

**FläktGroup**<sup>®</sup>

AIRTREND Ltd  
Predstavništvo u Beogradu  
Kumanovska 14, 11000 Beograd  
Tel: 011/3836886, 3085740  
Faks: 011/3444113  
e-mail: gobrid@eunet.rs  
web: www.airtrend.rs

# AIR HANDLING UNIT eQ

CATALOGUE



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**eQ™ HIGHLIGHTS**

- ENERGY EFFICIENT
- HIGH PERFORMANCE
- HYGIENIC DESIGN
- INTEGRATED CONTROLS
- MODULARITY/  
COMMON CROSS SECTIONS
- CORROSION CLASS C4
- SERVICE FRIENDLY
- FAST COMMISSIONING
- SHORT DELIVERY TIMES



eQ is our new, highly adaptable air handling unit offering a number of new features that have not previously been available on the market. The intelligent casing design, the energy-efficient components and the flexible design mean that eQ is cost-effective, and the possibility of both a single casing and a double casing unit makes it highly flexible.

eQ is based on long experience of air handling. Fläkt Woods has been developing and producing air handling units for more than 100 years, and the majority of eQ's main components, such as fans, recovery units,

dampers and silencers are manufactured by Fläkt Woods. The components have been selected to be as energy saving as possible.

The modern air handling unit is designed to meet all conceivable air handling requirements and standards in Europe. eQ meets the requirements according to the classification in the CEN standard for air handling units and is manufactured in a certified workshop with regard both to quality (ISO 9001) and to the environment (ISO 14001).

eQ is certified by EUROVENT.



## Introduction

eQ is available in 21 sizes covering a flow range from 0.1 m<sup>3</sup>/s to 12.5 m<sup>3</sup>/s. Then there is eQL in 8 sizes, which covers an air flow range from 8-30 m<sup>3</sup>/s. Read more about eQL in a separate catalogue. Everything from single supply air or exhaust air units to complete units with heat recovery, energy-efficient components and built-in control and regulation systems is available. The length of the unit is determined by the selected components. The unit is very simple to select, install and commission.

## Typical installations

The wide range means that eQ is available for every area; whether inside a unit room or on the roof. eQ is suitable for installations for industrial premises and public buildings as well as dwellings, schools, offices, shops and hospitals.



## eQ™ and eQ PLUS®

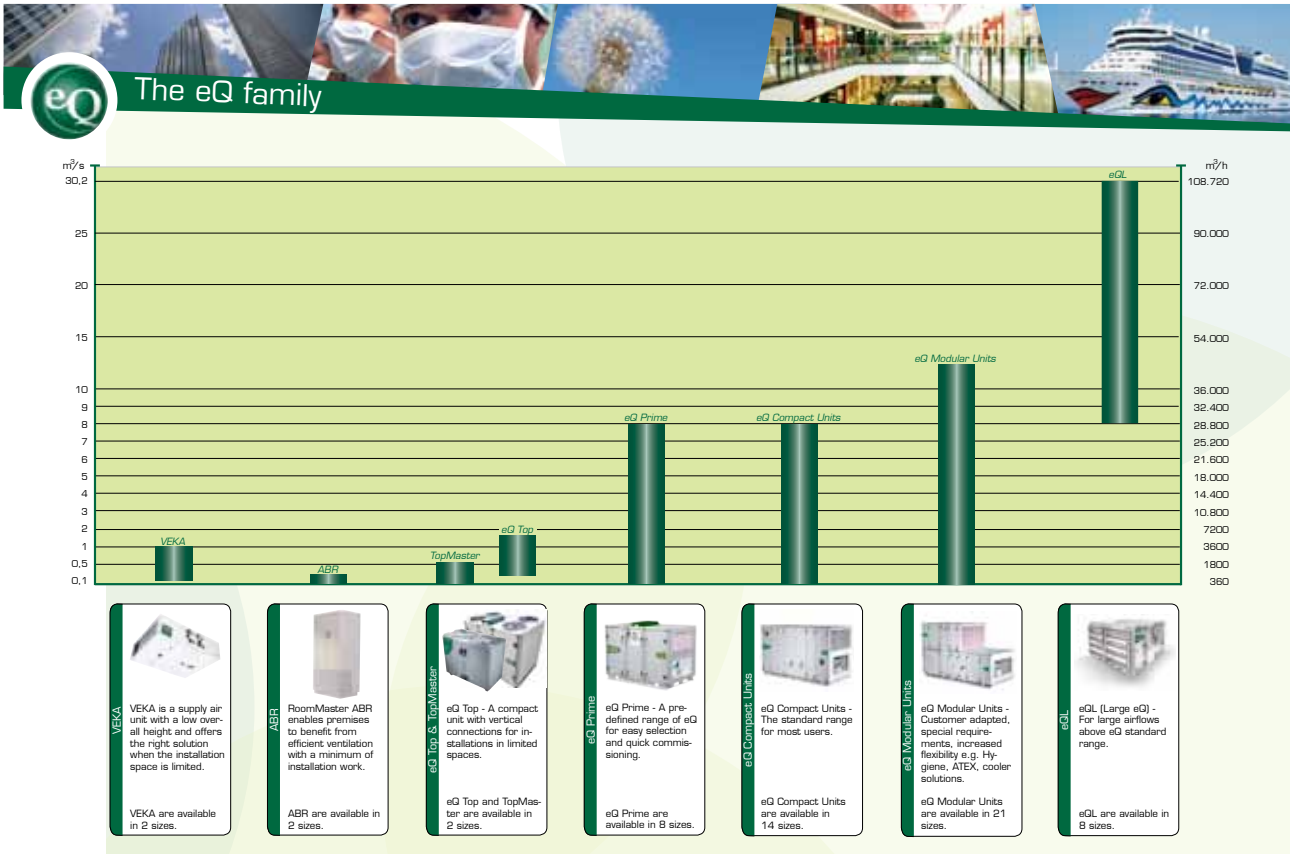
The eQ line covers the most common functions and is standardized, enabling shorter delivery times. The eQ PLUS line is customized and covers functions for applications with special demands. It is possible to com-

bine the two lines, with only one or a few eQ PLUS functions. Energy efficiency, high performance and fast commissioning are some of the qualities applied on both eQ lines.



# Introduction

Fläkt Woods offers a full range of Air Handling products covering a wide range of applications and requirements.



In this catalogue you will find details of our eQ units.

eQ is a range of Prime, Compact and Modular units with low energy consumption, and ease of use in focus.

- High efficiency plenum fan.
- Permanent magnet motors.
- Comprehensive range of optimised energy recovery systems to minimize your energy costs and environmental impact.
- Integrated controls packed with features to help you save energy while keeping a high standard of comfort.
- Integrated cooling systems with environmentally friendly latent energy recovery.
- A corrosion protected, well insulated, hygienic and air-tight casing.



Modular



Compact



Prime

## Introduction



### Centriflow plenum fan

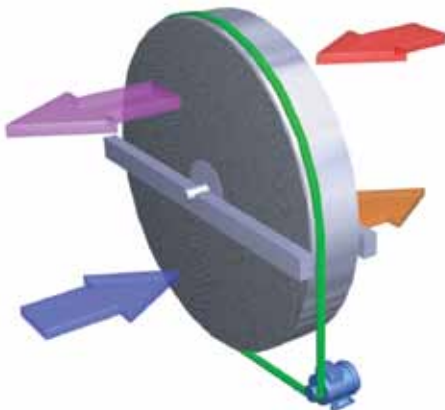
The FläktWoods Centriflow plenum fan features an impeller design that offers the best energy efficiency available on the market.

When it comes to leading edge technology in motors, we find the Permanent Magnet motors that have efficiencies equivalent to that required for an IE4 asynchronous AC motor.

Together, they offer the lowest available energy consumption. This combination is available for powers up to 11kW

As an alternative, our standard FläktWoods IE2 motors are also available.

The motors are driven by the latest technology in frequency converters that are efficient, compact and easy to use.



### Compact rotor

Our compact rotor can generally recover more than 90% of the total heat energy needed for the ventilation air during the year.

Four matrix options offering different levels of energy recovery allowing true optimization according to climate zone and supply air temperature needs.

The new hygroscopic version offers the best cooling recovery available on the market and significantly reduces size of the cooling system as well as reducing energy costs. It also offers improved winter performance as frosting is totally avoided and maximum energy recovery is available all through the winter. Not only that but the indoor climate is improved by a higher humidity level; which has been proven to be beneficial for health.



### eQ™ Plate

In multi-dwelling buildings and hotels it is important to have energy recovery systems that are simple to maintain, keeps energy costs low but avoids cross contamination.

The eQ Plate is a counter-flow plate heat exchanger offering over 80% temperature efficiency. The defrosting system has been fully laboratory tested and be relied on to minimize the consumption of energy.

# Introduction

## Control system

Air handling Units supplied with packaged controls will save site installation costs, delays to your program and the associated risks of having controls fitted on site. Our industrialised set up means that you get a high and consistent quality of the wiring and controls configuration.

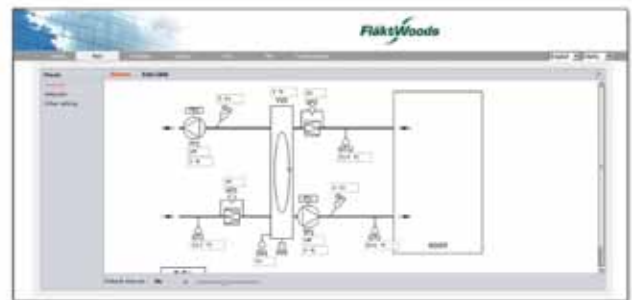
- Siemens Climatix based control system
- Easy to use interface
- OPC and Modbus.
- Simple web-server
- Bacnet, Lonworks and Modbus RTU



## Web system

Our own developed advanced web system offers a user friendly environment through which you can see all operating parameters and adjust them as necessary. It also offers a data logging facility so that you can track trends to optimise your system.

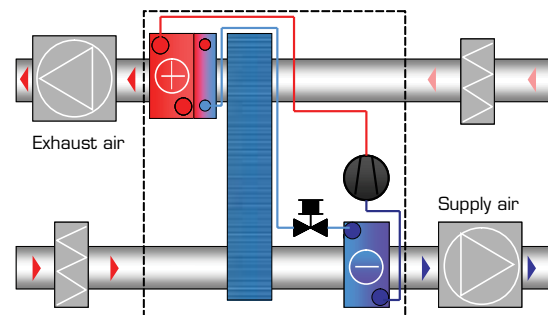
We download the diagram from our selection program Acon so it is customized according to the layout and component content of your unit.



## DX cooling system

Air handling units supplied with integrated cooling save a lot of installation work. The complete DX cooling system is built in to the unit and tested in our factory saving the costs of installation of the chiller and pipe work and making the complete installation quick smart and simple. Our newly developed ReCooler offers the added advantage of combining total cooling recovery using a rotary heat exchanger with a DX system with high COP.

The result is an exceptionally low energy cost for cooling. Our products are fitted with scroll compressors placed out of the airstream for trouble free operation, high efficiency and ease of service.





**PUBLIC BUILDINGS**



**SHOPS**



**SCHOOLS**



**HOSPITALS**



**INDUSTRIES**



**OFFICES**



# Unit configuration

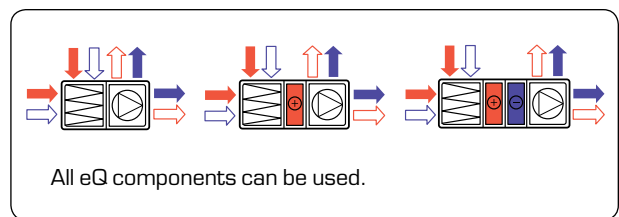
The eQ unit is available in several configurations, either as a modular unit in a single deck casing or as a compact unit in a double deck casing or as a combination between the two. Below are some examples:

**Supply air or exhaust air unit, modular design**  
 The length of the unit is dependent on the functions used. See product selection tool Acon for complete dimensions.



Airflow:

Outdoor air ⇨ Supply air ⇨ Extract air ⇨ Exhaust air ⇨



Supply air or exhaust air unit, modular design. To be used where only supply and exhaust air shall be handled or where liquid coupled heat recovery are used with separate location for supply and exhaust units.

Advantages: Compact design. Separate location for supply and exhaust air.

Unit size	Airflow, m <sup>3</sup> /s	Unit width, mm	Unit height, single deck, mm	Rotary heat exchanger REGOTERM®, TURBOTERM®	Plate heat exchanger RECUTERM®	Plate heat exchanger counterflow eQ_plate	Liquid-coupled heat exchanger ECOTERM®	Liquid-coupled heat exchanger ECONET®	Cooling unit, COOLER ReCooler with cooling recovery *	Built-in heating / cooling coils	Duct-mounted heating / cooling coils	Humidifier *	Combi Cooler *
005	0,1-0,7	800	457	✓	✓	✓	✓		✓	✓	✓		
008	0,2-1,3	1100	576	✓	✓	✓	✓	✓	✓	✓	✓		
009	0,2-1,4	800	776	✓	✓	✓	✓	✓	✓	✓	✓		
011	0,2-1,8	1200	676	✓	✓	✓	✓	✓	✓	✓	✓		
014	0,3-2,2	1100	776	✓	✓	✓	✓	✓	✓	✓	✓		✓
018	0,4-2,9	1400	776	✓	✓	✓	✓	✓	✓	✓	✓		✓
020	0,4-3,2	1100	1076	✓	✓	✓	✓	✓	✓	✓	✓		
023	0,5-3,6	1700	926	✓	✓	✓	✓	✓	✓	✓	✓		✓
027	0,5-4,3	1400	1076	✓	✓	✓	✓	✓	✓	✓	✓		✓
032	0,6-5,1	1800	1026	✓	✓	✓	✓	✓	✓	✓	✓		✓
036	0,7-5,8	1400	1376	✓	✓	✓	✓	✓	✓	✓	✓		✓
041	0,8-6,5	2000	1076	✓	✓	✓	✓	✓	✓	✓	✓		✓
045	0,9-7,2	1700	1376	✓	✓	✓	✓	✓	✓	✓	✓		✓
050	1-8	2300	1226	✓	✓	✓	✓	✓	✓	✓	✓		✓
054	1,1-8,6	2000	1376	✓	✓	✓	✓	✓	✓	✓	✓		✓
056	1,1-7,9	1700	1676	✓	✓	✓	✓	✓	✓	✓	✓		✓
063	1,3-9,5	2300	1376	✓	✓	✓	✓	✓	✓	✓	✓		✓
068	1,4-9,5	2000	1676	✓	✓	✓	✓	✓	✓	✓	✓		✓
072	1,4-10,1	2600	1376	✓	✓	✓	✓	✓	✓	✓	✓		✓
079	1,6-11	2300	1676	✓	✓	✓	✓	✓	✓	✓	✓		✓
090	1,8-12,6	2600	1676	✓	✓	✓	✓	✓	✓	✓	✓		✓

\* Functions in the eQ PLUS line.

Filters and fans are available for all sizes.

# Unit configuration

## eQ™ Top

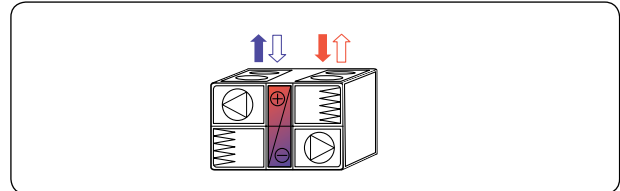
All connections are placed upwards.

See product selection tool Acon for complete dimensions.



Airflow:

Outdoor air Supply air Extract air Exhaust air



eQ Top with all connections placed upwards, available for sizes O08 and O11. Supply air and exhaust air unit with rotary heat exchanger.

Unit size	Airflow, m <sup>3</sup> /s	Unit width, mm	Unit height, mm	Rotary heat exchanger REGOTERM®, TURBOTERM®	Duct-mounted heating/ cooling coils
O08	0,2-1,1	1100	1152	✓	✓
O11	0,2-1,6	1200	1352	✓	✓

Filters and fans are available for all sizes.

# Unit configuration

## eQ™ Prime

Unitary unit, supply and exhaust air unit with heat recovery

Dampers, coils, silencers etc. are mounted in the ducts. The length of the unit is dependent on the functions used. See product selection tool Acon for complete dimensions.



Unitary unit in a double deck casing with basic functions built in the casing: filters, heat recovery and fans. Other components mounted in the ducts.

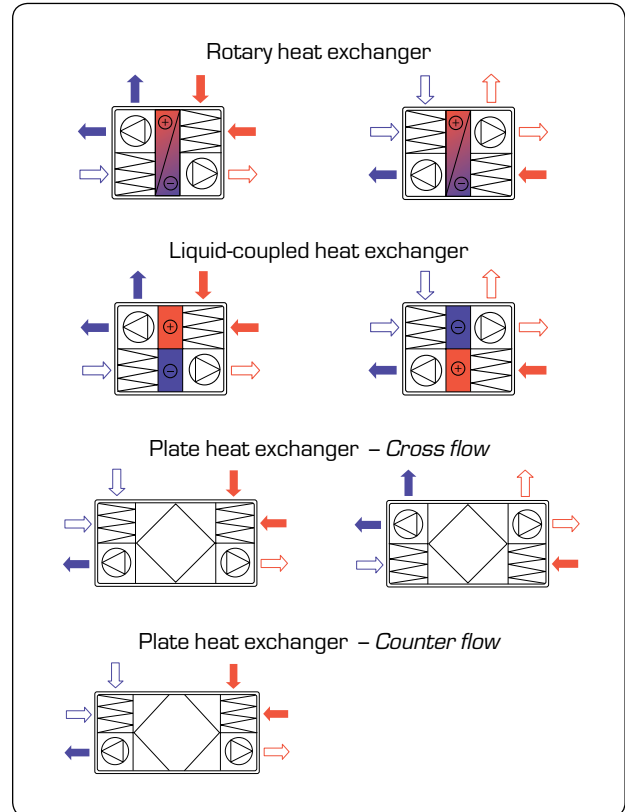
Advantages: All basic function in one unit which gives a small unit which is easy to install and commissioning.

Lowest cost.



Airflow:

Outdoor air Supply air Extract air Exhaust air



Unit size	Airflow, m <sup>3</sup> /s	Unit width, two deck, mm	Rotary heat exchanger REGOTERM®, TURBOTERM®	Plate heat exchanger RECUTERM®	Plate heat exchanger; counterflow eQ plate	Liquid-coupled heat exchanger ECOTERM®	Liquid-coupled heat exchanger ECONET®	Duct-mounted heating-/ cooling coils
005	0,1-0,7	800	952	✓	✓	✓		✓
008	0,2-1,3	1100	1152	✓	✓	✓	✓	✓
011	0,2-1,8	1200	1352	✓	✓	✓	✓	✓
018	0,4-2,9	1400	1552	✓	✓	✓	✓	✓
023	0,5-3,6	1700	1852	✓		✓	✓	✓
032	0,6-5,1	1800	2052	✓		✓	✓	✓
041	0,8-6,5	2000	2152	✓		✓	✓	✓
050	1-8	2300	2452	✓		✓	✓	✓

Filters and fans are available for all sizes.

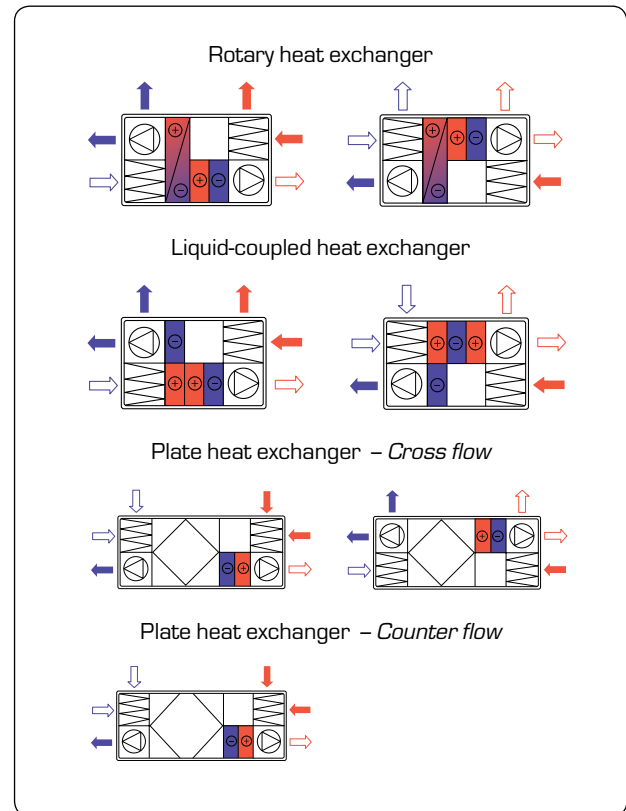
# Unit configuration

Compact unit, supply and exhaust air unit with heat recovery  
 All components built in, such as fans, filters, dampers, heat exchanger, cooling and heating coils.  
 The length of the unit is dependent on the functions used. See product selection tool Acon for complete dimensions.



Compact unit in a double deck casing with all functions built in in the casing.  
 Advantages: All functions in one casing. Compact casing and fast installation and commissioning. Lower cost than a similar modular unit.

Airflow:



Unit size	Airflow, m³/s	Unit width, mm	Unit height, single deck, mm	Unit height, two deck, mm	Rotary heat exchanger REGOTERM® TURBOTERM®	Plate heat exchanger RECUTERM®	Plate heat exchanger counterflow eQ-plate	Liquid-coupled heat exchanger ECDOTERM®	Liquid-coupled heat exchanger ECONET®	Cooling unit, COOLER ReCooler with cooling recovery *	Built-in heating/cooling coils	Duct-mounted heating/cooling coils	Humidifier *	Combi Cooler *
005	0,1-0,7	800	457	952	✓	✓	✓	✓	✓	✓	✓	✓	✓	
008	0,2-1,3	1100	576	1152	✓	✓	✓	✓	✓	✓	✓	✓	✓	
009	0,2-1,4	800	776	1552	✓	✓	✓	✓	✓	✓	✓	✓	✓	
011	0,2-1,8	1200	676	1352	✓	✓	✓	✓	✓	✓	✓	✓	✓	
014	0,3-2,2	1100	776	1552	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
018	0,4-2,9	1400	776	1552	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
020	0,4-3,2	1100	1076	2152	✓	✓	✓	✓	✓	✓	✓	✓	✓	
023	0,5-3,6	1700	926	1852	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
027	0,5-4,3	1400	1076	2152	✓	✓	✓	✓	✓	✓	✓	✓	✓	
032	0,6-5,1	1800	1026	2052	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
036	0,7-5,8	1400	1376	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	
041	0,8-6,5	2000	1076	2152	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
045	0,9-7,2	1700	1376	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	
050	1-8	2300	1226	2452	✓	✓	✓	✓	✓	✓	✓	✓	✓	

\* Functions in the eQ PLUS line.

Filters and fans are available for all sizes.

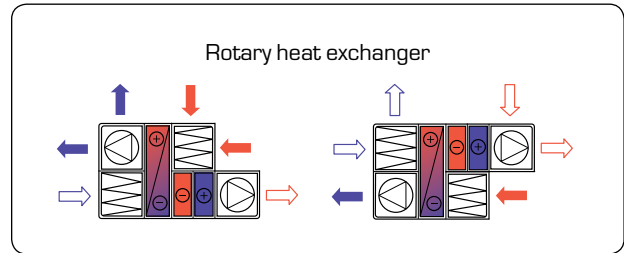
# Unit configuration

Modular unit, supply and exhaust air unit with heat recovery  
 All functions in its own module.  
 The length of the unit is dependent on the functions used. See product selection tool Acon for complete dimensions.



Airflow:

Outdoor air → Supply air → Extract air ← Exhaust air ←



In addition to the functions above all eQ's modules can be used in the modular unit.

The modular unit is build from modules containing one function. Every module is a single deck module. This gives the greatest possibilities to combine different functions and were to place them.

Advantages: The most flexible unit for all applications.

Unit size	Airflow, m <sup>3</sup> /s	Unit width, mm	Unit height, single deck, mm	Unit height, two deck, mm	Rotary heat exchanger RECOTERM®, TURBOTERM®	Plate heat exchanger RECU TERM®	Plate heat exchanger counterflow eQ-plate	Liquid-coupled heat exchanger, ECOTERM®	Liquid-coupled heat exchanger ECONET®	Cooling unit: COOLER ReCooler with cooling recovery.*	Built-in heating/cooling coils	Duct-mounted heating/ cooling coils	Humidifier *	Combi Cooler *
005	0,1-0,7	800	457	952	✓	✓	✓	✓		✓	✓	✓		
008	0,2-1,3	1100	576	1152	✓	✓	✓	✓	✓	✓	✓	✓		
009	0,2-1,4	800	776	1552	✓	✓	✓	✓		✓	✓	✓		
011	0,2-1,8	1200	676	1352	✓	✓	✓	✓		✓	✓	✓		
014	0,3-2,2	1100	776	1552	✓	✓	✓	✓		✓	✓	✓		✓
018	0,4-2,9	1400	776	1552	✓	✓	✓	✓		✓	✓	✓		✓
020	0,4-3,2	1100	1076	2152	✓	✓	✓	✓		✓	✓	✓		
023	0,5-3,6	1700	926	1852	✓	✓	✓	✓		✓	✓	✓		✓
027	0,5-4,3	1400	1076	2152	✓	✓	✓	✓		✓	✓	✓		
032	0,6-5,1	1800	1026	2052	✓	✓	✓	✓		✓	✓	✓		✓
036	0,7-5,8	1400	1376	-	✓	✓	✓	✓		✓	✓	✓		
041	0,8-6,5	2000	1076	2152	✓	✓	✓	✓	✓	✓	✓	✓		✓
045	0,9-7,2	1700	1376	-	✓	✓	✓	✓		✓	✓	✓		
050	1-8	2300	1226	2452	✓	✓	✓	✓	✓	✓	✓	✓		
054	1,1-8,6	2000	1376	-	✓	✓	✓	✓		✓	✓	✓		
056	1,1-7,9	1700	1676	-	✓		✓	✓		✓	✓	✓		
063	1,3-9,5	2300	1376	-	✓	✓	✓	✓		✓	✓	✓		
068	1,4-9,5	2000	1676	-	✓		✓	✓		✓	✓	✓		
072	1,4-10,1	2600	1376	-	✓	✓	✓	✓	✓	✓	✓	✓		
079	1,6-11	2300	1676	-	✓		✓	✓		✓	✓	✓		
090	1,8-12,6	2600	1676	-	✓		✓	✓		✓	✓	✓		

\* Functions in the eQ PLUS line.

Filters and fans are available for all sizes.

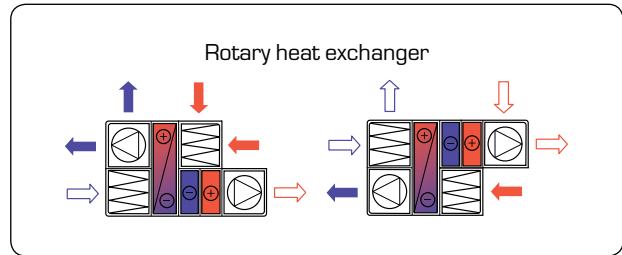
# Unit configuration

Combination of modular- and compact unit, supply and exhaust air unit with heat recovery. All functions in its own module. The length of the unit is dependent on the functions used. See product selection tool Acon for complete dimensions.



Airflow:

Outdoor air → Supply air → Extract air ← Exhaust air ←



In addition to the functions above all eQ's modules can be used in the modular unit.

The possibility to combine a modular and a compact unit is unique.

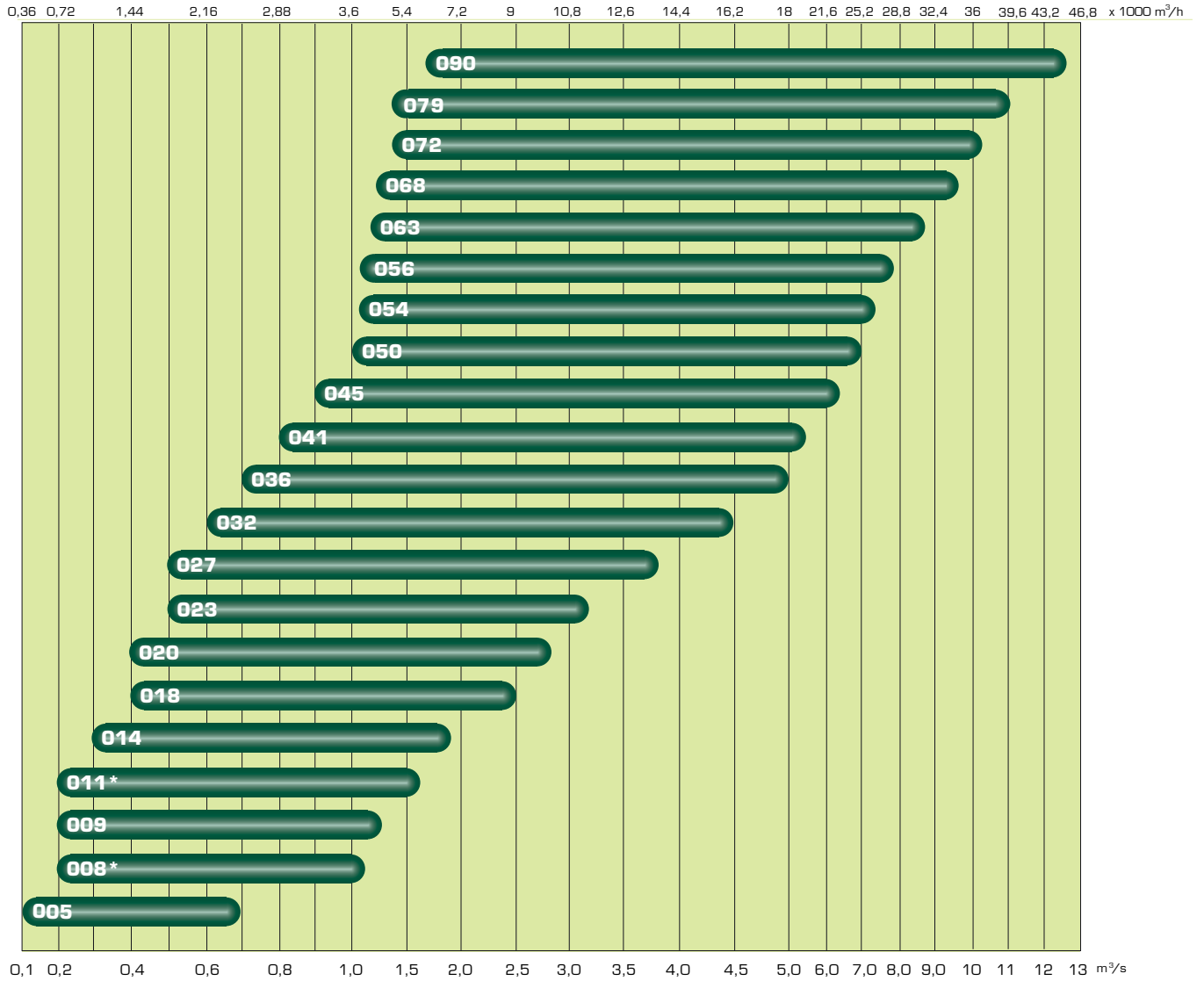
Advantages: Possible to have both the advantages from the compact unit and the modular unit. In most cases this gives the most flexible and cost effective solution.

Unit size	Airflow, m³/s	Unit width, mm	Unit height, single deck, mm	Unit height, two deck, mm	Rotary heat exchanger REGOTERM® TURBOTERM®	Plate heat exchanger RECU TERM®	Plate heat exchanger counterflow eQ plate	Liquid-coupled heat exchanger ECOTERM®	Liquid-coupled heat exchanger ECONET®	Cooling unit, COOLER	Cooling unit, COOLER ReCooler with cooling recovery.*	Built-in heating/cooling coils	Duct-mounted heating/cooling coils	Humidifier *	Combi Cooler *
005	0,1-0,7	800	457	952	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
008	0,2-1,3	1100	576	1152	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
009	0,2-1,4	800	776	1552	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
011	0,2-1,8	1200	676	1352	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
014	0,3-2,2	1100	776	1552	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
018	0,4-2,9	1400	776	1552	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
020	0,4-3,2	1100	1076	2152	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
023	0,5-3,6	1700	926	1852	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
027	0,5-4,3	1400	1076	2152	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
032	0,6-5,1	1800	1026	2052	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
036	0,7-5,8	1400	1376	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
041	0,8-6,5	2000	1076	2152	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
045	0,9-7,2	1700	1376	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
050	1-8	2300	1226	2452	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

\* Functions in the eQ PLUS line.

Filters and fans are available for all sizes.

# Flow chart











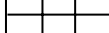

\* Available as eQ Top, with all connections faced upwards.





## Quick selection tables

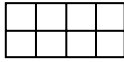
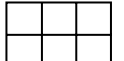
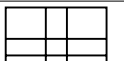

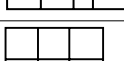

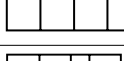
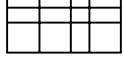
A three digit code describes the sizes in the eQ range and they indicate the airflow rate at a filter face velocity of 2.5 m/s.

	Air flow m <sup>3</sup> /s (m <sup>3</sup> /h)				Filter		Ext. cross-section		
	Max (3,5 m/s over filter)	Air cooler (buildt in cooling unit) face velocity, m/s			Filter cassettes	Cassettes	Unit width, mm	Unit height, mm single deck	Unit height, mm two deck
		2,0 m/s	2,5 m/s	3,0 m/s					
005	0,7 (2520)	0,4 (1400)	0,5 (1800)	0,6 (2160)	287x592		800	476	952
008*	1,1 (4032)	0,7 (2520)	0,9 (3240)	1,1 (3960)	792x392		1100	576	1152
009	1,3 (4680)	0,7 (2520)	0,8 (2880)	1,0 (3600)	592x592		800	776	1552
011*	1,6 (5760)	1,0 (3600)	1,3 (4680)	1,5 (5400)	2x492x492		1200	676	1352
014	1,9 (6840)	1,0 (3600)	1,3 (4680)	1,6 (5760)	592x592 287x592		1100	776	1552
018	2,5 (9000)	1,4 (5040)	1,8 (6480)	2,1 (7560)	2x592x592		1400	776	1552
020	2,8 (10080)	1,5 (5400)	1,9 (6840)	2,3 (8280)	592x592 2x287x592 287x287		1100	1076	2152
023	3,3 (11808)	2,2 (7920)	2,7 (9720)	3,3 (11880)	2x592x592 287x287		1700	926	1852
027	3,8 (13680)	2,1 (7560)	2,6 (9360)	3,1 (11160)	2x592x592 2x287x592		1400	1076	2152
032	4,5 (16200)	2,6 (9360)	3,3 (11880)	4,0 (14400)	4x392x792		1800	1026	2052
036	5,0 (18000)	2,6 (9360)	3,3 (11880)	4,0 (14400)	4x592x592		1400	1376	-
041	5,7 (20520)	3,2 (11500)	4,0 (14400)	4,8 (17280)	3x592x592 3x287x592		2000	1076	2152
045	6,3 (22680)	3,4 (12240)	4,2 (15120)	5,0 (18000)	4x600x600 2x287x592		1700	1376	-

\* Available as eQ Top.

## Quick selection tables

A three digit code describes the sizes in the eQ range and they indicate the airflow rate at a filter face velocity of 2.5 m/s.

	Air flow m <sup>3</sup> /s (m <sup>3</sup> /h)				Filter		Ext. cross-section		
	Max (3,5 m/s over filter)	Air cooler (buildt in cooling unit) face velocity, m/s			Filter cassettes	Cassettes	Unit width, mm	Unit height, mm single deck	Unit height, mm two deck
		2,0 m/s	2,5 m/s	3,0 m/s					
050	7,0 (25200)	4,3 (15480)	5,3 (19080)	6,4 (23040)	8x492x492		2300	1226	2452
054	7,3 (26280)	4,1 (14760)	5,1 (18360)	6,1 (21960)	6x592x592		2000	1376	-
056	7,9 (28350)	4,3 (15470)	5,4 (19340)	6,4 (23210)	4x592x592 4x287x592 287x287		1700	1676	-
063	8,8 (31750)	4,8 (17280)	6,0 (21600)	7,2 (25920)	6x592x592 2x287x592		2300	1376	-
068	9,5 (34020)	5,2 (18790)	6,5 (23490)	7,8 (28180)	6x592x592 3x287x592		2000	1676	-
072	10,1 (36290)	5,5 (19800)	6,9 (24840)	8,3 (29880)	8x592x592		2600	1376	-
079	11,0 (39600)	6,1 (22100)	7,7 (27630)	9,2 (33160)	6x592x592 5x287x592 1x287x287		2300	1676	-
090	12,6 (45360)	7,1 (25420)	8,8 (31770)	10,6 (38130)	8x592x592 4x287x592		2600	1676	-

## eQ™ Energy Solutions

To achieve an energy-efficient climate control system, the components must be carefully chosen to optimise the system's overall performance.

Normally, the most energy-intensive function in a climate system is the air handling unit. Energy is required both to control the airflow in and out of the building, and to condition the supply air.



The energy required to produce an airflow depends partly on the pressure increase the fan must achieve to prevent a pressure drop in the airflow components, and partly on the drive equipment's efficiency ratings. Energy consumption can be reduced by minimising pressure drop in the airflow components, and by ensuring that the fan, motor and control equipment are high efficient. A measure of an air handling unit's energy consumption when regulating the supply and extract airflow is the unit's SFP<sub>v</sub> value, defined as follows:

$$SFP_v = \frac{P_{\text{mains SF}} + P_{\text{mains EF}}}{Q_{\text{max}}}$$

SFP<sub>v</sub> = the specific fan power required by the air handling unit, kW/(m<sup>3</sup>/s)

P<sub>mains SF</sub> = the fan power of the supply air fan, kW

P<sub>mains EF</sub> = the fan power of the extract air fan, kW

Q<sub>max</sub> = the unit's highest flow, supply or exhaust air flow, m<sup>3</sup>/s

P<sub>mains</sub> is defined as the active electrical power supplied by the mains with an air density of 1.2 kg/m<sup>3</sup>, clean filters and dry heat exchangers.



## Save energy, economy and environment with Fläkt Woods

Energy optimization is an important aspect of ventilation, where Fläkt Woods have acclaimed expertise.

We use e<sup>3</sup> to highlight products and solutions that are particularly effective. They serve a dual purpose of saving both your long-term economy and our environment.

[www.flaktwoods.com/energy](http://www.flaktwoods.com/energy)



The energy required to condition the supply air to a building largely depends on how the energy in the extract air can be recovered. A high recovery degree reduces the energy requirement. However, an increased pressure drop over the heat regenerator raises the fan's energy consumption. For this reason, the regenerator must be optimised with regard to both recovery degree and pressure drop.

An optimally dimensioned climate system offers significant energy savings. These savings normally result in a very short payback time for the investment, while also significantly reducing the climate system's environmental impact.

### Fläkt Woods has spent many years developing products that take into account important factors such as:

- Efficiency
- Environmental impact
- Reliability
- Freezing
- Cooling recovery
- Pressure drop
- Leakage
- Control
- Humidity transfer
- Odour transfer

# eQ™ - when hygiene is especially crucial



In order for operations to run smoothly, certain working environments require a hygienic indoor climate that is guaranteed to be bacteriafree. Fläkt Woods has long experience of hygiene applications. Over 300 hospitals in 18 countries in Europe and Asia use Fläkt Woods ventilation systems.

With the new eQ air handling unit, we offer safe, high-quality solutions for a hygienic indoor climate.

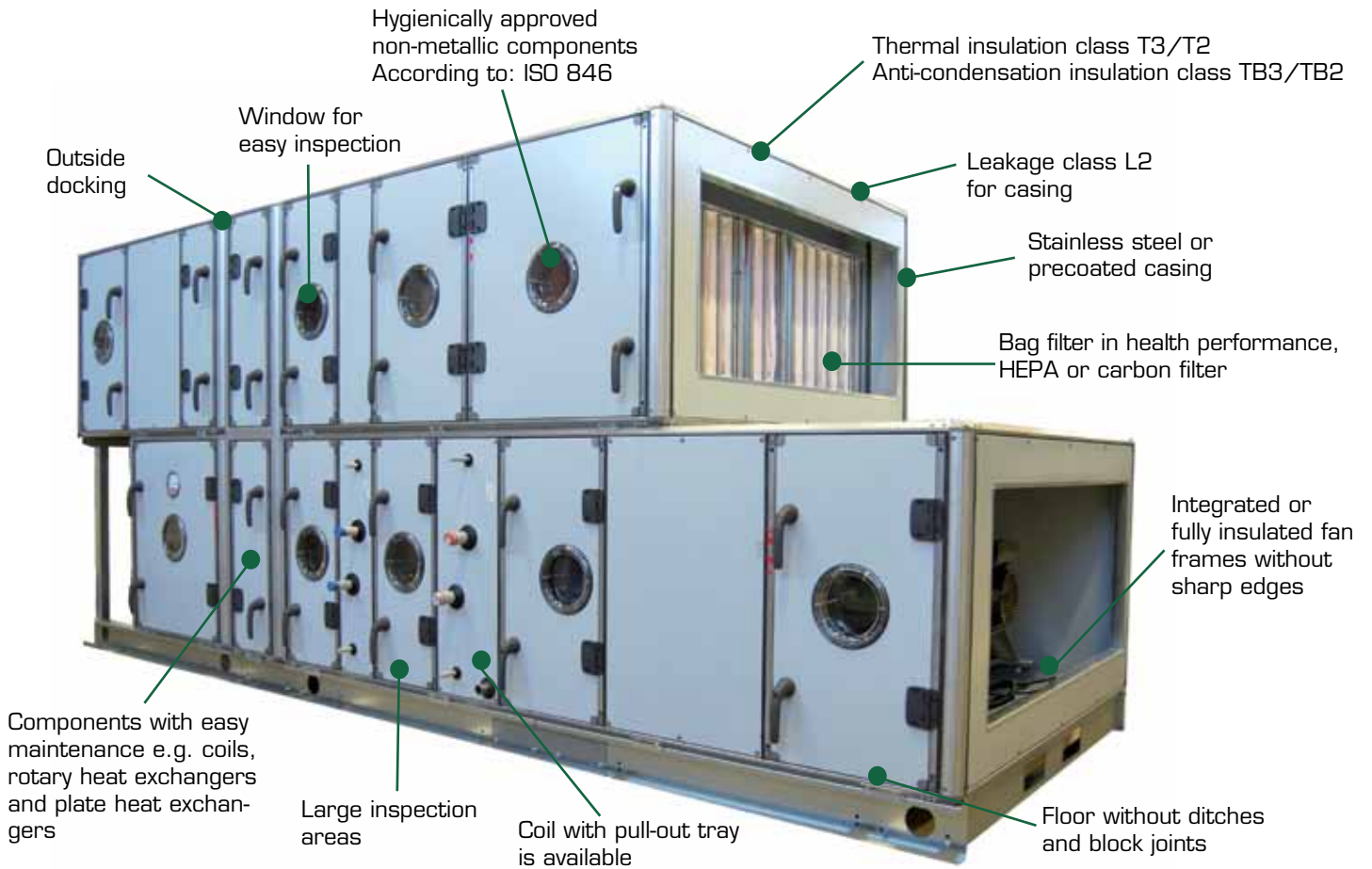


Institut für  
geprüft  
**RLT-Hygiene**  
2009-2012  
Lufthygiene

Hygienerrelevante Merkmale

- VDI 6022 (D)
- VDI 3803 (D)
- ÖNORM H 6021 (A)
- SWKI VA104-01 (CH)
- DIN EN 13779 (EU)
- DIN 1946 Teil 4 (D)
- SWKI 99-3 (CH)
- ÖNORM H 6020-1 (A)

geprüft durch **ILH BERLIN**

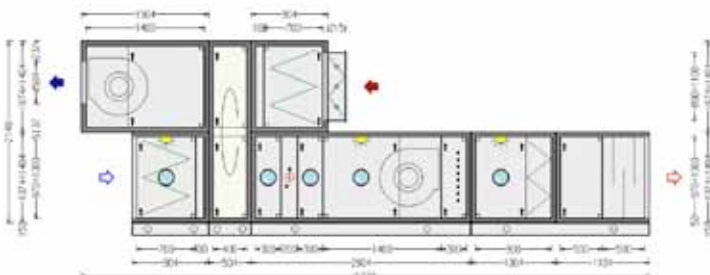


### Easy configuration with product selection tool ACON

To ensure correct configuration of hygiene units, ACON has a Hygiene Verification Check function that helps the user to configure a unit compliant with VDI 6022 for standard hygiene or EN 1946-4 for hospital environments. ACON provides clear recommendations and instructions to ensure that the unit meets relevant standards. Fläkt Woods recommends that the user has good prior experience of hygiene projects.

