

# TECHNICAL NOTE



## **DIVA-XLI 130-150** **DIVA-XLI SWING 130-150**

Cassette-type fan coil units with  
Brushless Inverter EC motor



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# 1. RHOSS USEFUL FOR LEED

LEED certification - which stands for "Leadership in Energy and Environmental Design" - is now the most internationally established protocol for defining and assessing the environmental sustainability of buildings. It was introduced in 1998 by the U.S. Green Building Council (USGBC) and was subsequently established internationally.



It is voluntary certification based on the consent that provides investors and all stakeholders with precise references for the design, construction and management of high performance green buildings.

LEED is a flexible system that can be applied to all types of buildings, both new and existing, and covers the entire life cycle of the building.

LEED certification is aimed at promoting a constructive transformation of the industry to achieve seven main objectives

[LEED Version 4 - BD+C Guide]:

- Invert the contribution to climate change
- Improving individual health and wellbeing
- Protect and restore water resources
- Protect, improve and restore ecosystems and biodiversity
- Promote procurement cycles of sustainable and regenerative materials
- Create "green economy"
- Improving social equity, public health and quality of life

Since LEED is certification dedicated to buildings, products, technologies or building materials cannot be LEED certified and can only help meet the criteria of specific pre-requisites and credits of the LEED reference guide and help the building increase its score.

However, making an informed choice of certain products and technologies other than others may have a significant impact on the total score of the building; an impact that can reach 50% of the total.

This is why the builder may have an important role in the certification process and provide concrete support to the concerned parties. The role of the manufacturer will be basically consist of two activities:

- Provide precise mapping of products and/or technologies, aimed at identifying which products can be used in a LEED project and which pre-requisite criteria and credits these products help fulfil
- Offer services and expertise that are able to simplify and facilitate a number of activities specifically required by LEED standards

RHOSS units have been analysed according to the criteria described in Version 4 of the LEED certification, published in November 2013 and currently still flanked by Version 3 of 2009, with particular attention paid to the LEED Building Design and Construction guide.

With regards to the minimum energy efficiency criteria, aimed at determining whether a particular model can be used in a LEED project, the reference standard of Version 4 is ASHRAE Standard 90.1-2010, section 6.4 - 6.8 and table 6.8.1C, which replaces ASHRAE Standard 90.1-2007 used as a reference for LEED certification Version 3. Clearly, all RHOSS models that meet the minimum efficiency criteria of Version 4 also automatically meet the criteria of Version 3.

**RHOSS SpA is a member of USGBC and actively supports the awareness of the principles of the sustainable design in the world.**

## GLOSSARY

**GWP** = Global Warming Potential - An index that expresses the greenhouse effect caused by gas emission into the atmosphere. Each substance has a definite potential in relation to CO<sub>2</sub>, which has been conventionally defined as a potential equal to 1.

**LCGWP** = Life Cycle Global Warming Potential - An index which defines the global warming potential of the entire life cycle of the product. This index depends on: GWP of the refrigerant used, useful life of the product, estimated annual loss of refrigerant and end of life, amount of unit refrigerant.

**LCODP** = Life Cycle Ozone Depletion Potential - The index which defines the potential destruction of the stratospheric ozone layer of refrigerant used throughout the life cycle of the product. This index is 0 for refrigerants of the HFC family (R134a and R410A).

## 2. GENERAL FEATURES

### 2.1. STRUCTURAL FEATURES

- Cassette-type fan coils for installation in false ceilings, with air return and delivery directly into the room, comprising of separately supplied units and curtain walling.

#### DIVA-XLI

- Self-supporting structure in galvanised sheet steel with internal thermal insulation in closed cell expanded polyethylene (10 mm) and an anti-condensation barrier on the external wall.
- Internal condensate drain tray in thermo-coupled ABS with high density expanded polystyrene, with preformed air passages adequately shaped to optimise the air passage. Fire reaction class B1 according to DIN 4102.
- Finned coil heat exchanger with copper pipes and aluminium fins fixed to the pipes by mechanical expanding process and suitably shaped.
- Radial fan with single intake.
- EC brushless Inverter synchronous motor, with continuous speed adjustment, three-phase type permanent magnet, controlled with reconstructed current according to BLAC sinusoidal wave. Inverter electronic board for motor operation control powered at 230 Volt in single-phase and, by means of a switching system, generates a frequency and waveform modulated three-phase power supply. The type of electrical supply required for the machine is therefore single-phase with 230 - 240 V voltage and 50 - 60 Hz frequency.
- The motor-fan unit suspended on anti-vibration mounts, particularly silent.
- Centrifugal condensation evacuation pump with a 650 mm head, directly controlled by the electronic board to which a float system is combined to control the condensate level and act as an alarm.
- Auxiliary condensate collection tray supplied inside the packaging.
- Control board for managing the condensate evacuation pump and inverter electronic board.
- Electrical panel external to the unit with an electronic control board and connection terminals.
- Ceiling panelling (PLP) supplied separately, in white RAL9003 ABS polymer, with return grilles, frame and manually adjustable distribution fins on each side, washable renewable synthetic G0 filter, easily accessible (for DIVA-XLI).
- Ceiling (PLP/PM1) supplied separately, made of ABS polymer in white RAL9003, with manually adjustable intake grids, frame and diffuser fins on each side, ePM1 55% - F7 filter to be replaced at the end of the cycle, easily accessible (for DIVA-XLI).

#### DIVA-XLI SWING

- Self-supporting structure in galvanised sheet steel with internal thermal insulation in closed cell expanded polyethylene (10 mm) and an anti-condensation barrier on the external wall.
- Internal condensate drain tray in thermo-coupled ABS with high density expanded polystyrene, with preformed air passages adequately shaped to optimise the air passage. Fire reaction class B1 according to DIN 4102.
- Finned coil heat exchanger with copper pipes and aluminium fins fixed to the pipes by mechanical expanding process and suitably shaped.
- Radial fan with single intake.
- EC brushless Inverter synchronous motor, with continuous speed adjustment, three-phase type permanent magnet, controlled with reconstructed current according to BLAC sinusoidal wave. Inverter electronic board for motor operation control powered at 230 Volt in single-phase and, by means of a switching system, generates a frequency and waveform modulated three-phase power supply. The type of electrical supply required for the machine is therefore single-phase with 230 - 240 V voltage and 50 - 60 Hz frequency.
- The motor-fan unit suspended on anti-vibration mounts, particularly silent.
- Centrifugal condensation evacuation pump with a 650 mm head, directly controlled by the electronic board to which a float system is combined to control the condensate level and act as an alarm.
- Auxiliary condensate collection tray supplied inside the packaging.
- SWING advanced control for managing the unit with motorised fins via remote control or wired panel supplied separately, control board for managing the condensate evacuation pump and inverter electronic board.
- Electrical panel outside the unit with SWING advanced control and connection terminals.
- Ceiling light (PLP/S) supplied separately, made of ABS polymer in white RAL9003, with adjustable air intake grids, frame and diffusion fins by remote control or wall control, IR receiver for remote control, washable synthetic G0 filter, easily accessible (for DIVA-XLI SWING).
- Ceiling (PLP/S/PM1) supplied separately, in white RAL9003 ABS polymer, with adjustable light grids, frame and diffuser fins via remote control or wall control, IR receiver for remote control, ePM1 55% - F7 filter to be replaced at the end of the cycle, easily accessible (for DIVA-XLI SWING).

### 2.2. DECLARED CONDITIONS OF USE

DIVA-XLI is a fan coil intended for the treatment of air (summer and winter air-conditioning) inside buildings used for domestic and similar purposes. The unit is not designed to be installed in rooms used for laundry purposes (IEC EN 60335-2-40). The units have been designed for indoor installation in "urban" non-marine atmospheres with non-corrosive and non-dusty characteristics. The unit must not be installed in locations where flammable gases or substances of an acid or alkaline nature are present.

