

**CONTROL SYSTEMS FOR HYDRONIC INDOOR UNITS** 







ADAPTABLE TO EVERY NEED















**ELECTROMECHANICAL CONTROLLERS** USER-FRIENDLY OPERATION

SERIAL COMMUNICATION

SUPERVISION SYSTEMS CENTRALISED CONTROL SYSTEM

SYSTEM CONTROLLER

Together with generation systems and hydronic indoor units, climate control is the third family of Galletti products. The persistent growth strategy translates into an advantage for the customer too, ensuring the possibility of customization to meet the specific needs for each application.

# Innovation in the field of climate adjustment

With a department entirely dedicated to the development of products related to climate control, Galletti, which is one of the leading companies in the air conditioning sector, is gradually expanding its product offerings, developing an increasingly effective line of products that are in line with the customer's needs.



Galletti hydronic indoor units' controls are perfectly compatible with the different series in the catalog and can be integrated to comprise an all-in-one package with other products.



For several years now, Galletti has decided to invest heavily also in improving climate control systems for its hydronic indoor units, progressively expanding its range of products with increasingly refined and effective solutions for the customer. The development and internal production of products in relation to system regulation and monitoring are absolutely strategic for the company, because they allow full control over one of the fundamental system elements for maintaining ideal temperature and humidity conditions.

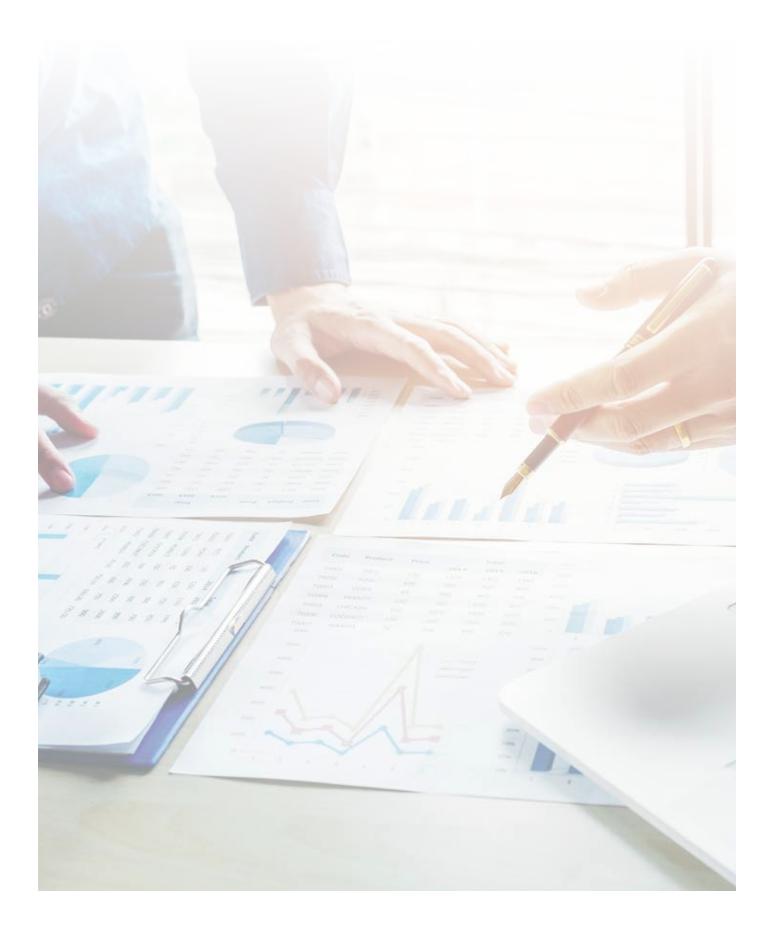
Together with generation systems (chillers, heat pumps, multi-purpose units) and hydronic indoor units, climate control is the third family of Galletti products. Their persistence in pursuing such a strategy of development and growth translates into an advantage for the customer too, ensuring flexibility and the possibility of customization

to meet the specific needs for each application.

Galletti hydronic indoor units' controls are perfectly compatible with the different series in the catalog and can be integrated to comprise an all-in-one package with other products.

This brochure presents a wide range of controls for Galletti hydronic indoor units: a line of products strategically designed to guarantee the well-being of the end user and to achieve increasingly higher levels of energy efficiency.

All the products presented are harmoniously included in the comprehensive range of products and services offered by the Group, which is able to guarantee specific areas of expertise regarding the various HRVAC sectors.





## p. 10 Electromechanical Controllers



The range of Galletti electromechanical controls is well suited to all the regulation needs for hydronic indoor units, offering the possibility to mount the control on the indoor unit or on the wall, the management of the opening and closing of one or two shut-off valves, the control of the water temperature entering the fan coil unit, and allowing the control of multiple units.

## p. 16 Electronic controllers



Galletti electronic controls permit finer and more advanced management of hydronic indoor units, allowing different logics for selecting the operating mode, the automatic variation of the fan speed, the management of indoor units equipped with BLDC motor, the possibility of establishing master-slave type networks, and the availability of digital inputs and outputs for greater customization of regulation.

## p. 23 Supervision systems



To complete the Galletti product offering: ERGO LIGHT, ERGO, and ERGO Web monitoring systems are available for centralized zone regulation or regulation of the entire building being air conditioned.

1					EL	ECTROM	<b>IECHANI</b>	CAL CON	ITROLLE	RS		
	SERIES	<b>MOTOR</b>	СВ	CD	CDE	TB	TD	TIB	TDC	TD4T	TA	TA2
	CONTROL CODE		EYCB	EYCD	EYCDE	EYTB	EYTD	EYTIB	EYTDC	EYTD4T	EYTA	EYTA2
		-	<b>Ø</b> 1	•	•	<b>⊘</b> 1	•	<b>Ø</b> 1	•	•	<b>Ø</b>	•
	ESTRO FL/FA/FU/CL/FB	i	-	-	-	_	-	-	-	-	-	-
		GT	-	-	-	-	-	-	-	-	-	-
		-	-	•	•	-	•	-	•	•	<b>Ø</b>	<b>Ø</b>
	ESTRO FP/FC/FF/FBC	i	-	-	-	-	-	-	-	-	-	-
		GT	-	-	-	-	-	-	-	-	-	-
Z	FLAT	-	<b>Ø</b> 1	<b>Ø</b>	•	-	•	<b>Ø</b> 1	0	•	<b>Ø</b>	•
FAN COIL UNITS		i	-	-	-	=	=	-	-	-	-	-
AN CO	FLAT S	-	•	•	•	-	•	•	•	•	•	•
		i	-	-	-	-	-	-	-	-	-	-
	ART-U	-	-	-	-	-	-	-	-	-	-	-
	FM	-	-	-	-	=	-	-	-	-	-	-
	2X1	-	<b>⊘</b> 2	-	-	=	-	-	-	-	-	-
		i	-	-	-	-	-	-	-	-	-	-
	IWC	-	-	-	-	-	-	-	-	<b>Ø</b>	-	-
		i	-	-	-	-	-	-	-	-	-	-
	DUCTIMAX	-	-	<b>Ø</b>	<b>Ø</b>	-	<b>Ø</b>	-	•	•	<b>Ø</b>	•
SIIIS		i	-	-	-	-	-	-	-	-	-	-
DUCTABLE UNITS	PWN	-	-	•	<b>Ø</b>	-	•	-	<b>Ø</b>	•	<b>Ø</b>	<b>Ø</b>
UCTAB		i	-	-	-	-	-	-	-	-	-	-
	UTN <sup>3</sup>	-	-	•	<b>Ø</b>	-	•	-	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	0
		i	-	-	-	-	-	-	-	-	-	-
FAN HEATERS	AREO	-	-	-	-	-	-	-	-	-	<b>Ø</b>	0
EN EN	ANLO	i	-	-	-	-	-	-	-	-	-	-

