COMPACT VENTILATION UNIT LG 1400

COMFORT VENTILATION

AUSTRIA

CERTIFIED COMPONENT
Passive House Institute

for residential buildings (T Version)
for non-residential buildings (T Version)

EN13141-7:2010

TÜV AUSTRIA
TYPE TESTED
TÜV AUSTRIA SERVICES GMBH

ErP 2018

EU Regulation 1253/2014

PICHLER

Systematic ventilation.

Product description

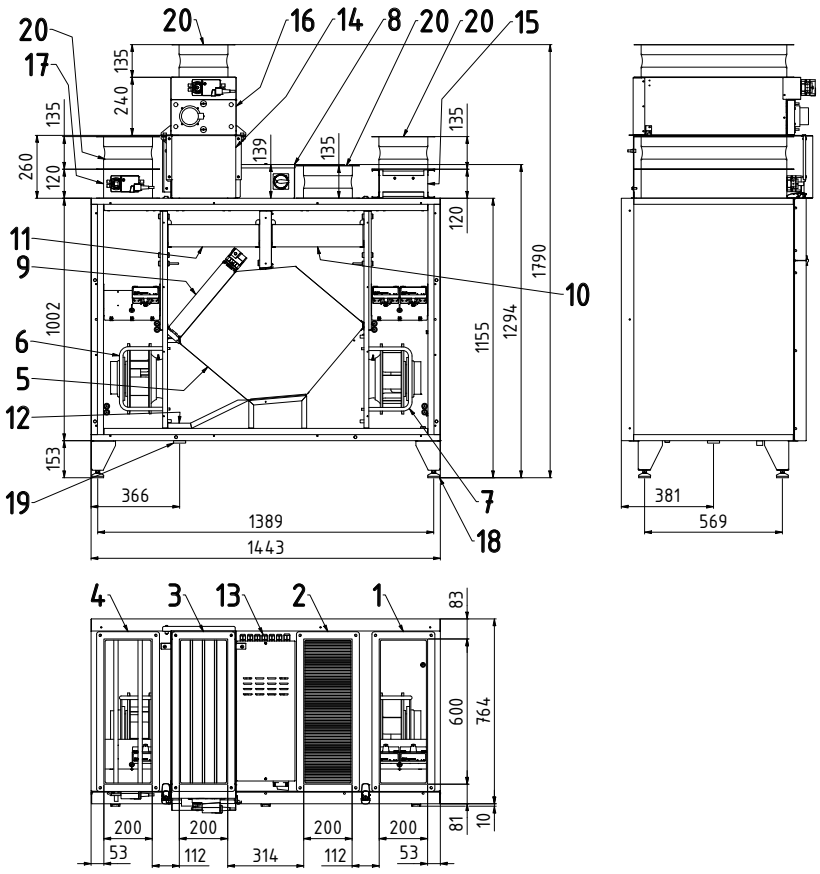
The LG 1400 compact ventilation unit with passive house certificate consists of a compact, thermal bridge-free and 50 mm heat-insulated housing made of galvanised steel sheeting, external powder coating in RAL 9010. The T version (degree of temperature change > 85%) of the ventilation unit contains a highly efficient heat recovery system with an air/air counterflow heat exchanger made of aluminium. The F version (with humidity recovery) has an enthalpy exchanger, an automatic 100% bypass, energy-saving radial fans in the latest EC motor technology with optional CO2 sensor module for demand-based comfort ventilation operation, an ODA filter ISO ePM1 55% for outdoor air and ETA filter ISO Coarse 90% for the extract air, internally wired control electronics. Expansion options such as constant volume flow control, constant pressure control or our advanced, efficiency-optimised Pichler System Optimiser control round out the extensive basic functions. Compact ventilation unit suitable for standing installation in frost-free rooms. Optional enhancements such as constant volume flow regulation, constant pressure regulation or our enhanced, efficiency-optimised Pichler System Optimiser regulation complement the extensive basic functions. Compact ventilation unit suitable for free-standing installation in frost-free rooms.

Area of application

The LG 1400 and LG 1400 S compact ventilation unit is used as a central unit for up to 17 apartments, schools, doctor's surgeries, offices and similar applications and for the controlled mechanical aeration and ventilation of larger apartment buildings. The range of use extends fundamentally to residential buildings in passive or low-energy construction, with an adjustable air volume flow up to approx. 1200 m^3/h.