### 2.3. SERIES

#### DIVA-XLI

Fan coils with EC-Brushless Inverter motor.

#### DIVA-XLI SWING

Fan convectors with EC-Brushless Inverter motor and motorised fins.

### 2.4. INSTALLATIONS

#### Type of system

- 2T - Single main battery.
- 4T - Dual battery, main and additional.
- RE - Single main battery and supplementary electric heater

## 2.5. ACCESSORIES

### ON/OFF electrovalves

Brass 2-way valves, electrothermal actuator with ON/OFF action (NC normally closed).

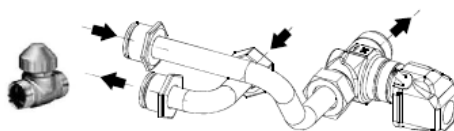
3-way and 4-port valves with built-in by-pass, ON/OFF electrothermal actuator (NC normally closed).

Power supply: 230Vac

Protection rating: IP44

Total opening time: 4 minutes

- 2V (factory fitted)
  - K2V (supplied separately)
- 2-way ON/OFF solenoid valve for 2-pipe and 2-pipe+resistance systems



- 3V (factory fitted)
  - K3V (supplied separately)
- 3-way ON/OFF solenoid valve for 2-pipe and 2-pipe+resistance systems



- 2V-4T (factory fitted)
  - K2V-4T (supplied separately)
- 2-way ON/OFF electrovalves for 4-pipe systems.

- 3V-4T (factory fitted)
  - K3V-4T (supplied separately)
- 3-way ON/OFF electrovalves for 4-pipe systems.

## 2.6. ACCESSORIES SUPPLIED SEPARATELY

### DIVA-XLI

#### • PLP

Panelling in white RAL9003 ABS polymer, with return grilles, frame and manually adjustable distribution fins on each side, washable renewable synthetic G0 filter, easily accessible (for DIVA-XLI only).

#### • PLP/PM1

ABS polymer ceiling in white RAL9003, with intake grids, frame and manually adjustable diffusion fins on each side, ePM1 55% - F7 filter to be replaced at the end of the cycle, easily accessible (only for DIVA-XLI).

DIVA-XLI SWING

#### • PLP/S

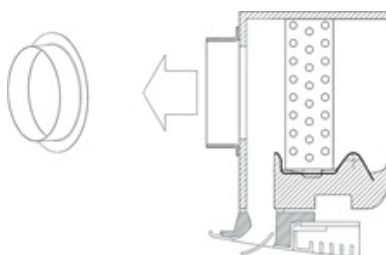
ABS polymer ceiling light in white RAL9003, with adjustable light grids, frame and diffuser fins via remote control or wall control, IR receiver for remote control, washable synthetic G0 filter, easily accessible (only for DIVA-XLI SWING).

#### • PLP/S/PM1

ABS polymer ceiling light in white RAL9003, with adjustable light grids, frame and diffuser fins via remote control or wall control, IR receiver for remote control, ePM1 55% - F7 filter to be replaced at the end of the cycle, easily accessible (only for DIVA-XLI SWING).

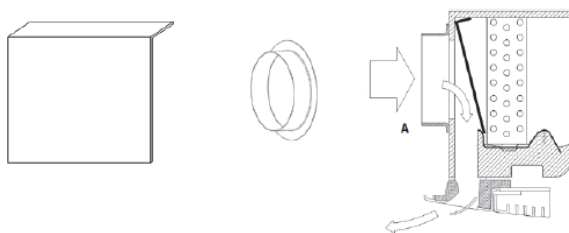
#### • KCDA

Shank for air distribution at a distance from the unit (fitting diameter 180mm).



#### • KAP

1-way primary air kit (fitting diameter 180mm).



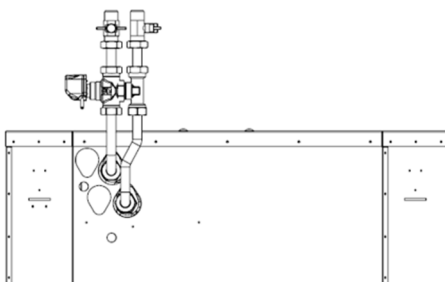
#### • KIC

Casing for unit installation in view, in the absence of false ceiling. Only for 2-pipe-systems.



#### • K3VIC

3-way ON/OFF valve and balancing valve with connections upwards for KIC casing.





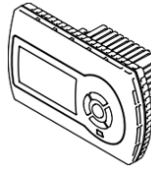
## KTVDI-KTVDIM for DIVA-XLI

### KTVDI

Electronic control panel with display, for semi-recessed wall mounting, including ON/OFF button, MODE, 3 SPEED+AUTO, SET-POINT change or delta SET-POINT (OFFSET  $\pm 3^{\circ}\text{C}$ ); fan control (0-10 Vdc); auxiliary contacts for ON/OFF valve control in 2-pipe (2T) systems with electric resistance (RE) and 4-pipe (4T); summer/winter manual/automatic/contact switching; fan start delay or minimum thermostat with probe (KSO); continuous/intermittent ventilation; configurable digital inputs (SCR, ECO, SIC, ALARM), weekly time band management. Fixing in 503-type three module recessed boxes (not supplied by Rhoss); (dimensions 128 x 80 x 55,5 mm).

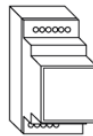
### KTVDIM

Complete with resident RS485 serial interface (Modbus RTU protocol) (dimensions 128 x 80 x 25,5 mm)



### KADC

Analogue digital signal converter for the management of inverter boxes by means of 3-speed relay commands (dimensions 35 x 90 x 65,5mm)



### KSO

Remote air temperature probe (2m) for KTVD (M).



## 2.7. ADVANCED LIT-TOUCH CONTROLS (FOR DIVA-XLI)

- KPLTB - LIT-Touch wired control panel in glossy black (supplied separately)
- KPLTW - LIT-Touch wired control panel in pearl white (supplied separately)

LIT-Touch wired control panel, complete with a LED display to view the room temperature or the desired set-point, with capacitive touch sensors to set the room set-point, the fan speed (AUTO, MIN, MED, MAX) and the summer/winter manual/automatic operating mode and fan (OFF/E/I/Auto/Fan) and ambient air temperature probe.

Wall mounting installation to cover any recessed electrical box 503.  
Only in conjunction with control (K)CF/P. Dimensions 120x86x17 mm



- **KTLT – LIT-Touch remote control (supplied separately)**

IR LIT-Touch remote control to control remotely with KRLT receiver, complete with a wall-mounting support.  
Only in conjunction with KRLT receiver and control (K)CF/P.

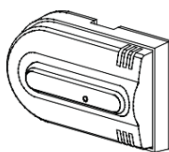


- **KRLT – LIT-Touch receiver (supplied separately)**

IR LIT-Touch receiver to control remotely with the KTLT remote control, complete with an ambient air temperature probe, operating mode LED and emergency micro-key in the case of no remote control.

Wall mounting installation (height 1.5 m).

Only in conjunction with control (K)CF/P. Dimensions 95 x 58 x 30 mm



- **CF/P - On-board LIT-Touch control (factory fitted, only for 2-pipe and 4-pipe versions)**

- **KCF/P - On board LIT-Touch control (supplied separately)**

Electronic control with set-point or delta set-point adjustment, for 2-pipe, 2-pipe with electric resistance or 4-pipe systems, for on-board installation complete with minimum water temperature probe and air probe, auxiliary relay contacts for managing the ON/OFF valves in 2-pipe, 2-pipe with electric resistance or 4-pipe systems.

