



LVD Unit Heater, TEMPER<sup>®</sup>

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# LVDV Unit Heater



## Product Description

The type LVDV fan-assisted unit heaters are designed for space heating in shop entrances, lobbies, doorways, warehouses and workshops, garages and similar premises. The unit is designed for mounting beneath a ceiling. Hot water is used as the heating medium.

All units comply with EU requirements on machinery safety, 91/368/EEC.

The fan-assisted unit heater:

- is made of galvanised sheet steel, painted white
- has low overall height, short or long throw – can thus be fitted in premises with various ceiling heights
- can be fitted with an air discharge device to increase the throw
- is easy to clean; simple to service
- can easily be mounted against the ceiling or suspended from it.

The LVDV incorporates a quiet fan impeller and flange motor to IEC Publ. 34-1, available in two versions:

- Single-phase, 230 V, with thermostatic contacts in the motor -winding, reconnectable for three speeds, factory-wired for running at high speed
- 3-phase, 400 V, 4-pole or 6-pole motor.

Both motors have degree of protection IP 54.

## Materials and Finish

Unit casing: Made of galvanised sheet steel, painted white (RAL 9010). On delivery, the white-painted surfaces are covered with protective transparent plastic foil.

Heating coil: Finned coil consisting of aluminium fins and copper tubes. Brass connections. kopparrör.

Impeller: Axial-flow impeller made of aluminium and sheet steel.

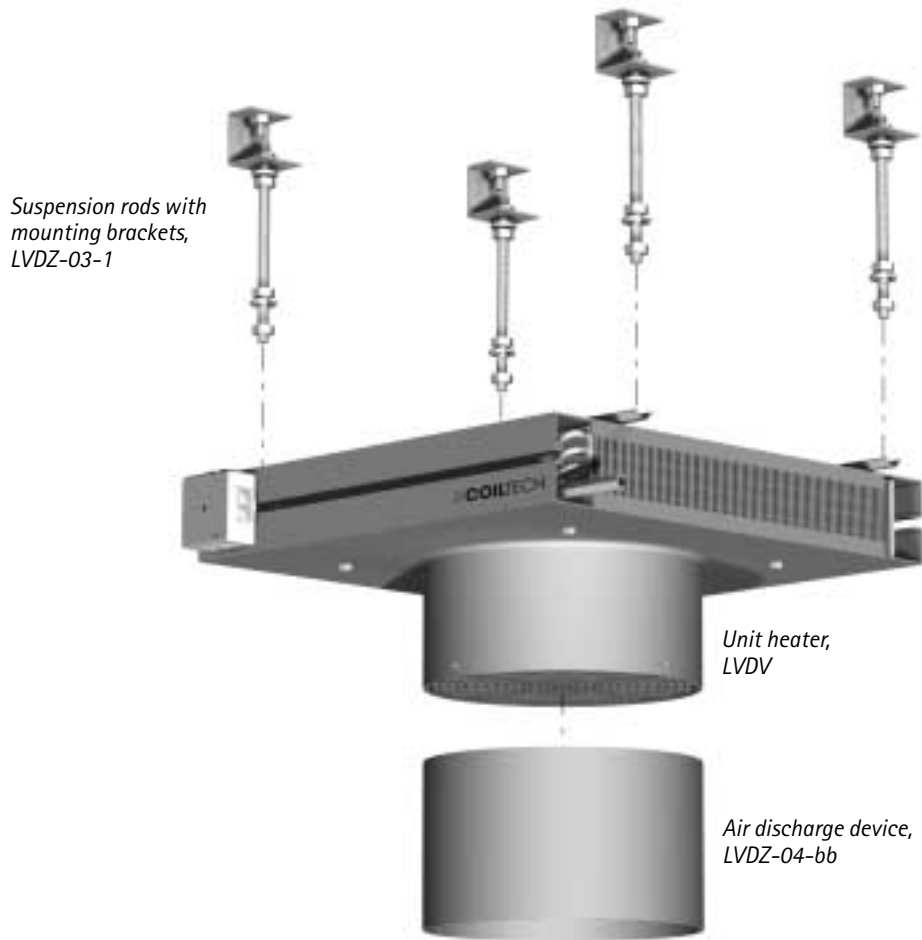
## Packaging

The unit heater and its accessories are delivered in corrugated cardboard cartons.

CE labelled.



# Unit Heaters – Product Overview



# Accessories and Control Equipment



Automatic fan control,  
simple, FHC  
LVDZ-15-4 1 x 230 V, 2A



Automatic fan control,  
simple, FHC  
LVDZ-34-1 3 x 400 V



Automatic unit heater control,  
advanced, ATC  
LVDZ-29-1 1 x 230 V, 9A



Automatic unit heater control,  
advanced, ATC  
LVDZ-33-1 1 x 230 V, 2A



Speed selector switch,  
LVDZ-14-1



Valve with thermal actuator,  
LVDZ-17-3



Valve with actuator,  
quick-action,  
LVDZ-17-4



Room thermostat for  
Fan operation, IP 30,  
LVDZ-18-3



Room thermostat for fan  
operation, IP 65,  
LVDZ-19-3



Remote control for ATC,  
LVDZ-21-3  
LVDZ-21-4



Timer for ATC,  
LVDZ-22-3



Speed selector switch, 2A,  
LVDZ-24-3



Transformer, 2A,  
LVDZ-25-3



Speed selector switch, 9 A  
LVDZ-28-1



Junction box,  
(included in unit heater order)  
LVDZ-30-1



Temperature sensor,  
RG Humidity,  
LVDZ-35-1  
LVDZ-35-2



Remote control unit,  
infrared,  
LVDZ-36-1



Auxiliary module,  
network connection,  
LVDZ-37-1

# Installation Packages

To make the task of selecting control equipment easier, we have produced ready-to use package solutions for the most common control options. You can of course combine whichever installation package you choose with other accessories. See the Installation Examples Section in this catalogue.

The components that make up the various installation packages are also sold as separate accessories.

## Applications

**A-Box** – entrances, gateways, warehouses, garages.

**B-Box** – entrances, workshops, shopping centres, sport centres

**C-Box** – same as B-Box but where higher demands, such as night-time temperature reduction, alarms, network connection or microprocessor substation

(0-10 V) control, must be satisfied.

## Survey – Components of the boxes

<i>Unit – control accessories</i>	<i>A-Box</i>	<i>B-Box</i>	<i>C-Box</i>
<i>Unit heater</i>	x	x	x
<i>Junction box</i>	x	x	-
<i>Room thermostat</i>	x	-	-
<i>Automatic fan control, FHC, simple</i>	-	x	-
<i>Automatic unit heater control, ATC, advanced</i>	-	-	x
<i>Temperature sensor</i>	-	x	x
<i>Liquid valve</i>	x	x	x
<i>Documentation</i>	x	x	x

*x = included*

## Survey – Functions

<i>A-Box</i>	<i>Temperature-controlled airflow control, on/off, with liquid valve, on/off..</i>
<i>B-Box</i>	<i>Temperature-controlled airflow control in 3 steps or switched-off position with liquid valve, on/off.</i>
<i>C-Box</i>	<i>Temperature-controlled airflow control in 3 steps or switched-off position with liquid valve, on/off. With provision for timer control. 0-10 V control, remote control, network connection, alarm output. Control with 2A, LVDZ-33-1, for max: 1 type LVDV-40-1 1 type LVDV-50-1</i>

# Installation Packages

Without Control Equipment, contains:



Complete delivery unit consisting of unit heater, junction box and instructions.

1 st Unit heater  
aa = size of air heater, 40, 50.

LVDV-aa-1

1 Instruction manual  
Installation, operation and maintenance instructions.

## Ordering Example

Unit heater

LVDV-aa-1-c-d

Size (aa) \_\_\_\_\_  
40, 50

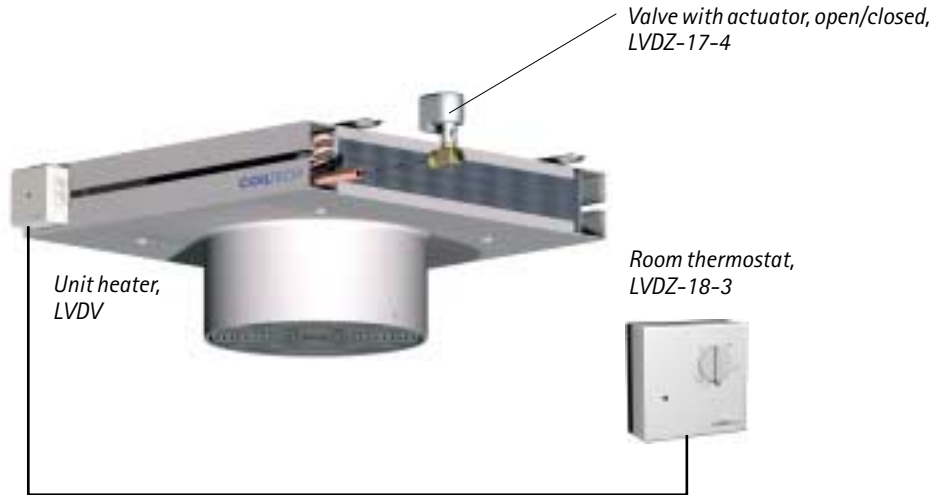
Motor (b) \_\_\_\_\_  
1 = single-phase 230 V  
4 = three-phase 400 V, 4-pol  
6 = three-phase 400 V, 6-pol

Control (c) \_\_\_\_\_  
0 = without control

Design (d) \_\_\_\_\_  
1 = 2004 -

# Installation Packages

The A-Box, contains:



Complete delivery unit consisting of unit heater, junction box appropriate accessories and instructions

**1 st Unit heater** LVDV-aa-1  
 aa = size of air heater, 40, 50.

**1 Room thermostat** LVDZ-18-3  
 IP 30, single-phase 230 V, 16 A.

**1 Valve with actuator, open/closed** LVDZ-17-4  
 IP 54, single-phase, 230 V, temperature range: 2-110 °C,  
 kvs 4.0, on/off, 10-second action.

**1 Instruction manual**  
 Installation, operation and maintenance instructions.

**Operation:**

When heating is required, the room thermostat starts the unit heater and opens the liquid valve. When the preset temperature is reached, the liquid valve closes and the fan is switched out.