### ACON provides all the information and support required for good planning

- Product size
- Audio data
- Efficiency
- LCC
- Delivery time
- DXF and DWG files can be exported to CAD software
- Support available for Autodesk i-drop
- Relevant documentation always supplied
- Hygiene check





## eQ™ Top

The eQ Top is a compact configuration, manufactured in two sizes with an air flow range of 0.2 - 1.6 m<sup>3</sup>/s. Since all connections are placed upwards, the eQ Top is suitable for narrow installations.

The eQ Top is supplied with direct-driven supply and extract air fans, supply and extract air filters and a rotary heat exchanger. There is a wide range of accessories for the eQ Top for in-duct air processing, such as dampers, coils, silencers etc. The control system, which is integrated with the unit, is ready for use with a large number of external functions. Temperature sensors and actuators can be easily connected using quick connectors.

### Fan

The eQ Top is equipped with plenum fans Centriflow PLUS®.

The fans are driven by high efficient motors which means that the air handling unit is very energy efficient.

The fans' integral or EC motors have infinitely variable control.

#### Fan motors available for the eQ Top

- Integral motor
- EC motor
- Standard motor without frequency converter

### Typical installations

The eQ Top is suitable for installation in public buildings such as child care centres, schools, offices, shops etc.

The eQ Top is intended for indoor installation.

### Filter

Supply and extract air filters made of fibreglass.

Filter class F7 (EU7).

All filters in the eQ Top are of the ultra compact type which are easy to pull out when they are being replaced.





### Connections

All connections are placed upwards, which makes eQ Top suitable for installations with minimum space. The connections are round with rubber rings.

It is possible to connect external functional components such as coils, silencers etc., directly onto the air handling unit whereas cooling coils, for example, needs to be placed horizontally in the duct system.

### Easy dismantle for transportation indoors

To make it easy to transport through narrow doorways the eQ Top can be ordered as a version that can be dismantled. The unit parts are delivered on one base frame. The three sections can easily be separated using external joints. If the unit needs to be dismantled there are quick connections between the unit sections in order to simplify the separation of blocks.

The most common external components are delivered with quick connections for easy connection to the cabinet.

### Operation

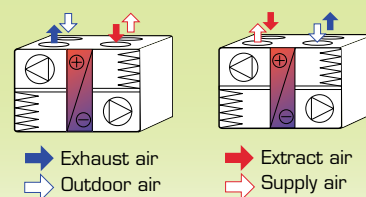
The eQ Top is supplied with a control unit as standard and this includes a control panel for operation. All functions are displayed in plain text.

All settings are made and readings taken using the control panel.

### Delivery configuration

The units can be supplied with customized fan arrangement. The standard configuration is a top or bottom right-hand supply air fan. The unit can be changed with ease to a configuration with a top or bottom left-hand supply air fan. This is done by means of a simple switching operation in the control system.

#### Available configurations





# eQ™ Prime

eQ Prime is a simple solution to many of your engineering problems

- Cost effective
- Energy saving
- Simple installation
- Quick delivery
- Packaged controls
- Space saving
- Integrates with the BMS
- Start-up by Fläkt Woods

## Benefits with eQ Prime

Capital cost savings!	Energy cost savings!
<ul style="list-style-type: none"> <li>→ Save costs by value engineering</li> <li>→ Reduce plantroom size/steelworks</li> <li>→ Reduce cooling loads</li> <li>→ Reduce heating loads</li> <li>→ Reduce airflow and AHU cost</li> <li>→ Reduce ducting size and cost</li> <li>→ Many more savings possibilities to suit your projects</li> </ul>	<ul style="list-style-type: none"> <li>→ Save energy by efficient design</li> <li>→ Highest energy recovery devices</li> <li>→ Removed or reduced cooling machines</li> <li>→ Reduced or removed boilers</li> <li>→ Energy monitoring controls</li> <li>→ Reduced airflow</li> <li>→ New lowest energy fan</li> <li>→ Centriflow plus with PM-motor</li> </ul>



**NEEDS**



**SELECTION**



**DELIVERY**



**START-UP**



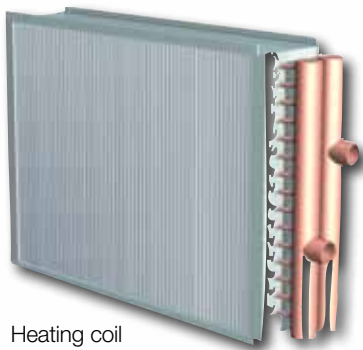
**OPERATION**

## Duct components and accessories

For your convenience, the unit can be delivered with the following duct components:

### Parts for ducts

- Dampers with actuator, two positions with spring.
- Heating coil with frost protector, valve and actuator.
- Cooling coil with valve and actuator.



Heating coil



Damper



### The eQ Prime control and adjustment system has the following standard functions:

- Energy saving summer/night cooling function
- Fan flow control (CAV)
- Temperature regulation control
- Control of accessories, heating/cooling coils etc.
- Cooling recovery
- Filter monitoring
- BMS interface options
- Free and simple web server
- Input: extended or forced operation via external switches
- Input: external fire alarm
- Alarms functions
- Cooling recovery

## Design and characteristics



### A unit for high demands for air handling

Air handling unit eQ meets the requirements according to the classification in the CEN standard for air handling units. The component parts making up the unit are designed and tested in accordance with international norms. The eQ air handling unit is manufactured in 21 sizes, which cover an air flow range from 0.1 to 12.5 m<sup>3</sup>/s (360 m<sup>3</sup>/h to 45 000 m<sup>3</sup>/h). It is supplied in blocks, which include one or more

functions, or as a complete pre-assembled unit. The unit is available for both indoor and outdoor installation with air handling combinations for different heat recovery alternatives. The unit is manufactured by Flakt Woods, which has a certified management system according to ISO 9001 (quality), ISO 14001 (external environment) and AFS 2001:1 (working environment).

### What gives the unit its quality:

- The construction of the unit casing meets the requirements of the CEN standard for air handling units.
- In-house manufacture means that the functions are optimally adapted to the eQ unit.
- A robust frame with fully closed frame profiles gives a unit casing with high strength.
- Casing elements in double-wall construction with a 50 mm thick sandwich layer of non-combustible mineral wool insulation providing good thermal and acoustic insulation.
- Mechanically secured sealing strips of cellular rubber in the inspection doors reduce leakage flow to a minimum.
- Can be supplied in blocks with one or more functional parts to facilitate transport and installation in tight spaces.
- Totally smooth inside and outside, which ensures that strict hygiene requirements are met.
- Free choice of material and surface finish for the unit casing.
  - Casing element and frame made of aluminium zinc coated sheet steel or stainless sheet steel.
  - Casing element with internal and external polyester-coated, galvanized sheet steel and aluminium zinc coated frame.
  - Mineral wool.

# Sizing



## Unit sizing via the Web

Airhandlingconfiguration - ACON is the name of the new generation of web-based product selection programs. With ACON, eQ can be sized quickly and easily. The program offers an air handling unit specification and all the facts needed, such as dimensions, efficiencies, acoustic levels, etc.

The program also provides product specific documentation concerning installation, mounting and maintenance. ACON enables calculations for LCC (Life Cycle Costs), energy consumption and operation costs.

- Always the latest version of the soft ware.
- Requires no installation.
- Always available on the Internet.
- Fan performance curves with duty points, etc.
- The unit drawing can be exported to CAD.
- Calculates energy consumption and CO2 emissions.
- Calculates the units LCC (Life Cycle Costs).
- Easy to combine eQ and eQ PLUS.

To enable you to access to the program, you need a user ID and a password.

You can obtain these by contacting our nearest sales representative.

To find the nearest sales representative, visit our web site at [www.flaktwoods.com](http://www.flaktwoods.com).

# Unit description

## Casing

The unit casing consists of closed frame profiles made of aluminium zinc coated sheet steel, which are joined together with strong corner pieces. Taken all together, this forms a strong and stable frame.

The casing elements and inspection doors are executed as a double plate construction with a 50 mm sandwich layer of mineral wool insulation.

The inspection doors are mounted on adjustable hinges in all unit sizes and are equipped with mechanically secured sealing strips.

The inspection doors can also be obtained with door locks. The double-wall construction of the casing gives the unit a smooth inside and outside, which facilitates cleaning and reduces the risk of accumulations of dirt. The fact that the inside of the unit is fully covered with sheet metal eliminates the risk of fibres being carried along by the air flow.

To facilitate maintenance and service, the casing for many functional parts can be supplied with inspection windows.

The unit casing is mechanical designed for:

- 2500 Pa negative or positive pressure
- max 70°C air temperature
- min -30°C air temperature

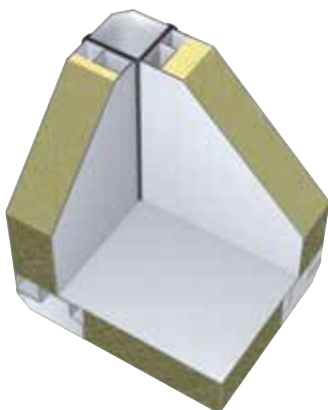
The unit casing is electric designed for:

- max 40 °C air temperature
- min -20 °C air temperature



### Design, eQ PLUS®

- insulation equivalent fire ratings EI15 resp. EI30
- hygienic design for indoor and outdoor applications.



## Frame

The frame is manufactured from closed profiles using 1.5 mm galvanized sheet steel or aluminium zinc coated sheet steel. Joining of blocks is done using internal or external screwed joints.

## Casing element in double-wall construction

The casing elements are manufactured as a double-plate construction with a 50 mm sandwich layer of mineral wool insulation. The insulation is made of mineral wool, standard and heavy. The standard wool has the quality of heat-insulation, whereas the heavy wool has the quality of sound-proof. The casing elements consist of 0.9 mm aluminium zinc coated sheet steel depending on the size. Alternatively, the wall elements consist of polyester coated galvanized 0.9 mm sheet steel, or a combination of these.



### Design, eQ PLUS®

The casing is available in several materials. See our product selection tool ACON. Internal components are available in stainless sheet steel.

## Intermediate floor in double deck casing

The intermediate floor is executed as an airtight and stable partition wall in a double-plate construction between the supply air and exhaust air flows, which prevents condensation on the exhaust air side. In the intermediate floor there is 50 min mineral wool insulation.

## Sealing strip

Sealing strips made of cellular rubber (EPDM) with closed pores are used for sealing the unit casing. The sealing strip is attached by mechanical means to the inspection door.

		Exterior plate			
		Alu-zink steel plate 0.9 mm	Polyester covered steel plate 0.9 mm	Stainless steel plate 0.7 mm AISI 304	Stainless steel plate 0.7 mm AISI 316L
Innerplät	Alu-zink 0.9 mm	X	X		
	Polyester covered steel plate 0.9 mm		X		
	Steel plate 0.7 mm AISI 304		X	X	
	Stainless steel plate 0.7 mm AISI 316L				X

## Unit description

### Classifications

The coefficient of thermal transmittance, insulation factor, leakage flow and strength of the unit casing are classified according to CEN standard EN 1886. The corrosivity class (environmental class) of the unit casing is classified according to BSK 94/99 and ISO 12944-2 and ISO 9223\*.

The casing is designed to handle density classes up to 2500 Pa.

Hygienic version of eQ casing comply EN 1886.

AHU Mechanical Performance

- Mechanical strength
- Leak casing
- Filter bypass leakage
- Technical performance
- Acoustic isolation

#### eQ unit casing conforms to the following classes:

	Class
Thermal insulation (coefficient of thermal transmittance class)	T2 (eQ PLUS) T3 standard insulation
Anti-condensation insulation	TB2 TB3
Air-tightness class (leakage flow)	L2
Strength class	D2
Corrosivity class (environmental class)	C4 in standard design C5 in stainless design (eQ PLUS) C5 in acid proof A4 CA15 (3162) (eQ Plus)

\* For more information, see the Technical Handbook, Air handling technology (ID-number 8629).

### Official testing

The classifications of the eQ unit casing have been verified by measurement at the TÜVSÜD independent laboratory in Germany.

### Outdoor design

The unit in outdoor design is mostly identical to that in indoor design, and both have the same technical data. The outside of the casing is sealed with permanent elastic sealing compound.

The unit is equipped with a convex roof, EQBZ-01, to ensure good water run-off. The roof has a projecting drip edge.

The base frame EQAZ-04 are always used for positioning outdoors. The units should preferably be installed on longitudinal base members or on supports with a max. spacing of 1.5 m.

Units in outdoor design are manufactured only for duct connections on the end walls.

Shunts are positioned in a warm and easily accessible indoor area.

### Hygienic design

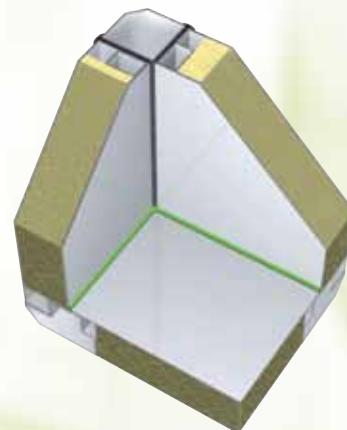
Even in its basic version, the eQ unit meets very strict hygiene standards. The sides of each module's casing are very smooth, meaning that there are no differences in level between the panel surfaces and the closed frame profiles. There is no ledge at the base of the unit. Large inspection doors allow easy to inspect and cleaning inside the unit. The hygiene version of the eQ is interior columns sealed so that no pollutants can be trapped.

- The casing elements have a doublewall construction with a 50 mm thick non-combustible mineral wool insulation providing excellent thermal and acoustic insulation.

- Twin-wall polycarbonate window for easy cleaning and inspection.

- Mechanically secured foam rubber sealing strips in the inspection doors minimise leakage flow.

- The door locks are fitted into the door frame to allow unobstructed airflow and prevent dirt accumulation.



## Unit description

### Fan

EQLK Plenum fan, Centriflow Plus®

EQLT Plenum fan, Centriflow Plus® for eQ Top

### Design

Centriflow Plus® plenum fan, with an efficiency up to 77%. The fans are driven by efficient motors, which give a highly energy-saving unit.

The plenum fan is equipped with 4 measurement points for measurement of the air flow, which give a very high accuracy of measurement. This is important in order to achieve the lowest possible energy consumption. The absence of a fan cover permits easy cleaning. Since the fan can be balanced to produce low levels of vibration, it is suitable for applications where vibration-free running is called for. Outlet direction forwards or upwards.

The eQ range offers several motor options:

Conventional asynchronous motors, also as integral motors, in efficiency class IE2. PM-motors (corresponding to efficiency class IE4\*) for lowest energy consumption and EC-motor in the lower flow range.

### Material

Vibration dampers made of rubber or steel spring dampers. The fan frame and blades are available as epoxy painted.



Centriflow Plus® with integral motor



Centriflow Plus® with PM-motor



### Design, eQ PLUS®

The frame and wheel are epoxypainted in stainless design.

\* The PM-motor is equal to or exceeds the drafted IE4 requirements on efficiency.

## Unit description

### EQLR Centrifugal fan

#### Design

EQLR is a fan with spiral casing and backward curved blades, i.e. type B impeller. The fan has high efficiency, low sound emission and a stable fan characteristic throughout the recommended working range.

The impellers are designed for high rigidity and strength.

On some unit sizes the motor is placed next to the fan, which enables a short fan block. The complete fan unit (fan, motor, belt drive and base frame), mounted on vibration dampers.

In order to avoid vibrations in the connected duct system or unit sections the outlet of the fan is connected to the casing via a flexible connection (PVC-coated woven glass fibre). All bearings are rated for L10, 40 000 hours operation with 90 % probability at the maximum fan speed. This means that the probable average life expectancy will be good at the fastest rpm but considerably better at a lower rpm.



#### Material

The hood and wheel can be enhanced with epoxy painting. Vibration dampers made of rubber or steel spring dampers.



#### Design, eQ PLUS®

The frame and wheel are epoxypainted in stainless design.

Double motors internally, single and double motors externally.

### Belt drive for centrifugal fan EQLR

The flat belt drive is designed for each combination of fan and motor and for the required speed, so that the motor and fan will have a useful life of at least 40 000 hours and that the belts will have a useful life of at least 25 000 hours.



## Unit description

### Filter

#### EQPA Panel filter

##### Design

Filter cassettes, G4. Filter manufactured from a synthetic material, that is cleanable.

For simple applications, where there are low demands for filtration. A tray drainage is available as an accessory



##### Design, eQ PLUS®

EQPA is available with filter class G2 in aluminium that is cleanable. Available with a drain tray.



#### EQPB Filter

##### Design

- Filter cassettes, coarse filter: G4, fine filter: F5, F7, F9.
- For other filter classes, replacement filter EQPZ-03 and EQPZ-05 are available.
- Synthetic or glass fibre.
- Can also be provided with a pre-filter G3 and G4.
- Glass fibre filter for lower pressure drop (low SFP<sub>v</sub>, energy-saving filter), available for all sizes.
- A stainless tray without drainage is available as an accessory.



##### Design, eQ PLUS®

- Compact filter.
- Cityflo (glass fibre and active carbon)
- Citycarb (compact and active carbon)
- Available with drain tray in stainless sheet steel.



#### EQPT Filter for eQ Top

##### Design

Supply and extract air ultra compact filters made of fibreglass. Filter class F5 on the extract air side and F7 on the supply air side.



## Unit description

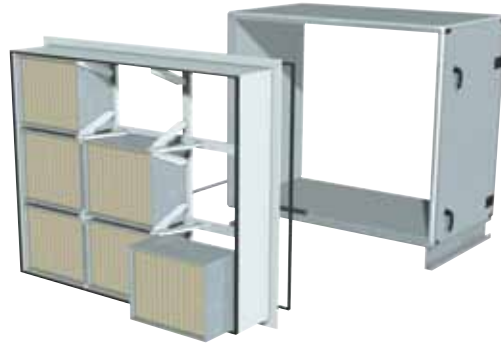
### Filter



#### EQPF HEPA filter

##### Design

HEPA filter for air handling units with high demands on hygiene. EQPF has a pentented seal to eliminate the risk of leakage. Welded mounting frame in which the filter cassettes are fixed.



#### EQPK Carbon filter

##### Design

Filter for adsorption/ removal of the gas pollutants and odors. The filter consist of cartridges filled with active carbon. Cartridges installes with a bayonet in the unit. Bayonet fitting makes the change quick an easy. The used cartridges are exchanged for new or refilled with new active carbon.



## Unit description

### Rotary heat exchanger

EQRB REGOTERM®/TURBOTERM®

#### Design

- TURBOTERM® provides 6% higher efficiency than REGOTERM® because of tighter foil spacing.
- Non hygroscopic (heat transfer only).
- Hygroscopic (heat transfer and moisture transfer).
- Sorptions rotor.

Forced air cleaning sector, electronic speed control and rotation sensor.

There is no need for defrosting for normal comfort ventilation. The risk of frost formation may be present at a relative humidity greater than 30% in the exhaust air and an outdoor temperature lower than -15 °C.

The Fläkt Woods ACON product selection tool verifies the need for defrosting.

#### Material

Rotor in aluminium and frame in casing material.



#### Design, eQ PLUS®

- Sorption rotor
- Edge-reinforcing
- Sectorized and divisible rotor
- Epoxy painted rotary

### Plate heat exchanger

EQRC RECUTERM®

#### Design

- Large heat exchanger with section defrosting, which gives the best energy solution.
- Large heat exchanger with or without a by-pass damper.
- Small heat exchanger with a by-pass damper.

Hygiene approved inclined drain tray on the exhaust air side, made of stainless steel.

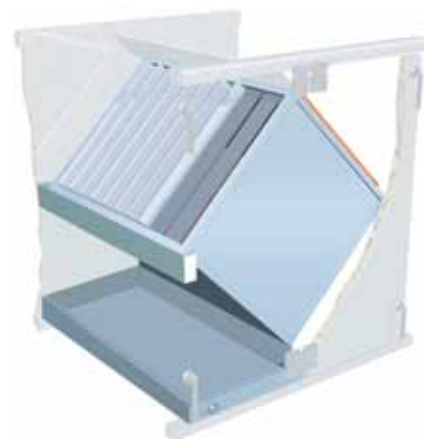
Droplet eliminator in plastic.

At high atmospheric humidity, a tray (EQRZ-01) may also be required on the supply air side.

Must be defrosted at an outdoor air temperature below ca -7 °C.

#### Material

Aluminium.



## Unit description

### Plate heat exchanger

EQRG eQ Plate

#### Design

Heat exchanger who works as a counter flow exchanger which gives higher recovery than a cross-flow exchanger e.g. EQRC.

Must be defrosted at an outdoor air temperature below ca -2°C, this is done with the built in defrosting system. Below -22 °C outdoor temperature a pre heater must be used.

#### Material

Aluminium.

eQ Plate is available for units up to size eQ 018 and maximum flow rate is 1.7 m<sup>3</sup> / s (6100 m<sup>3</sup>/h).



## Unit description

### Liquid-coupled heat exchanger

#### EQRT ECONET®

##### Pump unit

ECONET® pump units are available in two different versions, standard or compact. Standard pump units is equipped with a separate control unit. The controller is flexible with a numerous additional features, as the energy calculatic efficiency calculation, LON communication etc. In the compact pump unit the control function is integrate into the inverter. This means a smaller pump unit and cost savings. Basic functionality is the same for both, the two version are Modbus compatible.

##### Design

The ECONET® functional section is unique in that it can completely eliminate the need for additional heating coils and cooling coils. The extra energy necessary for heat-ing/cooling is supplied directly in the energy recovery circuit. High-efficiency heat exchangers make it possible to utilise low-grade heat, often in the form of waste heat. The difference between the supply air temperature de-sired and the temperature of the incoming medium can also be kept very low.

Besides the two heat exchangers, the product also includes the following;

- Pump unit

The unit consists of a pump, piping components and necessary sensors. The pump is a multi-stage centrifugal pump driven by a controllable variable-speed motor. The pump casing, impeller and end pieces are made of stainless steel.

- Frequency inverter for controlling the speed of the pump.
- Control unit. The unit consists of a controller that controls the liquid circuit.

Alarm functions that include anti-frost protection are included. If condensation is likely to form on the coil surface and the air velocity exceeds 3 m/s, the coil must be equipped with a droplet eliminator.

The adjustment should be performed by authorized personnel on installation site.

##### Material

The two heat exchangers, one for supply air and one for extract air, consist of copper tubes and aluminium fins. The droplet eliminator is made of plastic. Both heat exchangers have sloping drain trays made of stainless steel.



#### Design, eQ PLUS®

The ECONET® is available with maximum front-area, in which the entire internal surface is utilized for coil fins and copper headers are placed outside the airstream. In addition, the coils can be ordered in many different material qualities. See our product selection tool ACON or the product code for alternatives.



Standard



Compact

## Unit description

### Liquid-coupled heat exchanger

EQRF ECOTERM®

#### Design

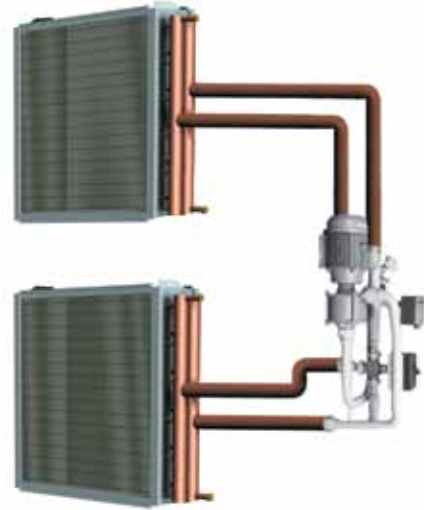
4 output variants.

The exhaust air coil has an inclined drain tray in stainless steel. The droplet eliminator is made of plastic. Withdrawable drain trough is available for size 005-090.

If the risk of condensation is present, and if the air velocity exceeds 3 m/s, the coil should be provided with a droplet eliminator.

#### Material

Copper pipes and aluminium fins.



#### Design, eQ PLUS®

The ECOTERM® is available with maximum front area.

In addition, the coils can be ordered in many different material qualities. See our product selection tool ACON or the product code for alternatives.

### Heaters/Coolers

EQEE, EQEG, EQKE Air heater for hot water, frost coil

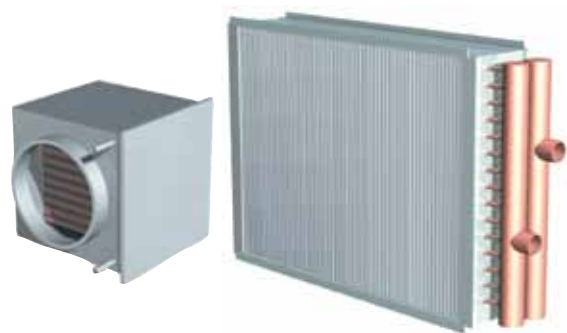
#### Design

- The air heater has exposed collector pipes.
- Max. operating pressure: 16 bar at a max. operating temperature 100 °C.
- Max. operating pressure: 10 bar at a max. operating temperature of 150 °C.

EQKE is available for duct installation.

#### Material

Copper pipes and aluminium fins.



#### Design, eQ PLUS®

The air heater can also be ordered in many different material qualities. See our product selection tool ACON or the product code for alternatives.

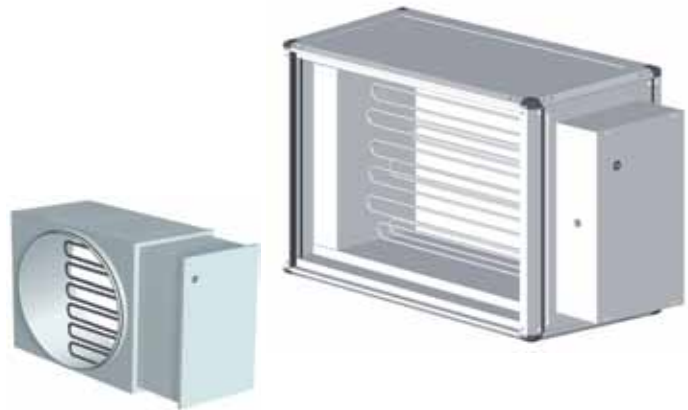
## Unit description

EQEK, EQKK Air heater, electric

### Design

- Max surface temperatures: 90°C.
- Voltage: 3 x 230 / 3 x 400 V.
- IP class: IP-43 / IP-55.
- Meets SEMCO, NEMKO requirements.

EQKK is available for duct installation.



EQNN, EQNP Air cooler

Chilled water, evaporative refrigerant

### Design

A water trap for positive or negative pressure is available as an accessory.

- All air coolers include a drip tray mounted underneath the coils.
- Max. operating pressure: 16 bar at a max. operating temperature of 100 °C (Water).
- Max. operating pressure: 10 bar at a max. operating temperature of 150 °C (Water).
- Max. operating pressure: 22 bar at a max. operating temperature of 100 °C (Evaporative refrigerant).
- Fin pitch 2 mm.

### Material

Drip trays made of stainless steel AISI 304.

Aluminium fins and copper tubes.

Droplet separator made of plastic.



### Design, eQ PLUS®

EQNN and EQNP are also available with:  
Fin pitch 2,5 and 3 mm.

In addition, the air cooler can be ordered in many different material qualities. See our product selection tool ACON or the product code for alternatives.

## Unit description

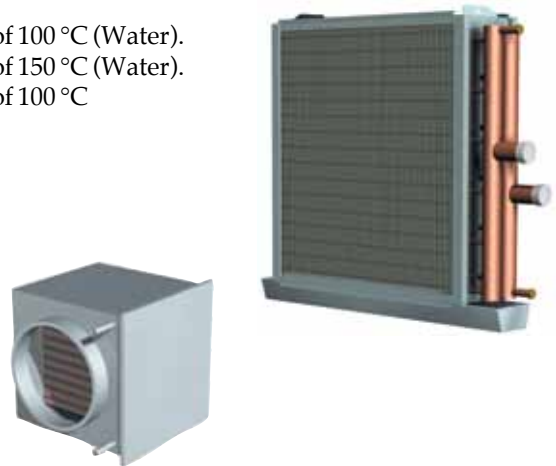
EQKN, EQKP Air cooler  
Chilled water, evaporative refrigerant

### Design

- Max. operating pressure: 16 bar at a max. operating temperature of 100 °C (Water).
- Max. operating pressure: 10 bar at a max. operating temperature of 150 °C (Water).
- Max. operating pressure: 22 bar at a max. operating temperature of 100 °C (Evaporative refrigerant).
- Fin pitch 2 mm.

### Material

Aluminium fins and copper tubes.  
Droplet separator made of plastic.



### EQHN, EQHP Air cooler in hygienic design

Cooling water or DX

#### Design

Air cooler for hygiene applications.  
Withdrawable drain tray is available. The tray lenas in two directions in order to ensure that all water flows out. It is easily accessible to facilitate cleaning.  
EQHN and EQHP meet the requirements according to VDI 6022.

#### Material

Droplet eliminator in plastic.  
In addition, the coil can be ordered in many different material qualities. See our product selection tool ACON or the product code for alternatives.





## Unit description

### Empty section

EQTB, EQTC Empty section

Design

#### EQTC

For inspection and maintenance operations and connection of ducts. With or without door.

Connections: Ceiling, bottom, rear side and inspection side.

#### EQTB

Empty section for air coolers, intended for easier maintenance in hygiene applications.



Design, eQ PLUS®

EQTC is available with drain tray.

### Jointing frame



EQVH Jointing frame

Design

Jointing frame for installation between modules of different size. Fitted to the larger module.

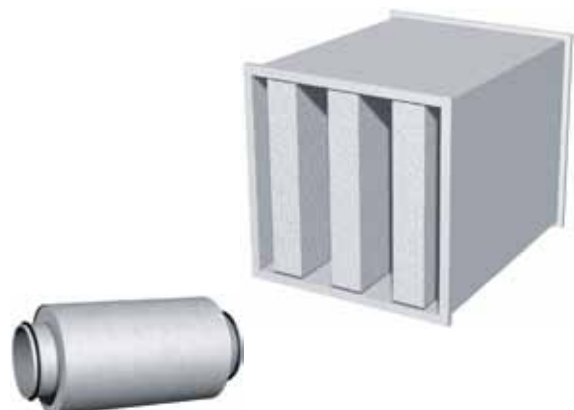
### EQSA, EQSD Silencer

Design

Absorption silencer with baffles.

Non-combustible mineral wool with external protective woven fabric, which prevents fibres from the wool being carried along by the air flow. The baffles are available for wet cleaning.

EQSD is available for duct installation.



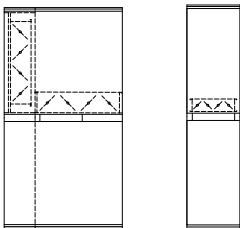
## Unit description

### Recirculated air section

#### Design

The function is intended for the circulation and heating of room air, e.g. night-time heating.

It is positioned between the heat recovery unit and the air heater. Available with recirculated air damper only, or with recirculated air damper and exhaust air damper. Internal dampers must be provided with a door.



### Mixing section

#### Design

This function is intended for mixing different air flows. The mixing section can have one, two or three dampers depending on the desired function.



### EQAZ-12 Damper

#### Design

- Counter-rotating stable damper blades in double-plate construction with rubber seals made of EPDM.
- The damper shafts rotate in bearings made of acetal plastic. Smaller dampers with toothed wheels and larger dampers with a linkage mechanism.
- Max permissible pressure difference: 1000 Pa when the damper is closed.
- Air-tightness class CEN3 or CEN4. Note! If you want to have a unit in air-tightness class L2 (CEN b) the outside mounted dampers need to fulfil CEN 4.
- A mounted actuator is available as an accessory.
- Insulated damper blades are also available.

At air velocities below 10 m/s, the sound power level is less than 20 dB.

#### Material

Galvanized sheet steel or stainless sheet steel.



## Unit description

### Humidifier



#### EQQA Humidifier for once-through water and circulated water

##### Design

Intended both for direct humidification of the supply air and for indirect humidification positioned in the extract air part. In the latter case the extract air is cooled evaporatively before a rotary heat exchanger that cools the supply air. Evaporative humidifier with humidifier fill in aluminium for 90% or 60 % humidification rate. EQQA Humidifier is hygienic and economical designed. Its water consumption is minimal and it is a good energy solution.

##### Material

Humidifier fill in aluminium. The tray is leaning and made of stainless sheet steel.

#### EQQA Humidifier for circulated water

##### Design

The water supply is controlled by a built-in solenoid valve. Required supply water flow rate is set on the flow regulator. The bleed-off flow is determined by the water quality and its quality zone is adjusted on the control regulator. To ensure that the water is maintained clean the control system is factory-set for emptying and flushing once a day. For hygienic reasons the control system can also be set to empty the tray after a certain period when there has not been any need for humidification.



#### EQQA Humidifier for once-through water

##### Design

Water is supplied to the sprinkler tubes via a pulse valve and a constant flow valve, which ensures the right water application flow rate.

#### EQQB Empty section

##### Design

Empty section for steam humidifier. The steam lances are installed on site and the length of the empty section must conform with the recommendations from the steam lances supplier.

## Unit description

### Cooling unit

#### EQKA COOLER



#### Design

The cooling unit is always supplied as a complete, factory-tested unit, with provision for connection to other functional sections. For horizontal airflow only. The cooling unit cools the supply air by means of circulating R407C refrigerant

The cooling unit can be equipped with a mains water-cooled condenser, which is connected upstream of the ordinary air-cooled condenser and in series with it. The water-cooled condenser is equipped with water connections and a water-saving valve. The water-cooled condenser has sufficient capacity to handle a maximum of 50 % of the total condenser rating of the corresponding output variant. The condenser is self-regulating and provides additional condensing capacity when necessary. No adjustments need be made.

The cooling unit is controlled by an external 0–10 V control signal. The cooling unit contains 2 to 4 compressors, depending on the unit size, and these are switched in three or four output stages.

In the project design work, it is normally presumed that the extract airflow is higher than or equal to the supply air flow, in order to guarantee satisfactory cooling of the condenser. The product selection tool ACON should be used for more precise project design work.

The cooling unit is intended for outdoor air temperatures between +20 °C – +32 °C and a min. supply air temperature of +12 °C.

The cooling unit is not suitable by supply air temperature control unless optional hot gas by-pass is fitted. The Cooler is best controlled by return air or room air temperature set point as supply air temperature control may give rise to stability problems. The three steps of cooling are controlled by a 0–10 V input signal from the AHU controller.

Note: Step control is not suitable for VAV systems.

If condensate is likely to form and the air velocity exceeds 3 m/s, the evaporator must be equipped with droplet eliminator to prevent condensate entrainment.

#### Material

Evaporator and a condenser with copper tubes with aluminium fins.

The evaporator is equipped with a sloping drain tray made of stainless sheet steel.



#### Design, eQ PLUS®

The COOLER can be ordered in many different material qualities. See our product selection tool ACON or the product code for alternatives.

## Unit description

### Cooling unit



#### EQKB ReCooler with cooling recovery

### Design

This is a system consisting of a COOLER combined with a hygroscopic rotor. The cooling unit's condenser and subcooling coil is located in the extract air after the rotor. The separate subcooler allows the use of a special type of condenser which is very efficient at partial loads.

The EQKB Cooling unit is always supplied as a complete, factory tested unit, ready for connection to other functional components. The refrigerant is R407C and the unit is intended for a horizontal air flow direction.

When cooling is required and the outdoor air is warmer than the extract air, the supply air is cooled and dehumidified in the rotor. Then the supply air is recooled to the desired temperature in the cooling unit's evaporator. When heating is required, the hygroscopic rotor provides high heat and moisture recovery.

The EQKB Cooling unit is controlled by an external 0–10 V signal. The EQKB contains 2 or 3 compressors, depending on the size of the air handling unit. These can be switched in three power stages.

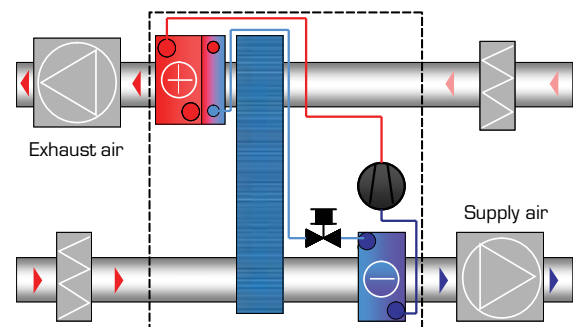
To ensure the satisfactory cooling of the condenser project design assumes that the extract airflow is greater than or equal to the supply air flow.

The rotor is operated for cooling recovery when the outdoor air is hotter than the extract air; and for heat recovery when there is a demand for heat.

The cooling unit is intended for outdoor air temperatures between +20 °C– 35 °C and a minimum supply air temperature +12 °C.

The cooling unit is not suitable for supply air temperature control, unless an optional hot gas bypass is fitted. The cooling unit is best controlled by the setpoint of the extract air or room air temperature, as supply air temperature control may give rise to stability problems.

In the event of condensation and air speeds above 3 m/s, the evaporator must be equipped with a drip separator.



### Material

Evaporators, condensers and subcoolers are made of copper pipe with aluminium fins. The evaporator is equipped with a sloping stainless steel drain tray. The rotor is made of aluminium.

## Unit description

### Cooling unit



#### EQKC Combi Cooler



#### Design

The Combi Cooler is a ready-to-install functional part with an internal cabinet for all control and safety apparatus. Only the electrical power supply and the control signals required from superordinate control systems need to be connected to the installation site.

Each Combi Cooler is factory tested and the test report is included in the delivery.

The EQKC Combi Cooler is a liquid cooler from Fläkt Woods which is integrated into the air handling unit. It is optimised for use in conjunction with a chilled beam system. The Combi Cooler cools water which is then used to cool supply air and a chilled beam circuit. The Combi Cooler can also produce cold water for the chilled beam circuit at the same time as it heats the supply air using heat from an external system.

#### Functions

- 1) Controlling the supply air temperature: both heating and cooling.
- 2) Produces cold water for an internally mounted supply air coil.
- 3) Produces cold water for room-based cooling.

Room-based cooling is carried out either using chilled beams, fan convectors or cassette chilled beams. The Combi Cooler has a supply air coil that operates as a heating coil as well as a cooling coil. The integrated shunt group regulates heating or cooling to the supply air coil as necessary. The network of chilled beams is connected by its own pipes to the Combi Cooler, which produces cold water for them.

When using the Combi Cooler, all refrigeration components are installed in the plant room. No separate liquid coolers or roof-mounted condensers are needed with the Combi Cooler. Because these are not needed, external condenser pipes and their pumps need not be routed to the roof. Because the appearance of the building is not changed, renovation is easier, and at the same time noisy condenser fans are not needed.

The Combi Cooler is most appropriate where room-based cooling is carried out using chilled beams and the cooling power is a maximum of 50 W/m<sup>2</sup>. In general this cooling power is sufficient in normal office and business premises.

In traditional solutions the supply air temperature is 15-16° C, while in the Combi Cooler it is 18° C. Because the supply air temperature is slightly higher, areas such as empty meeting rooms maintain a comfortable temperature with no heating load.

#### Material

Evaporator and a condenser with copper tubes with aluminium fins. The cooling coil is equipped with a inclined drain tray in stainless sheet steel. Water heat exchanger is made of copper / stainless steel.  
Isolation: Armaflex.

## Unit description

### Climate control system



#### Control unit Twin Wheel



#### Design

Twin Wheel is a system with a hygroscopic rotor, a cooling coil and a sensible rotor. When cooling is required and the outdoor air is warmer than the extract air, the supply air is cooled in two stages. The hygroscopic rotor cools and dehumidifies the supply air. In the cooling coil, the air is cooled to the desired humidity level and reheated to the optimal supply air temperature in the sensible rotor. This system significantly cuts down on cooling energy compared to traditional systems where all the cooling energy is supplied in the cooling coil.

The system is suitable when there is a need for cooling and humidity control, especially in facilities with chilled beams where a low humidity level is required in the supply air. If heating is required, the double rotors have such a high recovery degree that a heating coil is usually not necessary.

#### Functions

- The outer rotor pre-cools the supply air thus reducing the need to use a cooling coil and cooler.
- The outer hygroscopic rotor transfers moisture from the supply air to the extract air. This reduces the amount of moisture that must be removed in the cooling process, making it possible to use smaller coils and coolers.
- The need for a heating coil is dramatically reduced. The inner rotor recycles enough heat from the extract air – which means free heat most of the year!
- The Twin Wheel system works outstandingly together with chilled beams and fan convectors. It reduces the risk of condensation forming on the chilled beams thanks to its use of energy efficient technology.

# Unit description

## Motors

To obtain a high total efficiency for the fan it must have a highly efficient motor and have the optimum combination of fan, motor and transmission for the application. The ACON air handling unit selection program is an excellent aid in obtaining data related to total efficiency and operating costs etc. eQ fans can be fitted with many different types, configurations and makes of fan.

