Automatic flow regulators

AutoFlow®

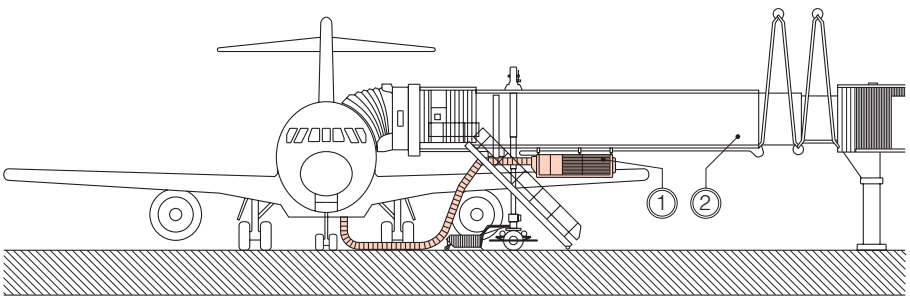
AUTOFLOW APPLICATION No. 15

Air-conditioning machine for aircraft on the ground

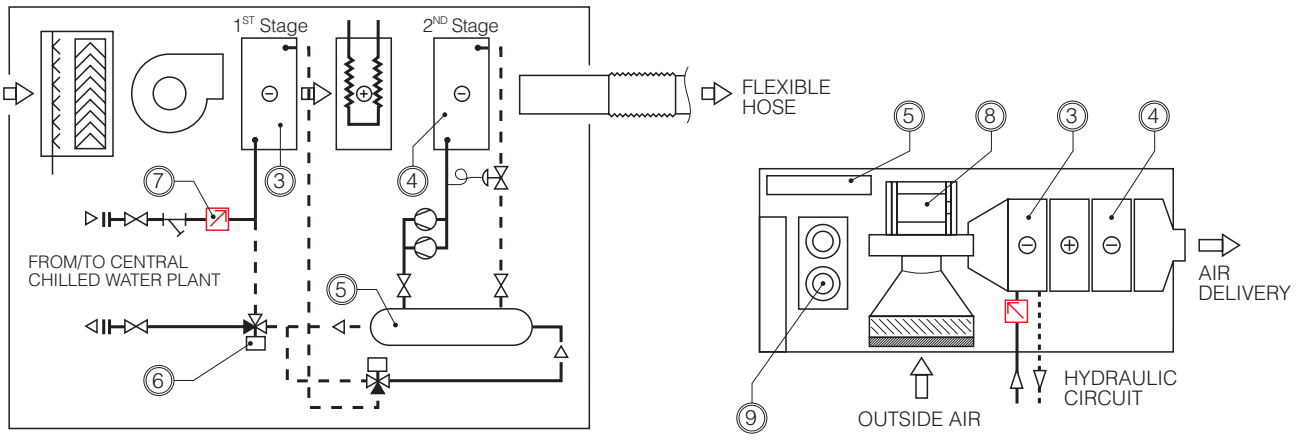
This system is designed for air-conditioning of aircrafts when they are on the ground, connected to the mobile jetways at the airport terminal satellite.
An air-conditioning machine is placed below each jetway and, in the summer cooling load, will condition the air to –4°C and blow it through flexible hoses into the inside of the aircraft. The total cooling power installed in the system for the machines is 3300 kW. In the case of a winter heat load, however, a simple electrical heating battery is used.
Inside each machine is a first stage heat exchanger set supplied with chilled water at 7°C originating from the refrigeration unit and controlled by a 3-way modulating regulating valve. A condenser, connected in series to the same circuit gets rid of the heat extracted by the second stage direct expansion coil.
The regulator controls the valve taking into account the air delivery temperature, the cabin temperature and the outside temperature. The chilled water circuit is also used here for air-conditioning inside the airport satellite.
For the hydraulic balance of the circuit, an Autoflow automatic flow regulator is positioned on the connection to each coil inside the machine. This means that the flow rate of chilled water supplied to each coil is limited to the nominal design value when the total load of the system varies.
In addition, the flow rate in the circuit is kept constant when the position of the 3-way valve is changed. This guarantees the optimum service from the air-conditioning unit and the central chillers.

AUTOFLOWs installed:	22 x series 125 with 2” connections:
Flow rate:	14 m³/h
Δp range:	14÷220 kPa.

AIR CONDITIONING MACHINE



1	AIR CONDITIONING MACHINE
2	JETWAY
3	1ST STAGE COIL
4	2ND STAGE COIL
5	WATER CONDENSER
6	3-WAY REGULATING VALVE
7	AUTOFLOW
8	FAN
9	COMPRESSORS



INSTALLED AT: **Fiumicino Airport - New Western Satellite, Rome, Italy**
DESIGN: **KLIMAT S.p.A., Sesto Ulteriano, Milan, Italy**