**Ordering Example**

Unit heater LVDV-aa-1-A-d

Size (aa) \_\_\_\_\_  
 40, 50

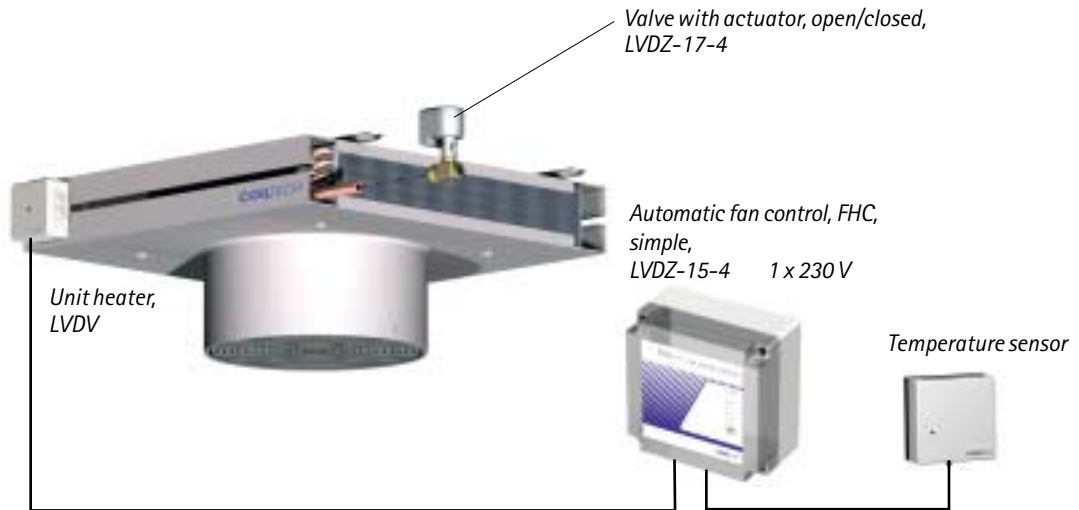
Motor (b) \_\_\_\_\_  
 1 = single-phase 230 V

Control (c) \_\_\_\_\_  
 A = The A-box

Design (d) \_\_\_\_\_  
 1 = 2004 -

# Installation Packages

The B-Box, contains:



Complete delivery unit consisting of unit heater, junction box appropriate accessories and instructions.

**1 Unit heater** **LVDV-aa-1**

aa = size of air heater, 40, 50.

**1 Automatic fan control, FHC, Simple** **LVDZ-15-4**

IP 54, 1 x 230 V, 2 A.

1 temperature sensor

**1 Valve with actuator, open/closed** **LVDZ-17-4**

IP 54, 1 x 230 V, temperature range: 2-110 °C

kvs 4.0, on/off, 10-second action.

**1 Instruction manual**

Installation, operation and maintenance instructions.

### How it operates:

When heating is needed, the liquid valve opens and the automatic fan controller, in response to signals from the temperature sensor, controls the fan to accelerate or decelerate in three fixed steps to maintain the preset temperature. When heating is no longer necessary, the

liquid valve closes and the fan is switched out. The fan speed can also be manually set at three different speed settings or be switched out.

An LED indicates when the valve is open and which functions have been selected.

For particulars of other fan speeds, see page 33.

### Ordering Example

Unit heater **LVDV-aa-1-B-d**

Size (aa) \_\_\_\_\_  
40, 50

Motor (b) \_\_\_\_\_  
1 = single-phase, 230 V

Control (c) \_\_\_\_\_  
B = The B-box

Design (d) \_\_\_\_\_  
1 = 2004 -

# Installation Packages

The C-Box, contains:



Complete delivery unit consisting of unit heater, appropriate accessories and instructions.

**1 Unit heater** LVDV-aa-1  
 aa = size of air heater, 40, 50.

**1 Automatic unit heater control, ATC, advanced, mounted on unit heater** LVDZ-33-1  
 IP 54, single-phase, 230 V, 2 A  
 1 temperature sensor.

**1 Valve with actuator, open/closed** LVDZ-17-4  
 IP 54, 1 x 230 V, temperature area 2-110 °C,  
 kvs 4.0, on/off, 10-second action.

**1 Instruction manual**  
 Installation, operation and maintenance instructions.

**How it operates:**

When heating is needed, the liquid valve opens and the automatic fan controller, in response to signals from the temperature sensor, controls the fan to accelerate or decelerate in three fixed steps to maintain the preset temperature. When heating is no longer necessary, the liquid valve closes and the fan is switched out. The preset temperature is shown in the display.

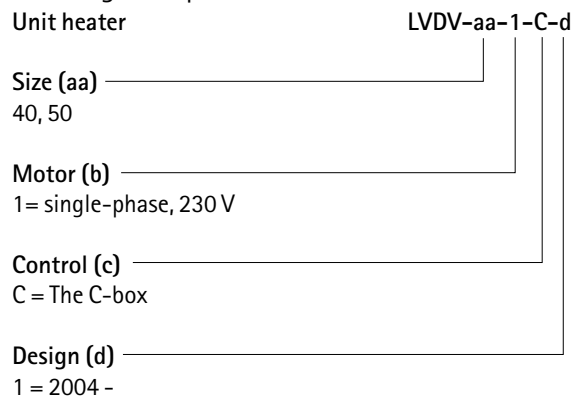
For particulars of other fan speeds, see page 33.

The control unit has provision for the following accessories:

Alarm indicator for external alarms, time switch for day/night operation, remote control via wire or infrared light and network connection.

The software for establishing a connection to a computer is included, LAN, 0-10 V signal (microprocessor substation).

**Ordering Example**



# Installation Example



Control equipment, ATC  
Valve with actuator, for the ATC

LVDZ-33-1  
LVDZ-17-3



Suspension rod set  
Air discharge device  
Speed selector switch  
Room thermostat

LVDZ-03-1  
LVDZ-04-bb  
LVDZ-14-1  
LVDZ-18-3

# Installation Example

## Speed control



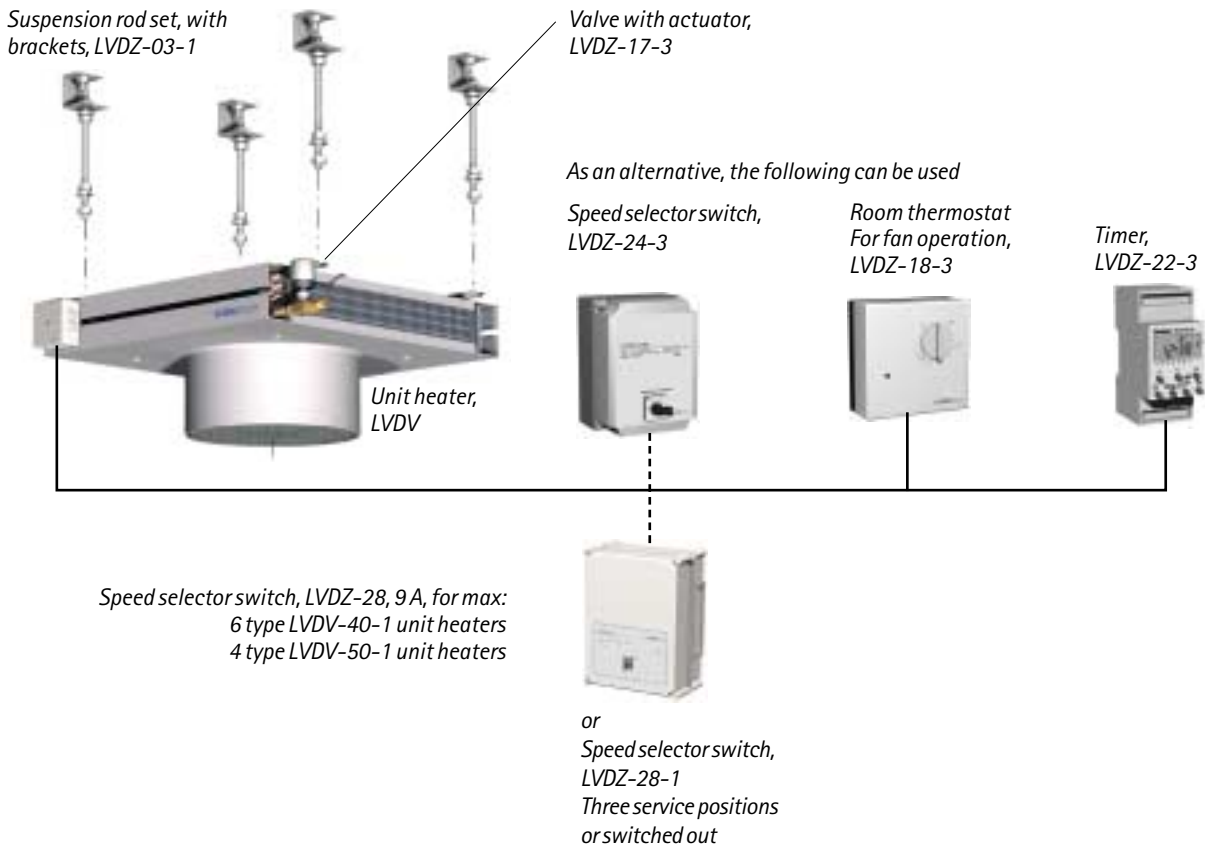
### Operation:

The manual speed selector switch LVDZ-14-1 is used for switching between high and medium speed and the shut-off position.

Voltage: single-phase, 230 V.  
Max current: 10 A.

# Installation Example

Connection options for the LVDZ-24-3 and LVDZ-28-1 speed selector switches



*Temperature-controlled airflow control, on/off, fixed speeds with nighttime temperature reduction and on/off liquid valve.*

## Operation

The speed switch is designed for use in applications where manually setting the capacity (speed) is desirable.

Switching is carried out between three preset speeds: low – medium – high, as well as switched out.

An LVDZ-17-3 valve, LVDZ-18-3 or LVDZ-19-3 room thermostat and LVDZ-22-3 timer can be wired to the switch. Simple and cost-effective control equipment for the unit heater can be obtained using the switch and one

or several accessories shown above.

