FLOWAIR
intelligent air flow

Air curtain-fan heater combo units
ELiS DUO

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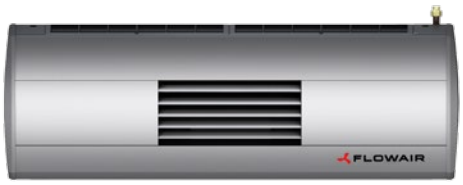
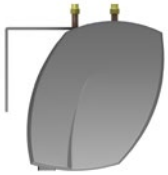


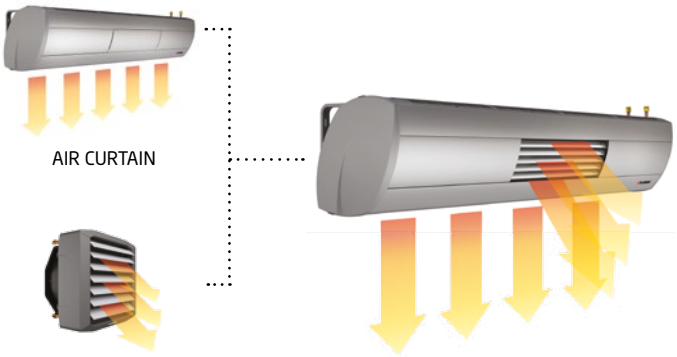
Air curtain-fan heater combo unit ELiS DUO	
Max. range of curtain[1] [m]	2,5
Max. range of heater[2] [m]	8
Heating capacity[3] [kW]	10,1–29
Air flow [m³/h]	1200–3700
Weight [kg]	23,9–41,1
Materials	steel + plastic
Colour	silver (RAL 9006) / white (RAL 9010)

[1] Vertical range of isothermal stream, at 2 m/s velocity limit
[2] Horizontal range of isothermal stream, at 0,5 m/s velocity limit
[3] For DUO W during operation at 3rd step, at inlet air temperature 10°C and water temperature 90/70°C

ELiS DUO is an 2-in-1 unit, designed to operate indoors. It's main task is to protect door opening against heat losses, insects and dust. Additionally, the auxiliary air stream enables heating of the room



ELiS DUO curtains are available in:
- are available in 2 lengths: 1 m, 2 m
- are available in 2 versions:
  - ⊕ – with water heat exchanger (W)
  - ⚡ – with electric heaters (E)
- designed for horizontal installation



DUO-W/E-100

DUO-W/E-200

DESIGNATION OF ELiS DUO CURTAIN-HEATER COMBO UNITS ELiS DUO

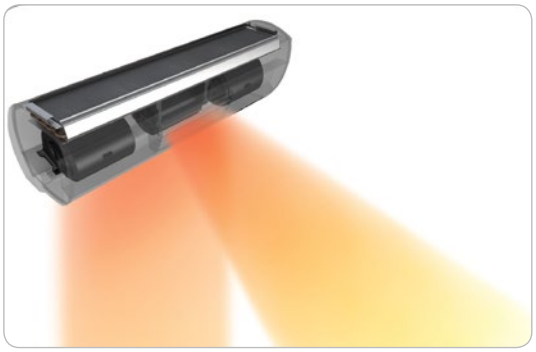
DUO-W-100

1 2 3

1 | DUO – ELiS DUO, range of air curtain 2,5 m

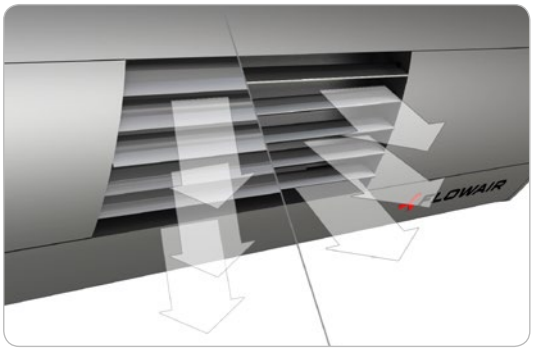
2 | W – curtain with water heat exchanger
E – curtain with electric heaters

3 | 100/200 – length of air outlet



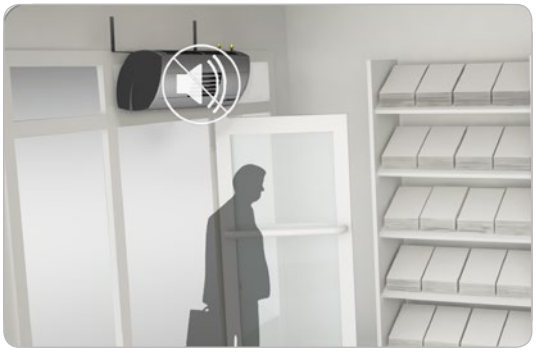
WATER HEAT EXCHANGER

High efficiency of heat exchangers thanks to the large area of aluminium fins set on copper tubes.



ADJUSTABLE AIR STREAM

Air deflectors installed in the outlet of the heater section enable direction of the warm air stream into the occupied area. Variable angle of the air barrier ensures perfect adjustment to the door opening/entrance.



QUIET FANS

Radial fans-characterized by quiet operation and low power consumption are housed in a casing made of light and durable material.

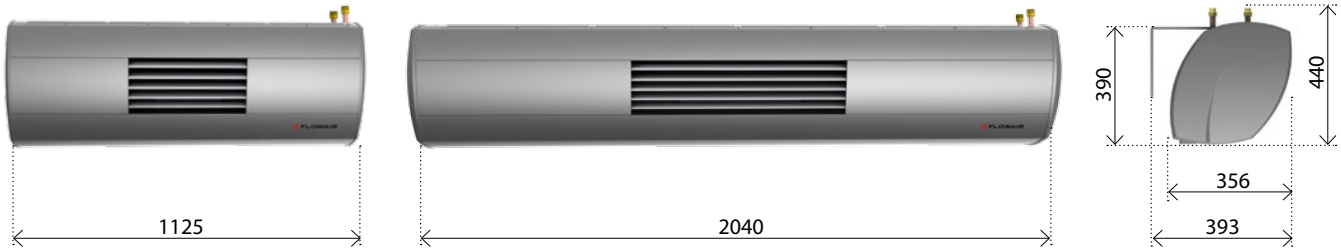
BMS CONTROL SYSTEM

A BMS compatible advanced control system permits chaining and control of the units.