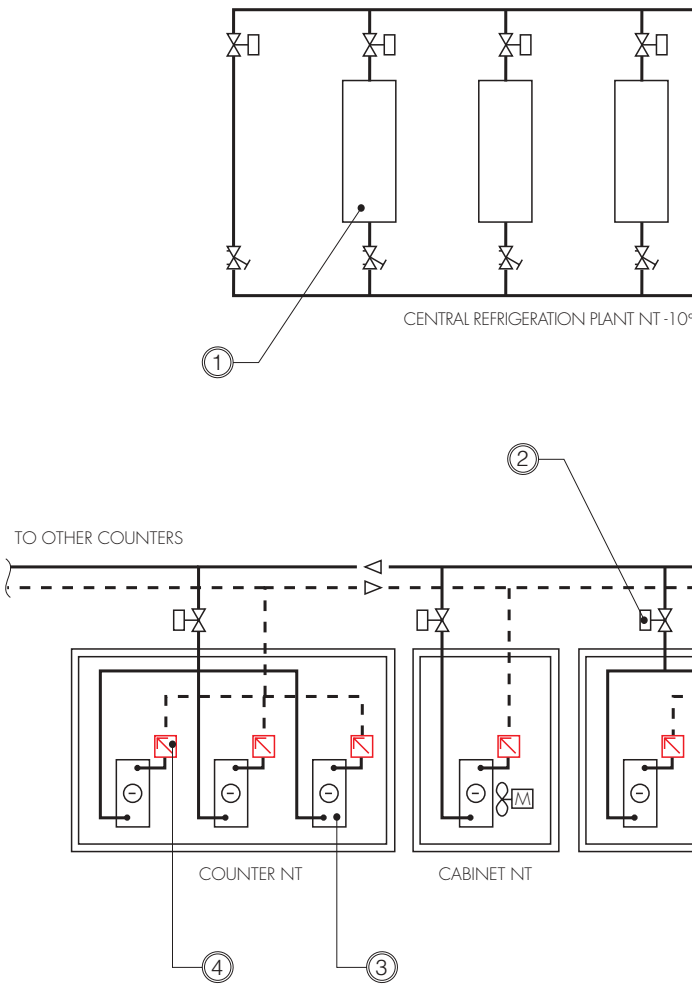
Food refrigeration system

This system is designed for the refrigeration of counters and cabinets for the preservation of food products. It is installed in a hypermarket in a shopping centre with a covered area of about 35000 m².
The cooling power installed in the refrigeration system is about 340 kW.
All kinds of food on display or stored in the supermarket, such as vegetables, cold meats, and deep-frozen foods, have specific thermal conservation requirements.
To control the temperature, each counter and cabinet contains a fanned heat transfer coil. A user thermostat controls the two-way on/off solenoid valve on the coil itself.
This system uses innovative ecological technology, making it possible to reduce emissions of **chlorofluorocarbons, which are harmful to the atmosphere**. The coils are, in fact, supplied with an appropriate anti-freeze fluid produced in a central refrigeration plant at -10°C and -30°C and distributed to the user cabinets through pumps; this system replaces the traditional method of supplying the coils directly with coolant gas.
The central refrigeration plant consists of 4 units in parallel for temperature **NT (-10°C)** and 3 units in parallel for temperature **LT (-30°C)**.
The fluid distribution pump are **variable speed with constant Δp regulation** to reduce pumping costs as the controlled flow rate of the two-way valves is reducing.

The hydraulic supply circuits for the user units, both NT and LT, are of the direct return type and are **dinamically balanced using the Autoflow automatic flow stabiliser installed in the circuit returning from each coil**. When the open/closed condition of the valve changes, the flow of fluid is continuously restricted to the nominal value in the circuits which remain open. The system can thus operate in optimum conditions when the heat load varies, thanks to the better overall operation of the coils and the cooling units.

