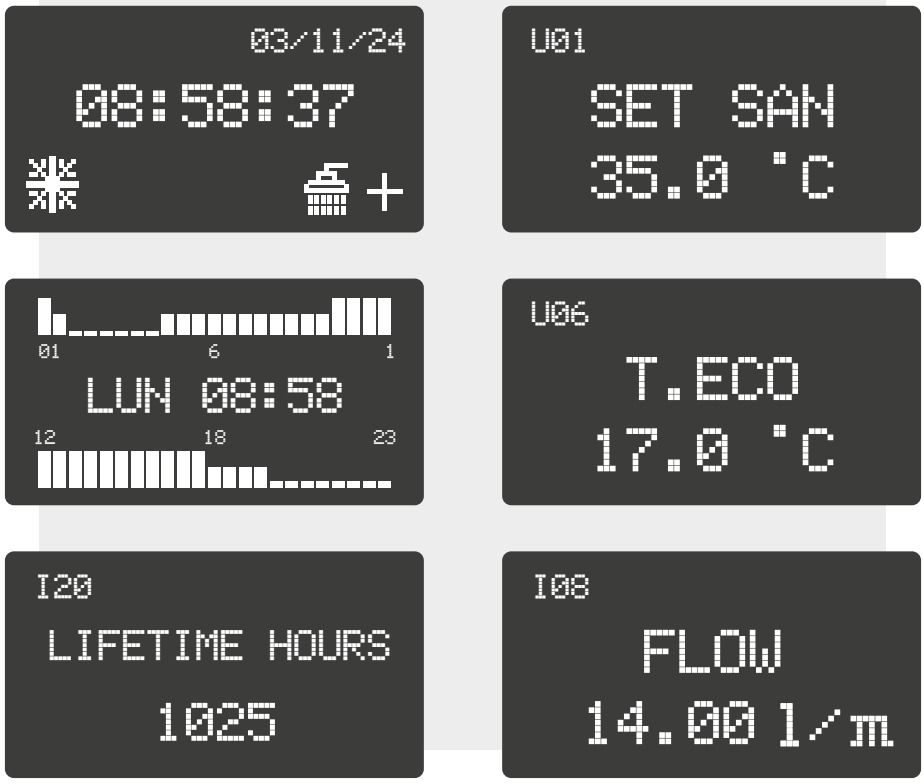


ELECTRONIC CONTROLLER

All E-SAT HIUs are equipped with an electronic controller which allows management of each individual module with numerous functions:

- Control of the flow temperature to the climate control circuit.
- Possibility to control the heating flow temperature with climate compensation (with outdoor temperature sensor) or room compensation (with indoor temperature sensor).
- Setting of comfort time bands if using the indoor temperature sensor.
- Screed drying programme for radiant systems.
- Anti-frost function.
- Possibility to set a primary return limit temperature.
- Possibility to operate with constant temperature differential (delta) in heating mode.
- Domestic hot water temperature control.
- Heat exchanger keep-warm function.
- Recirculation circuit control.
- Clogged heat exchanger monitoring function.
- Anti-legionella function for recirculation circuit and plate heat exchangers.
- Anti-lock function.
- DHW priority enablement/disablement.



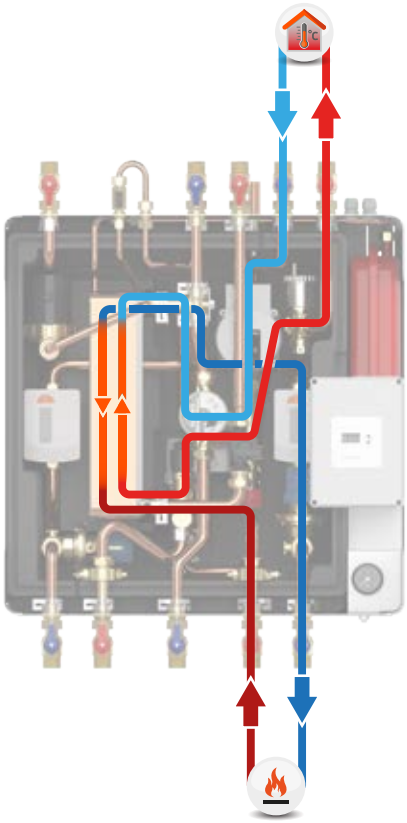


IVAR•ESAT DUAL H/C

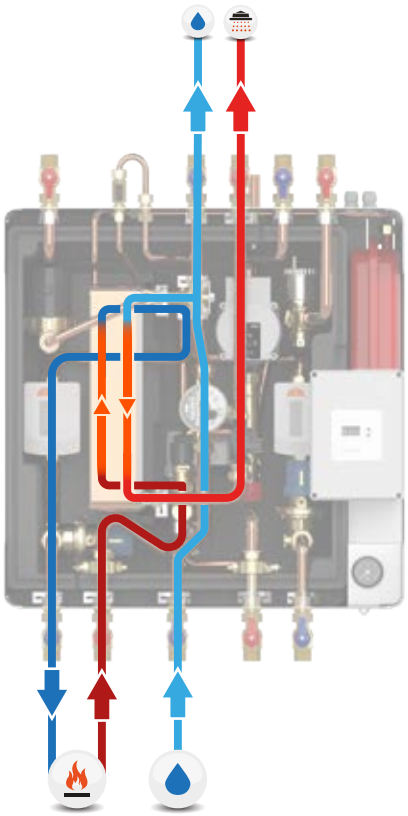
Dual heat exchanger heat interface unit for instantaneous production of domestic hot water and technical water for heating and cooling systems, with advanced electronic control.

OPERATIONAL DIAGRAMS

Heating/Cooling Mode



DHW Production Mode



TECHNICAL DATA

Compatible Fluids	Water (max glycol content 30%)
Maximum operating temperature	90 °C
Maximum operating pressure	Primary circuits: 16 bar Secondary heating/cooling circuit: 3 bar Secondary DHW circuit: 10 bar
Safety valve calibration	3 bar
Maximum pressure differential at ends of the actuator	0.9 bar
Hydraulic connections	3/4" BSPP M
Expansion vessel	Capacity: 8 l Maximum pressure: 3 bar Precharge: 1 bar Precharge range: 0.5÷2.5 bar
Power supply	230 V AC ±10%, 50 - 60Hz (IEC60038 standard)
Temperature sensors	10 kΩ NTC

MATERIALS

Connection Components	CW617N brass
Gaskets and O-rings	peroxide EPDM
Pipes	Copper
Plate Heat Exchangers	Stainless steel
DHW flow meter body	PA 6.6
Insulating casing	ARPRO 4135 FR (EPP with flame retardant)
Regulation electronic regulator cover	ABS v0
Frame	RAL 9016 powder coated stainless steel

PERFORMANCE - HEATING

Plate Heat Exchangers	T, primary flow [°C]	T, primary return [°C]	Primary flow rate [l/h]	Power [kW]	ΔT, heating [°C]	Heating flow rate [l/h]	ΔP, module (heating) [bar]
Model 10	45	30.50	180.0	3	35-30	519.6	0087
		30.94	309.3	5		866.0	0242
	55	31.90	302.7	8	40-30	693.4	0155
		32.31	385.2	10		866.7	0243
Model 11	45	30.20	176.3	4	35-30	519.6	0071
		30.67	364.4	6		1039	0284
	55	31.14	293	8	40-30	693.4	0126
		31.72	450.5	12		1040	0284

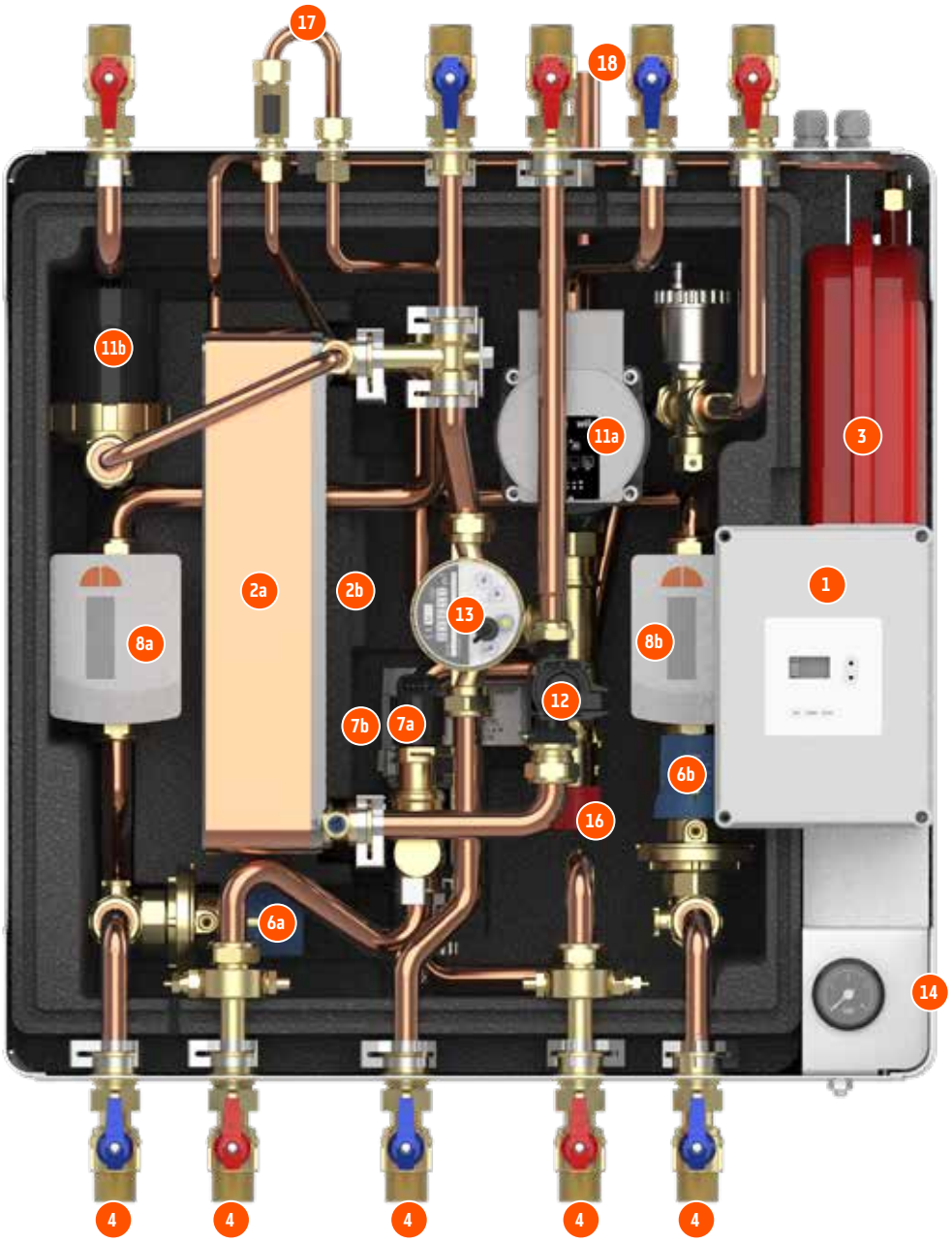
PERFORMANCE - COOLING

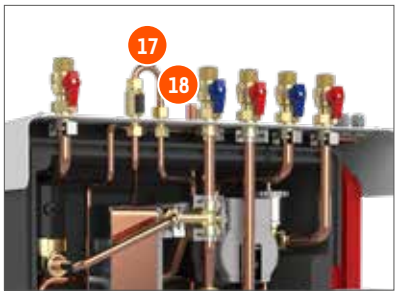
Plate Heat Exchangers	T, primary flow [°C]	T, primary return [°C]	Primary flow rate [l/h]	Power [kW]	ΔT, cooling [°C]	Cooling flow rate [l/h]	ΔP, module (cooling) [bar]
Model 10	10	16.11	140.7	2	14-18	215.0	0.0213
		14.64	370.4	3		430.2	0.0837
		13.45	748.1	4		645.1	0.1864
Model 11	10	17.02	367.3	3	14-18	645.8	0110
		16.65	517.3	4		861.1	0195
		16.37	675.2	5		1076	0304

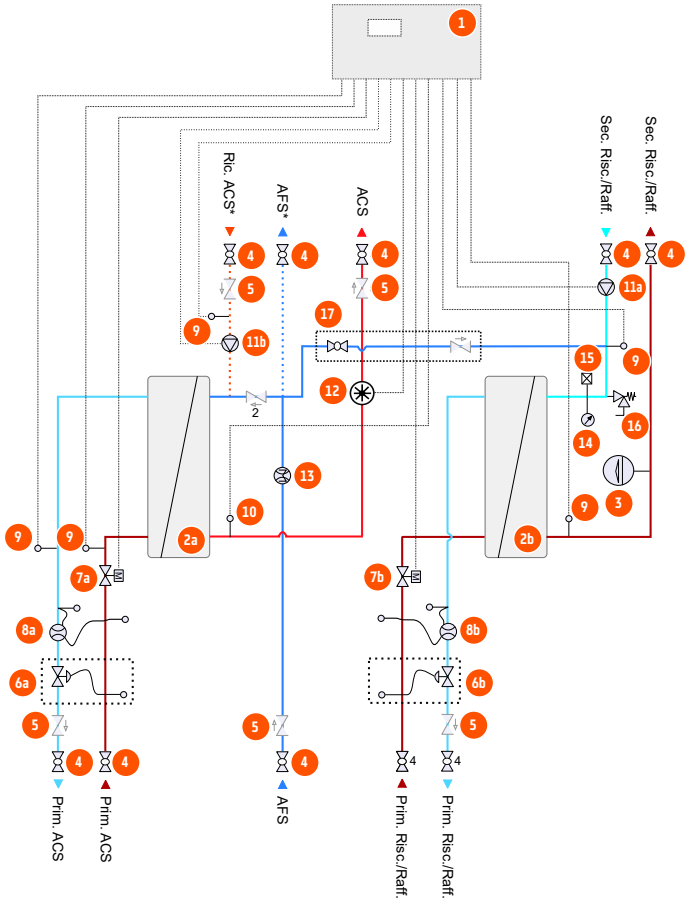
PERFORMANCE - DHW PRODUCTION

Plate Heat Exchangers	ΔP, module (primary) [bar]	Primary flow rate [l/h]	T, primary flow [°C]	T, primary return [°C]	Power [kW]	ΔT, DHW [°C]	DHW flow rate [l/min]
Model 51	0300	1013.3	60	26.36	39.57	10 – 45	16.23
				30.83	34.31	10 – 50	12.32
			70	26.00	51.77	10 – 48	19.56
				31.30	45.55	10 – 55	14.53
Model 57	0300	1060.5	60	23.09	45.43	10 – 45	18.64
				27.03	40.58	10 – 50	14.57
			70	22.55	58.42	10 – 48	22.07
				27.22	52.68	10 – 55	16.81

PLUMBING DIAGRAM AND COMPONENTS



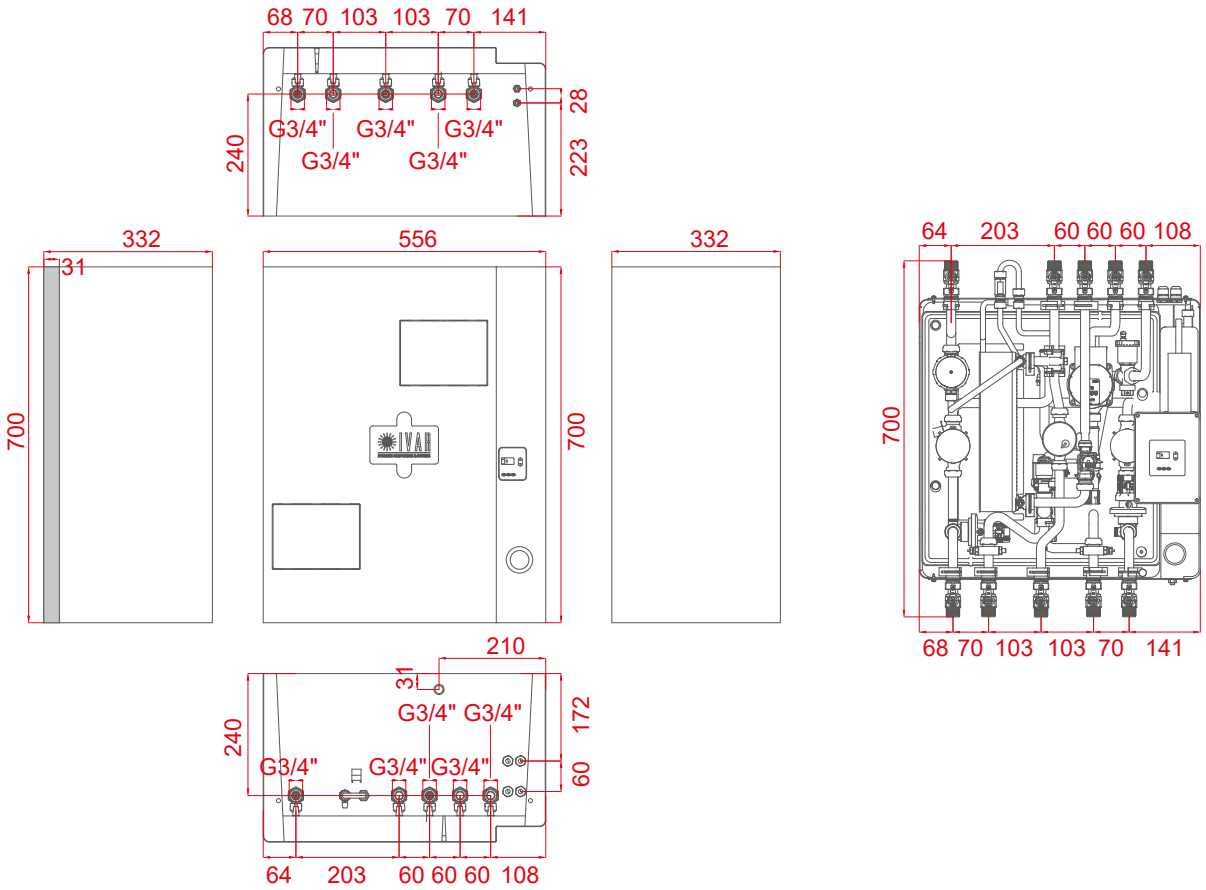




1	Electronic regulator
2	Plate heat exchangers: DHW (a), heating/cooling with insulating casing (b)
3	Expansion vessel on secondary heating/cooling circuit
4	Ball-type shutoff valves
5	Check valves
6	Differential pressure regulators: primary DHW circuit (a)*, primary heating/cooling circuit (b)*
7	Two-way valve with stepper motor: primary DHW circuit (a), primary heating/cooling circuit (b)
8	Heat meters: primary DHW circuit (a)**, primary heating/cooling circuit (b)**
9	Clip-on temperature sensors
10	Immersion temperature sensor
11	Pumps: secondary heating/cooling circuit (a), DHW recirculation (b)*
12	ACS flow meter
13	DCW+DHW volumetric meter**
14	Pressure gauge on secondary heating/cooling circuit
15	Automatic bleed valve on secondary heating/cooling circuit
16	Safety valve on secondary heating/cooling circuit
17	Heating/cooling system filling kit composed of ball-type shut-off valve and check valve
18	Drain hose for safety valve on secondary heating/cooling circuit
19	Insulating casing
20	Sheet-metal cover*