### Main types of motor

- Asynchronous motors
- Integral motors
- DC motors (EC) single or two speed
- PM-motors

## Asynchronous motors

3-phase motors in one or two speed configurations. This motor, which is also known as an induction motor, copper wire coils generate a rotating magnetic flux. The core of the rotor is laminated and consists of aluminium rods.

eQ fans are available in the following configurations:

### Number of poles:

- Single speed version with 2, 4, 6 or 8 poles
  - Two speed version with 2/4, 4/6, or 4/8 poles.
- Intended for belt drive centrifugal fans.

### Supply voltage, 3-phase:

- 220-230 V
- 380-400V
- 400-415 V
- 500 V

### Temperature monitors:

- With a thermo-contact trip
- With a thermistor

### Efficiency classes for single speed motors:

- IE1
- IE2

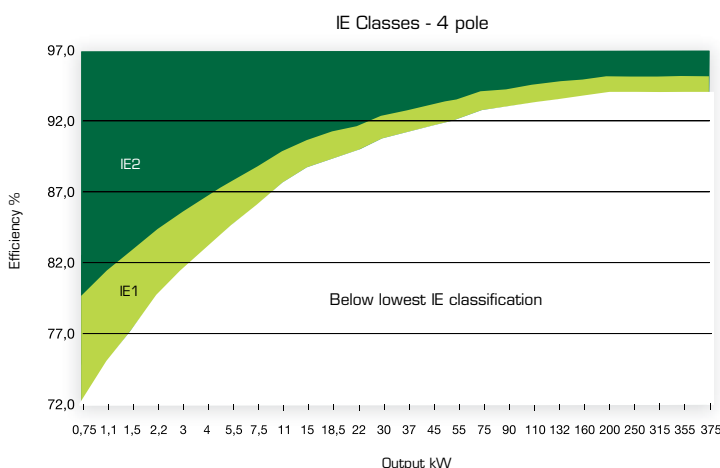


Centriflow Plus® with asynchronous motor

### The new standard covers motors as follows:

- Single speed, 3-phase, 50 Hz and 60 Hz
- 2, 4 or 6 poles
- Rated output from 0.75 to 375 kW
- Rated voltage Un up to 1000 V
- Duty type S1 (continuous operation) or S3 (intermittently periodic operation)
- Can be supplied with power directly from a 50 or 60 Hz grid

These are the new efficiency classes defined in accordance with the IEC 60034-30:2008 standard, see diagram below.





## Unit description

### Integral motors

The integral motor is an asynchronous motor with an integrated frequency converter.

This results in negligible sensitivity to interference in contrast to motors with a separate frequency converter and a cable between the motor and frequency converter.

The motor is available as an IE2 version with 2 or 4 poles and a rated output up to 7.5 kW. Supply voltage 400–415 V, 3-phase. The speed is controlled by a 0-10 V signal.



Centriflow Plus® with integral motor

### PM-Motors

The PM-motor is a permanent magnet AC-motor. The high efficiency is based on rare earth permanent magnets which eliminate rotor losses and therefore less magnetizing current is drawn from the power supply network, the efficiency corresponds to IE4\*. This in turn results in lower temperatures inside the motor and thereby guaranteeing a long life time for the bearings. Permanent magnet motors are based on IEC standard frame sizes but they are typically smaller than traditional AC-motors with the same nominal output.

Permanent magnet motors are designed exclusively for operation with a speed controller. The speed controller is included in the delivery scope and it has a special algorithm for permanent magnet motors. Speed controller is programmed for the given fan/motor combination. Each fan/motor/controller unit is tested at our factory before the delivery. Direct on-line connection is not possible for permanent magnet motors.

Speed controller is supplied loose and it is to be mounted nearby the fan e.g. on the side panel of the air handling unit.



Centriflow Plus® with PM-motor

### Characteristics

Low losses: The high efficiency motor + optimal air flow through fan impeller + high efficiency fan impeller gives very high energy saving.

Standard IEC motor sizes, power range up to 22 kW.

Reduction of overall dimensions and weight e.g. 2 IEC sizes smaller than a conventional AC-motor with same power.

\* The PM-motor is equal to or exceeds the drafted IE4 requirements on efficiency.

## Unit description

### DC motors (EC)

The EC motor is a DC motor with electronic commutation. This means that the motor speed can be controlled very effectively. The motor speed is controlled by how rapidly the magnetic flux in the motor switches. The permanent magnets of the rotor create the magnetic flux in the motor. Speed control is carried out using a control unit integrated with the motor. Control signal 0–10 V. Start at 1.4 V and stop at <1 V. The EC motor is efficient throughout its operating range and is brushless, requiring less maintenance.



Centriflow Plus® with DC-motor

### Characteristics

- The same or greater efficiency as the integral motor.
- Maintains its efficiency during downwards speed regulation.
- Silent
- Smaller physical dimensions
- 1-phase power supply at low power

The motor is available for the direct drive of plenum fans with a rated output up to 3 kW and supply voltages of 1x230 V and 3x400 V.

# Control equipment

## ControlMaster

The ControlMaster is a complete control system for Fläkt Wood's ventilation units. The flexible equipment is compact designed as standard features such as in other connections are classified as special.

### Simplicity

The ControlMaster has been developed and constructed to be easy to plan, install and use. Because of this an eQ air handling unit with a factory installed control system is a practical solution for consultants, installation engineers and end users.

The integrated control equipment is supplied programmed, configured and tested, together with all the necessary field components. Of course the control system conforms to EU directives (MD, EMC and LVD) and is CE marked. The ControlMaster is the perfect solution for both small installations with straightforward control functions, and also for large installations with data communication requirements.

### Communication

The ControlMaster supports communication via open standard protocols, which allows its simple and cost effective integration with building automation systems. Connection to other systems is carried out by the system integrator.

### Easy project design

Using Fläkt Wood's selection tool ACON the project design of the ControlMaster system is straightforward. This program automatically selects the control equipment for the unit you have chosen. Shunts are dimensioned for the relevant air heater and air cooler. Frequency converters are dimensioned for the relevant motor, drive system and fan. A simple yet effective solution that saves time.

### Quick installation

Not only is time saved on project design but also on installation. The ControlMaster is self-contained and requires no major on-site electrical installation. The control equipment is ready to go as soon as the unit is installed.

### High quality

Installing a control system for a high quality air handling unit requires experience and expertise of air handling. The ControlMaster has been designed by the same team that designed the eQ and eQ PLUS, with a focus on design details that give good insulation, little leakage and low noise. The production of the ControlMaster is characterised by a rigorous quality assurance system to ensure an approved and electrically safe product. Naturally the standardised design is also a guarantee of cost effectiveness, reliability and high quality.



# Control equipment

## Delivery options

### ControlMaster - Standardised

#### Compact standard control cabinet

- Flexible standard design
- Standard control unit
- Control cabinet integrated into a fixed panel/ceiling
- Mounted field components

#### Compact terminal block interface

- Flexible standard design
- Supplied without a control unit
- Terminal block interface integrated into a fixed panel/ceiling
- Mounted field components

## Functions

- Temperature control
- Frequency converter operation for constant air flow or duct pressure
- On-demand control
- Heating and cooling shunts
- CO<sub>2</sub>-compensation of fans
- Fire protection functions
- Control of different types of heat exchanger
- Energy measurement
- Control of extra fans
- Control of temperature zones
- Preheaters
- Communication via BACnet, LonWorks or Modbus
- Monitoring via a web interface

# Control equipment

## ControlMaster

### Regulator

The ControlMaster is characterised by the high quality of its component parts, because it is based on quality components from some of the leading manufacturers in the field. At its heart is one of the market's most powerful digital controllers. The software has been specially developed for Fläkt Woods, and contains all the functionality that could be needed for an air handling unit. All functions are ready for activation, although some need add-on hardware.

The control system is supplied with a simple, easy to use control panel. All functions are displayed in plain text in the desired language. The menu structure is logical and easy to understand. All settings, such as desired temperature setpoint or timer switch settings can be made from the control panel. From here it is also possible to read off the operating values and any alarms.

The control panel is handheld, but has a magnetic mount and is supplied with a flexible long cable.

### Plint Interface

ControlMaster can also be supplied without controller. This means that the cabling will be deducted from all electrical components in the air handling unit to the terminal block in the electrical cabinet.

The concept allows easy connection of external control system while a high-quality integration of electrical installation is achieved.

In order to be compatible with the common controllers in the market can ControlMaster with plint interface delivers with the following types of temperature sensors:

- PT1000
- NTC 1.8K
- NTC 20K

Smaller controllers installs with advantage directly into the controller in eQ. To make it easy with the installation remove the base plate from the control cabinet. It is prepared with DIN rails for controller, relays and terminal block.

### Location

As standard, the air handling unit's electrical equipment cubicle is located in a fixed panel by one fan, apart from for the 005-018 unit which is located in the ceiling for reasons of space. As an alternative the electrical equipment cubicle can be located on an empty section anywhere on the unit (option).

All incoming cables are connected to the electrical equipment cubicle either from above or below. For outdoor units connection made from below. Cable routing in double deck casings is internal, while for single deck casings the wiring is located externally.

### Quick connectors

The unit is equipped with quick connectors for auxiliary equipment in the direct proximity of the unit; damper actuator, valve actuator, control panel for the control cabinet. In addition, in units divided into blocks there are internal quick connectors to facilitate installation.

### Technical data

- Control circuit for pumps, 1-phase or 3-phase, max. 3A (standard 1-phase without motor protection)
- Auxiliary transformer for 24 VAC

### Speed-controlled motors

- EC motor, integral motor, frequency converter for asynchronous motors and PM-motors
- Speed controller for regulating the speed of the heat exchanger rotor
- Day/Week timer built-into the control unit.
- Battery backup in the event of a loss of power supply 72 hours.

The terminal block for incoming supply is rated for:

- Max 25 mm<sup>2</sup>/80 A

The following are used internally in the unit

- 2.5 mm<sup>2</sup> for power distribution up to 16 A/fan.
- 6 mm<sup>2</sup> for power distribution up to 30 A/fan.

### External fuse protection

External fuse protection must always be carried out to conform to the legislation of each country. In order to calculate maximum power consumption, the currents of the fans are aggregated with other loads. The latter are internally protected by 10 A fuses.



# Control equipment

## Technical data

### Testing

The unit is supplied as fully connected internally. The insulation and performance of controls for each unit are tested prior to delivery. In addition, a factory setting is made for order-specific parameters.

### Standards

The control system conforms to the following standards and regulations:

- Machinery Directive 2006/42 EC, Electrical equipment of machines, EN 60 204-1.
- EMC Directive 2004/108 EC, Adjustable speed electrical power drive systems EN 61800-3, EMC EN 61000-6-3:2007 (emissions) and EN 61000-6-2:2005 (immunity).
- Low Voltage Directive 72/23/EEC [DF2], Electronic equipment EN 50178.

### Environmental Requirements

<b>Operation:</b>	Temperature	0...50°C
	Relative humidity	< 85 % RF

If there is a risk of the temperature dropping below 0 °C, for outdoors units for example, the control cabinet can be fitted with a heater. Indicate this when ordering.

### Connection data

The control system can be supplied for the following supply voltages. The power supply cable must be fitted with an external load interrupter, which can cut the power to the entire unit. The load interrupter is available as an accessory.

- 3 x 230 ±10% VAC, 50 Hz, 4-conductor system (Norway).
- 3 x 400 ±10% VAC, 50 Hz, 5-conductor system.

# Control equipment

## Terminal block Interface

Terminal block	Function	Signal
1	Start supply air	DI
2	Voltage source (Terminal block 1)	24 VDC
3	Start extract air	DI
4	Voltage source (Terminal block 3)	24 VDC
5	Fan speed 2	DI
6	Voltage source (Terminal block 5)	24 VDC
7	Start heating	DI
8	Voltage source (Terminal block 7)	24 VDC
9	Start cooling	DI
10	Voltage source (Terminal block 9)	24 VDC
11	Damper actuators outdoor air/exhaust air/return air	DI
12	Voltage source (Terminal block 11)	G (24VAC)
13	Damper actuators extract air	DI
14	Voltage source (Terminal block 13)	G (24VAC)
15	Control signal supply air	AI (0...10 VDC)
16	Control signal extract air	AI (0...10 VDC)
17	Signal reference (Term. block 15,16)	M (0 VDC)
18	Control signal heating	AI (0...10 VDC)
19	Control signal cooling	AI (0...10 VDC)
20	Signal reference (Term. block 18,19)	M (0 VDC)
21	Signal recovery	AI (0...10 VDC)
22	Control signal	AI (0...10 VDC)
23	Signal reference (Term. block 21,22)	M (0 VDC)
24	Supply air flow sensor	AO (0...10 VDC)
25	Extract air flow sensor	AO (0...10 VDC)
26	Signal reference (Term. block 24,25)	M (0 VDC)
27	Supply air temperature	B
28	Outdoor air temperature	B
29	Signal reference (Term. block 27,28)	M
30	Frost protection sensor	B
31	Signal reference (Term. block 30)	M
32	Extract air temperature	B
33	Signal reference (Term. block 32,24)	M
34	Exhaust air temp./cold corner	B
35	Filter guard supply air	DO
36	Filter guard extract air	DO
37	Fan guard supply air	DO
38	Fan guard extract air	DO
39	Alarm recycling	DO
40	Alarm heating	DO
41	Alarm cooling	DO
42	Pressure switch, anifreeze rotary	DO
43	Signal reference (Term. block 35-42)	
44	Signal zero (Terminal block 43)	OV

## Extended terminal block Interface

Terminal block	Function	Signal
1	Supply 24V	G (24VAC)
2	Zero supply	GO (0 VAC)
3	Incoming supply	24 VDC
4	Signal reference	M (0 VDC)
5	Control signal preheater (ref. T.B 2)	AI (0...10 VDC)
8	Twin Wheel setpoint (ref. T.B 4)	AI (0...10 VDC)
10	Alarm preheater (ref. T.B 2)	DO
16	Temperature sensor after preheater (ref. T.B 4)	B
17	Frysskyddsgivare förvärmare (ref. T.B 4)	B
24	Start signal preheater (ref. T.B 2)	DI (24VDC)
25	Twin Wheel start signal external heater	DO
26	Twin Wheel A-alarm	DO
27	Twin Wheel stat signal	DI
28	Twin Wheel B-alarm	DO

# Control equipment

## Standard functions

### Speed control

The ControlMaster can manage motors with speed control. Speed control can be obtained using a separate frequency converter or using an actuator integrated with the fan motor. Three different setpoints can be handled for each fan. The following control types are available for speed control. The necessary sensors are included.

### Flow control

The setpoints for the supply air fan and extract air fan are set in the control unit. Three setpoints for each fan allow the switching of fan speed using a clock, timer, push button or occupancy detector.

**Function:** maintaining flow in the duct system.

### Pressure control

The setpoints for the supply air fan and extract air fan are set in the control unit. Three setpoints for each fan allow the switching of fan speed using a clock, timer, push button or occupancy detector.

**Function:** maintaining pressure in the duct system.

**Note!** The unit can be supplied with pressure control of one fan and slave-controlled flow control of the other.

### CO<sub>2</sub> compension

The speed of the supply air fan is controlled by a CO<sub>2</sub> sensor so that a set threshold is not exceeded. Sensors are available for duct mounting and room mounting.

### Adjusting the drive system

The drive systems for the supply air fan and extract air fan are factory set. The setpoints are corrected on the control unit control panel.

## Temperature control

Temperature control can be carried out using two different setpoints for both heating and cooling. This means that a comfort mode and an economy mode can be obtained. The air heater, heat exchanger and any air cooler and mixing section are controlled in sequence. The following options are available for the ControlMaster. The necessary temperature sensors are included.

### Supply air control

**Function:** maintaining the temperature in the supply air duct at the set setpoint.

### Extract air control

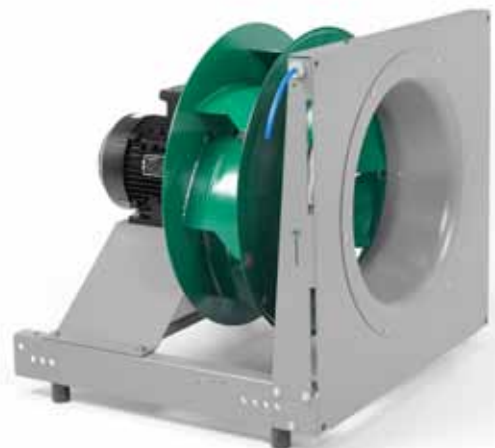
**Function:** maintaining the temperature in the extract air duct at the set point value, through the cascade control of the supply air temperature using minimum and maximum restrictions.

### Room control

**Function:** maintaining the temperature in the premises at the set point value, through the cascade control of the supply air temperature using minimum and maximum restrictions.

### Seasonal temperature control

- Function winter: maintaining the temperature in the supply air duct at the set setpoint.
- Function summer: maintaining the temperature in the extract air duct at the set point value, through the cascade control of the supply air temperature using minimum and maximum restrictions.
- Summer mode applies between two variable dates. At other times of the year winter mode applies, unless the outdoor temperature exceeds a set threshold value.





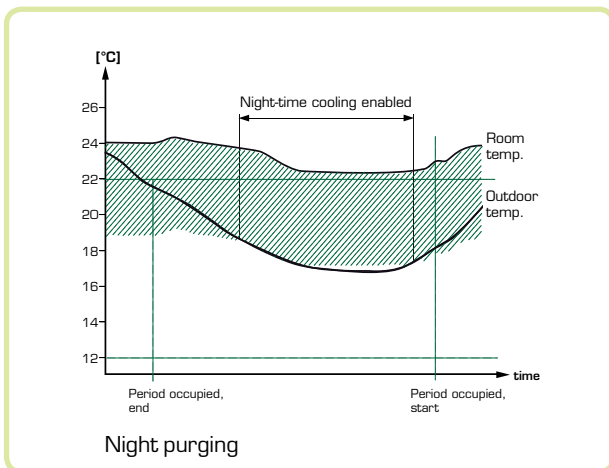
# Control equipment

## Other functions

### Night purging (free cooling)

The night purging setting is used during the summer, outside ordinary operating periods, in order to cool the premises with cool outdoor air at night.

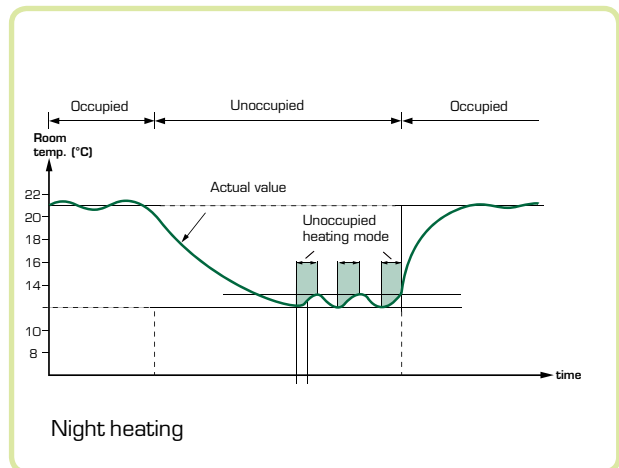
**Function:** As both the room temperature and outdoor temperature exceed the set threshold value and the difference between these threshold values exceeds the set differential, the unit is started in order to cool the premises using fresh outdoor air. The post cooler is not activated. Outdoor sensors and room sensors are included.



### Night heating

Night heating is used to prevent the premises from being cooled during the night outside the normal operating time.

**Function:** the unit starts with full power from the air heater if the room temperature drops below the set value. If the unit is equipped with a mixing/return air damper this is opened to reduce energy consumption, while the outdoor air and extract air dampers remain closed. Room sensors included.



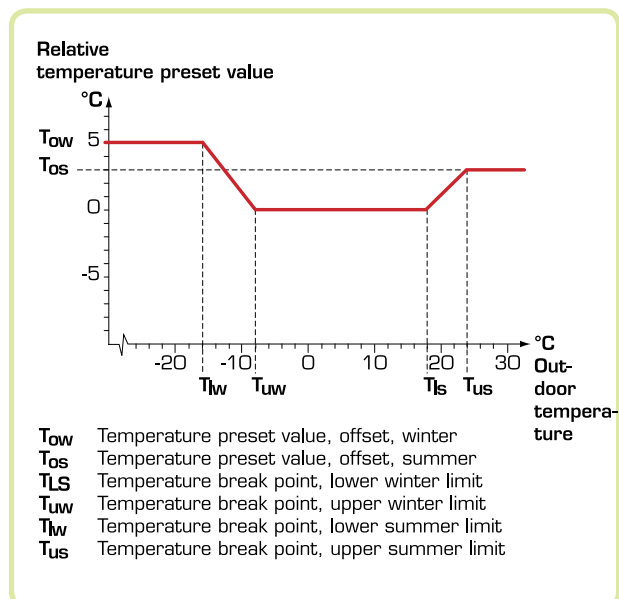
### Cooling recovery

**Function:** starts the rotary heat exchanger at full recovery for cooling the supply air, when the extract air temperature is lower than the outdoor air temperature and there is a need for cooling. Outdoor temperature and extract air sensors included.

### Weather compensated temperature setpoint

**Function:** offsets the set setpoint for supply air, extract air or room temperature using a four point graph coupled to the outdoor temperature.

**Setting:** set the four break points on the control unit. Outdoor temperature sensor included.

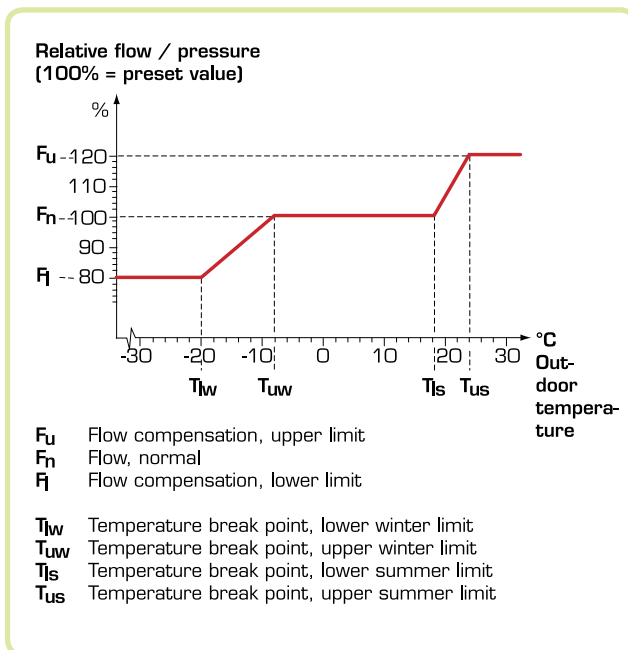


# Control equipment

## Weather compensated flow/pressure setpoint

One way of preventing the cooldown of the premises is to reduce the flow/pressure when the outdoor temperature drops. To prevent the heating of the premises when outdoor temperatures are high, the flow/pressure is increased as the outdoor temperature rises. The flow/pressure setpoint is adjusted, regardless of whether the heat exchanger and heater are at full power, using a four point graph linked to the outdoor temperature. The speed of both fans is adjusted to prevent negative pressure in the building.

**Setting:** set the four break points and the maximum and minimum flow/pressure on the control unit. Outdoor temperature sensor included.



## Outdoor temperature controlled fan speed

One simple way of avoiding the cooldown of premises is to prevent the forcing of fans when the outdoor temperature falls below a set value.

**Setting:** set the break point for the outdoor temperature in the control unit. Outdoor temperature sensor included.

**Note!** Normally the heat exchanger starts as soon as there is a heat demand. If there is an additional heat demand the air heater is also utilised. Where the heat exchanger and afterheater are at full power, but there is still a need for more heat, the supply air temperature will drop. By reducing the air flow last in the sequence, the air can be heated more despite the air heater producing the same output. If necessary, this function can be activated in retrospect for the ControlMaster because no extra sensor is required.

## External components

### Controlling the air heater

Control signal 0–10 V DC for valve actuator or electric air heater with built-in thyristor and stepping switch if fitted.

### Control of air cooler

Control signals for different types of cooling:

- 0–10 V DC for air cooler, water or Cooler.
- Closing switch for 1, 2 or 3 steps (binary) DX cooling (direct expansion).

### Control of combined air heater/air cooler

Control signal 0–10 V DC for combined air heater and air cooler, which cools during the summer and heats during the winter. The switch between summer mode and winter mode can take place based on the date, outdoor temperature, system temperature in the water circuit or external signal.

### Circulation pump for air heater or air cooler

The circulation pumps for heating, cooling and the coil heat exchanger can be supplied with power from the control cabinet. Maintenance operation is carried out via control panel. Separate alarms from each pump, e.g. a thermo-contact trip, can be connected to the unit electrical equipment cubicle. The pumps should be clog resistant. A maximum 3A single phase supply is available for the ControlMaster. One of the pumps can also be supplied with a maximum 3 A 3-phase (option).

### Valve and valve actuator

The ControlMaster can be supplied with both valves and valve actuators for controlling the fluid flow to the heating coil, cooling coil and through the coil heat exchanger. Depending on the valve size (Kvs value) both electromechanical and electrohydraulic actuators can be used.

### Damper actuator

Damper actuators intended for mounting on on/off dampers and modulating dampers are available as accessories. Spring return damper actuators should be used for units equipped with water coils to ensure that the dampers close in the event of a loss of power.

# Control equipment

## Alarm management

### Filter monitoring

The pressure drop across filters or prefilters can be monitored using filter monitors connected to the air handling unit control unit. If the actual filter pressure drop exceeds the set value an alarm is generated.

### Flow monitoring

To ensure the air flow through the unit, the measured values from flow sensors are monitored so that a flow alarm is generated if the measured value deviates from the current setpoint by more than is permissible.

### Fire protection functions

The unit can be equipped with functions to prevent the spread of combustion gas. As standard the unit is stopped and an A alarm is generated. Alternatively the operating signal to one or both of the fans can continue.

### Frost protection

The air heater for heating water is equipped with frost protection. Function: when the unit is not in operation the water temperature is maintained at 25 °C. During operation the valve is controlled so that the return temperature does not fall below 12 °C. If the temperature falls below 5 °C the unit stops and an alarm is generated. Frost protection sensor included.

### Thermal overload protection

Electric air heaters are equipped with built-in thermal overload protection. As standard the air heater is equipped with a thermostat which cuts the current if the temperature of touchable surfaces exceeds 90–100 °C, for example when the air flow is low. This thermostat resets automatically. In addition there is a temperature limiter, for disaster protection, which cuts the current to the heating elements before dangerous overheating can occur, for example if the fan stops. This thermostat is reset manually and is normally set at 120–150 °C. The alarm stops the unit. A alarm.

## Operation

In the ControlMaster the startup and shutdown of the unit, including the selection of setpoints, are managed by the control unit via the built-in calendar function (internal time channels). When the unit is started the dampers in the supply and extract air sides normally open first. These dampers close following a normal shutdown and in the event of a loss of power. During heat recovery the supply air fan starts after the extract air fan.

Prolonged and forced operation can be obtained using a timer, push button or occupancy detector.

### Timer low speed

- Function: start of the unit at low speed or switch to low speed when the unit is running at high speed.
- Setting 0...5 hours.
- Intended for surface or recessed mounting.

### Timer high speed

- Function: start of the unit at high speed or switch to high speed when the unit is running at low speed. If both timer inputs are active at the same time, high speed is dominant.
- Setting 0...5 hours
- Intended for surface or recessed mounting

### Push button

- Function: start at low speed or high speed in accordance with the timer high or low speed function.
- The time is set in the unit control unit, 0...23 hours.
- Intended for surface mounting.

### Presence detector

- Function: start at low speed or high speed in accordance with the timer high or low speed function.
- CO<sub>2</sub> monitor
- Function
- Delay setting 2...15 min.
- Intended for surface mounting

## Control equipment

### Rotary heat exchanger

The heat exchanger starts automatically to blow itself clean when there is no heat demand. The built-in rotation monitoring activates an alarm if the rotor is stationary when there is a heat demand or during cleaning mode. Defrosting via a pressure monitor is available as an accessory. Defrosting is started when the pressure drop across the heat exchanger has increased to the value set on the pressure monitor. During defrosting the heat exchanger is regulated to its minimum

### Plate heat exchanger

#### Section defrosting

Section defrosting is activated at outdoor temperatures below  $-7\text{ }^{\circ}\text{C}$ . The heat exchanger is defrosted continuously by closing the bypass damper and then closing the recirculation dampers for 15 minutes in order to defrost by section.

#### Cold corner defrost

Frosting is avoided by limiting the temperature in the cold corner of the heat exchanger to  $+2\text{ }^{\circ}\text{C}$ , by reducing the heat exchanger efficiency, i.e. progressively opening the bypass damper

### Liquid-coupled heat exchanger

At temperatures below the value set in the temperature sensor in the inlet duct, approximately  $-5\text{ }^{\circ}\text{C}$ , the valve actuator regulates towards the closed position.

### ECONET®

The control system for the ECONET® is simply combined with the unit control system. The transfer of the necessary information for the ControlMaster via data communication, but in other cases via traditional I/Os.



### Mixing/Recirculated air

In properties where this is acceptable mixing can be used to reduce energy consumption. The mixing section can be controlled from the air handling unit's control unit for return air at night, or as a part of the control sequence with a maximum restriction of the  $\text{CO}_2$  concentration. In this application exhaust air must be placed before mixing in the air direction.

Mixing can be placed before or after the air heater in the control sequence, depending on the energy saving versus comfort requirement.



## Control equipment

### Frequency converter

Speed control using a frequency converter is an environmentally friendly control method which reduces energy consumption. By controlling the speed exactly to match demand, energy consumption can be reduced by 50% compared to throttle control.

#### CAV and VAV systems

In CAV systems a frequency converter is often used to maintain the flow irrespective of changes in pressure drop, arising from the clogging of filters for example. In this case flow control is a suitable option.

Frequency converter operation with pressure control is recommended for CAV systems.

VAV systems use pressure control, if necessary with flow compensation for the extract air to maintain the balance in the system if there is an extra extract air fan.

The frequency converter is also an excellent tool for adjusting the flow, and can eliminate the need to replace belt gear to change the air flow. However, this can have a certain negative effect on optimum efficiency.

#### Test operation

A frequency converter in the ControlMaster concept is installed in accordance with the applicable EMC standards. The converters are factory tested and the most important parameters are set and checked.

#### Technical benefits

The comprehensive protective functions in the converter include everything from component level protection to motor overload protection. The monitoring of control signals and overcurrent, overvoltage, undervoltage, thermal overload, short-circuit and earth fault protection are standard functions which increase safety and reduce maintenance.

A soft-start function, along with a frequency converter, reduces wear on the V-belt, coupling and fan.

#### Built-in frequency converter

The ambient temperature for the frequency converter during operation is limited to 0...40 °C. To protect the frequency converters on an outdoor unit against cold and heat, these can be integrated into a terminal box, EQTK or EQEL. Alternatively the frequency converters must be mounted elsewhere in the building.

#### Choice of frequency converter and motor

The optimum efficiency of the drive system is achieved when the frequency converter, motor, transmission and fan are designed and optimised for a common operating curve.

This type of optimization achieves considerably better efficiency than dimensioning all the component parts separately.

When selecting a motor and frequency converter using the ACON air handling unit selection program, the motor is always dimensioned for hypersynchronous operation. Take the following into account when dimensioning and selecting a system without software support.

Depending on the required system, CAV or VAV, Fläkt Woods has developed a method in which the correct SFP value,  $SFP_V$  or  $SFP_{VAV}$ , are used when dimensioning the belt gear, converter and motor.

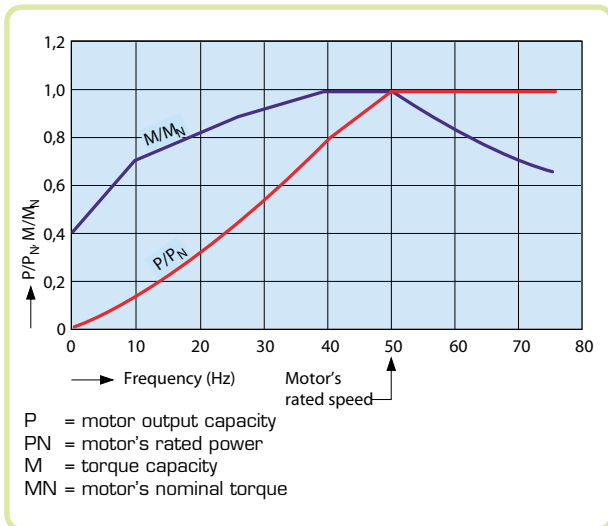


# Control equipment

## Dimensioning

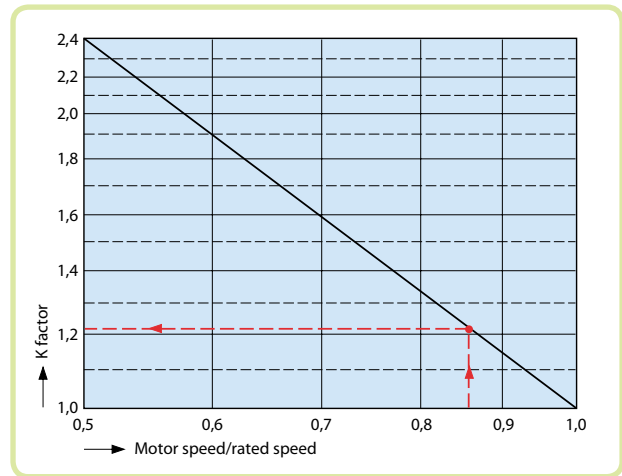
- The rated current of the converter must be equal to or greater than that of the motor.
- The rated output must be greater than the power requirement of the fan.
- The thermal load capacity of the motor must be taken into account

The thermal load capacity of the motor primarily affects the motor output during subsynchronous operation below 50 Hz, in which case the motor should be oversized, in accordance with the diagram below:



As the above diagram shows the thermal load capacity of the motor, expressed as torque, drops for frequencies above 50 Hz. However, because speed increases with frequency, the thermal load capacity of the motor expressed as power is constant for these frequencies. For frequencies below 50 Hz the torque capacity drops again, and thus power capacity drops even more rapidly because the speed decreases at the same time.

Therefore, this must be particularly taken into account when the motor is running at a subsynchronous speed at full power. In order to take account of this, use the K factor for the subsynchronous dimensioning of motors in accordance with the diagram overleaf. Subsynchronous dimensioning is particularly relevant for direct drive fans.



Example, subsynchronous dimensioning of motor:

- Fan speed at the current flow = 2,500 rpm
- Necessary power at 2,500 rpm = 3.8 kW
- Motor rated speed = 2,900 rpm
- Engine speed / rated speed 2,500 / 2,900 = 0.86
- K factor according to the diagram = 1.22
- Minimum motor output  $1.22 * 3.8$  = 4.6 kW
- Select the next larger standard motor = 5.5 kW

The following table can be used as a rule of thumb for hypersynchronous fan operation:

Maximum speed in converter operation with maintained power (50 Hz mains frequency)				
Motor size	2-pole	4-pole	6-pole	8-pole
112-132	4,800 (85Hz)	2,500 (85Hz)	1,700 (85Hz)	1,250 (85Hz)
160-200	4,500 (77Hz)	2,500 (85Hz)	1,700 (85Hz)	1,250 (85Hz)
225-250	3,600 (61Hz)	2,500 (85Hz)	1,700 (85Hz)	1,250 (85Hz)

Note that the specified maximum speed only applies if the maximum current of the motor/converter is not exceeded.

# Control equipment

## Transformer

To allow the use of integral motors and EC motors intended for 3x400 VAC in Norway, where this voltage is not available, a transformer that converts 3x230 V to 3x400 V+N is needed.



### Full transformer

The full transformer is to be used in sites with an indirectly earthed mains supply. The transformer forms a TN system on the secondary side which means that no modification is required to the Swedish configuration.

The transformer must be provided with primary protection. This consists of a conventional micro circuit breaker connected to the 230 V incoming supply to the transformer to protect it from overload. Fläkt Woods do not supply primary protection. The installation engineer will provide the necessary equipment.

### Standards

The transformers conform to the following standards and regulations:

- Low voltage directive, LVD 73/23/EEC, 93/68/EEC EN 61558-2-4:1997
- EMC directive 89/336/EEC, 91/263/EEC, EN 61000-3-2:1995, EN 61000-3-3:1995

### Enclosure

As standard the transformer is supplied in an IP23 sheet-metal casing for a maximum ambient temperature of 40 °C.

Power kVA	Weight (kg)	Length (mm)	Width (mm)	Height (mm)
12.5	96	481	450	590
16.0	122	481	450	590
20.0	148	481	450	590
25.0	170	599	550	630
40.0	200	670	520	827

## Energy measurement

There is an accessory for the ControlMaster for monitoring instantaneous electrical power and total accumulated electrical energy consumption from startup. The measuring unit also contains a resettable meter (cf. trip meter) for electrical energy consumption. The values are presented in the unit's control unit. The incoming supply is connected through the energy meter, which can cope with a maximum cable cross-sectional area of 16 mm<sup>2</sup> for currents up to 64A. Current coils are used for larger currents.

Accuracy of measurement:

- Class 1 conforming to EN 62053-21 and MID Annex MI-003 Class B
- Class 2 conforming to EN 62053-23

## Control equipment

### Communication

There are many communication possibilities for the ControlMaster; for connecting accessories, connection to monitoring systems or connection to the internet and mobile services.

#### Base communication for the ControlMaster

An eQ with integrated control system always includes a simple web server and Modbus. The integrated web server displays the same information that is available in the handheld terminal. Everything that can be changed in the handheld terminal can also be changed in the web interface. No special software is needed to utilise this function, just a normal computer with a web browser, (such as Internet Explorer). The web server can be connected to a standard local TCP/IP network, and then the unit can be monitored from any computer in the local network. If there is no network one can either install a cable between the unit and the computer, or use a GSM modem (accessories).

The Modbus interface can either be utilised to connect a monitoring system or to connect accessories (such as an energy meter) to the control system. There are two potential connections for Modbus, TCP/IP and RS-485. If the internal connection over RS-485 is used as a master and, at the same time, the unit control is the slave of a master system, a communications module must also be used.

#### Protocols

Depending on the control unit used, the control system can be equipped for communication with the following protocols. The communication protocols available for the ControlMaster are:

#### BACnet

The ControlMaster can be equipped with a communications module for integration into a BACnet system. BACnet is an open global standard, especially developed for building automation. Connection is via TCP/IP.

#### LonWorks

Communication via LonWorks is available as an accessory for ControlMaster. Connection is via FTT-10.

The eQ is equipped with automatic transmission of all SNTVs which allows easy commissioning. The LonWorks image for the eQ has 64 SNTVs.

#### Modbus RTU

The Modbus RTU via RS-485 is an open de facto industry standard for connection via RS-485. The ControlMaster can be equipped with a communications module for Modbus RTU, allowing connection to a master system, at the same time as the integrated Modbus connection is used internally in the unit for the connection of accessories.

#### eQ Smart Web

There is a Smart Web application available with the same function as a conventional monitoring system, but at a considerably lower price. In addition to web pages this module contains a mail client which can transmit alarms from the unit as e-mail.





## Control equipment

### Fire protection functions

#### Fire/smoke system, FICO-128

The FICO-128 is a suitable choice for fire/smoke systems with more than 2 fire dampers.

**Function:** monitoring of fire dampers and smoke detectors. The fire dampers are exercised every 48 hours. During exercise the unit is interlocked. Stopping the unit following an A alarm. In the event of an equipment malfunction a B alarm is generated.

Control and monitoring unit for fire/combustion gas  
The unit is built into a plastic enclosure with a glazed front panel of ingress protection class IP66 and is CE marked.

Technical data:

- Automatic performance test
- Manual performance test
- Summation alarm A following a triggered detector
- Summation alarm B following a damper or detector malfunction
- Relay contact for interlocking the ventilation unit
- 24 VAC supply to the damper actuator
- Unit power supply, 230 VAC.



**Function:** the unit is interlocked when the summation alarm is sent to the corresponding terminal block in the unit electrical equipment cubicle. Following an activated alarm the unit stops. However, it is possible to still send operating signals to one or both fans.

#### Multibox FCBA-2

Multibox FCBA-2 is intended for use together with main unit FICO-128. It can manage two dampers and is mounted in the unit.

Technical data:

- Built-in transformer, 230 VAC
- Intended for 1–2 fire dampers
- Screw and quick connection of damper actuators
- Manual exercise by button
- LED indication of damper position
- Smoke detector status
- Fault indication for easy fault-tracing
- Dimensions: 180 x 130 x 60 mm (W x H x D)



#### Fan storage box FCFA-1

Fan storage box FCFA-1 is intended for use together with main unit FICO-128. The storage box is used for interlocking air handling units. If necessary, the system can be expanded to handle up to 10 groups.

Technical data:

- Dimensions: 130 x 130 x 60 cm (W x H x D)
- Outputs: Interlocking controlled 230 VAC, 3A



## Control equipment

### Smoke detector

Smoke detector for duct mounting with an optical function for connection to the control and monitoring unit. The section being inserted (the venturi tube) must be cut to the correct length.

Technical data:

- the cable for 24 V power supply and alarms must be connected to the monitoring unit.
- permissible ambient temperature -10 °C to +50 °C.



### Combustion gas unit, FCMA-2

The FCMA-2 control unit can manage smoke detectors, fire thermostats and up to two fire dampers. During damper exercise, which takes place every 48 hours, the ventilation unit is stopped.

Fire alarm (A alarm) stops the unit and in the event of an equipment malfunction a B alarm is generated. Supply voltage 230 V. Ingress protection class IP54.



### Control unit for smoke detectors, ABAV

The control unit is designed to meet the requirements set to provide dependable fire protection together with our smoke detectors. It has relay contacts for controlling dampers and fans. A fire alarm stops the unit.

