

## Automatic Flow Regulators

# AutoFlow<sup>®</sup>



### AUTOFLOW APPLICATION N° 9

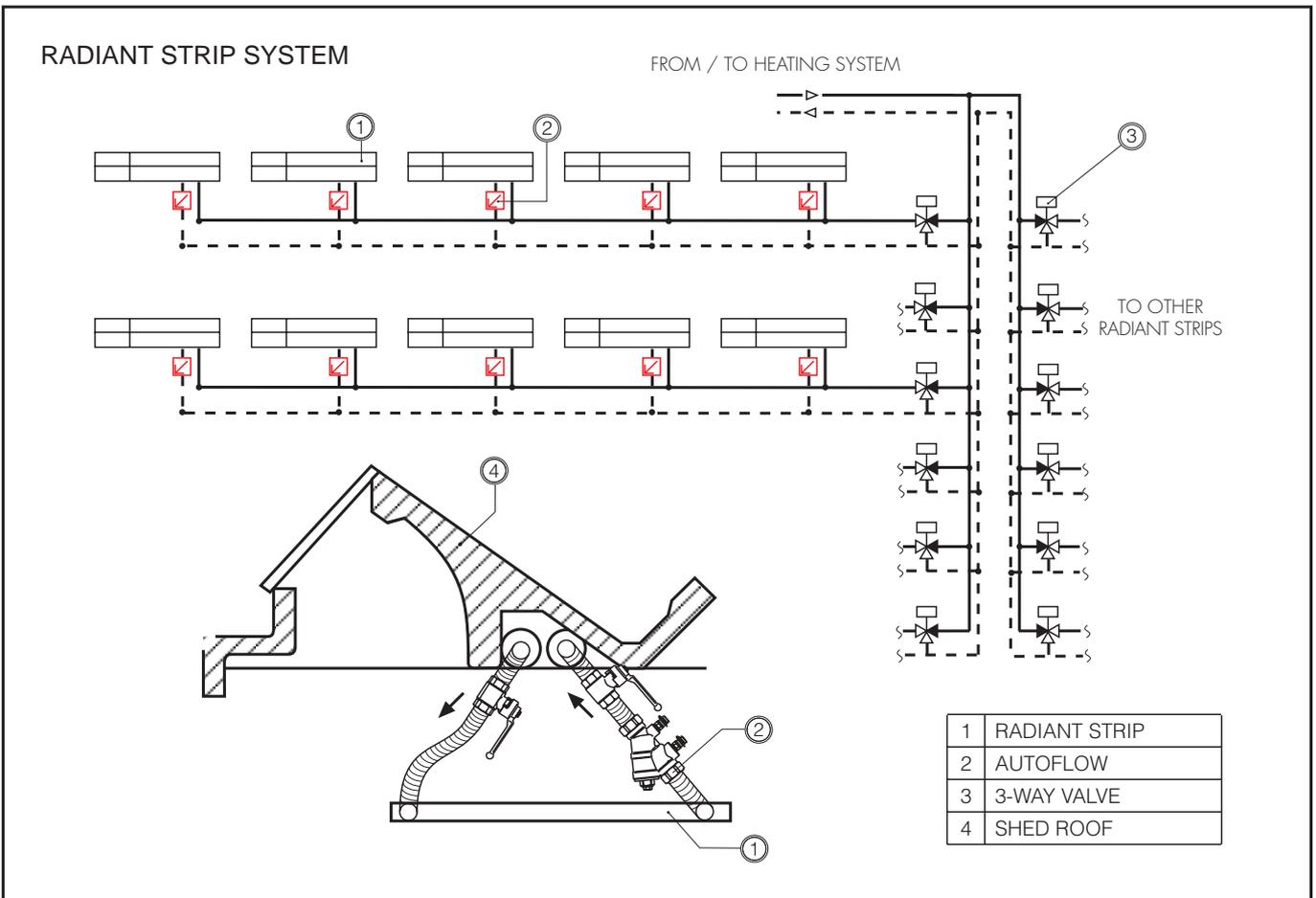
#### Radiant strip heating system

This system is designed for an industrial shed with an area of 4500 m<sup>2</sup> and a net volume of approx. 30,000 m<sup>3</sup> which forms part of a production unit. The total installed heating output is 700 kW. The building is heated in winter by 60 radiant strips installed under the roofing line at a height of approx. 6 m. The heat-carrying fluid is distributed by means of two main circuits which run from the main boiler headers. Branch circuits run from each main circuit, each serving 5 radiant strips.

In order to be able to supply each radiant strip at its design capacity and thus balance the hydraulic circuit, an **AUTOFLOW** automatic flow regulator has been installed on the return pipe from each radiant strip.

This means that **the plant is always balanced**, even if the open/closed position of the 3-way valve modulating the supply of each set of radiant strips is altered.

AUTOFLOWs installed: n° 60 series 125, sizes 3/4"  
 Flow rate: 500 l/h and 1,000 l/h  
 Δp range: 14 ÷ 220 kPa



INSTALLED AT: Calpeda S.p.A. Production Unit, Montorso (VI) Italy  
 DESIGN : Studio di progettazioni termotecniche: P.I. Paolo Lucatello, Torri di Quartesolo (VI) Italy  
 E-mail: lucatello.p@nbnet.it

**Industrial refrigeration system**

This system is designed for **the industrial refrigeration and air-conditioning** of a production unit in **the food sector**, which processes hams and sausages.