MODERN DESIGN

Modern design of the unit came into existence in cooperation with experienced team of industrial designers.

Dimensions



Technical data

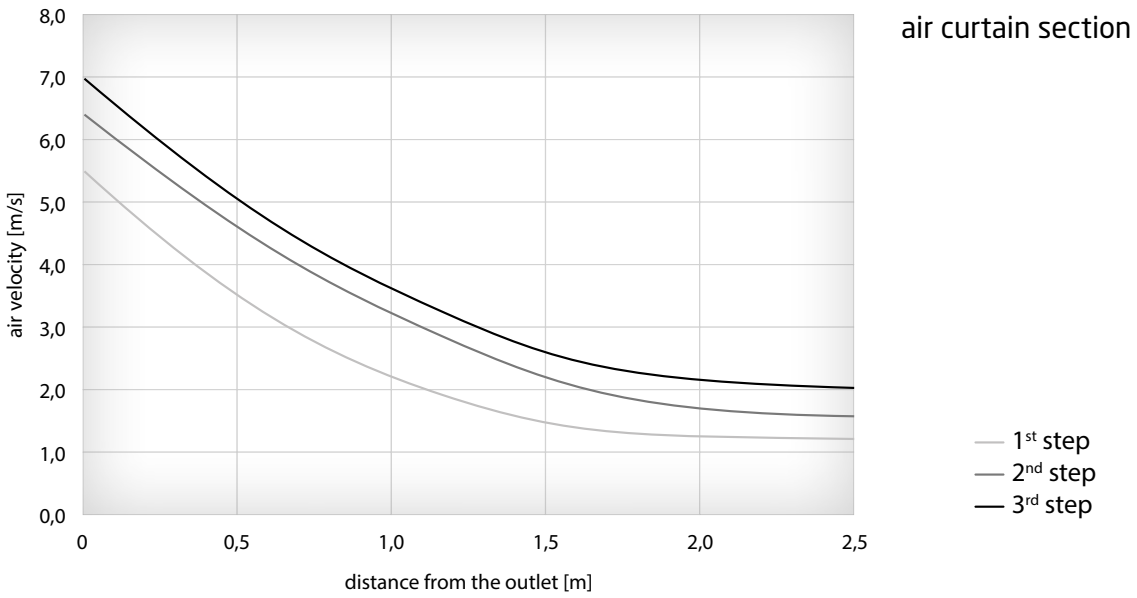
	ELiS DUO-W-100			ELiS DUO-E-100			ELiS DUO-W-200		
Fan	3 x radial with double air inlet, single phase, AC						5 x radial with double air inlet, single phase, AC		
Max. air flow stream of curtain [m³/h]	1400						3000		
Max. air flow stream of heater [m³/h]	700						700		
Power supply [V/Hz]	230/50			3x400/50			230/50		
Max. current consumption [A]	1,1			14,7			1,85		
Max. power consumption [kW]	0,25			10,1			0,43		
IP	21						21		
Max. acoustic pressure level(1) [dB(A)]	53						56		
Max. range of curtain air stream(2) [m]	2,5						2,5		
Max. range of heater air stream(3) [m]	8						8		
Fan setting	I step		II step		III step		I step	II step	III step
Fans revs [1/min]	850		1020		1350		850	1020	1350
Air flow of curtain [m³/h]	800		1100		1400		1700	2250	3000
Current consumption of curtain fans [A]	0,54		0,7		0,72		1,08	1,4	1,44
Power consumption of curtain fans [W]	124		160		168		248	320	341
Air flow of heater [m³/h]	400		550		700		400	550	700
Current consumption of heater fans [A]	0,27		0,35		0,36		0,27	0,35	0,36
Power consumption of heater fans [W]	62		80		84		62	80	84
Air flow of entire unit [m³/h]	1200		1650		2100		2100	2800	3700
Current consumption of all fans [A]	0,81		1,05		1,1		1,35	1,75	1,8
Power consumption of all fans [W]	186		240		252		310	400	425
Acoustic pressure level(1) [dB(A)]	42		46		53		45	49	56
Heat exchanger	Cu–Al, two rows						Cu–Al, two rows		
Curtain heating capacity(4) [kW]	I step	II step	III step	I step	II step	III step	I step	II step	III step
	10,3	12,6	14,7	6,3	6,5	6,8	16,6	19,7	23,2
Heater heating capacity(4) [kW]	I step	II step	III step	I step	II step	III step	I step	II step	III step
	5,2	6,3	7,3	2,9	3,1	3,3	4,1	4.9	5,8
Air temperature rise for curtain (ΔT)(4) [°C]	I step	II step	III step	I step	II step	III step	I step	II step	III step
	37	33	30	23	21	20	29	26	23
Air temperature rise for heater (ΔT)(4) [°C]	I step	II step	III step	I step	II step	III step	I step	II step	III step
	37	33	30	23	21	20	29	26	23
Max. water pressure [MPa]	1,6			–			1,6		
Max. water temperature [°C]	95			–			95		
Connection ["]	½			–			½		
Position of installation	horizontal								
Weight of unit [kg]	23,9			28,5			41,1		
Weight of unit filled with water [kg]	25,3			–			42,8		