*optional
**not included

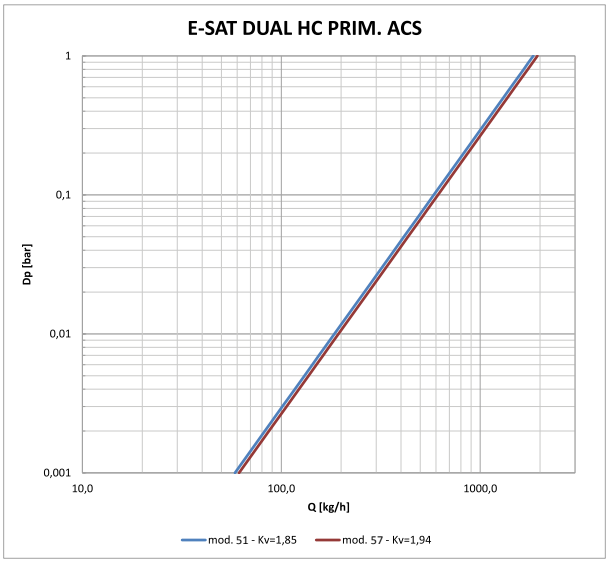
DIMENSIONS

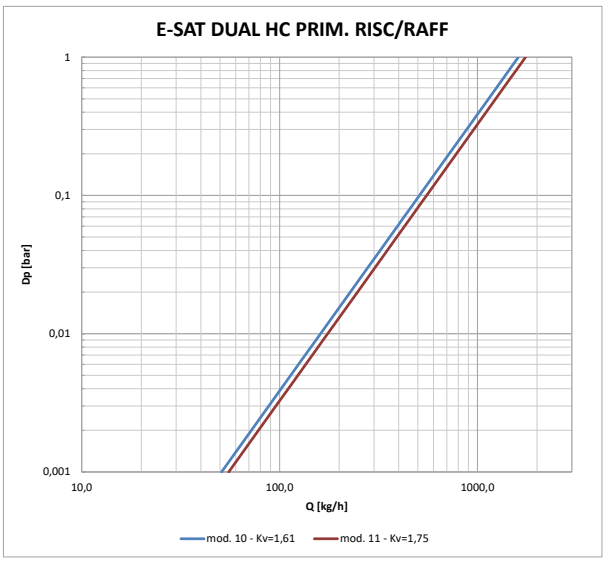


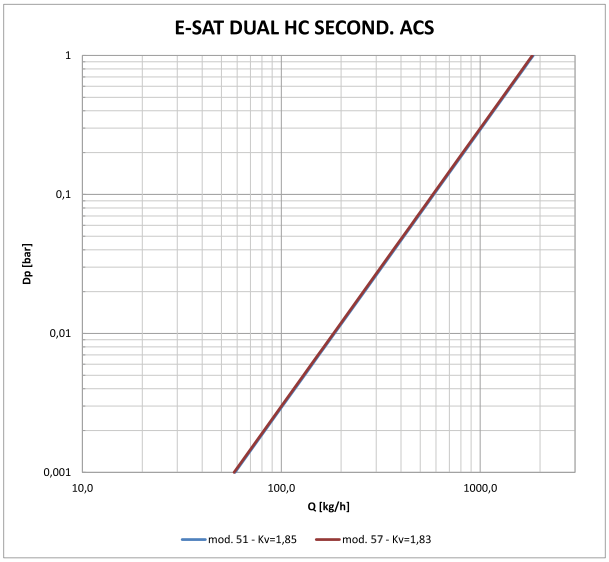
ADVANTAGES

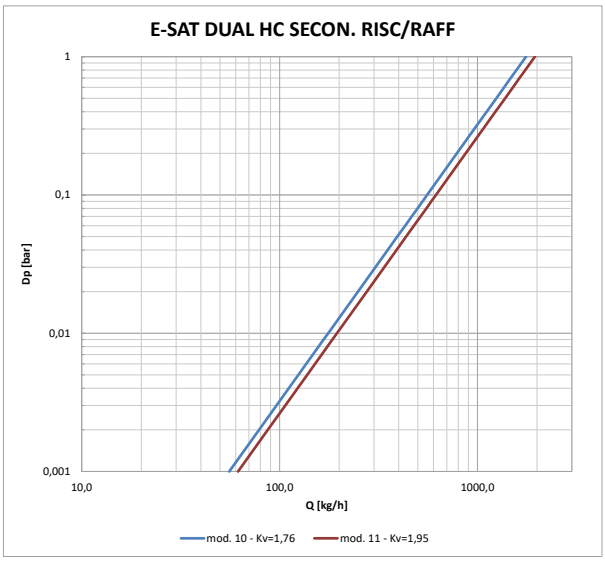
- Separated water between the centralised and domestic systems → easy maintenance of each individual terminal device
- Instantaneous DHW production → no common pipes, no storage tanks, no legionella
- DHW recirculation and heat exchanger keep-warm → hot water without waiting time
- Heating and cooling time bands → smart management
- For low- and high-temperature systems: ok for radiators, fan coils, radiant systems
- Flow temperature climate compensation and room compensation → maximum comfort
- Intelligent modulation of the primary circuits' flow rate → energy savings
- Dynamic circuit balancing → optimum working conditions at all times
- Metering of total energy and volumetric consumption → complete management of consumption
- Anti-frost function, anti-lock, screed drying, anti-legionella cycles, DHW priority, clogged heat exchanger monitoring, automatic system filling etc. → advanced electronic control

PRESSURE LOSS GRAPHS





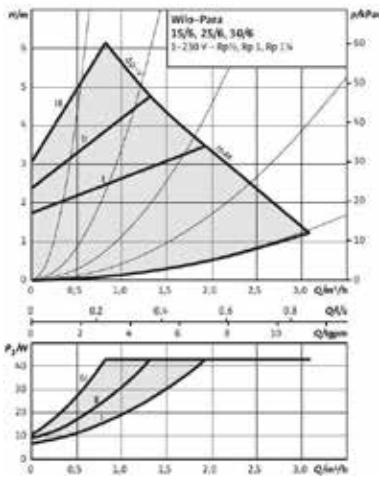




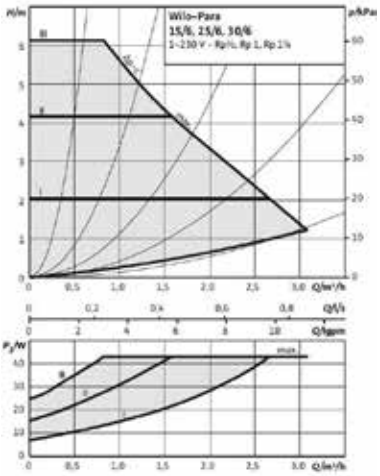
PUMP CURVES

WILO PARA 15-130/6-43/SC pump model (code WILO11)

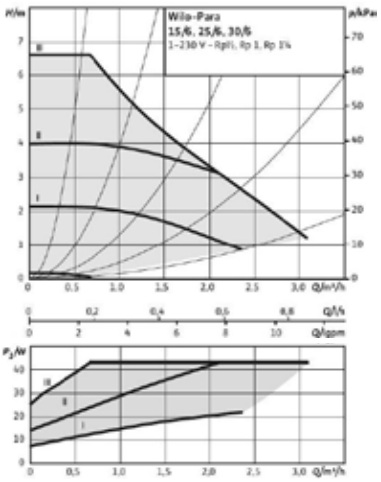
Δp-v (variable)



Δp-c (constant)

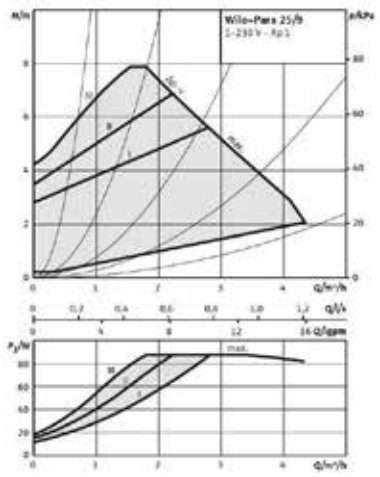


Constant speed I, II, III

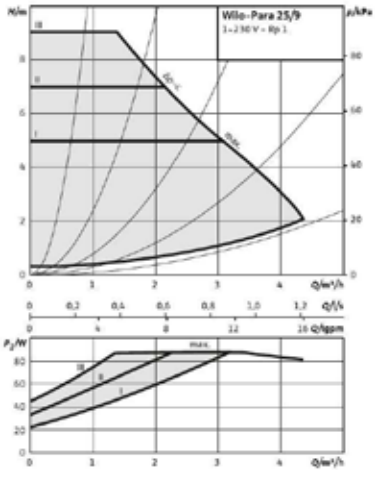


WILO PARA 15-130/9-87/SC pump model (code WILO12)

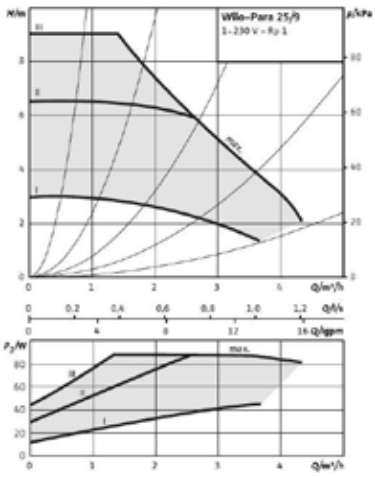
Δp-v (variable)



Δp-c (constant)



Constant speed I, II, III

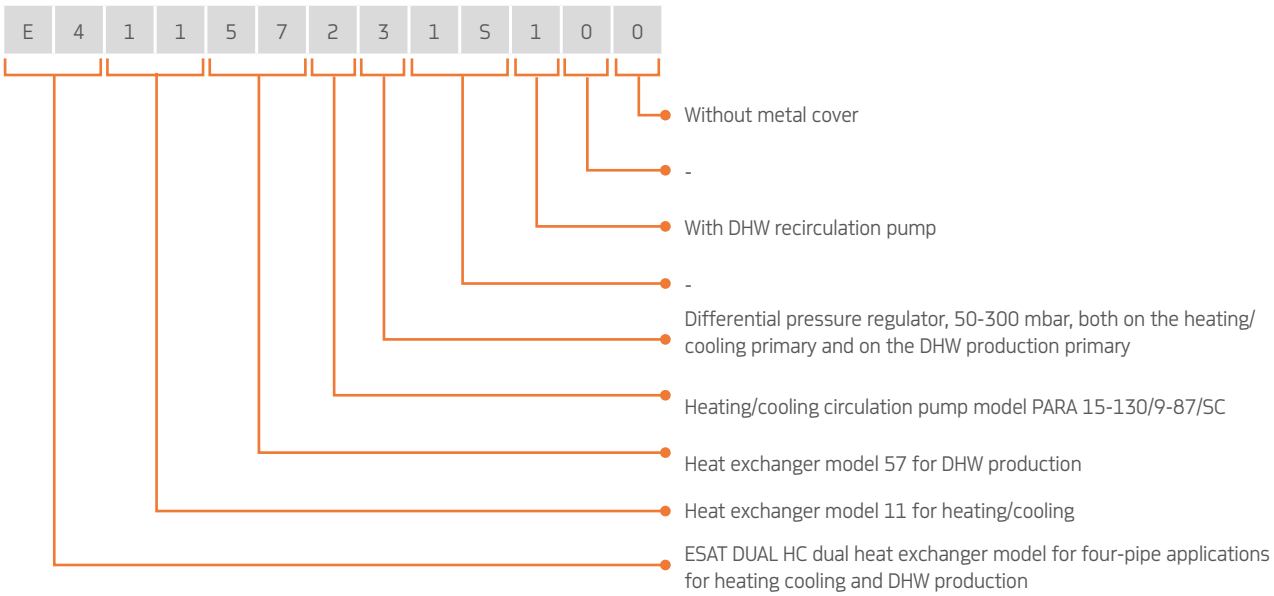


PRODUCT CODES: IVAR•ESAT DUAL H/C

A	B	C	D	E	F	G	H	I	J	K	L	M	COMPONENTS	
E													Dual electronic version	
	4												Dual four-pipe HEATING/COOLING version	
		X	X										Heating/cooling heat exchanger model*	
				X	X								DHW heat exchanger model*	
						1							WILO PARA 15-130/6-43/SC pump model (code WILO11)	
						2							WILO PARA 15-130/9-87/SC pump model (code WILO12)	
							0						DPCV no heating/cooling	DPCV no DHW
							1						DPCV no heating/cooling	DPCV DHW 50-300 mbar
							2						DPCV no heating/cooling	DPCV DHW 250-600 mbar
							3						DPCV heating/cooling 50-300 mbar	DPCV DHW 50-300 mbar
							4						DPCV heating/cooling 50-300 mbar	DPCV DHW 250-600 mbar
							5						DPCV heating/cooling 250-600 mbar	DPCV DHW 50-300 mbar
							6						DPCV heating/cooling 250-600 mbar	DPCV DHW 250-600 mbar
							7						DPCV heating/cooling 50-300 mbar	DPCV no DHW
							8						DPCV heating/cooling 250-600 mbar	DPCV no DHW
								1					-	
									S				-	
										0			No recirculation	
										1			With recirculation	
											0		-	
												0	Without cover	
												1	With cover	

**Contact the LINEA ARANCIO quotation service for specific requirements regarding heat exchanger power.*

Example

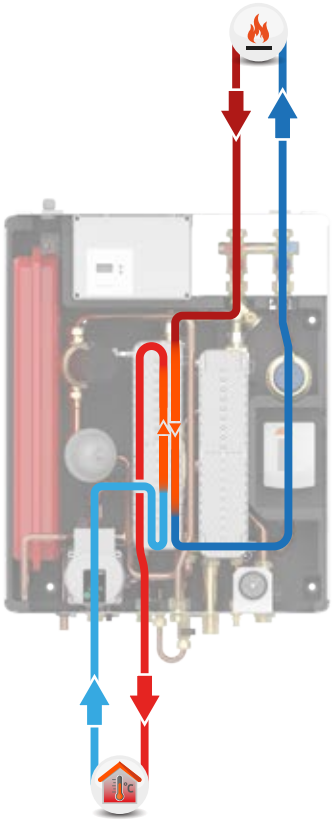


IVAR•ESAT DUAL

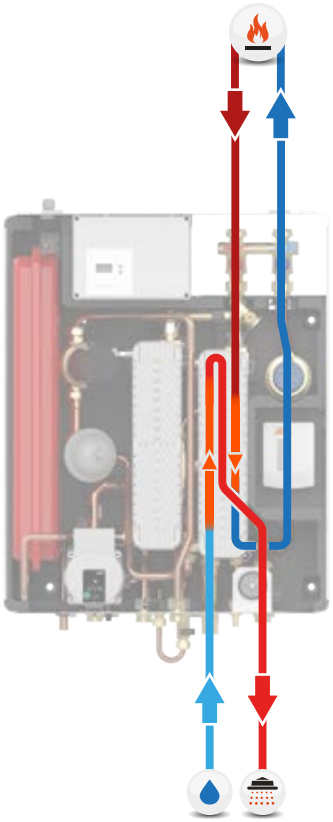
Dual heat exchanger heat interface unit for instantaneous production of domestic hot water and technical water for heating systems, with advanced electronic control.

OPERATIONAL DIAGRAMS

Heating Mode



DHW Production Mode



TECHNICAL DATA

Compatible Fluids	Water (max glycol content 30%)
Maximum operating temperature	90 °C
Maximum operating pressure	Primary circuit: 16 bar Secondary heating circuit: 3 bar Secondary DHW circuit: 10 bar
Safety valve calibration	3 bar
Maximum pressure differential at ends of actuator(s)	0.9 bar
Hydraulic connections	3/4" BSPP M
Expansion vessel	Capacity: 8 l Maximum pressure: 3 bar Precharge: 1 bar Precharge range: 0.5÷2.5 bar
Power supply	230 V AC ±10%, 50 - 60Hz (IEC60038 standard)
Temperature sensors	10 kΩ NTC

MATERIALS

Connection Components	CW617N brass
Gaskets and O-rings	peroxide EPDM
Pipes	Copper
Plate Heat Exchangers	Stainless steel
DHW flow meter body	PA 6.6
Insulating casing	ARPRO 4135 FR (EPP with flame retardant)
Regulation electronic regulator cover	ABS v0
Frame	RAL 9016 powder coated stainless steel

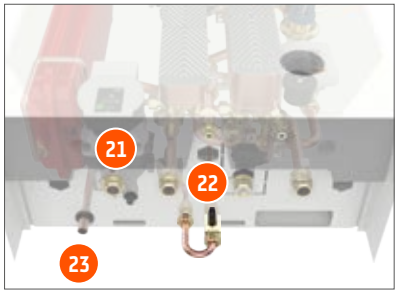
PERFORMANCE - HEATING

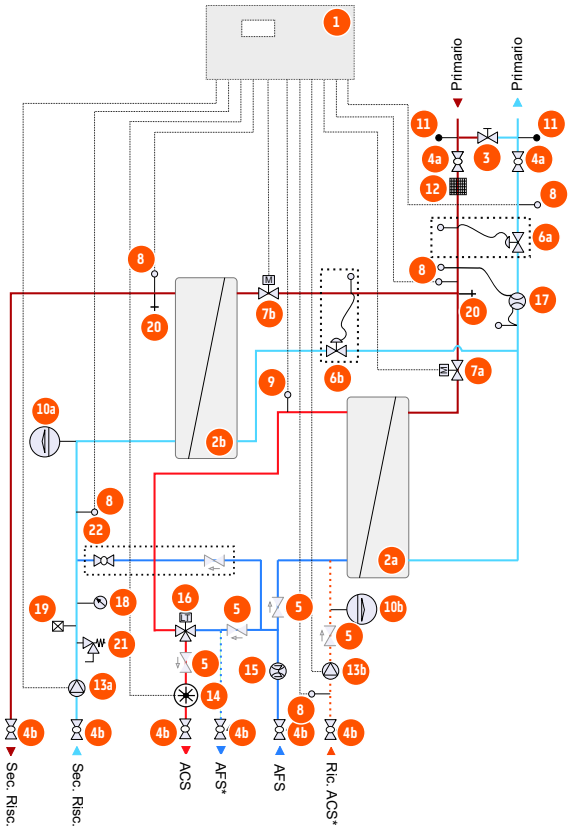
Plate Heat Exchangers	T, primary flow [°C]	T, primary return [°C]	Primary flow rate [l/h]	Power [kW]	ΔT, heating [°C]	Heating flow rate [l/h]	ΔP, module (heating) [bar]
Model 10	60	30.44	118.5	4	40-30	346.7	0.029
		31.34	244.5	8		693.4	0.118
	70	45.10	282.7	8	60-40	348.6	0.030
		46.55	450.2	12		522.9	0.067
Model 11	60	30.37	177.4	6	40-30	520.0	0.052
		30.66	238.9	8		693.4	0.093
	70	44.17	340.8	10	60-40	435.7	0.037
		44.2	496.8	14		610.0	0.072

PERFORMANCE - DHW PRODUCTION

Plate Heat Exchangers	ΔP, module (primary) [bar]	Primary flow rate [l/h]	T, primary flow [°C]	T, primary return [°C]	Power [kW]	ΔT, DHW [°C]	DHW flow rate [l/min]
Model 51	0.300	1091.0	60	26.85	41.98	10 – 45	17.22
				31.34	36.30	10 – 50	13.03
			70	26.57	55.02	10 – 48	20.79
				31.90	48.28	10 – 55	15.41
Model 57	0.300	1150.6	60	23.58	48.64	10 – 45	19.95
				27.61	43.26	10 – 50	15.53
			70	23.10	62.66	10 – 48	23.68
				27.82	56.36	10 – 55	17.98
Model 69	0.300	906.6	60	15.61	46.71	10 – 45	19.16
				18.54	43.62	10 – 50	15.66
			70	14.78	58.12	10 – 48	21.95
				17.88	54.85	10 – 55	17.50

PLUMBING DIAGRAM AND COMPONENTS

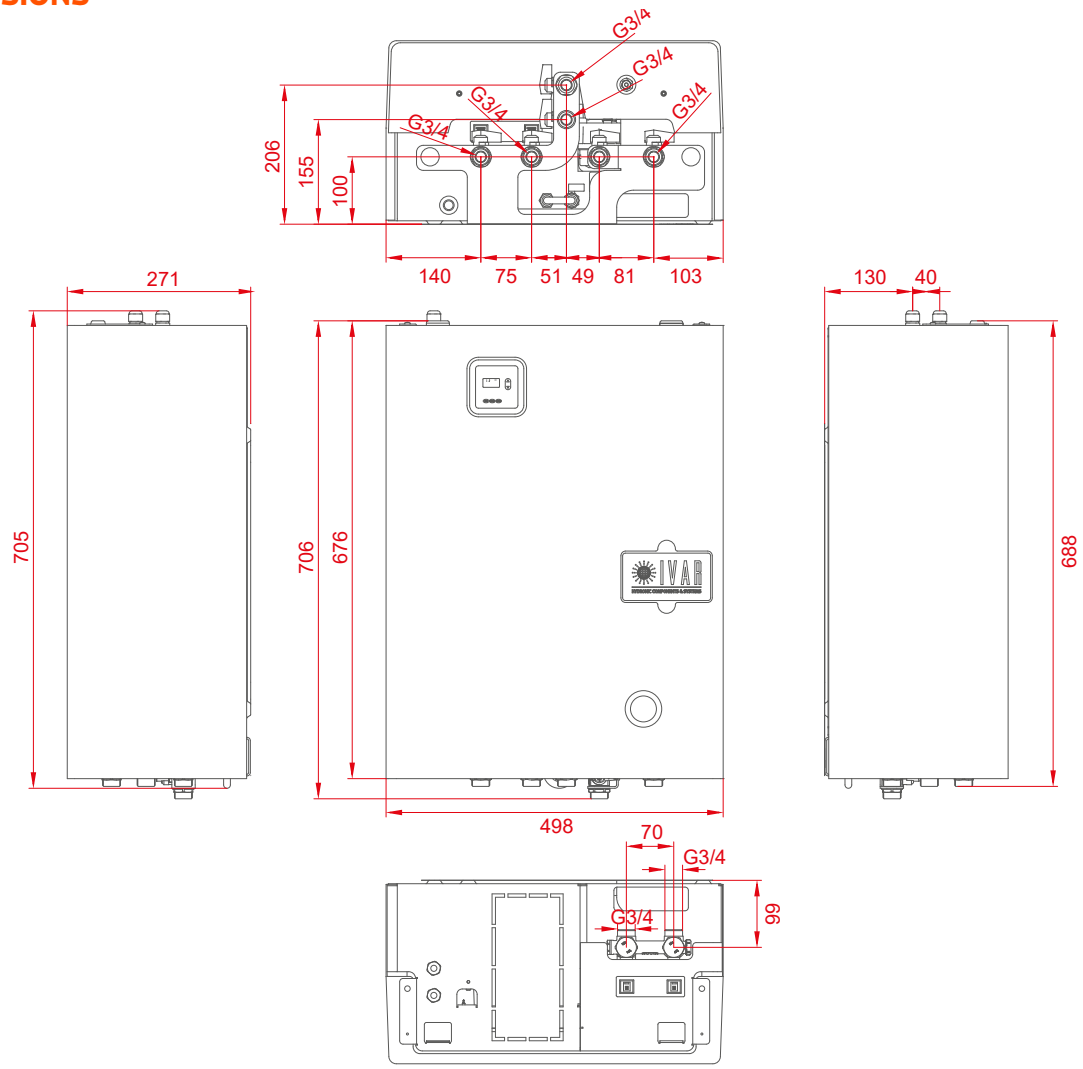




1	Electronic regulator
2	Plate heat exchangers: DHW production (a), heating (b)
3	Bypass for primary circuit flushing
4	Ball-type shut-off valves: primary circuit (a), secondary and recirculation circuits (b)**
5	Check valves
6	Differential pressure regulators: primary circuit (a)*, primary heating circuit (b)*
7	Two-way valves with stepper motor: primary DHW side circuit (a), primary heating side circuit (b)
8	Clip-on temperature sensors
9	Immersion temperature sensor
10	Expansion vessels: secondary heating circuit (a), DHW recirculation (b)*
11	Pressure ports at ends of primary circuit
12	Y strainer
13	Pumps: secondary heating circuit (a), DHW recirculation (b)*
14	ACS flow meter
15	DCW+DHW volumetric meter**
16	Anti-scalding device*
17	Heat meter on primary circuit**
18	Pressure gauge on secondary heating circuit
19	Automatic bleed valve on secondary heating circuit
20	Manual bleed valve
21	Safety valve on secondary heating circuit
22	Heating system filling kit composed of ball-type shut-off valve and check valve
23	Drain hose for safety valve on secondary heating circuit
24	Insulating casing
25	Sheet-metal cover*
26	Ball-type shut-off valves kit, straight or elbow, with 3/4"M x 3/4"F swivel fitting*