Layout sketch LG 1400 (free-standing installation)

Air line connections, top: outdoor air / exhaust air / supply air / extract air (W x H) 200 x 596 mm
Air line connections: with connecting profile P30



1 Supply air 200 x 596 mm
2 Extract air 200 x 596 mm
3 Outdoor air 200 x 596 mm
4 Exhaust air 200 x 596 mm
5 Counterflow heat exchanger
6 Exhaust air fan
7 Supply air fan
8 Control system
9 Bypass damper with actuator
10 Extract air filter
11 Outdoor air filter
12 Condensate tray
13 Cable inlets 2 x M20, 8 x M16
14 Electric preheater battery (optional), with an optional heat insulation
15 Electric reheater battery (optional)
16 Filter and flap box (required in connection with electric preheater battery) or supply air butterfly valve (optional, without electric preheater battery, 120 mm high)
17 Exhaust air shut-off valve (optional)
18 Height adjustable feet
19 Condensate drain
20 Flexible connections top

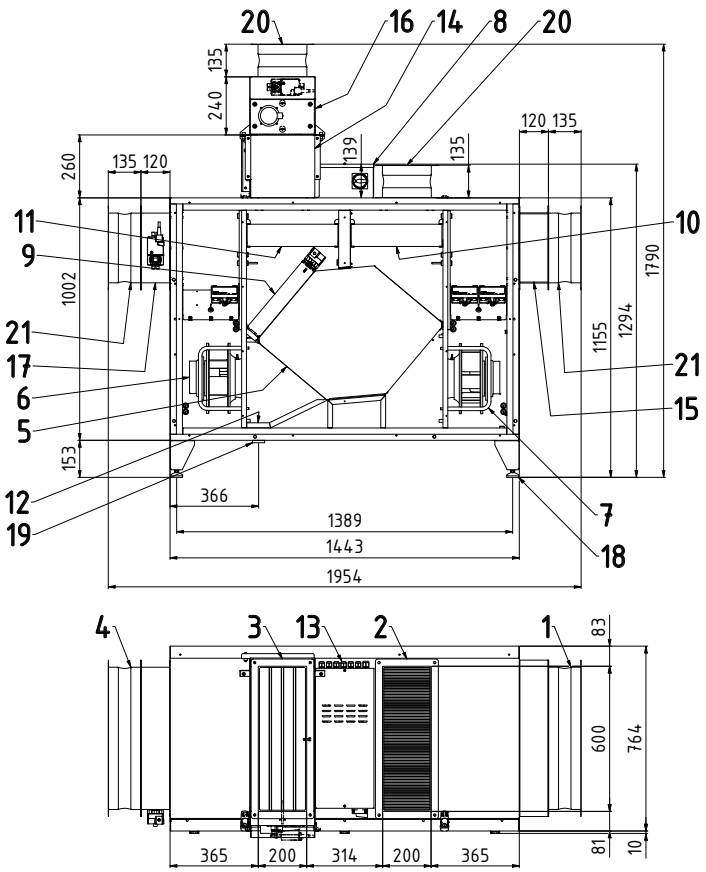
Optional: Hot water preheater battery and hot water preheater battery for duct installation

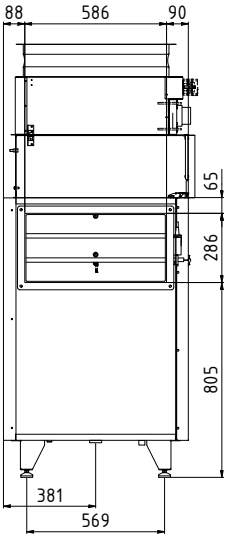
Figure: LG 1400 R (right-hand version)

The PI-HMI operating unit is delivered separately.