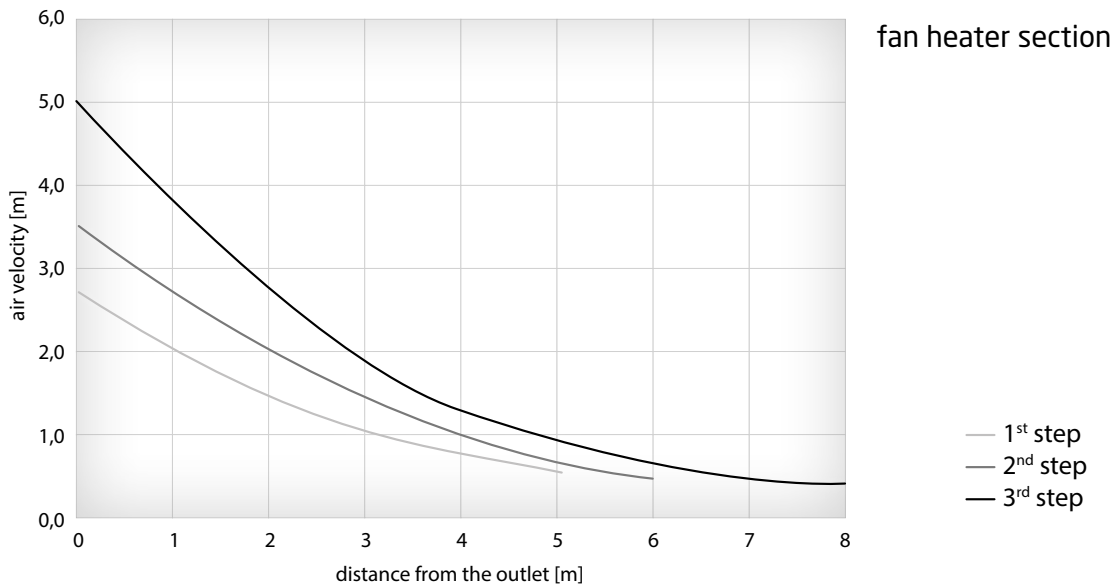
(1) Acoustic pressure level measured in the room with average sound absorption, capacity 500 m³, at distance of 3 m from the unit
(2) Vertical range of isothermal stream, at 2 m/s velocity limit
(3) Horizontal range of isothermal stream, 0,5 m/s velocity limit
(4) For operation at 3rd step, at inlet air temperature 10°C, for DUO-W at inlet/outlet water temperature 90/70°C

Range

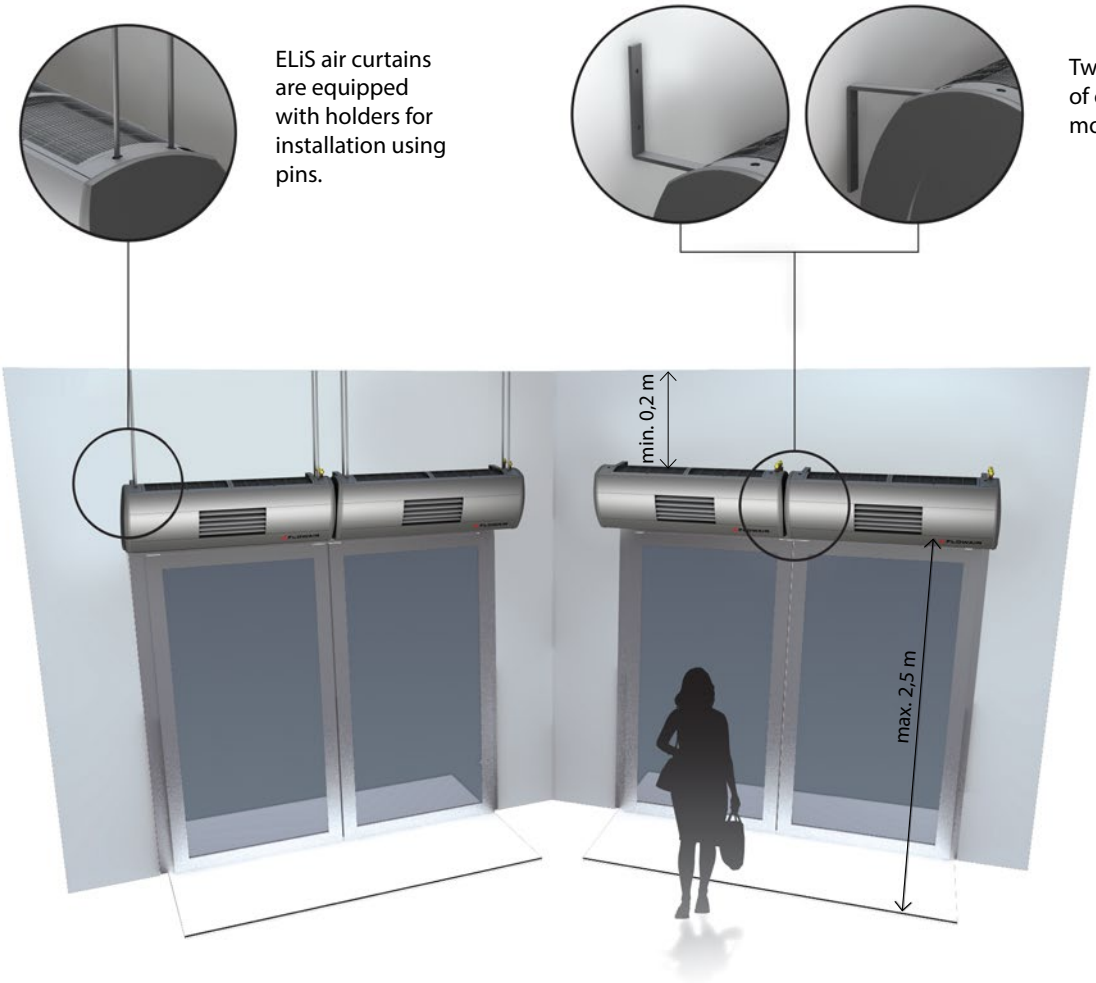
Air curtain range defines the maximum height of installation. For ELiS DUO it is 2,5 m - on this height the fan heater section has an 8 m range.