*optional.
NOTE point 6. CAUTION: it is possible to order the version without a differential pressure regulator or with a single regulator in configuration 6a or 6b.
**not included

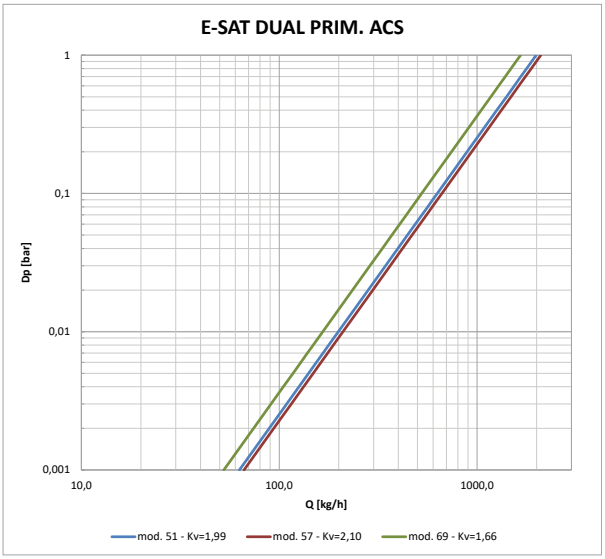
DIMENSIONS

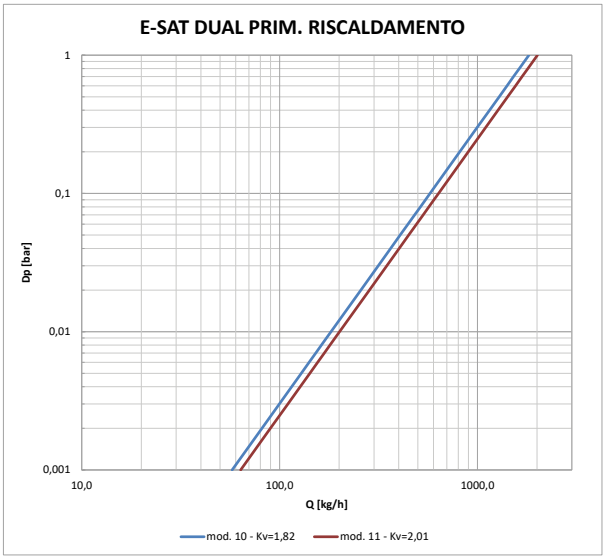


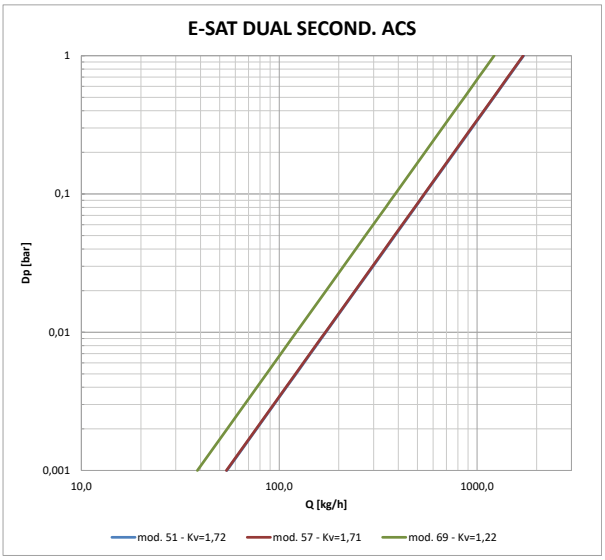
ADVANTAGES

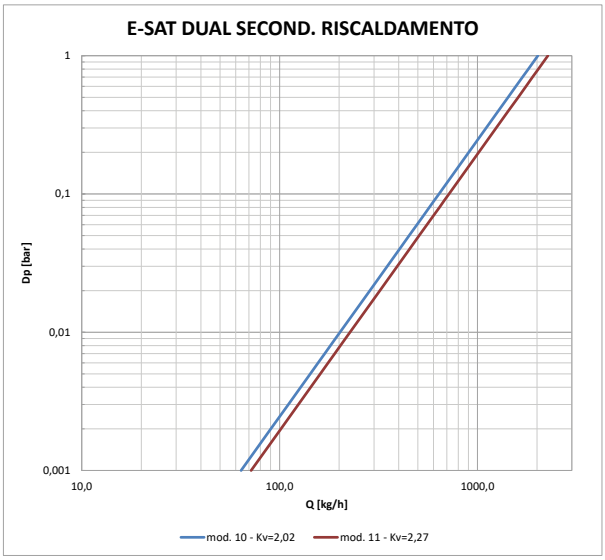
- Separated water between the centralised and domestic systems → easy maintenance of each individual terminal device
- Instantaneous DHW production → no common pipes, no storage tanks, no legionella
- DHW recirculation and heat exchanger keep-warm → hot water without waiting time
- Heating time bands → smart management
- For low- and high-temperature systems: ok for radiators, fan coils, radiant systems
- Flow temperature climate compensation and room compensation → maximum comfort
- Intelligent modulation of the primary circuit's flow rate → energy savings
- Dynamic circuit balancing → optimum working conditions at all times
- Metering of total energy consumption with a single meter → streamlined management
- Anti-frost function, anti-lock, screed drying, anti-legionella cycles, DHW priority, clogged heat exchanger monitoring, automatic system filling etc. → advanced electronic control

PRESSURE LOSS GRAPHS



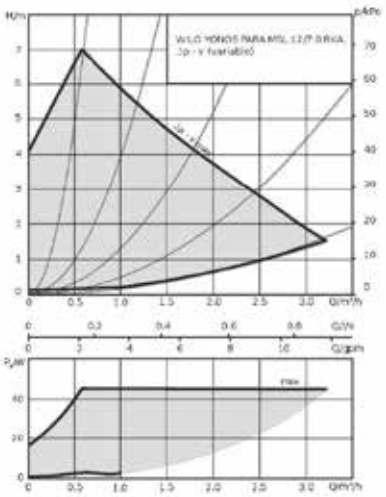


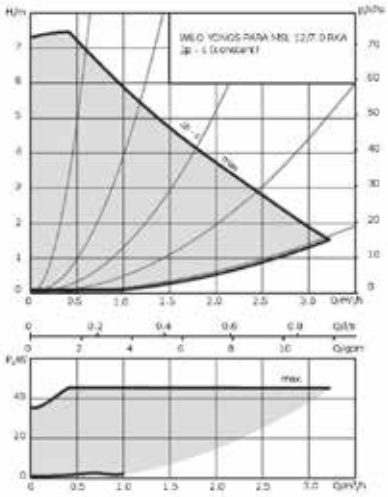




PUMP CURVES

YONOS PARA MSL 12/7 RKA pump model (WILO10)



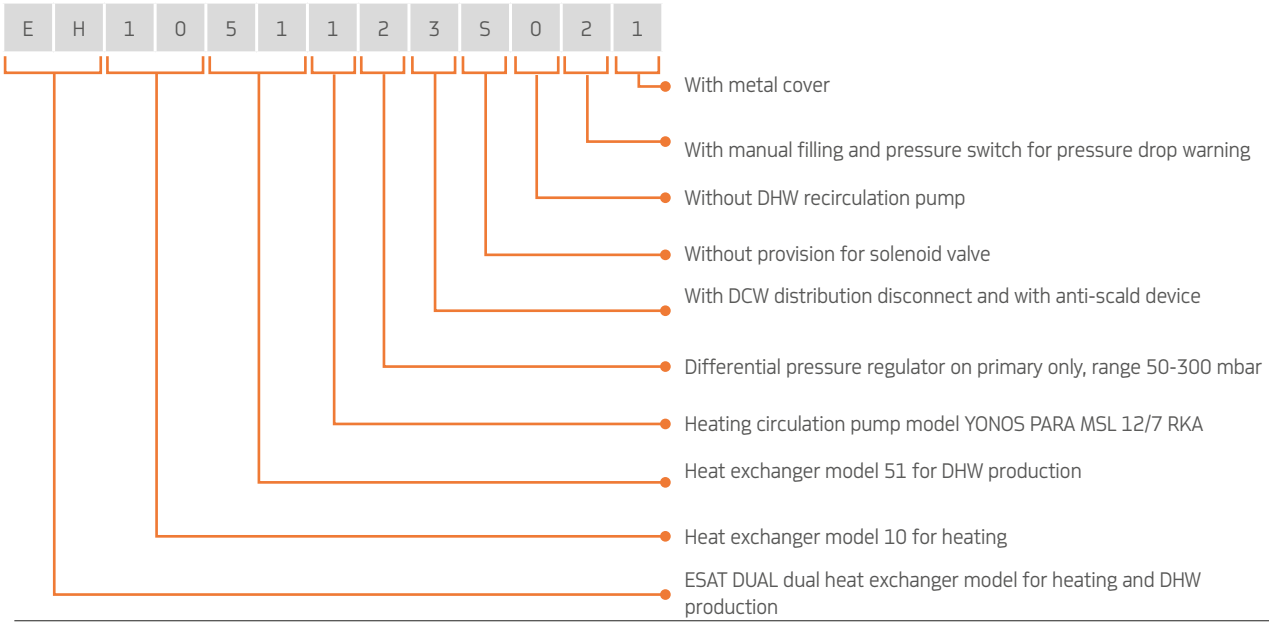


PRODUCT CODES: IVAR•ESAT DUAL

A	B	C	D	E	F	G	H	I	J	K	L	M	COMPONENTS
E													Dual electronic version
	H												Dual version for heating + DHW production
		X	X										Heating heat exchanger model*
				X	X								DHW heat exchanger model*
						1							YONOS PARA MSL 12/7 RKA pump model (WILO10)
							0						No DPCV
							1						DPCV 50-300 on primary
							2						DPCV 50-300 mbar on heating primary
							3						DPCV 250-600 on primary
							4						DPCV 250-600 mbar on heating primary
								0					Without DCW disconnect, without anti-scald
								1					With DCW disconnect, without anti-scald
								2					Without DCW disconnect, with anti-scald
								3					With DCW disconnect, with anti-scald
									T				With jigs for solenoid valve
									S				Without jigs
										0			No recirculation
										1			With recirculation
											0		Manual filling
											1		Automatic filling
											2		Manual filling + pressure sensor for warning
											3		Manual filling + CAb disconnector
												0	Without cover
												1	With cover

**Contact the LINEA ARANCIO quotation service for specific requirements regarding heat exchanger power.*

Example



JIG CODES FOR IVAR•ESAT DUAL

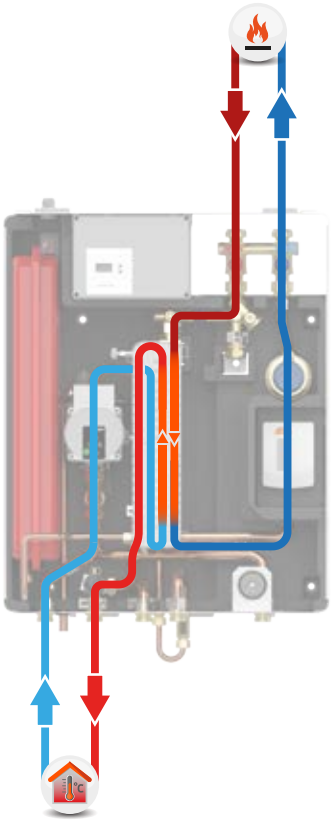
Shut-off valves type	Base version	DCW outlet disconnect	DHW recirculation disconnect	Jig code
 3/4" straight valves	✓	-	-	508013
	✓	✓	-	508018
	✓	-	✓	508020
	✓	✓	✓	508022
 Valves with 3/4" M x 3/4" F swivel elbow fittings	✓	-	-	508012
	✓	✓	-	508019
	✓	-	✓	508021
	✓	✓	✓	508023

IVAR•ESAT MONO B

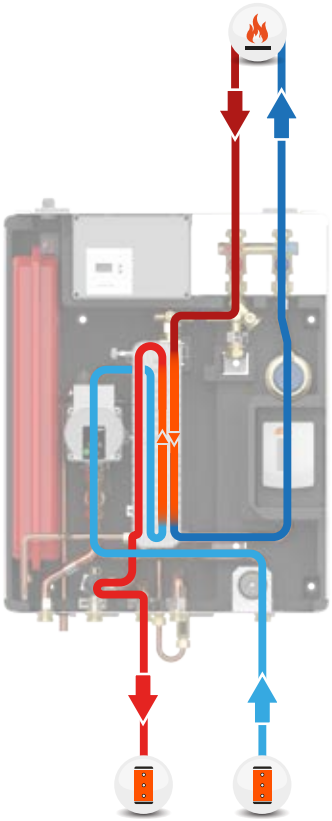
Heat exchanger heat interface unit for instantaneous production of technical water to supply a hot water tank and heating systems, with advanced electronic control.

OPERATIONAL DIAGRAMS

Heating Mode



DHW Production Mode



TECHNICAL DATA

Compatible Fluids	Water (max glycol content 30%)
Maximum operating temperature	90 °C
Maximum operating pressure	Primary circuit: 16 bar Secondary heating circuit: 3 bar Secondary hot water tank circuit: 3 bar
Safety valve calibration	3 bar
Maximum pressure differential at ends of actuator(s)	0.9 bar
Hydraulic connections	3/4" BSPP M
Expansion vessel	Capacity: 8 l Maximum pressure: 3 bar Precharge: 1 bar Precharge range: 0.5÷2.5 bar
Power supply	230 V AC ±10%, 50 - 60Hz (IEC60038 standard)
Temperature sensors	10 kΩ NTC

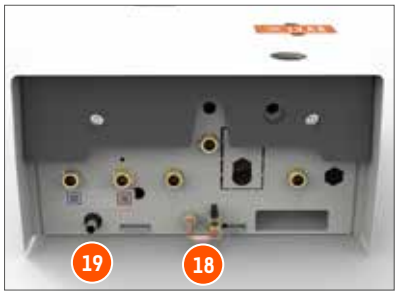
MATERIALS

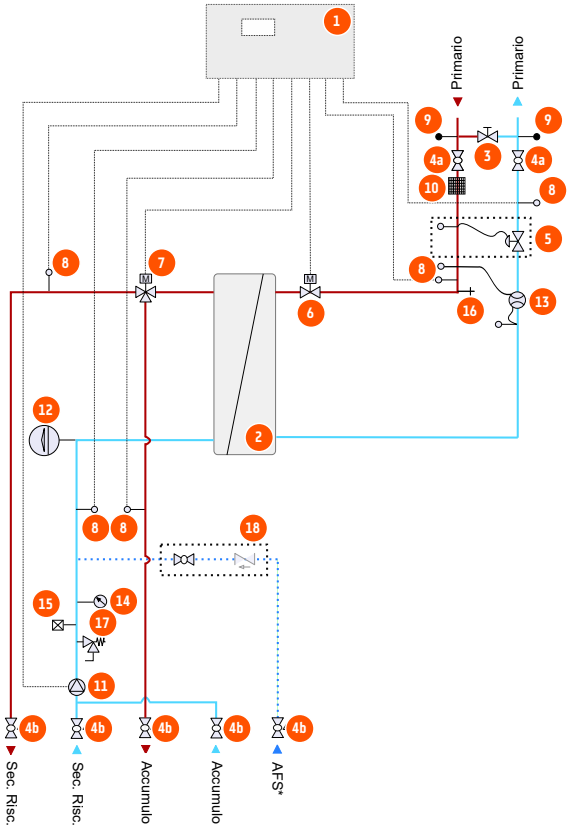
Connection Components	CW617N brass
Gaskets and O-rings	peroxide EPDM
Pipes	Copper
Plate Heat Exchangers	Stainless steel
DHW flow meter body	-
Insulating casing	ARPRO 4135 FR (EPP with flame retardant)
Regulation electronic regulator cover	ABS v0
Frame	RAL 9016 powder coated stainless steel

PERFORMANCE - HEATING

Plate Heat Exchangers	T, primary flow [°C]	T, primary return [°C]	Primary flow rate [l/h]	Power [kW]	ΔT, heating [°C]	Heating flow rate [l/h]	ΔP, module (heating) [bar]
Model 10	60	30.44	118.5	4	40-30	346.7	0.035
		31.34	244.5	8		693.4	0.140
	70	45.10	282.7	8	60-40	348.6	0.036
		46.55	450.2	12		522.9	0.080
Model 11	60	30.37	177.4	6	40-30	520.0	0.065
		30.66	238.9	8		693.4	0.116
	70	44.17	340.8	10	60-40	435.7	0.046
		44.2	496.8	14		610.0	0.089

PLUMBING DIAGRAM AND COMPONENTS

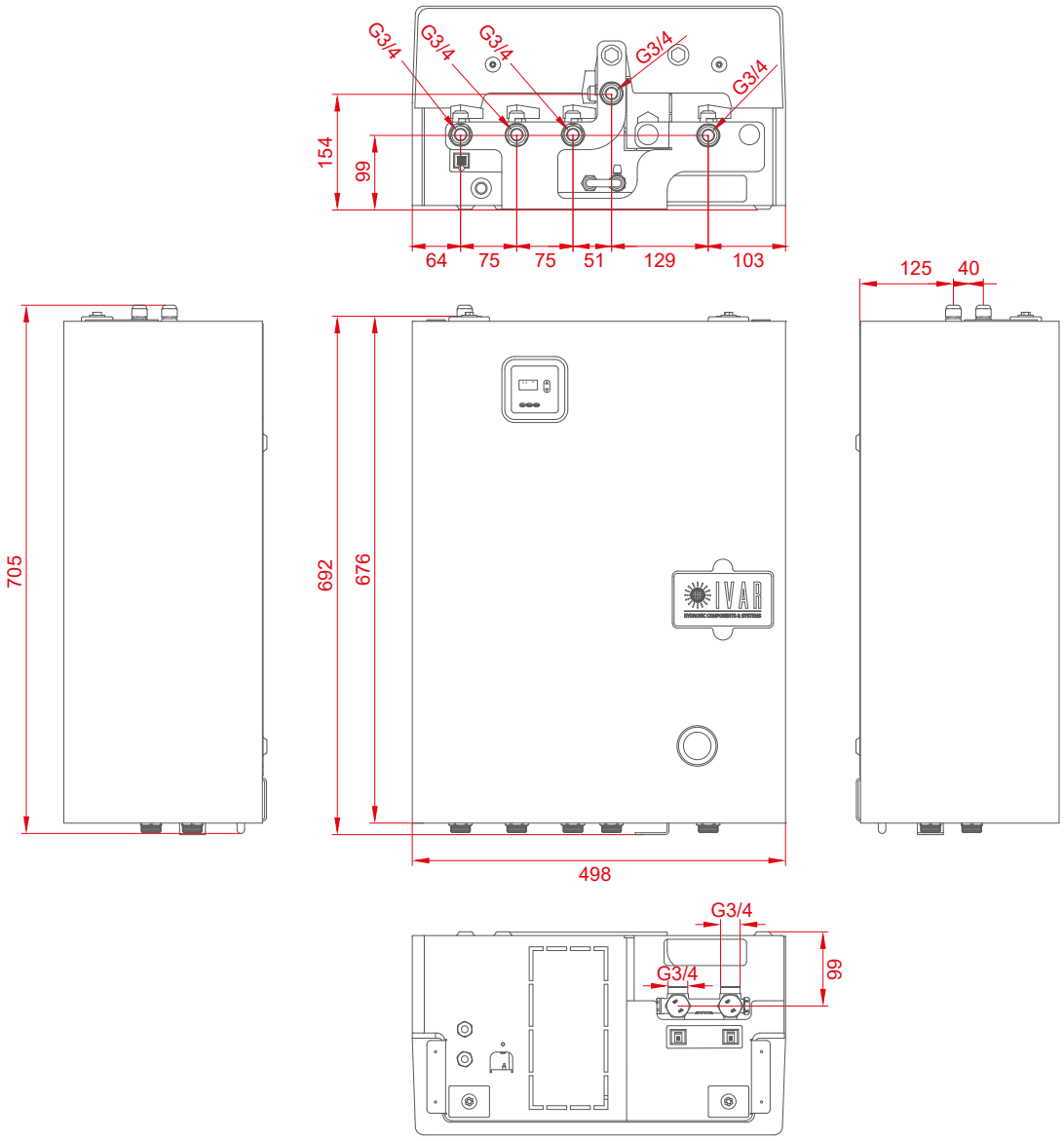




1	Electronic regulator
2	Plate Heat Exchanger
3	Bypass for primary circuit flushing
4	Ball-type shut-off valves: primary circuit (a), secondary circuits (b)**
5	Differential pressure regulator on the primary circuit*
6	Two-way valves with stepper motor on the primary circuit
7	DHW priority valve
8	Clip-on temperature sensors
9	Pressure ports at ends of primary circuit
10	Y strainer
11	Pump on the secondary circuit
12	Expansion vessel on secondary circuit
13	Heat meter on primary circuit**
14	Pressure gauge on the secondary circuit
15	Automatic bleed valve on the secondary circuit
16	Manual bleed valves on the primary circuit
17	Safety valve on secondary heating circuit
18	System filling kit composed of ball-type shut-off valve and check valve
19	Drain hose for safety valve on secondary heating circuit
20	Insulating casing
21	Sheet-metal cover*
22	Ball-type shut-off valves kit, straight or elbow, with 3/4"M x 3/4"F swivel fitting*