The building covers a total area of 10,000 m<sup>2</sup> with a net volume of approx. 40,000 m<sup>3</sup>.

The system has a heating output of approx. 1200 kW and cooling output of approx. 900 kW.

The climatic requirements of the various zones into which the plant can be divided change according to the type of work and processing carried out during food production. In particular, a 'all-air' solution has been chosen with **a central treatment unit** having a dual cold/hot duct system with a terminal mixer box for working rooms, and **a dual cold/hot coil** for each maturing chamber, while **each storage chamber, held at a temperature of 0 °C**, has its own **refrigeration heat transfer unit**.

One heating plant, two refrigeration units and two closed-circuit cooling towers provide the primary production of the hot and cold fluids. The secondary hydraulic circuit distributing the fluid to the various heat exchange batteries is of the variable flow type, with 2-way and 3-way modulating valves on the batteries and main pumping sets served by an inverter to vary the speed with the load.

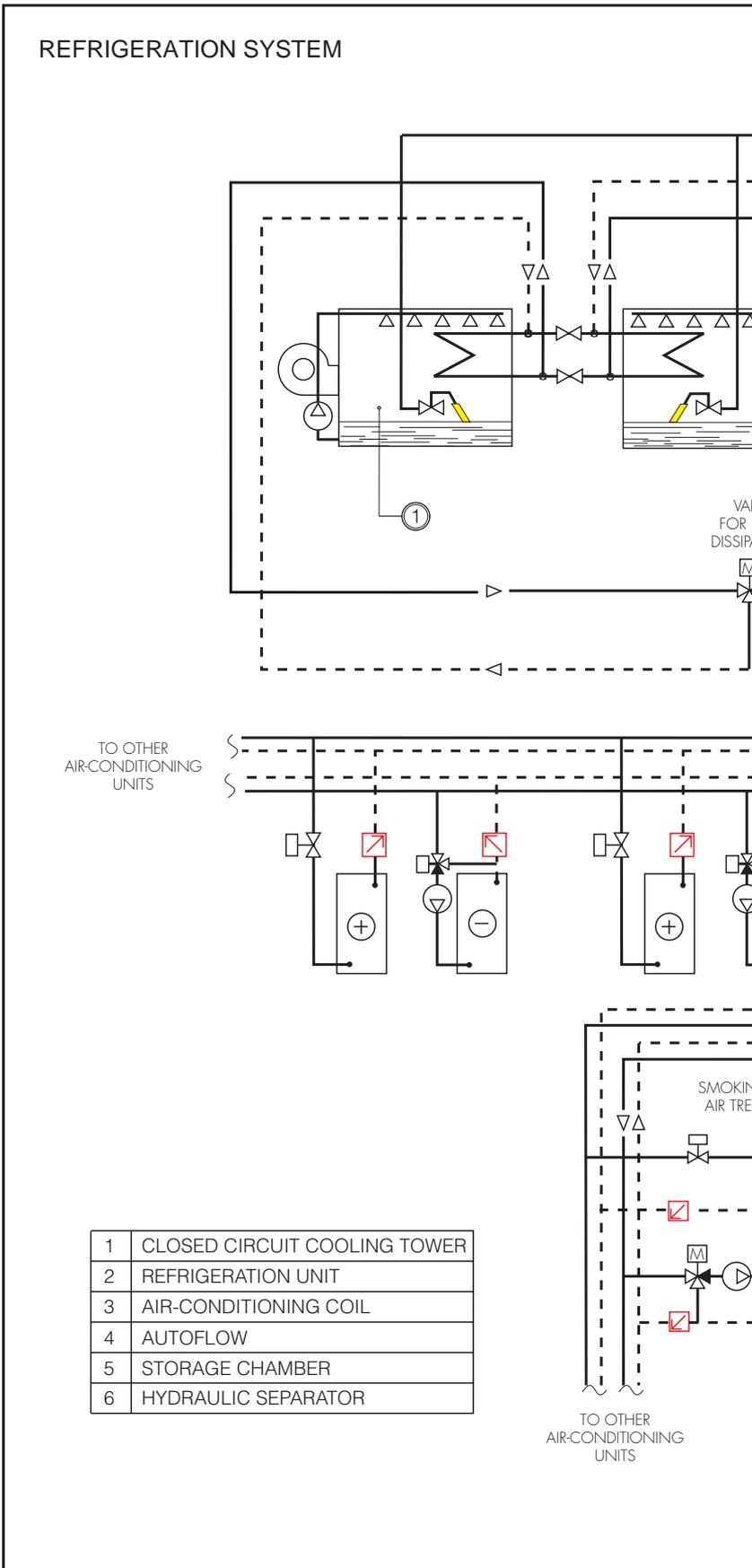
**In order to balance the hydraulic circuit dynamically, an Autoflow automatic flow regulator** has been installed **on the return junction of each hot and cold coil**.