<sup>&</sup>lt;sup>1</sup> Only if the U version is wall mounted - <sup>2</sup> Special CBK control for 4-speed management <sup>3</sup> From size 30 it is necessary to couple the controls to the IPM board due to the high power consumption

ELECTRO	ONIC CONT	ROLLERS	ELEC	TRONIC	CONTRO	LLERS <i>y</i>	VITH DIS	PLAY				
TED2T	TED4T	TED10		MCME	MCLE	EVO	LED503		IR	MOTOR	SERIES	
EYTED2T	EYTED4T	EYTED10	EYMCBE	EYMCME	EYMCLE	EYEVOBOARD +EYEVODISP	EYLED503	SKAWP000000	SATWC000TIO	<b>—</b>	CONTROL CODE	
<b>Ø</b>	<b>Ø</b>	-	<b>Ø</b>	<b>⊘</b>	<b>Ø</b>	<b>Ø</b>	•	-	-	-		
-	-	<b>Ø</b>	-	-	•	•	-	-	-	i	ESTRO FL/FA/FU/CL/FB	
-	-	•	-	-	<b>Ø</b>	<b>Ø</b>	-	-	-	GT		
<b>Ø</b>	<b>Ø</b>	-	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	-	-	-		
-	-	•	-	-	•	•	-	-	-	i	ESTRO FP/FC/FF/FBC	
-	-	•	-	-	<b>Ø</b>	<b>Ø</b>	-	-	-	GT		
•	<b>Ø</b>	-	•	•	•	•	•	-	-	-	FLAT	TS
-	-	•	-	-	<b>Ø</b>	<b>Ø</b>	-	-	-	i		FAN COIL UNITS
•	<b>Ø</b>	-	<b>Ø</b>	•	<b>Ø</b>	<b>Ø</b>	<b>⊘</b>	-	-	-	FLAT S	-AN CO
-	-	•	-	-	<b>Ø</b>	<b>Ø</b>	-	-	-	i		Ť
-	-	•	-	-	<b>Ø</b>	<b>Ø</b>	-	-	-	i	ART-U	
-	-	-	-	=	-	-	-	<b>Ø</b>	<b>Ø</b>	-	FM	
-	-	-	•	•	•	•	-	-	-	-	2X1	
-	-	-	-	-	<b>Ø</b>	<b>Ø</b>	-	-	-	i		
-	-	-	•	•	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	-	<b>Ø</b>	-	IWC	
-	-	-	-	-	•	•	-	-	•	i		
•	<b>Ø</b>	-	•	•	<b>Ø</b>	<b>Ø</b>	•	-	-	-	DUCTIMAX	
-	-	•	-	-	<b>Ø</b>	<b>Ø</b>	-	-	-	i		ITS
<b>Ø</b>	<b>Ø</b>	-	•	•	•	•	<b>Ø</b>	-	-	-	PWN	DUCTABLE UNITS
-	-	•	-	-	•	•	-	-	-	i		UCTAB
•	•	-	•	•	•	•	•	-	-	-	UTN <sup>3</sup>	D
-	-	<b>Ø</b>	-	-	•	•	-	-	-	i		
-	-	-	•	•	•	•	-	-	-	-	AREO	FAN HEATERS
-	-	-	-	-	<b>Ø</b>	<b>Ø</b>	-	-	-	i		FAN

					ELECTRO	MECHANI	CAL CONT	ROLLERS		
		СВ	CD	CDE	ТВ	TD	TIB	TDC	TD4T	TA
INSTALLATION	On-board	•	-	-	•	-	•	_	-	-
INSTALL	Wall mounted	-	<b>Ø</b>	•	-	<b>②</b>	-	<b>Ø</b>	<b>②</b>	•
TEM	2 pipes	<b>Ø</b>	•	<b>⊘</b>	<b>Ø</b>	•	•	•	•	<b>Ø</b>
SYSTEM	4 pipes	-	_	-	-	-	-	_	<b>⊘</b>	-
	Air thermostat	-	-	-	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>⊘</b>	<b>Ø</b>
	3 speeds	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>⊘</b>	-
TMENT	4 speeds	-	_	_	-	-	-	_	-	-
ADJUSTMENT	Automatic speeds	-	_	-	-	-	-	_	-	-
	Variable speed	-	_	_	-	_	-	_	-	_
	Dehumidifica- tion/r.h. reading	-	_	-	-	_	-	_	-	-
RS	Water sensor	-	_	_	-	_	-	_	-	_
SENSO	Remote air sensor	-	_	-	_	_	-	_	_	_
EXTERNAL SENSORS	Remote r.h. sensor	-	_	-	_	_	-	_	-	_
ЕХТЕ	Water operating thermostat	<b>Ø</b>	•	<b>⊘</b>	<b>Ø</b>	<b>⊘</b> <sup>+</sup>	<b>⊘</b> <sup>+</sup>	•	-	<b>Ø</b>
S	ON/OFF valve man- agement	_	_	_	<b>⊘</b> <sup>+</sup>	_	<b>Ø</b> <sup>†</sup>	_	<b>⊘</b>	<b>Ø</b>
DEVICE	Modulating valve management	_	_	_	_	_	_	_	_	_
EXTERNAL DEVICES MANAGEMENT	Control of heating element	_	_	_	_	_	_	_	_	_
EXTE	Digital outputs	_	_	_	_	_	_	_	_	_
	Summer/Winter local	_	_	_	_	<b>⊘</b>	<b>⊘</b>	_	<b>⊘</b>	_
SNO	Summer/winter water	_	_	_	_	_	_	_	_	_
ANCILLARY FUNCTIONS	Summer/Winter air (4 pipes)	_	_	_	_	_	_	_	_	_
LARY F	Economy	-	_	_	_	_	_	_	_	_
ANCILI	Digital inputs	_	_	_	_	_	_	_	_	_
	Modbus communi- cation	-	_	_	_	_	-	_	-	-