*optional
**not included

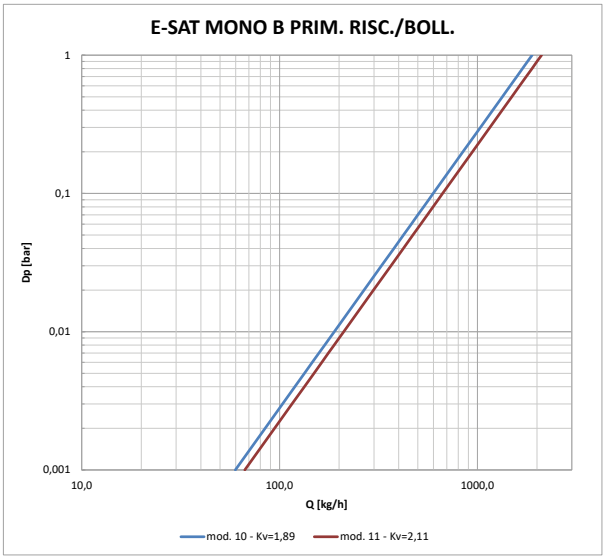
DIMENSIONS

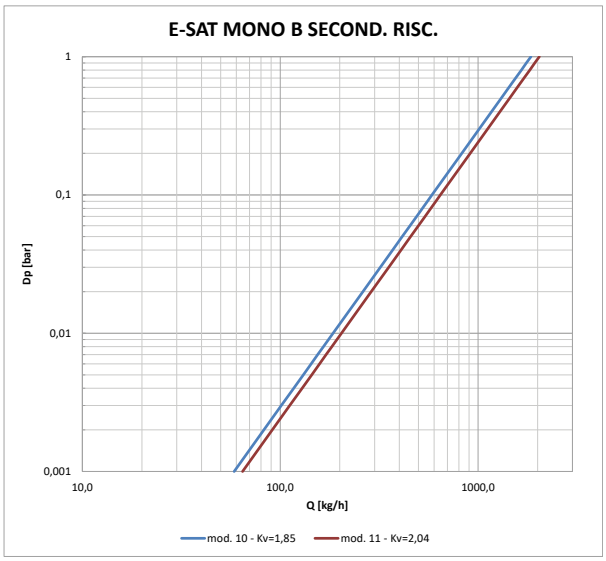


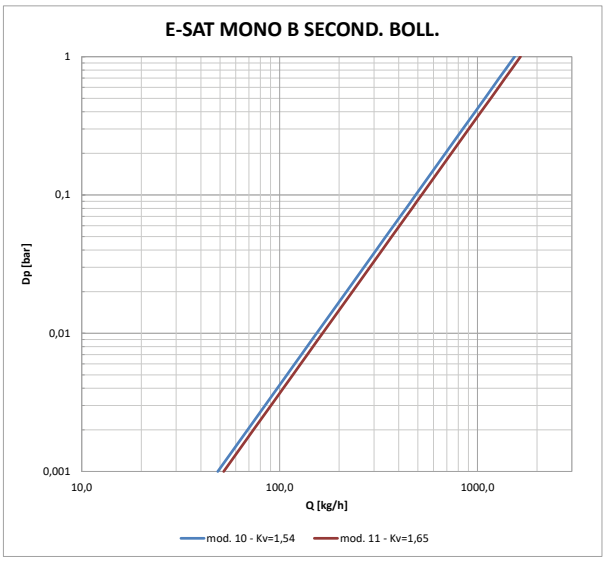
ADVANTAGES

- Separated water between the centralised and domestic systems → easy maintenance of each individual terminal device
- Local DHW production → reduced number of pipes in main distribution
- Heating time bands → smart management
- For low- and high-temperature systems: ok for radiators, fan coils, radiant systems
- Flow temperature climate compensation and room compensation → maximum comfort
- Intelligent modulation of the primary circuit's flow rate → energy savings
- Dynamic balancing → optimum working conditions at all times
- Metering of total energy consumption with a single meter → streamlined management
- Anti-frost function, anti-lock, screed drying, anti-legionella cycles, clogged heat exchanger monitoring, automatic system filling etc. → advanced electronic control

PRESSURE LOSS GRAPHS

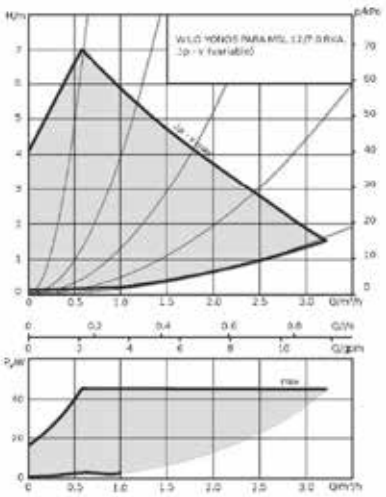


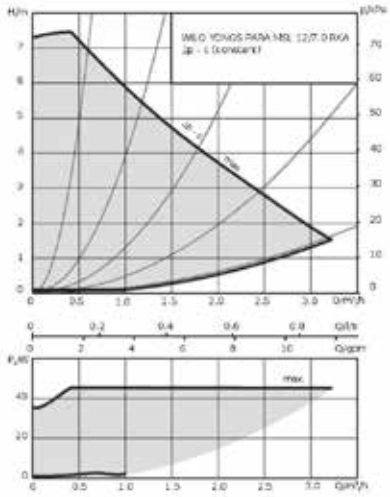




PUMP CURVES

YONOS PARA MSL 12/7 RKA pump model (WILO10)



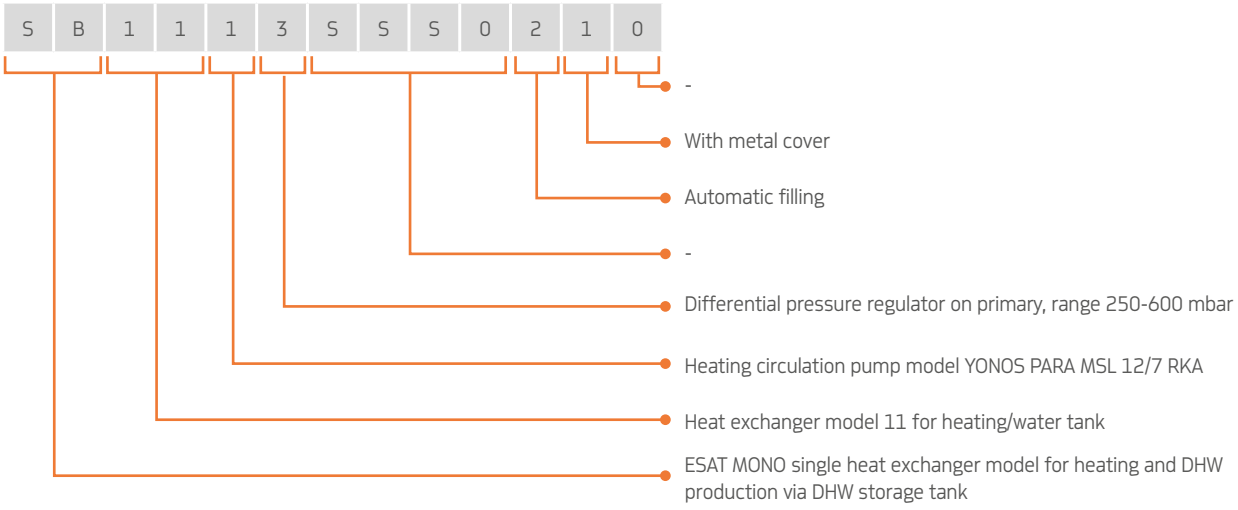


PRODUCT CODES: IVAR•ESAT MONO B

A	B	C	D	E	F	G	H	I	J	K	L	M	COMPONENTS
S													Mono Electronic version
	B												DHW production via storage tank
		X	X										Heat exchanger model*
				1									YONOS PARA MSL 12/7 RKA pump model (WILO10)
					0								No DPCV
					1								DPCV 50-300 on primary
					3								DPCV 250-600 on primary
						S							-
							S						-
								S					-
									0				No recirculation
									1				With recirculation
										1			Manual filling
										2			Automatic filling
										3			Manual filling + pressure sensor for warning
										4			Manual filling + CAb disconnector
											0		Without cover
											1		With cover
												0	-

**Contact the LINEA ARANCIO quotation service for specific requirements regarding heat exchanger power.*

Example



JIG CODES FOR IVAR•ESAT MONO B

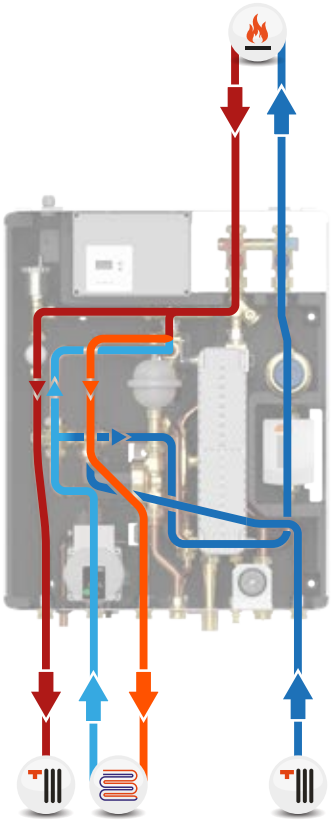
Shut-off valves type	Jig code
 3/4" straight valves	508024
 Valves with 3/4" M x 3/4" F swivel elbow fittings	508025

IVAR•ESAT MONO HL

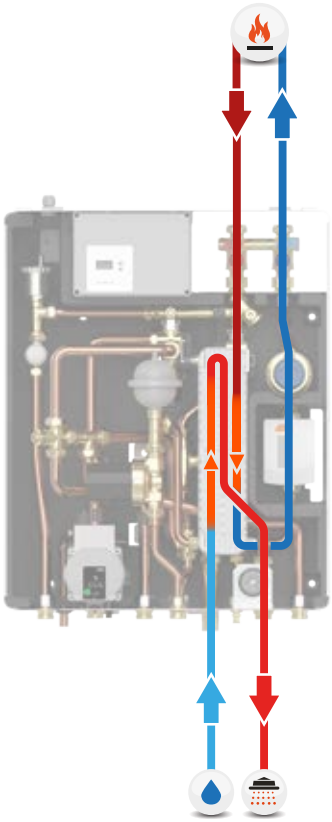
Heat exchanger heat interface unit for instantaneous production of domestic hot water and management of high- and low-temperature heating systems, with advanced electronic control.

OPERATIONAL DIAGRAMS

Heating Mode



DHW Production Mode



TECHNICAL DATA

Compatible Fluids	Water (max glycol content 30%)
Maximum operating temperature	90 °C
Maximum operating pressure	Primary circuit: 16 bar Secondary heating circuits: 3 bar Secondary DHW circuit: 10 bar
Maximum pressure differential at ends of actuator(s)	0.9 bar
Hydraulic connections	3/4" BSPP M
Expansion vessel	Capacity: 8 l Maximum pressure: 3 bar Precharge: 1 bar Precharge range: 0.5÷2.5 bar
Power supply	230 V AC ±10%, 50 - 60Hz (IEC60038 standard)
Temperature sensors	10 kΩ NTC

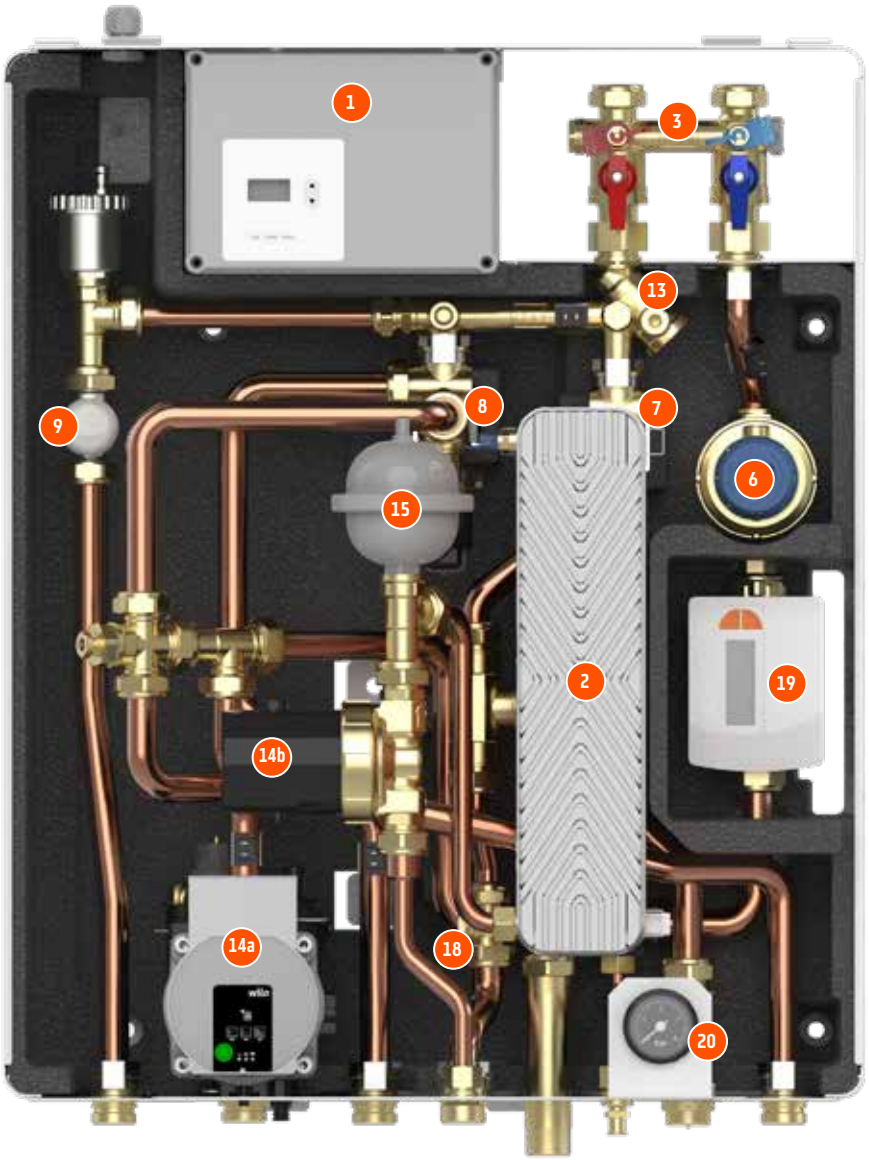
MATERIALS

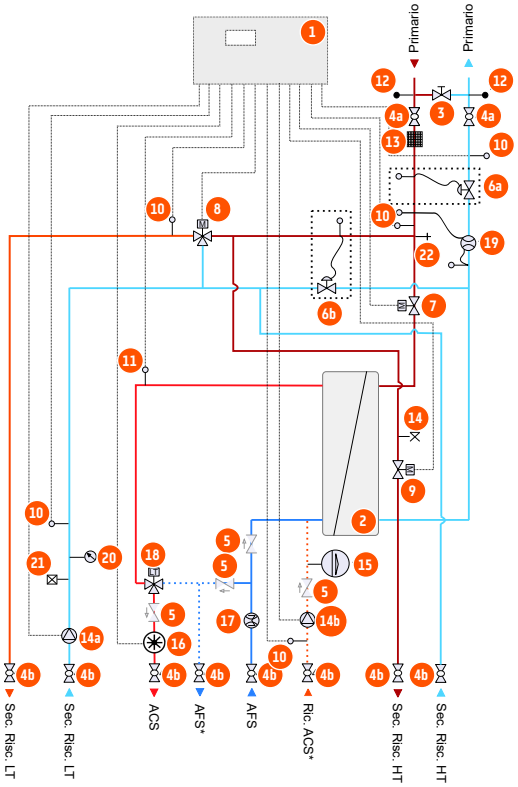
Connection Components	CW617N brass
Gaskets and O-rings	peroxide EPDM
Pipes	Copper
Plate Heat Exchangers	Stainless steel
DHW flow meter body	PA 6.6
Insulating casing	ARPRO 4135 FR (EPP with flame retardant)
Regulation electronic regulator cover	ABS v0
Frame	RAL 9016 powder coated stainless steel

PERFORMANCE - DHW PRODUCTION

Plate Heat Exchangers	ΔP, module (primary) [bar]	Primary flow rate [l/h]	T, primary flow [°C]	T, primary return [°C]	Power [kW]	ΔT, DHW [°C]	DHW flow rate [l/min]
Model 51	0.300	1194.0	60	27.46	45.10	10 – 45	18.50
				31.97	38.85	10 – 50	13.94
			70	27.26	59.26	10 – 48	22.39
				32.64	51.82	10 – 55	16.53
Model 57	0.300	1273.5	60	24.20	52.92	10 – 45	21.71
				28.32	46.83	10 – 50	16.81
			70	23.79	68.33	10 – 48	25.82
				28.58	61.25	10 – 55	19.55
Model 69	0.300	963.2	60	15.87	49.34	10 – 45	20.24
				18.86	46.00	10 – 50	16.51
			70	15.03	61.46	10 – 48	23.22
				18.21	57.91	10 – 55	18.48

PLUMBING DIAGRAM AND COMPONENTS

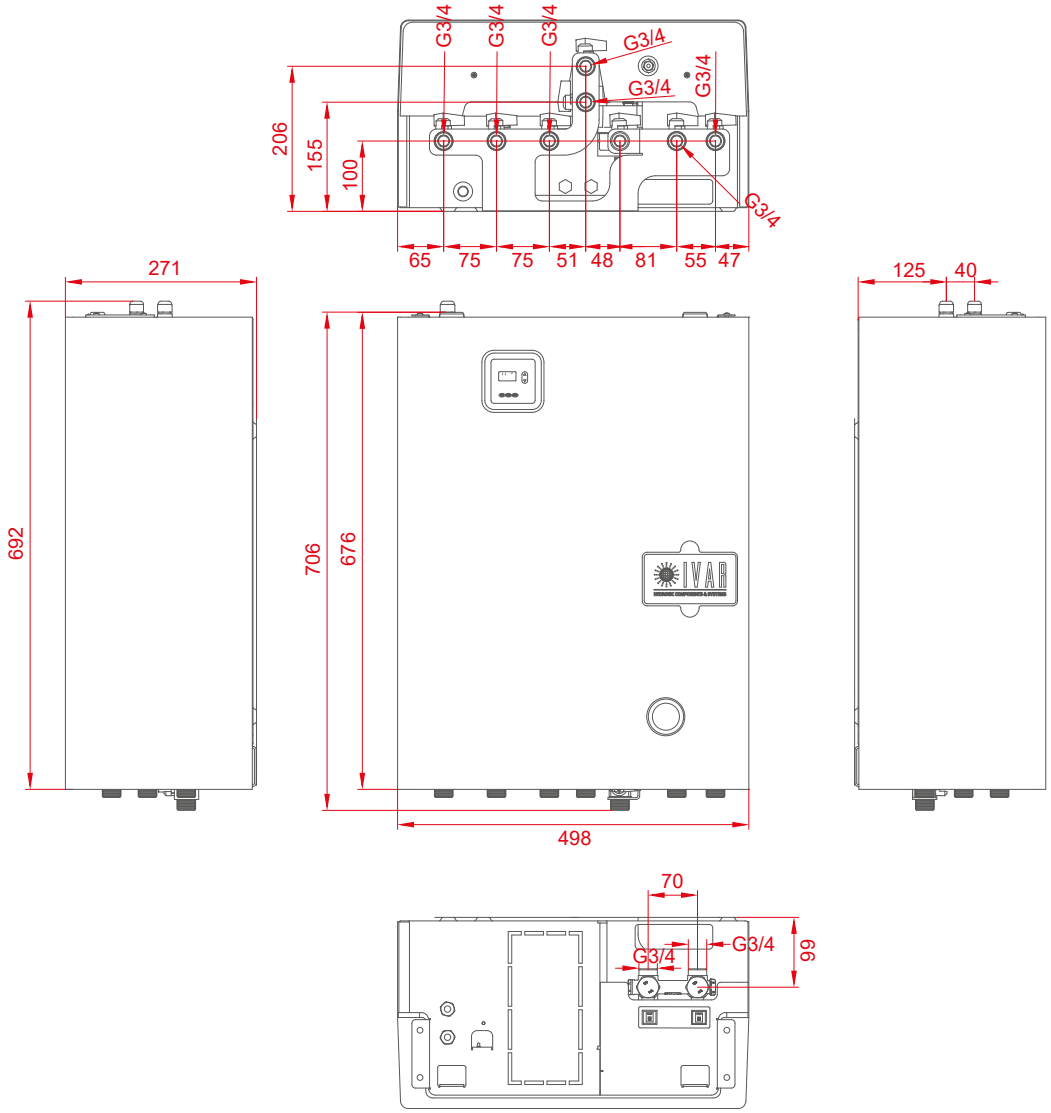




1	Electronic regulator
2	Plate heat exchanger for DHW production
3	Bypass for primary circuit flushing
4	Ball-type shut-off valves: primary circuit (a), secondary and recirculation circuits (b)**
5	Check valves
6	Differential pressure regulators: primary circuit (a)*, primary heating side circuit (b)*
7	Two-way valves with stepper motor on the primary circuit for DHW temperature control
8	Low-temperature heating mixer valve
9	High-temperature heating On/Off valve
10	Clip-on temperature sensors
11	Immersion temperature sensor
12	Pressure ports at ends of primary circuit
13	Y strainer
14	Pumps: secondary heating circuit (a)*, DHW recirculation (b)*
15	Expansion vessel on DHW recirculation*
16	ACS flow meter
17	DCW+DHW volumetric meter**
18	Anti-scalding device*
19	Heat meter on primary circuit**
20	Pressure gauge on secondary heating circuit
21	Automatic bleed valve on secondary heating circuit*
22	Manual bleed valves on the primary circuit
23	Insulating casing
24	Sheet-metal cover*
25	Ball-type shut-off valves kit, straight or elbow, with 3/4"M x 3/4"F swivel fitting*