Layout sketch LG 1400 S (free-standing installation)

Air line connections, top: outdoor air / extract air (W x H) 200 x 596 mm
Air line connections, side: exhaust air / supply air (W x H) 286 x 586 mm
Air line connections: with connecting profile P30





1 *Supply air 286 x 586 x mm*
2 *Extract air 200 x 596 mm*
3 *Outdoor air 200 x 596 mm*
4 *Exhaust air 286 x 586 mm*
5 *Counterflow heat exchanger*
6 *Exhaust air fan*
7 *Supply air fan*
8 *Control system*
9 *Bypass damper with actuator*
10 *Extract air filter*
11 *Outdoor air filter*
12 *Condensate pan*
13 *Cable inlets 2 x M20, 8 x M16*
14 *Electric preheater battery (optional) with an optional heat insulation*
15 *Electric reheater battery (optional)*
16 *Filter and flap box (required in connection with electric preheater battery) or supply air butterfly valve (optional, without electric preheater battery, 120 mm high)*
17 *Exhaust air shut-off valve (optional)*
18 *Height adjustable feet*
19 *Condensate drain*
20 *Flexible connections top*
21 *Flexible connections side*

Optional: Hot water preheater battery and hot water reheater battery for duct installation

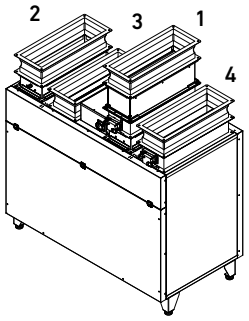
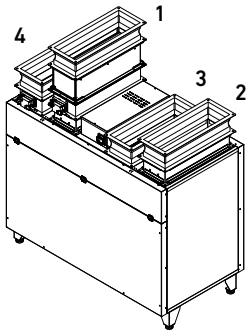
Figure: LG 1400 SR (right-hand version)

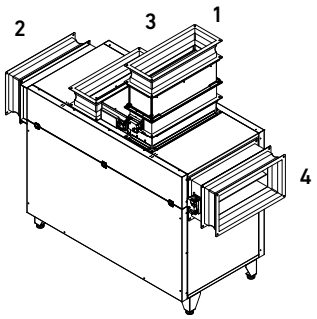
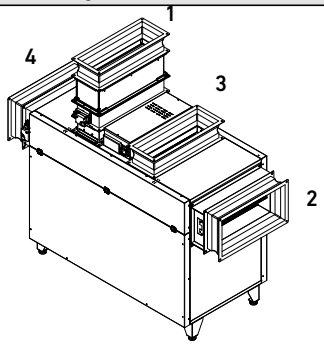
The PI-HMI operating unit is delivered separately.

Versions

The compact ventilation unit LG 1400 is available in several different versions:

- Right- or left-hand depending on the position of the supply air connection
- Optional exhaust air and supply air sockets on the side
- Optional installed, insulated, electrical preheater battery 6 kW (requires additional filter and flap box, 08FKK1400A)
- Optional installed electric reheater battery 2 kW
- With counterflow heat exchanger (T version) or enthalpy exchanger for humidity recovery (F version)

LG 1400: Air line connections on the top	Left-hand version	Right-hand version
1 Outdoor air *2 Supply air* *3 Extract air* *4 Exhaust air*		

LG 1400 S: Supply and exhaust air on the side	Left-hand version	Right-hand version
1 Outdoor air *2 Supply air* *3 Extract air* *4 Exhaust air*		

Article key LG 1400

08LG1400 T S L VN

Add-on parts
* ... No designation: without add-on parts
V ... Electric preheater battery
N ... Electric reheater battery

Inspection side seen from the supply air direction
L ... Left
R ... Right

Design
* ... No designation: air line connections on top
S ... Side supply and exhaust air connection

Heat exchanger type
T ... Counterflow heat exchanger with temperature change > 85%
F ... Enthalpy exchanger with humidity recovery

Unit type
08LG1400 ... Ventilation unit LG 1400

Technical specifications

Dimensions:
(W x H x D) 1445 x 1265 x 775 mm
Housing in double-shell construction made of galvanized sheet steel, 50 mm heat insulation
LG 1400 air line connections:
ODA/EHA/SUP/ETA (W x H) 200 x 596 mm (top)
LG 1400 S air line connections:
ODA/ETA (W x H) 200 x 596 mm (top) and
EHA/SUP (W x H) 286 x 586 mm (side)
Connection profile: P30
Condensate connection with syphon and mechanical sealing device ø 40 mm at the bottom
Electrical connection without electric heater battery:
230 V/50 Hz/20 A
Electrical connection with electric heater battery:
400 V/50 Hz/25 A
Degree of protection: IP 20
Permitted ambient temperature for the unit:
+ 5° C bis + 40° C
Weight without accessories: approx. 190 kg

VALUES ACCORDING TO EU REGULATION 1253-2014:

(See product data sheet for additional values, downloadable from www.pichlerluft.at)