<sup>&</sup>lt;sup>+</sup>Options that are not mutually compatible

	ELECTRO	NIC CONT	ROLLERS	ELECT	RONIC CO	NTROLLER	S WITH D	ISPLAY		
TA2	TED2T	TED4T	TED10	MCBE	MCME	MCLE	EVO	LED503		
-	<b>Ø</b>	•	<b>Ø</b>	<b>Ø</b>	•	•	_	•	On-board	INSTALLATION
•	•	•	•	<b>Ø</b>	•	•	<b>②</b>	•	Wall mounted	INSTAL
<b>②</b>	<b>Ø</b>	-	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	2 pipes	IEM
-	-	<b>Ø</b>	•	•	<b>Ø</b>	<b>Ø</b>	<b>②</b>	<b>⊘</b> +	4 pipes	SYSTEM
•	<b>Ø</b>	Air thermostat								
-	<b>Ø</b>	•	<b>Ø</b>	<b>Ø</b>	•	•	<b>Ø</b>	•	3 speeds	_
-	-	-	-	•	<b>Ø</b>	<b>②</b>	•	<b>⊘</b> +	4 speeds	ADJUSTMENT
-	-	-	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	Automatic speeds	SOLO
ı	-	_	<b>⊘</b>	-	-	<b>⊘</b>	•	-	Variable speed	•
ı	-	-	-	•	<b>Ø</b>	<b>Ø</b>	-	-	Dehumidifica- tion/r.h. reading	
-	<b>Ø</b>	Water sensor	ORS							
1	•	<b>⊘</b>	<b>⊘</b>	<b>⊘</b>	•	<b>⊘</b>	•	•	Remote air sensor	SENS
-	-	-	-	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	_	-	Remote r.h. sensor	EXTERNAL SENSORS
1	-	-	-	-	-	-	-	-	Water operating thermostat	EXTE
•	<b>Ø</b>	<b>②</b>	<b>②</b>	•	<b>Ø</b>	<b>②</b>	•	<b>Ø</b>	ON/OFF valve man- agement	CES
-	-	-	-	-	-	<b>Ø</b>	<b>Ø</b>	-	Modulating valve management	DEVICEMEN
-	-	-	-	<b>Ø</b>	•	•	•	<b>⊘</b> +	Control of heating element	EXTERNAL DEVICES MANAGEMENT
-	-	-	-	-	-	<b>②</b>	<b>⊘</b>	-	Digital outputs	EXT
<b>Ø</b>	Summer/Winter local									
-	-	-	-	•	<b>Ø</b>	<b>②</b>	<b>②</b>	<b>Ø</b>	Summer/winter water	SNOL
-	-	<b>Ø</b>	Summer/Winter air (4 pipes)	FUNC						
-	-	-	-	•	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	-	Economy	ANCILLARY FUNCTIONS
-	-	-	-	•	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	Digital inputs	ANCIL
-	-	-	-	-	<b>Ø</b>	<b>Ø</b>	<b>Ø</b>	-	Modbus communi- cation	

## **CONTROL SYSTEMS FOR HYDRONIC INDOOR UNITS**

Code Ref. FYCB<sup>1</sup> **EYCB** CB

On-board speed switch

#### **Features**

- Installation on the unit.
- Suitable for 2-pipe systems units
- Manual switchover of 3 fan speeds plus turn-off
- Possible combination with minimum thermostat for enabling of ventilation

FAN COILS								
ESTRO	FLAT	FLAT S						
VERSION								
FL/FA/CL <sup>2</sup> /FU <sup>3</sup> /FB	L/U³	-						
	MOTOR DRIVE							
ON / OFF								

- Code referred to FLAT and FLAT S series Code EYCB-C
- If the fan coil is wall mounted only



4 speed switch, on-board installation

- Installation on the unit
- Suitable for 2-pipe systems units
- Manual switchover of 4 fan speeds plus turn-off
- Possible combination with minimum thermostat for enabling of ventilation



FAN COILS							
2X1							
VERSION							
ON/OFF							

### Ref.

#### Code

## CD

## **EYCD**

Recess wall-mounted speed selector



#### **Features**

- Recess mounted
- 503 cassette included
- Suitable for 2-pipe systems units
- Manual switchover of 3 fan speeds
- Possible combination with minimum thermostat for enabling of ventilation
- Dimensions: 82x115x56 mm

FAN COILS								
ESTRO	FLAT	FLAT S						
DUCTABLE UNITS								
DUCTIMAX	PWN	UTN <sup>1</sup>						
	MOTOR DRIVE							
	ON / OFF							

1 Starting from size 30 it is necessary to use the UYIPM circuit board

#### Ref.

## Code

## CDE

## **EYCDE**

Wall-mounted speed selector

#### **Features**

- Wall mounted
- Suitable for 2-pipe systems units
- Manual switchover of 3 fan speeds
- ON / OFF switch
- Possible combination with minimum thermostat for enabling of ventilation
- Dimensions: 74x74x24 mm

FAN COILS								
ESTRO	FLAT	FLAT S						
DUCTABLE UNITS								
DUCTIMAX	PWN	UTN <sup>1</sup>						
	MOTOR DRIVE							
	ON / OFF							

1 Starting from size 30 it is necessary to use the UYIPM circuit board



## **CONTROL SYSTEMS FOR HYDRONIC INDOOR UNITS**

Ref. Code

TB EYTB

Thermostat and on-board switch



#### **Features**

- · Installation on the fan coil unit
- Suitable for 2-pipe systems units
- · Manual switchover of 3 fan speeds plus turn-off
- Air-based thermostatation
- Possible combination with minimum thermostat for enabling of ventilation \*
- ON/OFF valve opening and closing control \*

FAN COILS
ESTRO
VERSION
FL/FA/CL <sup>1</sup> /FU <sup>2</sup> /FB
MOTOR DRIVE
ON / OFF

- 1 EYTB-C Code
- 2 If the fan coil is wall mounted only
- + Alternative functionalities

Ref. Code

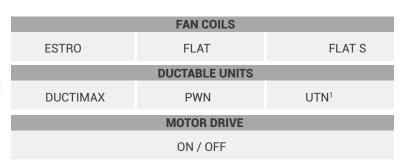
TDC

## **EYTDC**

Wall-mounted control with speed selector and thermostat



- Wall mounted
- Suitable for 2-pipe systems units
- Manual switchover of 3 fan speeds
- ON / OFF switch
- Air-based thermostatation
- Possible combination with minimum thermostat for enabling of water-based ventilation
- Dimensions: 127.25x74.5x24.75 mm



1 Starting from size 30 it is necessary to use the UYIPM circuit board



## **ELECTROMECHANICAL CONTROLLERS**

## Ref.

#### Code

## TD

## **EYTD**

Wall-mounted speed selector, thermostat and summer/ winter selecting switch



#### **Features:**

- Wall mounted
- Suitable for 2-pipe systems units
- Manual switchover of 3 fan speeds
- ON/OFF button
- Air-based thermostatation
- Possible combination with minimum thermostat for enabling of ventilation
- Summer/Winter with dedicated button
- Dimensions: 127.25x74.5x24.75 mm

FAN COILS							
ESTRO	FLAT	FLAT S					
DUCTABLE UNITS							
DUCTIMAX	PWN	UTN <sup>1</sup>					
MOTOR DRIVE							
	ON / OFF						

1 Starting from size 30 it is necessary to use the UYIPM circuit board

#### Ref.

### Code

TIB

## **EYTIB**

FYTIB 1

On-board thermostat speed and summer/winter selecting switch



- · Installation on the fan coil unit
- Suitable for 2-pipe systems units
- · Manual switchover of 3 fan speeds plus turn-off
- · Air-based thermostatation
- Possible combination with minimum thermostat for enabling of ventilation \*
- Summer/winter with dedicated button
- ON/OFF valve opening and closing control \*

FAN COILS								
ESTRO	FLAT	FLAT S						
VERSION								
FL/FA/CL <sup>2</sup> /FU <sup>3</sup> /FB	L/U³	-						

## MOTOR DRIVE

ON / OFF

- 1 Code referred to FLAT and FLAT S series
- 2 EYTB-C Code
- 3 If the fan coil is wall mounted only
- + Alternative functionalities



## **CONTROL SYSTEMS FOR HYDRONIC INDOOR UNITS**

## Ref. Code

## TD4T

## EYTD4T

Wall-mounted speed selector, thermostat and summer/ winter selecting switch, valve and fan speed control.