Speed control 0-10Vdc; continuous/timed ventilation setting by parameters.

Set-point adjustment or limited with delta set-point (+/-3°C can be varied) with respect to a reference value, for restricted hotel room operation.

In heating mode in 2-pipe systems, the control for the additional valve can be configured for thermostatically controlled activation of a radiator or radiant panel, with joint or separate operation to the main coil of the fan coil unit.

Integrated Master Slave management of up to 15 units in total via a single unit with KPLTB/KPLTW wired control panel or KTLT remote control.

3 digital inputs, configurable as remote ON/OFF, remote summer/winter, economy, window contact, general alarm in unit input.

The control consists of an electronic board inside the electrical cabinet, which can contain any additional components:

- KDO2 - Additional board with 2 digital relay outputs, which can be configured as ON/OFF call, summer/winter call, unit alarm.

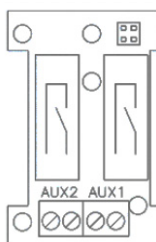
- KIF485 - RS485 serial board with unit addressing from control panel or remote control.

On board installation - for all versions, only combined with a KPLT panel or KRI, KRIM, KRLT receiver.

- **KDO2 - Board with 2 digital outputs (supplied separately)**

Additional board with 2 digital relay outputs, which can be configured as ON/OFF call, summer/winter call, unit alarm.

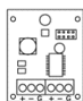
On board installation on control (K)CF/..



## 2.8. SERIAL INTERFACES FOR LIT-TOUCH EVOLVED CONTROLS

- **KIF485 - RS485 serial board to control KCF/.. (supplied separately)**

RS485 serial interface board for SYS-TO (System Touch Manager) by Rhoss or third-party supervision (Protocols supported: Modbus® RTU).





## 2.9. ADVANCED DIVA-XLI SWING CONTROLS

### Flush panel

KPS - Wired control panel for units with motorised fins with room temperature control, Summer/Winter/AUTO mode, MAX/MED/MIN/AUTO speed - wall installation only for DIVA-XLI SWING.



### Remote control

KTS - Remote control for units with motorised fins with room temperature control, Summer/Winter/AUTO mode, MAX/MED/MIN/AUTO speed - only for DIVA-XLI SWING.



### Receiver

KRS - Recessed wall-mounted receiver for KTS remote control, with air temperature probe and operating LED. Fixing in 2-module flush-mounted boxes type 502 (not supplied by Rhoss) - wall installation only for DIVA-XLI SWING, as an alternative to the ceiling-mounted receiver PLP/S and PLP/S/PM1.



### On board controls

CF/S - SWING advanced control for motorised fins and RS485-Modbus RTU serial card, integrated in the unit.

Electronic control with set-point or delta set-point adjustment, for 2-pipe, 2-pipe with electric resistance or 4-pipe systems, for on-board installation complete with minimum water temperature probe and air probe, auxiliary relay contacts for managing the ON/OFF valves in 2-pipe, 2-pipe with electric resistance or 4-pipe systems.

Speed control 0-10Vdc; continuous/thermostatic ventilation setting by dip-switch.

Integrated Master Slave management of up to 20 units in total via a single unit with KPS wired control panel or KTS remote control.

Digital inputs n.2, configurable as remote ON/OFF, remote summer/winter, window contact, digital outputs n.2 configurable as call ON/OFF, pump status, alarm. The control is installed inside the electrical cabinet.

Note: The configuration of the serial addresses of units with Swing control can be carried out using dip-switches on the board.

## 2.10. GATEWAY

### • KGTW-BAC

RS485/BACnet gateway for communication from MODBUS RTU to BACNET IP; up to 32 fan coils can be connected. The fan coils must be equipped with an SS serial interface (KIFS485).

### • KGTW-LON

RS485/FTT10-LonWorks gateway for communication from MODBUS RTU to FTT10-LonWorks; up to 32 fan coils can be connected. The fan coils must be equipped with an SS serial interface (KIFS485).

**NOTE:** For more information on Commands and Controls and for the connection wiring diagrams, refer to the Technical Note Code K20002.

## 3. FUNCTIONING LIMITS

Water inlet temperature

- 6÷80°C.

Room air temperature:

- 6÷40°C for 2 or 4-pipe versions.
- 6÷25°C for versions with electric resistance.

Relative humidity: 15÷75%.

Maximum exchanger pressure: 1000 kPa (102 m.c.a.).

Power supply voltage: 230V±10% 50-60Hz.

## 4. TECHNICAL DATA

				DIVA-XLI 2T		DIVA-XLI 4T	
				130	150	130	150
Nominal cooling capacity EN 1397 (total heat) (*)	kW	10Vdc	Max	12,60	15,13	11,61	13,59
		5Vdc	Med	9,43	11,38	8,86	10,59
		1Vdc	Min	6,36	7,86	6,07	7,45
Nominal cooling capacity EN 1397 (sensitive heat) (*)	kW	10Vdc	Max	9,31	11,41	8,87	10,68
		5Vdc	Med	6,77	8,30	6,53	7,96
		1Vdc	Min	4,45	5,58	4,33	5,40
Water flow rate (*)	l/h	10Vdc	Max	2182	2631	2010	2363
		5Vdc	Med	1627	1968	1528	1831
		1Vdc	Min	1096	1356	1046	1286
Water pressure drops (*)	kPa	10Vdc	Max	22,7	31,8	22,6	30,4
		5Vdc	Med	13,4	18,8	13,8	19,1
		1Vdc	Min	6,6	9,6	7,0	10,1
Heating capacity EN 1397 (input water 45°C) (**)	kW	10Vdc	Max	13,39	16,40	-	-
		5Vdc	Med	9,59	11,86	-	-
		1Vdc	Min	6,18	7,82	-	-
Water flow rate (**)	l/h	10Vdc	Max	2302	2822	-	-
		5Vdc	Med	1650	2040	-	-
		1Vdc	Min	1062	1346	-	-
Water pressure drops (**)	kPa	10Vdc	Max	21,5	31,0	-	-
		5Vdc	Med	11,8	17,3	-	-
		1Vdc	Min	5,4	8,2	-	-
Heating capacity (input water 50°C) (***)	kW	10Vdc	Max	15,84	19,57	-	-
		5Vdc	Med	11,42	14,07	-	-
		1Vdc	Min	7,39	9,33	-	-
Water flow rate (**)	l/h	10Vdc	Max	2182	2631	-	-
		5Vdc	Med	1627	1968	-	-
		1Vdc	Min	1096	1356	-	-
Water pressure drops (***)	kPa	10Vdc	Max	19,3	26,9	-	-
		5Vdc	Med	11,5	16,1	-	-
		1Vdc	Min	5,8	8,3	-	-
Additional coil nominal thermal potential EN 1397 (65°C) (****)	kW	10Vdc	Max	-	-	10,55	12,17
		5Vdc	Med	-	-	8,40	9,80
		1Vdc	Min	-	-	6,01	7,19
Additional coil water capacity (****)	l/h	10Vdc	Max	-	-	908	1047
		5Vdc	Med	-	-	723	842
		1Vdc	Min	-	-	517	618
Additional coil pressure drops (****)	kPa	10Vdc	Max	-	-	19,9	25,7
		5Vdc	Med	-	-	13,2	17,4
		1Vdc	Min	-	-	7,2	10,0
Additional coil nominal thermal potential EN 1397 (70°C) (*****)	kW	10Vdc	Max	-	-	12,04	13,89
		5Vdc	Med	-	-	9,58	11,18
		1Vdc	Min	-	-	6,84	8,20
Additional coil water capacity (*****)	l/h	10Vdc	Max	-	-	1036	1195
		5Vdc	Med	-	-	824	961
		1Vdc	Min	-	-	588	705
Additional coil pressure drops (*****)	kPa	10Vdc	Max	-	-	24,9	32,3
		5Vdc	Med	-	-	16,5	21,8
		1Vdc	Min	-	-	9,0	12,5
Electrical supply	V-ph-Hz			230-1-50/400-3-50		230-1-50	
RE electrical resistance	kW			3	3	-	-
RE absorbed current	A	230V/400V		13/4,3	13/4,3	-	-
Air flow rate	m³/h	10Vdc	Max	1905	2480	1905	2480
		5Vdc	Med	1290	1650	1290	1650
		1Vdc	Min	790	1025	790	1025
Sound power	dB(A)	10Vdc	Max	58	64	58	64
		5Vdc	Med	49	55	49	55
		1Vdc	Min	38	44	38	44