T VERSION WITH COUNTERFLOW HEAT EXCHANGER:

Maximum operating point:
Volume flow: 1200 m^3/h
External pressure: 250 Pa
Nominal operating point:
Volume flow: 800 m^3/h
External pressure: 200 Pa
Specific fan power (SFP): 0,36 Wh/m^3
Thermal transfer rate: 85,4 %

F VERSION WITH ENTHALPY EXCHANGER FOR HUMIDITY RECOVERY:

Maximum operating point:
Volume flow: 1200 m^3/h
External pressure: 250 Pa
Nominal operating point:
Volume flow: 800 m^3/h
External pressure: 200 Pa
Specific fan power (SFP): 0,38 Wh/m^3
Thermal transfer rate: 77,8 %
Humidity transfer rate: 71,7 %

CERTIFIED COMPONENT
Passive House Institute

PASSIVE HOUSE CERTIFIED IN ACCORDANCE WITH PHI CRITERIA (T VERSION)

Non-residential building:
Area of application: 350 to 1100 m^3/h at an external pressure of 228 Pa
Housing seal-tightness: external leakage 0,39 %, internal leakage 0,56 %
Heat recovery rate: $\eta_{HR,\,eff}$ = 83 %
Comfort criterion: $T_{supply\ air}$ = +16,5 °C bei $T_{outdoor\ air}$ = -10 °C
Flow efficiency: η_{el} = 0,39 Wh/m^3

Residential building:
Area of application: 350 to 1200 m^3/h at an external pressure of 198 Pa
Housing seal-tightness: external leakage 0,36 %, internal leakage 0,52 %
Heat recovery rate: $\eta_{HR,\,eff}$ = 82 %
Comfort criterion: $T_{supply\ air}$ = +16,5 °C bei $T_{outdoor\ air}$ = -10 °C
Flow efficiency: η_{el} = 0,38 Wh/m^3

Colour touch display PI-HMI

Optimised operation with the Pichler-System-Optimiser

Operation

CONTROL UNIT

The ventilation units come equipped as standard with an integrated control and regulation system. The settings on the ventilation unit are carried out using an integrated web server, limited settings can also be carried out via the colour touch display PI-HMI. In addition, the current operating status conditions and system values such as operating type, fan speed, temperatures, etc. are displayed on the control system. Signal lamps display the operation (green) and faults (flashing red) including as plain text displays. Automatic or manual mode can be selected.

DIMENSIONS

Item	Dimensions	Item Number
PI-HMI with connecting cable, length 1 m and double-sided RJ12 connector	(W x H x D) 80 x 121 x 42 mm	included in the delivery

OPTIONAL: BUILDING AUTOMATION – NETWORKING OPTIONS

The Pichler-Air2-System offers multiple networking options as integration into a higher level building automation system.

- Integratred webserver
- Modbus RTU
- Modbus TCP/IP
- BACnet
- KNX-Gateway

The corresponding bus connection is activated/parameterized at the factory according to the customer's order.