Technical data:

- Supply voltage 230 V
- Indications and relays for
- Smoke alarm
- Service alarm
- Fault alarm: short-circuit/open-circuit
- DIN installation



# Control equipment



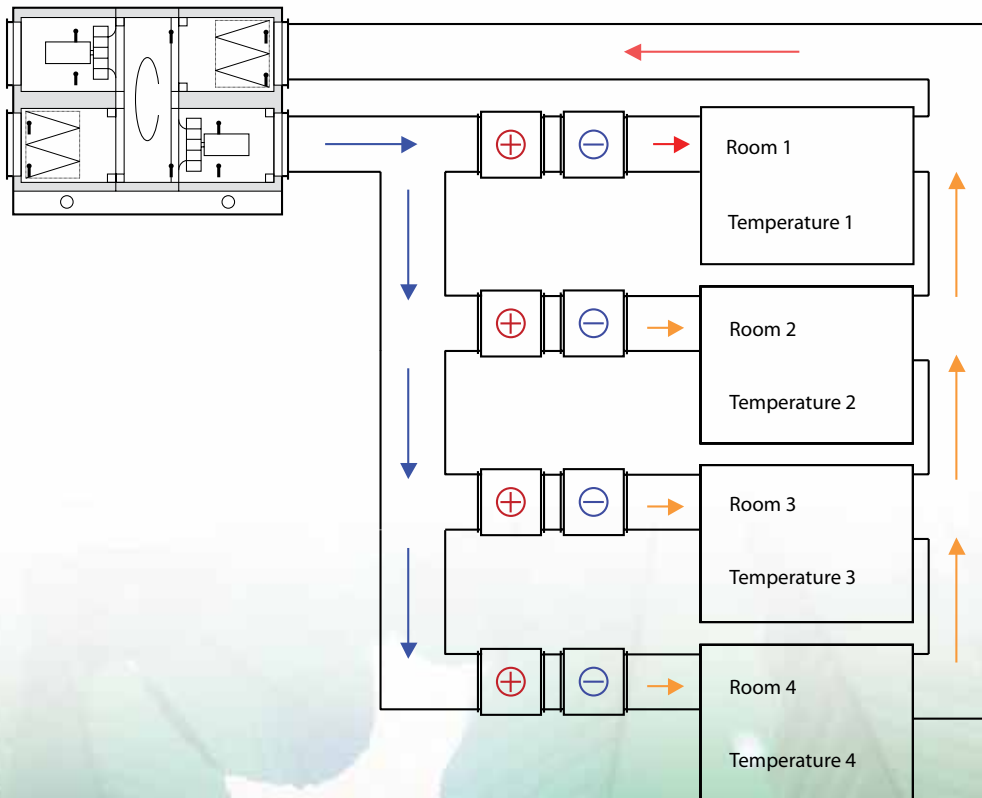
## Extra temperature zones

In order to control more than one temperature zone, the ControlMaster can be supplemented with controllers for up to four zones. These zone controllers handle heating and cooling in sequence, as well as supply air temperature control and cascade control. If a water coil is used for heating this should be provided with a frost protection sensor. The zone controllers for the ControlMaster are supplied in separate wall cabinets that exchange information with the unit via data communication. This means that setpoints, parameters and current operating values are processed via the unit controller's control interface.

## Extra fans

The ControlMaster can be supplemented to manage up to four external fans. The fan controllers manage both directly started and speed controlled fans. The latter can control both pressure and flow.

The control unit for external fans for the ControlMaster is supplied in a separate wall cabinet. Data communication allows a regular exchange of information with the unit's control unit. So setpoints, parameters and current operating values can be managed via the unit controller's control interface.

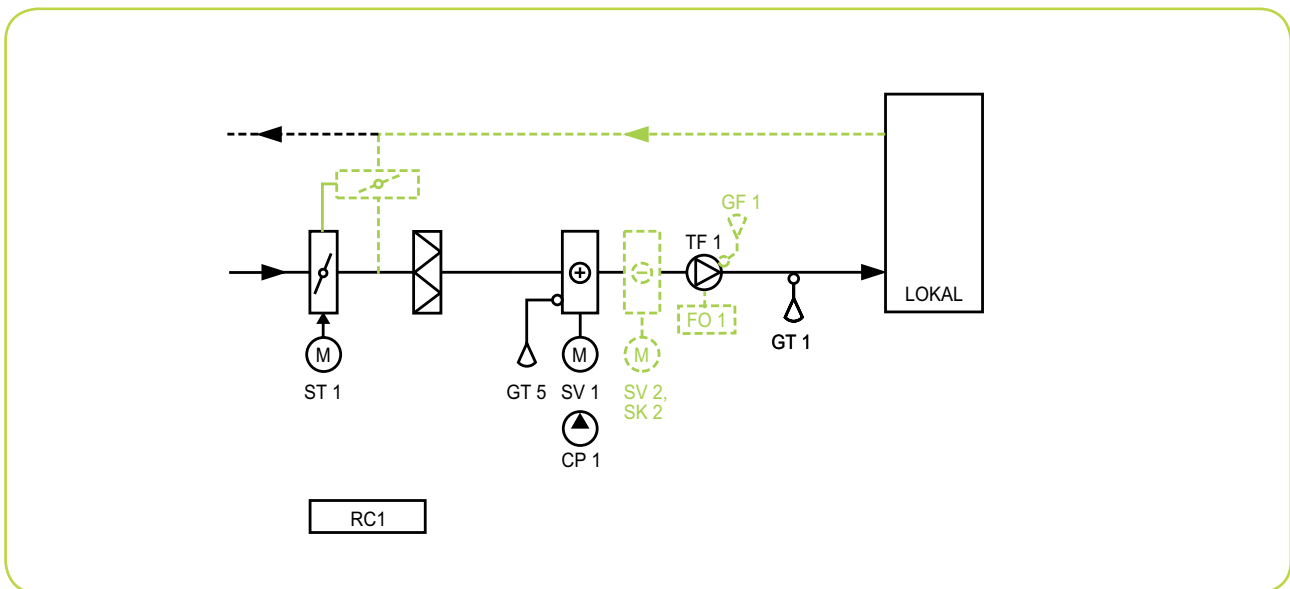


LIFE CYCLE COST

ENERGY EFFICIENCY

## Flow charts

### Supply air unit without heat exchanger



#### Component list

CP1	Circulation pump, heating water	ST1	Damper actuator, outdoor air
FO1	Frequency converter	SV1	Valve actuator, heating water
GF1	Flow sensor, supply air	SV2/SK2	Valve actuator cooling/stepping switch, cooling
GT1	Temperature sensor, supply air	TF1	Supply air fan
GT5	Frost protection sensor, air heater		
RC1	Control unit		

#### Function

TF1 is started and stopped by the timer built-into RC1. Mode switches along with operation and alarm indication are contained in the operator panel. Damper actuator ST1 opens before TF1 starts and closes when the fans stop.

#### Temperature control

The temperature sensor GT1 maintains the desired supply air temperature using RC1 that controls the air heater. If there is a heat demand valve actuator SV1 opens. If there is a cooling demand SV1 closes.

#### Air heater, heating water

If there is a risk of frost in the air heater, the frost protection sensor GT5 makes valve actuator SV1 open, after that the unit is stopped. When the unit is stopped, GT5 maintains the return water temperature at approx. 25 °C.

#### Alarm

Frost protection (A alarm), Deviation alarm fan, supply air (B alarm). Summation alarm to terminal block.

#### Options (light green in the flow chart)

##### Mixer component

Mixing dampers are controlled in sequence by valve actuator SV1.

##### Air cooler, cooling water

The air cooler valve actuator SV2 is controlled in sequence with the air heater and any mixing damper.

##### Air cooler, evaporated refrigerant

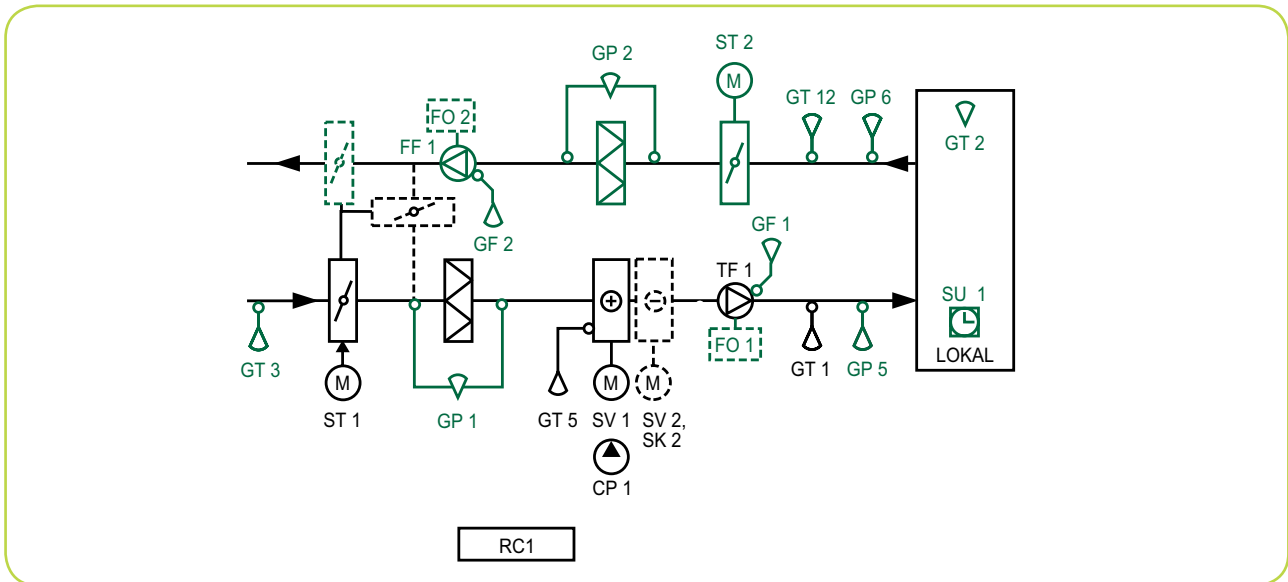
Stepping switch SK2 switches on the air cooler for the evaporated refrigerant in one or more stages using a stepping or binary switch, in sequence with the air heater and any mixing damper.

##### Flow control, fan

Flow sensor GF1 maintains the flow through the supply air fan. Frequency converter FO1 controls the speed of TF1.

## Flow charts

### Supply air unit without heat exchanger



#### Component list

FF1	Extract air fan	GP6	Pressure sensor, extract air
FO1	Frequency converter	GT2	Temperature sensor, room
GF2	Flow sensor, extract air	GT3	Temperature sensor, outdoor air
GP1	Pressure monitor, supply air filter	GT12	Temperature sensor, extract air
GP2	Filter monitor, extract air	ST2	Damper actuator
GP5	Pressure sensor, supply air	SU1	Timer

#### Accessories (dark green in the flow chart)

##### Room or extract air control

Room or extract air temperature is maintained by controlling the supply air temperature in a cascade limited to a min. and max. value.

##### Pressure control, fans

Pressure sensors GP5/GP6 maintain the air pressure in the ducts. Frequency converters FO1/FO2 control the speed of TF1/FF1.

##### Outdoor compensation

The desired air temperature setpoint is offset upwards or downwards at high and low outdoor temperatures respectively.

##### Filter monitor, supply and extract air

Generates an alarm if the pressure drop across each filter exceeds the set value (B alarm).

##### Damper actuator

For dampers other than the outdoor air damper.

##### Fire protection function

Stops the unit in the event of an alarm (A alarm).

##### Night purging

Starts the unit at night to cool the premises using cold outdoor air. Outdoor sensor for facade mounting.

##### Night heating

The unit starts automatically at night to heat the premises if the temperature inside is low.

##### Extended Operation

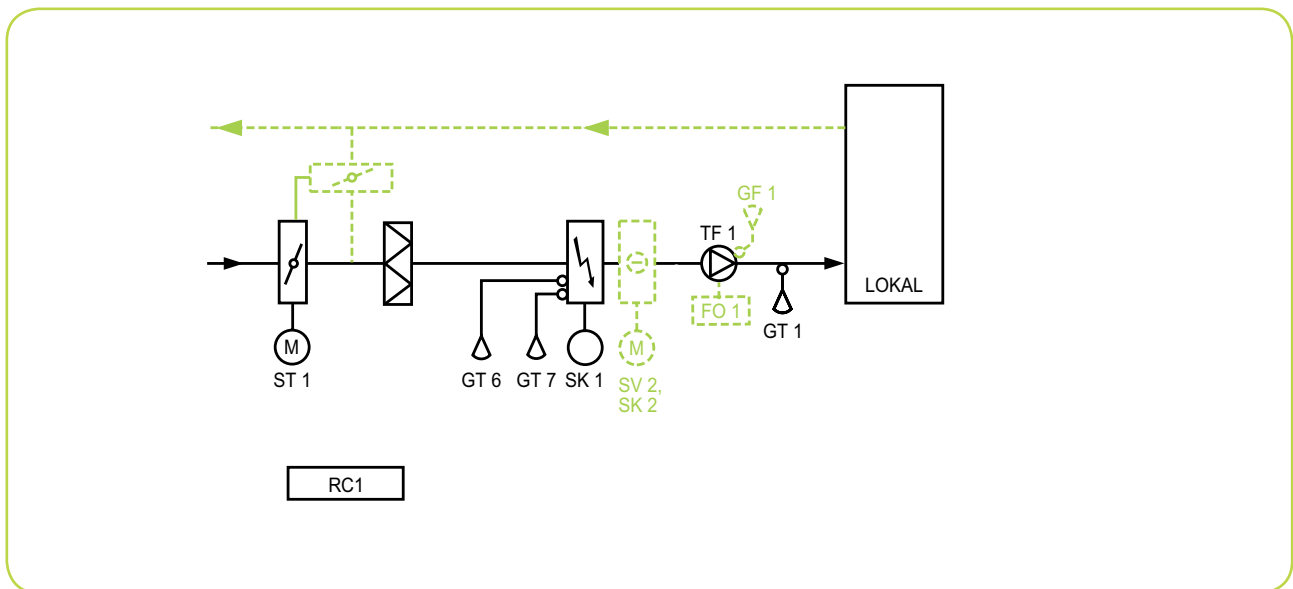
Prolonged operation via a timer or external push button with a time set on the panel.

##### Shunts

Shunt with pilot valve and pump group for the air heater or air cooler for heating water and cooling water.

## Flow charts

### Supply air unit without heat exchanger



#### Component list

FO1	Frequency converter	RC1	Control unit
GF1	Flow sensor, supply air	SK1	Stepping switch or thyristor actuator
GT1	Temperature sensor, supply air	ST1	Damper actuator, outdoor air
GT6	Thermal overload protection, automatic	SV2/SK2	Valve actuator cooling/stepping switch, cooling
GT7	Thermal overload protection, manual	TF1	Supply air fan

#### Function

TF1 is started and stopped by the timer built-into RC1. Mode switches along with operation and alarm indication are contained in the operator panel. Damper actuator ST1 opens before TF1 starts and closes when the fans stop.

#### Temperature control

The temperature sensor GT1 maintains the desired supply air temperature using RC1 that controls the electric heater. If there is a heat demand the stepping switch/thyristor SK1 are tied in. If there is a cooling demand SK1 is disconnected.

#### Air heater, electric

The air heater is interlocked by TF1 and fan monitor GP3. When the unit is stopped by a switch, timer or thermal overload protection, the electric heater is disconnected immediately while the fans continue to run for a set time to cool the unit.

#### Alarm

Thermal overload protection (B alarm), Deviation alarm fan, supply air (B alarm). Flow switch supply air (B alarm). Summation alarm to terminal block.

#### Options (light green in the flow chart)

##### Mixer component

Mixing damper ST3 is controlled in sequence with stepping switch/thyristor SK1.

##### Air cooler, cooling water

The air cooler valve actuator SV2 is controlled in sequence with the electric air heater and any mixing damper.

##### Air cooler, evaporated refrigerant

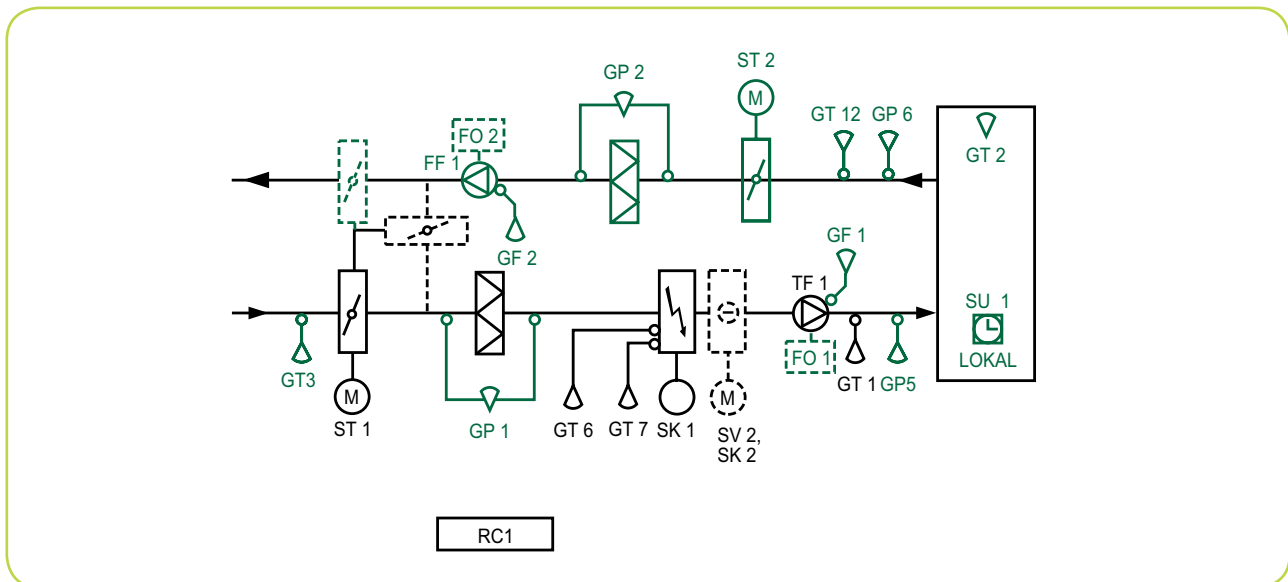
Stepping switch SK2 switches on the air cooler for the evaporated refrigerant in one or more stages using a stepping or binary switch, in sequence with the electric air heater and any mixing damper.

##### Flow control, fan

Flow sensor GF1 maintains the flow through the supply air fan. Frequency converter FO1 controls the speed of TF1.

## Flow charts

### Supply air unit without heat exchanger



#### Component list

FF1	Extract air fan	GP6	Pressure sensor, extract air
FO2	Frequency converter	GT2	Temperature sensor, room
GF2	Flow sensor, extract air	GT3	Temperature sensor, outdoor air
GP1	Filter monitor, supply air	GT12	Temperature sensor, extract air
GP2	Filter monitor, extract air	ST2	Damper actuator
GP5	Pressure sensor, supply air	SU1	Timer

#### Accessories (dark green in the flow chart)

##### Room or extract air control

Room or extract air temperature is maintained by controlling the supply air temperature in a cascade limited to a min. and max. value.

##### Pressure control, fans

Pressure sensors GP5/GP6 maintain the air pressure in the ducts. Frequency converters FO1/FO2 control the speed of TF1/FF1.

##### Outdoor compensation

The desired air temperature setpoint is offset upwards or downwards at high and low outdoor temperatures respectively.

##### Filter monitor, supply and extract air

Generates an alarm if the pressure drop across each filter exceeds the set value (B alarm).

##### Damper actuator

For dampers other than the outdoor air damper.

##### Fire protection function

Stops the unit in the event of an alarm (A alarm).

##### Night purging

Starts the unit at night to cool the premises using cold outdoor air. Outdoor sensor for facade mounting.

##### Night heating

The unit starts automatically at night to heat the premises if the temperature inside is low.

##### Prolonged operation

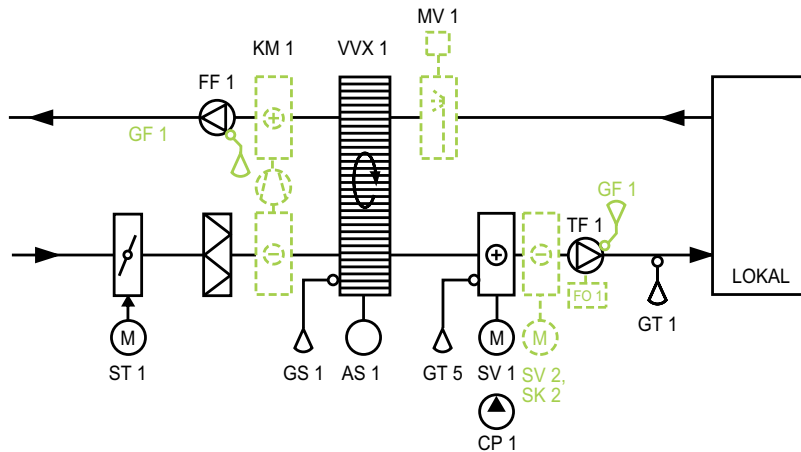
Prolonged operation via a timer or external push button with a time set on the panel.

##### Shunts

Shunt with pilot valve and pump group for cooling water for the air cooler.

## Flow charts

Supply air unit and extract air units with a rotary heat exchanger



### Component list

AS1	Speed controller heat exchanger	KM1	Cooler
CP1	Circulation pump, heating water	MV1	Solenoid valve
FF1	Extract air fan	RC1	Control unit
FO1/FO2	Frequency converter	ST1	Damper actuator, outdoor air
GF1	Flow sensor, supply air	SV1	Valve actuator, heating water
GF2	Flow sensor, extract air	SV2/SK2	Valve actuator cooling/stepping switch, cooling
GS1	Rotation monitor sensor	TF1	Supply air fan
GT1	Temperature sensor, supply air	VWX1	Rotary heat exchanger
GT5	Frost protection sensor, air heater		

### Function

TF1/FF1 are started and stopped by the timer built into RC1. Mode switches along with operation and alarm indication are contained in the operator panel. The extract air fan starts before the supply air fan. Damper actuator ST1 opens before TF1 starts and closes when the fans stop.

### Temperature control

The temperature sensor GT1 maintains the desired supply air temperature using RC1 that controls the heat exchanger and air heater in sequence. If there is a heat demand the AS1 speed controller increases the speed of the rotor and valve actuator SV1 opens. If there is a cooling demand SV1 closes and AS1 slows the speed of the rotor.

### Air heater, heating water

If there is a risk of frost in the air heater, the frost protection sensor GT5 makes valve actuator SV1 open, after that the unit is stopped. When the unit is stopped, GT5 maintains the return water temperature at approx. 25 °C.

### Alarm

Frost protection (A alarm), Deviation alarm fan, supply and extract air (B alarm), summation alarm VVX (B alarm). Summation alarm to terminal block.

### Options (light green in the flow chart)

#### Air cooler, cooling water

The air cooler valve actuator SV2 is controlled in sequence with the heat exchanger and air heater.

#### Air cooler, evaporated refrigerant

Stepping switch SK2 switches on the air cooler for the evaporated refrigerant in one or more stages using a stepping or binary switch, in sequence with the heat exchanger and air heater.

#### Cooler

When the room / extract air temperature exceeds the set value RC1 transmits a signal to air cooler KM1 which switches on one or more stages.

#### Indirect evaporative cooling

When the outdoor temperature exceeds the set value the rotor is started at maximum speed and solenoid valve MV1 in the water pipe is opened.

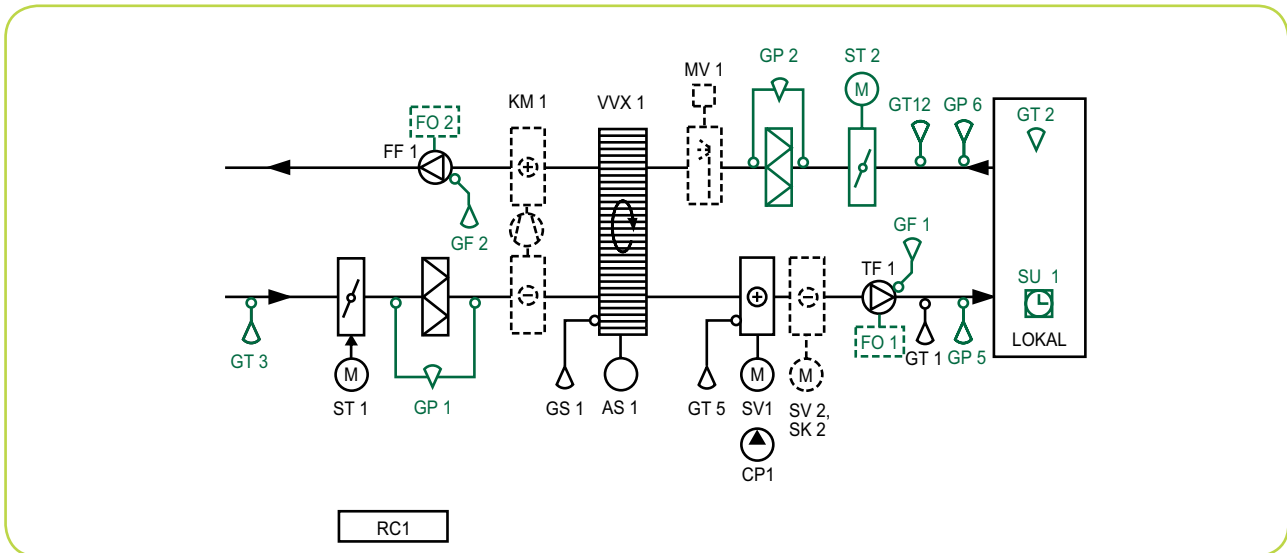
#### Flow control, fans

Flow sensor GF1/GF2 maintains the flow through each fan. Frequency converters FO1/FO2 control the speed of TF1/FF1.



# Flow charts

Supply air unit and extract air units with a rotary heat exchanger



## Component list

GP1	Filter monitor, supply air	GT3	Temperature sensor, outdoor air
GP2	Filter monitor, extract air	GT12	Temperature sensor, extract air
GP5	Pressure sensor, supply air	ST2	Damper actuator
GP6	Pressure sensor, extract air	ST3	Damper actuator, return air
GT2	Temperature sensor, room	SU1	Timer

## Accessories (dark green in the flow chart)

### Room or extract air control

Room or extract air temperature is maintained by controlling the supply air temperature in a cascade limited to a min. and max. value.

### Pressure control, fans

Pressure sensors GP5/GP6 maintain the air pressure in the ducts. Frequency converters FO1/FO2 control the speed of TF1/FF1.

### Cooling recovery

The heat exchanger is run for 100% recovery at extract air temperatures less than the outdoor temperature.

### Outdoor compensation

The desired air temperature setpoint is offset upwards or downwards at high and low outdoor temperatures

### Filter monitor, supply and extract air

Generates an alarm if the pressure drop across each filter exceeds the set value (B alarm).

### Damper actuator

For dampers other than the outdoor air damper.

### Fire protection function

Stops the unit in the event of an alarm (A alarm).

### Night purging

Starts the unit at night to cool the premises using cold outdoor air. Outdoor sensor for facade mounting.

### Night heating

The unit starts automatically at night to heat the premises if the temperature inside is low.

### Prolonged operation

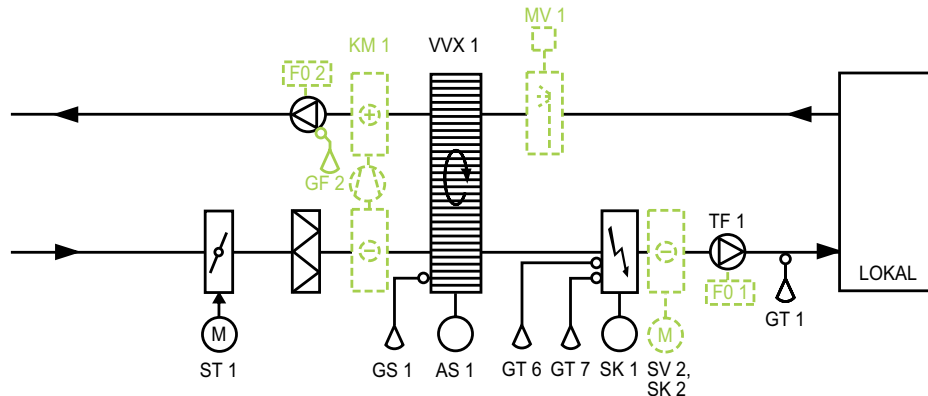
Prolonged operation via a timer or external push button with a time set on the panel.

### Shunts

Shunt with pilot valve and pump group for the air heater or air cooler for heating water and cooling water.

## Flow charts

### Supply air unit and extract air units with a rotary heat exchanger



#### Component list

AS1	Speed controller heat exchanger	KM1	Cooler
FF1	Extract air fan	MV1	Solenoid valve
FO1/FO2	Frequency converter	RC1	Control unit
GF1	Flow sensor, supply air	SK1	Stepping switch or thyristor
GF2	Flow sensor, extract air	ST1	Damper actuator, outdoor air
GS1	Rotation monitor sensor	SV1	Valve actuator, heating water
GT1	Temperature sensor, supply air	SV2/SK2	Valve actuator cooling/stepping switch, cooling
GT6	Thermal overload protection, automatic	TF1	Tilluftsfläkt
GT7	Thermal overload protection, manual	VWX1	Roterande värmeväxlare

#### Function

TF1/FF1 are started and stopped by the timer built-in to RC1. Mode switches along with operation and alarm indication are contained in the operator panel. The extract air fan starts before the supply air fan. Damper actuator ST1 opens before TF1 starts and closes when the fans stop.

#### Temperature control

The temperature sensor GT1 maintains the desired supply air temperature using RC1 that controls the heat exchanger and electric air heater in sequence. If there is a heat demand the AS1 speed controller increases the speed of the rotor and stepping switch/thyristor SK1 are tied in. If there is a cooling demand SK1 is disconnected and AS1 slows the speed of the rotor.

#### Air heater, electric

The air heater is interlocked by TF1 and fan monitor GP3. When the unit is stopped by a switch, timer or thermal overload protection, the electric heater is disconnected immediately while the fans continue to run for a set time to cool the unit.

#### Alarm

Thermal overload protection (B alarm), Deviation alarm fan, supply and extract air (B alarm), summation alarm VVX (B alarm). Summation alarm to terminal block.

#### Options (light green in the flow chart)

##### Air cooler, cooling water

The air cooler valve actuator SV2 is controlled in sequence with the heat exchanger and electric heater.

##### Air cooler, evaporated refrigerant

Stepping switch SK2 switches on the air cooler for the evaporated refrigerant in one or more stages using a stepping or binary switch, in sequence with the heat exchanger and air heater.

##### Cooler

When the room / extract air temperature exceeds the set value RC1 transmits a signal to air cooler KM1 which switches on one or more stages.

##### Indirect evaporative cooling

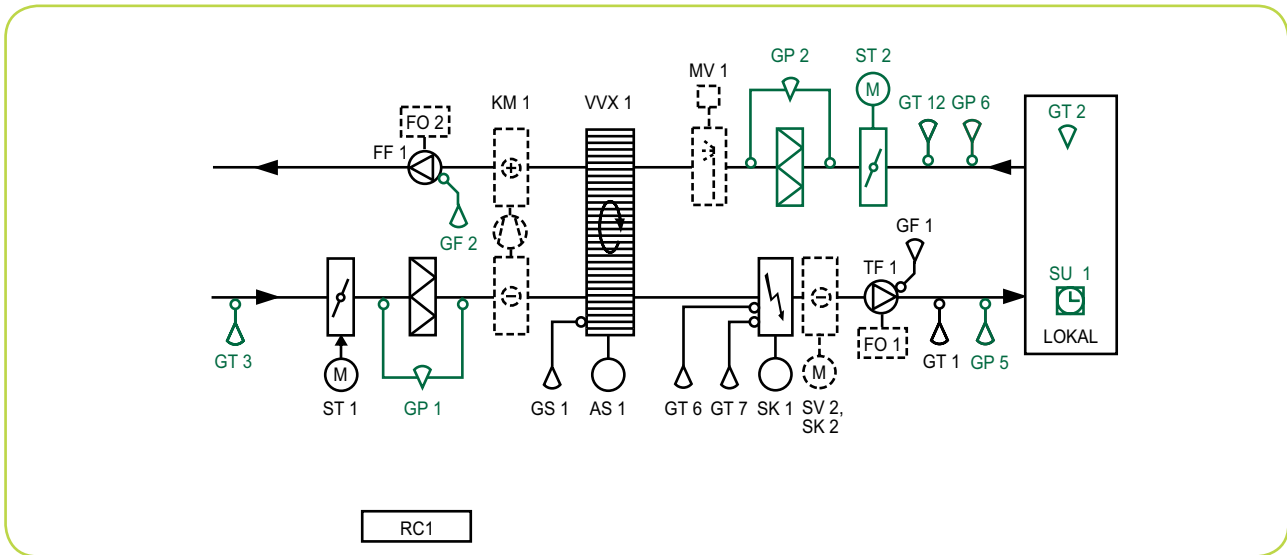
When the outdoor temperature exceeds the set value the rotor is started at maximum speed and solenoid valve MV1 in the water pipe is opened.

##### Flow control, fans

Flow sensor GF1/GF2 maintains the flow through each fan. Frequency converters FO1/FO2 control the speed of TF1/FF1.

# Flow charts

Supply air unit and extract air units with a rotary heat exchanger



### Component list

GP1	Filter monitor, supply air	GT3	Temperature sensor, outdoor air
GP2	Filter monitor, extract air	GT12	Temperature sensor, extract air
GP5	Pressure sensor, supply air	KM1	Cooler
GP6	Pressure sensor, extract air	ST2	Damper actuator
GP7	Pressure monitor, defrosting	ST3	Damper actuator, return air
GT2	Temperature sensor, room	SU1	Timer

### Accessories (dark green in the flow chart)

#### Room or extract air control

Room or extract air temperature is maintained by controlling the supply air temperature in a cascade limited to a min. and max. value.

#### Pressure control, fans

Pressure sensors GP5/GP6 maintain the air pressure in the ducts. Frequency converters FO1/FO2 control the speed of TF1/FF1.

#### Cooling recovery

The heat exchanger is run for 100% recovery at extract air temperatures less than the outdoor temperature.

#### Outdoor compensation

The desired air temperature setpoint is offset upwards or downwards at high and low outdoor temperatures respectively.

#### Filter monitor, supply and extract air

Generates an alarm if the pressure drop across each filter exceeds the set value (B alarm).

#### Damper actuator

For dampers other than the outdoor air damper.

#### Fire protection function

Stops the unit in the event of an alarm (A alarm).

#### Night purging

Starts the unit at night to cool the premises using cold outdoor air. Outdoor sensor for facade mounting.

#### Night heating

The unit starts automatically at night to heat the premises if the temperature inside is low.

#### Prolonged operation

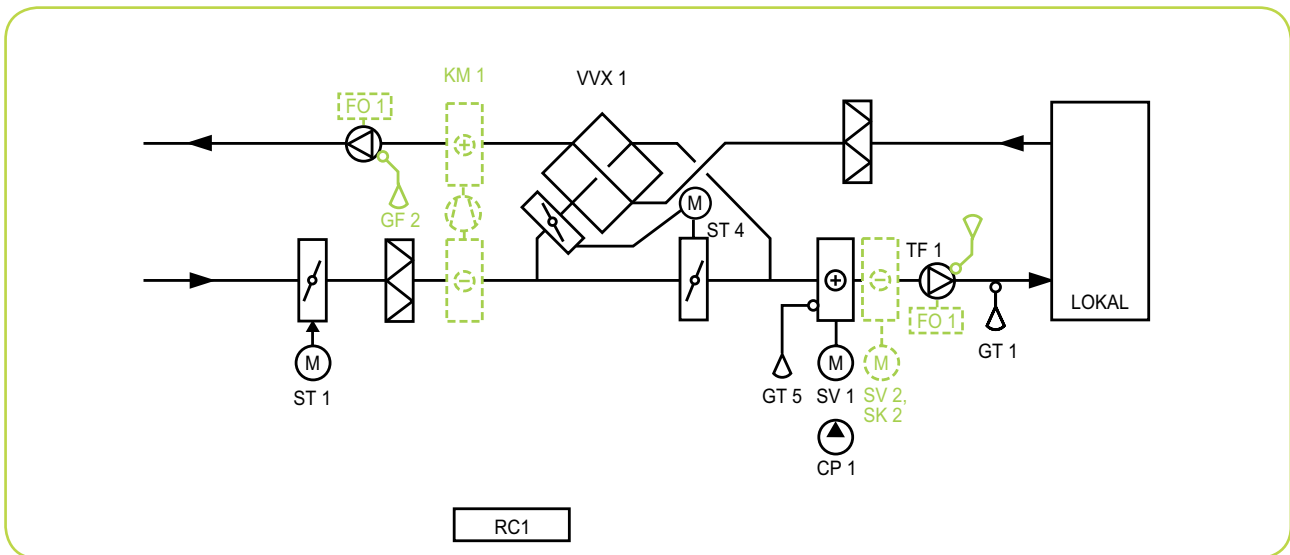
Prolonged operation via a timer or external push button with a time set on the panel.

#### Shunts

Shunt with pilot valve and pump group for cooling water for the air cooler.

## Flow charts

Supply air unit and extract air units with a plate heat exchanger



### Component list

CP1	Circulation pump, heating water	MV1	Solenoid valve
FF1	Extract air fan	RC1	Control unit
FO1/FO2	Frequency converter	ST1	Damper actuator, outdoor air
GF1	Flow sensor, supply air	ST4	Damper actuator, heat exchanger
GF2	Flow sensor, extract air	SV1	Valve actuator, heating water
GT1	Temperature sensor, supply air	SV2/SK2	Valve actuator cooling/stepping switch, cooling
GT5	Frost protection sensor, air heater	TF1	Supply air fan
KM1	Cooler	VWX1	Plate heat exchanger

### Function

TF1/FF1 are started and stopped by the timer built-in to RC1. Mode switches along with operation and alarm indication are contained in the operator panel. The extract air fan starts before the supply air fan. Damper actuator ST1 opens before TF1 starts and closes when the fans stop.

### Temperature control

The temperature sensor GT1 maintains the desired supply air temperature using RC1 that controls the heat exchanger and air heater in sequence. If there is a heat demand the ST4 bypass damper closes and valve actuator SV1 opens. If there is a cooling demand SV1 closes and ST4 opens.

### Air heater, heating water

If there is a risk of frost in the air heater, the frost protection sensor GT5 makes valve actuator SV1 open, after that the unit is stopped. When the unit is stopped, GT5 maintains the return water temperature at approx. 25 °C.

### Alarm

Frost protection (A alarm), Deviation alarm fan, supply and extract air (B alarm). Summation alarm to terminal block.

### Options (light green in the flow chart)

#### Air cooler, cooling water

The air cooler valve actuator SV2 is controlled in sequence with the heat exchanger and air heater.

#### Air cooler, evaporated refrigerant

Stepping switch SK2 switches on the air cooler for the evaporated refrigerant in one or more stages using a stepping or binary switch, in sequence with the heat exchanger and air heater.

#### Cooler

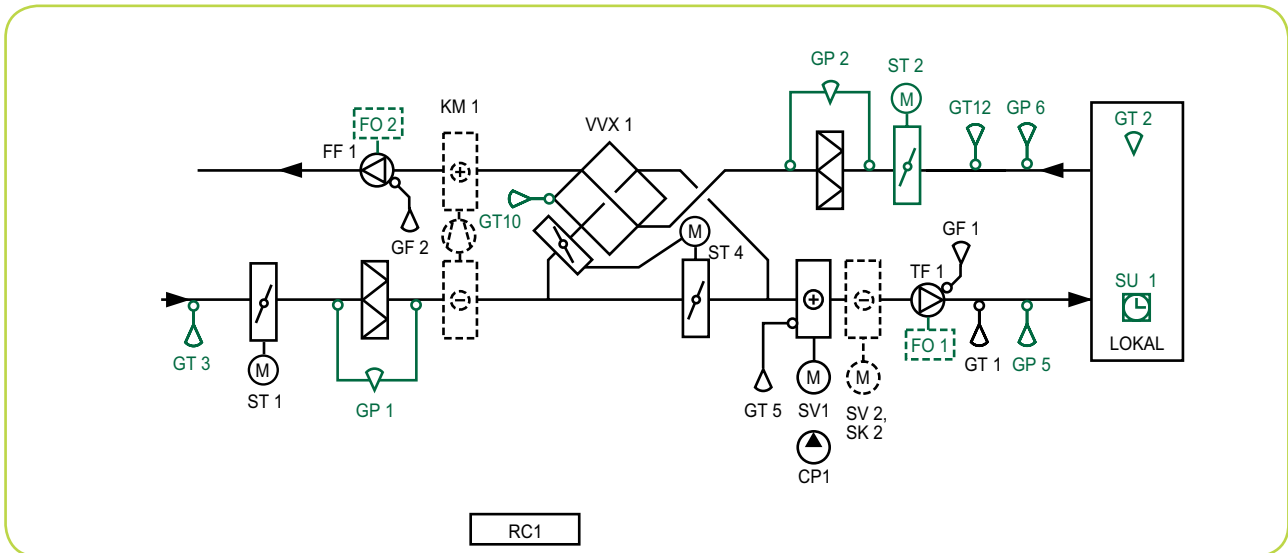
When the room/extract air temperature exceeds the set value RC1 transmits a signal to air cooler KM1 which switches on one or more stages.

#### Flow control, fans

Flow sensor GF1/GF2 maintains the flow through each fan. Frequency converters FO1/FO2 control the speed of TF1/FF1.

## Flow charts

Supply air unit and extract air units with a plate heat exchanger



### Component list

GP1	Filter monitor, supply air	GT3	Temperature sensor, outdoor air
GP2	Filter monitor, extract air	GT12	Temperature sensor, extract air
GP5	Pressure sensor, supply air	KM1	Cooler
GP6	Pressure sensor, extract air	ST2	Damper actuator
GP7	Pressure monitor, defrosting	ST3	Damper actuator, return air
GT2	Temperature sensor, room	SU1	Timer

### Accessories (dark green in the flow chart)

#### Room or extract air control

Room or extract air temperature is maintained by controlling the supply air temperature in a cascade, limited to a min. and max. value.

#### Pressure control, fans

Pressure sensors GP5/GP6 maintain the air pressure in the ducts. Frequency converters FO1/FO2 control the speed of TF1/FF1.

#### Cooling recovery

The heat exchanger is run for 100% recovery at extract air temperatures less than the outdoor temperature.

#### Outdoor compensation

The desired air temperature setpoint is offset upwards or downwards at high and low outdoor temperatures respectively.

#### Defrosting

1. Section defrosting is activated at outdoor temperatures below  $-7\text{ }^{\circ}\text{C}$ . The heat exchanger is defrosted continuously by closing the bypass damper and then closing the recirculation dampers one at a time for 15 minutes in order to defrost by section.
2. Frosting is avoided by limiting the temperature in the cold corner to  $+2\text{ }^{\circ}\text{C}$ , by reducing the heat exchanger efficiency, i.e. progressively opening the bypass damper.

#### Filter monitor, supply and extract air

Generates an alarm if the pressure drop across each filter exceeds the set value (B alarm).

#### Damper actuator

For dampers other than the outdoor air damper.

#### Fire protection function

Stops the unit in the event of an alarm (A alarm).

#### Night purging

Starts the unit at night to cool the premises using cold outdoor air. Outdoor sensor for facade mounting.

#### Night heating

The unit starts automatically at night to heat the premises if the temperature inside is low.