Other Autoflows have also been installed **on the cooling unit circuits on both the condenser and evaporator sides**.

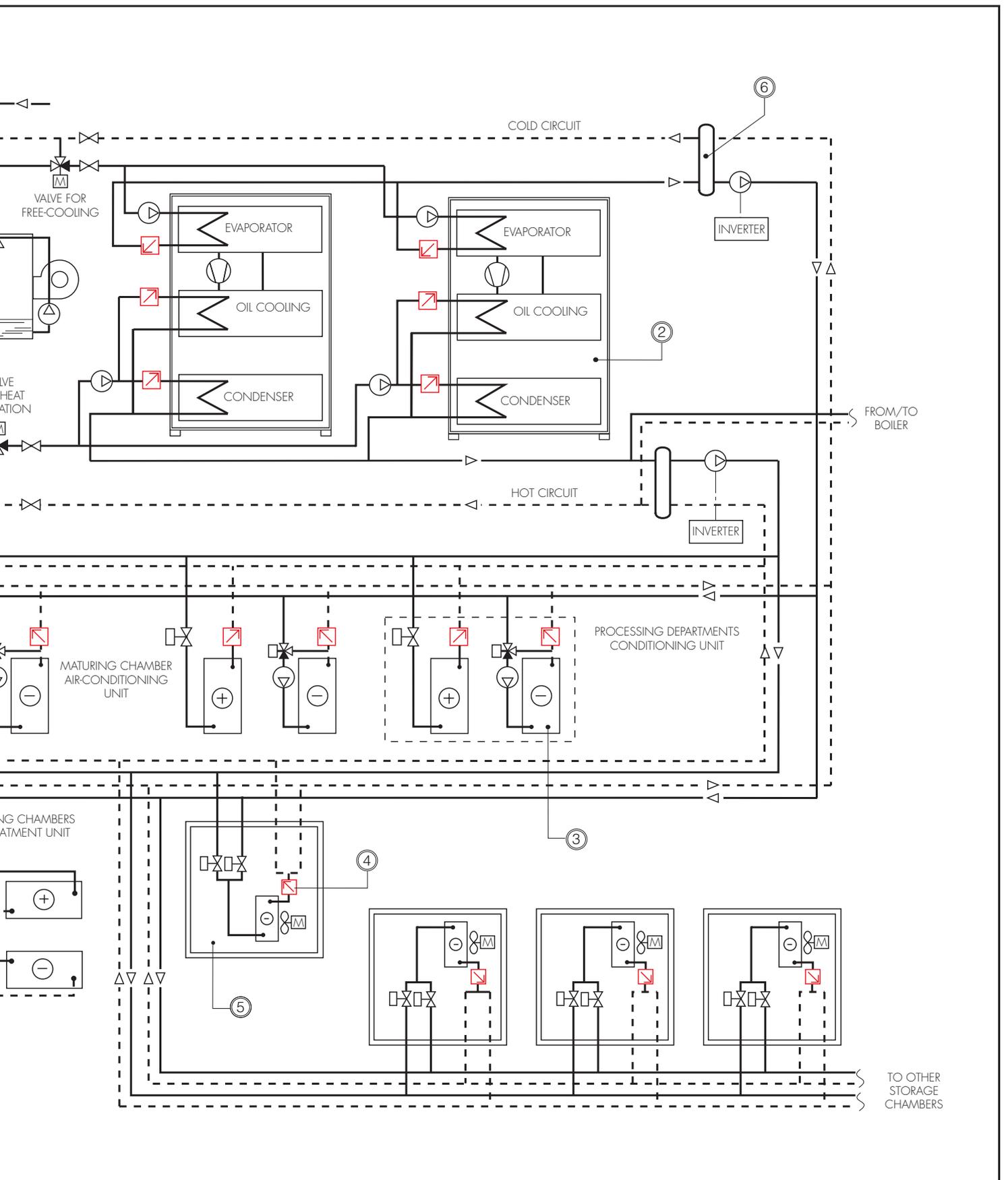
On the **secondary circuit**, the flow to each unit remains limited to the rated value when the opening of the coil regulating valve is altered; on the **primary circuit**, the flow remains constant when the opening position of the valves connecting the tower circuit for heat dissipation or free-cooling is varied. This optimises the operation of the air-conditioning machinery, the cooling units and thus the entire system.

AUTOFLOWS installed:	n° 50 series 125-103 sizes from 3/4" to DN 125
Flow rate:	from 600 to 80,000 l/h
Δp range:	14 ÷ 220 kPa

**INSTALLED AT:** Nocker Production Unit,  
Dobbiaco (BZ) Italy  
**DESIGN:** Thermostudio, Walter Prighel,  
Brunico - Merano (BZ) Italy  
E.mail: thermob@tin.it



# APPLICATION N° 10



**Air-conditioning system**

This system is designed for air-conditioning in a hospital. The building complex occupies a total area of 40,000 m<sup>2</sup> with a net volume of approx. 200,000 m<sup>3</sup>. The system has total installed output of approx. 8,000 kW. For air-conditioning of the buildings, a system was selected, allowing for the needs of the different zones; in particular, **primary air prepared in a zone treatment unit and local post-heating with duct coils** and radiators with thermostatic valves.

