



# Lindab Pascal

## Component overview

Regula Master HTML  
Regula Combi version 1.5



# Pascal component overview

## Regulation equipment

### Regula Master HTML

Regula Master HTML is a small and compact preprogrammed system controller with internal display. The display is backlit and the menus are easy accessible and controlled by pushbuttons on the front together with two LED indicators for alarm and write indication.



The software in Regula Master HTML is specially designed for the Pascal system, and contains three different set up configurations in the same standard unit:

Single Regula Master ( SRM ),  
Local Regula Master ( LRM ),  
and Global Regula Master ( GRM ).

### Regula Combi

Regula Combi is a room controller for integrated installation in products or directly on the wall. Regula Combi has a builtin temperature sensor and can use input from presence sensor, CO<sub>2</sub> sensor and an external temperature sensor. The display has indications for heating/cooling state, actual temperature and set point temperature when pressing increase/decrease buttons, and icons for the operating modes.



Regula Combi has 8 predefined programs which can be selected in the Service parameter menu in the display. Three of them are specially designed for Pascal VAV/DCV system (6, 7 and 8).

## Ceiling diffusers

### Ceiling diffuser LKP (-P)

LKP is a flush mounted square diffuser with a square unperforated face plate. LKP is suitable for horizontal supply of cooled air and has a large dynamic range.



LKP-P is with integrated presence sensor. The sensor is wired through MBV to Supply Regula Combi.

### Ceiling diffuser LCC / (-P), (-T), (-PT)

LCC is a flush mounted circular diffuser with a circular unperforated face plate. LCC is suitable for horizontal supply of cooled air and has a large dynamic range.



LCC comes in variant with integrated sensors, Presence (-P), Temperature (-T) and both (-P-T). The sensors is wired through MBV to Supply Regula Combi.

### Ceiling diffuser LCP (-P), (-T), (-PT)

LCP is a flush mounted square diffuser with a circular unperforated face plate. LCP is suitable for horizontal supply of cooled air and has a large dynamic range. LCP comes in variant with integrated sensors, Presence (-P), Temperature (-T) and both (-P-T). The sensors is wired through MBV to Supply Regula Combi.



## Visible air flow control

### Ceiling diffuser LCFV / (-P) - Visible

LCFV is a visible VAV plenum box and diffuser for supply air with a circular unperforated face plate for free hanging installations.



The LCFV includes a a unique linear cone damper with integrated volume flow regulator. In Pascal systems the LCFV is controlled by a Regula Combi room controller. LCFV is as standard delivered with a specially designed Regula connect card, for easy and simple wiring.

# Pascal component overview

## Chilled beams

### Premum/Premax

Lindab's supply air beam Premum can be used for cooling, heating and ventilation. Water valves, actuators, Regula Secura, Regula Combi and Regula Connect can all be built into the Premum beam.



Premum features the Lindab JetCone, an innovative way of regulating the air volume. The air volume can easily be adjusted without having to worry about pressure and noise issues.

The Angled Nozzles system secures a perfect air spread pattern, available in a number of factory preset angles.

As a plus feature the Lindab AirGuide system offers readjustable air spread pattern control.

### Munio

Lindab's supply air beam unit Munio can be used for cooling, heating and ventilation. It has been developed for the installation and integration into bulkheads for example in hotels, in hospitals or for any other rooms with bulkheads.



### Professor XP

Professor XP provide great freedom for the installation, as its inset height is low, only 120mm. Professor XP is equipped with divergent nozzles, which provides a draft-free indoor climate.



Professor XP can be used for cooling, heating and ventilation.

Professor XP can be furnished with the following features cooling, heating, ventilation, Regula Secura condensation guard, built-in valves and actuators, built-in lighting, built-in extract air valve, etc. It offers many possibilities and great flexibility.

### Plexus

Plexus gives many placement possibilities since it fits into the false ceiling 600 x 600 alternative 1200 x 600.



Plexus is provided with fixed lamellas which controls the primary air into non-parallel jets in a 360 degree air pattern. The 360 degree air pattern results in shorter air throws (30%) and a draft free indoor climate. Plexus can be used for both cooling, heating and ventilation. Plexus can be equipped with the functions Regula Secura condensation guard, down fold battery for better accessibility, and pre-mounted valves and actuators. The possibilities are many and the flexibility large.

### Architect

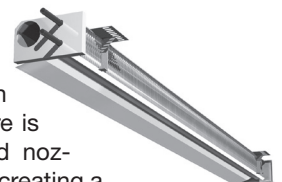
Architect is an active chilled beam for exposed installation that provides great freedom of choice in design. Easy applicable with a large number of predefined design solutions with great flexibility to create a customised design, without affecting the function and performance. One big advantage is that you can do your planning without having to decide on the design. This allows you to retrofit the design in a simple way.



Architect can be equipped with cooling, heating, ventilation, Regula Secura condensation guard, built-in valves, actuators and built-in lighting.