#### Prolonged operation

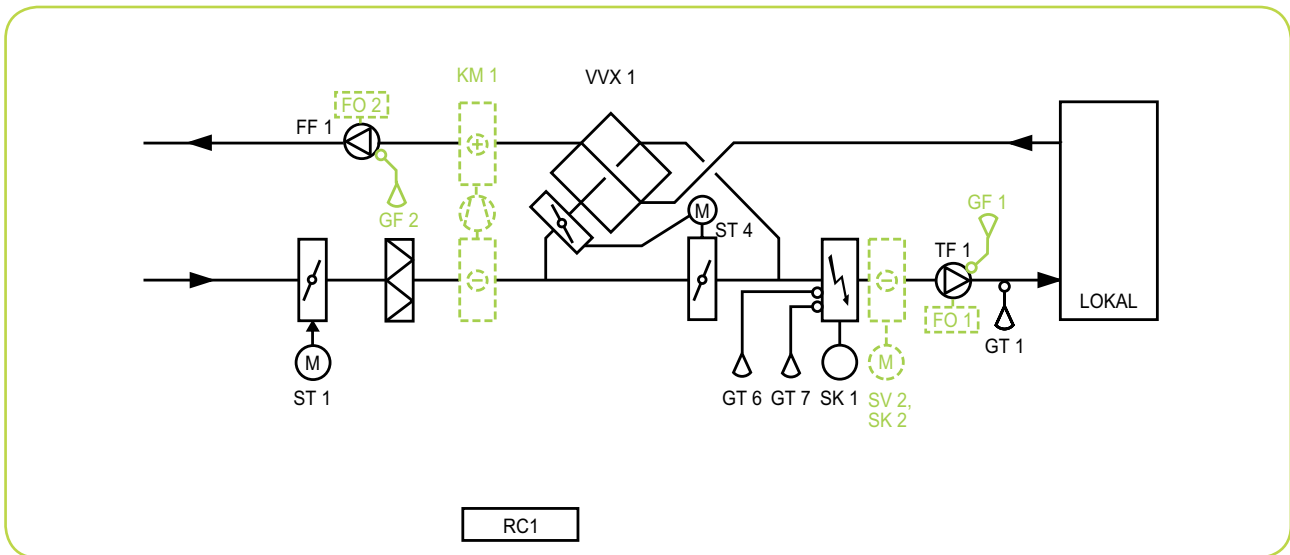
Prolonged operation via a timer or external push button with a time set on the panel.

#### Shunts

Shunt with pilot valve and pump group for the air heater or air cooler for heating water and cooling water.

## Flow charts

Supply air unit and extract air units with a plate heat exchanger



### Component list

FF1	Extract air fan	RC1	Control unit
FO1/FO2	Frequency converter	SK1	Stepping switch or thyristor
GF1	Flow sensor, supply air	ST1	Damper actuator, outdoor air
GF2	Flow sensor, extract air	ST4	Damper actuator, heat exchanger
GT1	Temperature sensor, supply air	SV2/SK2	Valve actuator cooling/stepping switch, cooling
GT6	Thermal overload protection, automatic	TF1	Supply air fan
GT7	Thermal overload protection, manual	VWX1	Plate heat exchanger
KM1	Cooler		

### Function

TF1/FF1 are started and stopped by the timer built-in to RC1. Mode switches along with operation and alarm indication are contained in the operator panel. The extract air fan starts before the supply air fan. Damper actuator ST1 opens before TF1 starts and closes when the fans stop.

### Temperature control

The temperature sensor GT1 maintains the desired supply air temperature using RC1 that controls the heat exchanger and electric air heater in sequence. If there is a heat demand bypass damper ST4 closes and stepping switch/thyristor SK1 is tied in. If there is a cooling demand SK1 is disconnected and ST4 opens.

### Air heater, electric

The air heater is interlocked by TF1 and fan monitor GP3. When the unit is stopped by a switch, timer or thermal overload protection, the electric heater is disconnected immediately while the fans continue to run for a set time to cool the unit.

### Alarm

Thermal overload protection (B alarm), Deviation alarm fan, supply and extract air (B alarm). Summation alarm to terminal block.

### Options (light green in the flow chart)

#### Air cooler, cooling water

The air cooler valve actuator SV2 is controlled in sequence with the heat exchanger and electric air heater.

#### Air cooler, evaporated refrigerant

Stepping switch SK2 switches on the air cooler for the evaporated refrigerant in one or more stages using a stepping or binary switch, in sequence with the heat exchanger and air heater.

#### Cooler

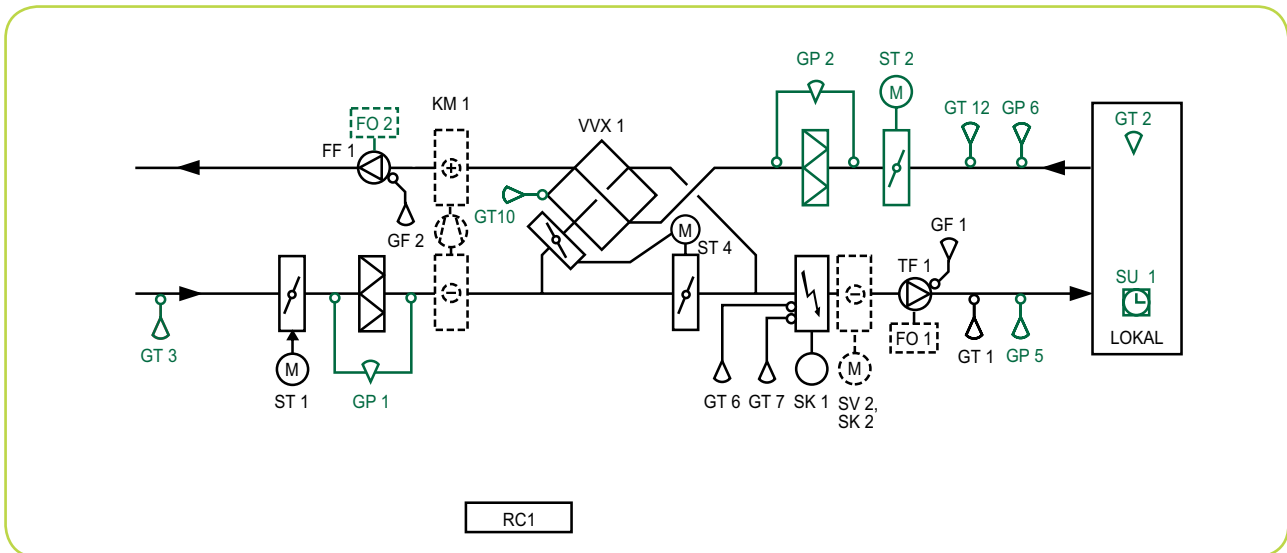
When the room/extract air temperature exceeds the set value RC1 transmits a signal to air cooler KM1 which switches on one or more stages.

#### Flow control, fans

Flow sensor GF1/GF2 maintains the flow through each fan. Frequency converters FO1/FO2 control the speed of TF1/FF1.

## Flow charts

Supply air unit and extract air units with a plate heat exchanger



### Component list

GP1	Filter monitor, supply air	GT10	Temperature sensor, cold corner
GP2	Filter monitor, extract air	GT12	Temperature sensor, extract air
GP5	Pressure sensor, supply air	ST2	Damper actuator, extract air/exhaust air
GP6	Pressure sensor, extract air	ST3	Damper actuator, return air
GT2	Temperature sensor, room	SU1	Timer
GT3	Temperature sensor, outdoor air		

### Accessories (dark green in the flow chart)

#### Room or extract air control

Room or extract air temperature is maintained by controlling the supply air temperature in a cascade, limited to a min. and max. value.

#### Pressure control, fans

Pressure sensors GP5/GP6 maintain the air pressure in the ducts. Frequency converters FO1/FO2 control the speed of TF1/FF1.

#### Cooling recovery

The heat exchanger is run for 100% recovery at extract air temperatures less than the outdoor temperature.

#### Outdoor compensation

The desired air temperature setpoint is offset upwards or downwards at high and low outdoor temperatures respectively.

#### Defrosting

1. Section defrosting is activated at outdoor temperatures below  $-7^{\circ}\text{C}$ . The heat exchanger is defrosted continuously by closing the bypass damper and then closing the recirculation dampers one at a time for 15 minutes in order to defrost by section.
2. Frosting is avoided by limiting the temperature in the cold corner to  $+2^{\circ}\text{C}$ , by reducing the heat exchanger efficiency, i.e. progressively opening the bypass damper.

#### Filter monitor, supply and extract air

Generates an alarm if the pressure drop across each filter exceeds the set value (B alarm).

#### Damper actuator

For dampers other than the outdoor air damper.

#### Fire protection function

Stops the unit in the event of an alarm (A alarm).

#### Night purging

Starts the unit at night to cool the premises using cold outdoor air. Outdoor sensor for facade mounting.

#### Night heating

The unit starts automatically at night to heat the premises if the temperature inside is low.

#### Prolonged operation

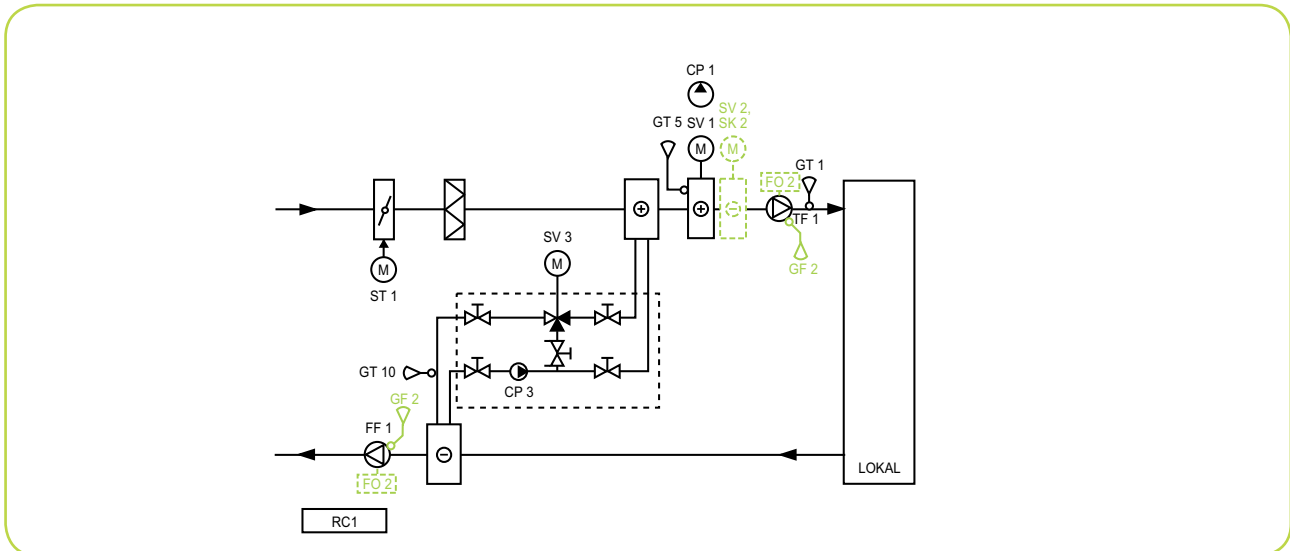
Prolonged operation via a timer or external push button with a time set on the panel.

#### Shunts

Shunt with pilot valve and pump group for cooling water for the air cooler.

## Flow charts

Supply air unit and extract air units with a liquid-coupled heat exchanger



### Component list

CP1	Circulation pump, heating water	GT10	Frost monitor, heat exchanger
CP3	Circulation pump, recovery water	RC1	Control unit
FF1	Extract air fan	ST1	Damper actuator, outdoor air
FO1/FO2	Frequency converter	SV1	Valve actuator, heating water
GF1	Flow sensor, supply air	SV3	Valve actuator, recovery water
GF2	Flow sensor, extract air	SV2/SK2 V	Valve actuator cooling/stepping switch, cooling
GT1	Temperature sensor, supply air	TF1	Supply air fan
GT5	Frost protection sensor, air heater		

### Function

TF1/FF1 are started and stopped by the timer built-in to RC1. Mode switches along with operation and alarm indication are contained in the operator panel. The extract air fan starts before the supply air fan. Damper actuator ST1 opens before TF1 starts and closes when the fans stop.

### Temperature control

The temperature sensor GT1 maintains the desired supply air temperature using RC1 that controls the heat exchanger and air heater in sequence. If there is a heat demand valve actuator SV3 opens first and then valve actuator SV1 opens. If there is a cooling demand SV1 closes first and then ST4 closes.

### Air heater, heating water

If there is a risk of frost in the air heater, the frost protection sensor GT5 makes valve actuator SV1 open, after that the unit is stopped. When the unit is stopped, GT5 maintains the return water temperature at approx. 25 °C.

### Alarm

Frost protection (A alarm), Deviation alarm fan, supply and extract air (B alarm). Summation alarm to terminal block.

### Options (light green in the flow chart)

#### Air cooler, cooling water

The air cooler valve actuator SV2 is controlled in sequence with the heat exchanger and air heater.

#### Air cooler, evaporated refrigerant

Stepping switch SK2 switches on the air cooler for the evaporated refrigerant in one or more stages using a stepping or binary switch, in sequence with the heat exchanger and air heater.

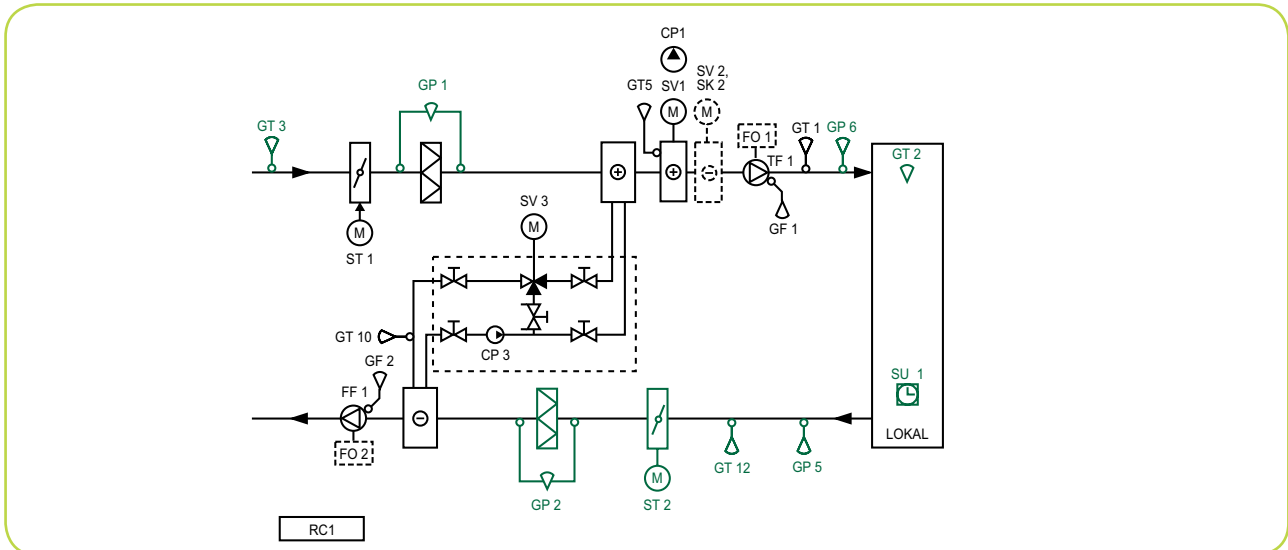
#### Flow control, fans

Flow sensor GF1/GF2 maintains the flow through each fan. Frequency converters FO1/FO2 control the speed of TF1/FF1.



# Flow charts

## Supply air and extract air units with a liquid-coupled heat exchanger



### Component list

GP1	Filter monitor, supply air	GT3	Temperature sensor, outdoor air
GP2	Filter monitor, extract air	GT12	Temperature sensor, extract air
GP5	Pressure sensor, supply air	ST2	Damper actuator
GP6	Pressure sensor, extract air	ST3	Damper actuator, return air
GT2	Temperature sensor, room	SU1	Timer

### Accessories (dark green in the flow chart)

#### Room or extract air control

Room or extract air temperature is maintained by controlling the supply air temperature in a cascade, limited to a min. and max. value.

#### Pressure control, fans

Pressure sensors GP5/GP6 maintain the air pressure in the ducts. Frequency converters FO1/FO2 control the speed of TF1/FF1.

#### Cooling recovery

The heat exchanger is run for 100% recovery at extract air temperatures less than the outdoor temperature.

#### Outdoor compensation

The desired air temperature setpoint is offset upwards or downwards at high and low outdoor temperatures respectively.

#### Defrosting

Frosting is avoided by ensuring that the temperature in the inlet line to the extract air heat exchanger does not drop below the set value, by reducing the heat exchanger efficiency, i.e. progressively closing the pilot valve.

#### Filter monitor, supply and extract air

Stops the unit and generates an alarm if the flow is low (B alarm).

#### Damper actuator

For dampers other than the outdoor air damper.

#### Fire protection function

Stops the unit in the event of an alarm (A alarm).

#### Night purging

Starts the unit at night to cool the premises using cold outdoor air. Outdoor sensor for facade mounting.

#### Night heating

The unit starts automatically at night to heat the premises if the temperature inside is low.

#### Prolonged operation

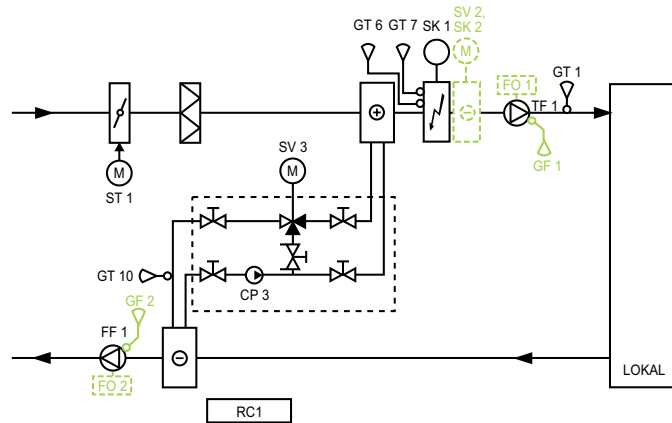
Prolonged operation via a timer or external push button with a time set on the panel.

#### Shunts

Shunt with pilot valve and pump group for the air heater or air cooler for heating water and cooling water.

## Flow charts

Supply air and extract air units with a liquid-coupled heat exchanger



### Component list

CP3	Circulation pump, recovery water	GT10	Frost monitor, heat exchanger
FF1	Extract air fan	RC1	Control unit
FO1/FO2	Frequency converter	SK1	Stepping switch or thyristor
GF1	Flow sensor, supply air	ST1	Damper actuator, outdoor air
GF2	Flow sensor, extract air	TF1	Supply air fan
GT1	Temperature sensor, supply air	SV2/SK2	Valve actuator cooling/stepping switch, cooling
GT6	Thermal overload protection, automatic	SV3	Valve actuator, recovery water
GT7	Thermal overload protection, manual		

### Function

TF1/FF1 are started and stopped by the timer built-in to RC1. Mode switches along with operation and alarm indication are contained in the operator panel. The extract air fan starts before the supply air fan. Damper actuator ST1 opens before TF1 starts and closes when the fans stop.

### Temperature control

The temperature sensor GT1 maintains the desired supply air temperature using RC1 that controls the heat exchanger and electric air heater in sequence. If there is a heat demand valve actuator SV3 opens and stepping switch/thyristor SK1 is tied in. If there is a cooling demand SK1 is disconnected and ST3 closes.

### Air heater, electric

The air heater is interlocked by TF1 and fan monitor GP3. When the unit is stopped by a switch, timer or thermal overload protection, the electric heater is disconnected immediately while the fans continue to run for a set time to cool the unit.

### Alarm

Thermal overload protection (B alarm), Deviation alarm fan, supply and extract air (B alarm). Summation alarm to terminal block.

### Options (light green in the flow chart)

#### Air cooler, cooling water

The air cooler valve actuator SV2 is controlled in sequence with the heat exchanger and electric heater.

#### Air cooler, evaporated refrigerant

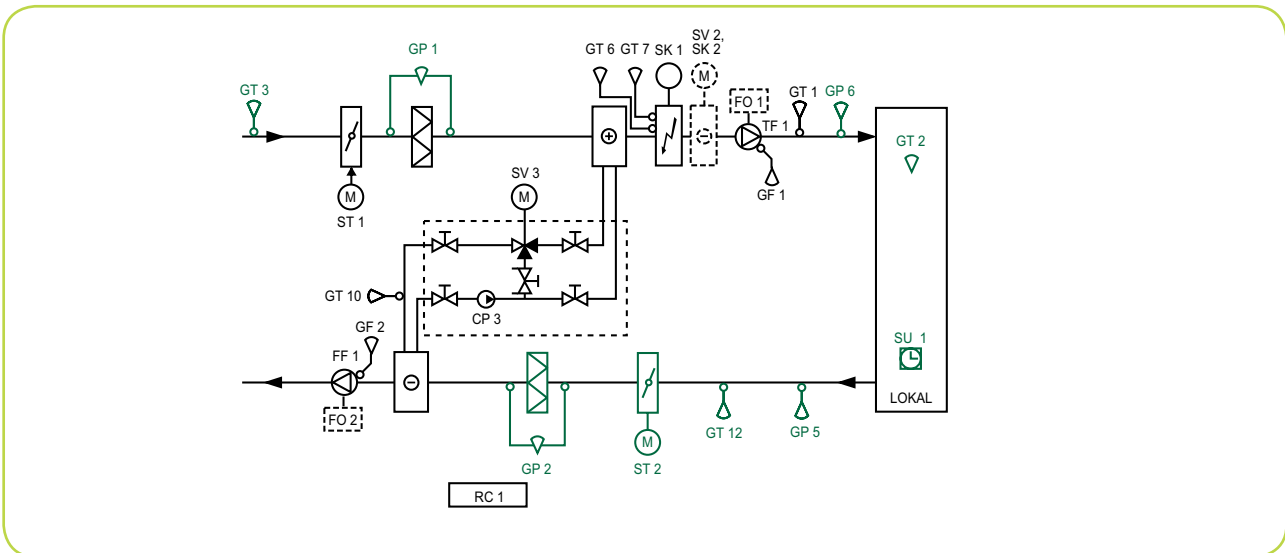
Stepping switch SK2 switches on the air cooler for the evaporated refrigerant in one or more stages using a stepping or binary switch, in sequence with the heat exchanger and air heater.

#### Flow control, fans

Flow sensor GF1/GF2 maintains the flow through each fan. Frequency converters FO1/FO2 control the speed of TF1/FF1.

## Flow charts

Supply air and extract air units with a liquid-coupled heat exchanger



### Component list

GP1	Filter monitor, supply air	GT3	Temperature sensor, outdoor air
GP2	Filter monitor, extract air	GT12	Temperature sensor, extract air
GP5	Pressure sensor, supply air	ST2	Damper actuator
GP6	Pressure sensor, extract air	ST3	Damper actuator, return air
GT2	Temperature sensor, room	SU1	Timer

### Accessories (dark green in the flow chart)

#### Room or extract air control

Room or extract air temperature is maintained by controlling the supply air temperature in a cascade, limited to a min. and max. value.

#### Pressure control, fans

Pressure sensors GP5/GP6 maintain the air pressure in the ducts. Frequency converters FO1/FO2 control the speed of TF1/FF1.

#### Cooling recovery

The heat exchanger is run for 100% recovery at extract air temperatures less than the outdoor temperature.

#### Outdoor compensation

The desired air temperature setpoint is offset upwards or downwards at high and low outdoor temperatures respectively.

#### Defrosting

Frosting is avoided by ensuring that the temperature in the inlet line to the extract air heat exchanger does not drop below the set value, by reducing the heat exchanger efficiency, i.e. progressively closing the pilot valve.

#### Filter monitor, supply and extract air

Generates an alarm if the pressure drop across each filter exceeds the set value (B alarm).

#### Damper actuator

For dampers other than the outdoor air damper.

#### Fire protection function

Stops the unit in the event of an alarm (A alarm).

#### Night purging

Starts the unit at night to cool the premises using cold outdoor air. Outdoor sensor for facade mounting.

#### Night heating

The unit starts automatically at night to heat the premises if the temperature inside is low.

#### Prolonged operation

Prolonged operation via a timer or external push button with a time set on the panel.

#### Shunts

Shunt with pilot valve and pump group for cooling water for the air cooler.

# Accessories

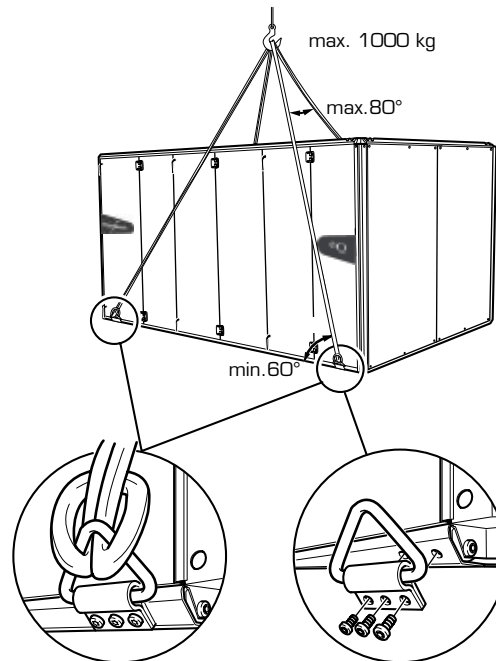
## Casing

### EQAZ-01 Inspection window

Double window in Plexiglas.



### EQAZ -02 Lifting device

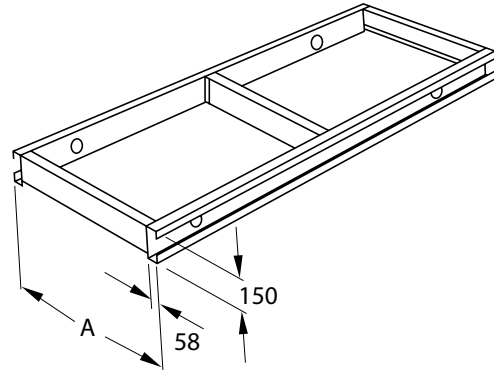


# Accessories

## Casing

### EQAZ-04 Base frame

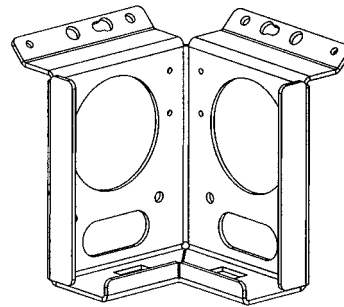
A very stable and torsionally resistant frame for the entire unit, one or more blocks. The base frame is secured to the frame profile of the unit with fixing plates. The length and width of the base frame must be adapted to the size of the unit and the combination of functional parts.



Unit size bbb	Width A	Unit size bbb	Width A
005,009	774	032	1774
008,014,020	1074	041,054,068	1974
011	1174	050,063,079	2274
018,027,036	1374	072,090	2574
023,045,056	1674		

### EQAZ-03 Base feet

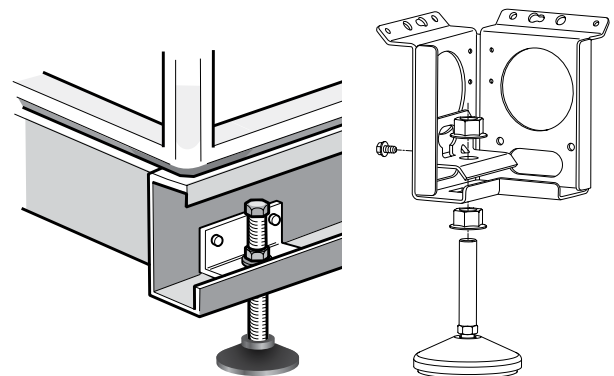
Instead of EQAZ-04, if you for example want to have better access under the unit.



### EQAZ-05 Adjustable feet (set)

The feet can adjust the height of the unit above the floor and can compensate for any unevenness in the floor. Use together with EQAZ-04 or EQAZ-03. Available in plastic.

Height adjustment:  
 55 - 120 mm  
 Inclusive EQAZ-04 or EQAZ-03  
 205 - 270 mm  
 Foot diameter = 100 mm



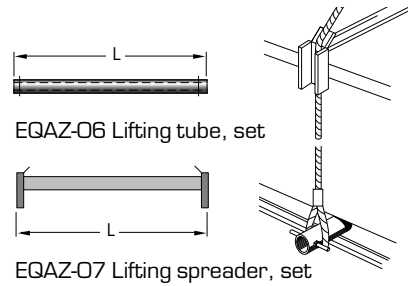
# Accessories

## Casing

EQAZ -06 Lifting tube, set

EQAZ -07 Lifting spreader, set

These are used in combination with base frame EQAZ-04.



Unit size bbb	Length L	Unit size bbb	Length L
005,009	1000	032	2100
008,014,020	1300	041,054,068	2300
011	1400	050,063,079	2600
018,027,036	1600	072,090	2900
023,045,056	1900		

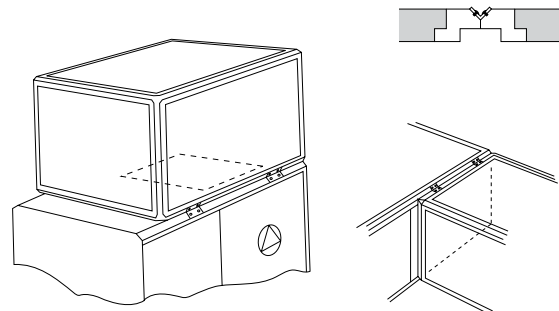
## EQAZ-09 Bulkhead light, IP-54

Internal lighting equipment Available as LED or low-energy bulb. Can be delivered wired to built-in control cabinet. The lamp fitting is mounted in the roof and the cable drawn out to the outside. Connection box and /or switch is delivered loose.



## EQAZ-16 Joining piece set

For joining units in an L-formed or stacked arrangement.



# Accessories

## Casing



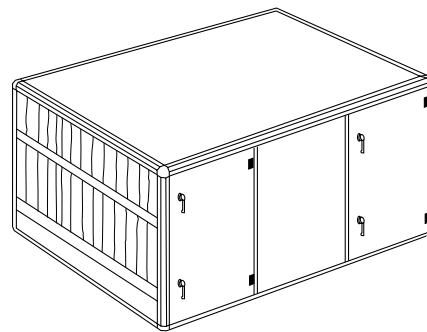
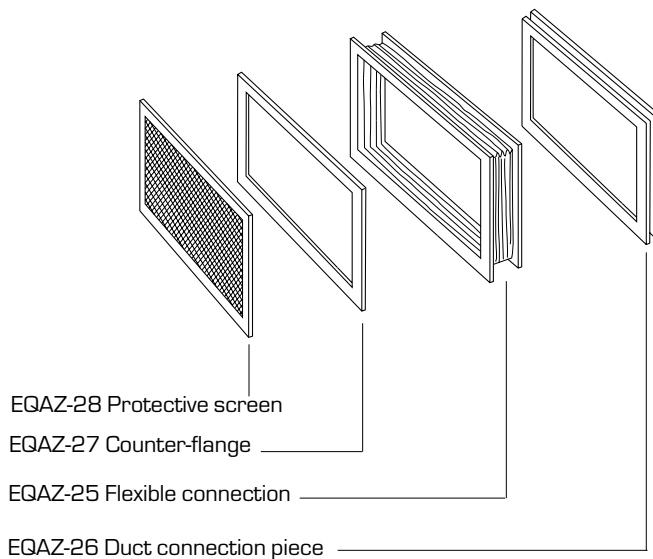
### EQAZ-20 Anti-slip protection

For units that allow access  
(must be equipped with anti-slip protection).

### EQAZ-24 Espagnolette

To facilitate the opening of doors higher than 2000 mm, an espagnolette can connect the handles on the inside of the door.

- EQAZ-25 Flexible connection
- EQAZ-26 Duct connection piece
- EQAZ-27 Counter-flange (d=2 )
- EQAZ-28 Protective screen



### EQAZ-30 Adjustment panels

Adjustment panels are supplied with the unit size 005-023 to create the correct pressure balance across the rotor so that purging air flow will pass in the right direction. The panels should be placed upstream of the extract air filter, if their use is necessary.



# Accessories

## Casing

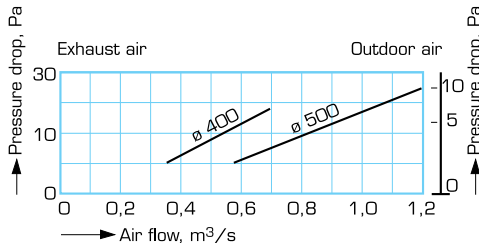
### EQAZ-60 Combination cover, for wall mounting

The cover is intended to be positioned on a wall for the intake of outdoor air on the bottom edge and blowing out of extract air directly outwards. The cover is manufactured from galvanized sheet steel and is painted with black epoxy paint. Inlet and outlet openings are provided with a secure net to exclude small animals.



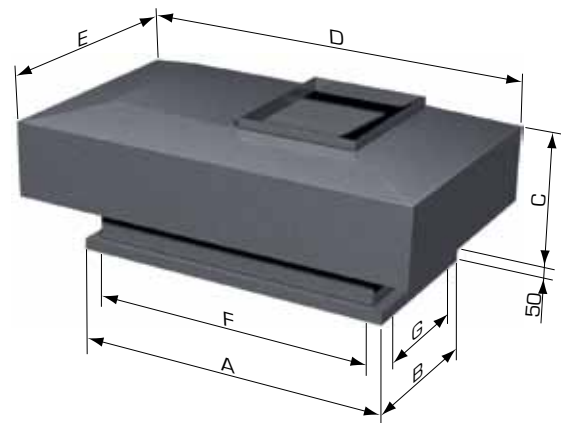
EQAZ-60-b	Connection	Outer dimension (W x H x L)	C/C	Weight kg
b=1(005)	2 x ø 400	1000 x 580 x 220	500	15
b=2 (008, 011)	2 x ø 500	1200 x 720 x 300	600	22

### Pressure drop, outdoor air and extract air



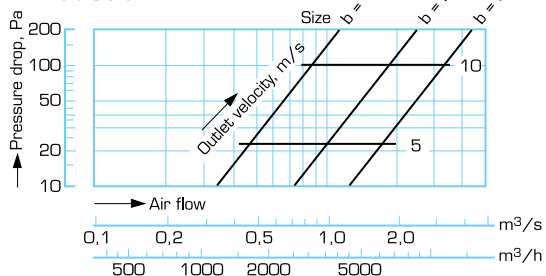
### EQAZ-61 Combination cover, ceiling mounting

The cover is intended to be positioned in the roof for the intake of outdoor air on the bottom edge and the blowing out of extract air upwards. The extract air part is equipped with a non-return damper. The outdoor air side is provided with a secure net to exclude small animals. The cover is manufactured from galvanized sheet steel. The cover matches ceiling lead-trough EQAZ-62.

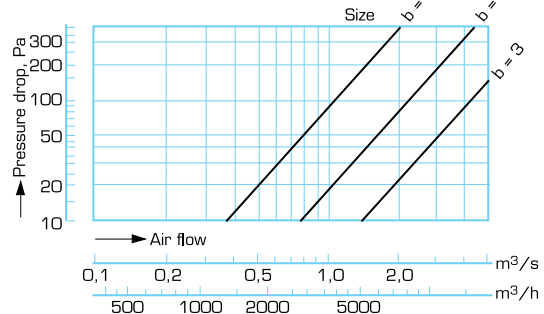


EQAZ-61-b	A	B	C	D	E	F	G	Weight kg
b = 1 (005, 008, 011) 1000 X 500	1050	550	525	1450	850	1000	500	45
b = 2 (011, 018) 1400 x 700	1450	750	675	1950	1150	1400	700	75
b = 3 (023) 1800 x 900	1850	950	750	2400	1400	1800	900	105

### Exhaust air



### Outdoor air





# Accessories

## Casing

### EQAZ-62 Ceiling lead-trough

The ceiling lead-trough is intended for combination cover EQAZ-61. It is insulated with 50 mm mineral wool which is covered with perforated sheet. Provided with angle brackets for attachment to the roof construction.

EQAZ-62-b	Outer dimension (W x H x L)	Duct connection	Hole dimensions	A	Weight kg
bb=1 (005, 008,011,) 1000x500	1000 x 500 x 800	2 x $\varnothing$ 400	1010 x 510	500	56
bb=2 (011, 018) 1400x700	1400 x 700 x 800	600 x 600	1410 x 710	700	72
bb=3 (023) 1800x900	1800 x 900 x 800	800 x 800	1810 x 910	900	92



### EQAZ-42 Extension legs with adjustable feet, set

Extension legs (not installed) can be cut to desired length. Plastic foot (EQAZ-05) included.

# Accessories

## Casing



EQWZ-01 Bottom drain

Drainage of casing, hygienic design.



EQWZ-02 Drain trough

Drainage of casing, hygienic design.

### Other accessories for the casing:

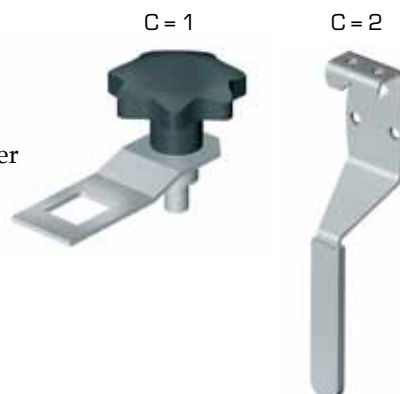
EQAZ-11 Support beam  
EQAZ-15 Tool kit for eQ casing  
EQAZ-17 Door stop (for doors on pressurized units)

EQAZ-23 Ground cable (eQ PLUS)  
EQAZ-29 Floor grating

## Damper

EQAZ-13 Lever actuator

The actuator is used for controlling the intake damper  
c = 1 Wheel (EQAZ-12 max bbb=150, ccc=080)  
c=2 Lever



# Accessories

## Filter

EQPZ-12 Analogue differential pressure gauge for measuring filter pressure drop

### b=1 U-tube manometer

Visual reading. Measurement range 0-800 Pa.  
Ambient temperature -25 °C to +100 °C.  
Supplied separately.

### b=2 Differential pressure gauge (Kyttelä type)

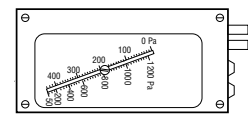
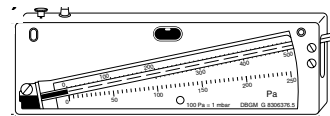
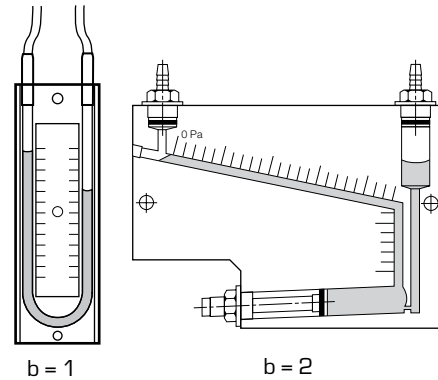
Visual reading. Measurement range: 0-300 Pa on an inclined scale and 300-500 Pa on a vertical scale.  
Ambient temperature -40 °C to +50 °C.  
Supplied separately.

### b=3 Sloping tube manometer

Visual reading. Measurement range 0-250 Pa or 0-500 Pa, can be reset to a suitable range.  
Ambient temperature -20 °C to +50 °C.  
Supplied separately.

### b=4 Pressure switch manometer

Visual reading and with breaking contacts.  
Measurement range 0-500 Pa or 50-1200 Pa.  
Ambient temperature -15 to +50 °C. Supplied separately.



b = 3

b = 4

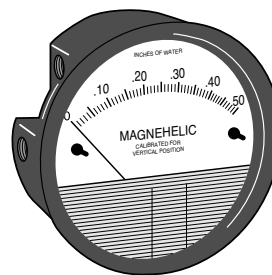
EQPZ-25 Differential pressure gauge type Dwyer Magnehelic

### Pressure range first sensor (b)

- 1 = 0-125 Pa
- 2 = 0-250 Pa
- 3 = 0-500 Pa
- 4 = 0-750 Pa
- 5 = 0-1000 Pa

### Pressure range second sensor (c)

- 0 = only one sensor
- 1 = 0-125 Pa
- 2 = 0-250 Pa
- 3 = 0-500 Pa
- 4 = 0-750 Pa
- 5 = 0-1000 Pa



Consists of one or two sensors recessed into the inspection door

## Other accessories for the filter:

- EQPZ-02 Filter mat for EQPA, set
- EQPZ-05 Prefilter for EQPB, set
- EQPZ-01 Replacement filter for EQPA, set

- EQPZ-03 Replacement filter for EQPB, set
- EQPZ-06 Replacement filter for EQPK, set (eQ PLUS)
- EQPZ-24 Filter cassettes for EQPF, set (eQ PLUS)

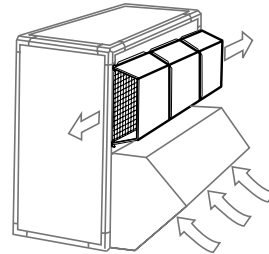
## Accessories

### Fan

EQLZ -02 Outlet cowl, fan

#### Variant (c)

- 1 = Outlet cowl (with side outlet)
- 2 = Outlet cowl (radial fan EQLR)
- 3 = Outlet cowl (plenum fan EQLK)



EQLZ-24 Screen protection



EQLZ-25 Telpher beam, EQLZ-29 Telpher

EQLZ-25 Telpher beam  
Used in motor replacement, Centrifugal fan EQLR.  
Only for casing with frame.

EQLZ-29 Telpher  
Set for EQLZ-25 for unit sizes 068, 079-090

## Accessories

### Fan

EQLZ-42 Manometer



#### Other accessories for the fan:

EQLZ-13 Air distributor

EQLZ-15 Inspection cover

EQLZ-16 Drain connection

EQLZ-28 Motor enclosures (eQ PLUS)

EQLZ-36 Outlet guard

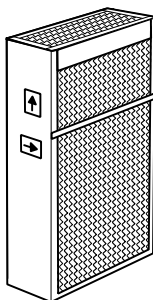
EQLZ-37 Inlet guard

EQLZ-48 Cable gland

### Humidifier



EQQZ-01 Humidifier replacement



### Control equipment

EQAZ-51 Cable trunk, horizontal

EQAZ-52 Cable trunk, vertical

External cable trunk in natural anodized aluminium.