*optional.
NOTE point 6. CAUTION: it is possible to order the version without a differential pressure regulator or with a single regulator in configuration 6a or 6b.
**not included

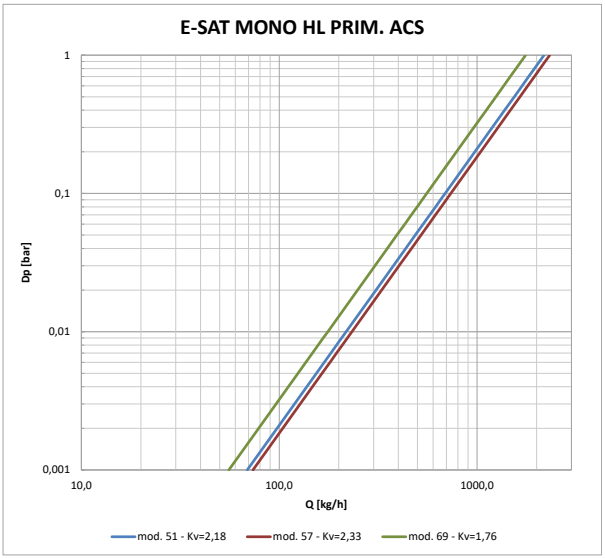
DIMENSIONS

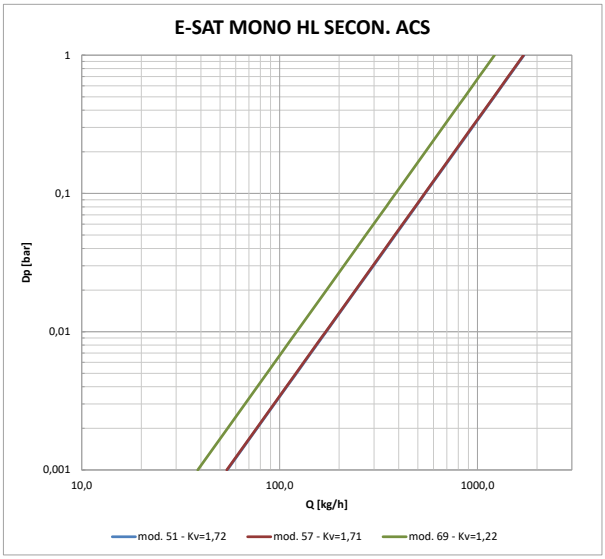


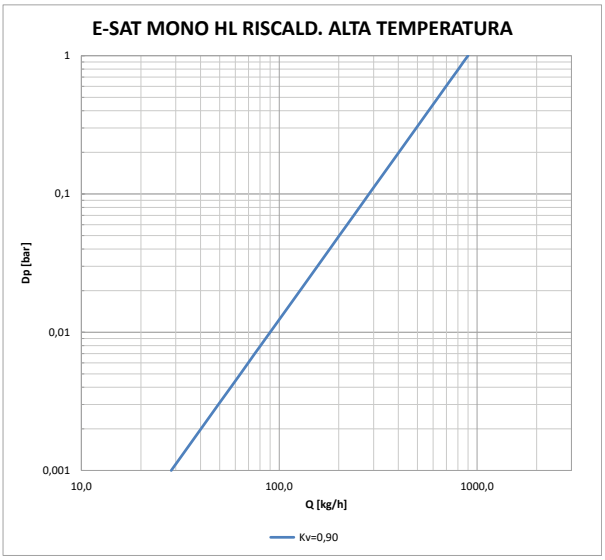
ADVANTAGES

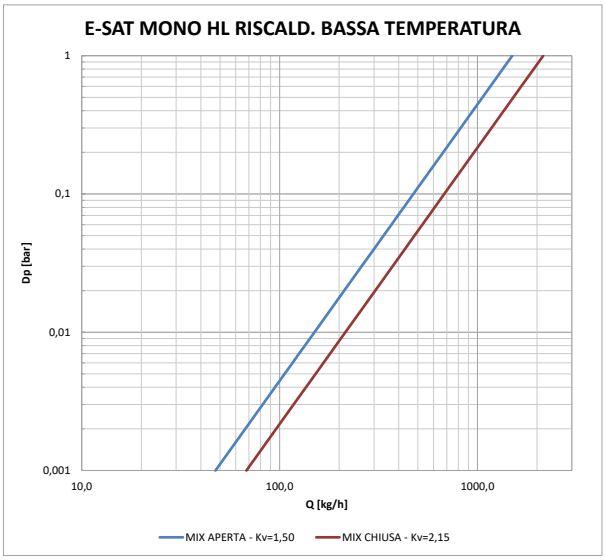
- Instantaneous DHW production → no common pipes, no storage tanks, no legionella
- DHW recirculation and heat exchanger keep-warm → hot water without waiting time
- Anti-scalding device* → maximum safety
- Heating time bands → smart management
- For low- and high-temperature systems: ok for radiators, fan coils, radiant systems
- Low temperature climate compensation and room compensation on flow → maximum comfort
- Intelligent modulation of the primary circuit's flow rate → energy savings
- Dynamic balancing → optimum working conditions at all times
- Metering of total energy consumption with a single meter → streamlined management
- Anti-frost function, anti-lock, screed drying, anti-legionella cycles, DHW priority, clogged heat exchanger monitoring etc. → advanced electronic control

PRESSURE LOSS GRAPHS



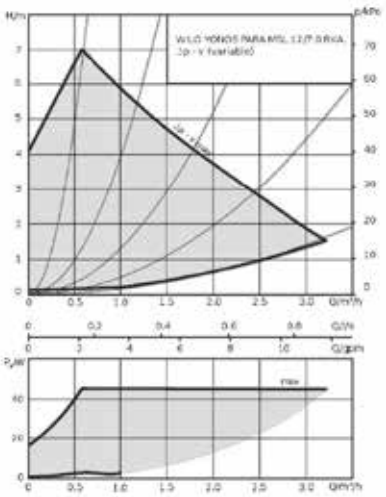


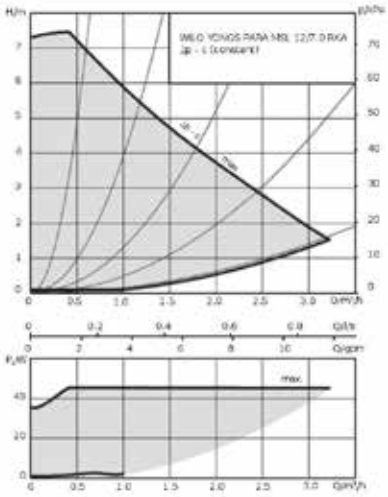




PUMP CURVES

YONOS PARA MSL 12/7 RKA pump model (WILO10)



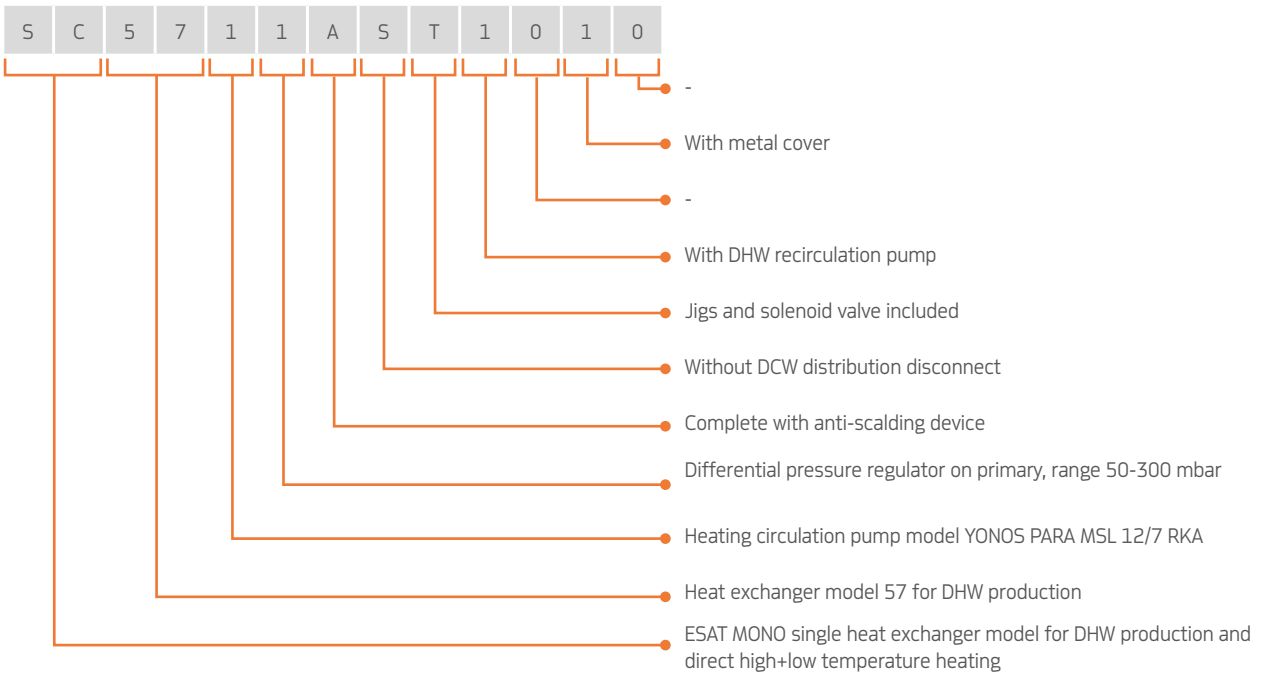


PRODUCT CODES: IVAR•ESAT MONO HL

A	B	C	D	E	F	G	H	I	J	K	L	M	COMPONENTS
S													Mono Electronic version
	C												Low- and high-temperature heating
		X	X										Heat exchanger model*
				1									YONOS PARA MSL 12/7 RKA pump model (WILO10)
					0								No DPCV
					1								DPCV 50-300 on primary
					2								DPCV 50-300 mbar on heating primary
					3								DPCV 250-600 on primary
					4								DPCV 250-600 mbar on heating primary
						A							With anti-scalding device
						S							Without anti-scalding device
							F						With DCW disconnect
							S						Without DCW disconnect
								T					With jigs for solenoid valve
								S					Without jigs
									0				No recirculation
									1				With recirculation
										0			-
											0		Without cover
											1		With cover
												0	-

**Contact the LINEA ARANCIO quotation service for specific requirements regarding heat exchanger power.*

Example

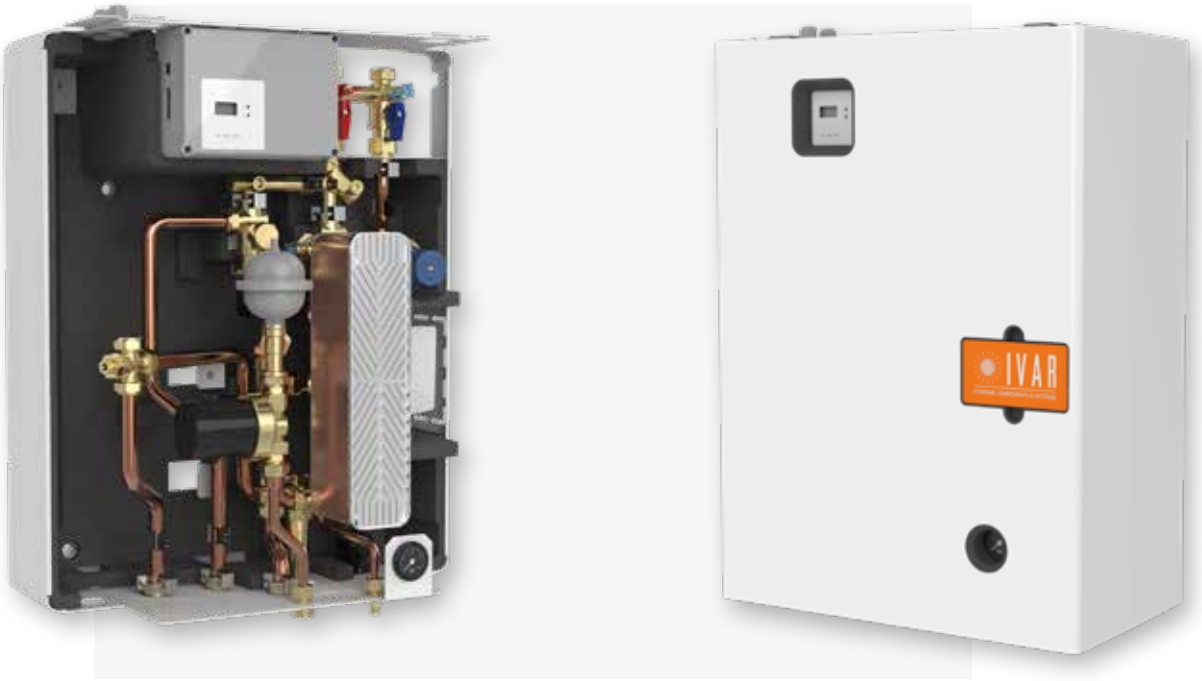


JIG CODES FOR IVAR•ESAT MONO HL

Shut-off valves type	Base version	DCW outlet disconnect	DHW recirculation disconnect	Jig code
 3/4" straight valves	✓	-	-	508026
	✓	✓	-	508028
	✓	-	✓	508030
	✓	✓	✓	508032
 Valves with 3/4" M x 3/4" F swivel elbow fittings	✓	-	-	508027
	✓	✓	-	508029
	✓	-	✓	508031
	✓	✓	✓	508033

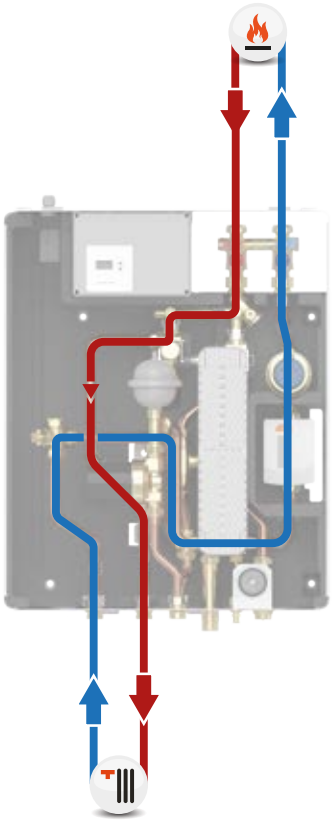
IVAR•ESAT MONO H

Heat exchanger heat interface unit for instantaneous production of domestic hot water and management of high-temperature heating systems, with advanced electronic control.

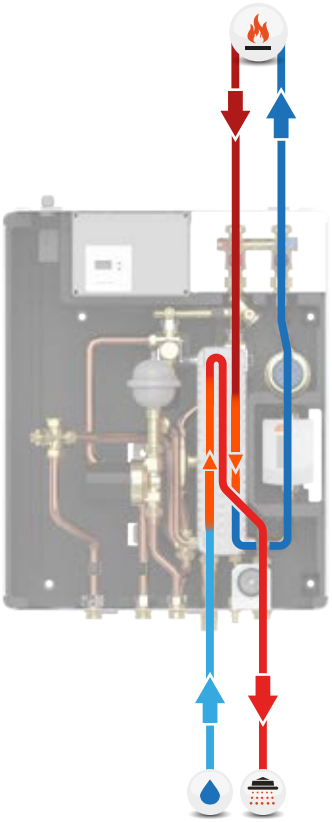


OPERATIONAL DIAGRAMS

Heating Mode



DHW Production Mode



TECHNICAL DATA

Compatible Fluids	Water (max glycol content 30%)
Maximum operating temperature	90 °C
Maximum operating pressure	Primary circuit: 16 bar Secondary heating circuit: 3 bar Secondary DHW circuit: 10 bar
Maximum pressure differential at ends of actuator(s)	0.9 bar
Hydraulic connections	3/4" BSPP M
Expansion vessel	Capacity: 8 l Maximum pressure: 3 bar Precharge: 1 bar Precharge range: 0.5÷2.5 bar
Power supply	230 V AC ±10%, 50 - 60Hz (IEC60038 standard)
Temperature sensors	10 kΩ NTC

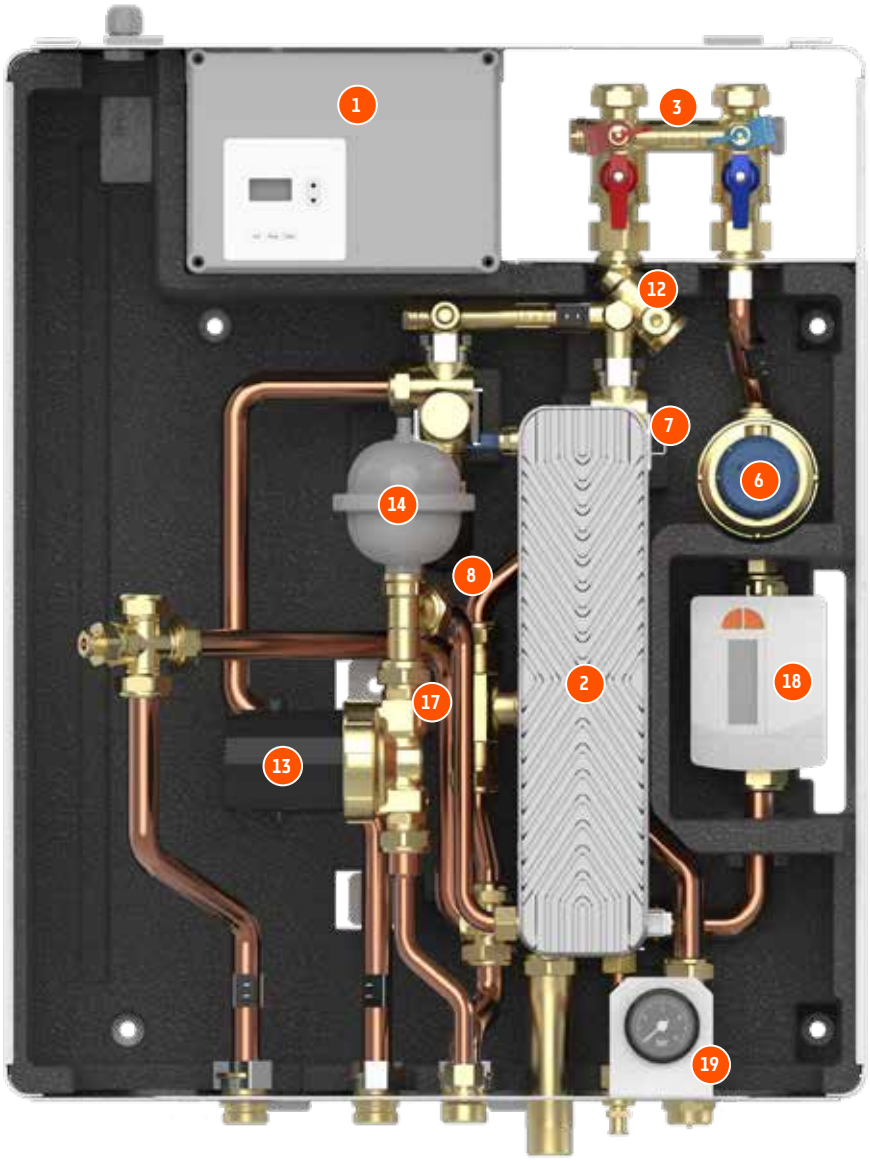
MATERIALS

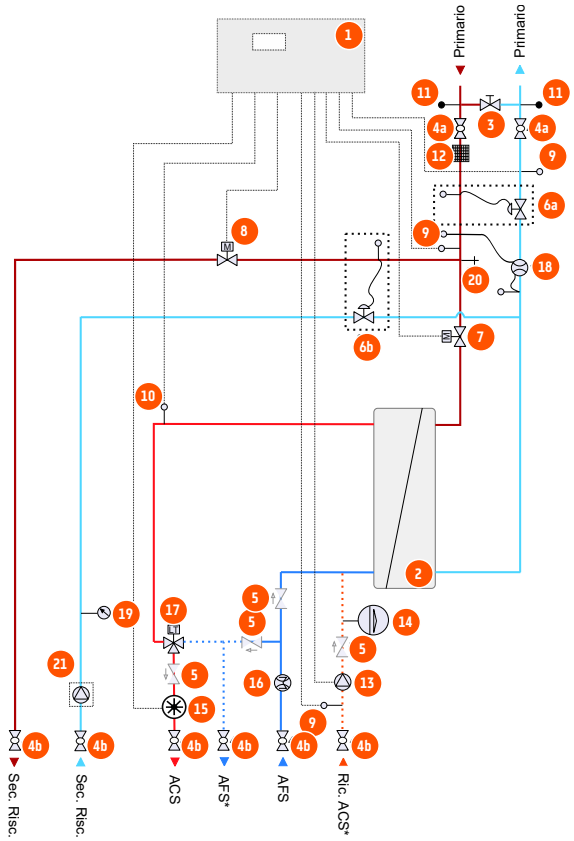
Connection Components	CW617N brass
Gaskets and O-rings	peroxide EPDM
Pipes	Copper
Plate Heat Exchangers	Stainless steel
DHW flow meter body	PA 6.6
Insulating casing	ARPRO 4135 FR (EPP with flame retardant)
Regulation electronic regulator cover	ABS v0
Frame	RAL 9016 powder coated stainless steel