#### Features:

- · Wall mounted
- Suitable for 2-pipe and 4-pipe systems units
- Manual switchover of 3 fan speeds
- ON/OFF button
- · Air-based thermostatation
- Summer/winter with dedicated button
- ON/OFF opening and closing control of one or two valves
- Dimensions: 127.25x74.5x24.75 mm

	FAN COILS										
	ESTRO	FLAT		FLAT S		IWC					
ĺ	DUCTABLE UNITS										
	DUCTIMA	DUCTIMAX PW				UTN <sup>1</sup>					
	MOTOR DRIVE										
			ON /	OFF							

1 Starting from size 30 it is necessary to use the UYIPM circuit board

Ref. Code

TA

**EYTA** 

**AYTA** 

Wall-mounted room thermostat



- Wall mounted
- Suitable for 2-pipe systems units
- Air-based thermostatation
- Possible combination with minimum thermostat for enabling of ventilation
- ON/OFF valve opening and closing control
- Dimensions: 74x74x24 mm

FAN HEATERS	FAN COIL UNITS				
ESTRO	AREO				
VERSION					
FL/FA/CL/FU/FP/FB/FC/FF/FBC	P/H/S/L				
MOTOR DRIVE					
ON / OFF					

### Ref. Code

TA2 EYTA2

AYTA2

Room thermostat with summer/winter selecting switch, wall mounting



#### **Features:**

- · Wall mounted
- Suitable for 2-pipe systems units
- Air-based thermostatation
- Summer/winter with dedicated button
- Possible combination with minimum thermostat for enabling of ventilation
- ON/OFF valve opening and closing control
- Dimensions: 74x74x24 mm

FAN HEATERS	FAN COIL UNITS					
ESTRO	AREO					
VERS	ION					
FL/FA/CL/FU/FP/FB/FC/FF/FBC	С					
MOTOR DRIVE						
ON / OFF						

## Ref. Code

RVM3

## AYRVM3<sup>1</sup>

Manual power regulator for single-phase power supply fan heaters



- Wall mounted
- Fan speed switching
- Indication of the operating limit in summertime mode
- Dimensions: 82x82x38 mm

	FAN HEATERS				
	AREO				
	VERSION				
	P/H/S/L/C <sup>2</sup>				
MOTOR DRIVE					
	ON / OFF				

- 1 Control available for single-phase power supply fan heaters only
- 2 Supplied as a standard feature on C model





A Galletti

#### Ref.

#### Code

### TED2T

## EYTED2T

Electronic control for the control of the asynchronous fan and an ON/OFF 230 V valve

## **Features:**

- On-board installation or wall mounted<sup>1</sup>
- Suitable for 2-pipe systems units
- Air-based thermostatation
- Manual switchover of 3 fan speeds
- Possible connection to a remote air sensor
- · Possible connection to a NTC water sensor
- ON/OFF button
- Summer/winter with dedicated button
- ON/OFF valve opening and closing control
- Dimensions: 125x75x32 mm
- To facilitate the installation it is possible to use a 503 horizontal box

FAN COILS						
ESTRO	FLAT S					
	DUCTABLE UNITS					
DUCTIMAX	DUCTIMAX PWN					
MOTOR DRIVE						
ON / OFF						

<sup>1</sup> On-board installation only on ESTRO (version FL, FA, FU-wall mounting, FB) after coupling to the kit for installation on board the unit, EYTEDKBLDX (FL, FU, FB to the right); EYTEDKBLSX (FL, FU, FB to the left); EYTEDKBA (FA) or on FLAT (version L, U-wall mounting) and FLAT S, after coupling to the kit for installation on board the unit, FYTEDKBF

#### Ref.

#### Code

## TED4T

## EYTED4T

Electronic control for the control of the asynchronous fan and two ON/OFF 230 V valves



- On-board installation or wall mounted<sup>1</sup>
- Suitable for 4-pipe systems units
- Air-based thermostatation
- Manual switchover of 3 fan speeds
- Possible connection to a remote air sensor
- · Possible connection to a NTC water sensor
- ON / OFF switch
- Summer/winter with dedicated button or air-based
- · Opening and closing control of two ON/OFF valves
- Dimensions: 125x75x32 mm
- To facilitate the installation it is possible to use a 503 horizontal box

	•					
FAN COILS						
ESTRO FLAT FLAT S						
DUCTABLE UNITS						
DUCTIMAX	PWN	UTN				
MOTOR DRIVE						
ON / OFF						

10n-board installation only on ESTRO (version FL, FA, FU-wall mounting, FB) after coupling to the kit for installation on board the unit, EYTEDKBLDX (FL, FU, FB to the right); EYTEDKBLSX (FL, FU, FB to the left); EYTEDKBA (FA) or on FLAT (version L, U-wall mounting) and FLAT S, after coupling to the kit for installation on board the unit, FYTEDKBF



Ref.

Code

TED10

## EYTED10

Electronic control for the control of the BLDC inverter fan and one or two ON/OFF 230 V valves



#### **Features:**

- On-board installation or wall mounted<sup>1</sup>
- Suitable for 2-or 4-pipe systems units
- Control of inverter units by a 0-10 V signal
- Air-based thermostatation
- · Automatic fan speed switching
- Possible connection to a remote air sensor
- · Possible connection to a NTC water sensor
- ON/OFF button
- Summer/winter with dedicated button or air-based
- ON/OFF opening and closing control of one or two valves
- Dimensions: 125x75x32 mm
- To facilitate the installation it is possible to use a 503 horizontal hox

	DUCTABLE UNITS						
ESTRO	FLAT S ART-U			DUCTIMAX	PWN	UTN	
MOTOR DRIVE							
INVERTER - GT	INVERTER						

10n-board installation only on ESTRO (version FL, FA, FU-wall mounting, FB) after coupling to the kit for installation on board the unit, EYTEDKBLDX (version FL, FU, FB to the right); EYTEDKBLSX (version FL, FU, FB to the left); EYTEDKBA (version FA), FLAT (version L, U-wall mounting) and FLAT S, after coupling to the kit on board the unit, FYTEDKBF, on ART-U after coupling to the kit for installation on board the unit, EYKBEVS



Code

#### Ref.

## EVO

## EYEVOBOARD EYEVODISP1

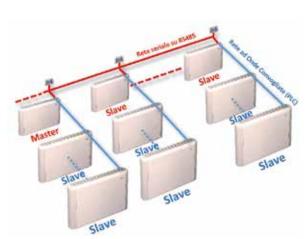
# User interface with EVO Clock display and 230 V circuit board

EVO encompasses the best of Galletti adjustment with regard to hydronic indoor units. Its advanced technology makes it possible to establish control networks for automatic and smart management of the system's indoor units.

The RS485 serial port and power-line communication (PLC) allow the creation of very extensive networks. Thanks to the numerous digital outputs and inputs present on EVO, it is possible to develop synergetic solutions with other system components.



- Low voltage LCD display back lit
- · Wall-mounted display, on-board power unit
- · Suitable for 2-or 4-pipe systems units
- Control of inverter units by a 0-10 V signal
- · Advanced adjustment logics:
- Manual switchover of 3 or 4 fan speeds
- Air-based thermostatation
- · Automatic fan speed switching
- · Possible connection to a remote NTC air sensor
- Possible connection to one or two NTC water sensor
- Possible connection to a humidity sensor
- Relative humidity advanced control
- Advanced time programming
- ON/OFF opening and closing control of one or two valves
- Control of one or two modulating valves
- Control of back-up heating element<sup>2</sup>
- Air-based or water-based local summer/winter changeover
- Presence of digital inputs
- Presence of digital outputs
- Completely configurable digital output
- · Economy function:
- · Minimum temperature controller
- RS485 serial port for Modbus RTU communication<sup>©</sup>
- Power line communication (PLC)
- · Setting up of Master/Slave networks
- Setting up of Small networks
- Setting up of mixed networks
- Dimensions: 120x72.5x22.3 mm
- To facilitate the installation it is possible to use a 503 horizontal box



FAN COIL UNITS					DUCTABLE UNITS			FAN HEATERS	
ESTRO	FLAT	FLAT S	ART-U <sup>3</sup>	2X1	IWC	DUCTIMAX	PWN	UTN <sup>4</sup>	AREO
MOTOR DRIVE									
ON/OFF-INVERTER-GT	ON/OFF-	-INVERTER	INVERTER	ON/OFF-INVERTER					

- 1 Referred to display and power units respectively
- 2 After installation of the water sensor
- 3 It is possible to install the on-board display after coupling to the EYKBEVS installation kit
- 4 Starting from size 30 it is necessary to use the UYIPM circuit board

#### Ref.

#### Code

## MYCOMFORT LARGE

## **EYMCLE**

## Electronic controllers with display - Large model



The Large version is the most complete product offering of the three different versions available for the MyComfort series control panels. Thanks to the backlit LCD display and the convenient keypad, the user can immediately access the main environmental and regulation parameters (temperature, set-point, relative humidity, and timing schedules). This control is equipped with digital inputs and outputs that make it

possible to extend the regulation range well beyond the individual fan coil unit.