From the primary hot water production circuit, the water is circulated into the secondary circuits, distributed by a set of five pumps, each controlled by an inverter to vary the speed with the load. A common pipe with a reversible flow direction guarantees **the hydraulic independence of the primary and secondary circuits.**

**Each variable flow secondary circuit** serves a certain number of units whose heat emission is regulated by **2- or 3-way modulating valves.** The 3-way valves are used to vary the delivery temperature with the load, while the 2-way valves are used to vary the flow with the load.

In order to balance the hydraulic circuit dynamically, **an Autoflow automatic flow regulator has been connected to each emitter branch circuit, conditioning coil, radiator circuit and heat exchanger.**

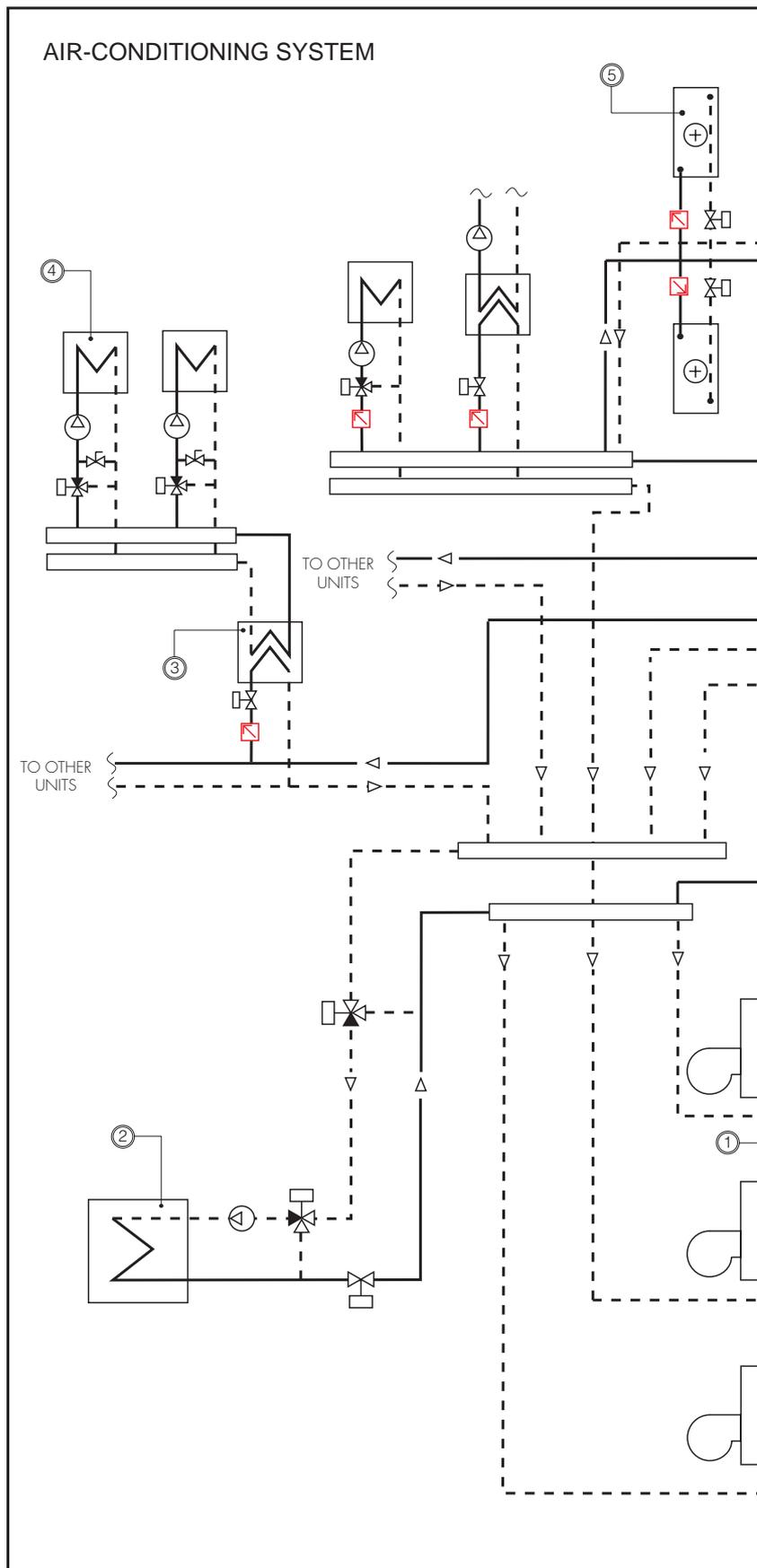
This means that, at the emitter, the rated capacity remains limited to the rated value when the opening of the regulating valve is varied under any load conditions.

The additional connection of some **Autoflows in by-passes** permits a minimum flow circulation in the circuit in such a way as to reduce the heat inertia at the header and thus safeguard the pumps in operation at a reduced flow.