				130 2T	150 2T	130 4T	150 4T
Sound pressure (*****)	dB(A)	10Vdc	Max	49	55	49	55
		5Vdc	Med	40	46	40	46
		1Vdc	Min	29	35	29	35
Absorbed power	W	10Vdc	Max	93	183	93	183
		5Vdc	Med	35	64	35	64
		1Vdc	Min	13	21	13	21
Absorbed current	A	10Vdc	Max	0,40	0,80	0,40	0,80
		5Vdc	Med	0,15	0,28	0,15	0,28
		1Vdc	Min	0,06	0,09	0,06	0,09
Condensate pump absorbed power	W			10		10	
Condensate pump absorbed current	A			0,04		0,04	
Main coil water content	l			4,6		3.6	
Additional battery water content	l			-		1.2	
Dimensioni cassetta	mm		LxHxP	869x304x869		869x304x869	
Panelling Dimensions	mm		LxHxP	1017x91x1017		1017x91x1017	
Box weight (with packaging/without packaging)	Kg			52/42		52/42	
Ceiling weight (with packaging/without packaging)	Kg			9,4/7,5		9,4/7,5	

(\*) In the following conditions: room temperature 27°C D.B.; 19°C W.B.; input water temperature 7°C with  $\Delta t$  5°C

(\*\*) In the following conditions: room temperature 20°C; input water temperature 45°C with  $\Delta t$  5°C

(\*\*\*) In the following conditions: room temperature 20°C; input water temperature 50°C, water flow rate as in cooling

(\*\*\*\*) In the following conditions: room temperature 20°C; input water temperature 65°C with  $\Delta t$  10°C

(\*\*\*\*\*) In the following conditions: room temperature 20°C; input water temperature 70°C with  $\Delta t$  10°C

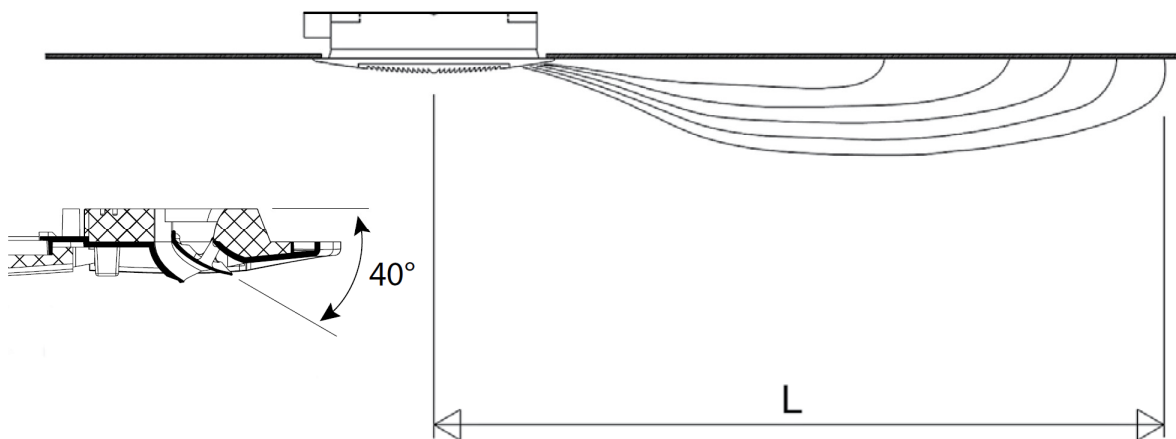
(\*\*\*\*\*) The sound pressure level is lower than the power level of 9 dB (A) for an environmental volume of 100 m<sup>3</sup> and echo time = 0.5 sec.

## 5. AIR BLOWS

The air blow indicated in the tables must only be considered as maximum value because it may significantly vary depending on the dimensions of the room in which the device is installed and the layout of the furniture in that same room.

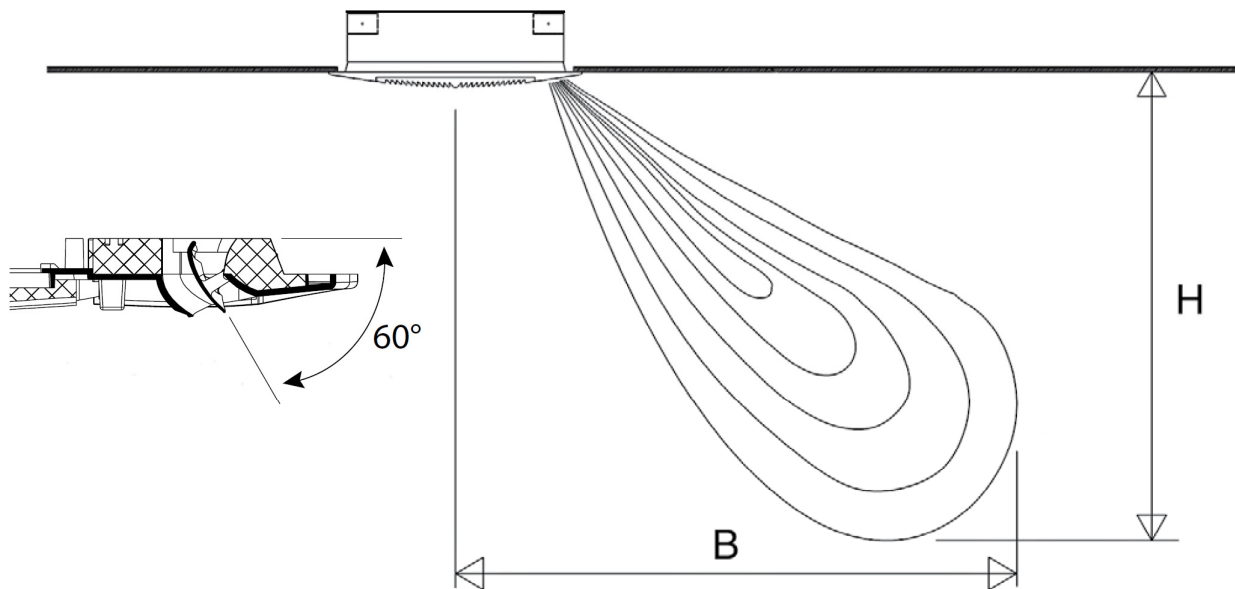
The useful blow L refers to the distance between the device and the point in which the air has a speed of 0.2 m/sec; in case the fin has a 40° inclination (recommended in cooling), we have the so-called "coanda" effect shown in the first graph, while with a 60° inclination (recommended in heating), we have a downward launch shown in the second graph.