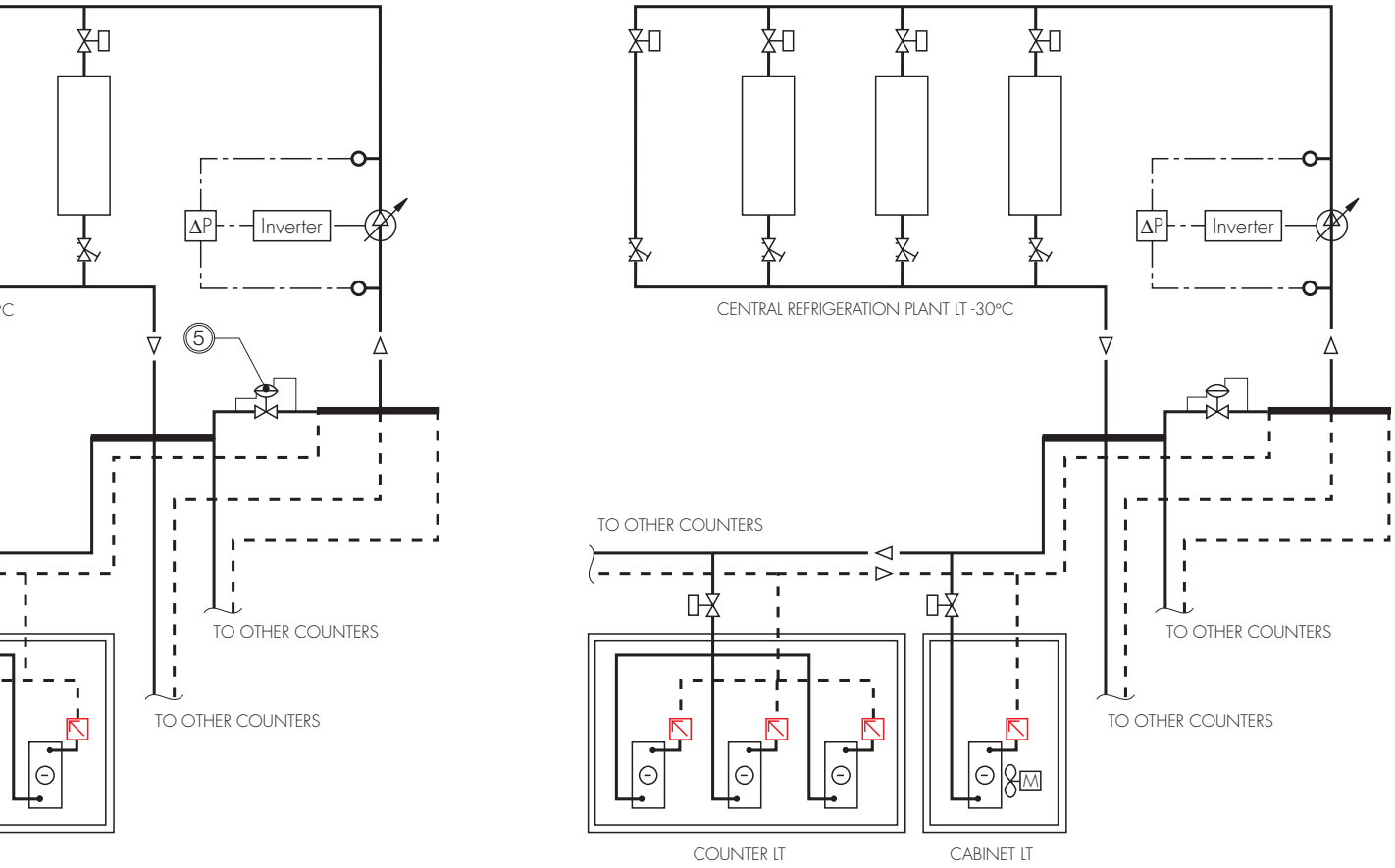
AUTOFLOWs installed:	150 x series 125 from 1/2" to 1 1/2" conn.:
Flow rate:	0,2÷5 m³/h
Δp range:	14÷220 kPa.