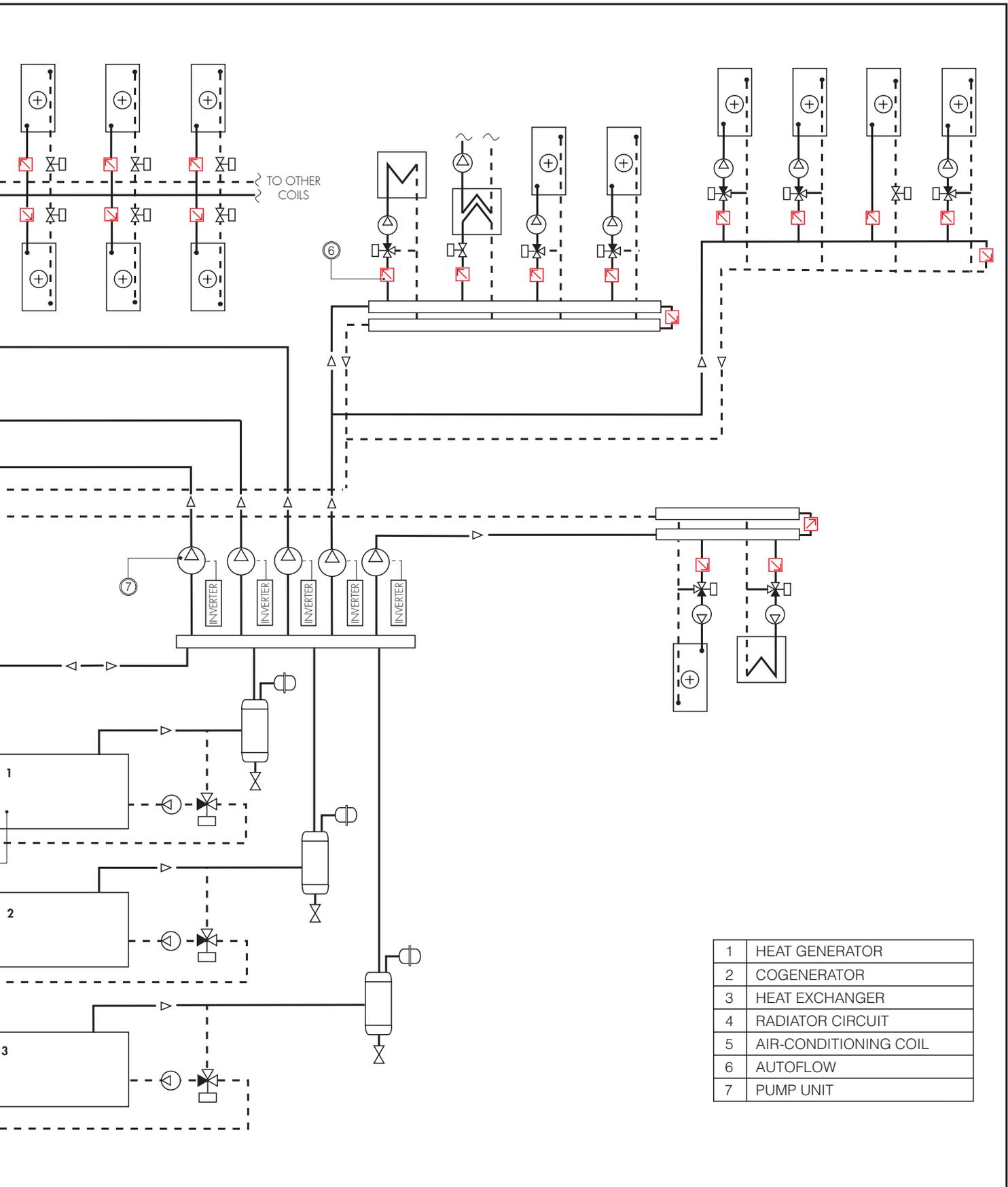
This allows the system to operate in the optimum manner when the heat demand is varied, with the best results in terms of **both comfort and energy saving.**

AUTOFLOWS installed:	n° 70 series 125-103 sizes from 1/2" to DN 100
Flow rate:	300 ÷ 31,000 l/h
Δp range:	14 ÷ 220 kPa

**INSTALLED AT:** Brunico Hospital (BZ) Italy  
**DESIGN:** Thermostudio, Walter Prighel,  
 Brunico - Merano (BZ) Italy  
 E.mail: thermob@tin.it



# PLICATION N° 11



1	HEAT GENERATOR
2	COGENERATOR
3	HEAT EXCHANGER
4	RADIATOR CIRCUIT
5	AIR-CONDITIONING COIL
6	AUTOFLOW
7	PUMP UNIT

## AUTOFLOW APPLICATION N° 12

### Air-conditioning system with heat pump

This system is designed for the air-conditioning of a shopping centre, partly used as a hyper-market and partly as shops.

The building covers a total area of 25,000 m<sup>2</sup> with an air-conditioned volume of 120,000 m<sup>3</sup>. The system has a total output of approx. 3500 kW.

For the air-conditioning of the various environments, an 'all-air' solution has been selected, with **heat pump air-conditioners** installed on the roof or in the ceiling. These modules have coils with direct expansion functioning as an evaporator in summer and a condenser in winter by inversion of the heat pump cooling cycle. A tube bank heat exchanger alternates as a condenser or evaporator according to the operating conditions.