With fin inclined by 40°



	DIVA-XLI 2T			DIVA-XLI 4T		
Speed	1	2	3	1	2	3
Air blow L	3,5	5,0	6,5	4,0	6,0	7.5

With fin inclined by 60°



	DIVA-XLI 2T			DIVA-XLI 4T		
Speed	1	2	3	1	2	3
Air blow H (*)	3,1	3.6	4,1	3,5	4,0	4,7
Air blow B	3,5	4,5	5,5	4,0	5,0	6,5

(\*) Maximum installation height

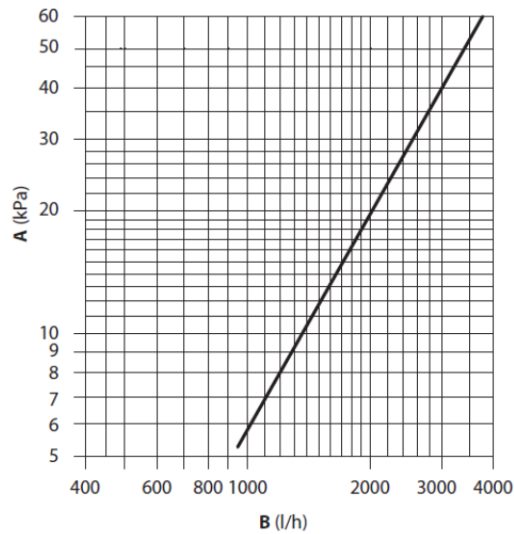
### Attention

During winter dimensioning, pay particular attention to buildings in which the floor temperature is very low (e.g. below 5°C). In this situation the floor could cool the air above to extremely low temperature values such to counteract the uniform diffusion of hot air coming from the device, reducing the blow value indicated in the table.

## 6. PERFORMANCE

### 6.1. WATER SIDE PRESSURE DROPS

#### 2-pipe system



The pressure drop refers to an average water temperature of 10°C; for different average temperatures, multiply the pressure drop by coefficient K in the table.

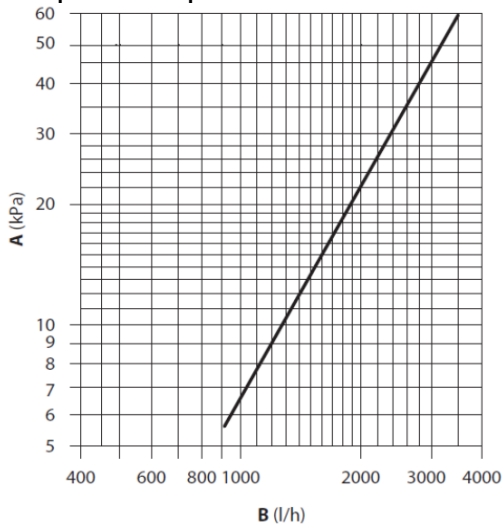
°C	20	30	40	50	60	70	80
K	0,94	0,90	0,86	0,82	0,78	0,74	0,70

**A** Pressure drop (kPa)

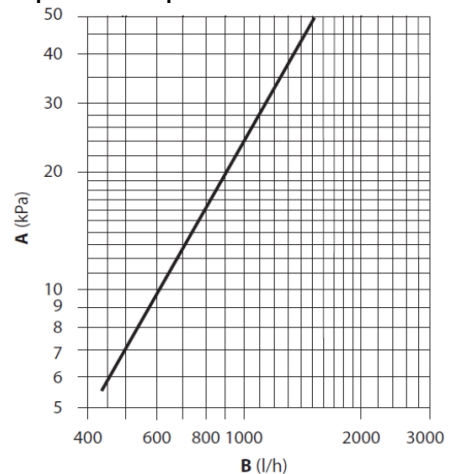
**B** Water flow rate (l/h)

#### 4-pipe system

##### Cold water coil pressure drops



##### Hot water coil pressure drops



The pressure drop refers to an average water temperature of 10°C; for different average temperatures, multiply the pressure drop by coefficient K in the table.

The pressure drop refers to an average water temperature of 65°C; for different average temperatures, multiply the pressure drop by coefficient K in the table.

°C	20	30	40	50	60	70	80	°C	40	50	70	80
K	0,94	0,90	0,86	0,82	0,78	0,74	0,70	K	1,12	1,06	0,94	0,88

**A** Pressure drop (kPa)

**B** Water flow rate (l/h)

## 6.2. SOUND POWER AND PRESSURE

DIVA-XLI			Sound power level in dB for octave bands								dB(A)	
	Speed	Speed (Vdc voltage)	m <sup>3</sup> /h	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Lw	Lp (A) (*)
130	Maximum	10	1905	46,1	50,8	53,4	53,2	48,0	38,1	27,5	58	49
	Medium	5	1290	35,2	42,2	44,1	45,5	33,6	27,8	24,9	49	40
	Minimum	1	790	26,5	31,3	36,3	25,4	22,7	24,4	23,1	38	29
150	Maximum	10	2480	52,1	56,8	59,4	59,2	54,0	44,2	32,5	64	55
	Medium	5	1650	41,8	48,0	50,2	50,8	42,6	33,4	26,8	55	46
	Minimum	1	1025	31,2	37,1	40,3	36,1	28,5	26,0	23,9	44	35

(\*) The sound pressure level and NR values referred to a room of 100m<sup>3</sup> and echo time = 0.5sec.

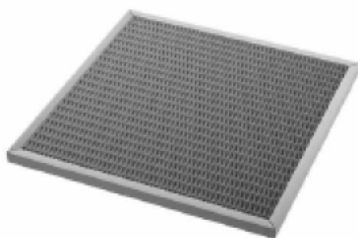
## 6.3. FILTER

### 55% ePM<sub>1</sub> filter - F7

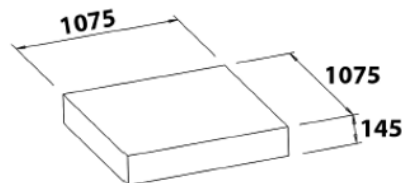
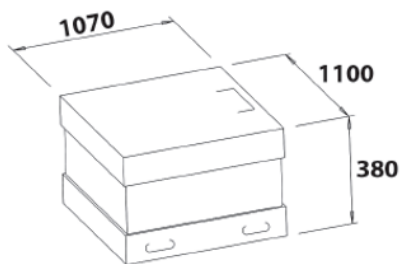
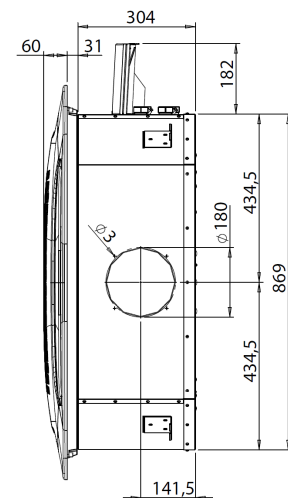
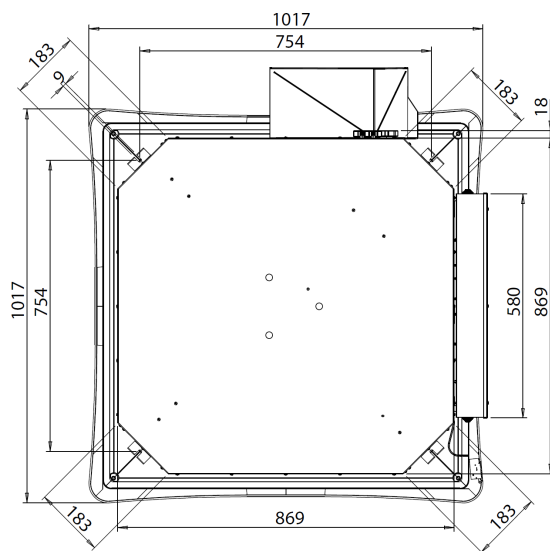
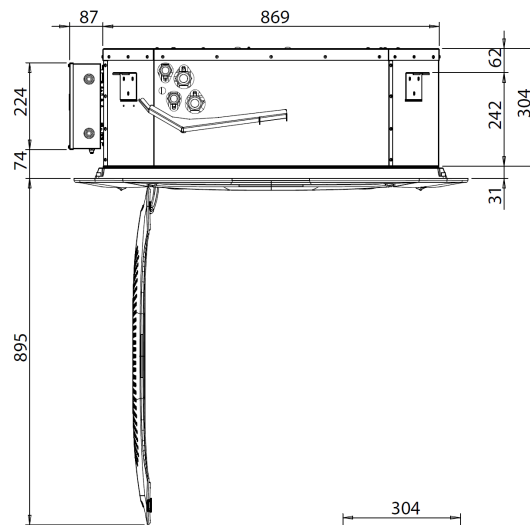
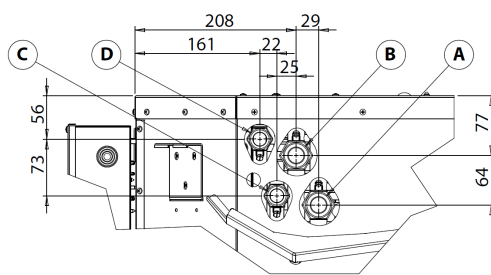
Micro-pleated filter size 578x578x24 mm.