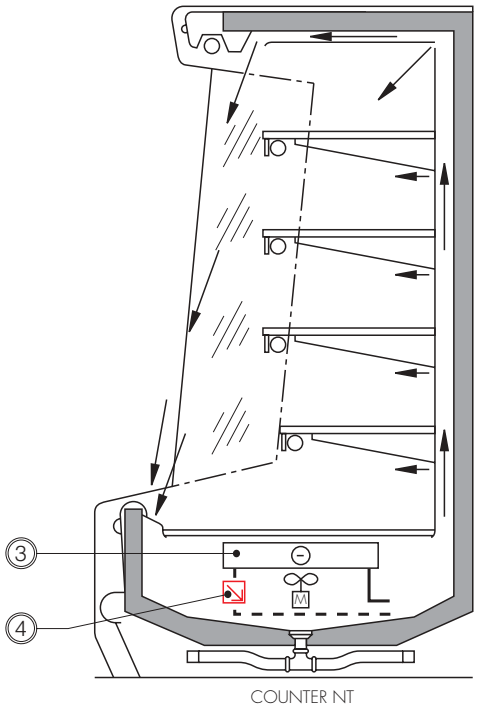
REFRIGERATION SYSTEM

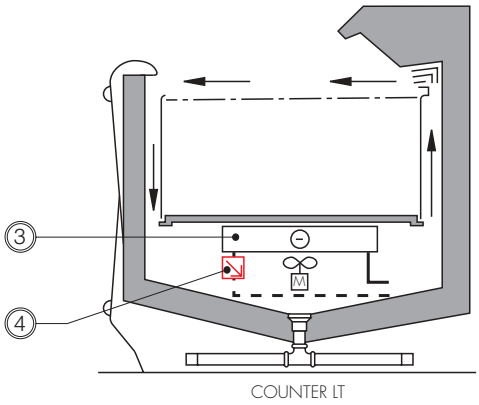


1	REFRIGERATION UNIT
2	REGULATING VALVE
3	HEAT TRASFER COIL
4	AUTOFLOW
5	BY-PASS VALVE

LICATION No. 16







Air-conditioning system with underfloor heating and primary air

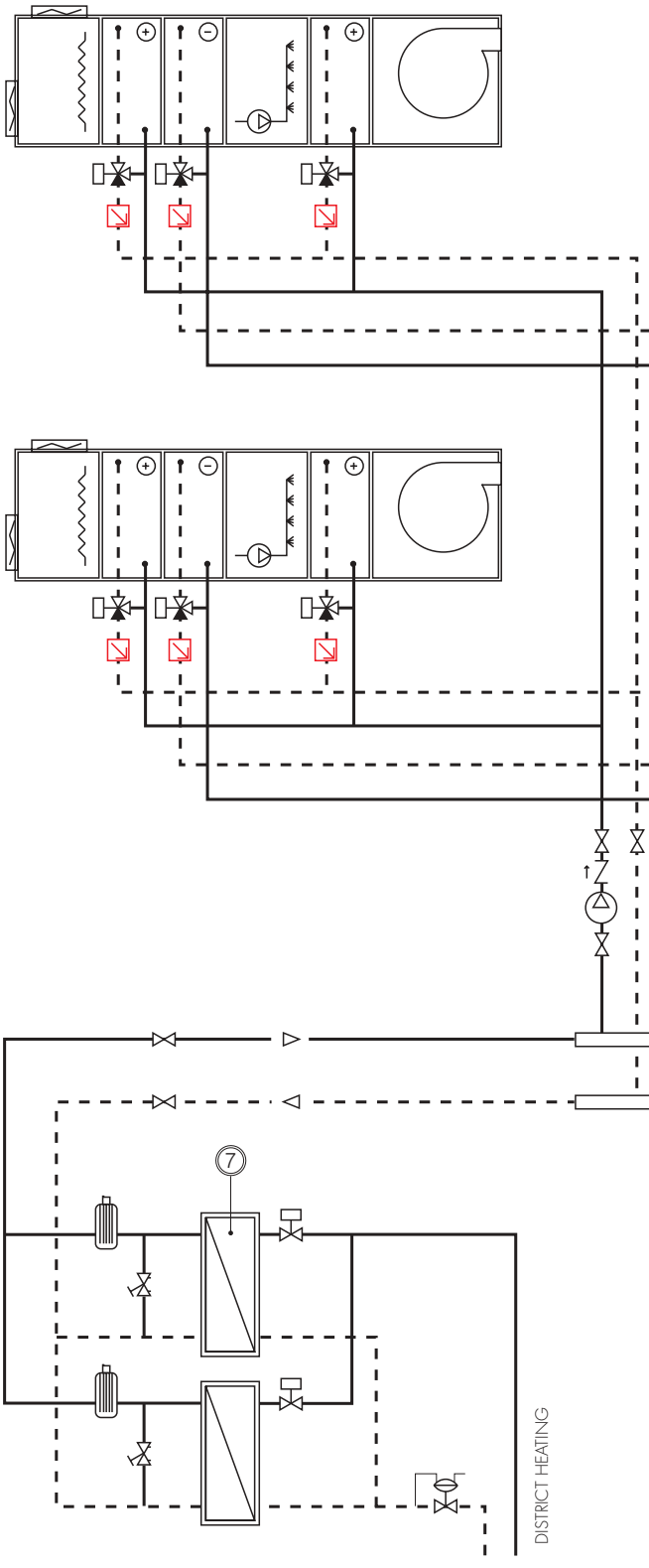
This system is designed for air-conditioning a building complex housing an art gallery and an archaeological museum. The buildings are on three floors; the air-conditioned area is approx. 6600 m^2.
The system has a total installed thermal output of approx. 1000 kW and refrigeration power of 450 kW.

For this type of structure, a **mixed water/air system** was selected, with, according to the zones involved, underfloor radiant panels and primary air or fan-coil units and primary air. In addition to heating, the panel system is used here for cooling in the summer season. The important control of the relative humidity and renewal air treatment is effected in this case by central treatment of the primary air, which is then distributed through ducts. A centralised supervision and control system allows that each zone can be managed fully and independently, allowing adjustment of the relative humidity and temperature parameters at will.

The distribution of the thermal carrier fluid is effected by means of direct return circuits to which are connected, according to zone, fan coil units or alternatively, **underfloor heating zone manifols**; the latter have two-way on/off regulating valves and individual panel shut-off and calibration valves.
The circuits operate with **variable flow rate** and are provided with pump units inverters to vary the speed with the load.
To **balance the hydraulic circuits dynamically**, an **Autoflow automatic flow stabiliser is installed for each panel manifold and for each fan-coil unit**.
This means that the balancing of the circuits is always guaranteed, even when the open/closed position of the regulating valves varies.
To the advantages arising from the use of underfloor heating panels are added those arising from the use of the Autoflow and the variable speed pumps, giving **optimuml results in terms of comfort and energy saving**.

AUTOFLOWs installed:	90 x series 120, with 1 1/4" connections:
Flow rate:	2÷6 m^3/h
Δp range:	14÷220 kPa.