These heat exchangers are hydraulically linked to a **reverse return circuit forming a loop**.

The heat exchangers give or take heat energy to or from the system fully independently of each other, according to the individual user requirements, permitting **overall energy saving**,

thanks also to the recycled heat originating from the cold storage plant. For possible back-up heating or cooling, two boilers and a battery consisting of 3 closed circuit cooling towers are also connected to the circuit.

**The system operates with a variable flow**, as each module **can be regulated by 2-way on/off valves**, which close when the compressor is switched off. The pumps are in parallel and have inverters for **varying the speed when the system load varies**.

In order to guarantee the correct design water flow, an **Autoflow automatic flow regulator** is installed in the circuit coming from each module. At the open circuits, the flow thus remains limited to its rated value, **optimising the performance** of the machinery and thus the system itself.

AUTOFLOWs installed:

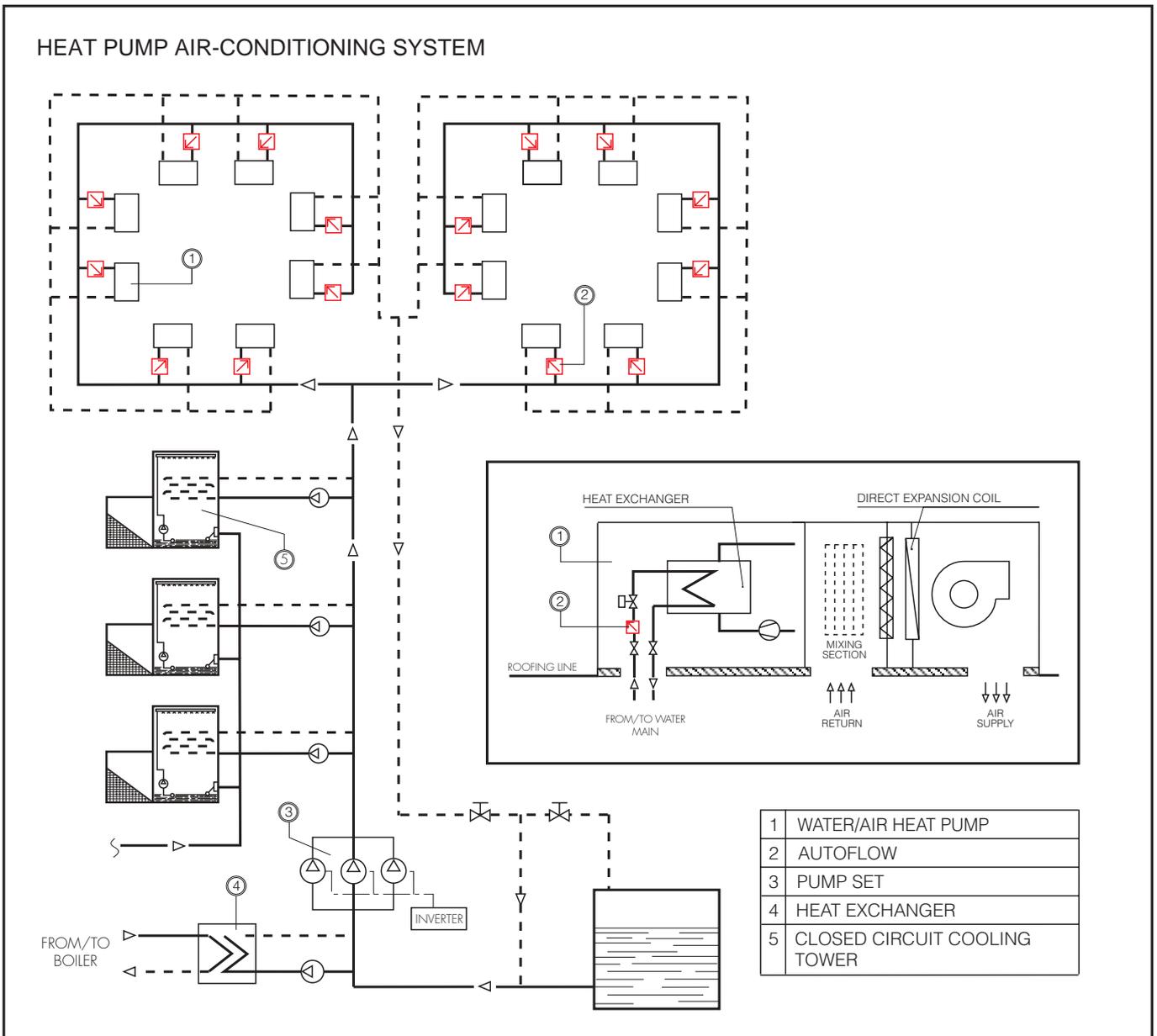
n° 90 series 125-103  
sizes from 1 1/4" to DN 125

Flow rate:

2500 ÷ 24,000 l/h

Δp range:

14 ÷ 220 kPa



**INSTALLED AT:** "Le Mura" Shopping Centre, Ferrara (FE) Italy  
**DESIGN:** Ing. Massimo Stefano Venco, Vicenza (VI) Italy