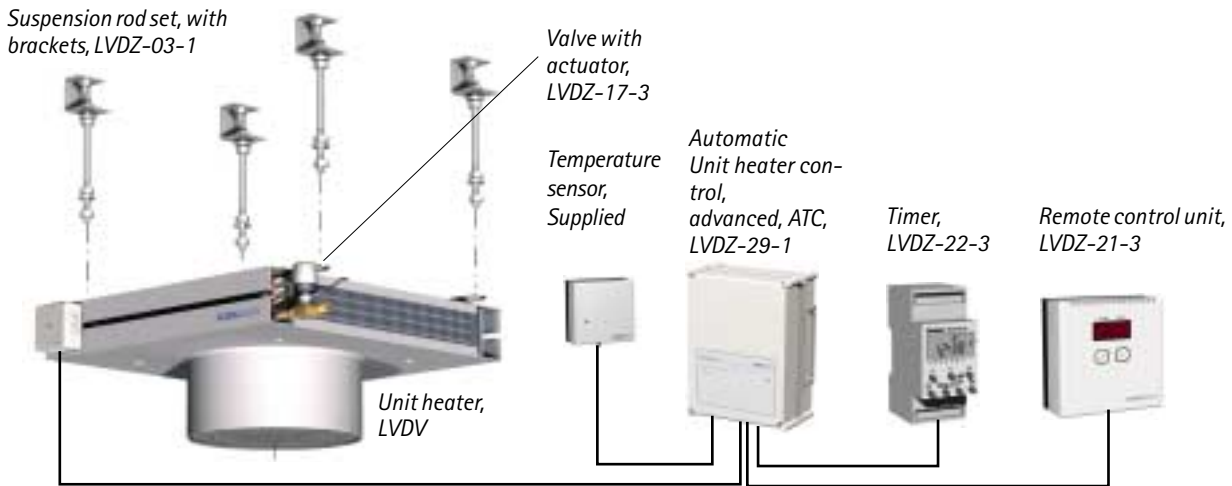
Several unit heaters can be wired to one and the same speed selector, however the total capacity must not exceed 2 A and 9A respectively. See motor data for the relevant sizes.

Voltage: single-phase, 230 V.

Optional speeds, see pages 33.

## Installation Example

Automatic Unit Heater Control, ATC, advanced, LVDZ-29-1, for several unit heaters



Automatic unit heater control, ATDZ-29-1,  
9 A, for max:  
6 type LVDV-40-1 unit heaters  
4 type LVDV-50-1 unit heaters

*Temperature-controlled airflow control of up to six air heaters with nighttime temperature reduction, remote control and on/off liquid valve.*

### Operation

The automatic unit heater control, ATC, advanced, LVDZ-29-1, regulates the speed of the unit heater motor in three preset steps in response to ambient temperature readings from the temperature sensor supplied. The desired temperature (set point) is set with the potentiometer set in the Automatic unit heater control mode. If the ambient temperature is warmer than the preset temperature, the control system reduces the speed step by step and when no heating is needed, it shuts off the fan motor. If the ambient temperature is lower than the preset temperature, the controller increases the speed step by step and the capacity as well.

A Timer (LVDZ-22-3) can be wired to the ATC for lowering the air temperature at night. Desired "night temperature" can then be set by means of another potentiometer in the Automatic temperature control system.

Automatic temperature control system can also be controlled in response to a 0-10 V signal. Remote control is available as an accessory (LVDZ-21-3).

A separate water valve with thermal actuator (LVDZ-17-3) can be connected to the Automatic temperature control system. When the desired air temperature has been reached and the fan has stopped, the valve closes and shuts off water flow.

When the air temperature drops and the fan starts, the valve opens again. In the event of a power failure, the valve will open.

**CAUTION!** External solenoid valves must not be connected to the Automatic temperature control system because a surge of current is likely to occur when they are switched on.

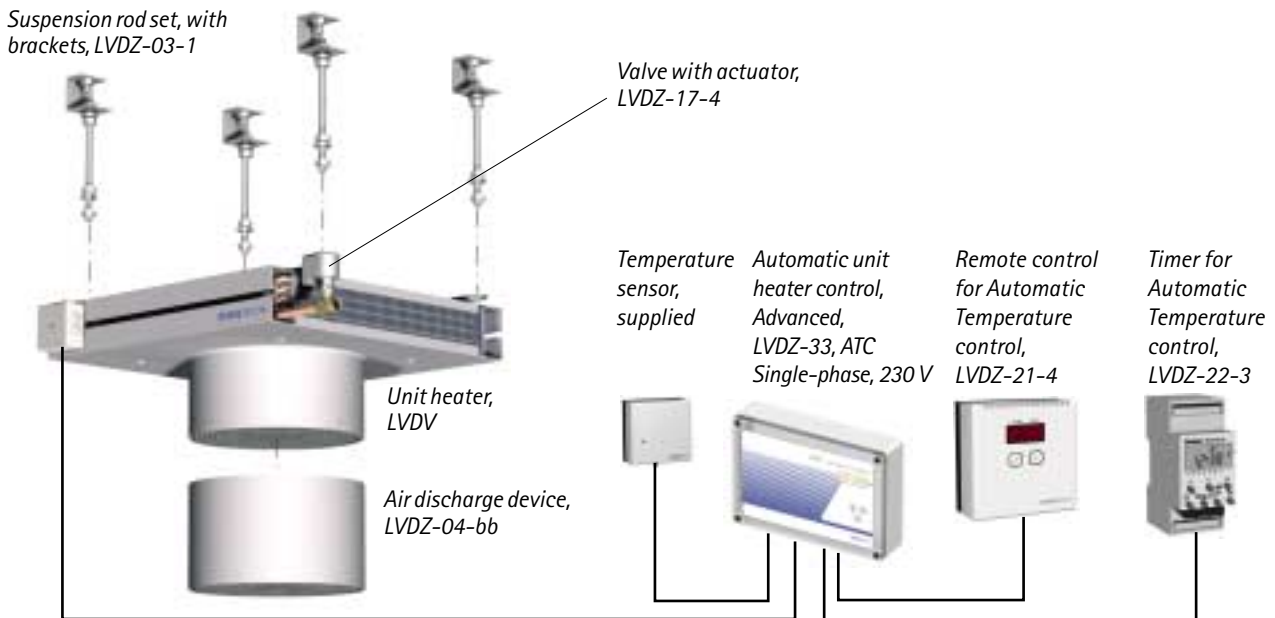
The Automatic temperature control system is tested to establish its electromagnetic compatibility (EMC) in accordance with

SS-EN 50081-1 and EMC-immunity in accordance with SS-EN 50082-2.

For particulars of alternative speeds, see page 33.

# Installation Example

## Speed control, advanced



*Temperature-controlled airflow regulation in three steps, with nighttime temperature reduction, remote control and on/off liquid valve.*

## Operation:

### Operation:

When heating is needed, the liquid valve (LVDZ-17-4) opens and the automatic fan control system, in response to signals from the temperature sensor, controls the fan to accelerate or decelerate in three fixed steps to maintain the preset temperature. When heating is no longer necessary, the liquid valve closes and the fan stops. The temperature can be preset by means of buttons on the cover. If the ventilation system is equipped with a timer for an optional temperature, that temperature can also be preset.

The control system can be supplemented with remote control across a cable (LVDZ-21-4 or a remote infrared unit LVDZ-36). Then the fan can control the speed in the automatic mode or three fixed speeds 1,2,3 or stop the fan in 0 position.

The control system has provision for control by means of a 0-10 V signal from a microprocessor substation, or a LAN network control.

An external fault alarm signal input can be wired to the control system.

For particulars of alternative speeds, see page 33.

## Accessories for the Unit Heater

Suspension rod set, with brackets,  
LVDZ-03-1  
Supplied in sets of 4.



Air discharge device,  
LVDZ-04-bb

To direct the air flow and provide a longer throw.  
Remove the safety guard from the unit heater and fit it to the  
air discharge device.



## Accessories and Control Equipment

### Automatic fan control, simple, FHC-1, LVDZ-15-4

Included in the B-Box Installation Package.

The speed control system (LVDZ-15-4) automatically controls the fan speed in three steps depending on the heating load and switches out the fan when heating is no longer required.

The automatic fan control system also controls the liquid valve (LVDZ-17-3, LVDZ-17-4) between the open and closed positions. The desired temperature can be set on the potentiometer inside the cubicle. The temperature sensor (supplied separately) is included. The fan speed can be manually set to three positions, or stopped by pressing the touch pads on the cover panel. An LED indicates when the valve is open.

Detailed technical description of the control system: When the ambient air temperature is 0.4 °C below the set point setting, the fan starts at the lowest preset speed. At 0.5 °C below the set point, the connected water valve opens. At 1.5 °C below the preset set point, the fan switches over to the medium speed.

At 2.5 °C below preset set point the fan switches over to the maximum speed setting.

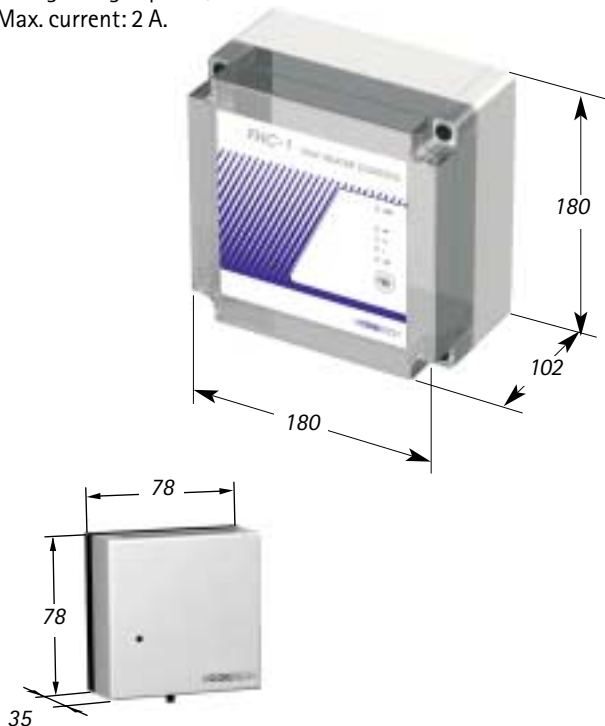
The automatic fan control system is delivered as a loose accessory.

The automatic fan control system has degree of protection IP 54.