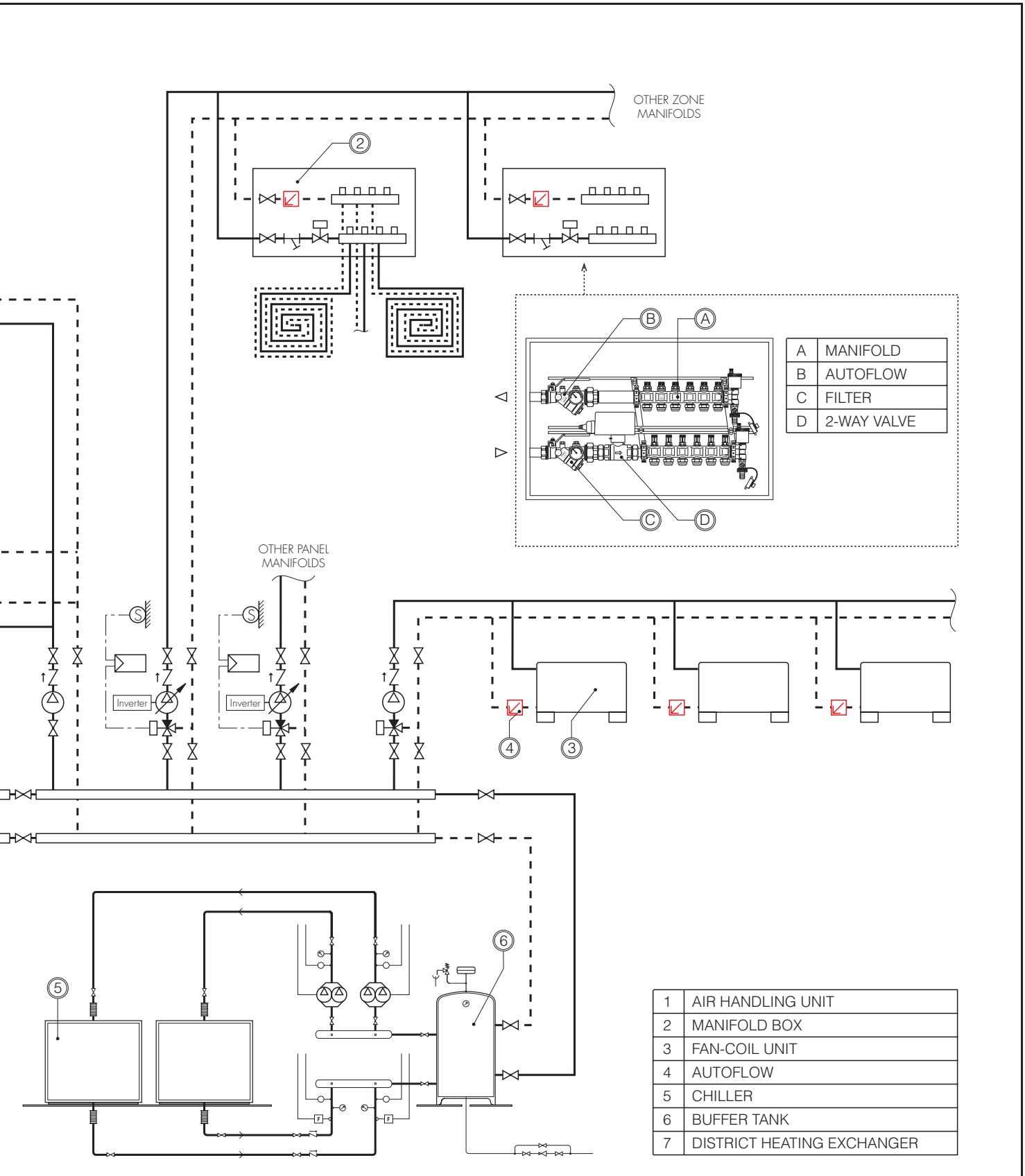
UNDERFLOOR HEATING SYSTEM



INSTALLED AT: **S. Giulia Museum Complex, Brescia (BS), Italy**

DESIGN: **Engineer Mario Doninelli, Brescia (BS), Italy**

LICATION No. 17



A	MANIFOLD
B	AUTOFLOW
C	FILTER
D	2-WAY VALVE

1	AIR HANDLING UNIT
2	MANIFOLD BOX
3	FAN-COIL UNIT
4	AUTOFLOW
5	CHILLER
6	BUFFER TANK
7	DISTRICT HEATING EXCHANGER

AUTOFLOW APPLICATION No. 18

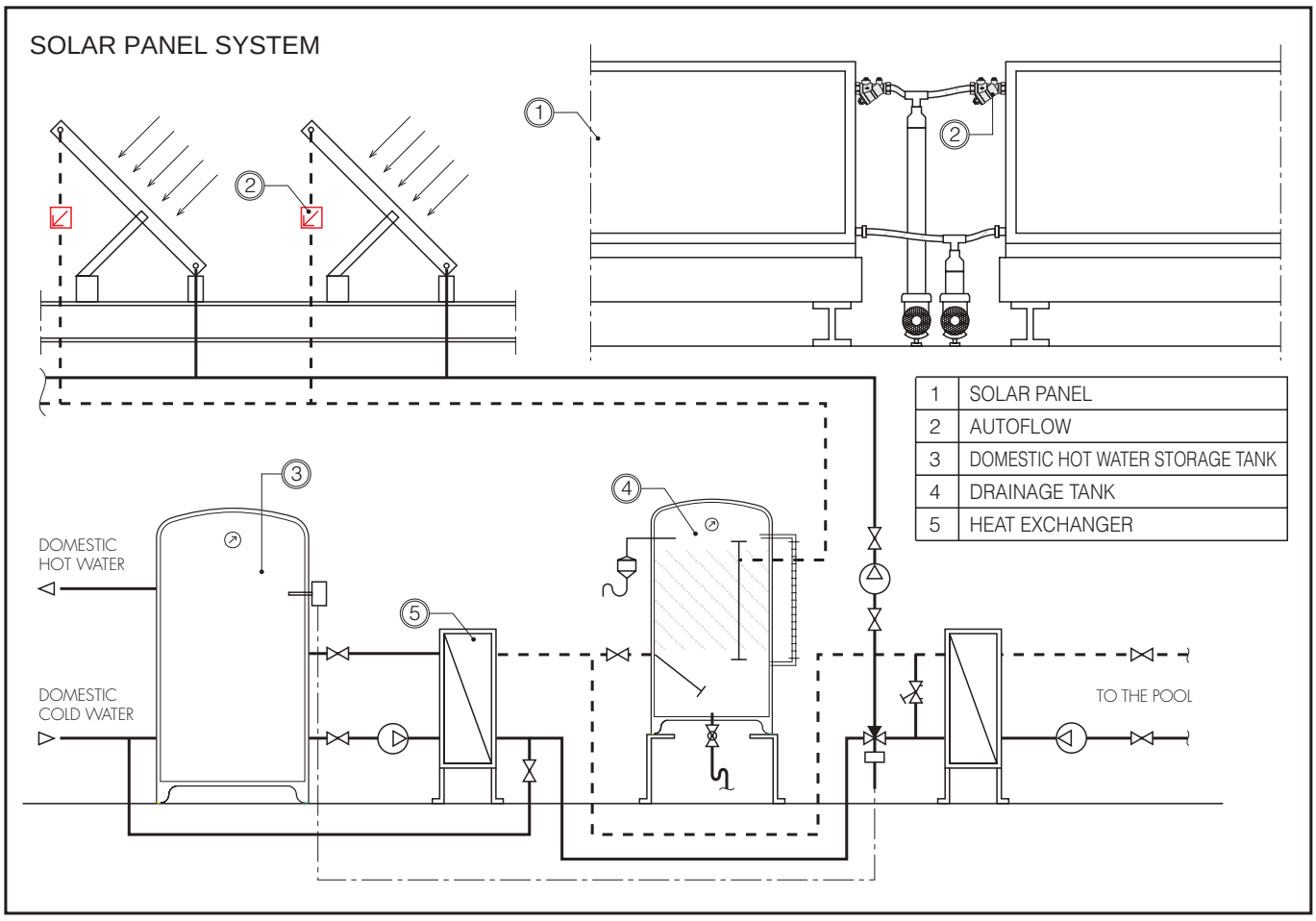
Solar panel system

This solar panel system was installed on the roof of a swimming pool at the end of the 1980s. Made with flat collectors, with an area of 104 m² and a thermal output of approx. 150 kW, after reconstruction work, it can meet all the heat requirements for the supply of domestic hot water and, in the most favourable periods, it also contributes to topping up the heating of the children's pool during summer operation. A traditional central heating system, with heat generators using gas oil, supplements the solar panel system or replaces it, in periods when there is insufficient sunshine and during winter operation.
The system, which was originally a closed circuit, has been changed into an "**open and draining**" system, which permits the solar collectors and all the connecting pipework to discharge completely whenever the electric supply pumps shut down, storing all the thermal carrier fluid in the stainless steel drainage tank in the central heating system, which then reaches the maximum level.
A system of plate heat exchangers, supported by a special electronic regulator, controls the correct operation of the solar panel system and stores the heat energy produced in it, directing it to the domestic hot water storage tank, or to the circuit for heating the children's pool, as required.