## Accessories

### Liquid-coupled heat exchanger

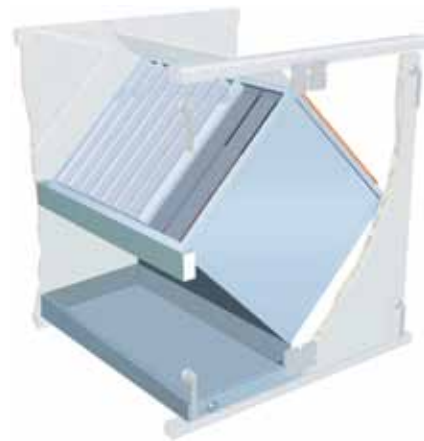
EQRZ-05 Heat exchanger package for ECONET®

In most cases some form of supplementary heating or cooling is necessary. Instead of ordering cooling/heat exchanger separately, Fläkt Woods offer a complete heating exchanger package.

### Plate heat exchanger

EQRZ-01 Washing tray, with drainage

Extra tray for plate heat exchanger, supply air side. Should be ordered if the unit will be installed in environments with high atmospheric humidity.



### Plate heat exchanger and heating/cooling coil

EQAZ-08 Water trap

b = 1 Negative pressure -800 Pa  
b = 2 Positive pressure +3000 Pa.



b = 1 Negative pressure  
-800 Pa



b = 2 Positive pressure  
+3000 Pa

# Accessories

## Heating/cooling coil

EQAZ-18 Manual air purging valve with spigot

Supplied separately.



EQAZ-19 Automatic air purging valve with spigot

For max. 115 °C and min. 0 °C, 1.1 MPa (11 atm).  
 The valve seat is not damaged by a high water temperature or by water which contains a frost protection fluid.  
 The valve can be combined with a freezing monitor.  
 Cannot be positioned outdoors.

Supplied separately.



EQAZ-21 Expansions valve

Thermostatic expansion valve for DX-coils.

EQAZ-35 Thermometer  
 (dial indicator with sensor bulb)

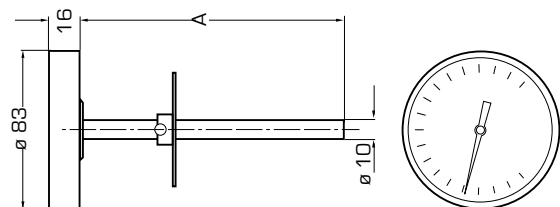
For positioning in a panel or duct. Supplied separately.

Available in three variants:

bbbb = 5021 = -20 °C to +60 °C      A = 400

bbbb = 5022 = -20 °C to +60 °C /  
 -4 °F to +140 °F      A = 200

bbbb = 5023 = 0 °C to +100 °C      A = 200



# Accessories

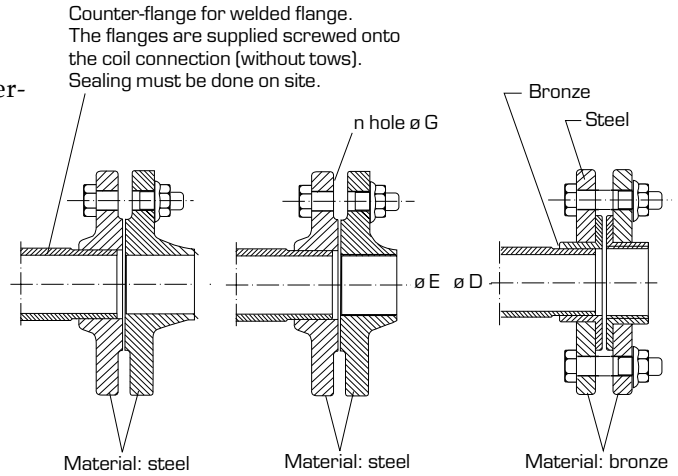
## EQAZ-40 Flange, for air heater and air cooler

For 1-off pipe connection. With or without counter-flange.

Connection dimension	D	E	G	n
15	95	65	14	4
25	115	85	14	4
40	140	100	18	4
50	165	125	18	4
80	200	160	18	8

**Material:**

Steel or bronze. Pressure class PN 16.



### EQTZ-05 Dagger plate

Dagger plate for empty section EQTB in combination with EQH(N,P). Available in stainless steel or galvanized sheet steel.

**Other accessories for heating/cooling coil:**

EQAZ-14 Fin comb

## Cooling unit, COOLER

### EQKZ-01 Hot gas by pass

Hot gas by pass is used for softer temperature regulations. More energy is consumed in favour of softer regulations.

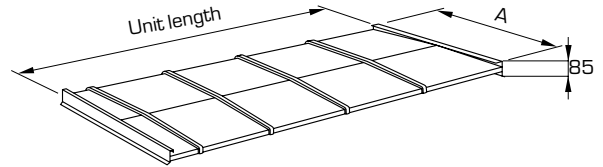


# Accessories

## Outdoor design

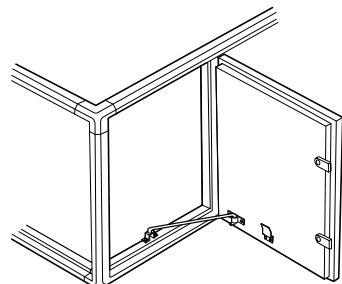
### EQBZ-01 Roof

Roof made of galvanized or polyester-coated sheet steel for an assembled unit.  
The roof is selected having regard for the size and length of the actual unit.



Unit size	Width A	Unit size	Width A
005,009	960	032	1960
008,014,020	1260	041,054,068	2160
011	1360	050,063,079	2460
018,027,036	1560	072,090	2760
023,045,056	1860		

### EQBZ-03 Door stop for a door



### EQBZ-09 Hood, louvered shutter, flaps for outdoor unit

- e = 1 Inlet hood
- e = 2 Louvered shutter (fins in PP)
- e = 3 Flaps

#### Other out door accessories:

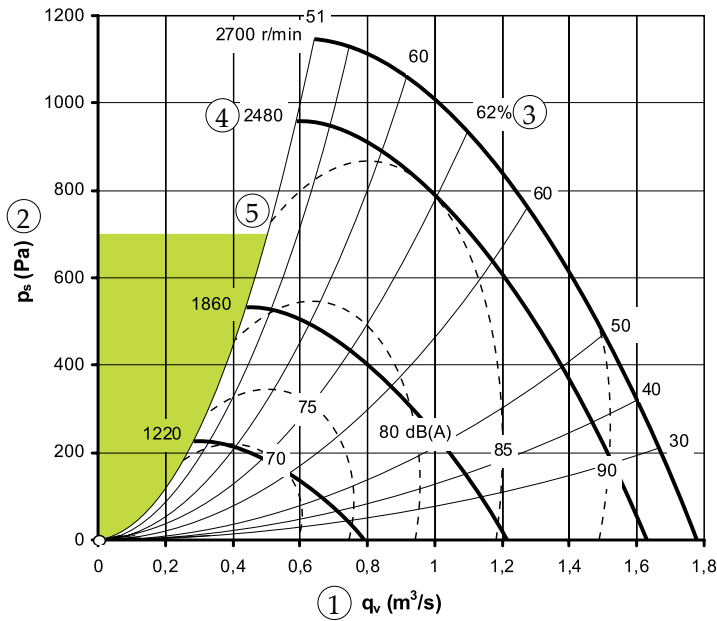
##### EQBZ-04 Roof connection

For sealing against the upper deck if it is shorter than the lower deck. Supplied ready assembled.

# Fan charts

Plenum fan EQLK, EQLT, Description

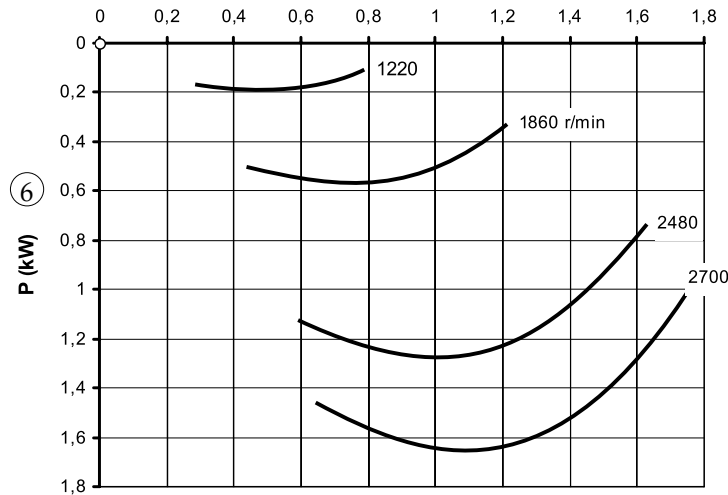
EQLK-011-2/014-2, EQLT-011-2 7



The fan charts give a general view. For more precise information, see product selection tool ACON.

The fan charts on the pages that follow are applicable to a bare fan and to air with a density of 1,2 kg/m³. When the fan is incorporated in a unit section an system loss will arise. This system loss depends on the components placement before the fan. For more precise information about system loss, see product selection tool ACON.

- 1 = Air flow, m³/s (horizontal axis)
- 2 = Static pressure increase,  $\Delta p_s$  Pa (vertical axis)
- 3 = Total efficiency,  $\eta$  %
- 4 = Max. speed of each motor, kW-no. of motor poles
- 5 = Total sound power level, LwA (dB), broken line
- 6 = Power required
- 7 = Unit and fan size
- = When the fan is controlled to operate at a lower speed, the duty point is allowed to come to rest within the coloured field.

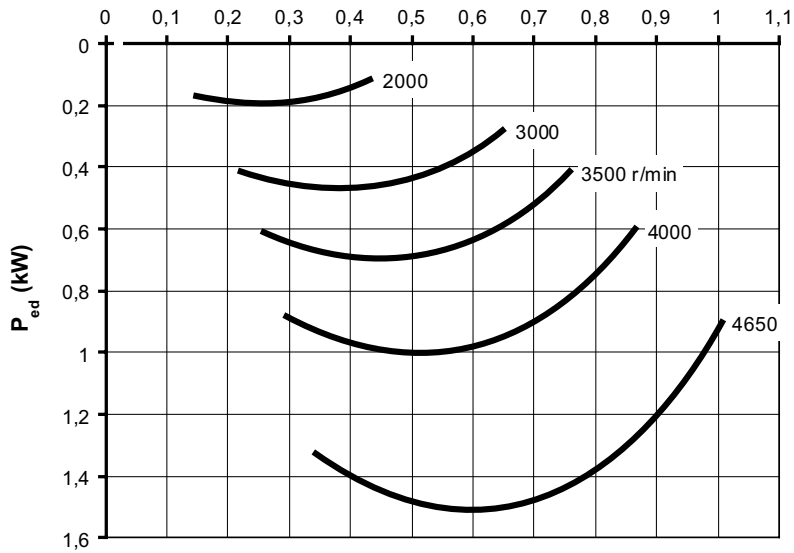
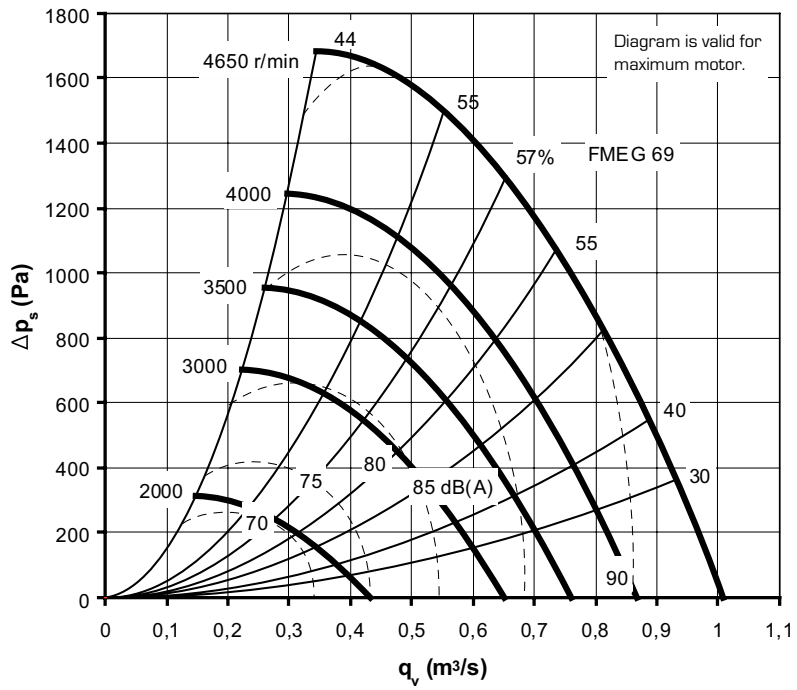


For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with PM-motor

EQLK-005-2

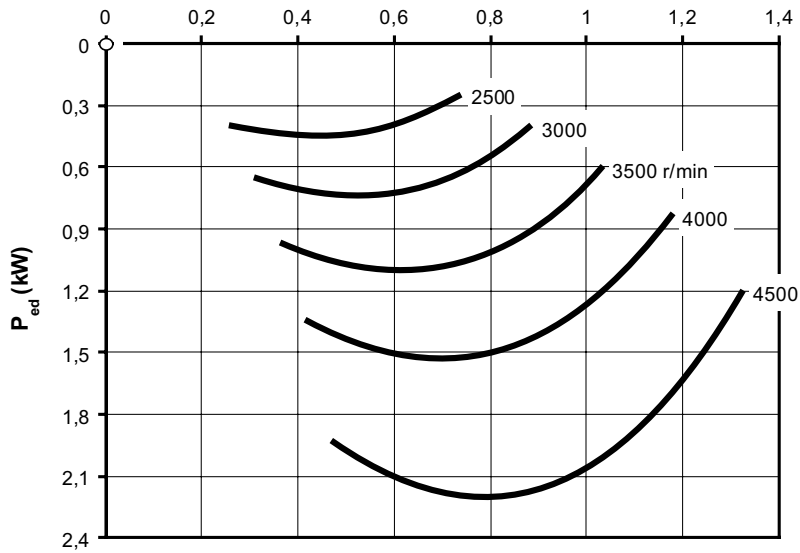
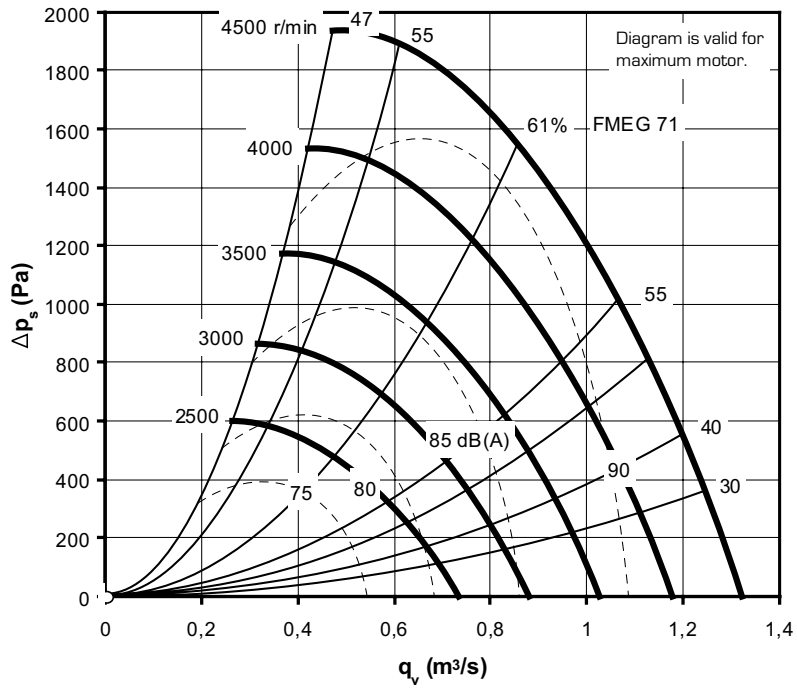


For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with PM-motor

EQLK-008-2/009-2

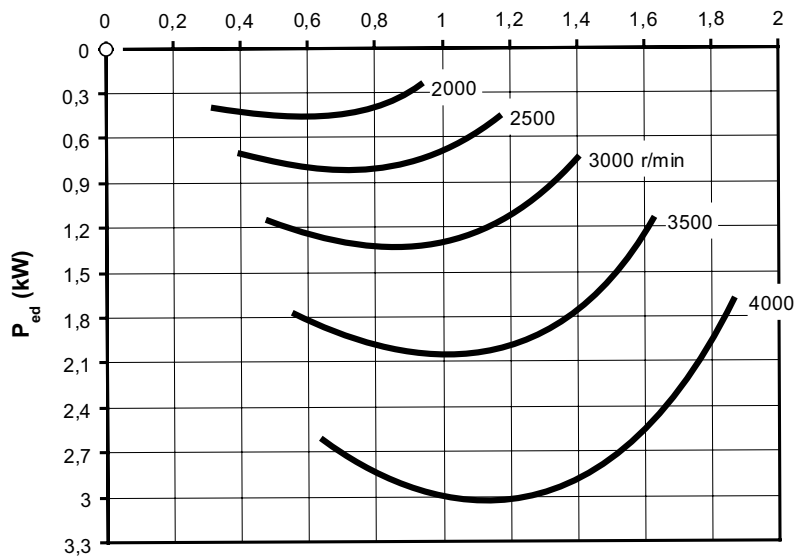
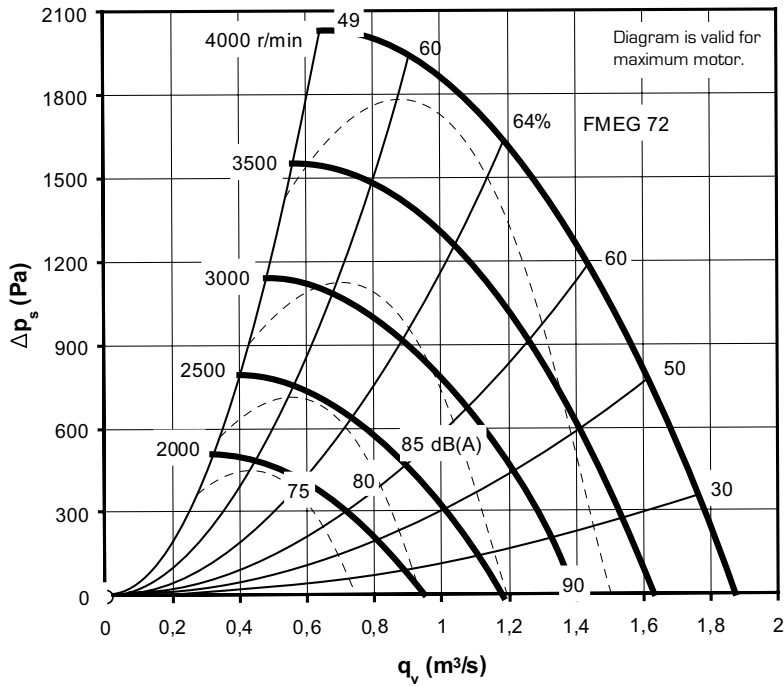


For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with PM-motor

EQLK-008-3/009-3

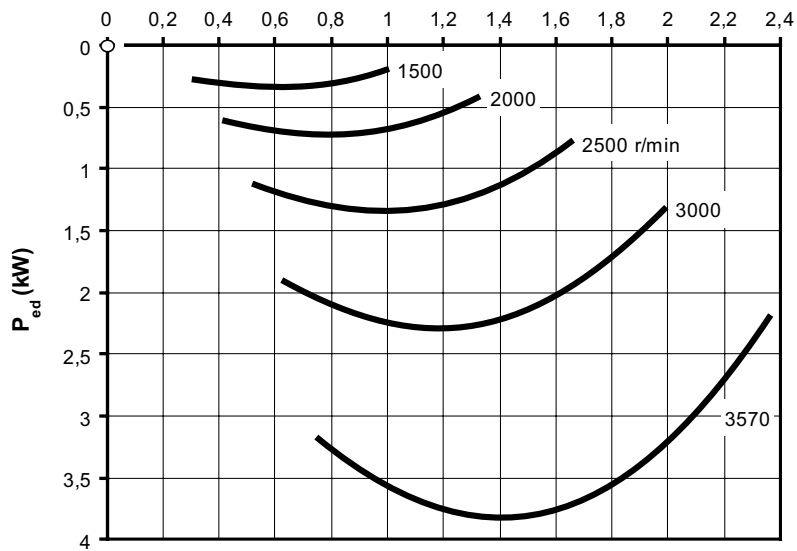
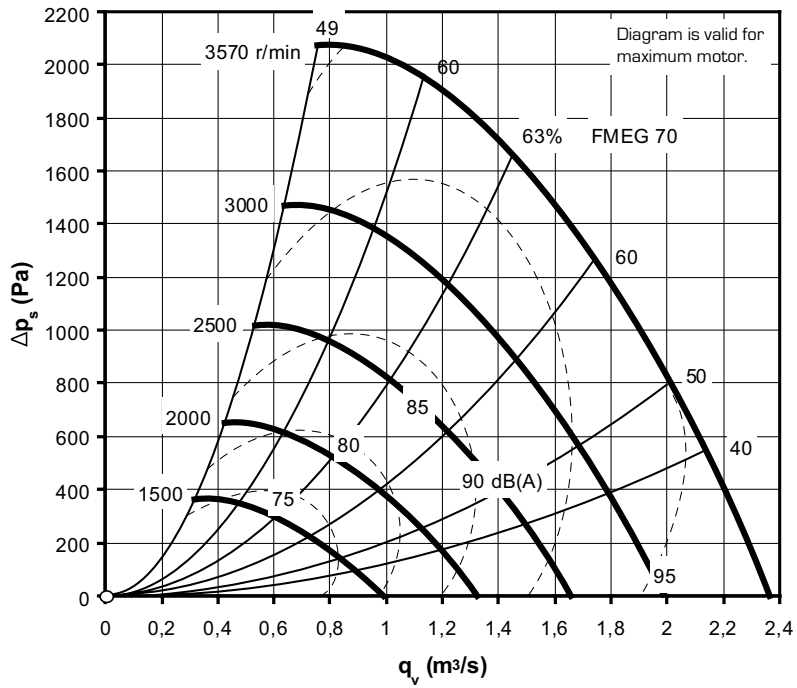


For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with PM-motor

EQLK-011-2/014-2

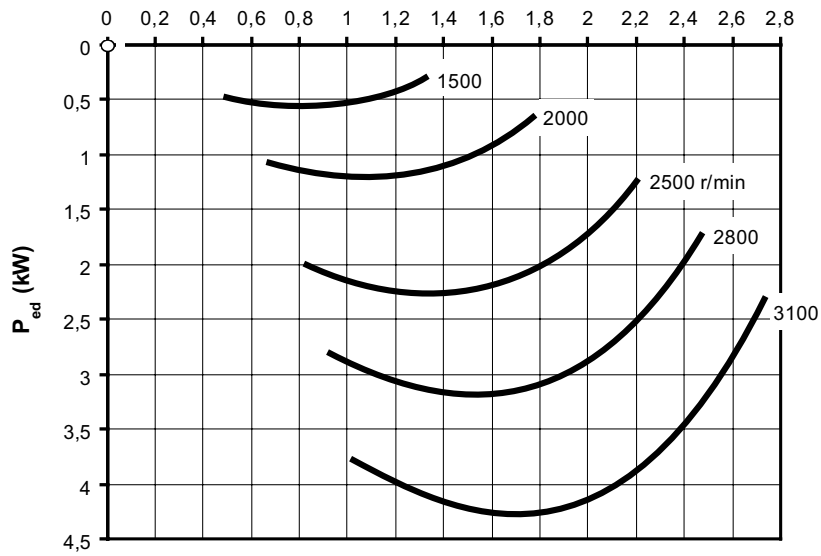
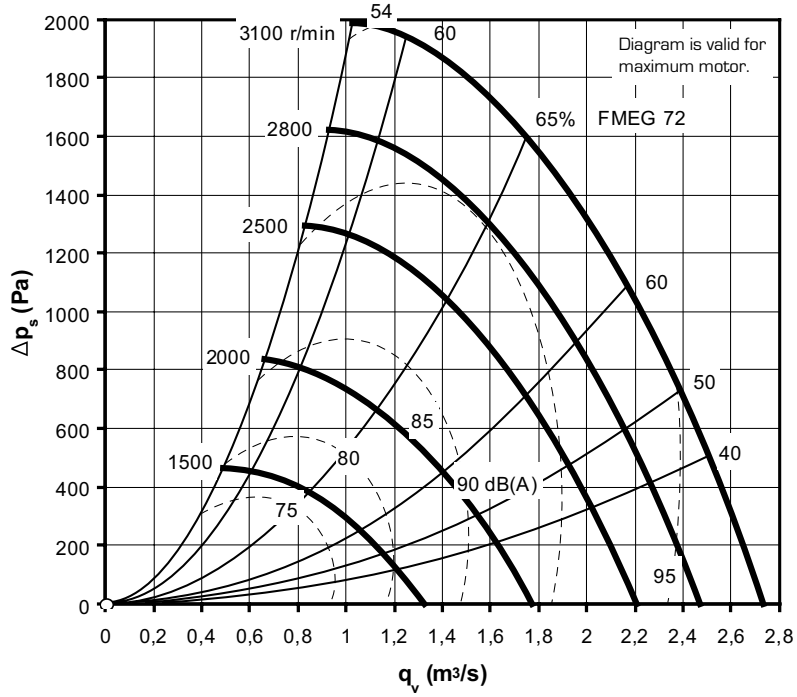


For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with PM-motor

EQLK-01 1-3/014-3/020-2

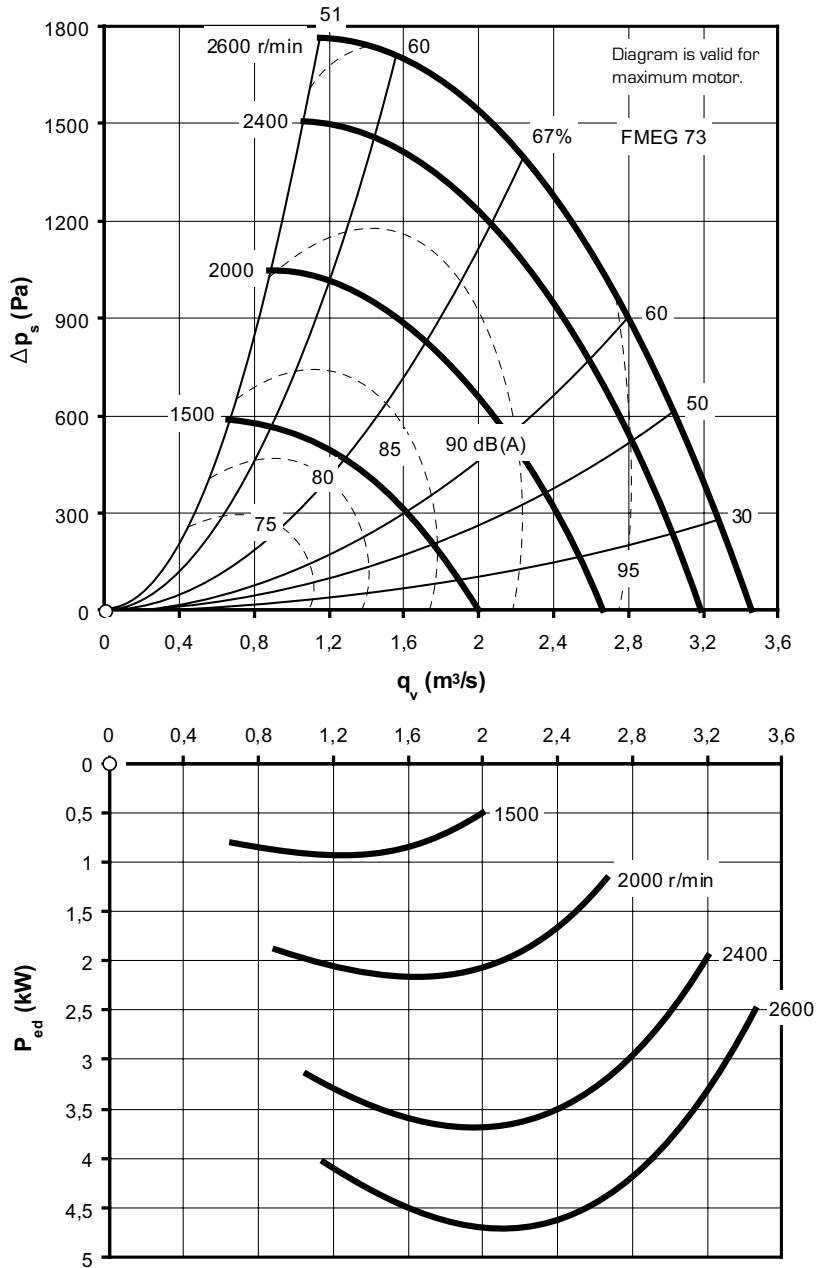


For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with PM-motor

EQLK-018-3/020-3



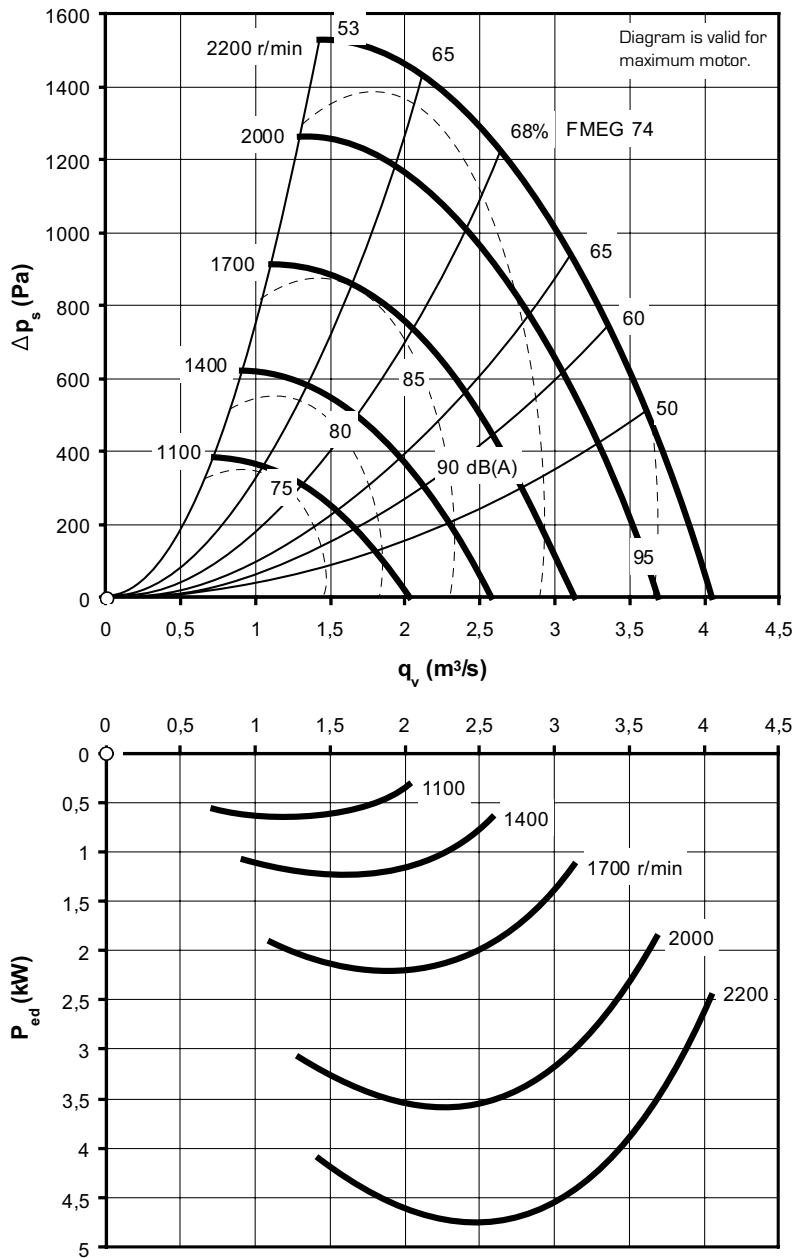
For information about system loss, see product selection tool ACON.



# Fan charts

Plenum fan EQLK with PM-motor

EQLK-023-2/027-2

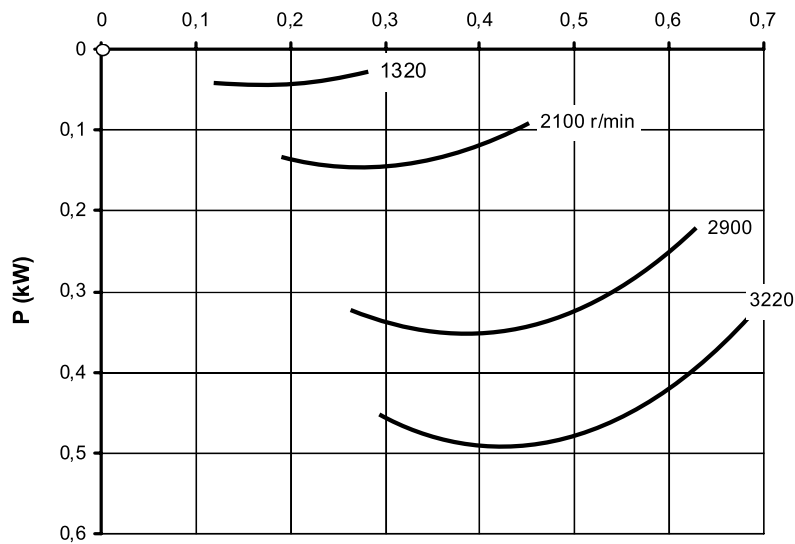
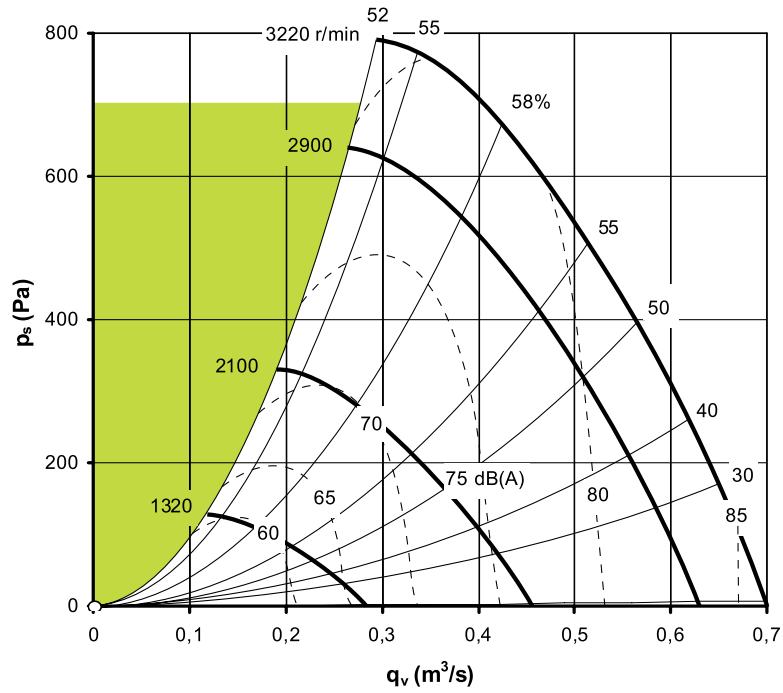


For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with EC-motor

EQLK-005-2



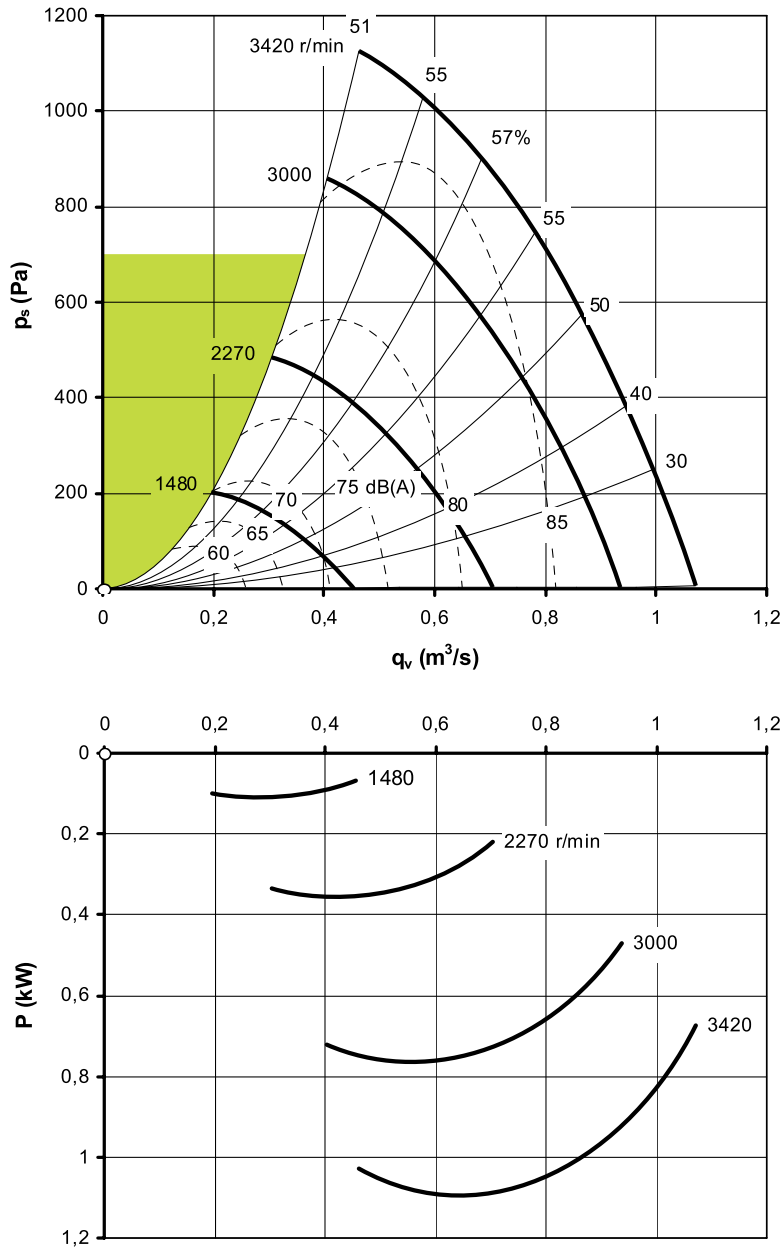
For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with EC-motor

Plenum fan EQLT with EC-motor for eQ Top

EQLK-008-2/009-2, EQLT-008-2



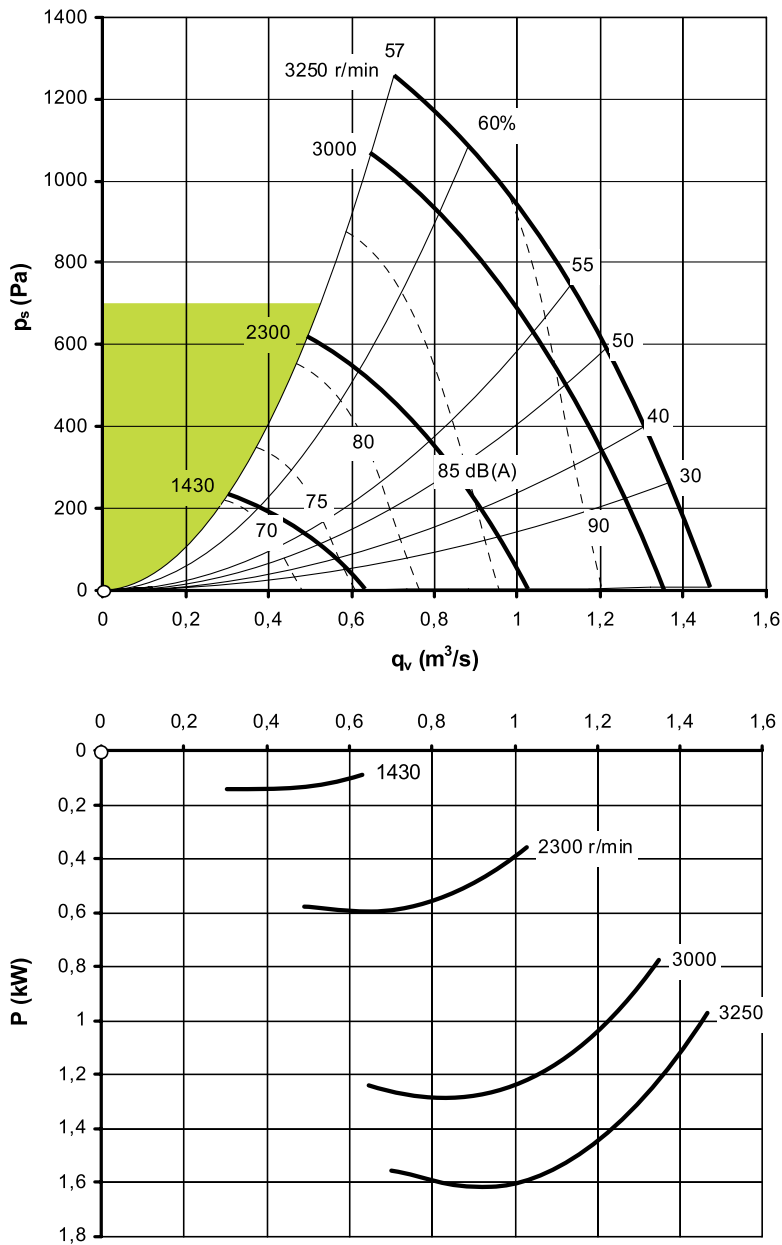
For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with EC-motor

Plenum fan EQLT with EC-motor for eQ Top

EQLK-008-3/009-3, EQLT-008-3

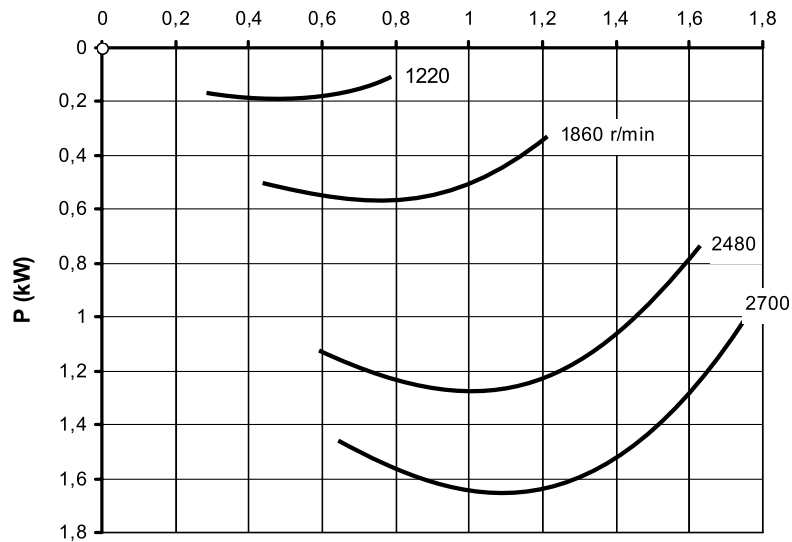
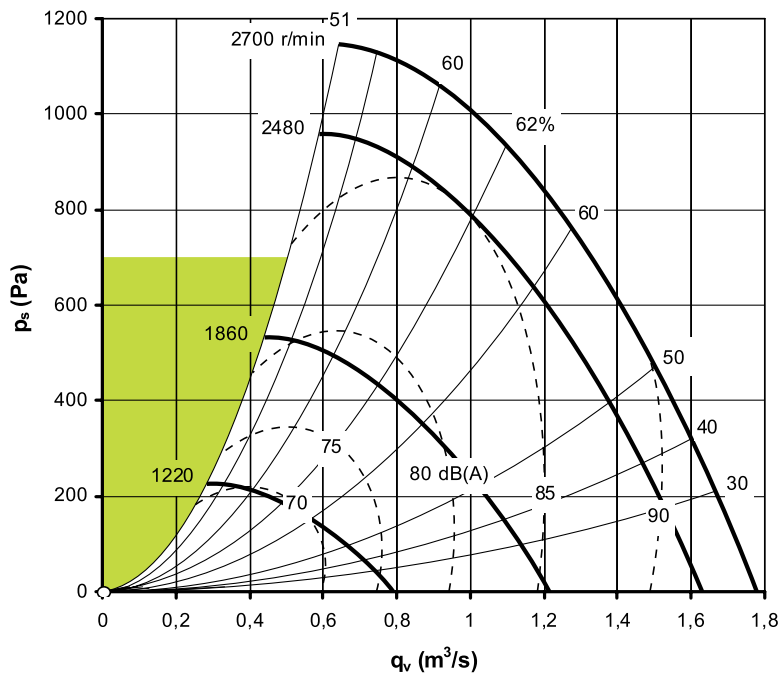


For information about system loss, see product selection tool ACDN.