SIGNAL EXCHANGE

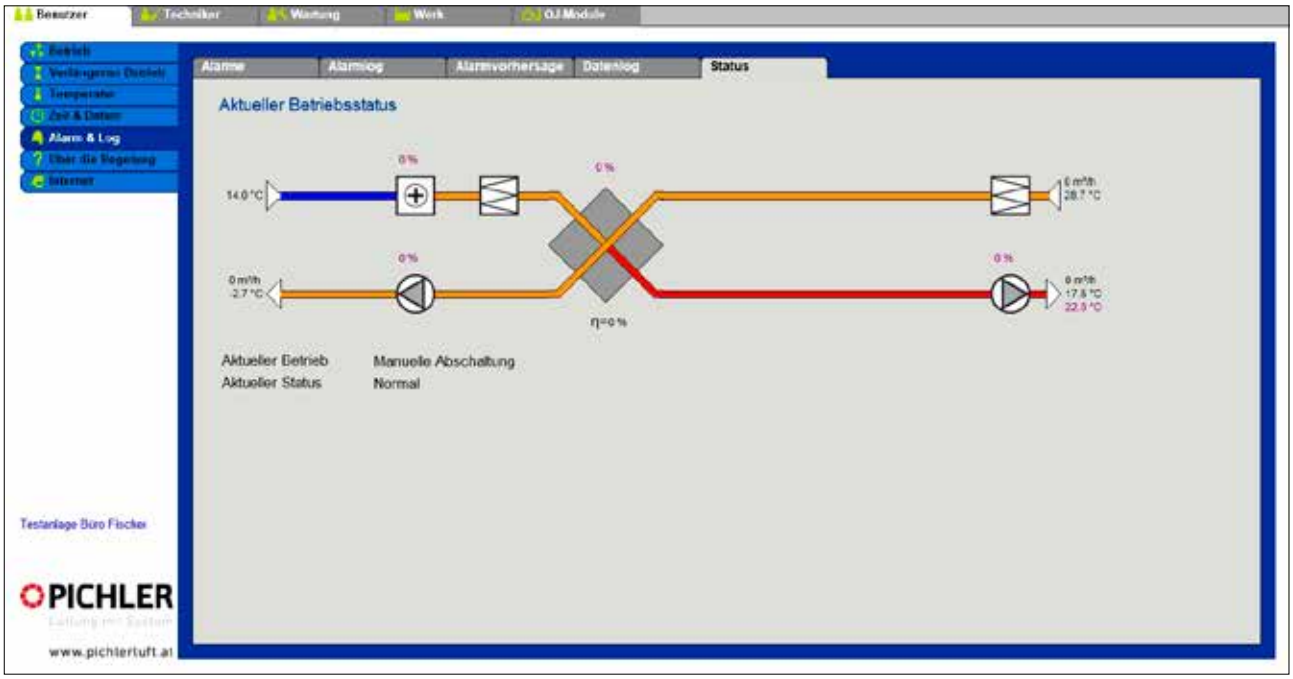
- Low rpm input
- High rpm input
- Error message Level A (shutdown of the system)
- External start input
- External stop input (optional)
- External fire alarm input (optional)
- Operational

FUNCTIONS OF THE PICHLER CONTROL

- Preheater battery, electric or PWW
- Reheater battery, electric or PWW
- Cooling battery PKW / DX
- Air ventilation and humidification
- Continuously controlled heat/"cold" recovery via the counterflow heat exchanger and bypass
- Air filter monitoring with pressure sensors (static or dynamic)
- External air compensation
- Summer nights cooling (only for weekly program)
- Weekly program

CONTROL METHODS

- Constant volume flow control
- Constant pressure control (optional)
- PICHLER System Optimiser (optional)
- Air quality control CO_2 (sensor required)
- Air quality control VOC (sensor required)
- External control signal 0-10 V (optional)



Integrated webserver plant status

Functional overview

Function	Description	Standard	Optional*
Ventilation control method:	Constant volume flow control	●	
	Constant pressure control		●
	PICHLER System Optimiser		●
	Air quality control CO_2		●
	Air quality control VOC		●
	External control signal 0-10 V		●
Temperature control method	Constant supply air temperature		●
	Constant extract air temperature	●	
Ancillary functions	External air compensation	●	
	Summer nights cooling (only for weekly program)	●	
Possible heating and cooling components	External electric pre-heater battery		●
	Control of an external E-re-heater battery		●
	DX cooler controller		●
	Control of a water pre-heater battery		●
	Control of a water re-heater battery		●
	Control of a water cooling battery		●
	Control of a water combi battery		●
Communication	Integrated web server		●
	Modbus TCP/IP		●
	Modbus RTU (not possible with System Optimiser!)		●
	BACnet		●
	KNX-Gateway		●
Signal exchange hardware	Analog input for VOC/CO_2 sensor (on terminal)		●
	Low rpm input		●
	High rpm input		●
	Shut-off valves 2x Belimo LM24A control (on terminal)	●	
	Error message Level A (floating max. 30V / 3A)	●	
	Error message Level B (Maintenance message)		●
	External start input (inverted)		●
	External stop input (on terminal)		●
	External fire alarm input (on terminal)		●
	Operational (floating max. 30V / 3A)	●	

**** The options must be specified in the order and will attract additional costs!***

CO_2 sensor

MODBUS/KNX-Gateway

Accessories

SPARE FILTER

Will ensure perfect hygiene and air quality given regular replacement, also proper functionality and efficient operation of the equipment.