PERFORMANCE - DHW PRODUCTION

Plate Heat Exchangers	ΔP, module (primary) [bar]	Primary flow rate [l/h]	T, primary flow [°C]	T, primary return [°C]	Power [kW]	ΔT, DHW [°C]	DHW flow rate [l/min]
Model 51	0.300	1194.0	60	27.46	45.10	10 – 45	18.50
				31.97	38.85	10 – 50	13.94
			70	27.26	59.26	10 – 48	22.39
				32.64	51.82	10 – 55	16.53
Model 57	0.300	1273.5	60	24.20	52.92	10 – 45	21.71
				28.32	46.83	10 – 50	16.81
			70	23.79	68.33	10 – 48	25.82
				28.58	61.25	10 – 55	19.55
Model 69	0.300	963.2	60	15.87	49.34	10 – 45	20.24
				18.86	46.00	10 – 50	16.51
			70	15.03	61.46	10 – 48	23.22
				18.21	57.91	10 – 55	18.48

PLUMBING DIAGRAM AND COMPONENTS

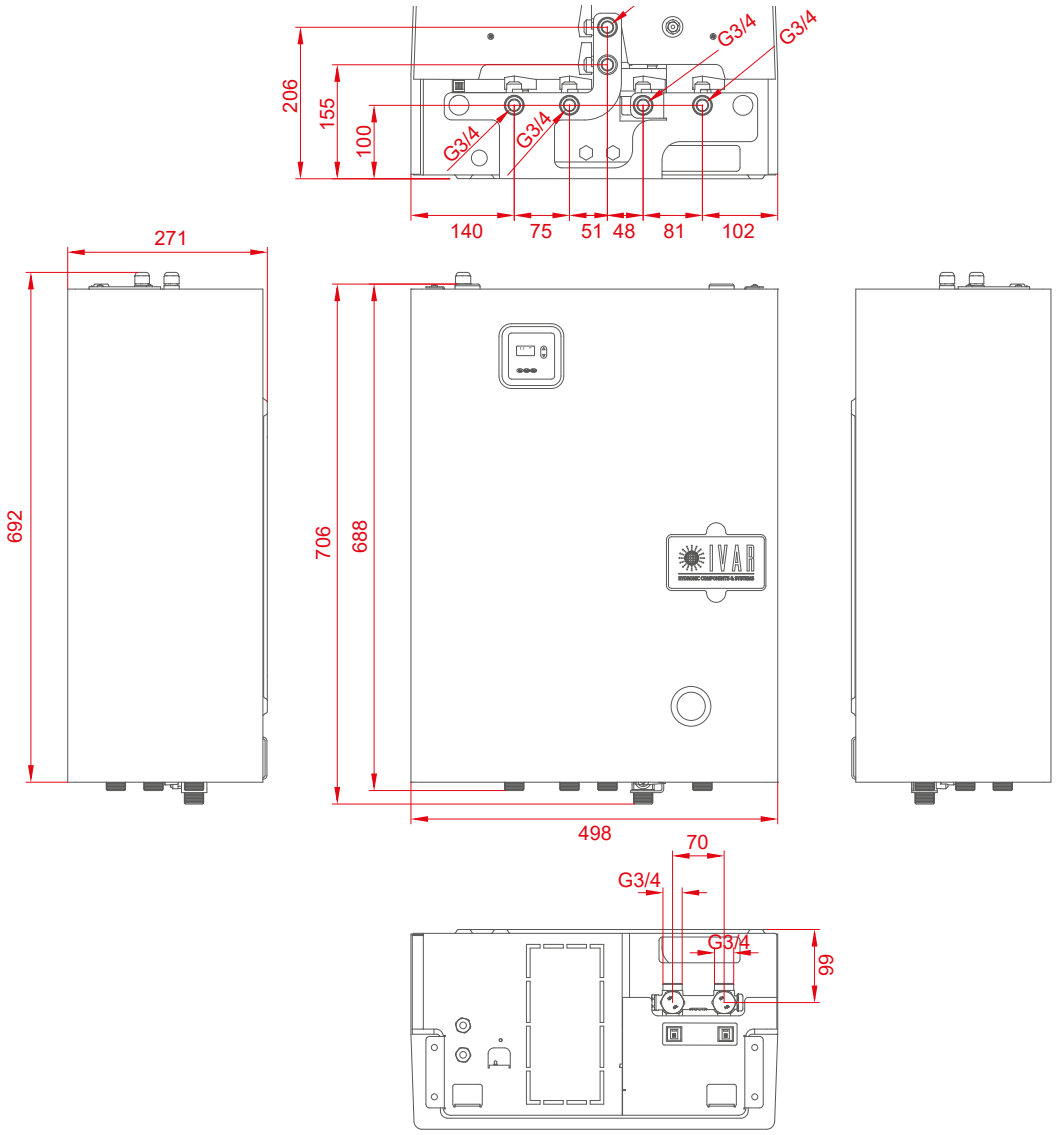




1	Electronic regulator
2	Plate heat exchanger for DHW production
3	Bypass for primary circuit flushing
4	Ball-type shut-off valves: primary circuit (a), secondary and recirculation circuits (b)**
5	Check valves
6	Differential pressure regulators: primary circuit (a)*, primary heating side circuit (b)*
7	Two-way valves with stepper motor on the primary circuit for DHW temperature control
8	Heating On/Off valve
9	Clip-on temperature sensors
10	Immersion temperature sensor
11	Pressure ports at ends of primary circuit
12	Y strainer
13	DHW recirculation pump*
14	Expansion vessel on DHW recirculation*
15	ACS flow meter
16	DCW+DHW volumetric meter**
17	Anti-scalding device*
18	Heat meter on primary circuit**
19	Pressure gauge on secondary heating circuit
20	Manual bleed valves on the primary circuit
21	Heating booster pump*
22	Insulating casing
23	Sheet-metal cover*
24	Ball-type shut-off valves kit, straight or elbow, with 3/4"M x 3/4"F swivel fitting*

*optional.
NOTE point 6. CAUTION: it is possible to order the version without a differential pressure regulator or with a single regulator in configuration 6a or 6b.
**not included

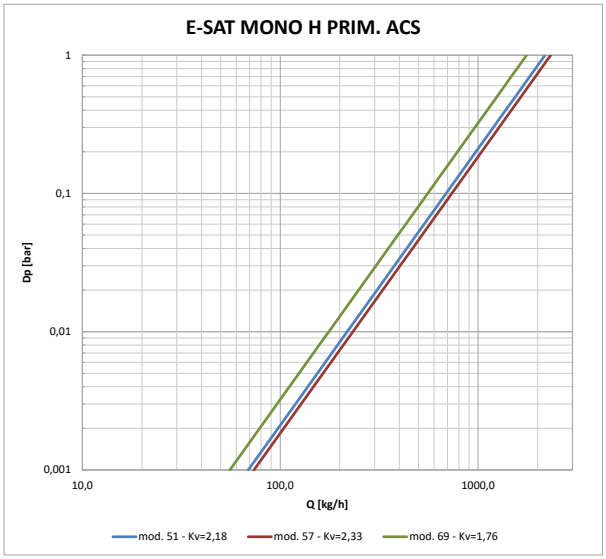
DIMENSIONS

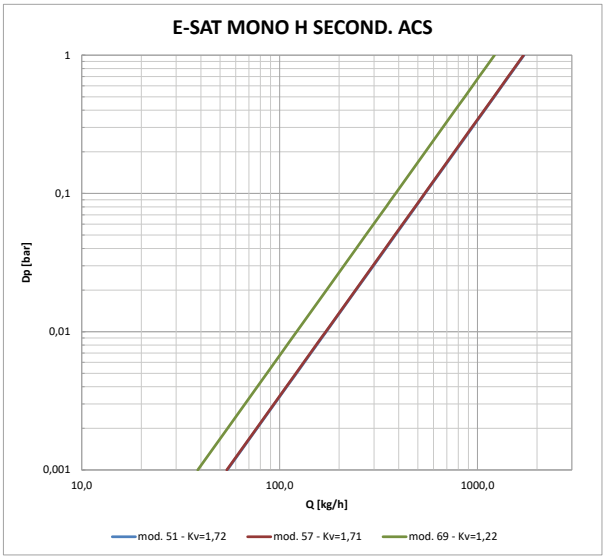


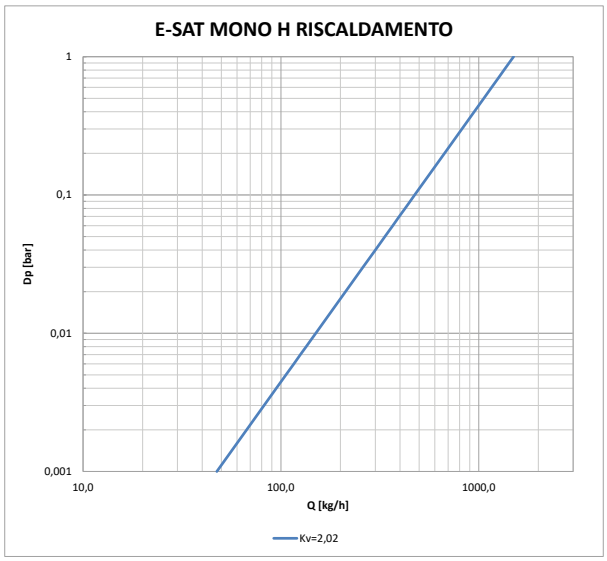
ADVANTAGES

- Instantaneous DHW production → no common pipes, no storage tanks, no legionella
- DHW recirculation and heat exchanger keep-warm hot water without waiting time
- Anti-scalding device* → maximum safety
- Heating time bands → smart management
- For high-temperature systems: ok for radiators and fan coils
- Flow temperature climate compensation and room compensation → maximum comfort
- Intelligent modulation of the primary circuit's flow rate → energy savings
- Dynamic balancing → optimum working conditions at all times
- Metering of total energy consumption with a single meter → streamlined management
- Anti-frost function, anti-lock, anti-legionella cycles, DHW priority, clogged heat exchanger monitoring etc. → advanced electronic control

PRESSURE LOSS GRAPHS

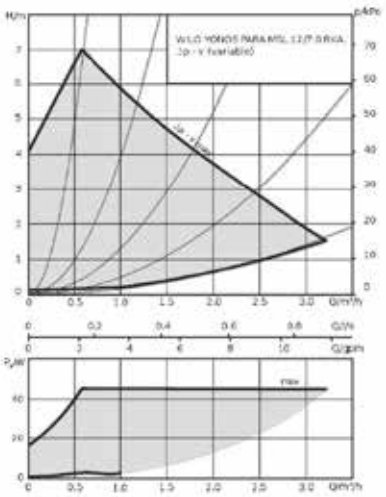


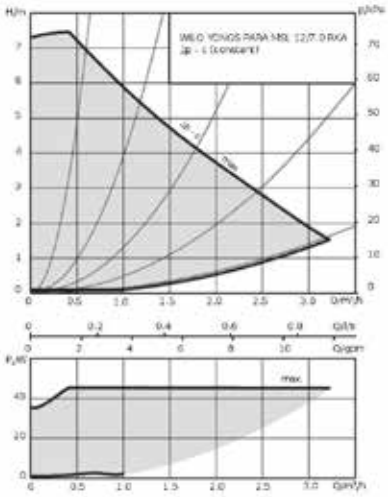




PUMP CURVES

YONOS PARA MSL 12/7 RKA pump model (WILO10)



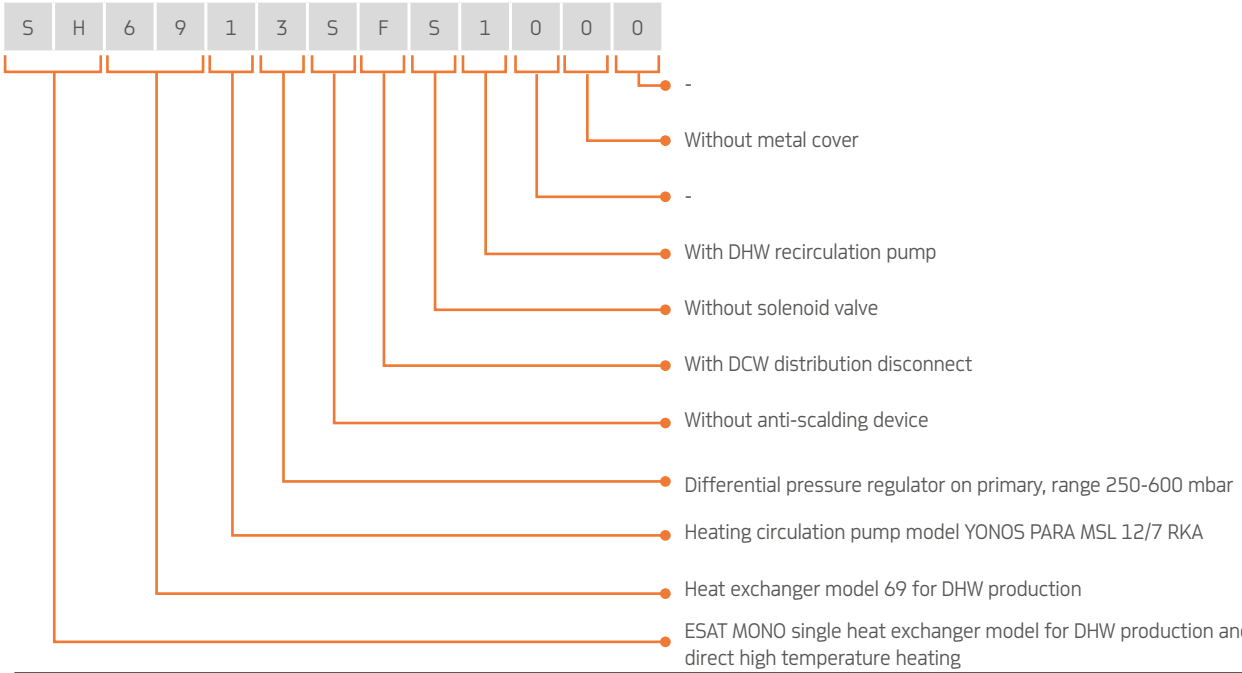


PRODUCT CODES: IVAR•ESAT MONO H

A	B	C	D	E	F	G	H	I	J	K	L	M	COMPONENTS
S													Mono Electronic version
	H												High-temperature heating
		X	X										Heat exchanger model*
				0									No heating-side pump
				1									YONOS PARA MSL 12/7 RKA pump model (WILO10)
					0								No DPCV
					1								DPCV 50-300 on primary
					2								DPCV 50-300 mbar on heating primary
					3								DPCV 250-600 on primary
					4								DPCV 250-600 mbar on heating primary
						A							With anti-scalding device
						S							Without anti-scalding device
							F						With DCW disconnect
							S						Without DCW disconnect
								T					With jigs for solenoid valve
								S					Without jigs
									0				No recirculation
									1				With recirculation
										0			-
											0		Without cover
											1		With cover
												0	-

**Contact the LINEA ARANCIO quotation service for specific requirements regarding heat exchanger power.*

Example



JIG CODES FOR IVAR•ESAT MONO H

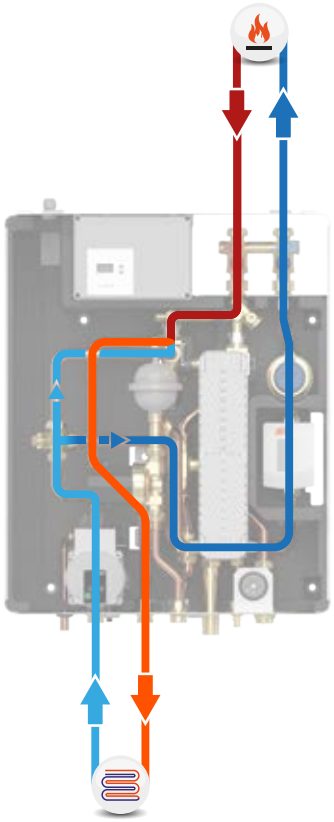
Shut-off valves type	Base version	DCW outlet disconnect	DHW recirculation disconnect	Jig code
 3/4" straight valves	✓	-	-	508013
	✓	✓	-	508018
	✓	-	✓	508020
	✓	✓	✓	508022
 Valves with 3/4" M x 3/4" F swivel elbow fittings	✓	-	-	508012
	✓	✓	-	508019
	✓	-	✓	508021
	✓	✓	✓	508023

IVAR•ESAT MONO L

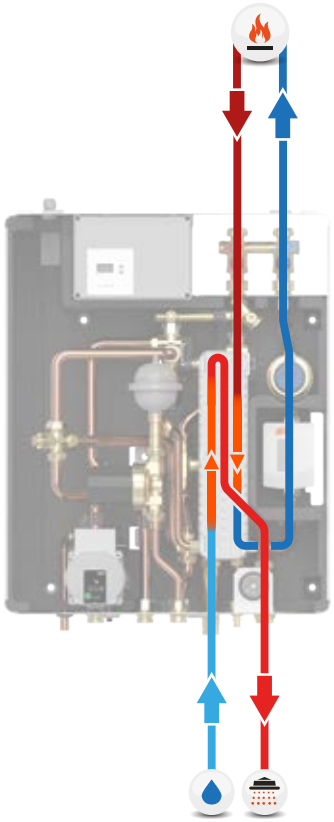
Heat exchanger heat interface unit for instantaneous production of domestic hot water and management of low-temperature heating systems, with advanced electronic control.

OPERATIONAL DIAGRAMS

Heating Mode



DHW Production Mode



TECHNICAL DATA

Compatible Fluids	Water (max glycol content 30%)
Maximum operating temperature	90 °C
Maximum operating pressure	Primary circuit: 16 bar Secondary heating circuit: 3 bar Secondary DHW circuit: 10 bar
Maximum pressure differential at ends of actuator(s)	0.9 bar
Hydraulic connections	3/4" BSPP M
Expansion vessel	Capacity: 8 l Maximum pressure: 3 bar Precharge: 1 bar Precharge range: 0.5÷2.5 bar
Power supply	230 V AC ±10%, 50 - 60Hz (IEC60038 standard)
Temperature sensors	10 kΩ NTC

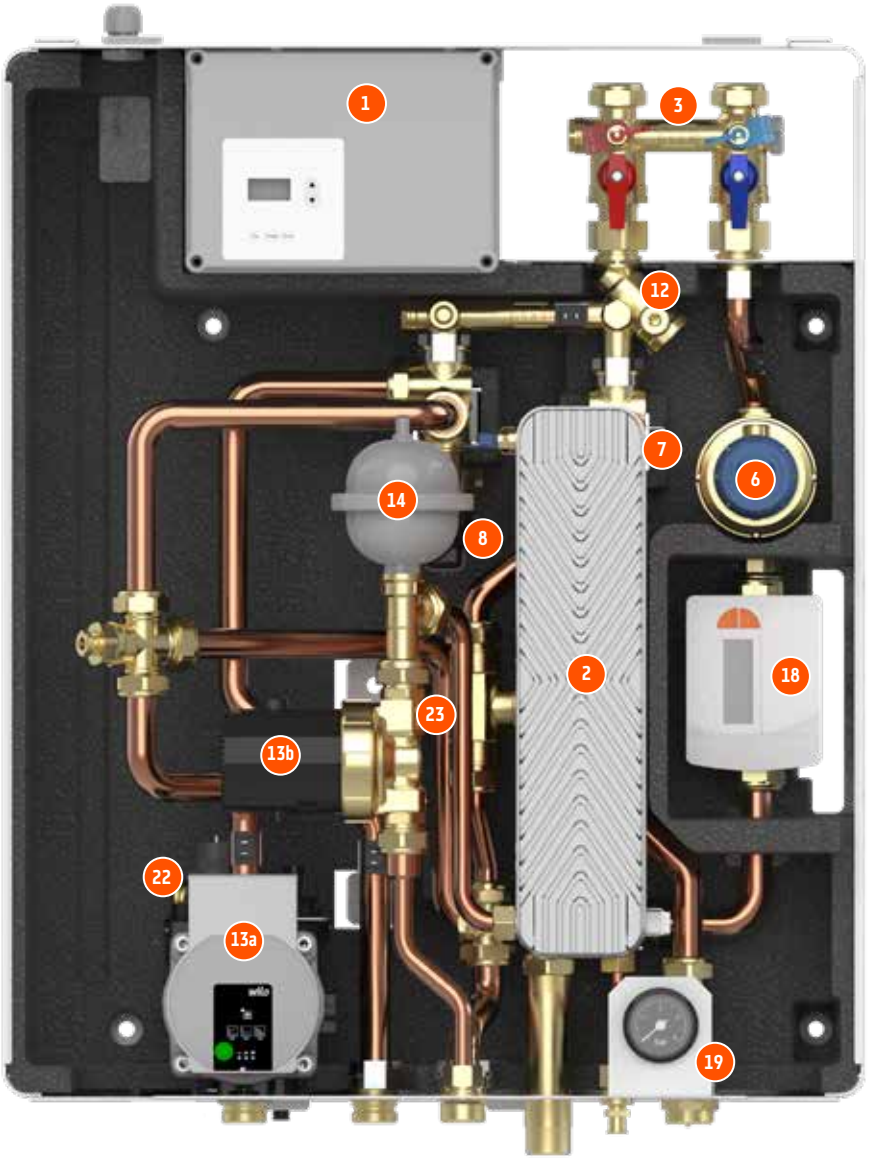
MATERIALS

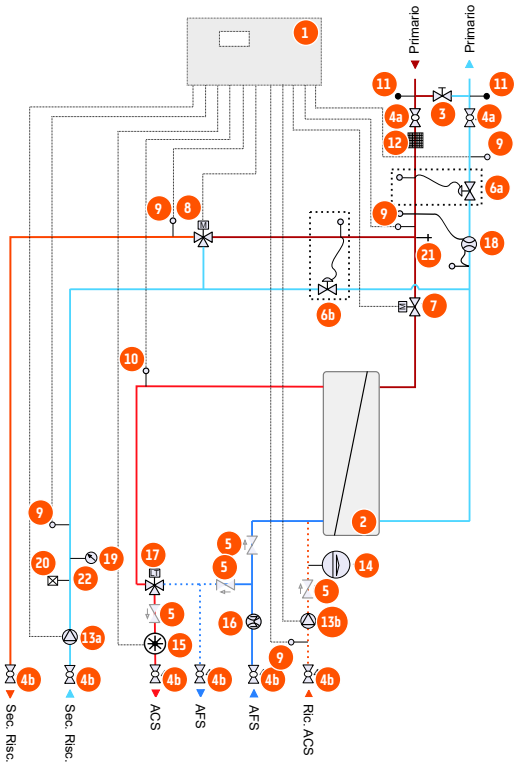
Connection Components	CW617N brass
Gaskets and O-rings	peroxide EPDM
Pipes	Copper
Plate Heat Exchangers	Stainless steel
DHW flow meter body	PA 6.6
Insulating casing	ARPRO 4135 FR (EPP with flame retardant)
Regulation electronic regulator cover	ABS v0
Frame	RAL 9016 powder coated stainless steel