The temperature sensor has IP 30.

Voltage: single-phase, 230 V.

Max. current: 2 A.



### Automatic fan control, simple, FHC-3, LVDZ-34-1

The speed control system (LVDZ-34) automatically controls the fan speed in three steps depending on the heating load and switches out the fan when heating is no longer required.

Automatic fan control system also controls the liquid valve (LVDZ-17-3, LVDZ-17-4) between the open and closed positions. The desired temperature can be set on the potentiometer inside the cubicle. The temperature sensor (supplied separately) is included. The fan speed can be manually set to three positions, or stopped by pressing the touch pads on the cover panel. An LED indicates when the valve is open.

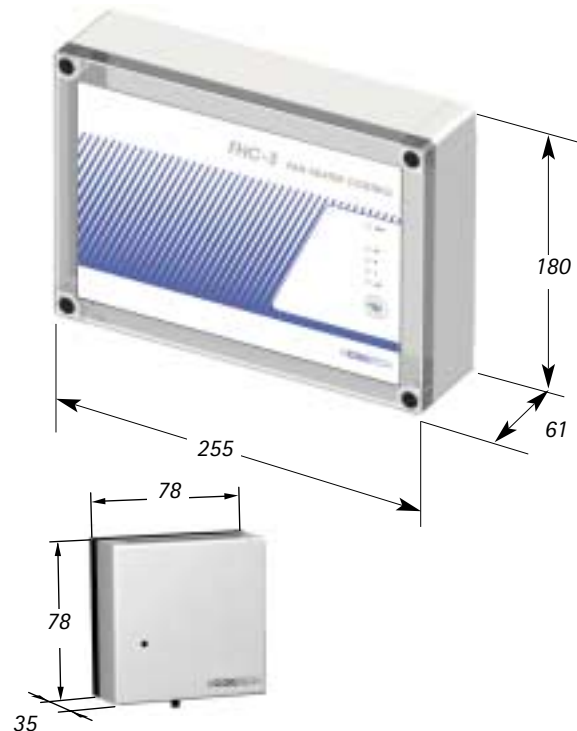
The automatic fan control system is delivered as a loose accessory.

The automatic fan control system has degree of protection IP 54.

The temperature sensor has IP 30.

Voltage: 3-phase, 400V.

Max. current: 2 A.



## Control Equipment Accessories

### Automatic unit heater control, ATC, LVDZ-29-1

Used for controlling max. 6 unit heaters within one zone. The automatic unit heater control system regulates the voltage supplied to the motor to regulate the fan speed in three preset steps in response to ambient temperature readings from the temperature sensor supplied. When heating is no longer required, the fan motor is switched off. A timer (LVDZ-22-3) can be connected to automatic unit heater control for lowering the air temperature at night. The automatic unit heater control system can also be controlled in response to a 0-10V signal. Remote control (LVDZ-21-3) is available as an accessory. A separate water valve (LVDZ-17-3) with thermal actuator motor, open/closed, can be connected to Automatic unit heater control system.

NB! An external solenoid valve must not be connected to the automatic temperature control system.

The Automatic temperature regulation system is tested to establish its electromagnetic compatibility (EMC) in accordance with EN 50081-1 and EMC-immunity in accordance with EN 50082-2 Standards.

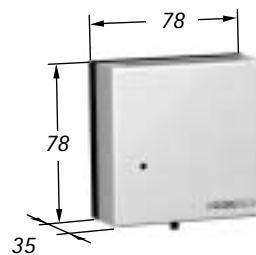
The ATC Automatic unit heater control system, to IP 54, is supplied separately and with separate temperature sensor.

For particulars of connection options, see the relevant installation example.

The temperature sensor is supplied loose, IP 30.

Voltage: single-phase, 230V.

Max. current: 9 A.



## Accessories and Control Equipment

### Automatic unit heater control, ATC, LVDZ-33-1

Included in the C-Box installation package

The unit heater control system (LVDZ-33-1) automatically controls the fan speed in three steps depending on the heating load and switches out the fan when heating is no longer necessary. The control system also controls the liquid valve (LVDZ-17-3 or LVDZ-17-4) between the open and closed positions. The desired temperature can be set by pressing buttons on the top panel, if the controller is to control to an alternative temperature across a timer (LVDZ-22) that temperature should also be preset.

Detailed technical regulation description: When the ambient air temperature is 0.4 °C below the preset set point, the fan starts at the lowest preset speed.

At 0.5 °C below the preset set point, the connected water valve opens. At 1.5 °C below the preset set point, the fan switches over to the medium speed. At 2.5 °C below preset set point the fan changes over to the highest preset speed. The corresponding 1-10V signal strengths are: 1.5V-2V-5V-8V.

Remote control via cable (LVDZ-21-3) and remote control via infrared communication (LVDZ-36) are available as accessories.

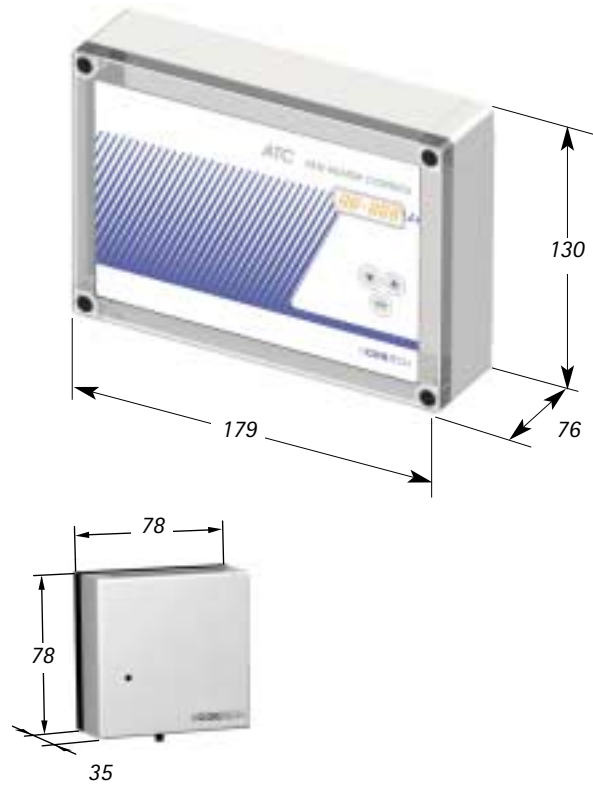
The speed control system can be controlled in response to a 0-10 V signal (from a microprocessor substation) or via a LAN network connection (Auxiliary Module LVDZ-37), further communication options are available on request. An unlimited number of speed controllers can be connected in series via cables with modular jack. The control system has an output for one external fault alarm signal. The preset temperature is shown in a display.

The automatic unit heater control system, ATC, is supplied mounted on the unit heater and has degree of protection IP 54.

The temperature sensor is supplied loose, IP 30.

Voltage: single-phase, 230 V.

Max. current: 2 A.



## Accessories and Control Equipment

### Speed selector switch

#### LVDZ-14-1

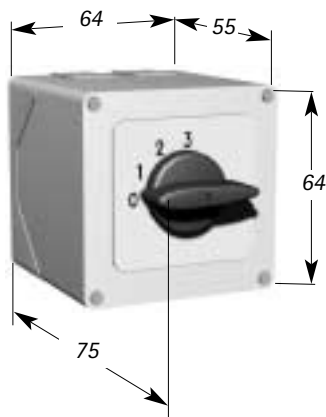
For manual switching from high to medium speed, low and switching out.

Plastic casing for wall-mounting.

Degree of protection: IP 42

Voltage: single-phase, 230 V.

Max current: 10 A.



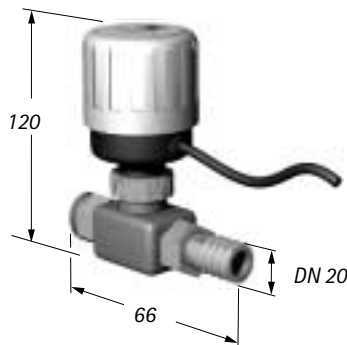
### Valve with thermal actuator, for water, open/closed, LVDZ-17-3

LVDZ-15-4, LVDZ-24-3, LVDZ-18-3, LVDZ-19-3, LVDZ-25-3, LVDZ-29, LVDZ-33, or LVDZ-34. The valve opens/closes the circuit. The valve housing is made of red brass. Temperature range: 2 – 110 °C, kvs 4.0. Thermal actuator. Dead (non-energised) valve is open. Max. permissible ambient temperature: 50 °C. Adapters for fitting to relevant water connection are supplied. Threaded pipe connection for further pipe routing.

Length of cable: 1.5 m.

Degree of protection: IP 40.

Voltage: single-phase, 230 V.



### Valve with actuator, for water, open/closed, LVDZ-17-4

For use together with the following: LVDZ-15-4, LVDZ-18-3, LVDZ-19-3, LVDZ-33, or LVDZ-34.

The valve opens/closes the liquid circuit.

Valve housing is made of red brass.

Temperature range: 2 – 110 °C, kvs 4.0.

Motorized valve with built-in anti-frost function.

Opening time: 10 seconds.

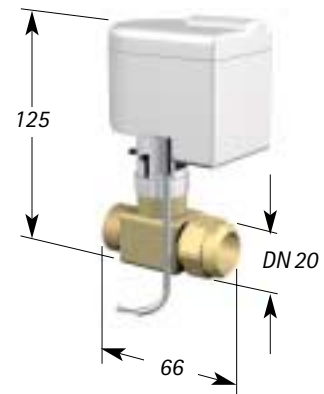
Max. permissible ambient temperature: 50 °C. Adapters for fitting to relevant water connection are supplied.

Threaded pipe connection for further pipe routing.

Length of cable: 1.5 m.

Degree of protection: IP 54.

Voltage: single-phase, 230 V.



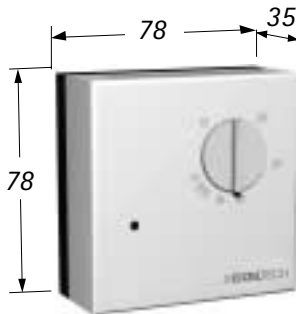
## Accessories and Control Equipment

### Room thermostat for fan operation, LVDZ-18-3

For switching in and switching out the unit heater.