Nomograms of air flow velocity



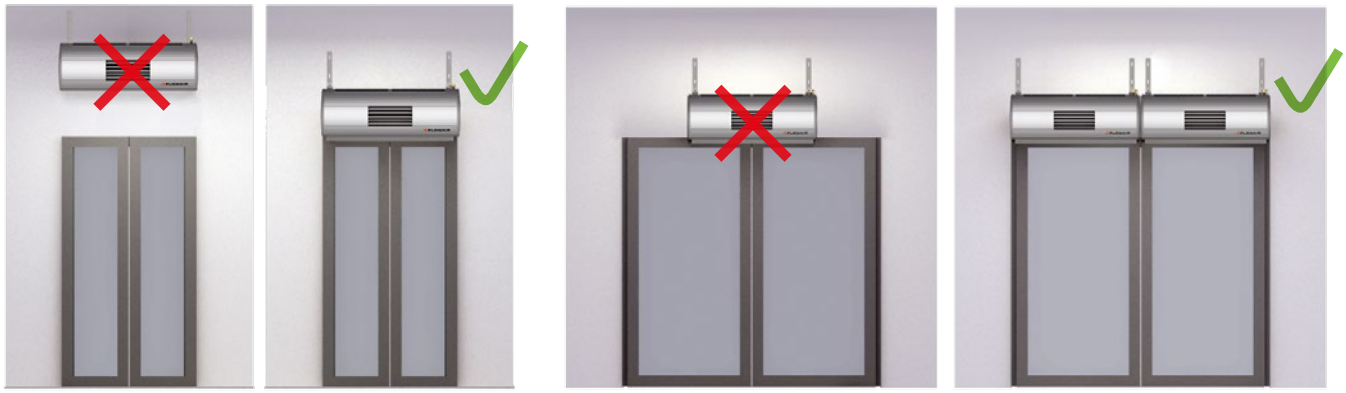


Installation



Correct installation

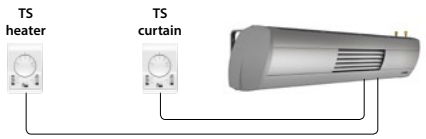
The key to the correct operation of the unit is to ensure an effective air barrier in the entire door opening/entrance area. ELiS DUO curtains are ready for chaining.



Comparison of control systems

	TS control	T-box control
		
Controlling options		
Manual 3-step air flow control	✔	✔
Modes		
Heating / Ventilation	✔	✔
Operation depending on door sensor and temperature	✔	✔
Weekly programmer		✔
BMS	✔	✔
Curtain switch off delay		✔
Idle speed mode		✔
Integration with FLOWAIR SYSTEM		✔
Max. number of connected units		
Via controller	5	31
Type of controller		
TS – 3-step fan speed controller with thermostat	✔	
T-box – intelligent controller with touch screen		✔
Type of fan		
AC – standard 3-step fan	✔	✔

TS control



ELiS DUO air curtain is equipped with control system, which enables you to connect:

- DCm/DCe door sensor,
- TS 3-step fan speed controller with thermostat.

Controller enables choice of 2 operating modes:

- Configuration 1 - curtain operation when overriding signal comes from door sensor as well as from 3-step fan speed controller with thermostat.
- Configuration 2 - curtain operation when overriding signal comes from door sensor, while 3-stem fan speed controller with thermostat is responsible for fan speed control and heating engagement.

CHAINING OF CURTAINS:

Control system enables connection of the units in MASTER-SLAVE configuration and control for up to 5 units via single TS and DC set.

BMS:

The control system can be connected to BMS- intelligent building management system. This solution enables you to save and load operating parameters of the curtain (e.g. fan step).

T-box control

ELiS DUO air curtain is equipped with control system, which enables you to connect:

- DCm/DCe door sensor,
- T-box intelligent controller with touch screen.

Controller enables choice of 2 operating modes:

- Configuration 1 - curtain operation when overriding signal comes from door sensor as well as from T-box controller.
- Configuration 2 - curtain operation when overriding signal comes from door sensor, while T-box is responsible for fan speed control and heating engagement signal.

Additionally, for both configurations it is possible to choose idle speed mode, curtain switch-off delay time and heating signal.

CHAINING OF CURTAINS:

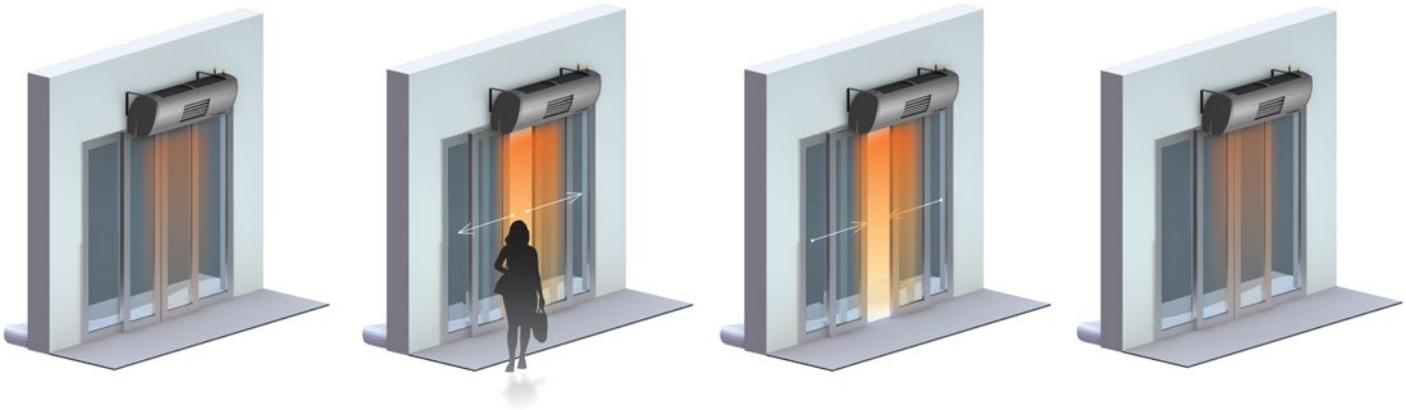
The control system is ready for chaining of the curtains and is able to control up to 31 units via a single T-box controller.

BMS:

The T-box controller can be connected to BMS- intelligent building management system. This solution enables you to control all of the units, which communicate with T-box controller.

Idle speed mode

When the doors are closed, fans are operating with a lower speed. This solution eliminates delay in the air barrier formation, which is caused by the time needed to switch on the fans.



A) Doors are closed – fans operate with a lower speed.

B) Doors are opening – speed of fan is rising.

C) Doors are closing – fans still operate with increased speed.

D) Doors are closed – fan operate with a lower speed again.

Curtain switch off delay time

If the doors in the building keep opening and closing constantly, it is possible to set a switch-off time delay. After closing the doors, curtain is still operating for the set time. If the doors open shortly, there is no need to switch off/on the curtain again. This solution increases reliability of the components and improves the air barrier effectiveness.

A) Doors are closed – fans are stopped.

B) Doors are open – fans operate with speed set on the controller.

C) Doors are closed – fans operate for a delay time set by the user. After that time, curtain may switch off or return to idle speed mode.

D) Doors are closed – fans will switch off after delay time.

BMS programming

Version 1

In the case of controlling the units via T-box controller using one address in BMS it is possible to control up to 31 units independently.