The filter media used is a polyester and propylene (PP + PS) fabric and is shaped with micro pleating so as to present an extremely large filtering surface and therefore increase its performance by containing pressure drops.

Air flow Qv (m <sup>3</sup> /h)	700	1000	1300	1600	1900	2200
Efficiency	70%	70%	65%	65%	55%	55%



## 7. DIMENSIONS AND CLEARANCES



....

DIVA-XLI	DEVICE		CEILING LIGHT		DEVICE			CEILING LIGHT		
	Packed unit weight	Unpacked unit weight	Packed unit weight	Unpacked unit weight	Packed unit height	Packed unit depth	Packed unit width	Packed unit height	Packed unit depth	Packed unit width
	Kg	Kg	Kg	Kg	mm					
	52	42	9,4	7.5	1100	380	1070	1075	145	1075

### 2-pipe system

- A 1" hot/cold water inlet
- B 1" hot/cold water outlet

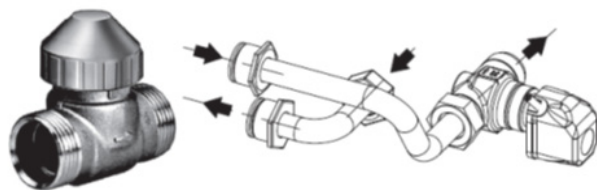
### 4-pipe system

- A 1" cold water inlet
- B 1" cold water outlet
- C 3/4" hot water inlet
- D 3/4" hot water outlet

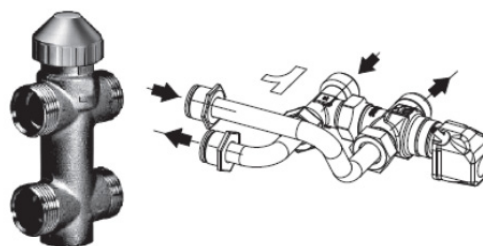


## 7.1. ELECTROVALVES PRESSURE DROPS

2-way ON/OFF valve



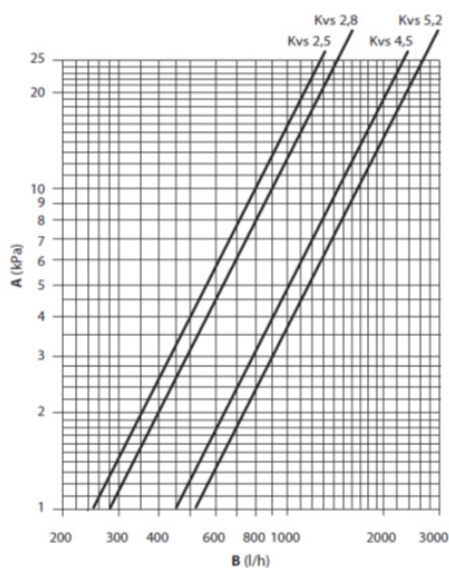
On/off 3-way valves



### Technical Data

Max operating pressure	2 bar
Max room temperature	50°C
Max water temperature	110°C
Power supply	230 V - 50/60 Hz
Absorption	3 VA
Protection	IP 43
Opening times	ca. 3min.
Max percentage of glycol	50%

### Valves pressure drops:



Air flow adjustment kit with 2- or 3-way valves of ON-OFF type with thermoelectric actuator. The kit includes the fitting pipes at unit.

### Note

The maximum pressure drop through the completely open valve should not exceed 25 kPa for cooling operation and 15 kPa for heating operation.

### 2-pipe and 4-pie system valves features

Type of coil	2-way valve			3-way valve		
	Kvs m3/h	$\Delta p_{max}$ kPa*	Valve connections**	Kvs m3/h	$\Delta p_{max}$ kPa*	Valve connections**
Main	5,2	60	1"	4,5	50	1"
Auxiliary	2.8	50	3/4"	2.5	50	3/4"

\* Maximum differential pressure with valve closed

\*\* External thread

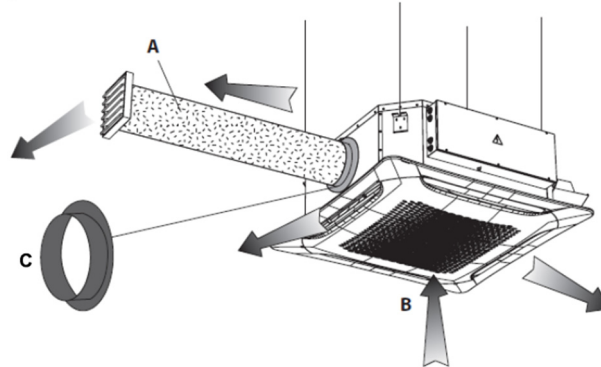
## 8. ACCESSORIES

### 8.1. KCDA - AIR DISTRIBUTION SHANK

Two side openings allow the separate realisation of a treated air flow duct in an adjacent room or greater distance. The total air capacity does not change. The flow values according to the pressure drops of the distribution duct, are indicated at the fan's maximum speed.

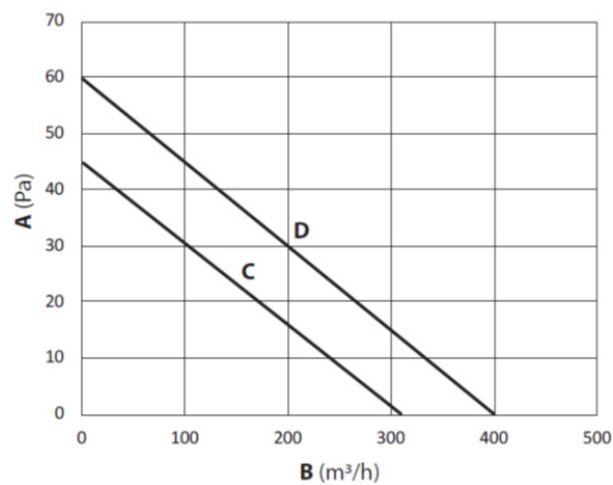
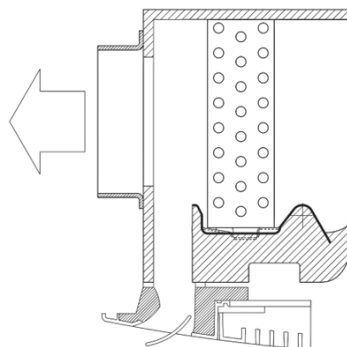
#### Note

The flow duct must be insulated to avoid condensation of the same.