The thermostat can also be connected to the LVDZ-28-1, LVDZ-24-3 and LVDZ-25-3. An LVDZ-17-3 or LVDZ-17-4 valve with motorized actuator can be connected to the thermostat. Make sure that the correct function is obtained, depending on the type of actuator.

Degree of protection: IP 30.  
Voltage: single-phase, 230 V.  
Max. current: 16 A.

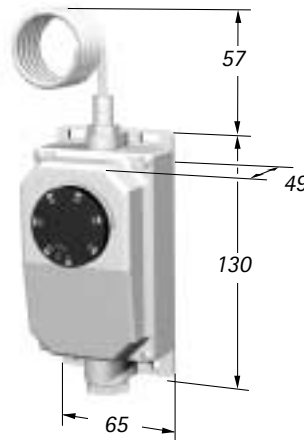


### Room thermostat for fan operation, LVDZ-19-3

For switching in and switching out the unit heater.

The thermostat can also be connected to the LVDZ-28-1, LVDZ-24-3 and LVDZ-25-3. An LVDZ-17-3 or LVDZ-17-4 valve with actuator can be connected to the thermostat. Make sure that the correct function is obtained, depending on the type of actuator.

Degree of protection: IP 65.  
Voltage: single-phase, 230 V.  
Max. current: 10 A.



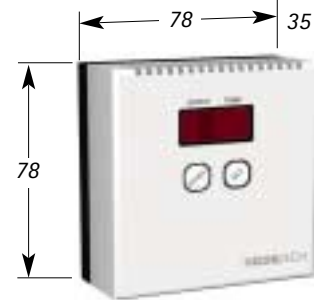
### Remote control for automatic temperature control, LVDZ-21-3 for LVDZ-29-1

### Remote control for automatic temperature control, LVDZ-21-4 for LVDZ-33-1

For remote control of the LVDZ-29 or LVDZ-33 Automatic unit heater control system. The desired set point temperature can be set on the controller. Automatic or manual operation as well as switched-off position can be selected by pressing the appropriate button. For manual operation, fixed low, medium or high fan speeds can be selected.

The set point, fan speed and temperature settings can be read in the display. A 5 m long connection cord with connector for connection to the unit heater control system is supplied. Extensions are available for lengthening the connection cord to 100 m.

Degree of protection: IP 30.

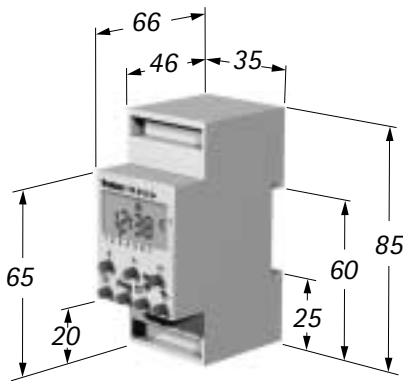


## Accessories and Control Equipment

### Timer for automatic temperature control, LVDZ-22-3

For switching between preset daytime and night time temperatures in the LVDZ-29-1/-33-1 (Automatic unit heater control). The timer enables switching to a second preset temperature in the Automatic unit heater control system. This makes it possible to obtain a lower temperature in the premises e.g. at night and during weekends to save on electric power. The timer can also be connected to the LVDZ-24-3 and LVDZ-25-3 and LVDZ-28.

Max. current: 10 A.



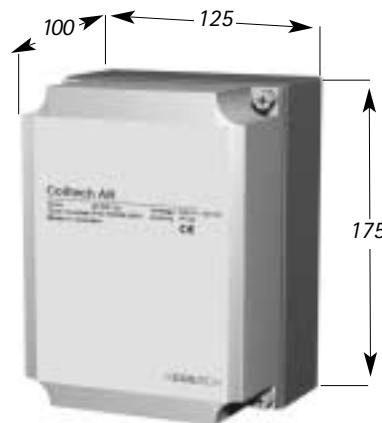
### Speed selector switch, LVDZ-24-3

For manual switching between three preset speeds, low – medium – high, as well as switched-off. The selector switch has a plastic casing and can be fitted e.g. to a wall. The switch has provision for connecting an LVDZ-17-3 valve, LVDZ-18-3 or LVDZ-19-3 room thermostat and an LVDZ-22-3 timer. For particulars of the connection options, see the appropriate installation example.

Degree of protection: IP 54.

Voltage: single-phase, 230 V.

Max. current: 2 A.



### Transformer, LVDZ-25-3

For obtaining a lower fixed speed than the factory-preset speed.

If current is to be supplied to several unit heaters, select the ATDZ-28-1.

The transformer has a plastic casing.

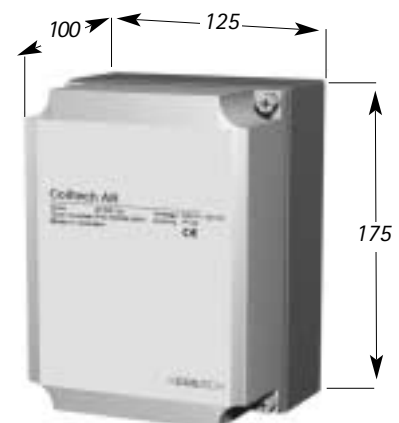
The transformer has provision for connecting an LVDZ-17-3 or LVDZ-17-4 valve, LVDZ-18-3 or LVDZ-19-3 room thermostat and an LVDZ-22-3 timer.

For particulars of the connection options, see the appropriate installation example.

Degree of protection: IP 54.

Voltage: single-phase, 230 V.

Max. current: 2 A.



## Accessories and Control Equipment

### Speed selector switch, LVDZ-28-1

For obtaining a lower fixed speed than the factory-preset speed, for max. 6 unit heaters. The transformer has a plastic casing. Has provision for connecting an LVDZ-17-3 valve, LVDZ-18-3 or LVDZ-19-3 room thermostat and an LVDZ-22-3 timer to the transformer.

For particulars of the connection options, see the appropriate installation example.

Degree of protection: IP 54.

Voltage: single-phase, 230 V.

Max. current: 9 A.



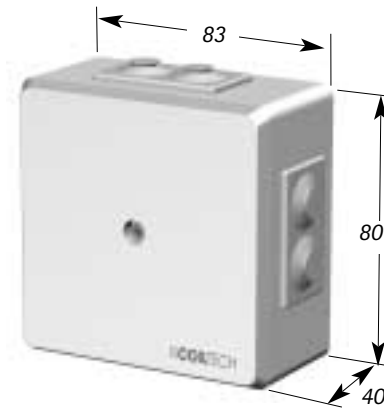
### Junction box, LVDZ-30-1

Junction box for arranging the electrical wiring to the unit heater.

Junction box is supplied fitted to the unit and is included in unit heater order.

Degree of protection: IP 44.

Voltage: single-phase, 230 V.



### Temperature sensor, RG humidity,

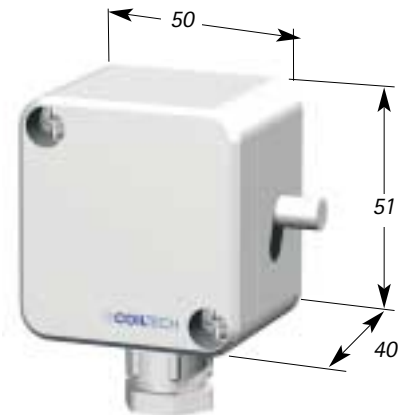
### LVDZ-35-1, LVDZ-35-2

Temperature sensor for humid environments. Can be used instead of the temperature sensor supplied on the following control systems, if needed:

If the ATC LVDZ-29 Automatic unit heater control is used, specify the LVDZ-35-1.

If some other Automatic fan/unit heater control is used, specify the LVDZ-35-2.

Degree of protection: IP 54.



## Accessories and Control Equipment

### Remote control, infrared, LVDZ-36-1

Battery-powered control unit including wall mounting bracket for remote control of the LVDZ-33-1 Automatic unit heater control. The desired set point is preset on the control unit. Automatic or manual operation and switched-off position can be selected by pressing the appropriate button. If the unit heater is to be operated manually, fixed low, medium or high fan speed can be selected. The preset temperature set point, fan speed and present temperature can be read in the display.

Degree of protection: IP 30.



### Auxiliary module for network connection, LVDZ-37-1

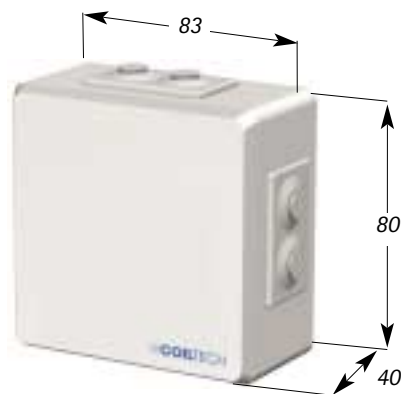
Automatic unit heater control, ATC, can be individually remote-controlled or controlled in a group.

All the settings can be read and altered.

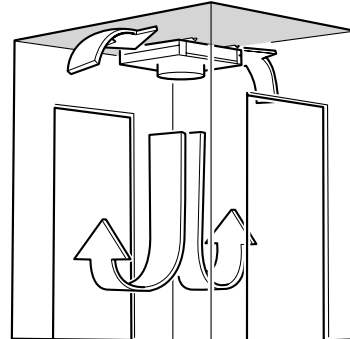
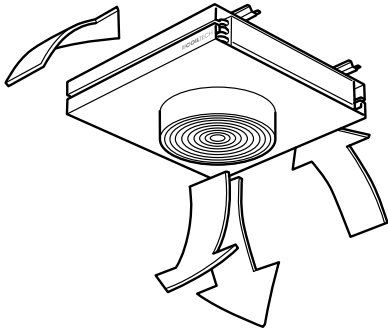
If several ATC Automatic unit heater control units are to be controlled from a master system, the module has a universal interface for other communication programs, such as Modbus, Profibus and RS 485.

Operating voltage: 10-30 V.

A quotation will be submitted on request.