Communication parameters:

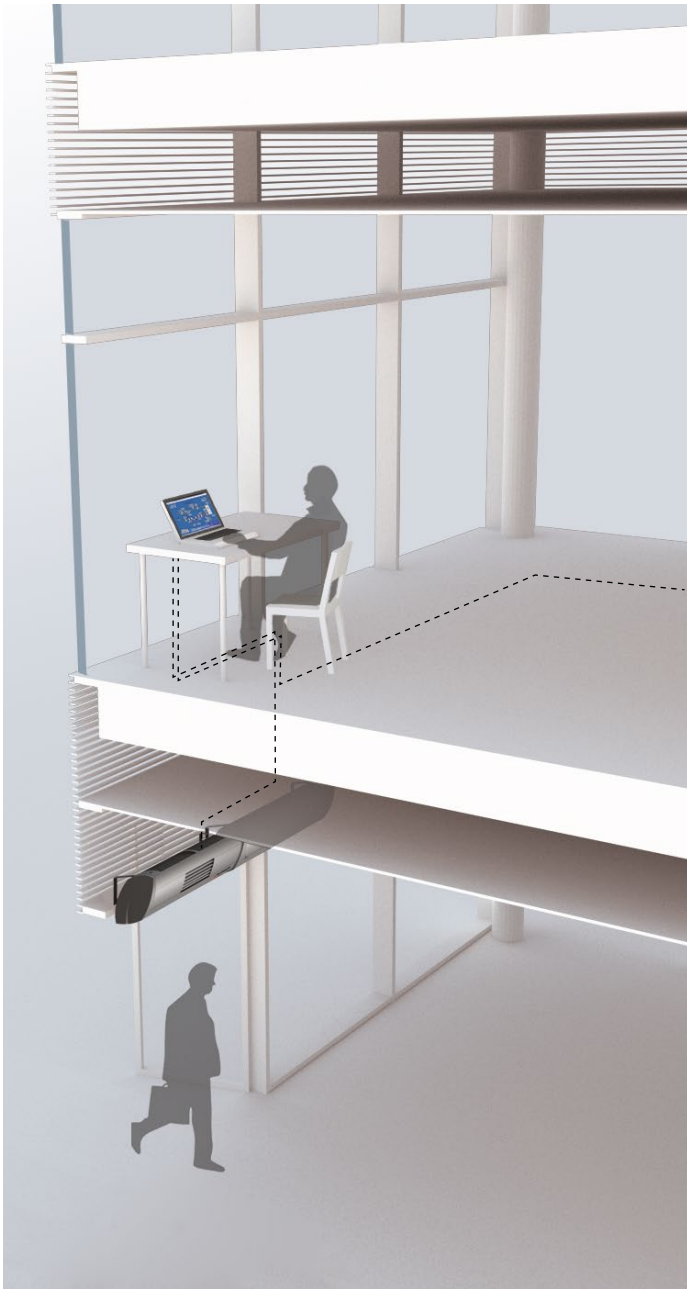
Name	Description
Physical layer	RS485
Protocol	MODBUS-RTU
Transmission rate	9600, 19200, 38400, 57600 or 115200 [bps]
Parity	Even
Number of data bits	8
Number of stop bits	1

Version 2

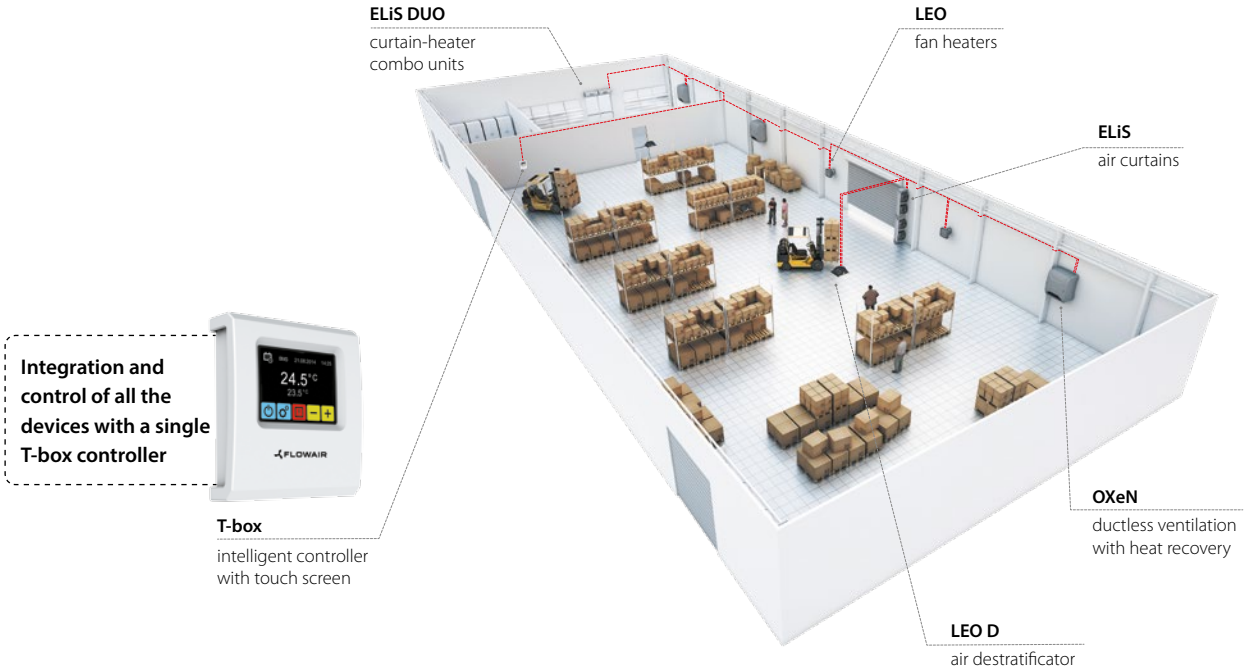
ELiS DUO curtains are equipped with a BMS compatible control system. It is possible to set up to 31 addresses. Setting the address for each unit enables independent loading and saving their operating parameters separately.