Item	Item number
Filter ODA ISO ePM1 55% (outdoor air)	40LG050130 (standard)
Filter ETA ISO Coarse 90% (extract air)	40LG050140 (standard)
Filter ODA ISO ePM1 85% (outdoor air)	40LG050150
Filter ETA ISO ePM10 70% (extract air)	40LG050160

DEMAND-ORIENTED VENTILATION CONTROL

CO_2 or VOC sensors for demand-oriented ventilation control. The ventilation unit will automatically increase or reduce the air volumes depending on the quality of the air in the room. The sensors are designed for flush and surface mounting.
Colour: white
Dimensions: W x H x D = 85 x 85 x 35 mm
Ambient temperature: 10-50°C
Measuring range: 0-2000 ppm
Sensor supply voltage: 24V AC/DC
Control signal: 0-10 V

Item	Item number
CO_2 sensor	07RCO248330

Needs-based operation via the CO_2 or VOC sensor module only functions in automatic mode. The assignment of the fan speeds, the ppm and humidity values can be changed via the integrated web server.

BUTTERFLY VALVES

Frames and galvanised slats, with mounted actuator LM24A-F.
Without electric preheater battery:
LG 1400: 2 x 08AKE600200
LG 1400S: 1 x 08AKE600200 + 1 x 08AKE586286
With electric preheater battery:
LG 1400: 1 x 08AKE600200 + 1 x 08FKK1400A
LG 1400S: 1 x 08AKE586286 + 1 x 08FKK1400A

Item	Dimensions	Item number
Butterfly valve for units with overhead connections with a flange: P30, actuator LM24A-F	Connection: W x H = 600 x 200 mm	08AKE600200
Butterfly valve for units with connections with a flange, which are positioned at the side: P30, actuator LM24A-F	Connection: W x H = 586 x 286 mm	08AKE586286

CANVAS CONNECTION

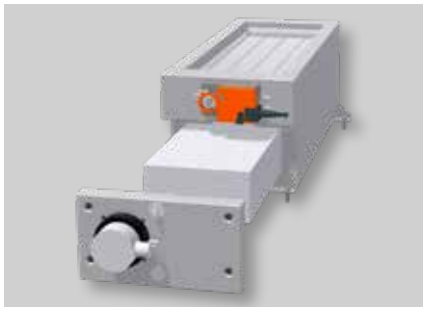
Made of laminated and highly tear-resistant fabric and with double-sided flanges made of galvanized sheet steel. P30 flange.
Elongated length : 150 mm
LG 1400: 4 x 08STELG1400
LG 1400S: 2 x 08STELG1400 + 2 x 08STELG1400S

Item	Dimensions	Item number
Canvas connection for units with overhead connections	Connection: W x H = 600 x 200 mm	08STELG1400
Canvas connections for units with connections that are positioned at the side	Connection: W x H = 586 x 286 mm	08STELG1400S

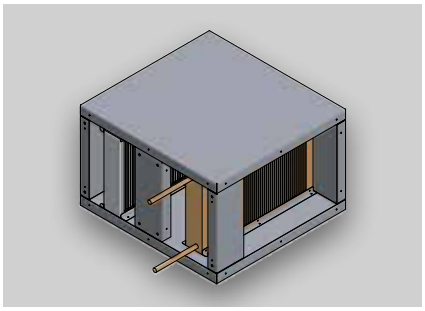
MODBUS/KNX-GATEWAY

The Modbus/KNX gateway allows for the connection of the compact ventilation unit LG 1400 to a KNX bus system. In this process, the gateway serves as a connective link between the two bus systems. It is provided with a Modbus RTU and TCP interface and is always the master on the Modbus. On the KNX side, however, it responds like a common KNX TP-1 unit. This makes it possible to centrally control and monitor the ventilation unit by a KNX system. The configuration is implemented via the IP or USB interface.
Dimensions: W x H x D = 88 x 56 x 90 mm
Installation: DIN rail or wall
Permissible ambient temperature: 0 - 60 °C
Permissible humidity: 5 - 95% non-condensing
Protection type: IP20
Voltage: 24V AC/DC
Interfaces: Ethernet, EIA-485, KNX-TP1

Item	Item number
MODBUS/KNX-Gateway	08KNXGA5006000A



Filter and flap box to protect the electric preheater battery



Filter and hot water preheater battery

FILTER AND FLAP BOX

The external filter and flap box is necessary for the protection of units with electric preheater batteries. It has a thermally insulated housing made of galvanized sheet steel with a wall thickness of 30 mm. The box can be placed directly on the heater battery and consists of a flap with a subsequent ISO Coarse 70% filter. The flap drive is already installed and pressure monitoring of the filter is included. In addition, the filter can be easily replaced from the front.