# Sizing



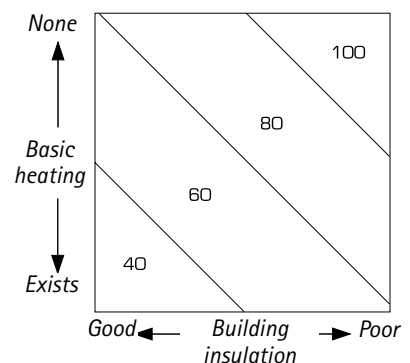
## Example 1. Workshop Halls, Warehouses

- 1. Start by measuring the floor surface of the premises.**  
Assume a warehouse with a floor surface of  $10\text{ m} \times 24\text{ m} = 240\text{ m}^2$ .
- 2. Then estimate the ceiling height.**  
For our example, we estimate a ceiling height of 4 m, which means that we can use the chart on the next page.
- 3. Then estimate the nature of the building and the type of heating used.**  
The warehouse is relatively new with good insulation, but totally lacks basic heating. Select  $80\text{ W/m}^2$  from the chart below.
- 4. Estimate the capacity required.**  
In this case, the capacity required will be  $240 \times 80 = 19.2\text{ kW}$ . Select the number of unit heaters needed. As a rule of thumb, each unit heater can heat  $100\text{ m}^2$  ( $10\text{ m} \times 10\text{ m}$ ). In this case, 3 units are therefore needed. We then will have 6.4 kW per unit heater.
- 5. Then plot the appropriate water temperature and inlet air temperature in the relevant table for heating on pages 26 and 28.**  
We intend to use  $55\text{--}35\text{ }^\circ\text{C}$  water, and maintain about  $20\text{ }^\circ\text{C}$  in the premises.  
We select three LVDV-40-1 units, which, at the given values, will each provide 6.5 kW operating at 900 r/min and meet our requirements. A total capacity of 19.5 kW.
- 6. Motor.**  
We select a single-phase, 230 V motor for simple installation. Should boosted capacity be required, the motor can easily be re-switched to a higher speed.
- 7. Select accessories required.**  
We included three LVDZ-04-40 discharge air devices to ensure that the discharged warm air will reach the lower occupied zone. We also select one LVDZ-18-3 room thermostat per air heater for maintaining uniform temperature in the premises.  
Our purchase list will then be:  
Three LVDV-40-1  
Three LVDZ-04-40  
Three LVDZ-18-3

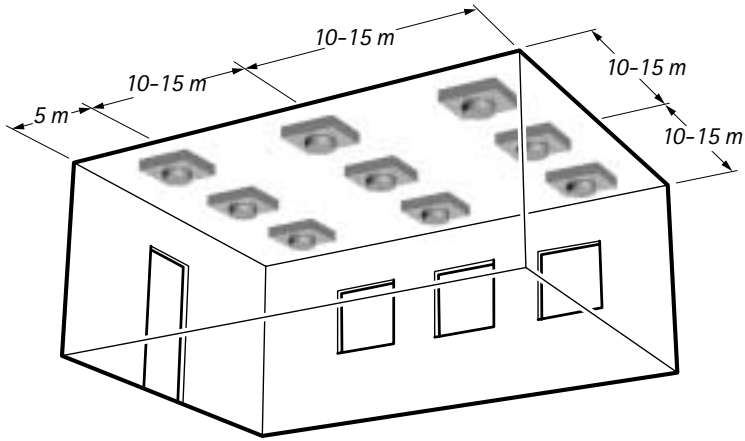
## Example 2. Shop Entrances, Doorways

- 1. Start by measuring the volume of the entrance.**  
Assume an entrance with a floor surface of  $3\text{ m} \times 4\text{ m}$  and a  $3\text{ m} \times 4\text{ m} \times 3\text{ m} = 36\text{ m}^3$
- 2. Then use the key figure  $200\text{ W/m}^3$  to calculate the capacity required**  
The capacity required will then be  $36 \times 200 = 7.2\text{ kW}$ .
- 3. Then plot the appropriate water temperature in the table on page 28, and read the capacity at an inlet air temperature of  $20\text{ }^\circ\text{C}$ , which is advisable.**  
In this case, we will use  $70\text{--}40\text{ }^\circ\text{C}$  water.
- 4. The size of unit and the fan motor speed can be obtained from the table.**  
To keep the sound level low, 700 or 900 r/min is advisable.  
We select a size 40 unit with the fan motor operating at 670 r/min which provides 7.9 kW.
- 5. Motor.**  
We select a single-phase, 230 V motor for simple installation. Should boosted capacity be required, the motor can easily be re-switched to a higher speed.
- 6. Select the accessories required.**  
We intend to mount the air unit in the ceiling and therefore need a suspension rod set.  
Our purchase list will then be:  
One LVDV-40-1  
One LVDZ-03

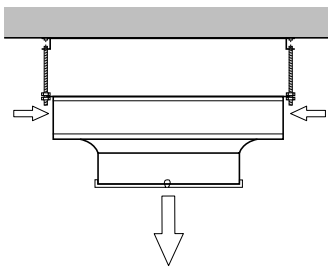
## Capacity required $\text{W/m}^2$ (max 5 m high ceiling)



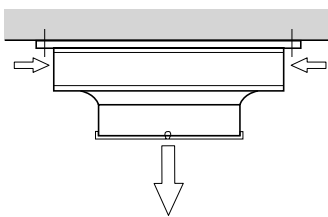
# Installation Particulars



Suspended from the ceiling on suspension rods

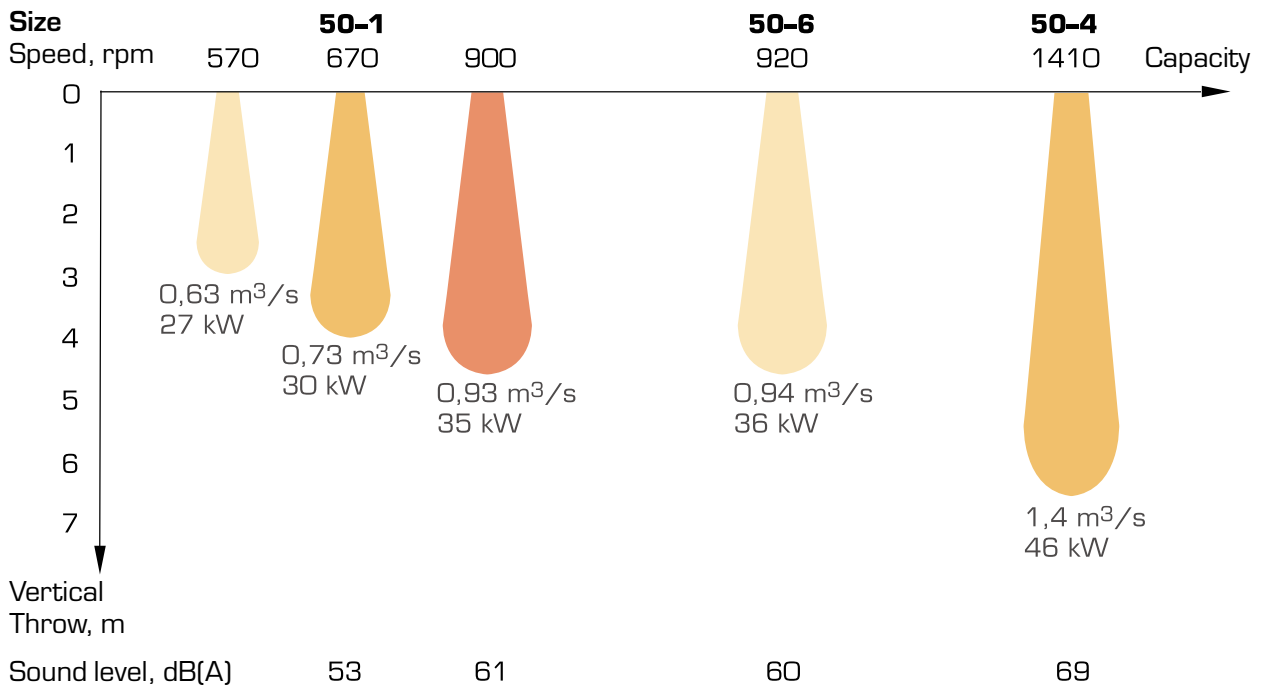
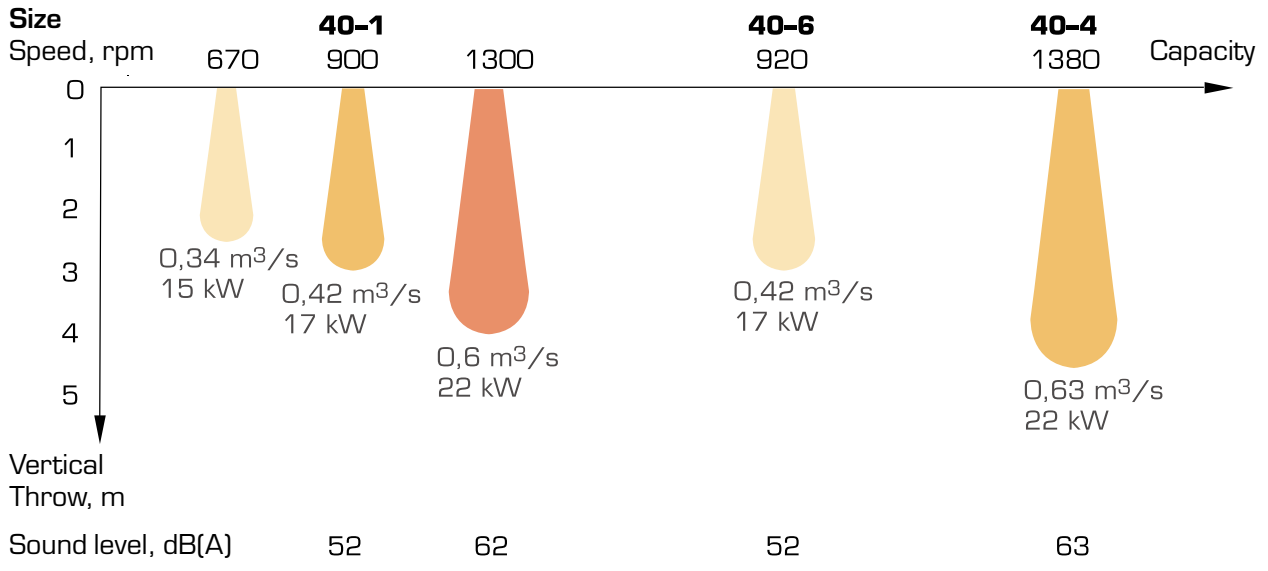