Communication parameters:

Name	Description
Physical layer	RS485
Protocol	MODBUS-RTU
Transmission rate	38400 [bps]
Parity	Even
Number of data bits	8
Number of stop bits	1



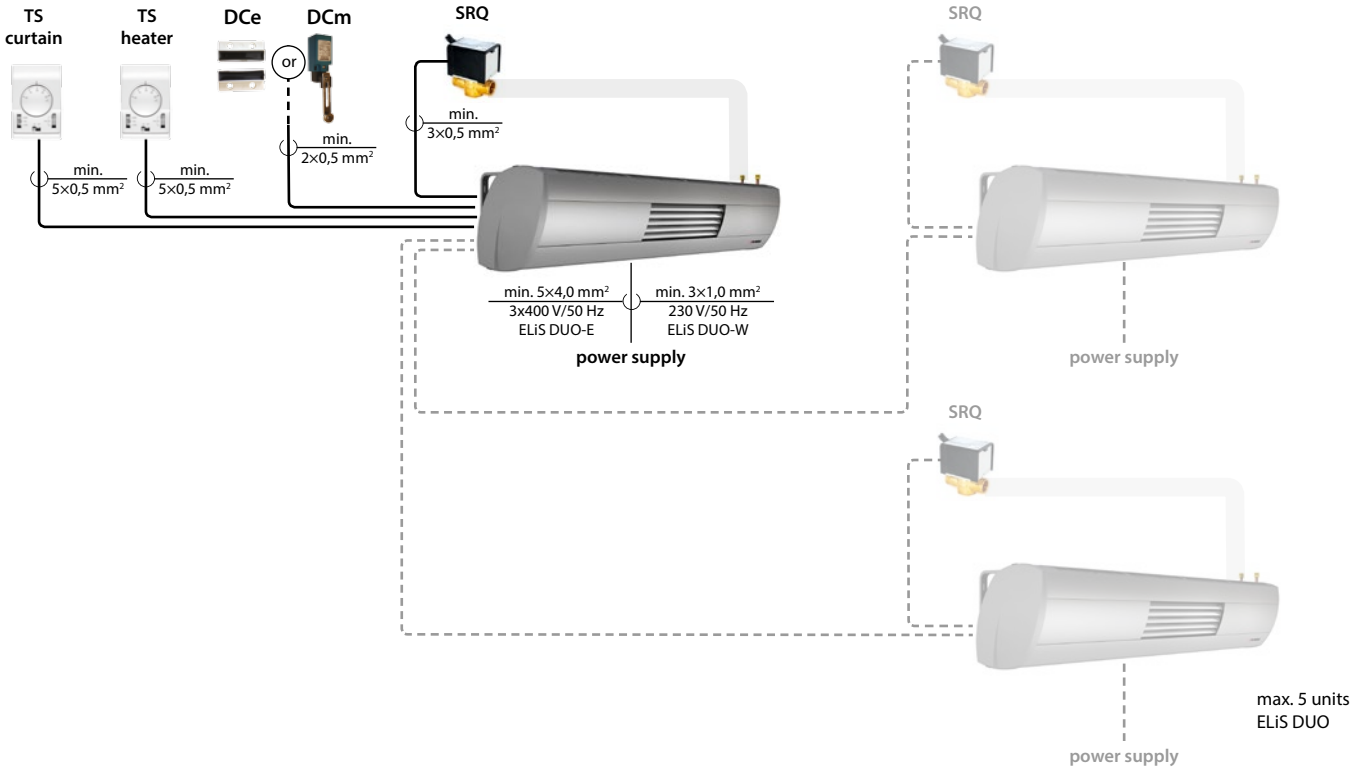
FLOWAIR SYSTEM is a complete offer of heating and ventilation devices integrated with one T-box controller enabling you to control all the units from one location.



Category	Name	Picture	Technical data
Controller	T-box intelligent controller with touch screen		Protection degree: IP20 Power supply: 24 VDC Operating temperature range: -10 … +60°C Temperature adjustment range: +5 … +35°C
	TS 3-step fan speed controller with touch screen		Protection degree: IP30 Temperature adjustment range: +10 … +30°C Operating temperature range: 0 … +40°C Contacts load: inductive 5 A, resistance 6 A
Door sensors	DCe magnetic door sensor		Operating temperature range: -5 … +60°C Protection degree: IP64 Material: plastic Length of connection wire: 2 m Jumpers: NC Resistance contacts load: 0,5 A Max. contacts voltage: 175 VDC Max. distance between contacts: 8 mm
	DCm mechanical door sensor		Operating temperature range: -10 … +80°C Protection degree: IP65 Material: plastic Length of connection wire: none Jumpers: 1xNC i 1xNO Inductive contacts load: 3 A Max. contacts voltage: 300 VAC or 250 VDC
Valves with actuator	SRQ2d two-way valve 1/2" with actuator		Protection degree: IP20 Power supply: 200–240 V 50/60 Hz Max. water temperature: +93°C Max. water pressure: 1,6 MPa Kvs: 3,0 m^3/h Installation: on water outlet pipe Opening/closing time: 18s/5s Dimensions (HxWxD): 108x86x66 mm
	SRQ3d three-way valve 1/2" with actuator		Protection degree:IP20 Power supply: 200–240 V 50/60 Hz Max. water temperature: +93°C Max. water pressure: 2 MPa Kvs: 3,4 m^3/h Installation: on water inlet pipe Opening/closing time: 18s/5s Dimensions (HxWxD): 118x86x66 mm