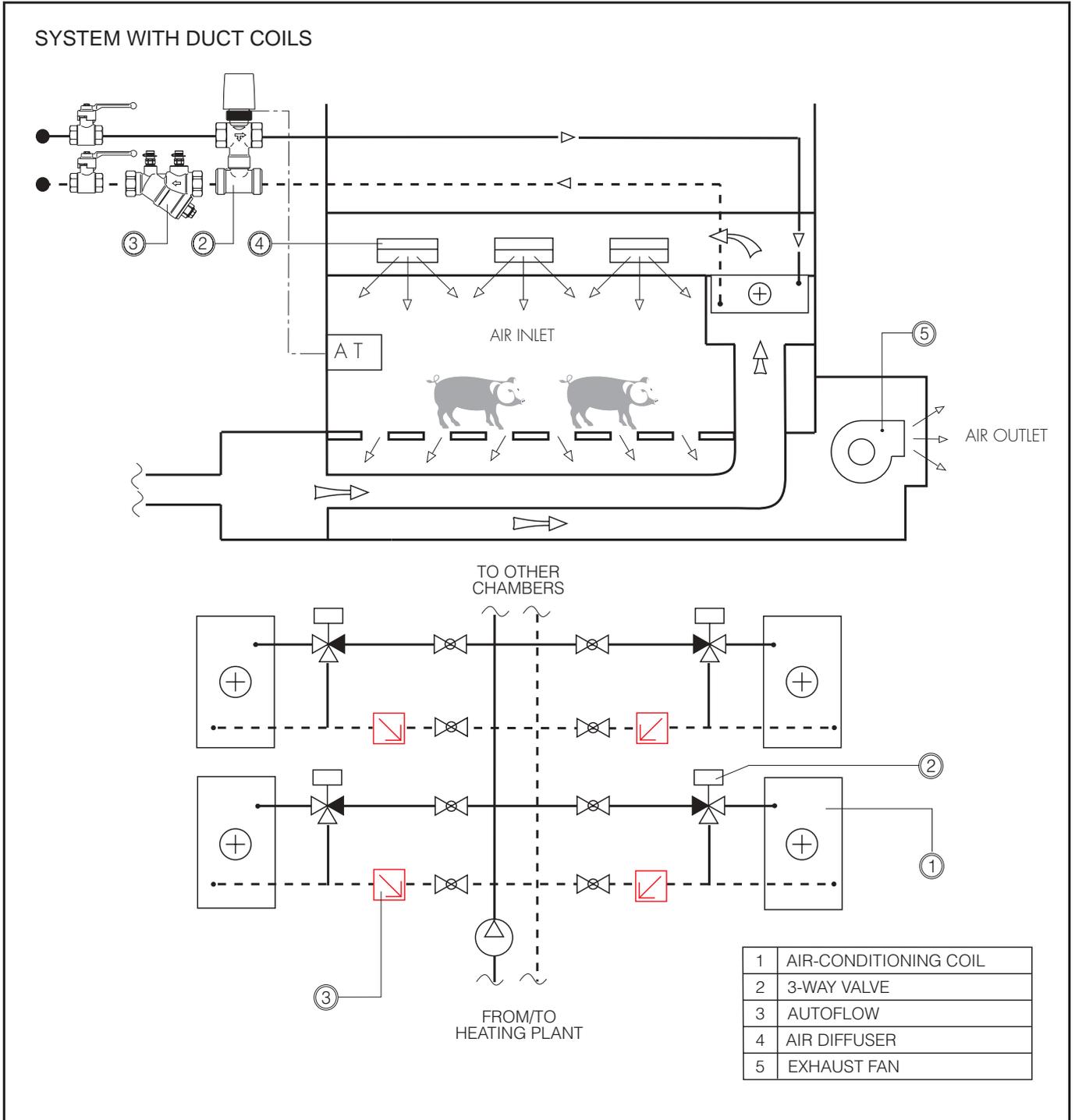
# AUTOFLOW APPLICATION N° 13

## Heating system with duct coils

This system is designed for heating a pig-breeding building. The building occupies an area of 1000 m<sup>2</sup> with a supplied volume of 2,000 m<sup>3</sup>. The system has an installed output of approx. 150 kW. The building is broken down into air-conditioned chambers at different temperatures, each housing an important phase in the animal's life cycle, in particular birthing and weaning. Each chamber is heated by a **heating coil positioned in a vacuum operated duct**. The temperature is controlled by a thermostat on a 3-way valve positioned on the connection to each

coil on the main distribution line. In order to balance the hydraulic circuit dynamically, **one Autoflow flow regulator has been connected to the return piping of each connection**. This means that the **rated flow is always guaranteed** even when the valve open/closed position is altered, without the need for balancing the by-pass to the valve itself.

AUTOFLOWS installed: n° 30 series 125, sizes 3/4"  
 Flow rate: 900 l/h  
 Δp range: 14 ÷ 220 kPa



INSTALLED AT: "La Savolda" Farm, Lonato (BS) Italy  
 DESIGN: Dr. Ing. Gabriele Ghilardi, Bergamo (BG) Italy  
 E.mail: gbp5912@uninetcom.it

## AUTOFLOW APPLICATION N° 14

### Moulding machine cooling system

This system is intended for use in a factory producing plastic items.