Mounting against the ceiling



# Capacity Chart

Survey Chart for Quick Selection



# Capacity table

Inlet air temperature +10 °C

Size LVDV	Speed  rpm	Air flow  m <sup>3</sup> /s	Inlet air temp. °C	Hot water											
				80–60 °C			70–40 °C			60–30 °C			55–35 °C		
				Capacity kW	Outlet Air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s
40-1	670	0,34	+10	16,0	52,9	0,19	11,1	38,4	0,09	7,8	29,5	0,06	8,8	32,2	0,11
	900	0,42		18,5	50,3	0,22	12,7	36,5	0,10	8,9	28,2	0,07	10,1	30,7	0,12
	1300	0,60		23,7	45,1	0,28	16,1	33,0	0,13	11,2	25,6	0,09	12,8	28,0	0,15
40-6	920	0,42		18,4	50,4	0,22	12,6	36,6	0,10	8,9	28,2	0,07	10,1	30,8	0,12
40-4	1380	0,63		24,2	44,6	0,29	16,4	32,6	0,13	11,4	25,4	0,09	13,1	27,8	0,16
50-1	570	0,63		29,4	53,0	0,35	20,1	38,2	0,16	14,1	29,1	0,11	16,1	32,1	0,19
	670	0,73		32,9	51,0	0,39	22,4	36,7	0,18	15,7	28,2	0,13	17,9	31,0	0,21
	900	0,93		38,8	47,7	0,46	26,2	34,4	0,21	18,3	26,4	0,15	20,9	29,2	0,25
50-6	920	0,94		39,1	47,5	0,47	26,4	34,3	0,21	18,4	26,4	0,15	21,1	29,1	0,25
50-4	1410	1,40		50,4	39,8	0,61	32,8	29,3	0,26	22,2	23,1	0,18	25,9	25,3	0,31

The temperature of the outlet hot water may vary in comparison to the lower temperature tabulated in the water temp. range above. The table is applicable to a unit heater with open air discharge. The air density at  $t_j$  has been taken into account in the calculation of the capacities (P). The calculation values for air density:

+10 °C = 1.25 kg/m<sup>3</sup>.

# Capacity table

Inlet air temperature +15°C

Size LVDV	Speed rpm	Air flow m <sup>3</sup> /s	Inlet air temp. °C	Hot water											
				80–60 °C			70–40 °C			60–30 °C			55–35 °C		
				Capacity kW	Outlet air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s
40-1	670	0,34	+15	14,6	54,2	0,17	9,5	39,5	0,08	6,1	30,2	0,05	7,3	33,4	0,09
	900	0,42		16,8	51,9	0,20	10,9	37,9	0,09	7,0	29,3	0,06	8,3	32,2	0,10
	1300	0,60		21,5	47,2	0,26	13,8	34,9	0,11	8,8	27,4	0,07	10,5	29,9	0,13
40-6	920	0,42		16,7	51,9	0,20	10,8	37,9	0,09	6,9	29,3	0,06	8,3	32,2	0,10
40-4	1380	0,63		22,0	46,7	0,26	14,1	34,6	0,11	9,0	27,2	0,07	10,8	29,7	0,13
50-1	570	0,63		26,7	54,3	0,32	17,3	39,3	0,14	10,8	29,7	0,09	13,2	33,2	0,16
	670	0,73		29,9	52,4	0,36	19,2	38,0	0,15	12,0	29,0	0,10	14,7	32,3	0,17
	900	0,93		35,3	49,5	0,42	22,6	36,2	0,18	14,2	28,0	0,11	17,3	30,9	0,21
50-6	920	0,94		35,6	49,3	0,42	22,8	36,1	0,18	14,3	27,9	0,11	17,4	30,8	0,21
50-4	1410	1,40		46,1	42,0	0,55	28,1	31,4	0,22	17,2	25,1	0,14	21,4	27,5	0,26

The temperature of the outlet hot water may vary in comparison to the lower temperature tabulated in the water temp. range above. The table is applicable to a unit heater with open air discharge. The air density at t<sub>i</sub> has been taken into account in the calculation of the capacities (P). The calculation values for air density:

$$+15\text{ °C} = 1,23\text{ kg/m}^3.$$

# Capacity table

Inlet air temperature +20°C

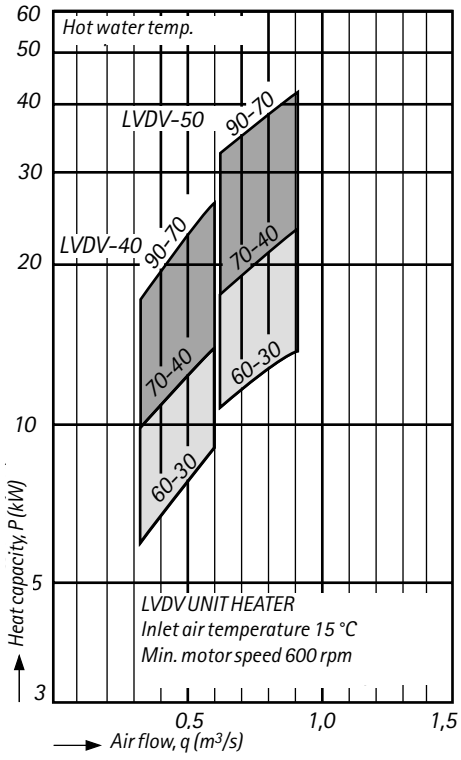
Size LVDV	Speed  rpm	Air flow  m <sup>3</sup> /s	Inlet air temp. °C	Hot water											
				80–60 °C			70–40 °C			60–30 °C			55–35 °C		
				Capacity kW	Outlet air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s	Capacity kW	Outlet air temp. °C	Water flow l/s
40-1	670	0,34	+20	13,2	55,5	0,16	7,9	40,5	0,06	4,3	30,7	0,04	5,7	34,4	0,07
	900	0,42		15,1	53,4	0,18	9,2	39,3	0,07	4,8	29,8	0,04	6,5	33,6	0,08
	1300	0,60		19,3	49,1	0,23	11,5	36,6	0,09	6,2	28,7	0,05	8,3	31,8	0,10
40-6	920	0,42		15,1	53,4	0,18	9,1	39,4	0,07	4,8	29,8	0,04	6,5	33,7	0,08
40-4	1380	0,63		19,8	48,7	0,24	11,8	36,4	0,09	6,3	28,6	0,05	8,4	31,6	0,10
50-1	570	0,63		24,1	55,6	0,29	14,3	40,2	0,11	8,3	31,4	0,07	10,3	34,2	0,12
	670	0,73		26,9	53,8	0,32	16,1	39,4	0,13	8,6	30,1	0,07	11,5	33,6	0,14
	900	0,93		31,7	51,2	0,38	18,8	37,7	0,15	9,5	28,7	0,08	13,5	32,5	0,16
50-6	920	0,94		32,0	51,0	0,38	18,9	37,6	0,15	9,6	28,7	0,08	13,6	32,5	0,16
50-4	1410	1,40		41,6	44,3	0,50	23,4	33,7	0,19	11,6	26,8	0,09	16,6	29,7	0,20

The temperature of the outlet hot water may vary in comparison to the lower temperature tabulated in the water temp. range above. The table is applicable to a unit heater with open air discharge. The air density at  $t_i$  has been taken into account in the calculation of the capacities (P). The calculation values for air density:

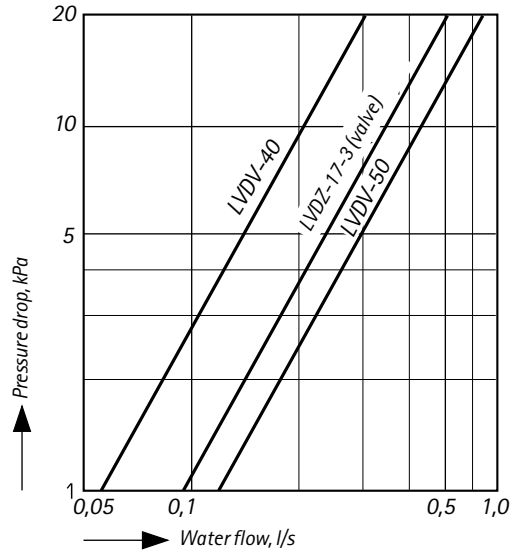
+20 °C = 1,20 kg/m<sup>3</sup>.

# Technical data

## Heat capacity



## Pressure drop on the water side



(With the valve fitted  $p_{tot} = p_{temper} + p_{valve}$ )

## Technical data

### Sound level, sound power level



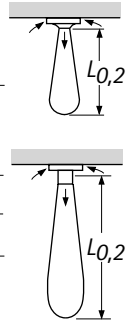
Size	Speed	Sound level, 1)	Sound power 2)	Linear sound power, dB, octave band, centre frequency, Hz							
				125	250	500	1000	2000	4000	8000	
LVDV	r/min	dB(A)	dB(A)								
40-1	670	45	63	63	64	61	59	52	46	34	
40-1	900	52	68	68	69	66	64	58	52	41	
40-1	1300	62	78	77	78	75	73	68	63	54	
40-6	920	52	68	66	69	66	63	57	51	41	
40-4	1380	63	79	80	79	76	74	69	64	56	
50-1	570	49	65	66	65	64	60	54	46	37	
50-1	670	53	69	71	69	68	65	59	51	42	
50-1	900	61	77	79	80	75	71	66	58	51	
50-6	920	60	76	78	76	75	72	66	60	52	
50-4	1410	69	85	86	84	84	80	75	71	66	

Tolerance:  $\pm 2$  dB

- 1) Sound level at a distance of 5 meters,  $Q = 2$ , absorption area = 200 m<sup>2</sup> Sabine.
- 2) Sound power in accordance with ISO 3744.

### Throw, vertical air discharge

Size aa-b	Speed r/min	Vertical throw, $L_{0,2}$	
		without LVDZ-04 m	with LVDZ-04 m
40-1	670	2,5	4,5
	900	3,0	5,5
	1300	4,0	8,0
40-6	920	3,0	5,5
40-4	1380	4,5	8,5
50-1	570	3,0	6,0
	670	3,5	7,0
	900	4,5	8,5
50-6	920	4,5	9,0
50-4	1410	6,5	12,5



The specified throw is applicable to a supply air temperature of +40°C and an indoor temperature of +18°C.