The "**open and draining**" system has other additional advantages:
- the possibility of using fresh water as the thermal carrier fluid, instead of mixed with glycol solution, which, as is well-known, has a much lower specific heat with a consequently reduced capacity to absorb thermal energy. This means that, with the same flow rate, a lower quantity of heat is "carried" from the solar collectors to the points of usage;
- there are no freezing problems when the system is empty in the winter period or overheating problems when on standby during the summer period;
- corrosion of the equipment, due to glycol solution, is avoided.

The system, originally, had solar collectors connected in series, with serious problems of dynamic balancing, so that its output could never fully meet requirements.
For this reason, when the distribution pipework, which was corroded in several places, was being replaced, the whole thing was converted into an "**open and draining**" system, and at the same time an **Autoflow automatic flow stabiliser** was installed in the return pipework of each individual solar collector, correctly dimensioned, and guaranteeing each individual collector the rated design flow, hence improving the heat output performance to the maximum.

AUTOFLOWs installed:	26 x series 125 with 1/2" connections:
Flow rate:	0,3 m³/h
Δp range:	14÷220 kPa.



INSTALLED AT: **Public Swimming Pool, Spiazzo Rendena (TN), Italy**
DESIGN: **Termotecnica & Impianti p.i. Donato Candioli, Storo (TN), Italy**