DIMENSIONS

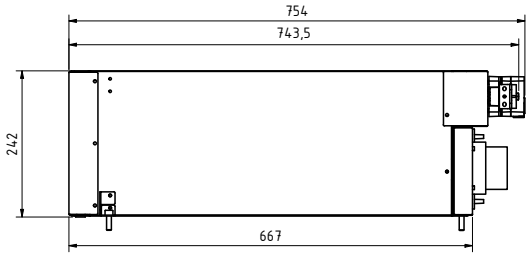
Item	Dimensions	Item number
Filter and flap box for LG 1400 with pre-filter ISO Coarse 70%	(W x H x D) 350 x 242 x 754 mm	08FKK1400A
Replacement filter ISO Coarse 70% filter and flap box LG 1400		40LG0500020A

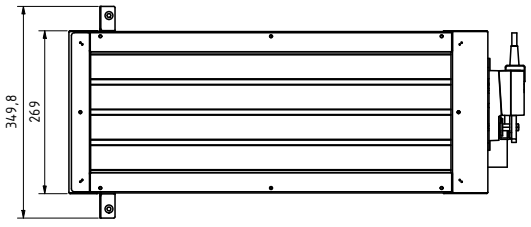
FILTER AND WARM WATER PREHEATING RADIATOR BOX

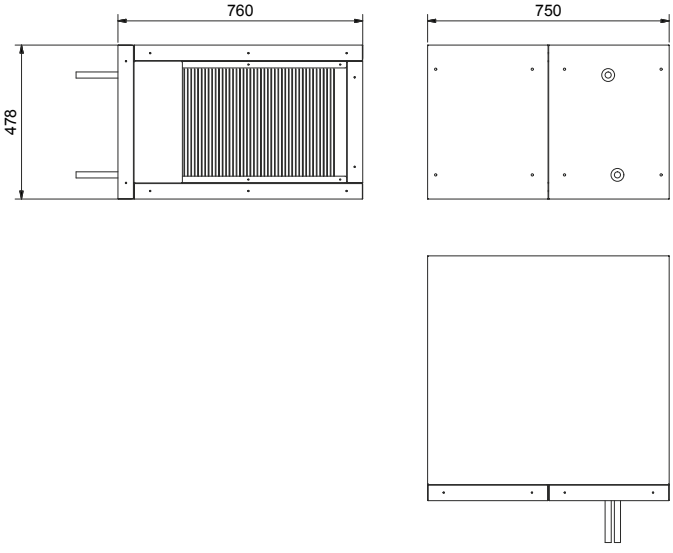
Insulated enclosure, consisting of a filter unit and a hot water pre-heating battery. The outside air filter of the ventilation unit is inserted into the filter and hot water pre-heating battery box. Only in connection with an additional duct temperature sensor (item number 40LG0400011B) and a three-way motor control valve (Art. Nr. 07R3..LR24ASR).

Air volume: 1400 m^3/h
Air inlet temperature: -16 °C
Air outlet temperature: 0 °C
Medium: 55/45 °C
Glycol fraction: 30%
Power: 7,5 kW

Item	Dimensions	Item number
Filter and warm water preheating radiator box, isolated	(W x H x D) 750 x 478 x 760 mm	08HBOXLG1400







Warm water reheating radiator

Cold water coil

Duct temperature sensor

EXTERNAL WARM WATER REHEATING RADIATOR

For reheating the supply air for duct installation
(W x H = 600 x 300 mm).
Only in connection with an additional duct temperature sensor (item number 40LG0400011B) and a three-way motor control valve (item number 07R3..LR24ASR).
Air volume: 1400 m^3/h
Medium: 60/40 °C
Duct connection: W x H = 600 x 300 mm
Dimensions: W x H x D = 638 x 338 x 250 mm

Number of pipe rows	Power	Item number
2 PCS	approx. 7 kW	40LG080180
4 PCS	approx. 12 kW	40LG080250

EXTERNAL COLD WATER COIL

For cooling the supply air for duct installation
(W x H = 600 x 300 mm), with integrated condensate drain, housing uninsulated.
Only in connection with an additional duct temperature sensor (item number 40LG0400011B) and a three-way motor control valve (item number 07R3..LR24ASR).