- A** Air distribution
- C** Shank
- B** Recirculation air

Connection diameter Ø 180mm



- A** Pressure drops
- B** Air flow rate
- C** 2-pipe system
- D** 4-pipe system

## 8.2. KAP - PRIMARY AIR KIT

The two side openings allow the separate realisation of a primary air inlet duct in the environment using a flow separator to be inserted inside the boxes and a circular connection fitting to the system's flexible piping.

The primary air does not pass through the heat exchanger but is conveyed directly on a single delivery nozzle.

The amount of primary air flow introduced into the environment will depend on the inlet head.

The diameter of the fitting is 180 mm.



m3/h	Residual Pa
160	3
200	8
300	15
400	25
500	36

### 8.3. KIC - CASING FOR IN VIEW INSTALLATION

The fairing was designed for all types of environments where a false ceiling, for mechanical and electrical systems' insertion, is not provided or cannot be realised.

The covering cabinet perfectly fits with the air flow and return grille. The hydraulic connections can be directed upwards. All technical features described in previous pages apply, bearing in mind that:

- Fairing is only provided for 2-pipe systems (single heat exchange coil)
- treatment with primary air is not possible
- the use of the additional electric coil is not possible

The fairing is delivered in a separate packaging that must be applied only after having installed the box with the hydraulic and electrical connections completed.



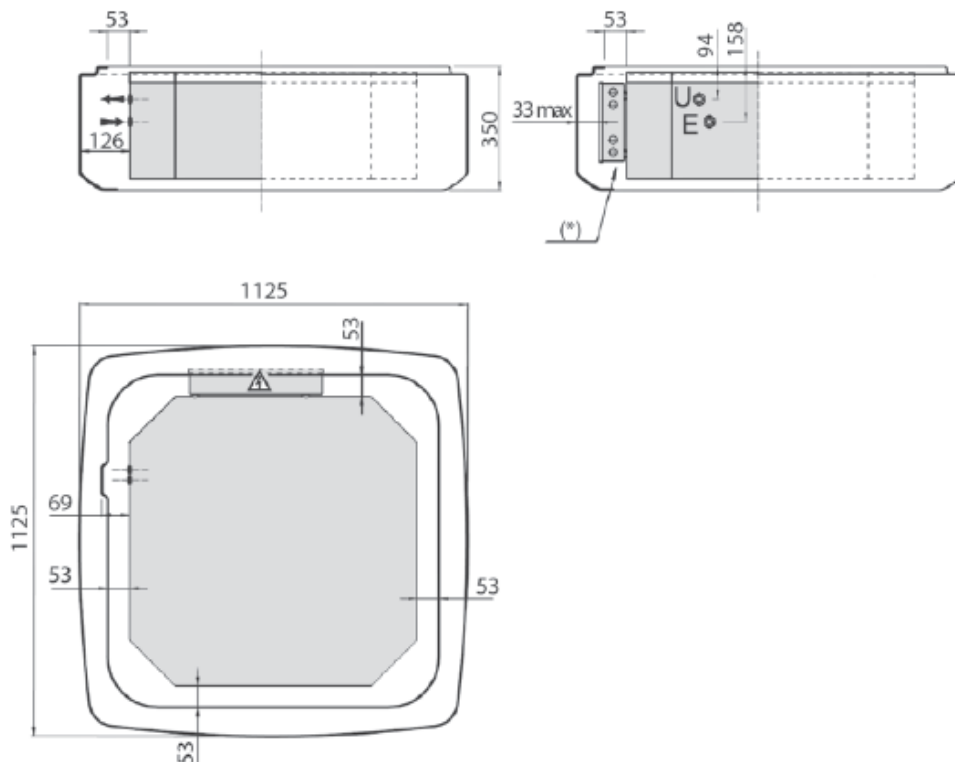
#### Note

Only for 2-pipe-systems.

#### Assembly diagram



## Dimensions and weights

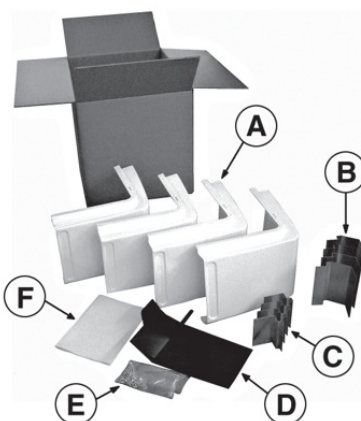


- E** Water inlet
- U** Water outlet
- (\*)** Electrical cable outlet

Weight with packaging Kg11  
Weight without packaging Kg14

## Casing components

The casing includes:

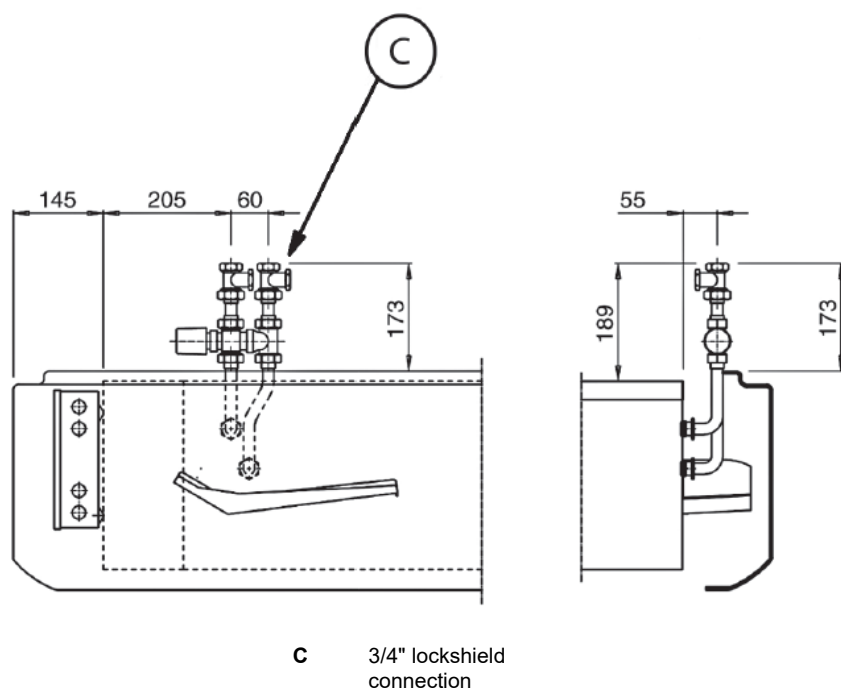


<b>A</b>	4 covering angles
<b>B</b>	4 lower brackets
<b>C</b>	4 upper brackets
<b>D</b>	Condensation drain tray
<b>E</b>	Screws kit (No. 45 TCX screws 3.9x9.5 mm)
<b>F</b>	Instruction sheet

### Valves kit for casing

The valve fittings allow hydraulic connection from above.