AUTOFLOW APPLICATION No. 19

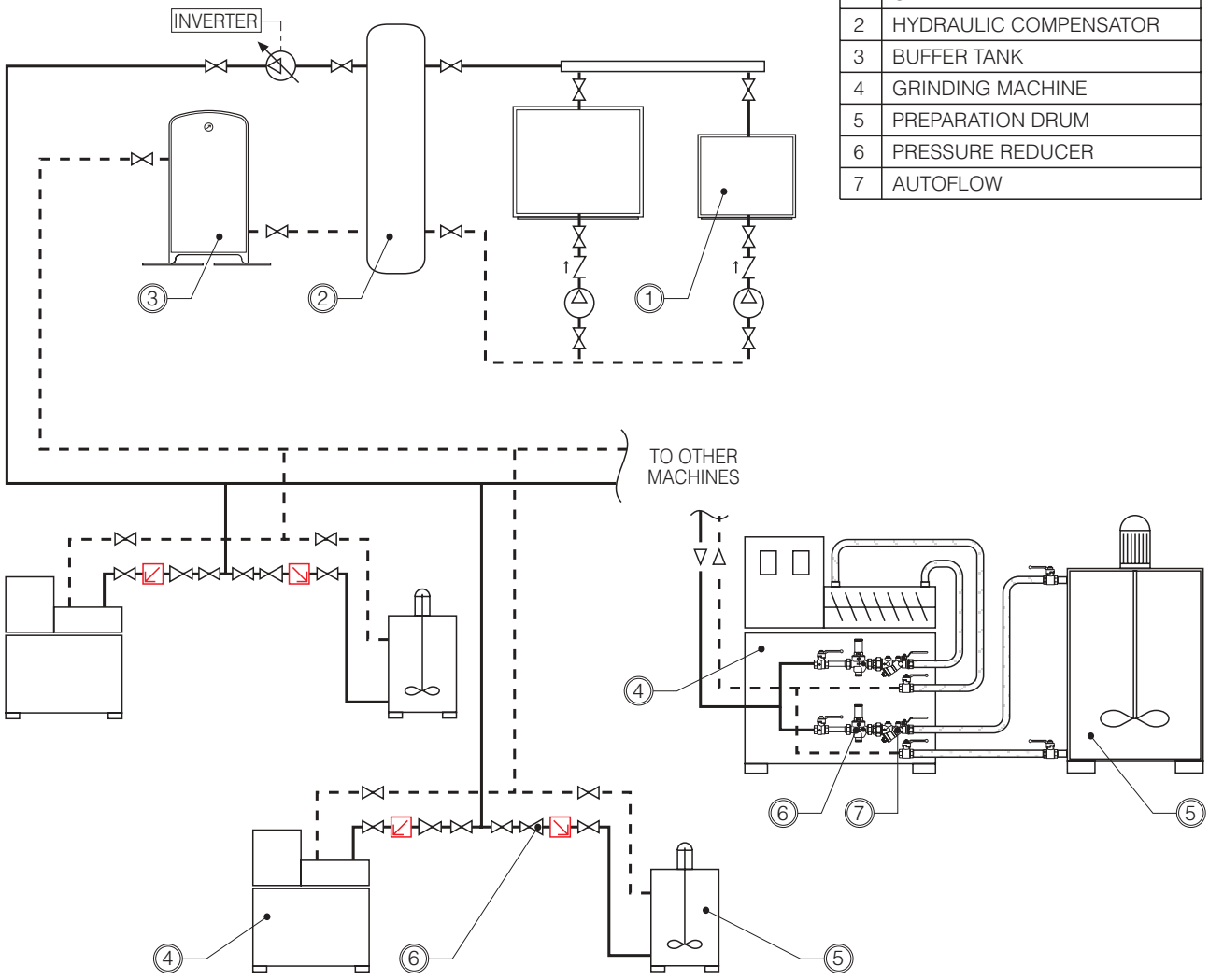
Cooling system for operating machinery

This system is designed for cooling operating machines used in a printing inks production unit.

These machines consist of two functional parts, one used for grinding the material, and the other, known as the drum, processes the ink as the finished product.
Each of the two component parts of the machine **must be cooled to keep the temperature at levels which will guarantee that the finished product has the required chemical and physical characteristics**.
A chilled water closed circuit supplies the heat exchangers located inside the machine itself. In addition to requiring to be supplied with the correct flow rate of fluid, these exchangers have limitations in terms of maximum pressure; specific pressure limits must not be exceeded inside each exchanger, or they will suffer structural damage. In order to meet both these requirements, **one pressure reducer designed to limit the pressure to the required value, and one Autoflow flow stabiliser, which keeps the flow constant at the nominal value** are installed in series at the connection to each exchanger.
The system operates with a variable flow rate, as the circuits supplying the grinding machines or the drums can be shut-off according to production requirements.
A variable speed pumping unit provides the head according to the system loading.
Thanks to the presence of the Autoflow, the flow rate in the open circuits is always restricted to the rated flow rate, regardless of the number of circuits connected, hence guaranteeing that each machine is operating under optimum conditions.

AUTOFLOWs installed:	30 x series 125 with 1/2" connections:
Flow rate:	0,3÷0,8 m³/h
Δp range:	14÷220 kPa.