The air deflector is fitted horizontally.

The premises are completely free of disturbance from air draughts and nearby furnishings.

$L_{0,2}$  = the perpendicular distance from the unit heater to air velocity  $v = 0.2$  m/s.

## Technical data

### Motor Data

LVDV – For hot water



Code LVDV- aa-b	Speed, r/min	Rated output, kW	Rated current (A), 50 Hz	
			230 V, 1-phase	400 star
40-1	670	0,15	0,7	-
	900		1,0	
	<b>1300</b>		1,50	
40-6	920	0,18	-	0,7
	40-4 <b>1380</b>	0,18	-	0,7
50-1	570	0,17	0,7	-
	670		1,2	
	<b>900</b>		1,7	
50-6	<b>920</b>	0,18	-	0,7
50-4	1410	0,55	-	1,5

The speeds specified in bold type are for the delivery version.

### Operating Data

Max. ambient air temperature around motor = +70 °C.


Max. operating pressure 1.6 MPa.

Max. operating temp. 100 °C.

Leakage tested.

### Varvtal med spänningsstyrning

	LVDV-40-1	LVDV-50-1
230 V	1300	900
150 V	980	770
130 V	820	690
115 V	690	610
100 V	560	510
80 V	380	370

 = supplied speed

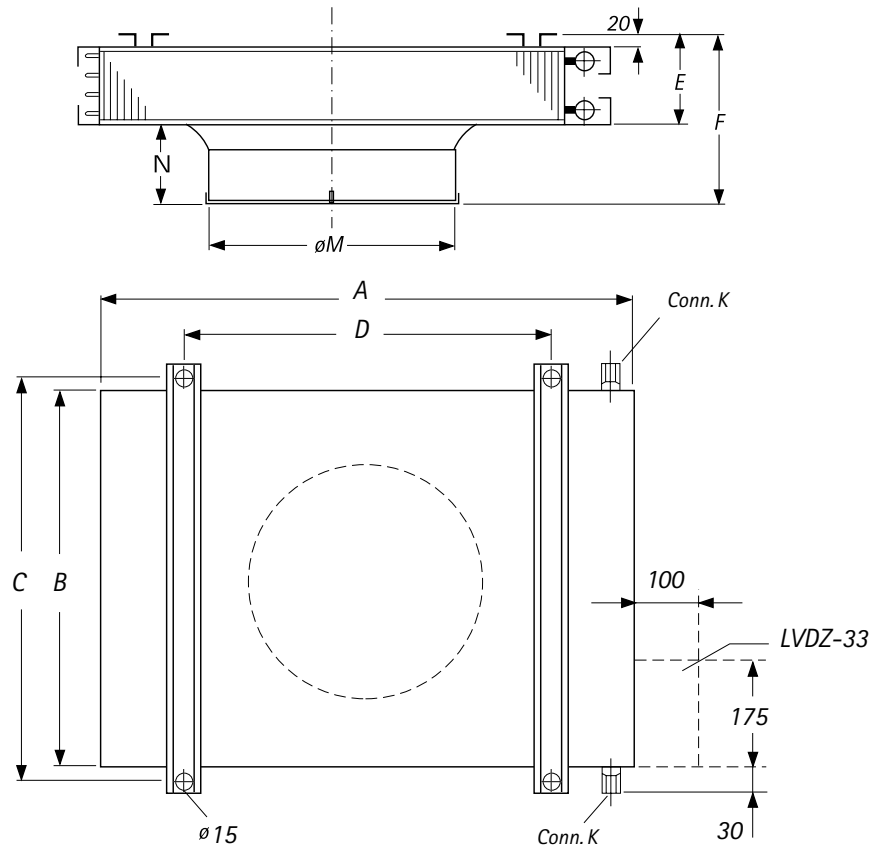
The accessories LVDZ-15-4, LVDZ-24-3, LVDZ-25-3, LVDZ-28-1, LVDZ-29-1 and LVDZ-33-1 include a transformer which, besides 230 V output current, has five lower voltages for lower speed. The LVDZ-15-4, LVDZ-29 and LVDZ-33 operate with 3 different voltages. These accessories are factory-wired making it possible to obtain the appropriate speed for each step.

The table above shows the factory-wired voltages and corresponding speed. If for some reason it is desirable to alter the speeds, this can be done by reconnecting the flexible connections on the transformer.

Detailed wiring diagrams for motors and accessories are provided in the installation, operation and maintenance instructions for the LVDV.

# Dimensions and Weights

All measurements in mm



Speed	A	B	C	D	E	F	M	N	Weight kg	Volume, litres	K. nom. pipe size
LVDV-40	930	600	635	760	155	345	406	190	31	1,6	DN20
LVDV-50	1130	700	735	960	220	380	514	160	45	3,8	DN25

# Product code

## Standard Version

### Unit Heater

LVDV-aa-b-c-d

**Size (aa)**

40, 50

**Motor (b)**

1 = single-phase, 230 V

4 = 3-phase, 400 V, 4 poles (without control, c = 0)

6 = 3-phase, 400 V, 6 poles (without control, c = 0)

**Control (c)**

0 = without control

A = The A-box

B = The B-box

C = The C-box

**Design (d)**

1 = 2004 -

## Accessories

### Suspension rod set

LVDZ-03-1

### Air discharge device

LVDZ-04-bb

**Size(bb)**

40, 50

## Control Equipment

### Installation Package for unit heater

LVDZ-a-1

**Type (a)**

A = The A-box

B = The B-box

C = The C-box

## Product code

### Control Equipment

**Automatic fan control** LVDZ-15-4  
**FHC-1, simple**  
 Including sensor to IP 30 for wall mounting.  
 Supplied separately. Single-phase, 230 V. Max 2 A.

**Automatic fan control** LVDZ-34-1  
**FHC-3, simple**  
 Including sensor to IP 30 for wall mounting.  
 Supplied separately. 3-phase, 400 V. Max 2 A.

**Automatic unit heater control** LVDZ-29-1  
**ATC, advanced**  
 Including sensor IP 30 for wall mounting  
 Supplied separately. Single-phase, 230 V. Max 9 A.

**Automatic unit heater control** LVDZ-33-1  
**ATC, advanced**  
 Including sensor to IP 30 for wall mounting.  
 Mounted on unit. Single-phase, 230 V. Max 2 A.

### Accessories for Control Equipment

**Speed switch** LVDZ-14-1

**Speed switch** LVDZ-24-3  
 Manual 3-step for single-phase, 230 V. 2 A motor.

**Speed switch** LVDZ-28-1  
 Manual 3-step for single-phase, 230 V. 9 A motor.

**Valve with thermal actuator** LVDZ-17-3  
 Open/closed. Single-phase, 230 V.

**Valve with actuator** LVDZ-17-4  
 Open/closed. Single-phase, 230 V.

**Room thermostat** LVDZ-18-3  
 On/off, single-phase, 230 V. IP 30

**Room thermostat** LVDZ-19-3  
 On/off, single-phase, 230 V. IP 65

**Remote control** LVDZ-21-3  
 for LVDZ-29-1 Automatic unit heater control.

**Remote control** LVDZ-21-4  
 for LVDZ-33-1 Automatic unit heater control.

**Remote control , infrared** LVDZ-36-1  
 for LVDZ-33-1 unit heater control

**Timer** LVDZ-22-3  
 Day/night temperature control for  
 Automatic unit heater control.

**Transformer** LVDZ-25-3  
 Lower speed: single-phase, 230 V motor.

**Connection box** LVDZ-30-1

**Temperature sensor** LVDZ-35-1  
 for LVDZ-29-1  
 Automatic unit heater regulation.  
 IP 54.

**Temperature sensor** LVDZ-35-2  
 sensor for  
 LVDZ-15-4,-33-1, -34-1 Automatic fan,  
 unit heater control  
 IP 54.

**Auxiliary module** LVDZ-37-1  
 for network LAN, LVDZ-33-1

## Product code

### Spare Parts

Fan impeller, for size 40 LVDV-99-01-5

Fan impeller, for size 50 LVDV-99-01-6

Motor for size 40 LVDV-99-02-12  
Single-phase, 230 V, 3 speeds.

Motor for size 40 LVDV-99-02-14  
3-phase, 400 V, 4 poles.

Motor for size 40 LVDV-99-02-16  
3-phase, 400 V, 6 poles.

Motor for size 50 LVDV-99-02-13  
Single-phase, 230 V, 3 speeds.

Motor for size 50 LVDV-99-02-15  
3-phase, 400 V, 6 poles.

Motor for size 50 LVDV-99-02-17  
3-phase, 400 V, 4 poles.

Safety guard, for size 40 LVDV-99-03-3

Safety guard, for size 50 LVDV-99-03-4

Heating coil, for size 40 LVDV-99-04-1

Heating coil, for size 50 LVDV-99-04-2

Temperature sensor LVDV-99-16-3  
for Automatic unit heater control  
LVDZ-29-1

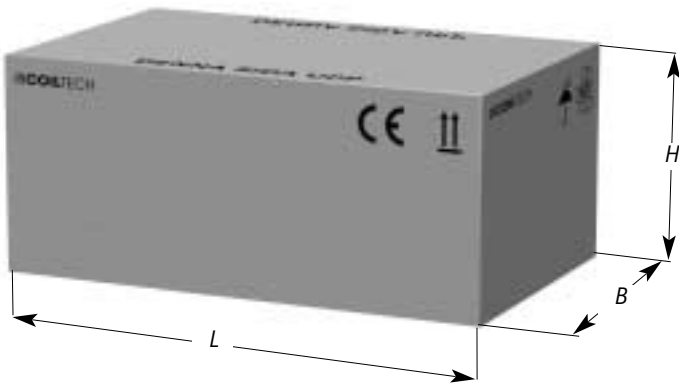
Temperature sensor LVDV-99-16-4  
for Automatic unit heater control  
LVDZ-15-4, -33-1, 34-4

## Packaging – Installation Package

The installation packages are supplied in a cardboard carton

*A, B, C-box dimensions in cm*

Size	L	B	H	Weight, kg
LVDV-40	106	70	45	36
-50	127	80	45	50





## **COILTECH**

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