Air volume: 1400 m^3/h
Medium: 7/12 °C
Number of pipe rows: 3 PCS
Power: approx. 8 kW
Duct connection: W x H = 600 x 300 mm
Dimensions: W x H x D = 728 x 338 x 395 mm

Item	Item number
Cold water coil	40LG080190
Droplet separator for cold water coils	01DE6030

EXTERNAL SUPPLY AIR TEMPERATURE SENSOR

Item	Item number
Duct temperature sensor – PT1000 sensor with flange, cable length 3 m	40LG0400011B

ROOM TEMPERATURE SENSOR

Item	Item number
Room temperature sensor – PT1000 sensor in the surface-mounted housing	40LG041330

THREE-WAY MOTOR CONTROL VALVE

Three-way control ball valve for the continuous closed-loop control of cold and warm water with a mounted closed-loop control actuator.
Belimo drive: LR 24ASR
Drive voltage: 24V AC/DC
Control signal: 0-10V DC
Control ball valve: R3015
Mounting position: optional

KVS value	Item number
0,63 m^3/h	07R3015P6LR24ASR
1,0 m^3/h	07R30151SLR24ASR
1,6 m^3/h	07R30151PLR24ASR
2,5 m^3/h	07R30152PLR24ASR

LG 1400 and LG 1400 S at a glance!

Fans:
energy-saving radial fans with state-of-the-art EC motor technology with optional automatic constant volume flow control with an optional constant volume flow control or constant pressure control

Counterflow heat exchanger:
Highly efficient heat recovery system with air/air counter-current heat exchanger with an automatic 100% bypass, optionally with an enthalpy exchanger

Air volume flow:
maximum 1200 m^3/h with an external pressure of 250 Pa

Filters:
ISO ePM1 55% in outdoor air and ISO Coarse 90% in extract air

Electric preheater battery:
optional installed, insulated, electrical preheater battery 6 kW (requires additional filter and flap box, 08FKK1400A)

Hot water reheater battery:
optional installed, electrical reheater battery 2 kW

Housing:
made from zinc-plated steel plate with 50 mm thermal insulation

LG 1400 air line connections:
ODA/EHA/SUP/ETA (W x H)
200 x 596 mm (top)

LG 1400 S air line connections:
ODA/ETA (W x H) 200 x 596 mm (top) & EHA/SUP (W x H) 286 x 586 mm (side)

Connection profile: P30

Installation position:
Free-standing installation

Summer changeover:
integrated 100% bypass damper with seal

Optional: building automation – networking options:
- Integratred webserver
- Modbus RTU
- Modbus TCP/IP
- BACnet
- KNX-Gateway

The corresponding bus connection is activated/parameterized at the factory according to the customer's order.

Electrical connection:
using terminals

Service – maintenance – initial startup

OUR COMPACT VENTILATION UNIT LG 1400 HAS BEEN EXTERNALLY INSPECTED BY

- Lucerne Polytechnic – Engineering & Architecture
- TÜV-AUSTRIA Services GmbH, Testing, Inspection and Certification Centre/Vienna

OUR COMPACT VENTILATION UNIT LG 1400 HAS BEEN CERTIFIED BY

- Passivhausinstitut (Passive House Institute) Darmstadt
- energie-cluster.ch, Declaration report by Lucerne Polytechnic

Notice:
Our product range includes units with a size up to 10,000 m^3/h as well as comprehensive accessories.

ErP 2018

ErP 2018

Fulfils the requirements of the Ecodesign Directive, in accordance with EU Regulation 1253/2014.

Your partner/installer:

klimaaktiv Partner

PASSIVHAUS Austria

Responsible for the content: J. Pichler Gesellschaft m.b.H. | ***Graphics and layout:*** WERK1
Photos: J. Pichler Gesellschaft m.b.H. | ***Text:*** J. Pichler Gesellschaft m.b.H.
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PICHLER

Systematic ventilation.

J. PICHLER
Gesellschaft m.b.H.

office@pichlerluft.at
www.pichlerluft.at

AUSTRIA
9021 KLAGENFURT AM WÖRTHERSEE
Karlweg 5
T +43 (0)463 32769
F +43 (0)463 37548

AUSTRIA
1100 WIEN
Doerenkampgasse 5
T +43 (0)1 6880988
F +43 (0)1 6880988-13

Sales offices in Germany, Slovenia, Serbia and Bosnia. Sales partners in Europe.