### DIVA-XLI 2T



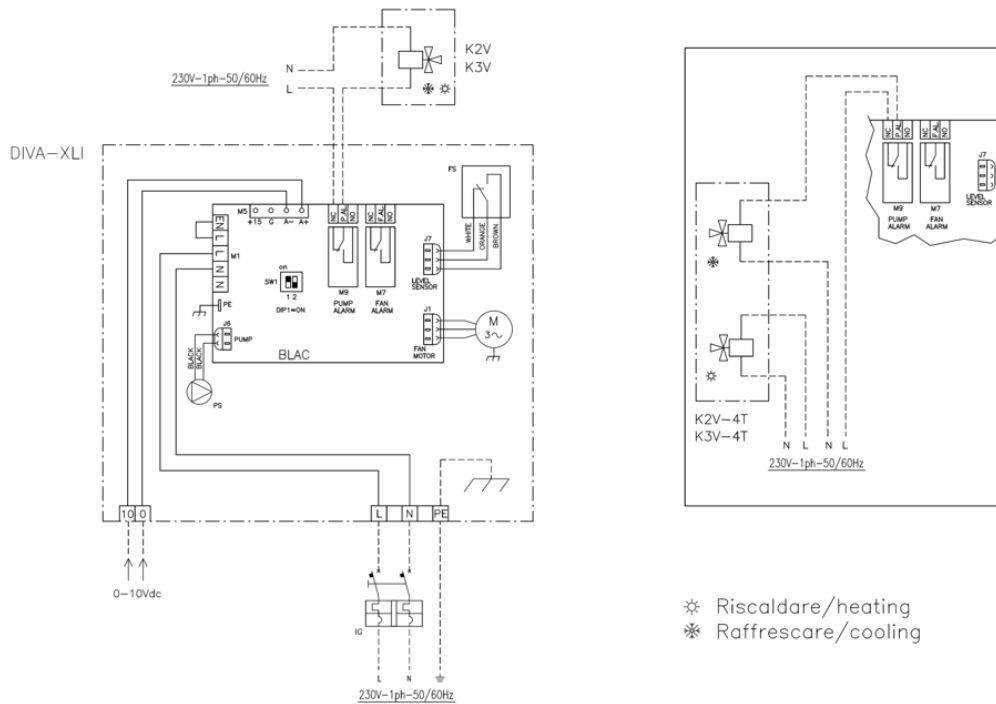
## 9. ELECTRICAL CONTROL BOARD

Electrical panel external to the unit with an electronic control board and connection terminals.

The advanced controls installed on board of CF/.. type are fixed and wired inside the same electrical panel on the side of the unit. The advanced controls supplied separately of KCF/.. type can also be secured at a distance from the unit. The fixing and wiring is carried out by the installer.

## 10. COUPLED WIRING DIAGRAMS

### DIVA-XLI electrical connection



	Manufacturer wiring
- - - - -	Installer wiring
FS	Safety float micro
M	Unit fan motor
PS	Drain pump
L	Line phase
N	Neutral

#### Fan command signal

- 0 Vdc = Fan OFF
- >1 Vdc = Fan ON
- 10 Vdc = Maximum speed

#### Blac ECM board

- Impedance referred to the signal input circuit 0÷10Vdc = 96kOhm

#### Note

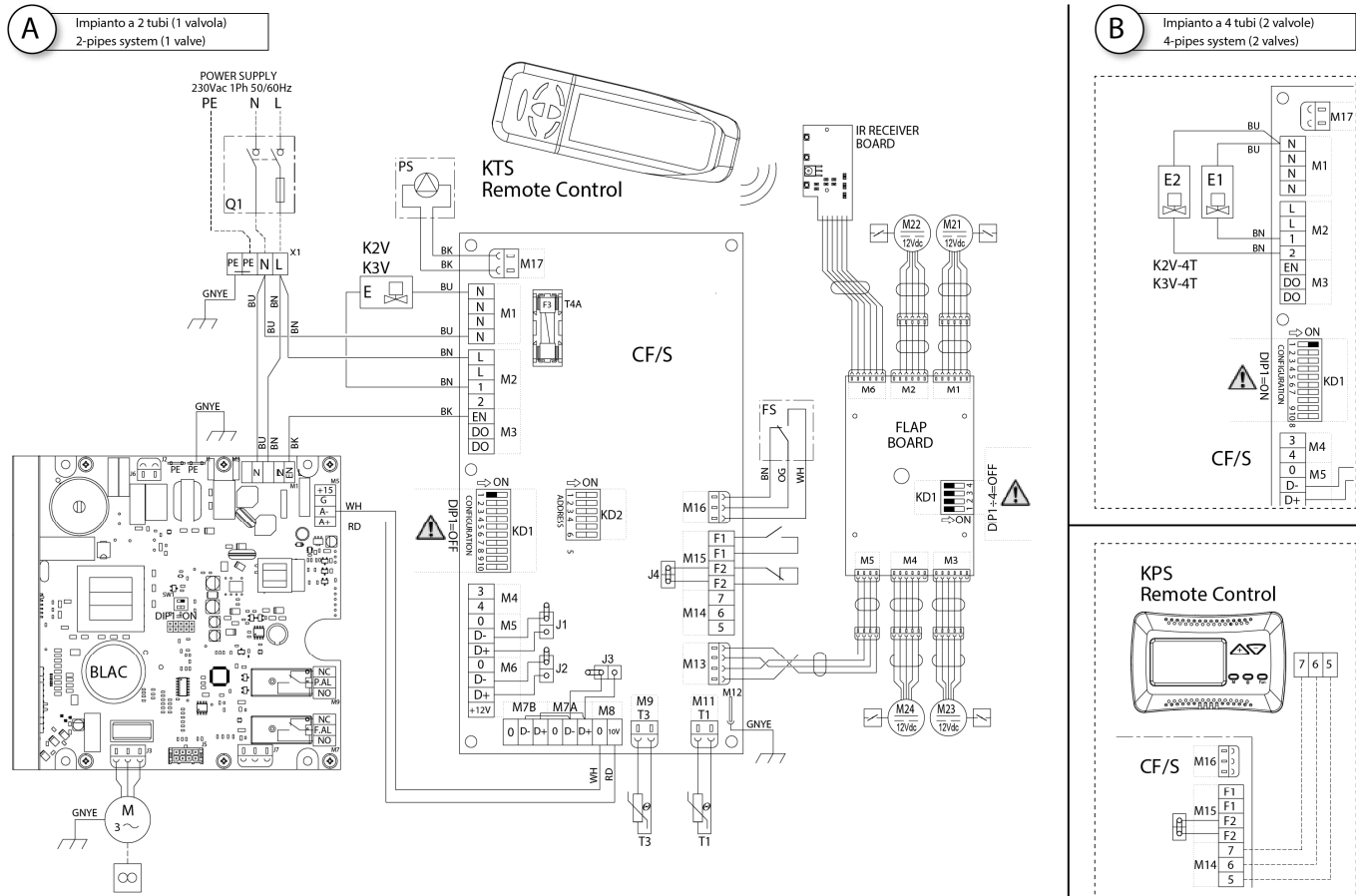
When designing and sizing the power line and protection systems for units with a brushless EC Inverter-type and DIVA-XLI type of synchronous motor, pay attention to the leakage current values to earth as they are higher than traditional units with an asynchronous motor.

It is always advisable to install the units with specific residual current protection.

The DIVA-XLI units with a brushless EC Inverter-type of synchronous motor, conform to the limits stipulated in standard IEC-EN 60335 with a maximum dispersion that is less than the limit value of 3.5 mA, which is permissible and imposed by the standard.



# DIVA-XLI SWING electrical connection



	Manufacturer wiring
- - - - -	Installer wiring
CF/S	SWING control
KTS	Remote control
KPS	Control panel
IR	Remote control receiver
FS	Safety float micro
M	Unit fan motor
PS	Drain pump
L	Line phase
N	Neutral

**Note**

When designing and sizing the power line and protection systems for units with a brushless EC Inverter-type and DIVA-XLI type of synchronous motor, pay attention to the leakage current values to earth as they are higher than traditional units with an asynchronous motor. It is always advisable to install the units with specific residual current protection.

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