PERFORMANCE - DHW PRODUCTION

Plate Heat Exchangers	ΔP, module (primary) [bar]	Primary flow rate [l/h]	T, primary flow [°C]	T, primary return [°C]	Power [kW]	ΔT, DHW [°C]	DHW flow rate [l/min]
Model 51	0.300	1194.0	60	27.46	45.10	10 – 45	18.50
				31.97	38.85	10 – 50	13.94
			70	27.26	59.26	10 – 48	22.39
				32.64	51.82	10 – 55	16.53
Model 57	0.300	1273.5	60	24.20	52.92	10 – 45	21.71
				28.32	46.83	10 – 50	16.81
			70	23.79	68.33	10 – 48	25.82
				28.58	61.25	10 – 55	19.55
Model 69	0.300	963.2	60	15.87	49.34	10 – 45	20.24
				18.86	46.00	10 – 50	16.51
			70	15.03	61.46	10 – 48	23.22
				18.21	57.91	10 – 55	18.48

PLUMBING DIAGRAM AND COMPONENTS

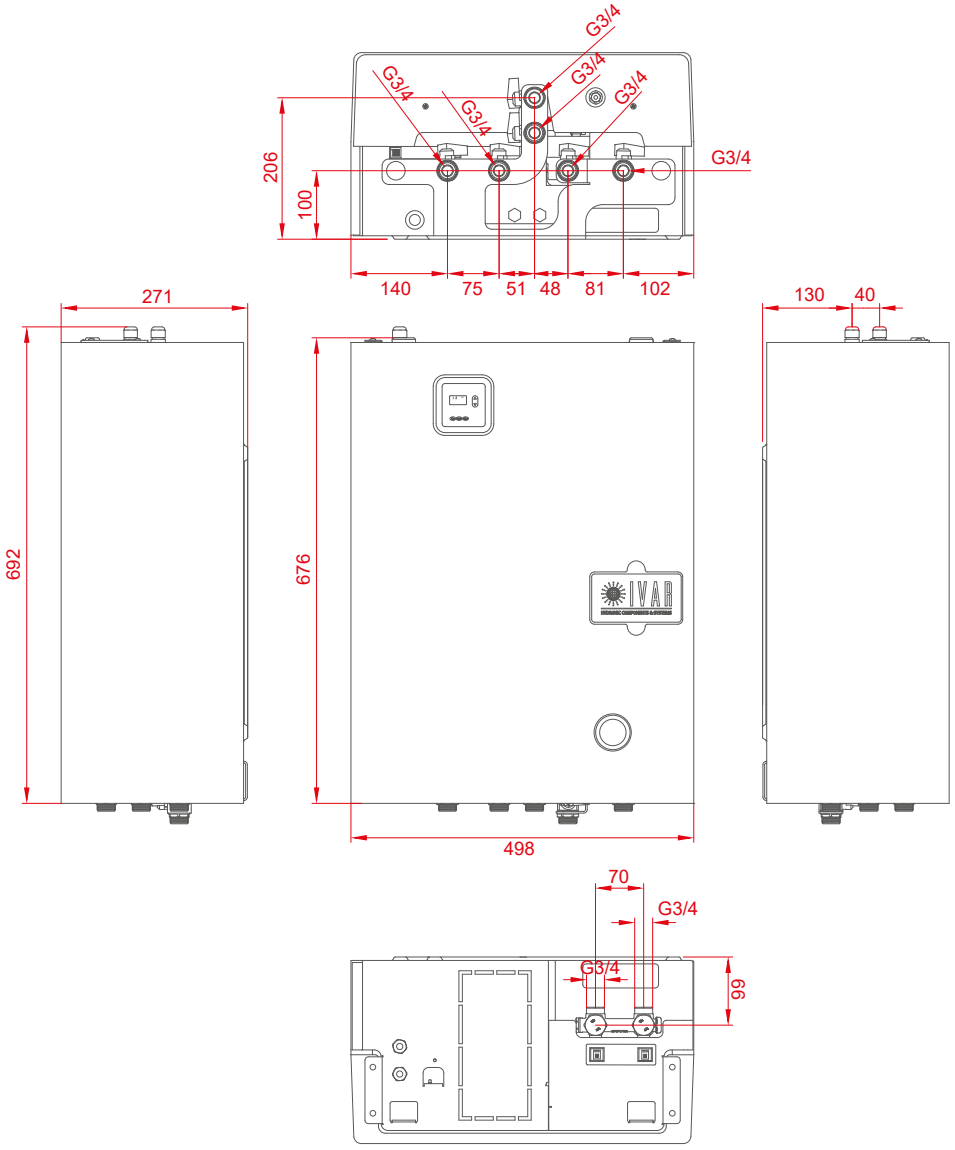




1	Electronic regulator
2	Plate heat exchanger for DHW production
3	Bypass for primary circuit flushing
4	Ball-type shut-off valves: primary circuit (a), secondary and recirculation circuits (b)**
5	Check valves
6	Differential pressure regulators: primary circuit (a)*, primary heating side circuit (b)*
7	Two-way valves with stepper motor on the primary circuit for DHW temperature control
8	Heating mixer valve
9	Clip-on temperature sensors
10	Immersion temperature sensor
11	Pressure ports at ends of primary circuit
12	Y strainer
13	Pumps: secondary heating circuit (a)*, DHW recirculation (b)*
14	Expansion vessel on DHW recirculation*
15	ACS flow meter
16	DCW+DHW volumetric meter**
17	Anti-scalding device*
18	Heat meter on primary circuit**
19	Pressure gauge on secondary heating circuit
20	Automatic bleed valve on secondary heating circuit*
21	Manual bleed valves on the primary circuit
22	Insulating casing
23	Sheet-metal cover*
24	Ball-type shut-off valves kit, straight or elbow, with 3/4"M x 3/4"F swivel fitting*

*optional.
NOTE point 6. CAUTION: it is possible to order the version without a differential pressure regulator or with a single regulator in configuration 6a or 6b.
**not included

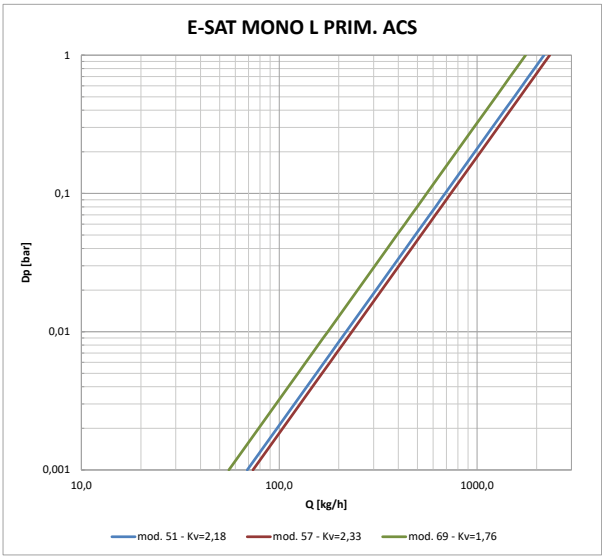
DIMENSIONS

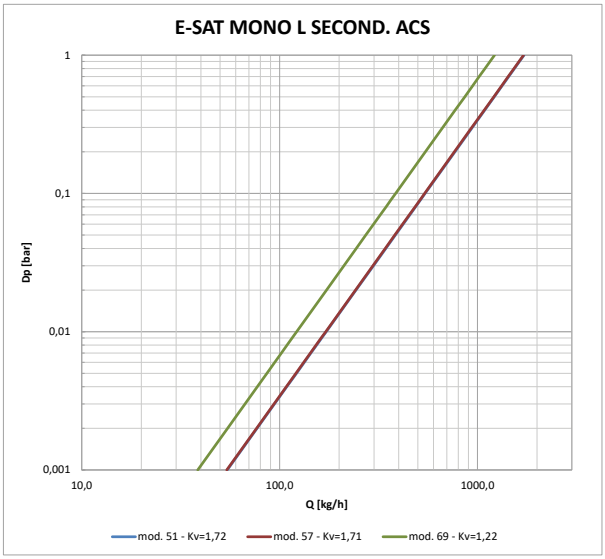


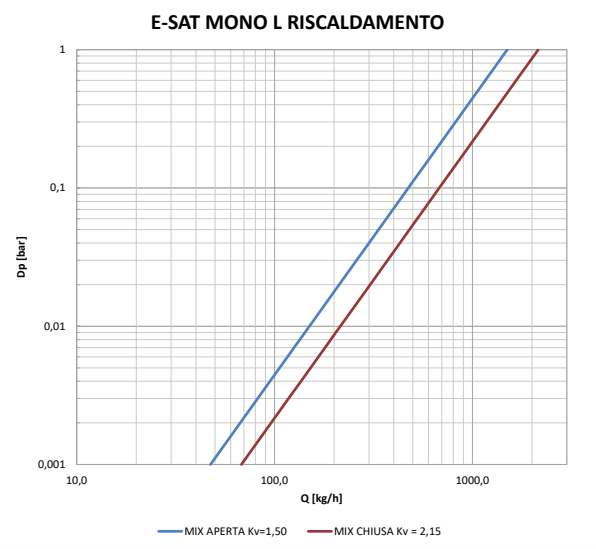
ADVANTAGES

- Instantaneous DHW production → no common pipes, no storage tanks, no legionella
- DHW recirculation and heat exchanger keep-warm → hot water without waiting time
- Anti-scalding device* → maximum safety
- Heating time bands → smart management
- For low-temperature systems: ok for radiant systems
- Flow temperature climate compensation and room compensation → maximum comfort
- Intelligent modulation of the primary circuit's flow rate → energy savings
- Dynamic balancing → optimum working conditions at all times
- Metering of total energy consumption with a single meter → streamlined management
- Anti-frost function, anti-lock, screed drying, anti-legionella cycles, DHW priority, clogged heat exchanger monitoring etc. → advanced electronic control

PRESSURE LOSS GRAPHS

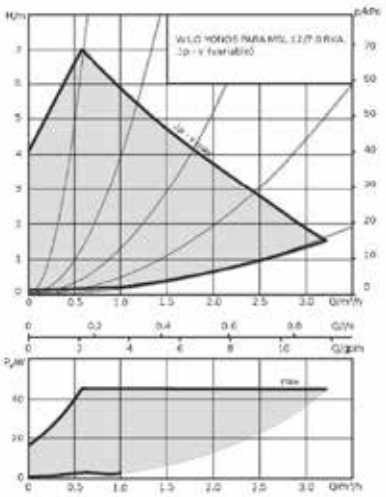


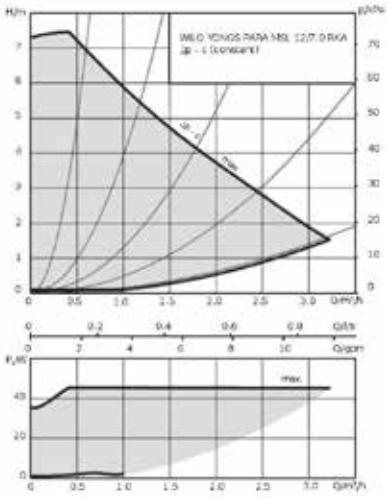




PUMP CURVES

YONOS PARA MSL 12/7 RKA pump model (WILO10)



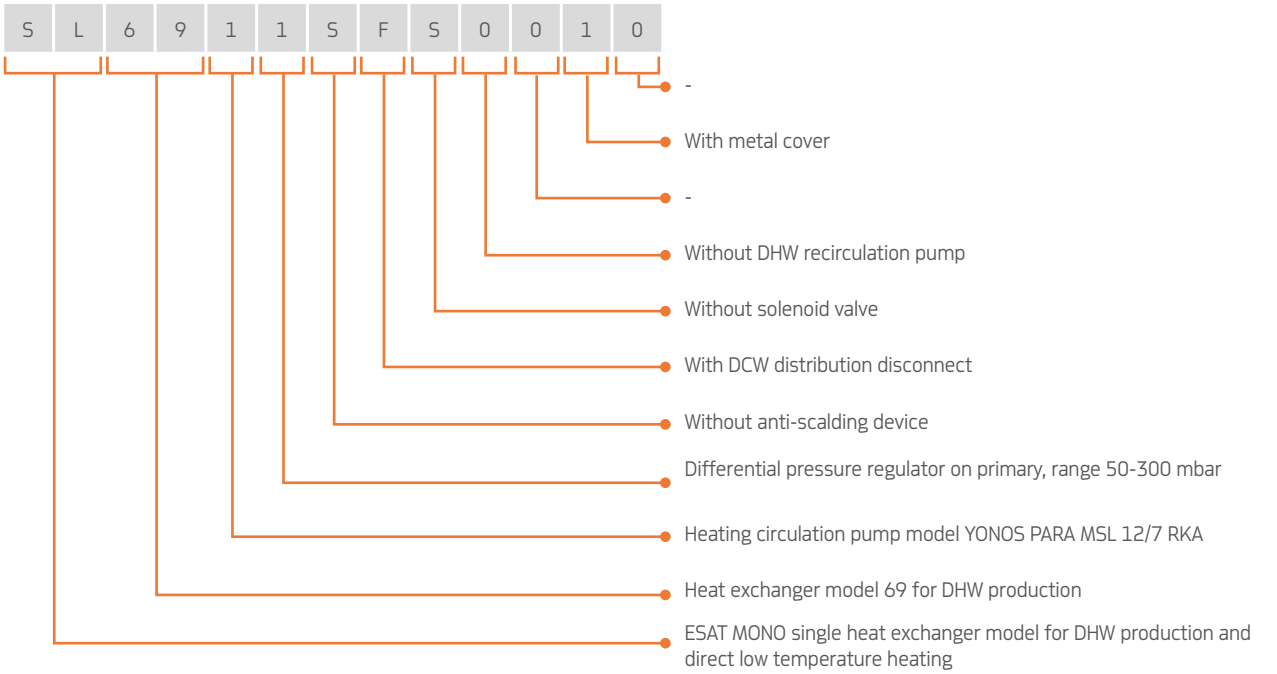


PRODUCT CODES: IVAR•ESAT MONO L

A	B	C	D	E	F	G	H	I	J	K	L	M	COMPONENTS
S													Mono Electronic version
	L												Low-temperature heating
		X	X										Heat exchanger model*
				1									YONOS PARA MSL 12/7 RKA pump model (WILO10)
					0								No DPCV
					1								DPCV 50-300 on primary
					2								DPCV 50-300 mbar on heating primary
					3								DPCV 250-600 on primary
					4								DPCV 250-600 mbar on heating primary
						A							With anti-scalding device
						S							Without anti-scalding device
							F						With DCW disconnect
							S						Without DCW disconnect
								T					With jigs for solenoid valve
								S					Without jigs
									0				No recirculation
									1				With recirculation
										0			-
											0		Without cover
											1		With cover
												0	-

**Contact the LINEA ARANCIO quotation service for specific requirements regarding heat exchanger power.*

Example



JIG CODES FOR IVAR•ESAT MONO L

Shut-off valves type	Base version	DCW outlet disconnect	DHW recirculation disconnect	Jig code
 3/4" straight valves	✓	-	-	508013
	✓	✓	-	508018
	✓	-	✓	508020
	✓	✓	✓	508022
 Valves with 3/4" M x 3/4" F swivel elbow fittings	✓	-	-	508012
	✓	✓	-	508019
	✓	-	✓	508021
	✓	✓	✓	508023

METERS

In apartment blocks with a single heat generator, current energy-saving regulations require the application of temperature regulation and heat metering systems which guarantee independent management for individual users, and at the same time correct division of expenses.
IVAR heat interface units are factory-equipped with provision for heat meters and for volumetric DHW meters, where required. In particular, the frames contain both the jigs which will then be removed to install the meters, and the well for the flow sensors. This limits the dimensions and facilitates the work of the installer.
IVAR offers a complete range of heat meters ranging from the smallest sizes, for use in modules or heating interface units, to larger sizes for use in a heating plant. The smaller counters are compact and are available in both the single-jet mechanical version and the ultrasonic version. Both versions are compatible with heating and cooling applications and are equipped with a wired M-BUS or AMR radio data transmission system.
In the same way, IVAR offers a complete range of volumetric DHW meters ranging from the smallest sizes, for use in heat interface units or modules, to larger sizes for use in a heating plant. They also feature provision for wired M-BUS or AMR radio data transmission, with suitable conversion modules.
All meters comply with the MID directive.

HMR-M

- **Mechanical heat meter with M-BUS output and two pulse inputs for installation in a box.**

Code	Reading	Size	Qp	Type
HMR15MFI	M-BUS + 2 pulse inputs	3/4"	1.50 m³/h	Cold/Hot

US-M

- **Ultrasound heat meter with M-BUS output and three pulse inputs for installation in a box.**

Code	Reading	Size	Qp	Type
US15MFI-E	M-BUS + 3 pulse inputs	3/4"	1.50 m³/h	Cold/Hot

HMR-R

- **Mechanical heat meter with radio output (WALK-BY or AMR) and three pulse inputs for installation in a box.**

Code	Reading	Sizes	Qp	Type
HMR15RFI-E	Radio (WALK-BY/AMR) + 3 pulse inputs	3/4"	1.50 m³/h	Cold/Hot

US-R

- **Ultrasound heat meter with radio output (WALK-BY or AMR) for installation in a box.**

Code	Reading	Sizes	Qp	Type
US15QRF	Radio (WALK-BY/AMR)	3/4"	1.50 m³/h	Cold/Hot

WFK

- **Volumetric meter for domestic cold water, direct reading, for installation in a box.**

Code	Reading	Sizes	Q3	Type
WFK30-D110	Direct reading	3/4"	2.50 m³/h	DCW (T max 30 °C)

CAFS-D REED

- **Volumetric meter for domestic cold water, direct reading, with provision for pulse output via reed switch, for installation in a box.**

Code	Reading	Sizes	Q3	Type
SFU-P-13SRP	Direct reading	3/4"	2.50 m³/h	DCW (T max 30 °C)

CAV-IMP

- **Cable for converting direct reading type "-D REED" meter into a meter with pulse output.**

Code	Reading	Length
CAV-IMP	Direct reading >> Pulse	2 m

RWM

- **Module for converting WFK and WFW direct reading meters into meters with WALK-BY or AMR radio centralised output (S-mode or C-mode).**

Code	Reading
RWM5-000N	Direct reading >> WALK-BY / AMR radio

METERS FOR HEATING PLANTS

Heat meters for heating plants have volumetric systems which can be mechanical (multijet or Woltmann depending on size) or ultrasound. These meters include a pair of temperature probes (wet or dry installation) and a calculation unit that uses the information received from the volumetric system and the probes to calculate the energy consumed. All versions are compatible with heating and cooling applications and are equipped with a wired data transmission system (M-BUS and pulse for connection to radio conversion modules, where required) .
In the same manner, DHW volumetric meters for heating plants feature provision for wired M-BUS or AMR radio data transmission, with suitable conversion models.