### Plafond

Plafond's function is based on the induction principle. Ventilation air with a certain dynamic pressure is released through specially-formed nozzles into a dispersal zone, thereby creating a low static pressure. This low pressure causes warm air from the room to be sucked towards the ventilation air passing through the battery. The volume of the warm indoor air is 4 to 5 times that of the ventilation air. The air is cooled as it passes through the battery, which consists of aluminium ribs with copper ducts filled with cold running water. The heat of the room is absorbed through the aluminium ribs and then transferred through the copper pipe to the water circuit and on to a central cooling unit.



# Pascal component overview

## Air flow control

### VAV plenum box MBV

MBV is a plenum box with integrated volume flow regulator used for VAV regulation of supply air diffusers. MBV is equipped with a unique linear cone damper technology which makes it possible to regulate in the full operational area up to 200 Pa with low sound level.



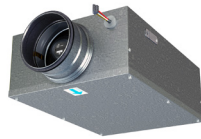
The built-in VAV actuator is delivered pre-programmed with damper characteristic and in combination with a stable flow measurement over the damper, it makes the VAV regulation very accurate and reliable.

MBV must be used in combination with a suitable diffuser that can handle low airflows, in Pascal system this is LCP, LKP and LCC.

MBV can be delivered in multiple configurations. Find more information on [www.lindQST.com](http://www.lindQST.com)

### VAV plenum box DBV

DBV is a volume flow regulator used for VAV regulation of the supply air in a terminal duct for an active chilled beam. Also suitable together with eg. wall diffusers.



DBV is equipped with a unique linear cone damper technology, which makes it possible to regulate in the full operational area 0 - 100% up to 200 Pa with low sound level.

The built-in VAV actuator is delivered pre-programmed with damper characteristic and in combination with a stable flow measurement over the damper, it makes the VAV regulation very accurate and reliable.

DBV can be installed directly in a terminal duct in front of the chilled beam and does not need an extra silencer after the damper. DBV is not suited for extract air.

For further details see DBV documentation.

### Ultralink FTCU

The controller is suitable for regulating air flow and temperature.

The controller consists of a sensor body and a motorized damper with Lindab Safegaskets.



Two flow sensors are mounted on the sensor body and connected to a display unit via cables. The display unit is mounted on top of a shelf on top of the motor.

The display unit is a small and compact preprogrammed controller which is controlled by a pushbuttons on the front, or via bluetooth with an app.

FTCU can be connected directly with Exoline when used for extract.

FTCU needs a silencer in the duct towards the room.

### VRU

VRU-MF is a circular volume flow regulator for VAV regulation in duct systems. VRU-MF consist of a measuring unit and a damper.



The unit is equipped with a compact Belimo motor with D3 sensor technology, which makes it possible to regulate in a large operational area.

In Pascal systems VRU-MF is primarily used for extract control, controlled by a Regula Combi with special designed extract program.

VRU-MF can also be used for supply regulation as an alternative to MBBV boxes, typically in large open offices or other rooms with a large number of supply diffusers.

VRU-MF needs a certain distance of straight duct before the unit and this has to be observed to obtain a stable and accurate airflow regulation and needs a silencer in the duct towards the room.

## Extract component

### Ultralink FTMU

The monitor is suitable for measuring air flow and temperature.

The monitor consists of a sensor body with Lindab Safegaskets.



Two flow sensors are mounted on the sensor body and connected to a display unit via cables. The display unit is mounted on top of a shelf on the sensor body.

The display unit is a small and compact preprogrammed controller which is controlled by a pushbuttons on the front, or via bluetooth with an app.

FTMU can be connected directly to LRM/SRM with Exoline.

### Plenum box MB

MB is a plenum box for supply and extract air, intended to achieve a stable airflow into diffusers, air flow measurement and balancing and also to attenuate sound from the duct system.



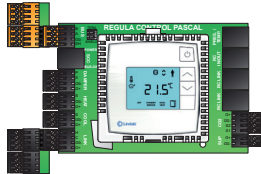
MB is available with several damper options and has small overall dimensions to ease up installation and handling.

# Pascal component overview

## Connection equipment

### Regula Control Pascal

Regula Control Pascal is the second generation connection hub with all possible input/output for a SRC (Supply Regula Combi), i.e. external sensors, air flow control units and actuators together with power supply and link connections.



For all low current signal Regula Control Pascal has RJ45 interfaces, and for the higher current signals Weidmuller BL/SL 3.5.

A Regula Combi can either be placed directly on the Regula Control Pascal (typically combined with an external temperature sensor) or connected via RJ45 and Weidmuller connections.

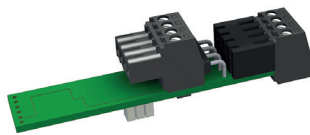
### Regula Connect Pascal

Regula Connect Pascal is the first generation connection hub for input/output for mainly SRC (Supply Regula Combi) in the Pascal system. Regula Connect Pascal has limited connection possibilities compared with Regula Control Pascal, but the connections are compatible.