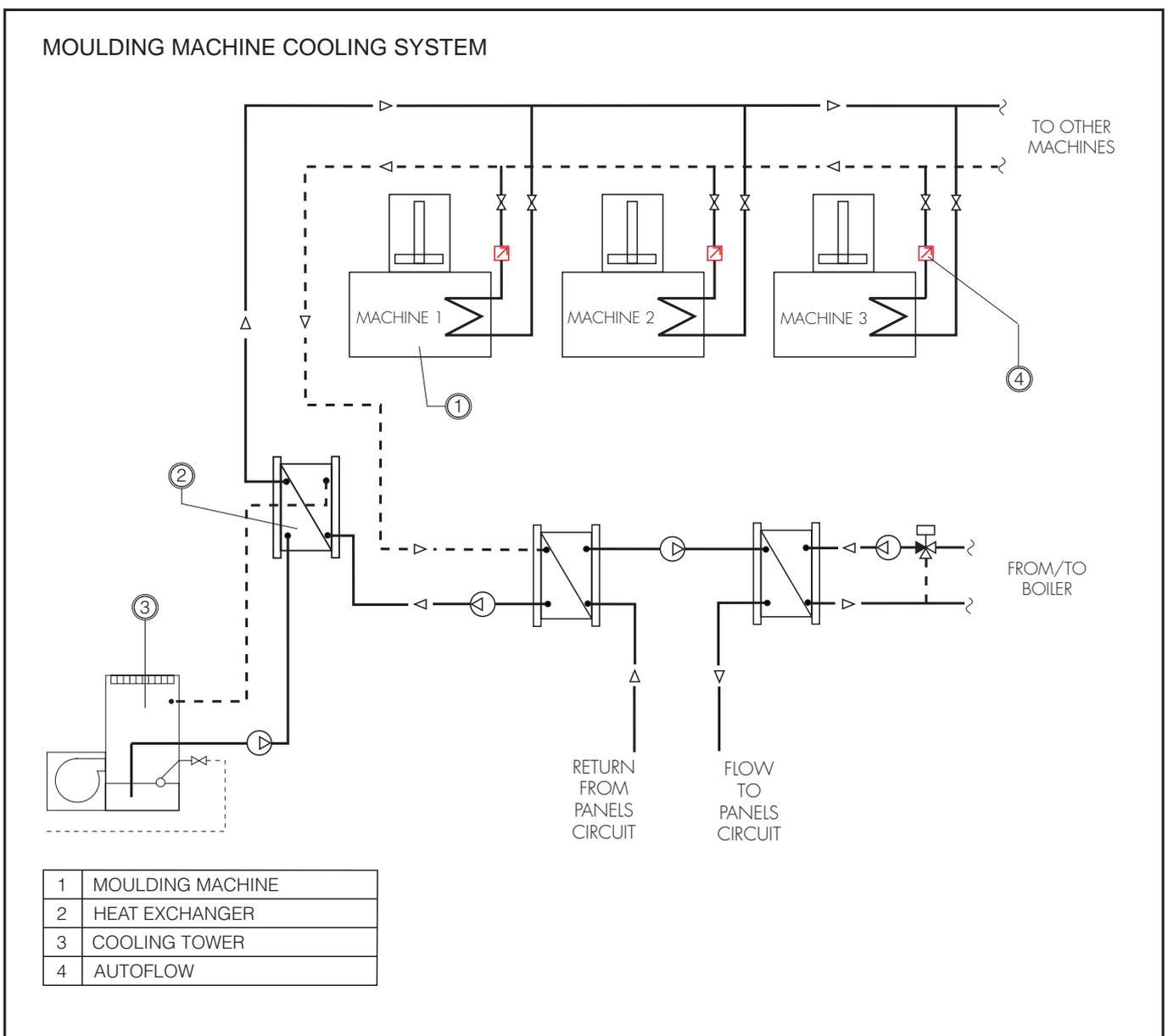
The hydraulic presses for moulding the components need to be very carefully cooled in order to maintain the **optimum temperature levels of the various parts and components.**

In order to optimise the heat transfer, each cooling circuit inside the moulding system must be supplied with a **clearly specified, constant flow of water.**

The circuits branching off to the various machines are served by a distribution network with closed circuit and direct return. **In order to balance the hydraulic circuit dynamically, one Autoflow flow regulator has been connected to the branch circuit to each machine.**

This means that **the rated flow is always guaranteed** at each circuit flowing to the machines, even if some of these have been closed down for maintenance. The heat transferred by the presses is also used in winter by an under-floor radiant panel heating system, thus permitting a **considerable energy saving.**

AUTOFLOWs installed: n° 20 series 125, sizes 3/4"  
 Flow rate: 600 ÷ 1400 l/h  
 Δp range: 14 ÷ 220 kPa



**INSTALLED AT:** Nuova Saimpa Production Unit, Cimego (TN) Italy  
**DESIGN:** Termotecnica & Impianti P.I. Donato Candioli, Storo (TN) Italy