# Fan charts

Plenum fan EQLK with EC-motor

EQLK-011-2/O14-2, 1.7 kW



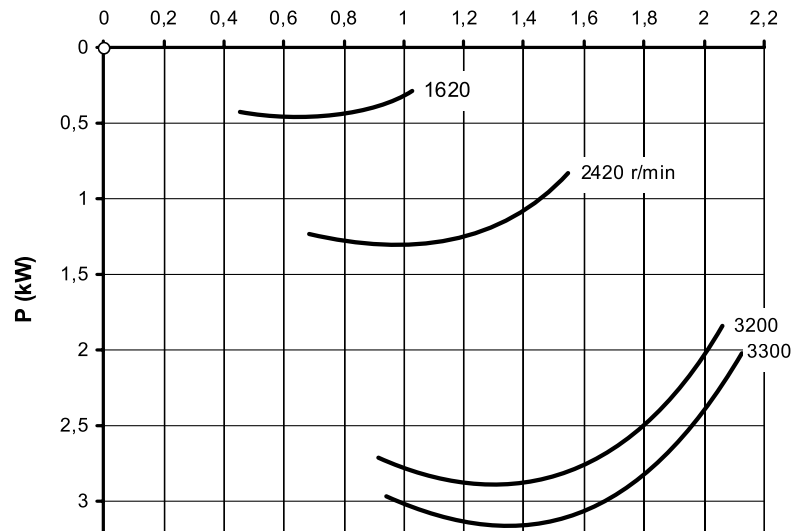
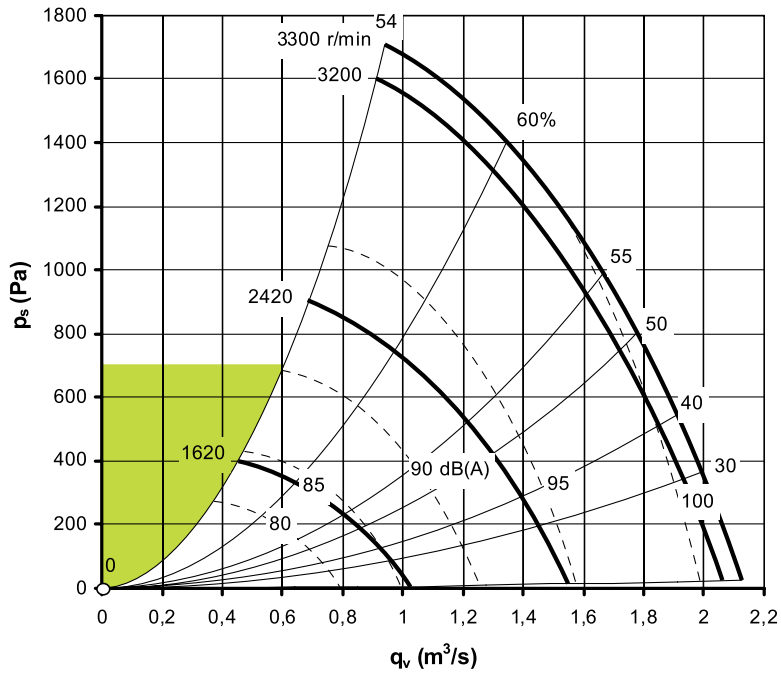
For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with EC-motor

Plenum fan EQLT with EC-motor for eQ Top

EQLK-011-2/014-2, EQLT-011-2, 3 kW



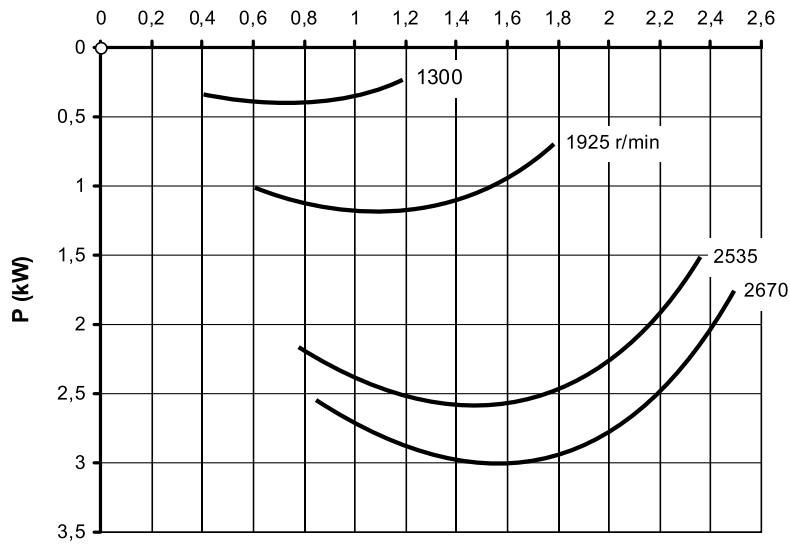
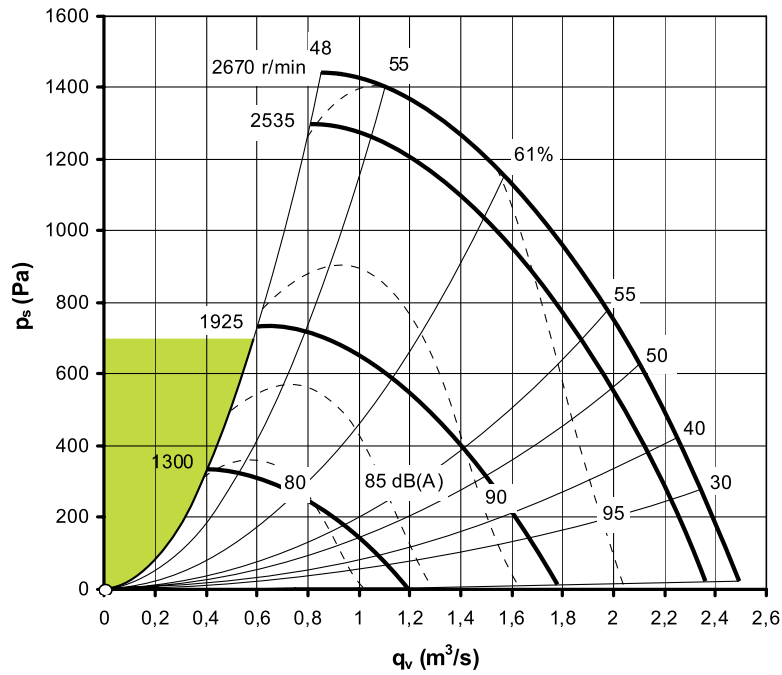
For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK with EC-motor

Plenum fan EQLT with EC-motor for eQ Top

EQLK-011-3/014-3/018-2/020-2, EQLT-011-3



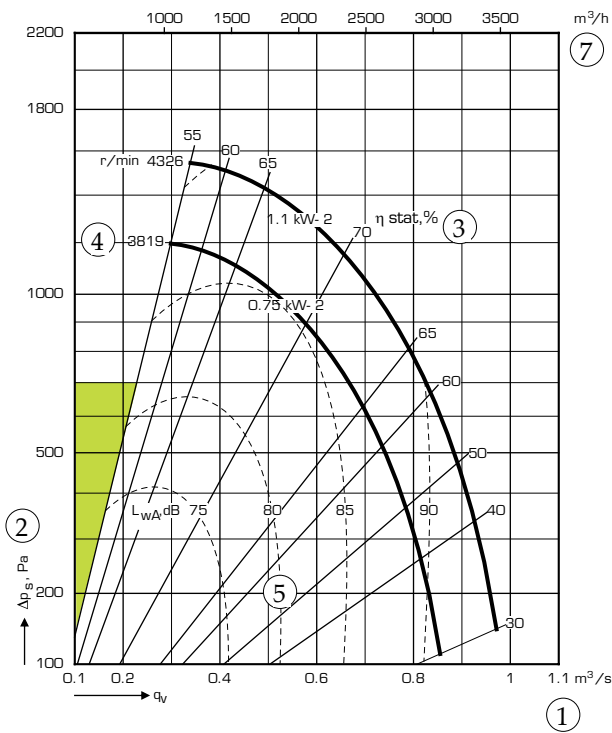
For information about system loss, see product selection tool ACON.

# Fan charts

Plenum fan EQLK, EQLT

Description

EQLK-005-2 (6)



The fan charts give a general view. For more precise information, see product selection tool ACON.

The fan charts on the pages that follow are applicable to a bare fan and to air with a density of  $1,2 \text{ kg/m}^3$ . When the fan is incorporated in a unit section an system loss will arise. This system loss depends on the components placement before the fan. For more precise information about system loss, see product selection tool ACON.

- ① = Air flow,  $m^3/s$  (horizontal axis)
- ② = Static pressure increase,  $\Delta p_s$  Pa (vertical axis)
- ③ = Fan efficiency,  $\eta \%$
- ④ = Max. speed of each motor, kW-no. of motor poles
- ⑤ = Total sound power level,  $L_{wA}$  (dB), broken line
- ⑥ = Unit and fan size
- = When the fan is controlled to operate at a lower speed, the duty point is allowed to come to rest within the coloured field.

The plenum fan must always be equipped with a frequency inverter for speed control and slow starts.

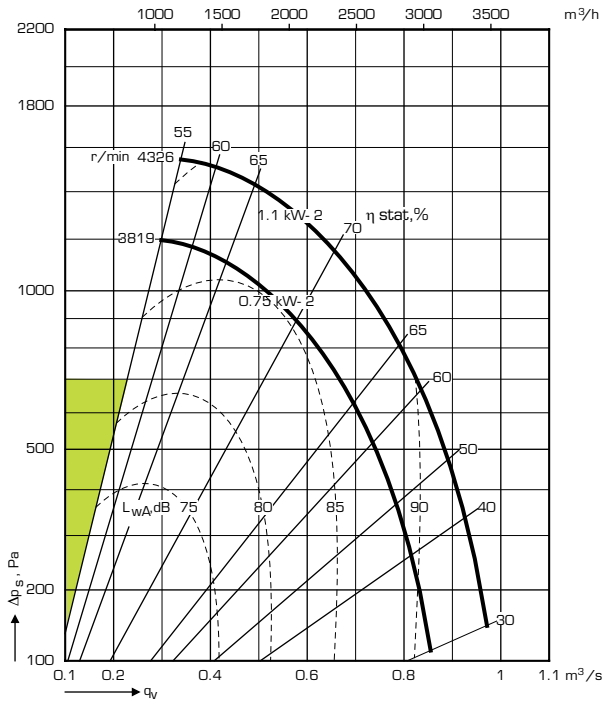


# Fan charts

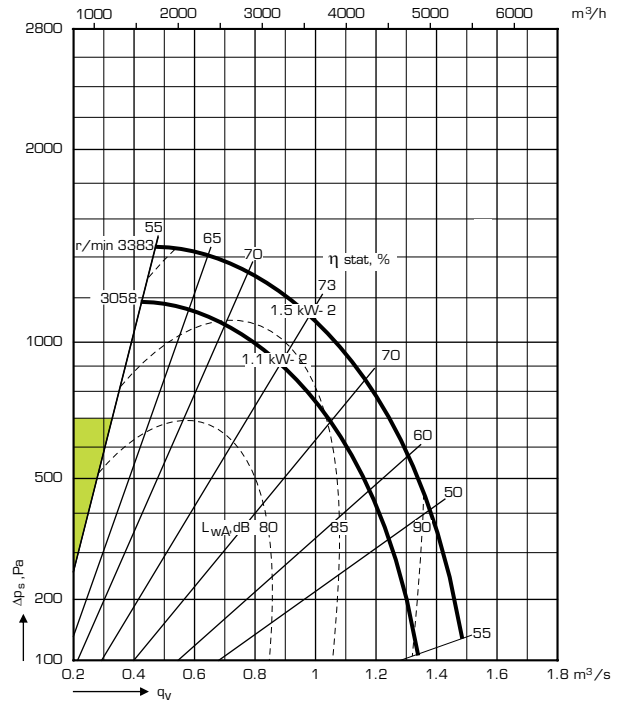
Plenum fan EQLK

Plenum fan EQLT for eQ Top

## EQLK-005-2

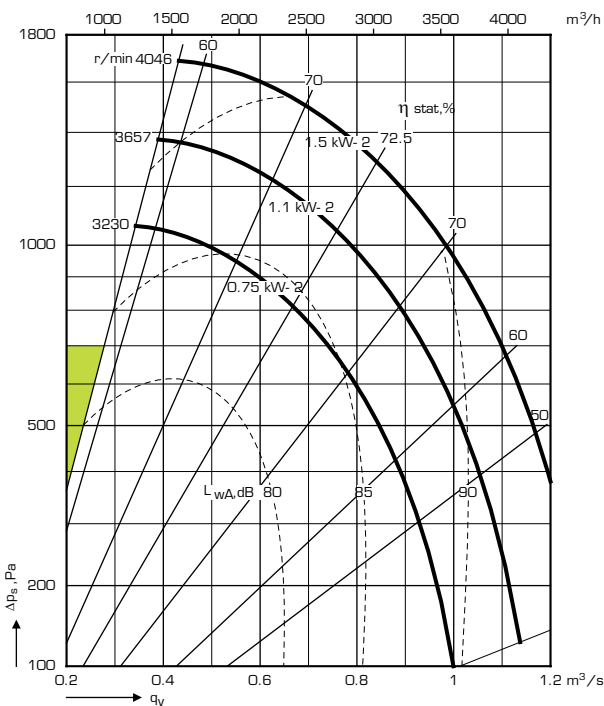


## EQLK-008-3/009-3, EQLT-008-3\*



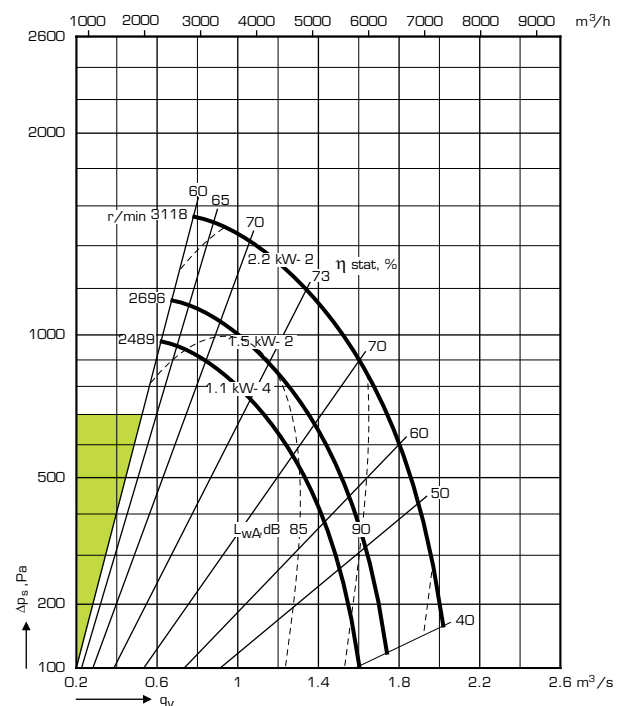
\* Only 1.5 kW

## EQLK-008-2/009-2, EQLT-008-2\*



\* Only 1.5 kW

## EQLK-011-2, EQLT-011-2\*



\* Only 2.2 kW

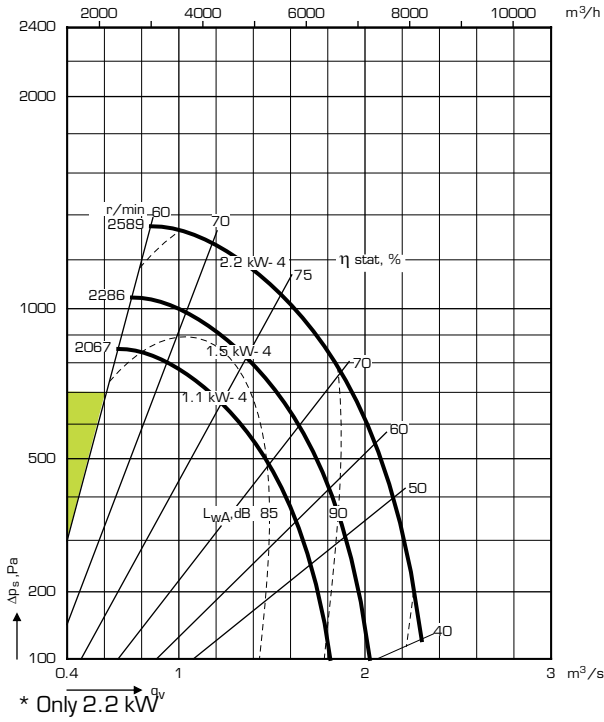
For information about system loss, see product selection tool ACON.

# Fan charts

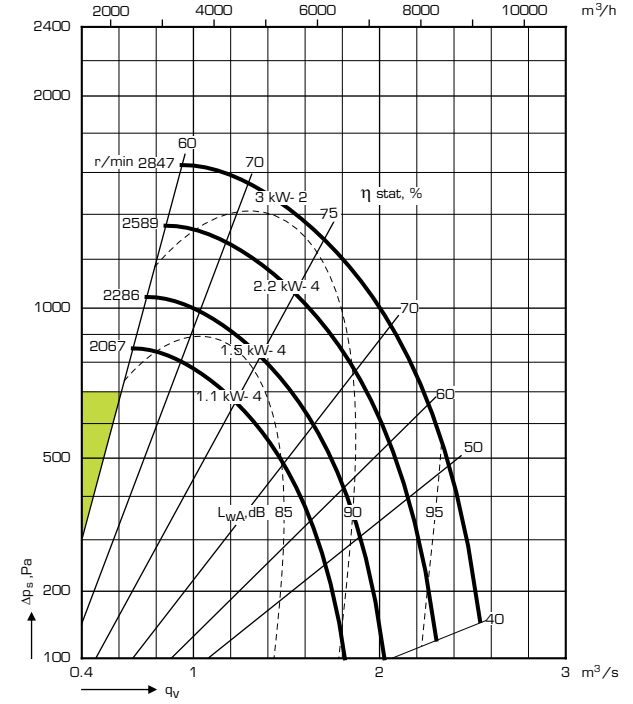
Plenum fan EQLK

Plenum fan EQLT for eQ Top

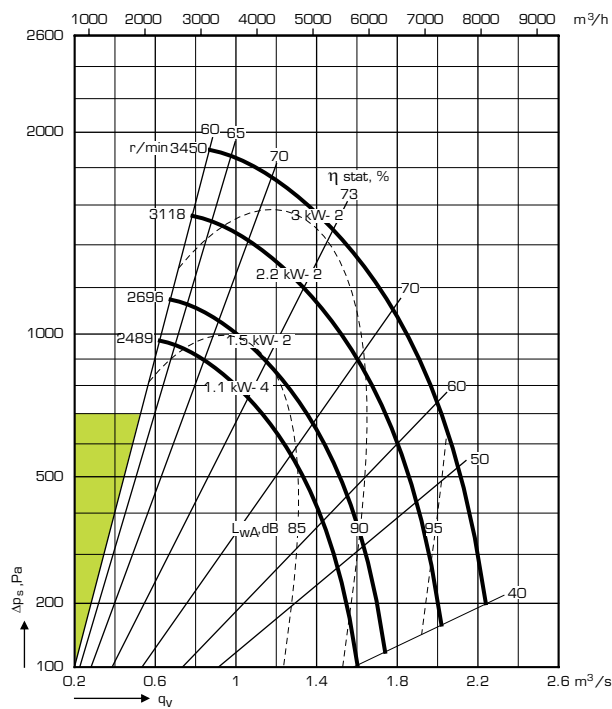
## EQLK-01 1-3, EQLT-01 1-3\*



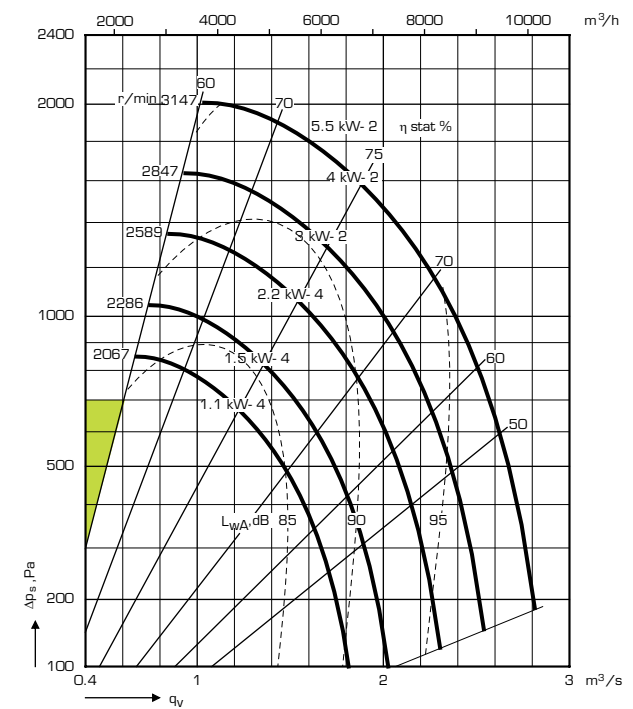
## EQLK-014-3



## EQLK-014-2



## EQLK-018-2

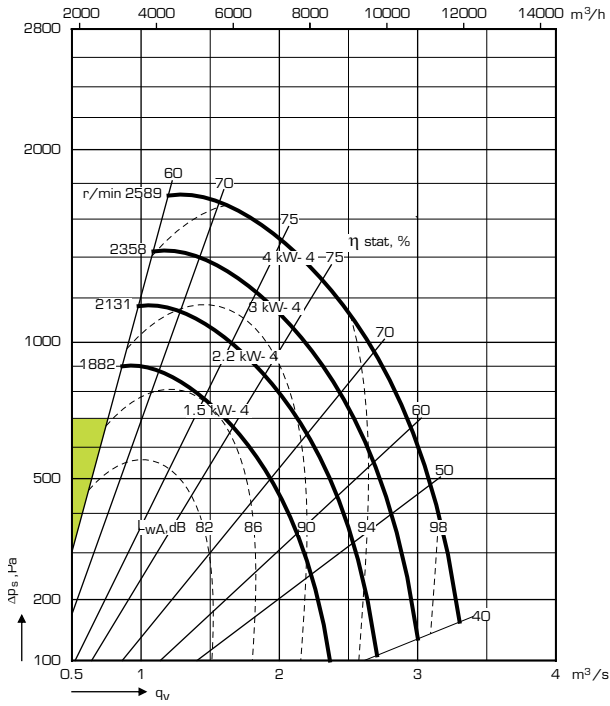


For information about system loss, see product selection tool ACON.

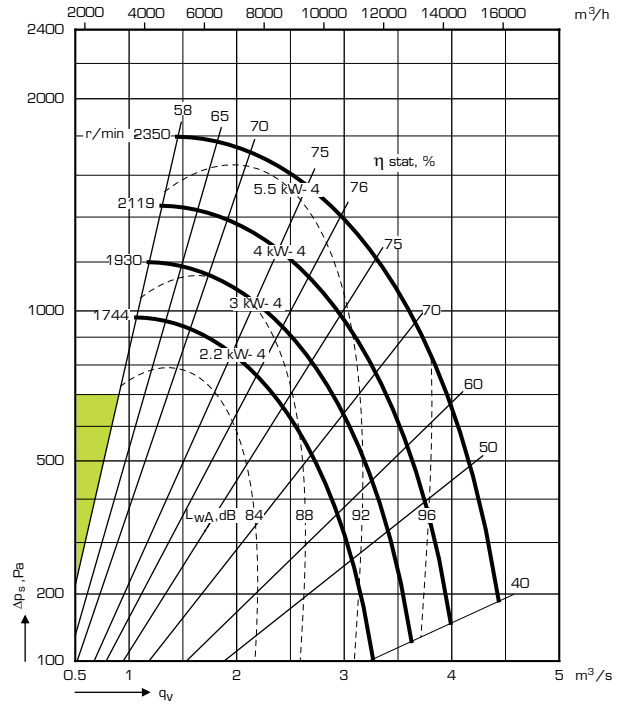
# Fan charts

## Plenum fan EQLK

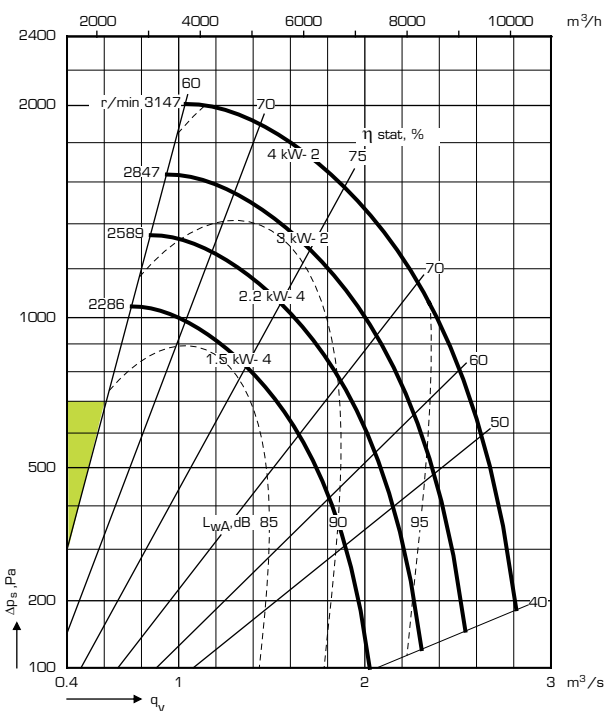
**EQLK-018-3/020-3**



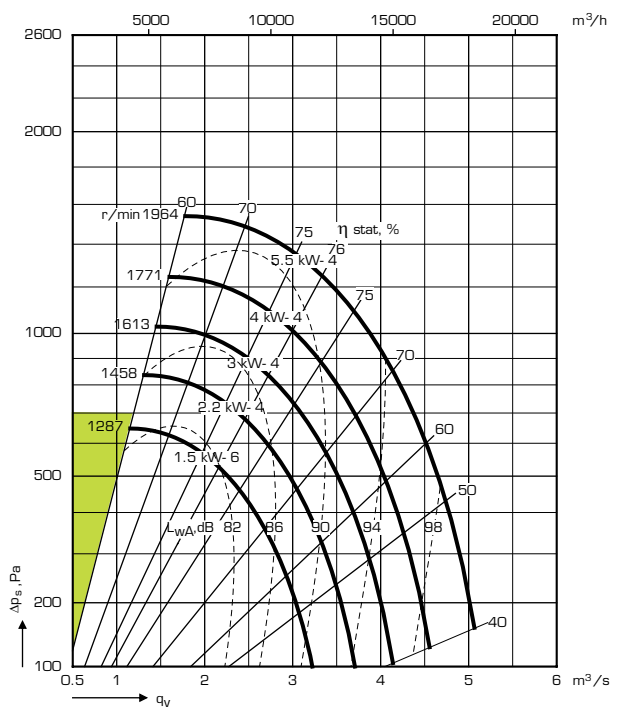
**EQLK-023-2/027-2**



**EQLK-020-2**



**EQLK-023-3/027-3**

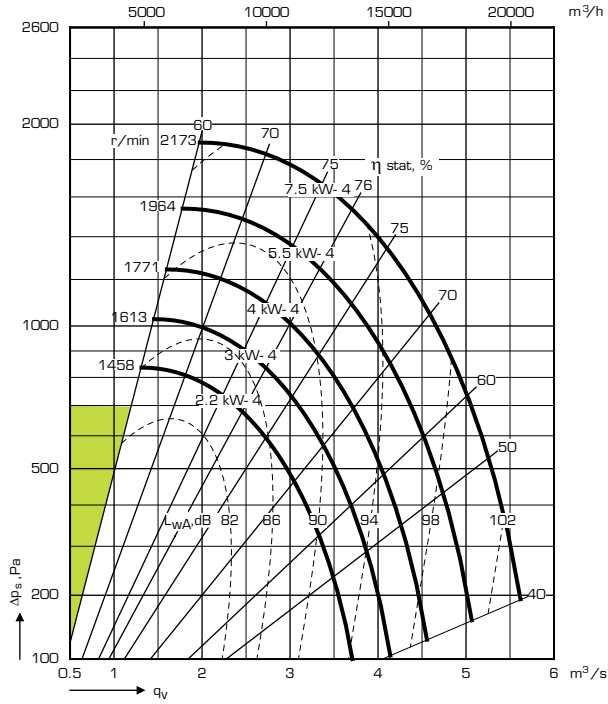


For information about system loss, see product selection tool ACON.

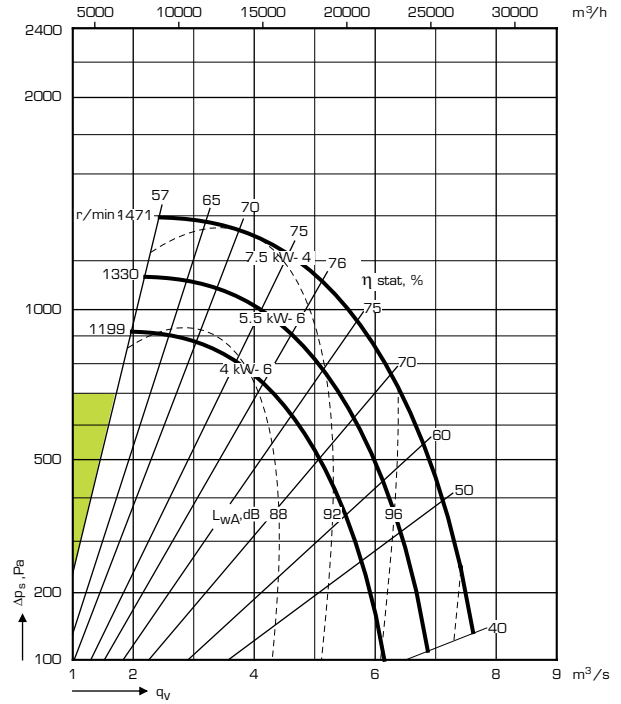
# Fan charts

## Plenum fan EQLK

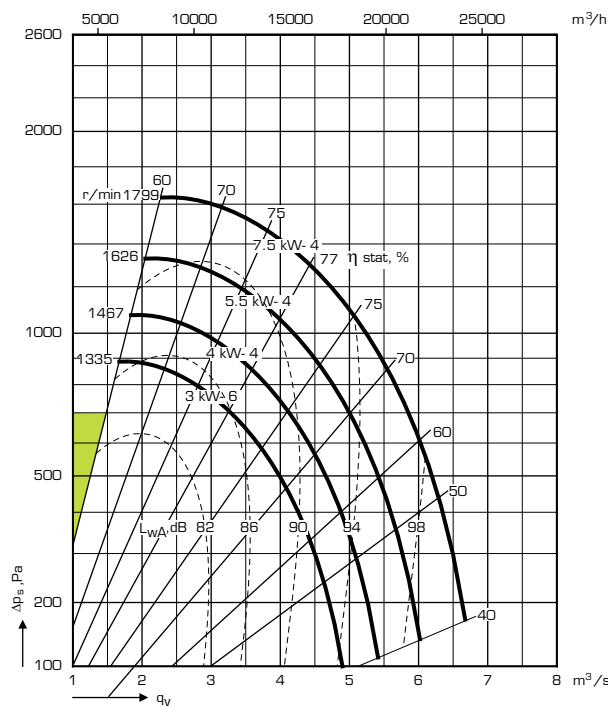
EQLK-032-2/036-2



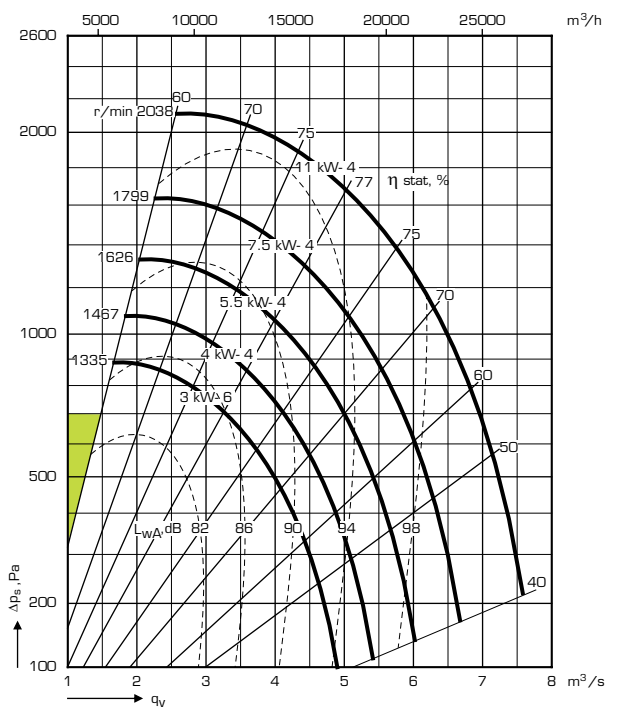
EQLK-041-3



EQLK-032-3/036-3/041-2



EQLK-045-2

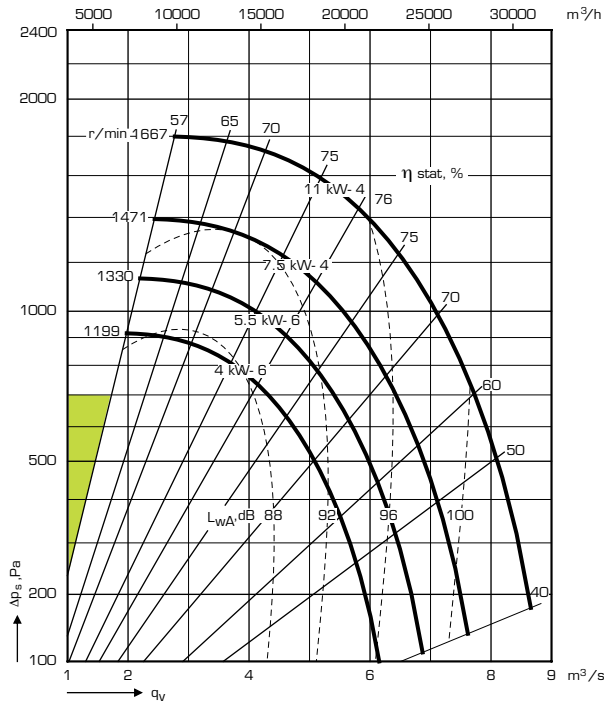


For information about system loss, see product selection tool ACON.

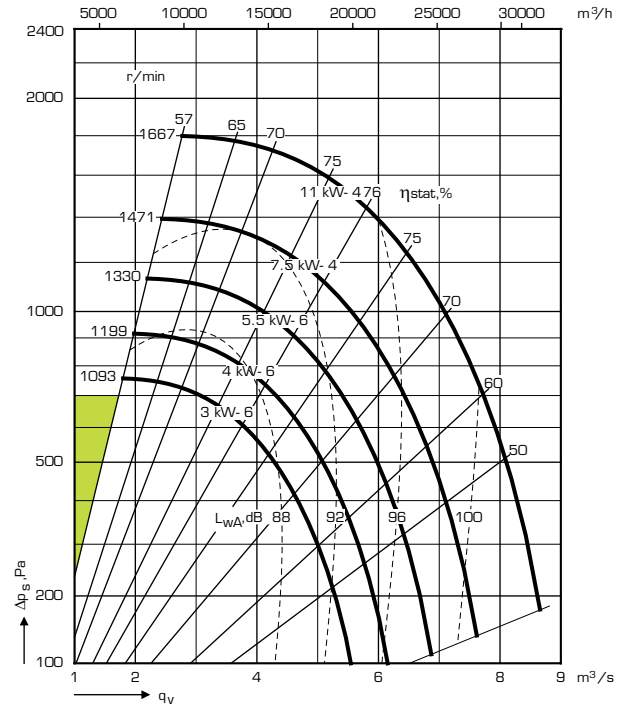
# Fan charts

## Plenum fan EQLK

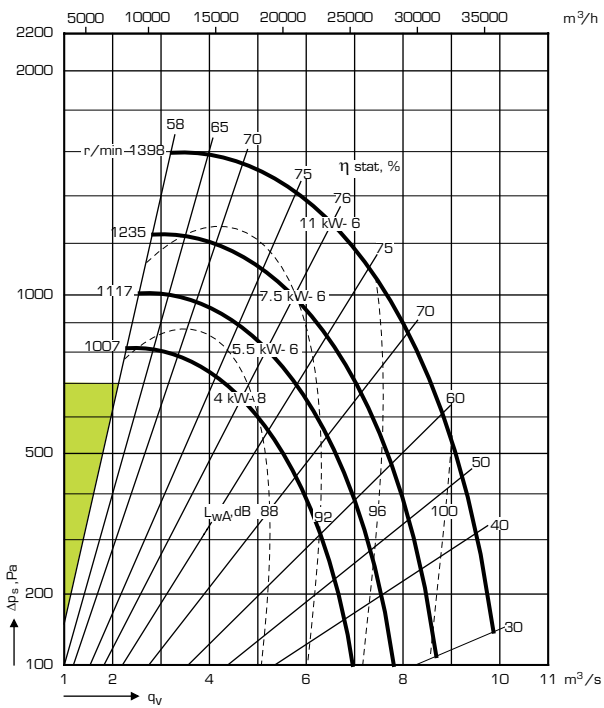
EQLK-045-3/050-2/054-2



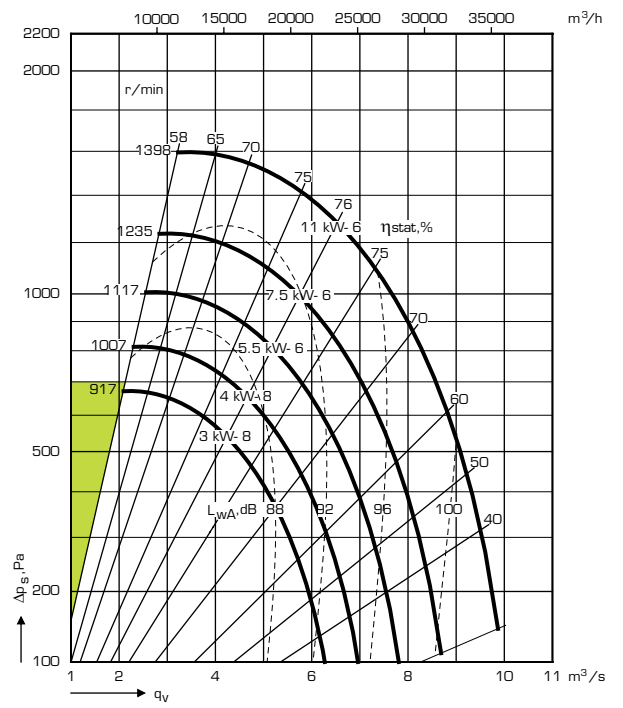
EQLK-056-2



EQLK-050-3/054-3



EQLK-056-3/068-2/072-3/079-2

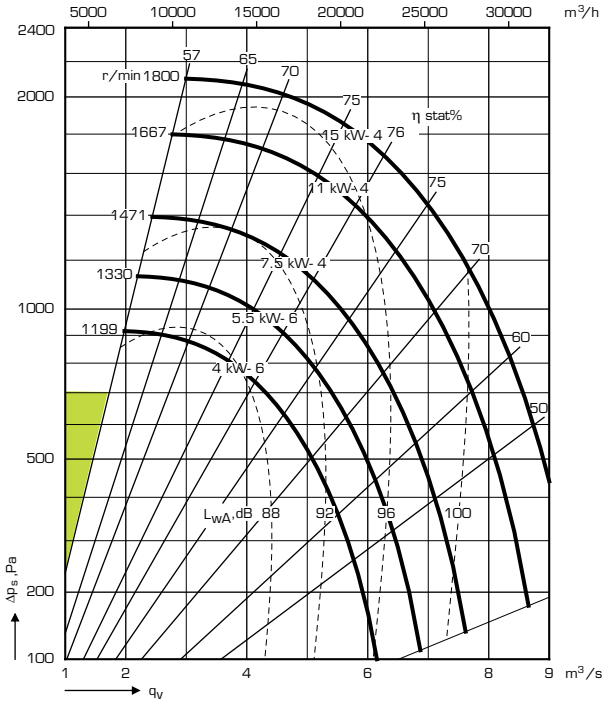


For information about system loss, see product selection tool ACON.