- LCD display back lit
- Wall mounted
- Installation on the fan coil1
- Suitable for 2-or 4-pipe systems units
- Control of inverter units by a 0-10 V signal
- Manual switchover of 3 or 4 fan speeds
- Air-based thermostatation
- Automatic fan speed switching
- Possible connection to a remote NTC air sensor
- Possible connection to a NTC water sensor
- Humidity sensor included, possibility of remote control
- Activation of dehumidification cycle
- Advanced time programming
- ON/OFF opening and closing control of one or two valves
- Control of a modulating valve
- Control of back-up heating element<sup>2</sup>
- Air-based or water-based local summer/winter changeover
- Presence of digital inputs
- Presence of digital outputs
- **Economy function:**
- Minimum temperature controller
- RS485 serial port for Modbus RTU communication®
- Setting up of Master/Slave networks
- To facilitate the installation it is possible to use a 503 vertical box



FAN COIL UNITS					DUCTABLE UNITS			FAN HEATERS	
ESTRO	FLAT	FLAT S	ART-U	2X1	IWC	DUCTIMAX	PWN	UTN <sup>3</sup>	AREO
MOTOR DRIVE									
ON/OFF-INVERTER-GT	ON/OFF-	-INVERTER	INVERTER	ON/OFF-INVERTER					

<sup>1</sup> Only on ESTRO (version FL, FU-wall mounting, FB) after coupling to the kit for installation on board the unit, EYKBESTE, or on FLAT (version L, U-wall mounting) and FLAT S, after coupling to the kit for installation on board the unit, FYKBFLAE, or on 2x1, after coupling to the kit for installation on board the unit,

<sup>2</sup> After installation of the water sensor

<sup>3</sup> Starting from size 30 it is necessary to use the UYIPM circuit board

#### Ref. Code

## **BASE MYCOMFORT**

## **EYMCBE**

Electronic controller with display - Base model

### **Features:**

- LCD Display
- Wall mounted
- Installation on the fan coil1
- Suitable for 2-or 4-pipe systems units
- Manual switchover of 3 or 4 fan speeds
- Air-based thermostatation
- Automatic fan speed switching
- Possible connection to a remote NTC air sensor
- Possible connection to a NTC water sensor
- ON/OFF opening and closing control of one or two valves
- Control of back-up heating element<sup>2</sup>
- Air-based or water-based local summer/winter changeover
- Presence of digital inputs
- Economy function:
- Minimum temperature controller
- To facilitate the installation it is possible to use a 503 vertical box

FAN COILS							
ESTRO	FLAT		FLAT S		2X1	IWC	
	DUCTABLE UNITS						
DUCTIMAX	DUCTIMAX PWN UTN <sup>3</sup>						
			FAN HEATERS				
	AREO						
MOTOR DRIVE							
ON / OFF							

#### Ref. Code

## **EYMCME**

Electronic controllers with display - Medium model

- LCD Display
- Wall mounted
- Installation on the fan coil1
- Suitable for 2-or 4-pipe systems units Manual switchover of 3 or 4 fan speeds Air-based thermostatation

- Automatic fan speed switching Possible connection to a remote NTC air sensor Possible connection to a NTC water sensor
- Humidity sensor included, possibility of remote control Humidity sensor included, possibility of remote control Activation of dehumidification cycle

- Opening and closing control of one or two ON/OFF valves Control of back-up heating element<sup>2</sup> Air-based or water-based local summer/winter changeover
- Presence of digital inputs
- Economy function:
- Minimum temperature controller

- RS485 serial port for Modbus RTU communication® Setting up of Master/Slave networks To facilitate the installation it is possible to use a 503 vertical box

10 100		To tale made the modellation it to product to do a doc vortical box					
		FAN COILS					
ESTRO	FLAT	FLAT S	2X1	IWC			
	D	UCTABLE UNIT	rs				
DUCTIMAX	DUCTIMAX PWN UTN <sup>3</sup>						
		<b>FAN HEATERS</b>					
		AREO					
MOTOR DRIVE							
ON / OFF							



- 1 Only on ESTRO (version FL, FU-wall mounting, FB) after coupling to the kit for installation on board the unit, EYKBESTE, or on FLAT (version L, U-wall mounting) and FLAT S, after coupling to the kit for installation on board the unit, FYKBFLAE, or on 2x1, after coupling to the kit for installation on board the unit, EYKB2X1E 2 After installation of the water sensor
- 3 Starting from size 30 it is necessary to use the UYIPM circuit board

### Ref. Code

## **LED503**

## EYLED503<sup>1</sup>

Recess wall-mounted electronic controller with display



- 1 The plate codes in conjunction with the controller are respectively. EYCOB black / EYCOG grey / EYCOW white
- 2 Only on ESTRO (version FL, FU-wall mounting, FB) after coupling to the kit for installation on board the unit, EYKL
- 3 After installation of the water sensor
- 4 Starting from size 30 it is necessary to use the UYIPM circuit board
- + Alternative functionalities

	ITI		

- LCD Display
- Recess mounted with 503 cassette
- Installation on the fan coil2
- Suitable for 2-or 4-pipe systems units+
- Manual switchover of 3 or 4 fan speeds \*
- · Air-based thermostatation
- Automatic fan speed switching
- Possible connection to a remote NTC air sensor
- Possible connection to a NTC water sensor
- Opening and closing control of one or two ON/OFF valves<sup>+</sup>
- Control of back-up heating element 3+
- Air-based or water-based local summer/winter changeover
- Presence of digital inputs
- Minimum temperature controller
- Dimensions: 114x69x48 mm

FAN COILS							
ESTRO	FLAT	FLAT S	IWC				
	DUCTABLE UNITS						
DUCTIMAX	PWN	I	UTN⁴				
MOTOR DRIVE							
ON / OFF							

## Ref. Code

## **WALLPAD**

## SKAWP000000

Wall-mounted cable control



- LCD Display
- Wall mounted
- Suitable for 2-pipe systems units
- · Management of units with BLDC motor
- Manual switchover of 3 fan speeds (settable)
- · Automatic fan speed switching
- Ventilation function
- · Activation of dehumidification cycles
- Time programming
- Sleep function
- Air outlet flap sweep
- Up to a max. 32 units can be connected to Master/Slave networks
- Control mode of all units or a single unit
- IR receiver for portable remote control
- Dimensions: 120x88x20 mm