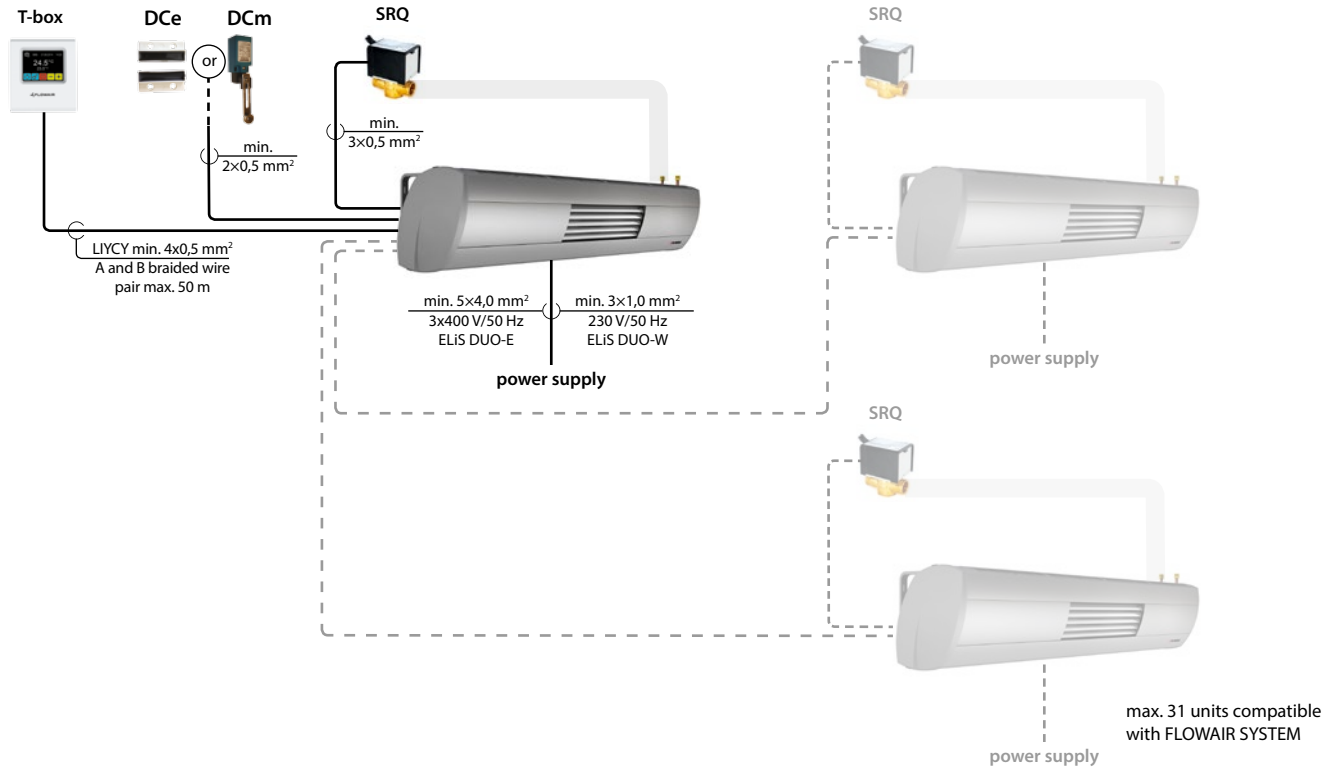
TS control

Control over:
- curtain section via DCe or DCm door sensor and TS 3-step fan speed controller with thermostat,
- heater section via TS 3-step fan speed controller with thermostat.



T-box control

Control over curtain section and heater section via single T-box controller.



ELiS DUO with water heat exchanger

ELiS DUO-W-100

Curtain parameters						Heater parameters				
Tp1	**V**	**PT**	**Qw** [1]	**Δpw** [1]	**Tp2**	**V**	**PT**	**Qw** [1]	**Δpw**[1]	**Tp2**
°C	m³/h	kW	l/h	kPa	°C	m³/h	kW	l/h	kPa	°C
Tw1/Tw2 = 90/70°C										
0	800/ 1100/ 1400	12,1/14,9/17,2	1141	12,8	42/37/34	400/550/700	6,1/7,4/8,6	1141	12,8	42/37/34
5		11,2/13,7/15,9			44/40/37		5,6/6,9/8,0			44/40/37
10		10,3/12,6/14,7			47/43/40		5,2/6,3/7,3			47/43/40
15		9,4/11,6/13,4			49/46/43		4,7/5,8/6,7			49/46/43
20		8,6/10,5/12,2			52/48/46		4,3/5,3/6,1			52/48/46
Tw1/Tw2 = 80/60°C										
0	800/ 1100/ 1400	10,4/12,8/14,8	976	9,9	36/32/29	400/550/700	5,2/6,4/7,4	976	9,9	36/32/29
5		9,5/11,7/14,8			38/35/32		4,8/6,4/6,8			38/35/32
10		8,6/10,6/12,3			41/38/35		4,3/5,3/6,1			41/38/35
15		7,8/9,5/11,1			43/40/38		3,9/4,8/5,5			43/40/38
20		6,9/8,5/9,8			46/43/41		3,4/4,2/4,9			46/43/41
Tw1/Tw2 = 70/50°C										
0	800/ 1100/ 1400	8,7/10,7/12,4	811	7,3	30/27/24	400/550/700	4,35/5,3/6,2	811	7,3	30/27/24
5		7,8/9,6/11,1			32/30/27		3,9/4,8/5,6			32/30/27
10		6,9/8,5/9,9			35/32/30		3,5/4,3/4,9			35/32/30
15		6,1/7,5/8,7			37/35/33		3/3,7/4,3			37/35/33
20		5,2/6,4/7,5			39/37/36		2,6/3,2/3,7			39/37/36
Tw1/Tw2 = 70/40°C										
0	800/ 1100/ 1400	7,2/8,8/10,2	447	2,5	25/22/20	400/550/700	3,6/4,4/5,1	447	2,5	25/22/20
5		6,3/7,7/9,0			27/25/23		3,2/3,9/4,5			27/25/23
10		5,4/6,7/7,7			29/27/26		2,7/3,3/3,9			29/27/26
15		4,5/5,6/6,5			31/30/29		2,3/2,8/3,2			31/30/29
20		3,5/4,5/5,2			33/32/31		1,8/2,2/2,6			33/32/31
Tw1/Tw2 = 60/40°C										
0	800/ 1100/ 1400	7,0/8,5/9,9	646	5,0	24/21/20	400/550/700	3,5/4,3/4,9	646	5,0	24/21/20
5		6,1/7,5/8,6			26/24/22		3,0/3,7/4,3			26/24/22
10		5,2/6,4/7,4			29/27/25		2,6/3,2/3,7			29/27/25
15		4,3/5,3/6,2			31/29/28		2,2/2,7/3,1			31/29/28
20		3,5/4,3/5,0			33/32/31		1,7/2,1/2,5			33/32/31
Tw1/Tw2 = 50/40°C										
0	800/ 1100/ 1400	6,7/8,2/9,5	1245	16,7	23/21/19	400/550/700	3,4/4,1/4,8	1245	16,7	23/21/19
5		5,8/7,2/8,3			26/23/22		2,9/3,6/4,2			26/23/22
10		5,0/6,1/7,1			28/26/25		2,5/3,1/3,6			28/26/25
15		4,2/5,1/5,9			30/29/27		2,1/2,6/3,0			30/29/27
20		3,3/4,1/4,8			32/31/30		1,6/2,0/2,4			32/31/30

Heating capacities given for air flow of entire unit at simultaneous operation of curtain section fans and heater section fans.
To obtain operating parameters concerning other water temperatures, please contact Sales Office.