CACML-I

- **Mechanical-multijet heat meter with pulse output, M-BUS output and two pulse inputs for horizontal installation.**

Code	Reading	Sizes	Qp	Type
CACML25IF	Pulse	DN 25	3.50 m³/h	Cold/Hot
CACML32IF	Pulse	DN 32	6 m³/h	Cold/Hot
CACML40IF	Pulse	DN 40	10 m³/h	Cold/Hot

HS-I

- **Ultrasound heat meter with pulse output, M-BUS output and two pulse inputs for horizontal and vertical installation.**

Code	Reading	Sizes	Qp	Type
HS25FI	Pulse	DN 25	3.60 m³/h	Cold/Hot
HS32FI	Pulse	DN 32	6 m³/h	Cold/Hot
HS40FI	Pulse	DN 40	10 m³/h	Cold/Hot
HS50FI	Pulse	DN 50 - Flanged	15 m³/h	Cold/Hot
HS65FI	Pulse	DN 65 - Flanged	25 m³/h	Cold/Hot
HS80FI	Pulse	DN 80 - Flanged	40 m³/h	Cold/Hot
HS100FI	Pulse	DN 100 - Flanged	60 m³/h	Cold/Hot

CCWO-I

- **Woltmann-type heat meter with pulse output, M-BUS output and two pulse inputs for horizontal and vertical installation.**

Code	Reading	Sizes	Qp	Type
CCWO50IF	Pulse	DN 50	15 m³/h	Cold/Hot
CCWO65IF	Pulse	DN 65	25 m³/h	Cold/Hot
CCWO80IF	Pulse	DN 80	40 m³/h	Cold/Hot
CCWO100IF	Pulse	DN 100	60 m³/h	Cold/Hot
CCWO125IF	Pulse	DN 125	100 m³/h	Cold/Hot
CCWO150IF	Pulse	DN 150	150 m³/h	Cold/Hot
CCWO200IF	Pulse	DN 200	250 m³/h	Cold/Hot

AFUL

- **Volumetric meter for domestic cold water with pulse output, for horizontal and vertical installation, complete with unions.**

Code	Reading	Sizes	Q3	Type
AFUL25	Pulse	DN 25	6.30 m³/h	DCW
AFUL32	Pulse	DN 32	10 m³/h	DCW
AFUL40	Pulse	DN 40	16 m³/h	DCW
AFUL50	Pulse	DN 50	25 m³/h	DCW

CAFSWO-I

- **Woltmann-type volumetric meter for domestic cold water with pulse output, for horizontal and vertical installation.**

Code	Reading	Sizes	Q3	Type
CAFSWO65I	Pulse	DN 65	25 m³/h	DCW
CAFSWO80I	Pulse	DN 80	40 m³/h	DCW
CAFSWO100I	Pulse	DN 100	60 m³/h	DCW
CAFSWO125I	Pulse	DN 125	100 m³/h	DCW
CAFSWO150I	Pulse	DN 150	150 m³/h	DCW
CAFSWO200I	Pulse	DN 200	250 m³/h	DCW

M-BUS pulse adapter

- **Pulse adapter to convert the pulse output into an M-BUS signal**

Code	Sizes
AEW310.2	Pulse (2 Input) >> M-BUS
ADA4	Pulse (4 Input) >> M-BUS

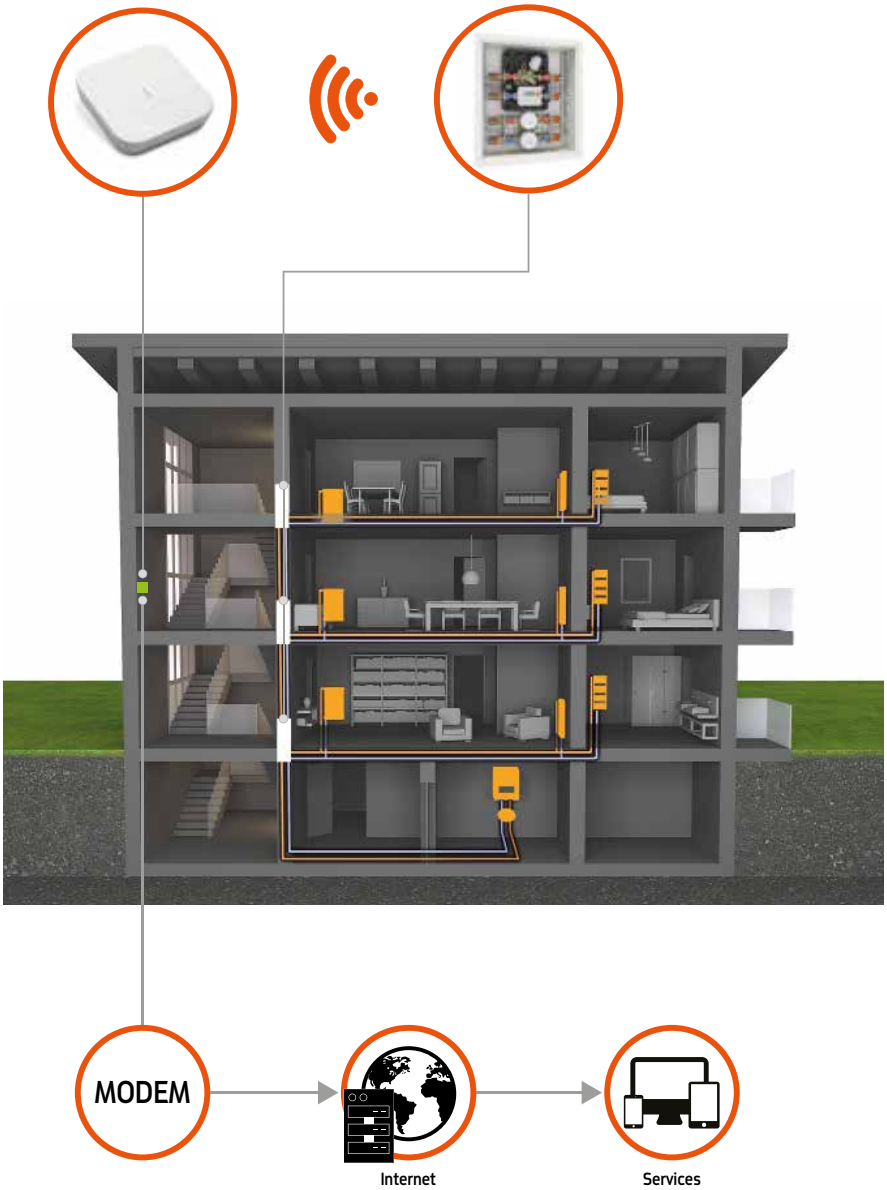
AMR pulse adapter

- **Pulse adapter to convert the pulse output into an AMR radio signal**

Code	Sizes
AEW36.2	Pulse (2 Input) >> AMR radio

DATA CENTRALISATION

According to the requirements of Italian Legislative Decree no. 73 of 14 July 2020, all heat metering devices installed after 25 October 2020 must be remotely readable. For this reason, it is important to provide for an adequate data centralisation system in apartment blocks with metering systems which allows for remote reading of devices.
The concentration of data at one point requires the use of measuring instruments and centralisation devices suitable for the chosen solution, which can be with M-BUS or AMR radio data transmission.
IVAR supplies solutions including metering devices, the relative data centralisation components and the IVAR CLOUD service for remote reading and processing of data.

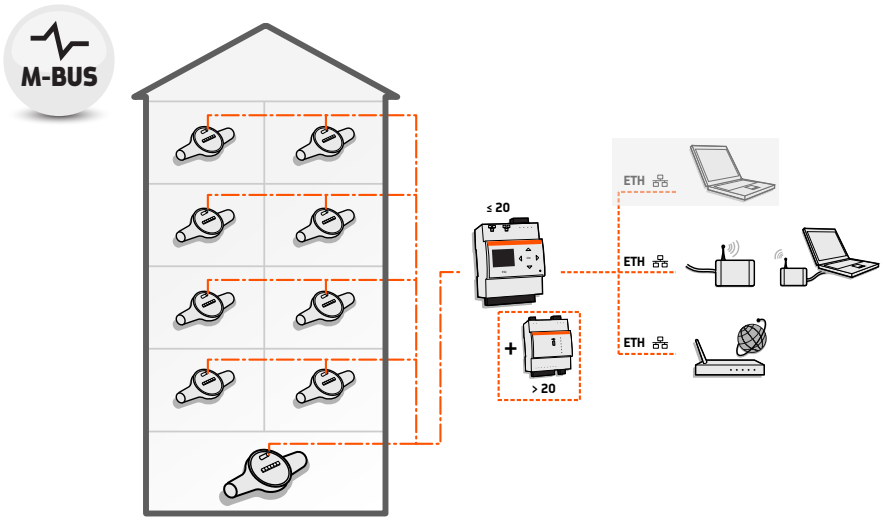


IVAR CLOUD



M-BUS SYSTEMS

The M-BUS communications protocol is one of the most frequently used in direct metering system installations with heat meters and domestic water flow meters. This is an open system, in compliance with the EN 1434-3 European standard, which provides for the wiring between the various devices (in branch configuration, star configuration or in line) until a collection point is reached where the so-called data concentrator is located. This device allows the individual instruments installed along the backbone to be read, thus facilitating consumption data collection operations.



IVAR's solutions are highly modular and particularly easy to use. They are essentially based on three modules that can be combined to create more and more complex architectures.
The modules are:

- The GWYMH unit, which is a central unit, includes a display and data logger function for data acquisition and archiving. Allows up to 20 devices to be read via M-BUS protocol and is expandable to read up to 500 device loads on two separate M-BUS lines (each of max 250 devices) by adding an appropriate Level Converter (B12).
  The same GWYMH unit also functions as a gateway for Multi-hop radio AMR systems and via dedicated backbone composed of RPTMH antennas is able to read up to 2500 W-MBUS devices, allowing storage of daily readings for up to 10 years.
- The B12 Level Converter is a device that allows the actual reading of M-BUS devices. Each Level Converter can read up to 60 devices. However, it is expandable by connecting other Level Converters, which can also act as repeaters in the case of particularly large backbones. This device has no display, but allows local reading via PC, USB interface and free reading software. Data archiving is not possible.

GWYMH

- **Multi-hop wireless + M-BUS wired gateway (20 devices).**

Code	Reading	Sizes
590153	Max 2500 wireless + 500 wired devices	15 W

B12

- **Level Converter module for reading of 60 devices.**

Code	Reading	Sizes
590130	Max 60 devices	24 VAC – 12 W

AB10

- **24 V DC power supply.**

Code	Sizes
590133	24 VDC – 15 W
590134	24 VDC – 60 W

MOD 02

- **Router for remote reading of central units.**

Code
590135

AMR SYSTEM

The AMR radio system provides for wireless communication between the installed measurement devices and the data collection devices. IVAR offers two different opportunities for backbone construction: a **single-hop** mode and a **multi-hop** mode.

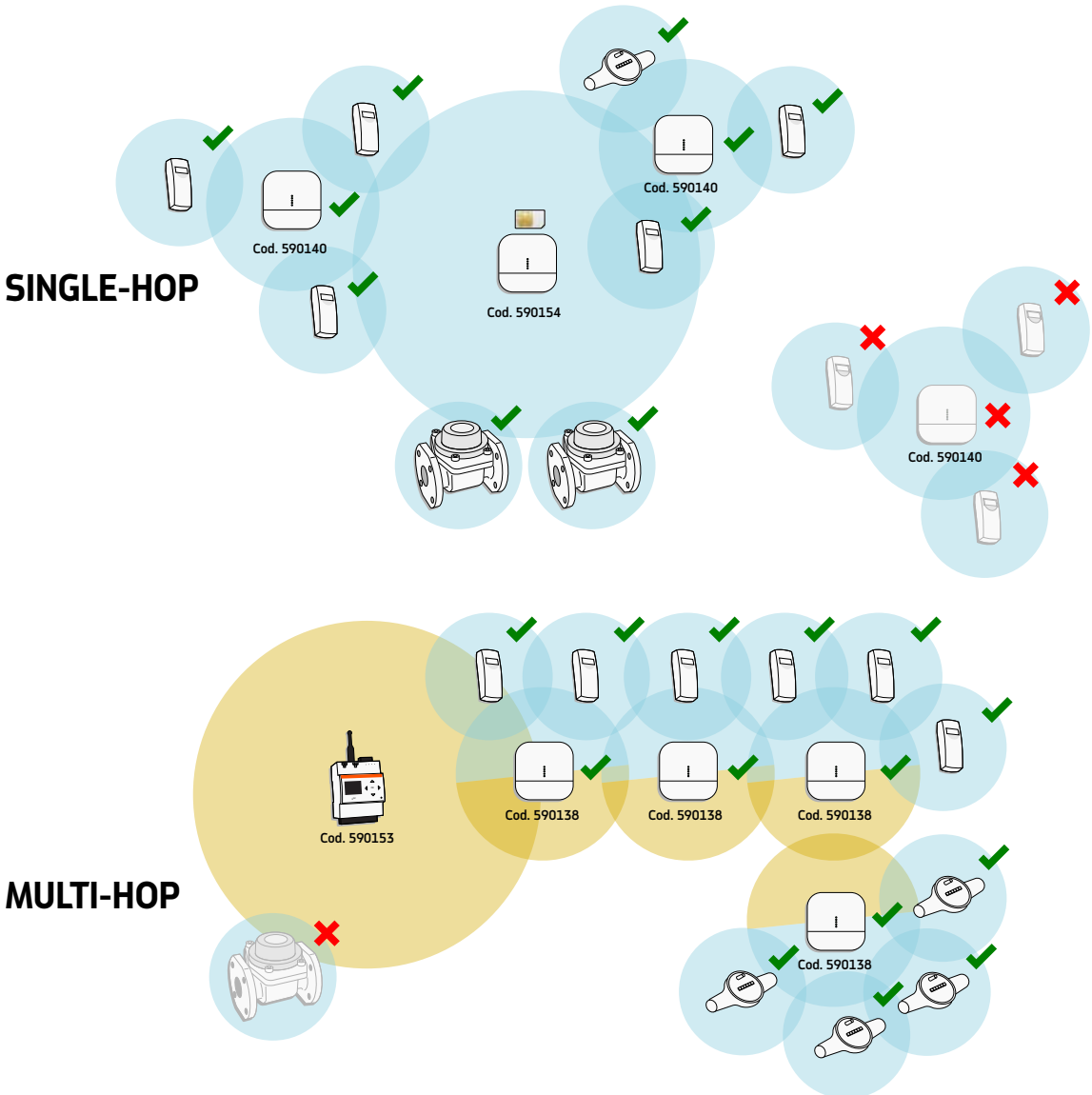
The **single-hop** mode is essentially based on two devices that work using standard procedures allowed by the W-MBUS: a gateway (code 590154) and a repeater (code 590140). Both items are able to receive data from devices (meters, distributors, pulse adapters, etc.) installed up to a maximum limit of 200 wireless devices on the network created. The only limit is represented by the size of the network: the connection between gateway and repeater can only take place if it is direct between the two devices. Actually, it is not possible to create a backbone in which several repeaters connect to each other and then to the gateway. This feature makes the single-hop system suitable for small apartment buildings.

The gateway is equipped with a data SIM which allows remote reading of the metering data. The reading is made with a typically weekly transmission frequency.

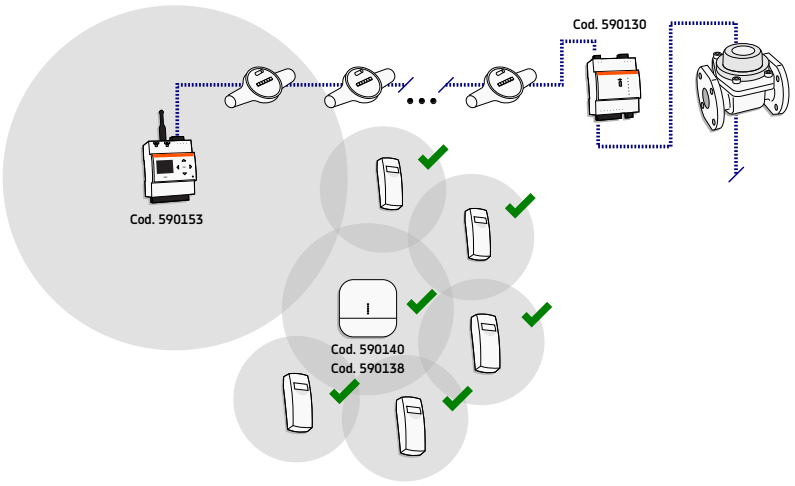
The **multi-hop** mode is also based on two devices, namely a repeater (code 590138) and a gateway (code 590153). Nevertheless, this technology is freed from the wireless M-BUS in the construction of the backbone and, thanks to a proprietary and enhanced transmission mode, each repeater (and only the repeaters) is able to receive consumption information from the installed devices and exchange it via a mesh network with the other nodes (repeaters) until it reaches the gateway.

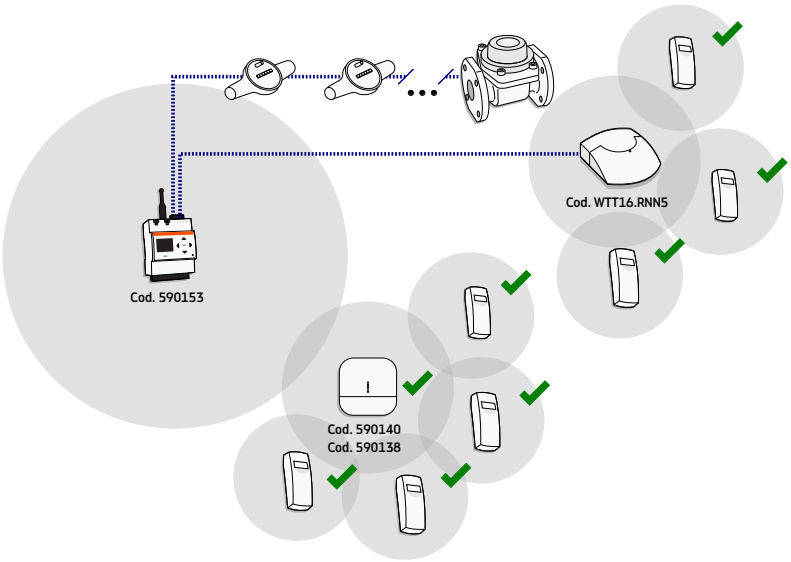
Through the new gateway, the maximum limit of radio devices which can be read is 2500, (up to 23 repeaters, code 590138, can be used, each of which offers a maximum of 500 devices).

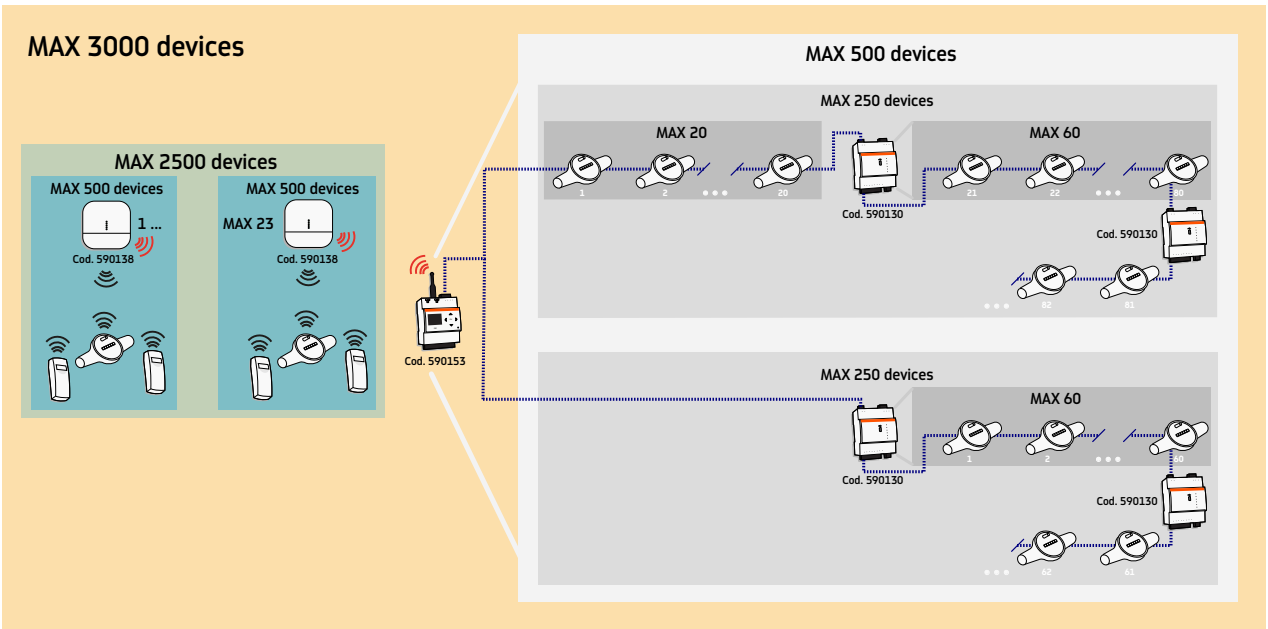
Furthermore, the multi-hop gateway is a hybrid type: though it can read up to 2500 wireless devices, it also has an M-BUS port that allows the direct wired connection of up to 20 M-BUS meters, which is expandable up to 500 using two backbones and special level converters (code 590130).



Both systems are compatible with the standard W-MBUS transmission modes and are therefore able to read devices made by other manufacturers (provided they communicate in W-MBUS) whether in T, S or C modes.
Each gateway can be read locally or remotely by internet connection (if required, a router is provided).







GWY1H

- M-BUS wireless single-hop gateway (router and SIM incorporated).

Code	Reading
590154	C/S mode compatible (max 200 devices)

GWYMH

- Multi-hop wireless + M-BUS wired gateway (20 devices).

Code	Reading
590153	Max 2500 wireless + 500 wired devices

RPT1H

- M-BUS wireless single-hop unidirectional repeater.

Code	Reading
590140	C/S mode compatible

AB10

- 24 V DC power supply.

Code	Sizes
590133	24 VDC – 15 W
590134	24 VDC – 60 W

RPTMH

- M-BUS wireless multi-hop repeater.

Code	Reading
590138	C/S mode compatible

MOD 02

- Router for remote reading of central units.

Code
590135

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IVAR APP

Access all **IVAR DOCUMENTATION** directly from **YOUR SMARTPHONE.**

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