FAN COILS		
FM		
1 141		
MOTOR DRIVE		
MOTOR DRIVE		
INVFRTFR		
IIIVLNILN		

# CONTROL SYSTEMS FOR HYDRONIC INDOOR UNITS CONTROLS

## REMOTE CONTROL FOR HIGH WALL-MOUNTED FAN COIL UNITS

Always supplied together with the FM series fan coil units



Remote control for high wall-mounted fan coil units

#### Features:

- Mini LCD Display
- · IR communication
- Suitable for 2-pipe systems units
- Management of units with BLDC motor
- Manual switchover of 3 fan speeds (settable)
- · Ventilation function
- Automatic fan speed switching
- Activation of dehumidification cycles
- Timer for unit on programming
- Sleep function

## REMOTE CONTROL FOR CASSETTE MOUNTED FAN COIL UNITS

IWC

IWCi

Always supplied together with the version equipped with IR receiver

SATWC000TI0



Remote controls for IWC cassette mounted fan coil units

#### **Features:**

- Mini LCD Display
- IR communication
- Suitable for 2-or 4-pipe systems units
- · Air-based thermostatation
- · Integrated air sensor
- Management of units with BLDC motor<sup>2</sup>
- Manual switchover of 3 fan speeds (settable)<sup>1</sup>
- · Automatic fan speed switching
- · Ventilation function
- Dehumidification Function
- Night function<sup>1</sup>
- ECO and High Power function<sup>2</sup>
- Timer for unit on programming
- Flap handling
- Possible transformation to wired<sup>2</sup> control

#### **FAN COILS**

IWC

#### MOTOR DRIVE

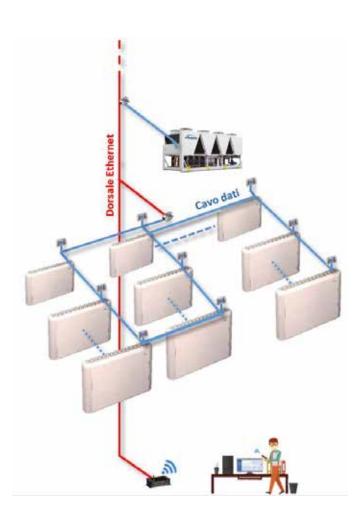
ON/OFF - INVERTER

1 Available functions in the version with ON/OFF motor

2 Available functions in the version with BLDC motor

## **ERGO WEB**





## Online supervision system

ERGO Web is a Web-Server monitoring system that allows you to supervise and oversee an entire system comprised of a large number of indoor units and one or more heat pumps. The information can be accessed remotely via any interface connected to the LAN network of the monitored structure and is, therefore, accessible via wireless from: tablets, smartphones, and personal computers.

The system is equipped with a built-in processor and does not require any dedicated support or installation of applications in the interfaces used.

ERGO Web makes it possible to monitor all Galletti indoor units and heat pumps, in addition to guaranteeing the scheduled on and off function of additional equipment present in the system (circulators, zone valves, etc.).

The time periods can be set in an intuitive and customizable way for each zone created.

- Web-server system that can be consulted by multiple devices
- · No need for installation of applications
- · Expandable system for large structures
- · Zone hierarchical control
- Chiller/heat pump monitoring
- Access to supervision advanced functions
- Advanced time programming
- · Customizable degree of control
- Calculation of the comfort index
- · Set-point correction by adaptive function
- · Creation of graphs of the main operating parameters
- Management of external devices of the system
- Self-adaptive responsive interface
- Remote access system
- · Robust and scalable network architecture
- Communication via Modbus RTU protocol<sup>®</sup>

## **ERGO**



### Supervision system

ERGO is intended specifically for hotels, administrative centers, offices, and apartment buildings and offers a control strategy that adapts the chiller and indoor units' operation to the actual thermal load requirements, guaranteeing:

- Energy savings in the production of chilled water
- A reduction in operating costs
- Centralised control over the system
- · Advanced system monitoring capabilities

### **Comfort index and adaptive function:**

These two features are integrated with the software: the first is an indication of the ability to maintain ideal conditions within a defined band around the (local or system) set-point.

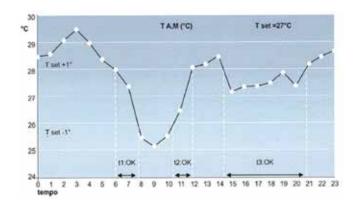
The second serves to correct the heat pump set point (in both the cooling and heating modes) based on the actual thermal load conditions in which the indoor units are required to work. The correction allows an increase in unit efficiency, and is a simultaneous function of the providing working aread of the

simultaneous function of the prevailing working speed of the indoor units, the calculated comfort index, and the average switch-on time of the units.

- Software that can be integrated into a Windows operating system
- Communication via Modbus RTU protocol<sup>®</sup>
- · Control of 126 rooms, 16 zones
- · Chiller/heat pump monitoring status
- · Access to supervision advanced functions
- Advanced time programming
- · Customizable degree of control
- Calculation of the comfort index
- · Set-point correction by adaptive function
- Creation of graphs of the main operating parameters
- · Management of external devices of the system







## **ERGO LIGHT**



### Zone control for fan coils and heat pumps

ERGO LIGHT takes advantage of a modern and attractive interface as a base for easy, integrated, and effective monitoring of the indoor units/system connection system.

The product development approach was geared toward providing ease of configuration and use in maintaining the typical features of a monitoring system.

The hardware, consisting of a touch screen display, leverages new technologies to make the installation suitable for all types of environments. The software, which is already integrated into the product, allows immediate consultation of the information regarding the operation of every single controlled unit, allowing rapid correction and exploiting the logics implemented in order to maximize energy savings.

- 7" touch screen display
- Communication via Modbus RTU protocol<sup>®</sup>
- 10 controlled points + heat pump
- Management of multifunctional unit
- Management of a single unit
- · Centralised controller
- · Can be interfaced with all indoor units controlled by EVO
- · Enabling advanced functions on individual controls
- Ease of installation/use











## CONTROL SYSTEMS FOR HYDRONIC INDOOR UNITS

## Star/Delta switches for three-phase fan heaters



Ref.	Code	Description
CST	AYCST	Delta/star selector for installation in electric panels
CSTP	AYCSTP	Delta/star selector for wall mounting

## **Spacer for wall mounting**



Ref.	Code	Description
DIST	EYDIST	Spacer for wall mounting of controllers of the MyComfort series

## **On-board installation kit for fan coil units**



## **LED 503 control plates** Ref. Code **Description** COB Plate for LED503 - RAL9005 black **EYCOB** COG **EYCOG** Plate for LED503 - RAL7031 grey COW **EYCOW** Plate for LED503 - RAL9003 white Interface for ON/OFF parallel connection fan coils Ref. Code **Description** ΚP **EYKP** Power interface for connecting in parallel up to •000000000000000000 4 fan coils in 3-speed version •----Board for connection to the controls of UTN units Ref. **Description** Code IPM Circuit board for connecting UTN 30-30A-40-**UYIPM** 40A to the control panels •----**Minimum temperature thermostat** Ref. Code **Description** TC **EYTC** Electromechanical thermostat for minimum water temperature in heating mode (42°C) **Water probes** Code **Description** Ref. **MCSWE EYMCSWE** Remote air or water sensor for EVO, MyComfort and LED503 controller **TEDSWA EYTEDSWA** Remote air or water sensor for TED controller **Humidity sensor** Ref. Code **Description** Humidity sensor for EVO, MyComfort - Medium **MCSUE EYMCSUE** and Large controllers

#### **OPERATION PRINCIPLE**

The technology that allows the controls to receive information, process data, and issue instructions with regard to the control action can be based on principles of various type and effectiveness. The main breakdown by type is as follows:

**ELECTROMECHANICAL CONTROLS:** are control systems in which mechanical properties of materials are exploited in synergy with electrical circuits with different architectures. A trivial example consists of bimetal thermostats, in which two sheets of different materials are placed in contact in order to exploit the different coefficients of expansion for powering or opening an electrical circuit.