COOLING SYSTEM FOR MACHINERY



1	CHILLER
2	HYDRAULIC COMPENSATOR
3	BUFFER TANK
4	GRINDING MACHINE
5	PREPARATION DRUM
6	PRESSURE REDUCER
7	AUTOFLOW

INSTALLED AT: **FISAT Production Unit, Collegno (TO), Italy**
DESIGN: **S.T.A. Studio Termotecnico Associato Revelli & Basso, Turin (TO), Italy**
INSTALLATION: **Impresa D'Ambrosio, Collegno (TO), Italy**

AUTOFLOW APPLICATION No. 20

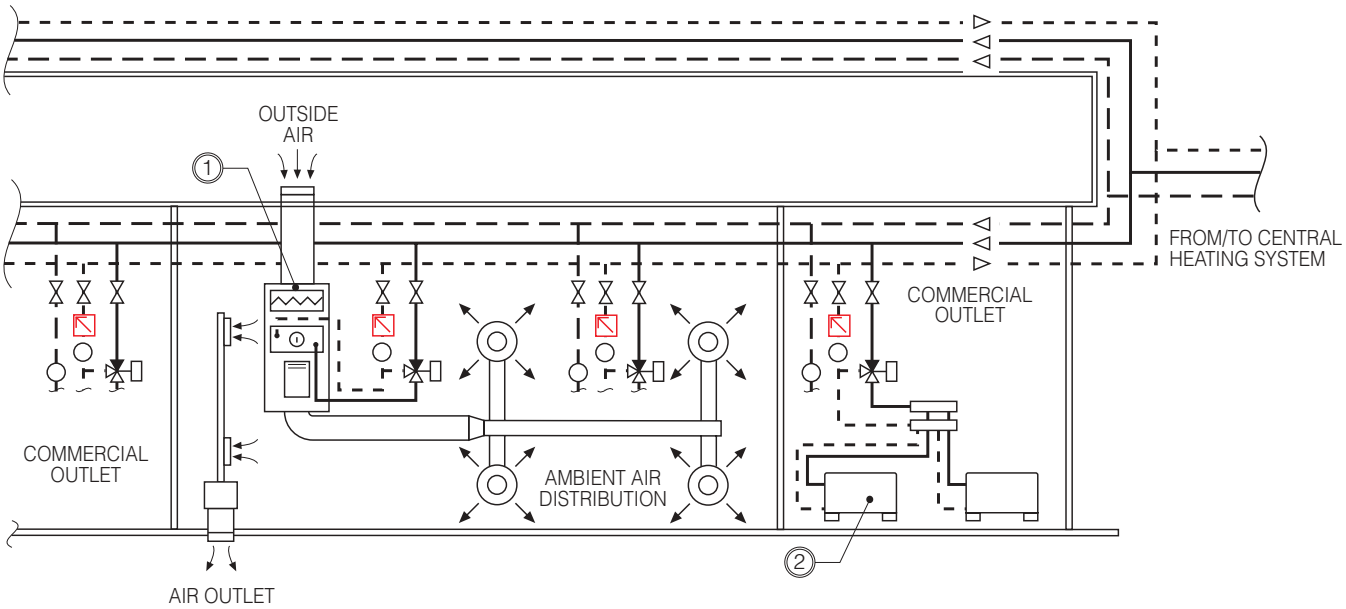
Air conditioning system

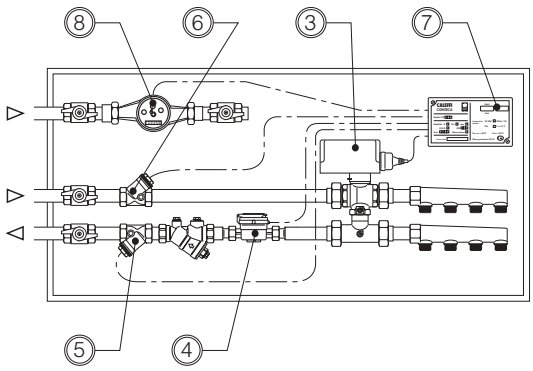
This system is designed for air-conditioning a multi-purpose centre, partly used for offices and partly for shops and small businesses.
The building is on 3 floors, with an area of 13.000 m^2 and a served volume of 50.000 m^3. The system has heating output of approx. 2.000 kW and cooling power of 1.400 kW.
For air-conditioning the various zones which the building is divided into, according to the individual user requirements, solutions have been selected with fan-coil units and/or zonal air treatment units. Each zone connection, either to the manifold assemblies in the case of fan-coil units or to the air conditioning coils, is provided with a **three-way regulating valve for controlling the ambient heating load, a direct heat meter for measuring the heat consumption for heating and domestic hot water, and**

Autoflow automatic flow stabiliser for the dynamic balancing of the hydraulic circuit.
The system operates at constant flow rate, with flow rate limitation to each user, according to the nominal design conditions, guaranteed by Autoflow.
A Conteca centralised heat consumption management system ensures the correct breakdown of the costs between the various users.
The overall operation of the plant, therefore, under these optimum conditions, gives the best results in terms of comfort and energy savings.

AUTOFLOWs installed:	70 x series 125 with 1" to 2" connections:
Flow rate:	0,9÷9 m^3/h
Δp range:	14÷220 kPa.

AIR CONDITIONING SYSTEM





1	AIR CONDITIONING UNIT
2	FAN-COIL UNIT
3	ZONE VALVE
4	HEAT METER
5	AUTOFLOW
6	SENSORS
7	CONTECA MANAGEMENT UNIT
8	DOMESTIC HOT WATER METER

INSTALLED AT: **Centro Polifunzionale Edilanciani, Corridonia (MC), Italy**
DESIGN: **Studio Tecnico Ing. Luigi Domenella, Civitanova Marche (MC), Italy**