### Regula Pulse

Regula Pulse is an adaptor that safely connects your modulating CO<sub>2</sub> sensor or modulating humidity (RH) sensor to Regula Control Pascal or Regula Connect Pascal.



An alternative version called Regula Pulse Combi is used if connecting the modulating CO<sub>2</sub>/RH sensor directly to a Regula Combi (SRC) via cable.

# Pascal component overview

## Sensors

### CTRTA(-D)-LB CO<sub>2</sub> and temperature transmitter

CTRTA\_LB is a CO<sub>2</sub> sensor with modulating output.

CTRTA\_LB is used in Pascal together with Regula Pulse, if actual CO<sub>2</sub> values are to be registered in a top level system via Regula Combi (SRC).

CTRTA\_LB has to be connected to Regula Combi via Regula Pulse and Regula Connect Pascal.

Actual CO<sub>2</sub> values will be registered in steps of 5 ppm.

Alternatively CTRTA-D\_LB (with display) or CTD2 ( for duct mounting ) can be used.



### CTDT2 CO<sub>2</sub> and temperatur transmitter

CTDT2 is a CO<sub>2</sub> sensor for duct mounting with modulating output. CTD2 is used in Pascal together with Regula Pulse, if actual CO<sub>2</sub> values are to be registered in a top level system via Regula Combi (SRC).



### HTRT10A(-D) Humidity and temperature transmitter

HTRT10A is a room transmitter for measurement of humidity and temperature.

HTRT10A is used in Pascal together with Regula Pulse, for actual humidity and temperature values to be registered in a top level system via Regula Combi (SRC).

### HTDT2500 Humidity and temperature transmitter

HTDT2500 is a duct mounted transmitter for measurement of relative humidity and temperature.

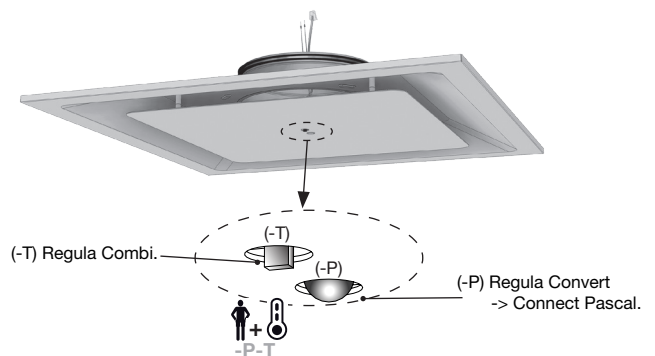
HTDT2500 is used in Pascal together with Regula Pulse, for actual humidity and temperature values to be registered in a top level system via Regula Combi (SRC).

The HTDT2500 has to be connected to Regula Combi via Regula Pulse and Regula Connect Pascal.



### Integrated sensors

As standard the Pascal difusers have no sensors, but can have both (-P) and (-T) integrated in the front plate.



### Presence (-P)

Discrete presence sensor integrated in the diffuser face plate. The presence sensor can register occupancy and is used in combination with the Pascal system.

### Temperature (-T)

External temperature sensor type PT1000 mounted in diffuser front plate to measure room temperature.

# Pascal component overview

## Other sensors and actuators

### Duct sensor PT1000

Duct sensor for measuring of air temperature in ducts. Can be used for additional functions as:

- ACB free cooling optimizer (2 sensors).
- Outdoor air cooling (1 sensor).



### Pressure sensor 0 - 10 V (SAF / EAF)

Duct pressure sensor for controlling and preventing a high duct pressure.

Install one on both supply and extract and connect it to the Pascal system, Regula Master.



### Heating actuator 0 - 10 V

To provide optimal valve control, a Lindab-actuator with non-halogen connection cable should be applied. Adapter rings ensures perfect fit for the most used brands on the market. The actuators can be supplied as a 24 V AC or 0-10 V DC actuator, Normally Open (NO) or Normally Closed (NC), to fit the specific situation.



To fit to a Lindab TTV/TTR valve an adaptor ring "Adapter VA 80" is needed.

For further information, please see the Actuators documentation.

### Water valves and actuators

Lindab's active chilled beams can be equipped with Lindab's water valves and actuators. These valves have an adjustable KV-value and ensures easy setup with our 24 V on/off "snap on" actuators, alternatively Lindab's analogue actuators 0-10 V can be used.





Most of us spend the majority of our time indoors. Indoor climate is crucial to how we feel, how productive we are and if we stay healthy.

We at Lindab have therefore made it our most important objective to contribute to an indoor climate that improves people's lives. We do this by developing energy-efficient ventilation solutions and durable building products. We also aim to contribute to a better climate for our planet by working in a way that is sustainable for both people and the environment.

[Lindab](#) | For a better climate