The user's settings are usually given by means of buttons and knobs that directly operate mechanically by altering the circuits inside the control.

**ELECTRONIC CONTROLS:** are control systems equipped with an electronic microprocessor. Generally, the regulation logics are placed on the control by means of specific software, and this is why regulation can be more complex and precise than with electromechanical controls. Configuration is carried out by entering operating parameters established by the user, which modify the calculation and processes performed by the control system. They are sometimes equipped with digital inputs and outputs capable of receiving and issuing instructions to other devices, as well as being able to be interconnected with centralized control systems.

**ELECTRONIC CONTROLS WITH DISPLAY**: are control systems with characteristics similar to those above, with the addition of an LCD display that shows the operating parameters and simplifies the entry and modification of operating procedures.

#### LEVEL OF CONTROL

Depending on the complexity of the control, it is possible to classify the control systems according to the following hierarchy:

**LOCAL MONITORING:** the simplest control systems can generally manage the regulation of a single fan coil unit, varying its fan speed and operating any associated valves. In this manner the degree of control is limited to the individual unit and to the climatic conditions of the room in which it is located.

**ZONE MONITORING:** if the control system for individual points is equipped with serial output ports capable of transmitting information to other units, it is possible to send information to a control system of a higher hierarchical rank that can process the received inputs, make them available for consultation, and issue instructions for individual zone controls. Examples of this type are power-line communication (PLC) networks or small master-slave systems.

SYSTEM MONITORING: if multiple local or zone control systems send information to a centralized monitoring system, the entire system can be controlled and managed from a single remote point. This gives an overview of the air conditioning system's performance, with the possibility of recording the historical trend of the data and obtaining information capable of improving the energy efficiency of the building being monitored. Generally the monitoring system consists of software that allows easy consultation of the system at its various hierarchical levels and guarantees the issuing of instructions that affect the overall regulation of the system. Different degrees of freedom may be allowed at the zone or localized management level. The hardware used by these systems sometimes allows the use of

advanced technologies such as wireless data transmission or the use of touch screen displays. Also the generation system (heat pump, boiler, etc.) and other equipment related to the system (circulation pumps, three-way valves, etc.) can be managed by the most advanced monitoring systems.

#### TYPES OF INSTALLATION

The installation of controls on the individual fan coil units can be carried out in different ways:

**ON-BOARD INSTALLATION:** the control is placed directly on one side of the fan coil unit, in a position that can be easily reached by means of the fan coil unit's side hatches. This type of installation generally involves the purchase of a specific installation kit that includes mounting brackets and the sensor to be attached to the fan coil unit's air intake to correctly measure the ambient temperature. It is not possible to use this type of installation in the case of recessed fan coil units, ceiling mounted units, or cassette indoor units.

**WALL MOUNTING:** the control is fastened to the wall, either near or away from the fan coil unit being controlled. In this case it is necessary to provide a cable connection between the fan unit, the control valves, and the regulation system itself. This installation has the advantage of using the sensor that is already on the control in the case of electronic regulation.

**RECESSED INSTALLATION:** the control is recessed in the wall (made of masonry or plasterboard), the cables between the control and the fan coil unit are walled, and a plate is placed in such a way as to frame the display.

#### SYSTEM

The architecture of a hydronic system for the air conditioning of a building can generally be realized in two ways, which affect the type of fan coil unit used and consequently the control assigned to it:

**TWO-PIPE SYSTEM**: the name derives from the number of pipes serving the hydronic indoor unit, represented in this case only by the delivery and return line of the heat transfer fluid. The fan coil unit is equipped with a single finned coil, through which flows alternatively hot or cold fluid depending on the season. A single shut-off valve is, therefore, able to isolate the coil when ventilation is blocked, and the control must be able to manage its opening and closing.

**FOUR-PIPE SYSTEM**: is a type of system adopted especially in those buildings where it is expected to have to simultaneously handle thermal and refrigeration loads located in different areas, especially during spring and autumn. The fan coil unit is equipped with two finned coils: one is dedicated to cold fluid and the other to hot fluid. Two valves are used for shutting off the water entering the unit, and the control for the unit must be able to manage them alternatively. In some applications it is possible to switch between summer and winter operation according to the ambient temperature, which is an additional feature for the control system.

#### **FAN SPEED**

The fan unit of the fan coil units is comprised of the coupling between an electric motor and a fan (centrifugal, tangential, radial, etc.). According to the technological level of the electric motor, the control system must be suitable for the management of the different fan speeds available, depending on the load of the air-conditioned environment:

## **GUIDE TO THE HYDRONIC INDOOR UNITS' CONTROLS**

**MULTI-SPEED ASYNCHRONOUS MOTORS:** is the simplest and most economical technology, which allows a variation of the "step" fan speed. Depending on the versions, there are motors with one, three, four, six, or more speeds that can be set. The control system serving the fan coil unit must, therefore, be suitable and set to switch between the available speeds. Some control systems are equipped with regulation logics that allow an automatic variation of the fan speed according to the difference between the set-point and the ambient temperature.

BLDC MOTORS WITH INVERTER BOARD: the electric motor is the BLDC type, that is, "brushless" and without rotor windings, which have been replaced by permanent magnets. The coupling with a rectifier-inverter unit makes it possible to efficiently vary the fan speed, adapting it to the actual load demand and consequently reducing noise and consumption. The controls set up to control these motors are electronic and must be able to supply a 0-10V analog signal.

#### SENSORS

The control systems for hydronic indoor units can be equipped with sensors capable of detecting the most important data on the basis of which to carry out regulation. Generally some sensors are integrated, as standard, in the control, while others can be added as extensions of the control:

**REMOTE AIR TEMPERATURE SENSOR:** is generally used in the controls placed on the fan coil unit. In this case it is necessary to apply the detector so that it is in contact with the intake flow in order to realize correct temperature control. In the wall-mounted controls serving the four-pipe systems, the additional feature that allows for seasonal change-over between heating and cooling modes based on the measured temperature is sometimes implemented.

WATER TEMPERATURE SENSOR: is a sensor placed in contact with the inlet valve to the coil of the fan coil units. It allows the temperature of the heat transfer fluid entering the unit to be measured, and deactivates ventilation if the water is too cold during the heating phase or too hot during the cooling phase (the latter function is only available in controls with advanced regulation logics, otherwise only the hot water control is supported). Alternatively, the electronic controls can make use of the information regarding the water temperature, to automatically carry out the seasonal change-over between summer and winter.

**WATER CIRCUIT ENABLING THERMOSTAT:** is a thermostat to be placed in contact with the finned coil that has the same function as the previous sensor during winter operation. This is the system used for enabling ventilation for the electromechanical controls.

**HUMIDITY SENSOR:** is used for measuring the relative humidity present in the area to be air conditioned. The most sophisticated electronic control systems are able to force the ventilation of the indoor units by activating dehumidification cycles to reduce the latent heat loads and thus keep the degree of humidity constant.

#### **VALVES**

The heat exchange coil in the indoor units is generally coupled with a valve that is able to block the entry of the heat transfer fluid when the ventilation is deactivated (thus avoiding further exchange by means of natural convection). Different types of valves can be used depending on the application, selecting suitable control systems.