PT – heating capacity
Tp1 – inlet air temperature
Tp2 – outlet air temperature
Tw1 – inlet water temperature
Tw2 – outlet water temperature
Qw – water stream flow in the heat exchanger
Δpw – water pressure drop in the heat exchanger

[1] Given maximum values of water flow and water pressure drops

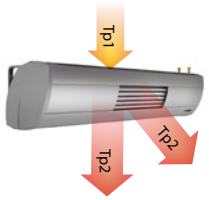
ELiS DUO with water heat exchanger

ELiS DUO-W-200

Curtain parameters						Heater parameters				
Tp1	**V**	**PT**	**Qw** [1]	**Δpw** [1]	**Tp2**	**V**	**PT**	**Qw** [1]	**Δpw**[1]	**Tp2**
°C	m³/h	kW	l/h	kPa	°C	m³/h	kW	l/h	kPa	°C
Tw1/Tw2 = 90/70°C										
0	1700/ 2250/ 3000	19/23/26,6	max.1465	max.18,9	34/30/27	400/550/700	4,7/5,8/6,6	max.1465	max.18,9	34/30/27
5		17,8/21,1/24,9			36/33/30		4,4/5,3/6,2			36/33/30
10		16,6/19,7/23,2			39/36/33		4,1/4,9/5,8			39/36/33
15		15,4/18,2/21,5			42/39/36		3,8/4,6/5,4			42/39/36
20		14,2/16,8/19,8			45/42/40		3,5/4,2/5,0			45/42/40
Tw1/Tw2 = 80/60°C										
0	1700/ 2250/ 3000	16,3/19,4/22,8	max.1252	max.14,5	29/26/23	400/550/700	4,1/4,8/5,7	max.1252	max.14,5	29/26/23
5		15,1/17,9/21,1			32/29/26		3,8/4,5/5,3			32/29/26
10		13,8/16,5/19,7			34/32/29		3,5/4,1/4,9			34/32/29
15		12,6/15/17,7			37/35/33		3,2/3,8/4,4			37/35/33
20		11,2/13,6/16			40/38/36		2,8/3,4/4,0			40/38/36
Tw1/Tw2 = 70/50°C										
0	1700/ 2250/ 3000	13,6/16,2/19	max.1039	max.10,6	24/21/19	400/550/700	3,4/4/4,7	max.1039	max.10,6	24/21/19
5		12,3/14,6/17,3			27/24/22		3,1/3,7/4,3			27/24/22
10		11,1/13,2/15,6			30/27/26		2,8/3,3/3,9			30/27/26
15		9,8/11,8/13,8			32/30/29		2,5/2,9/3,5			32/30/29
20		8,6/10,3/12,1			35/33/32		2,2/2,6/3,0			35/33/32
Tw1/Tw2 = 70/40°C										
0	1700/ 2250/ 3000	11,2/13,4/15,7	max.571	max.3,6	20/18/16	400/550/700	2,8/3,3/3,9	max.571	max.3,6	20/18/16
5		10/11,9/14			23//21/19		2,5/3/3,5			23//21/19
10		8,7/10,4/12,2			25/24/22		2,2/2,6/3			25/24/22
15		7,4/8,8/10,4			28/26/25		1,8/2,2/2,6			28/26/25
20		6,0/7,2/8,5			30/29/28		1,5/1,8/2,1			30/29/28
Tw1/Tw2 = 60/40°C										
0	1700/ 2250/ 3000	10,8/12,9/15,1	max.826	max.7,2	19/17/15	400/550/700	2,7/3,2/3,8	max.826	max.7,2	19/17/15
5		9,6/11,4/13,4			22/20/19		2,4/2,9/3,4			22/20/19
10		8,4/9,9/11,7			25/23/22		2,1/2,5/2,9			25/23/22
15		7,1/8,4/9,9			27/26/25		1,8/2,1/2,5			27/26/25
20		5,8/6,9/8,2			30/29/28		1,4/1,7/2			30/29/28
Tw1/Tw2 = 50/40°C										
0	1700/ 2250/ 3000	10,5/12,5/14,7	max.1599	max.24,4	19/17/15	400/550/700	2,6/3,1/3,7	max.1599	max.24,4	19/17/15
5		9,2/11/13			21/20/18		2,3/2,8/3,2			21/20/18
10		8,0/9,5/11,2			24/23/21		2/2,4/2,8			24/23/21
15		6,8/8,1/9,5			27/26/24		1,7/2/2,4			27/26/24
20		5,5/6,6/7,7			30/29/28		1,4/1,6/1,9			30/29/28

Heating capacities given for air flow of entire unit at simultaneous operation of curtain section fans and heater section fans.
To obtain operating parameters concerning other water temperatures, please contact Sales Office.

PT – heating capacity
Tp1 – inlet air temperature
Tp2 – outlet air temperature
Tw1 – inlet water temperature
Tw2 – outlet water temperature
Qw – water stream flow in the heat exchanger
Δpw – water pressure drop in the heat exchanger



[1] Given maximum values of water flow and water pressure drops

ELiS DUO with electric heaters

ELiS DUO-E-100

	Curtain section			Heater section			Curtain-heater combo unit		
	1 step	**2 step**	**3 step**	**1 step**	**2 step**	**3 step**	**1 step**	**2 step**	**3 step**
Power supply [V/Hz]	3x400/50								
Rated current of unit[1] [A]	9,1	9,4	9,9	4,2	4,5	4,8	13,3	13,9	14,7
Heating capacity[1] [kW]	6,3	6,5	6,8	2,9	3,1	3,3	9,2	9,6	10,1
Air temperature rise for curtain (ΔT)[1] [°C]	23	21	20	23	21	20	23	21	20

[1] At inlet air temperature 10°C

2015/2016 v.1