**ON/OFF VALVES:** are the simplest valves, characterized by an actuator that is able to completely block the flow of water inside the coil of the fan coil unit. They can be controlled by means of an electromechanical or electronic control, and versions powered at different voltages are available.

MODULATING VALVES: are valves that are able to gradually regulate the flow of water inside the fan coil unit up to the maximum opening value. Generally, a 0-10V analog signal is sent to the actuator, which corresponds to a proportional degree of opening (therefore, electronic controls are necessary to manage it). Limiting the inflow of water to the coil makes it possible to make a water-based adjustment that is added to the existing adjustment to the fan speed.

#### AIR HANDLING ACCESSORIES

Upon request, additional accessories are available for managing the backup equipment or for sanitizing the air that the fan coil unit discharges into the area to be air conditioned, which can be activated and managed directly by the system that monitors the fan coil unit:

**HEATING ELEMENT:** can be installed inside the fan coil unit as a backup system or as an addition to the finned coil. Management requires an air sensor and an electronic control, as it is necessary to provide ventilation logics to avoid overheating the heating element. If the heating element has a back-up function, a water sensor is also necessary.

**SANITIZING SYSTEMS:** are based on different technologies and are used to sanitize the impurities that may be present in the fan coil unit and the recirculated air in the room. They require an on/ off signal sent according to the fan coil unit's operation: this is why they are generally coupled with electronic control systems.

#### DIGITAL SIGNALS

The electronic controls can be equipped with additional digital inputs and outputs that allow "instructions" to be received remotely or the management of devices external to the controlled fan coil unit. The received or sent signal is open-closed, and the contacts used are voltage-free:

**DIGITAL INPUTS**: may be present in various numbers and have various functions. The digital inputs that are most used send the following to the control: the on/off information (for example, on the basis of the opening or closing of the window in the room), the type of operation (summer or winter), or information on the setting of an alternative set-point.

**DIGITAL OUTPUTS:** may be multiple and may send signals to multiple external devices, such as pumps, valves, sanitizing devices, alarms, chillers, or boilers. Sometimes an individual digital output may be configured to convey the desired information. Examples of information that can be transmitted are

the ON/OFF status of the control, the operating logic (summer/winter), the alarm status, a command to a dehumidifier/humidifier, an enabling signal, based on the water temperature.

#### **ADDITIONAL FEATURES**

Electronic controls can be equipped with additional features:

**TIME PERIODS:** if the control system is equipped with an integrated clock, it is possible to define, in advance, customized time intervals with various operating modes (ON/OFF, set-point, fan speed, etc.). This is useful for automating the operation of fan coil units, for example, when you already know a period of the week when air conditioning is not necessary.

**ECONOMY FUNCTION:** is a function present on some electronic controls that aims to reduce the noise and power consumption of the hydronic indoor unit (for example, during night operation). It consists of a correction to the set set-point and a forcing of the minimum fan speed.

**MINIMUM TEMPERATURE MONITORING:** is a function that prevents the room temperature from falling below a preset value, even when the thermostat is off, by operating the controlled fan coil unit in the heating mode.

#### SERIAL COMMUNICATION

Electronic controls can be interconnected with each other or connected to a hierarchically higher remote control system through serial ports, exchanging information via standard communication protocols, the most widespread of which is Modbus® RTU:

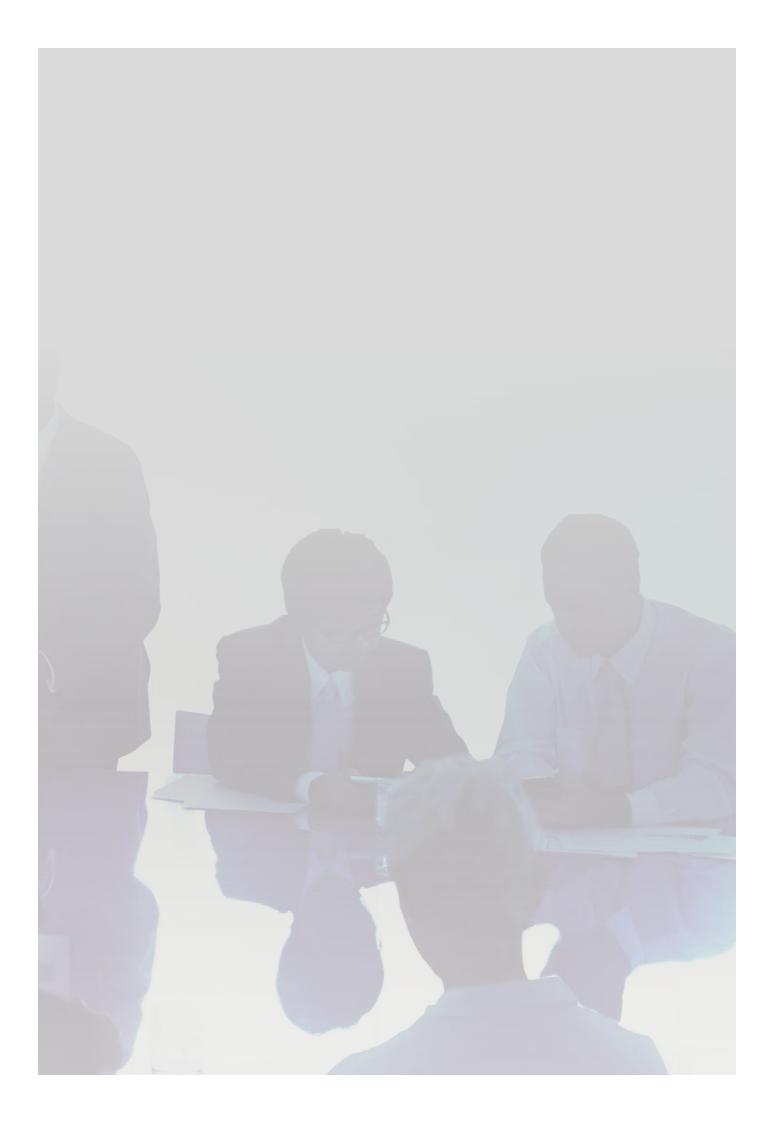
RS485 PORT: the electronic controls can be equipped with an appropriate serial port (basically the support that allows data input/output) capable of enabling the fan coil unit for communication, by means of the Modbus® RTU protocol. In this manner, by means of a suitable communication cable, an individual fan coil unit can be connected to a network of indoor units or to a monitoring system. The wiring required is the "enter/exit" type, according to a linear topology.

**POWER-LINE COMMUNICATION (PLC):** is a type of communication that is achieved by superimposing on the power supply a higher frequency signal that is modulated according to the information to be transmitted. The electronic controls of the fan coil units can be equipped with it together with the RS485 port: in this case the indoor unit with the Master function will be able to exactly replicate the operating status on the Slave units.

MASTER-SLAVE NETWORK: is a type of hierarchical connection for controlling multiple fan coil units generally placed in different rooms, at presumably different load conditions. Generally, a unit designated as the Master sends information about the main operating parameters to the other indoor units, which are called

Slaves. The Slave units are equipped with a defined degree of freedom in relation to the set-point to be maintained and can carry out temperature control independently. The Master unit function can also be carried out by a monitoring system.

MIXED NETWORK: is a network composed of a mix of units connected by means of RS485 with Master-Slave logic and units connected by means of power-line communication (PLC). Generally the first control level concerns fan coil units placed in different rooms that must handle different thermal loads and, therefore, require a certain degree of freedom of regulation. The lower control level, by means of power-line communication, allows the replication of the operating mode of the fan coil units that are located in the same room. This allows the network to be very extensive.







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