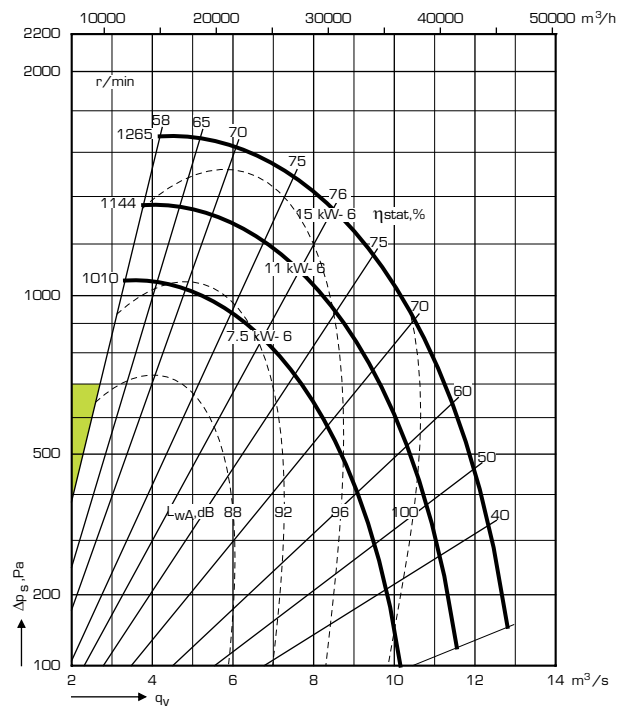
# Fan charts

## Plenum fan EQLK

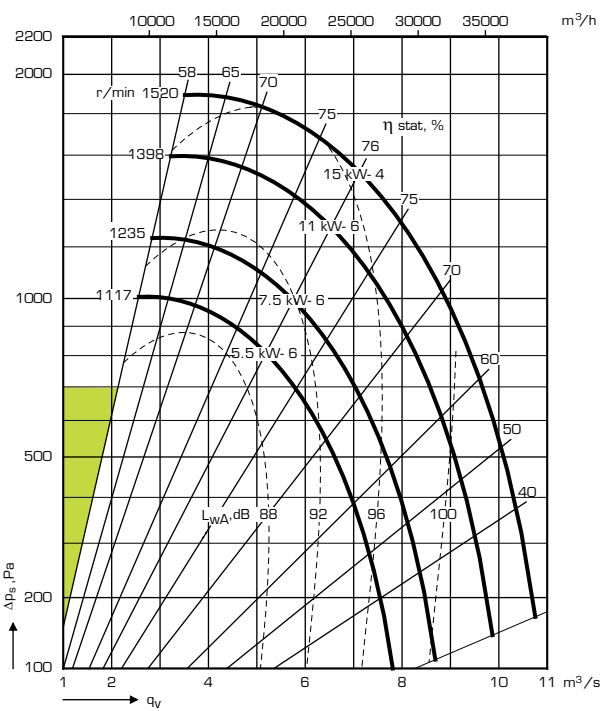
EQLK-063-2/072-2



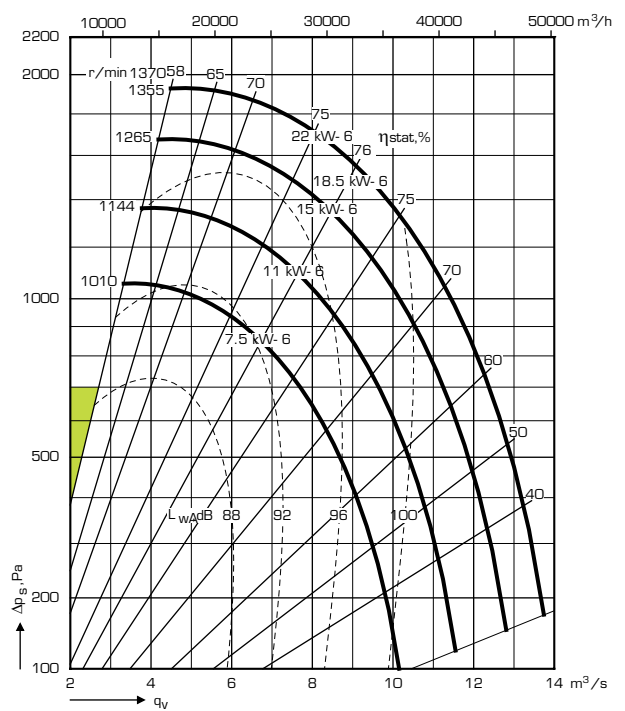
EQLK-068-3



EQLK-063-3, 072-3



EQLK-079-3/090-2

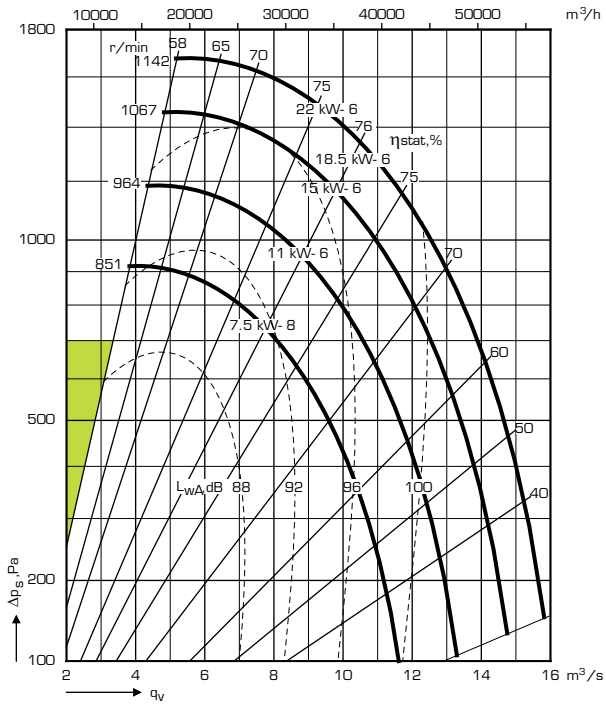


For information about system loss, see product selection tool ACON.

# Fan charts

## Plenum fan EQLK

### EQLK-090-3



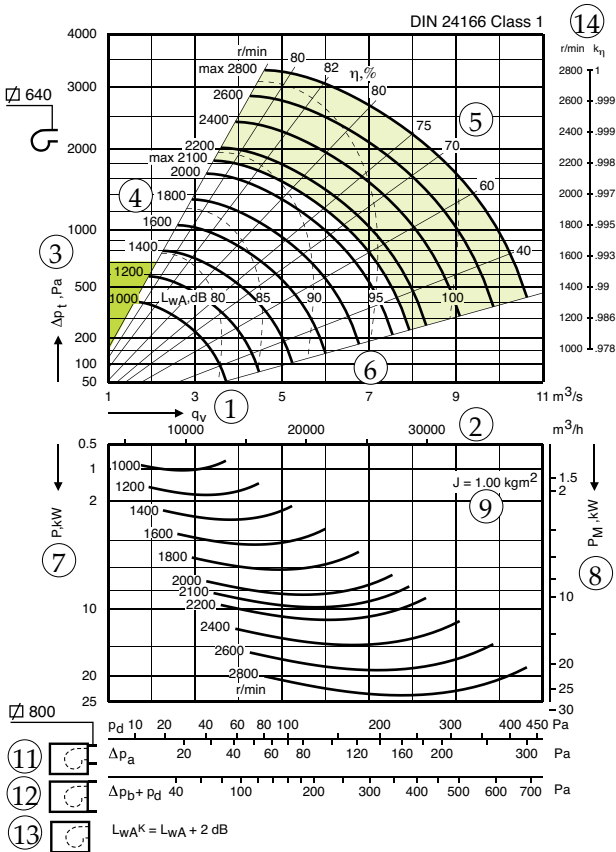
# Fan charts

Radial fan, B-wheel EQLR

Description

EQLR-008-3/009-2

10



## Bearing losses are included in the fan's power demand and affect efficiency

In fan charts, the fan's power demand is defined as the power demand at the fan shaft, which means that its bearing losses are included. The efficiency figures shown on the chart are valid for maximum speed, and are a few percentage points lower than they would be if the bearing losses were ignored. As the speed drops, the fan power falls in proportion to the third power of the speed, while the bearing losses fall only linearly proportionally to the speed. This means that, at lower speeds, the bearing losses become a higher proportion of the total losses while the efficiency becomes correspondingly lower.

Fan charts for fans with backward-curved impellers include a scale for  $k\eta$  which shows the drop in efficiency at lower speeds. The scale provides high accuracy of determination of  $k\eta$  over the normal working range, where the fan's power demand at a given speed is largely independent of the air flow.

The eQ fan charts on the pages that follow are applicable to air with a density of  $1.2 \text{ kg/m}^3$ .

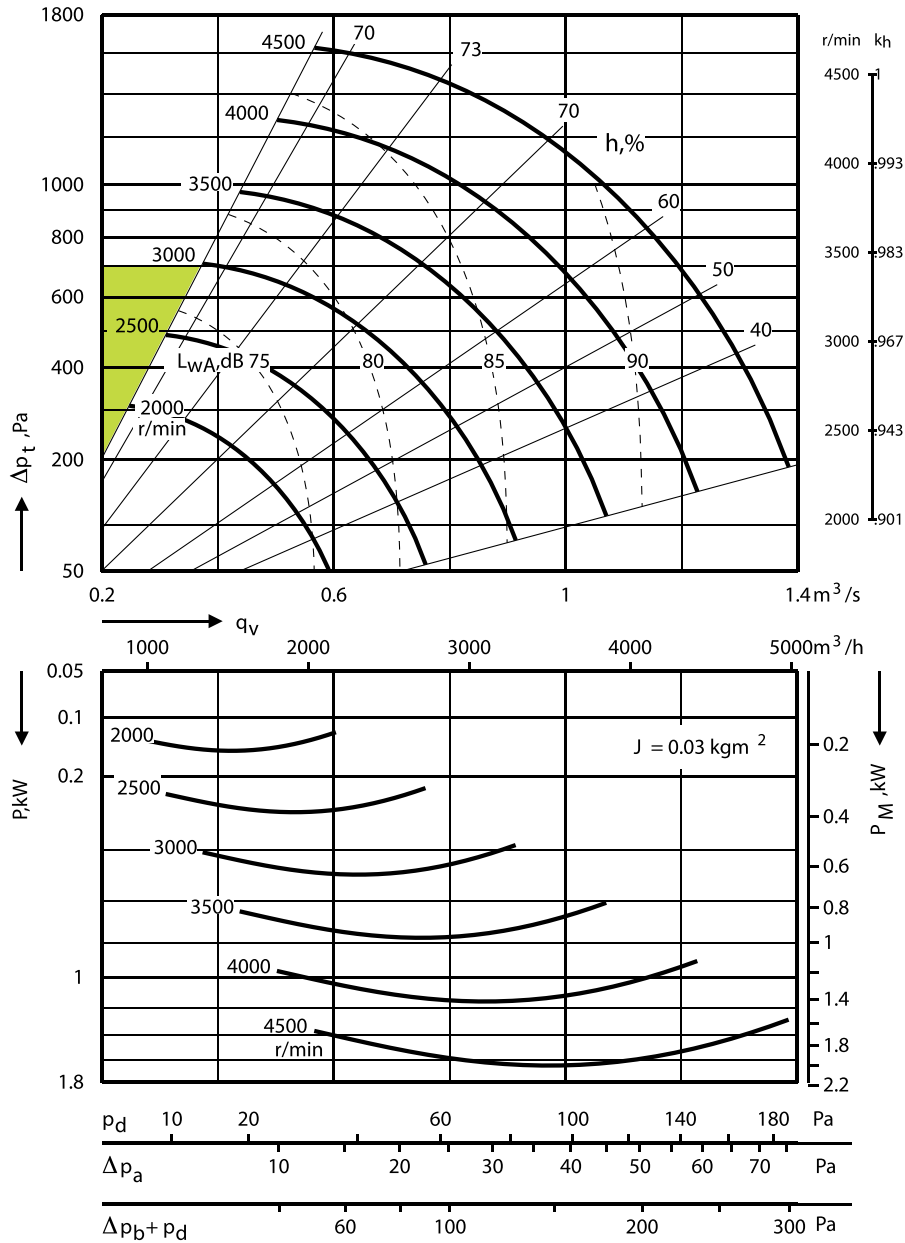
- ① = Air flow,  $\text{m}^3/\text{s}$  (x-axel)
  - ② = Air flow,  $\text{m}^3/\text{h}$  (x-axel)
  - ③ = Total pressure rise,  $\Delta p_t$  Pa (y-axel)
  - ④ = Fan speed, r/min
  - ⑤ = Fan efficiency  $\eta$ , %
  - ⑥ = Sound power level  $L_{wA}$  (dB), (dotted)
  - ⑦ = Fan shaft power, P (kW)
  - ⑧ = Min. recommended motor rating for direct on-line starting, PM (kW)
  - ⑨ = Mass moment of inertia J ( $\text{kg m}^2$ )
  - ⑩ = Unit size and fan size
  - ⑪ = Pressure losses to the standardized outlet duct,  $\Delta p_a$  (Pa)
  - ⑫ = Pressure losses through distributor section,  $\Delta p_b + p_d$  (Pa)
  - ⑬ =  $L_{wA}^K = L_{wA} + 2 \text{ dB}$
  - ⑭ = Correction factor for efficiency,  $k\eta$
- = Recommended working range of the fan
  - = Working range for reinforced fans
  - = When the fan is controlled to operate at a lower speed, the duty point is allowed to come to rest within the coloured field.



# Fan charts

Radial fan, B-wheel EQLR

EQLR-008-3/009-2

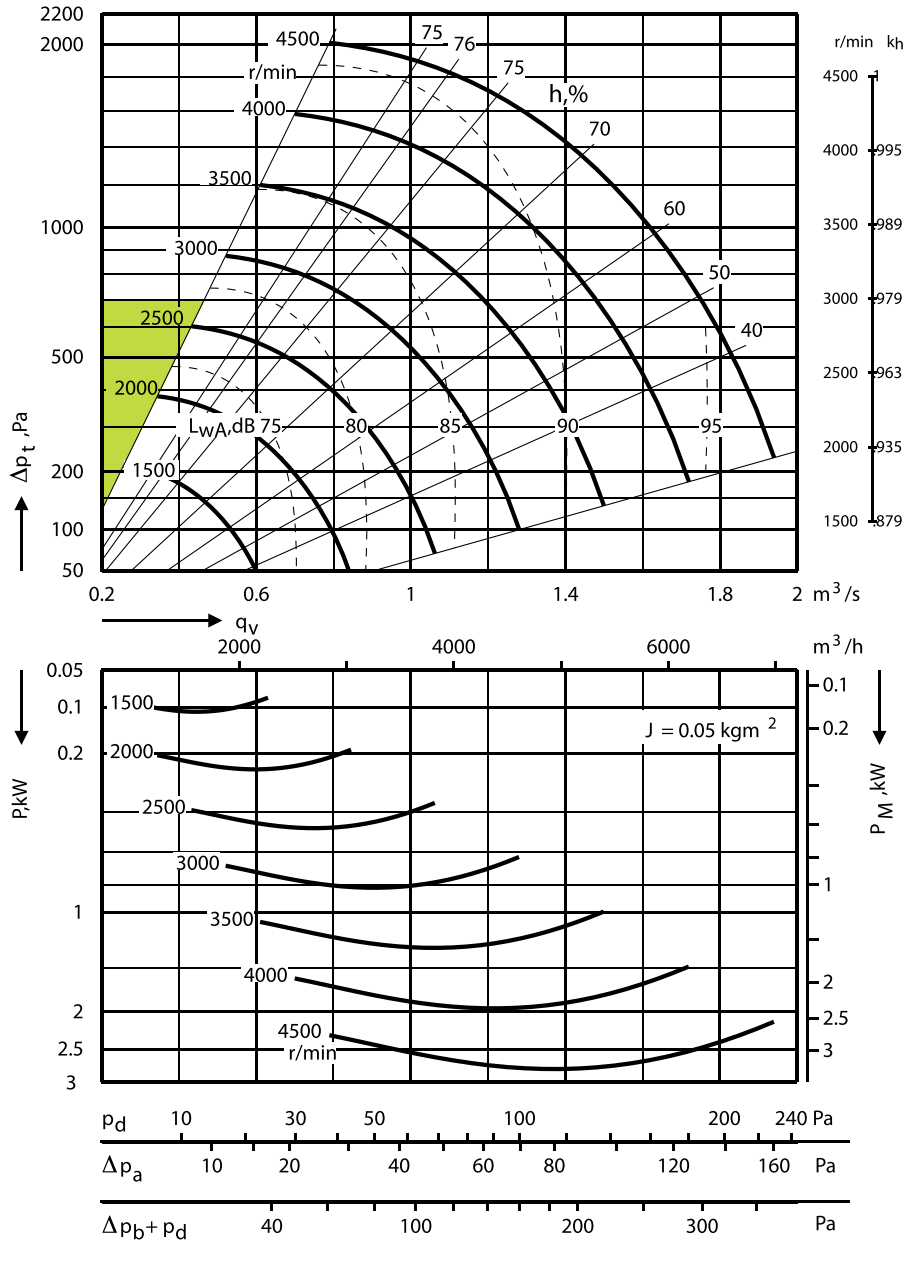


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

EQLR-009-3/011-2

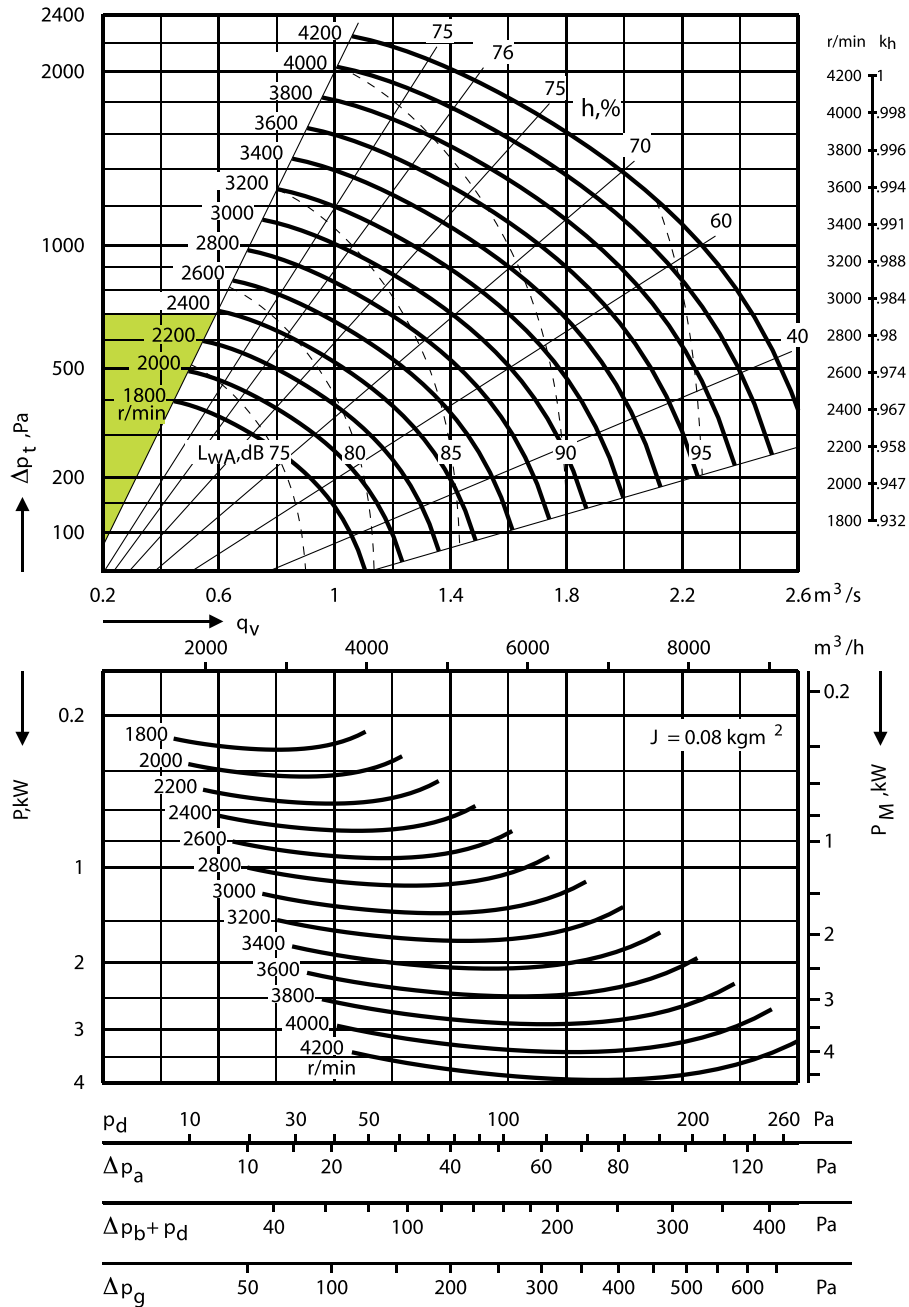


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

EQLR-011-3/014-2

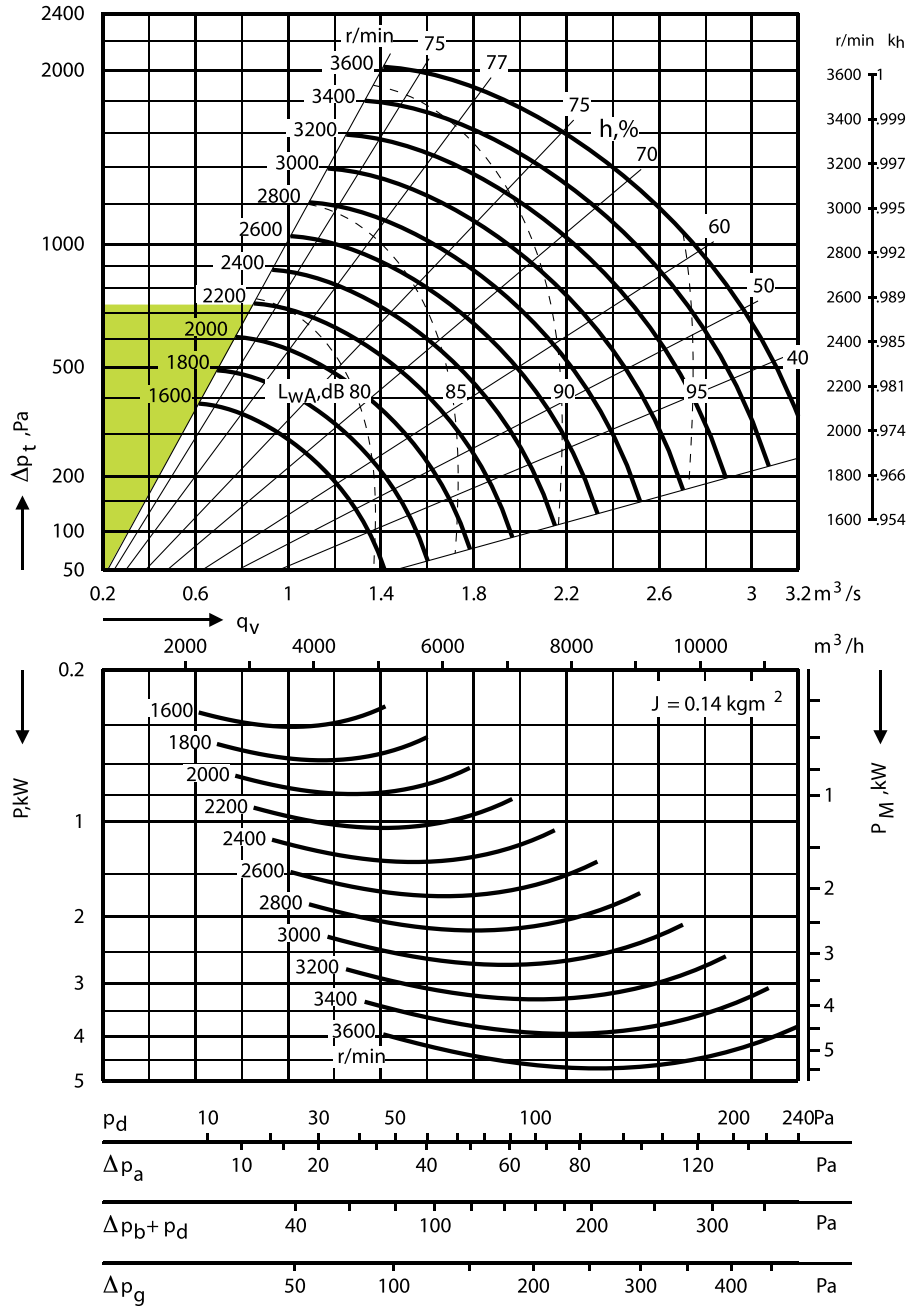


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

EQLR-014-3/018-2/020-2

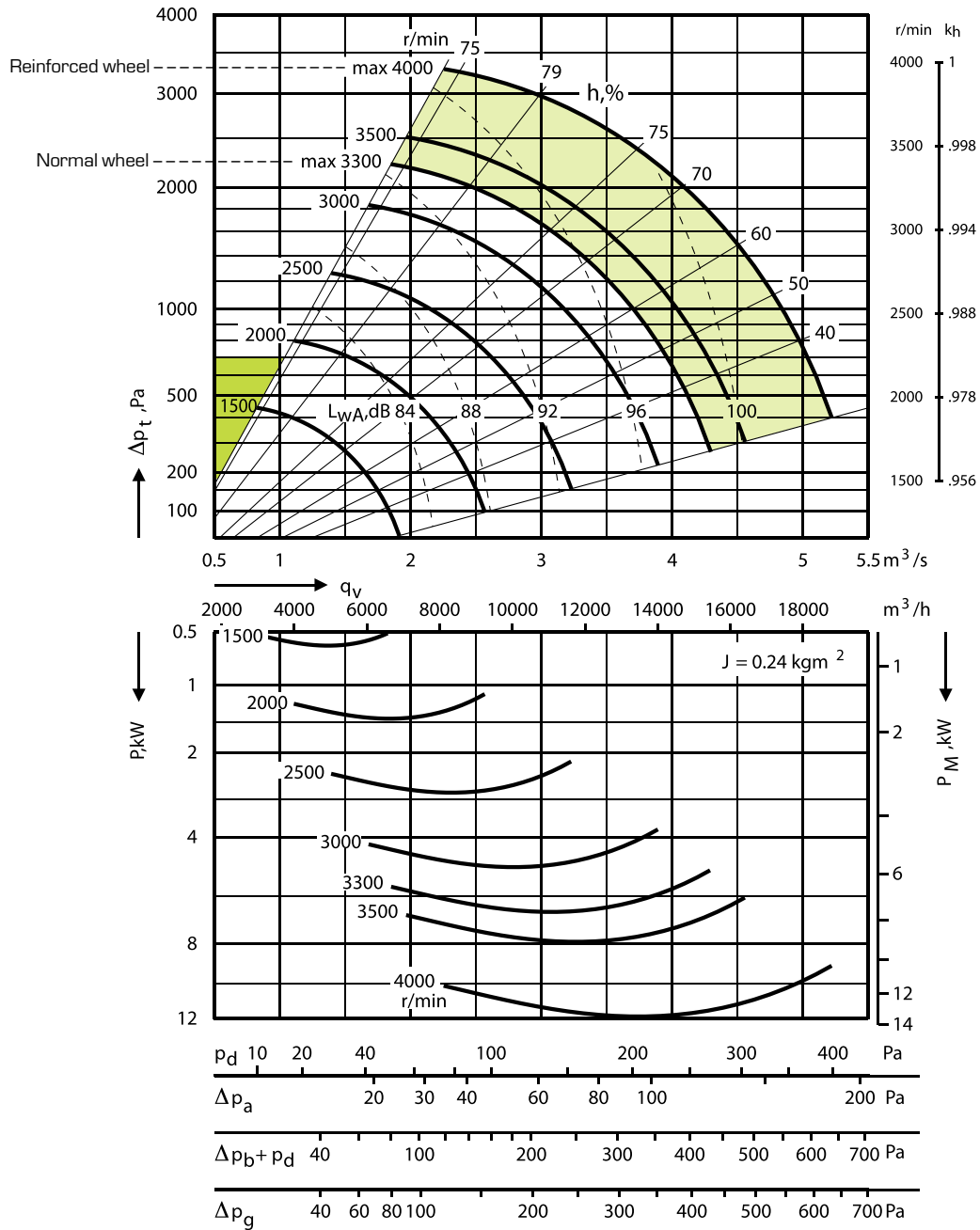


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

EQLR-018-3/020-3/023-2/027-2

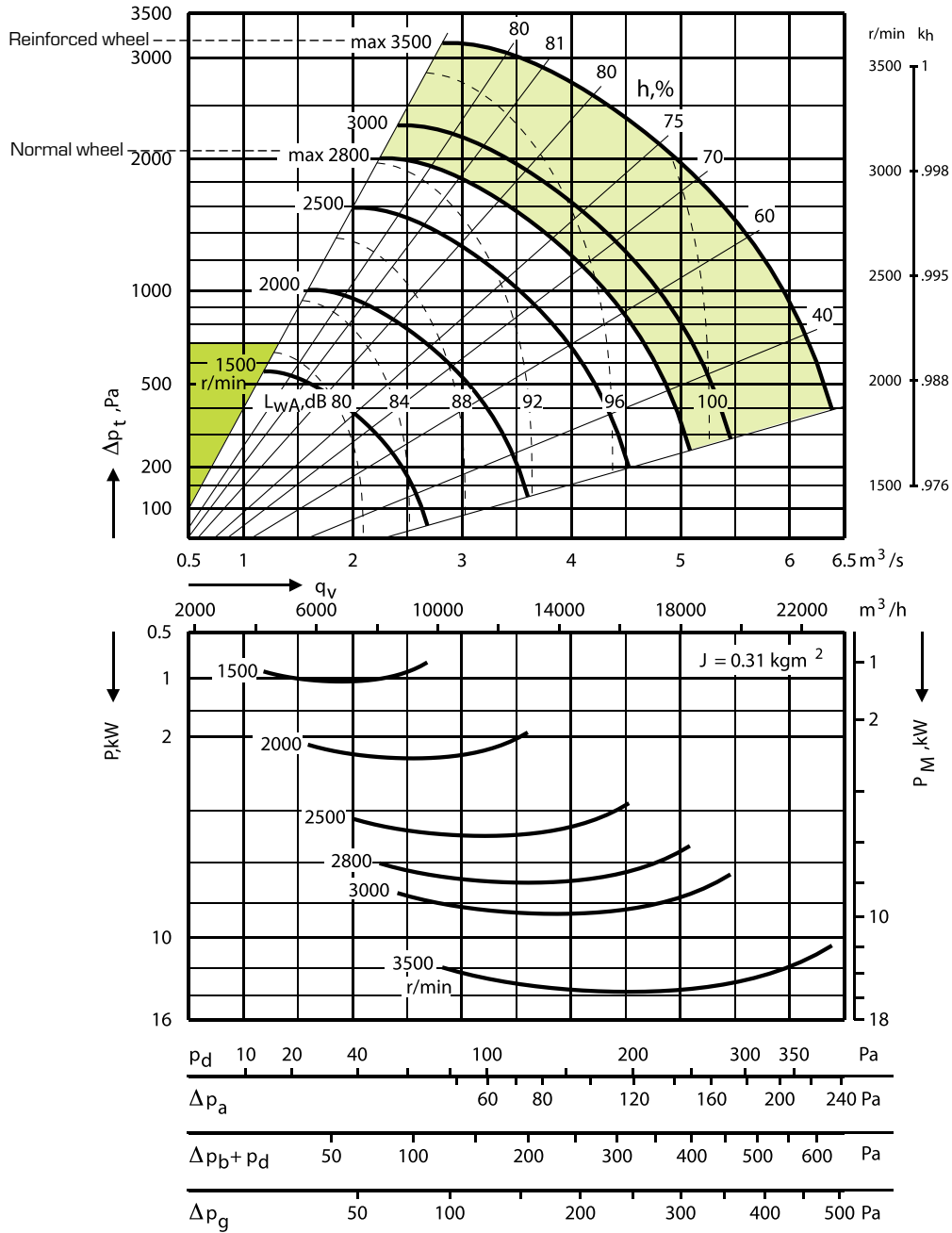


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

EQLR-023-3/027-3/032-2/036-2

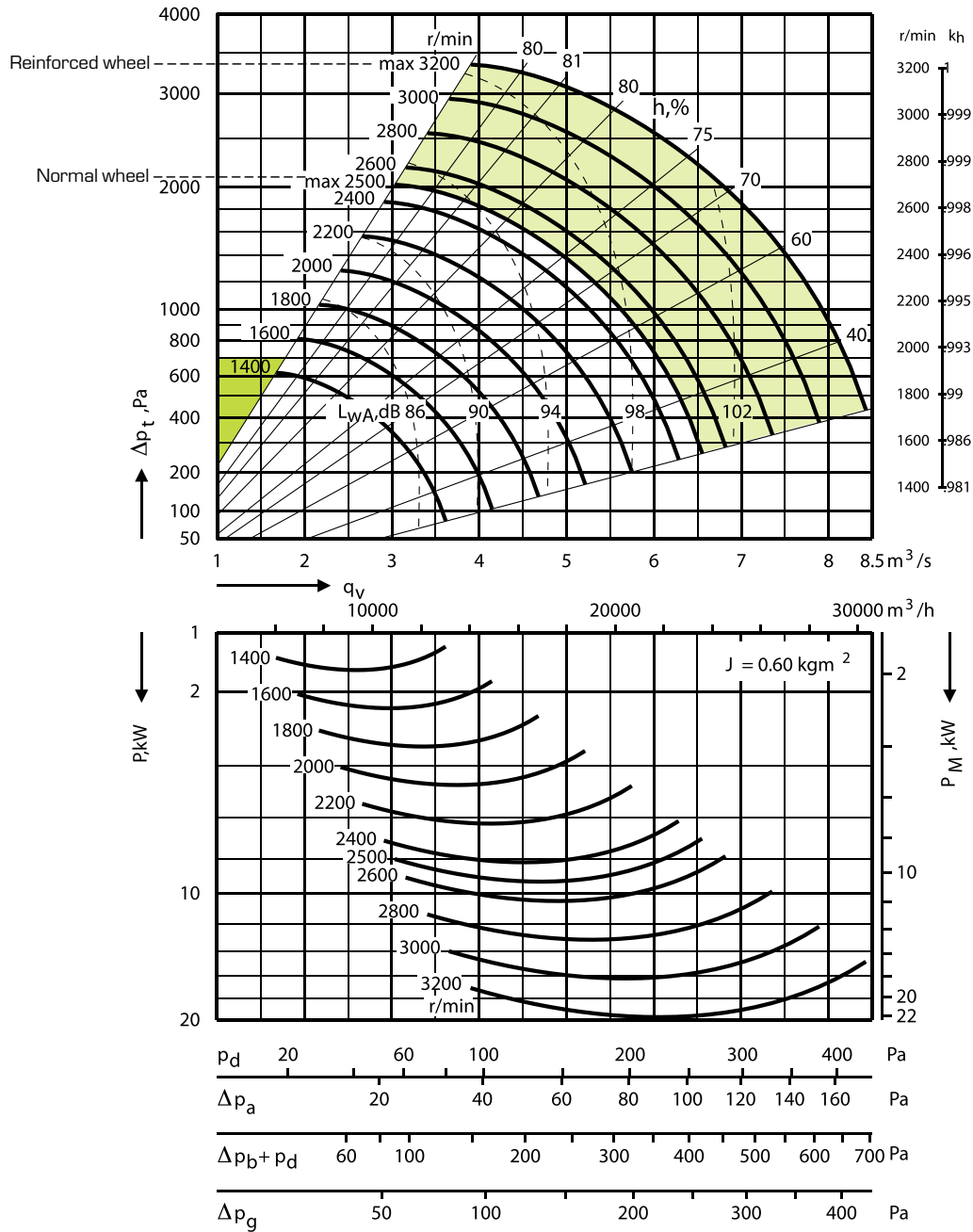


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

EQLR-032-3/036-3/041-2/045-2

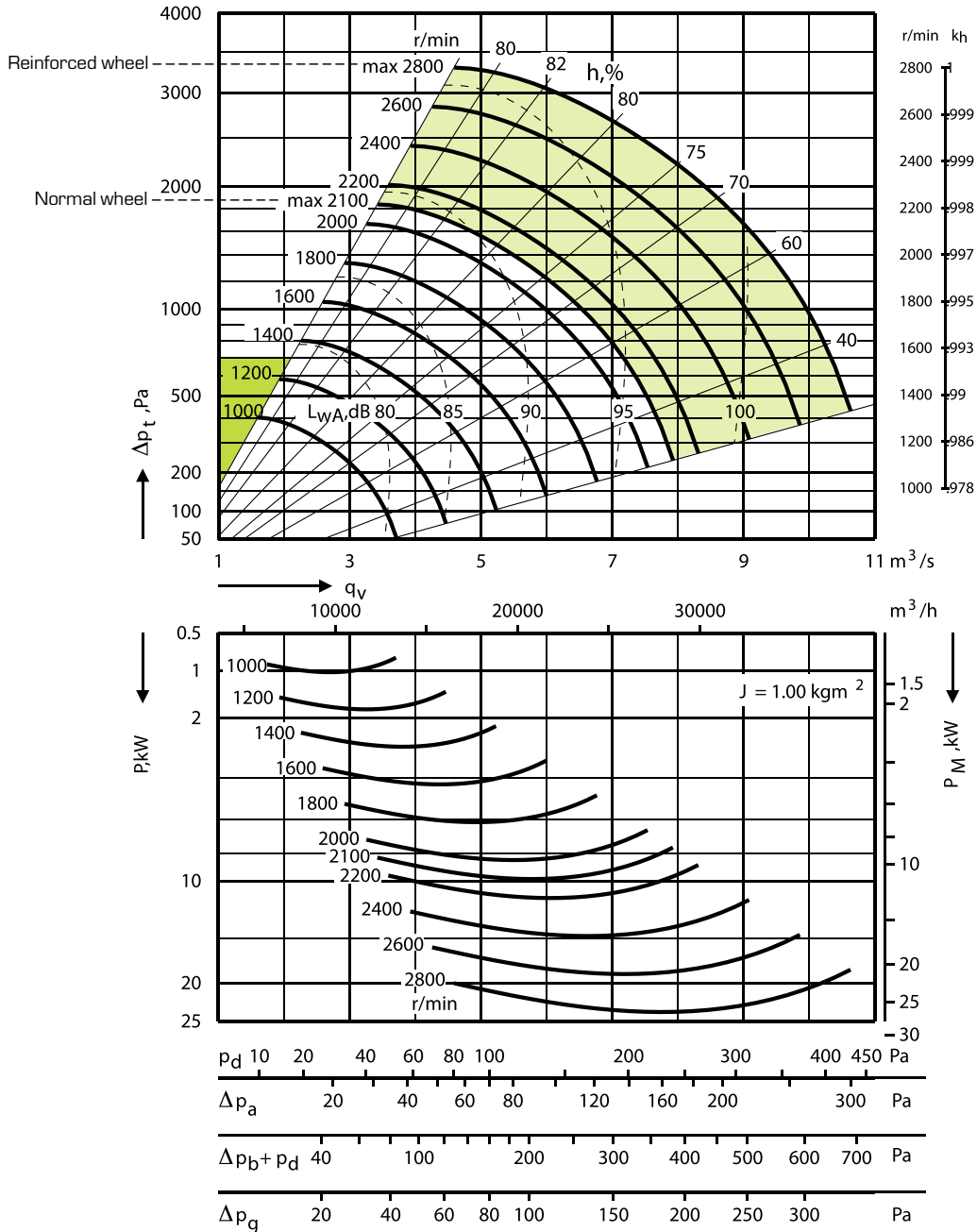


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

EQLR-041-3/045-3/050-2/054-2/056-2



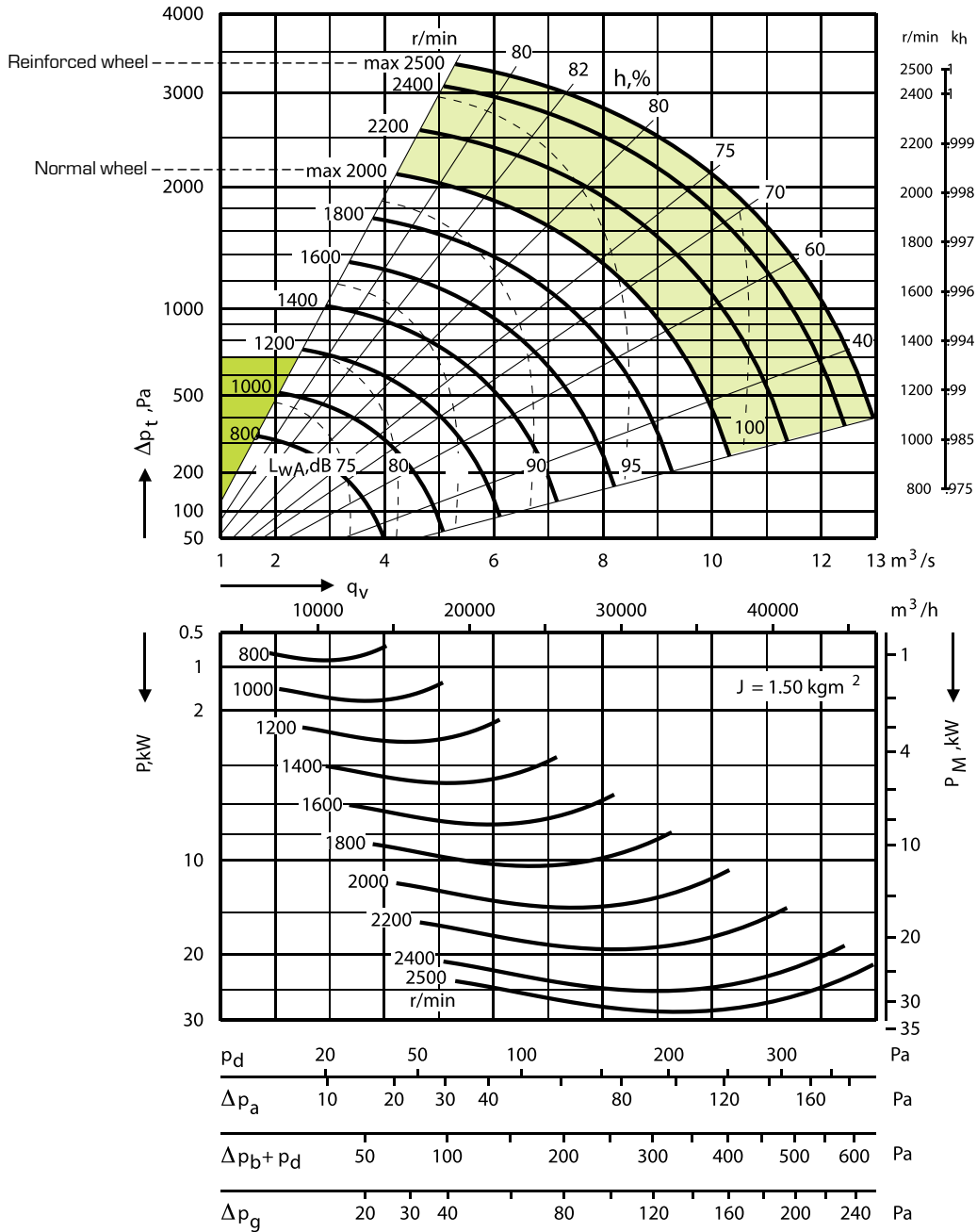
For information about system loss, see product selection tool ACON.



# Fan charts

Radial fan, B-wheel EQLR

EQLR-050-3/054-3/056-3/063-2/068-2/072-2/079-2

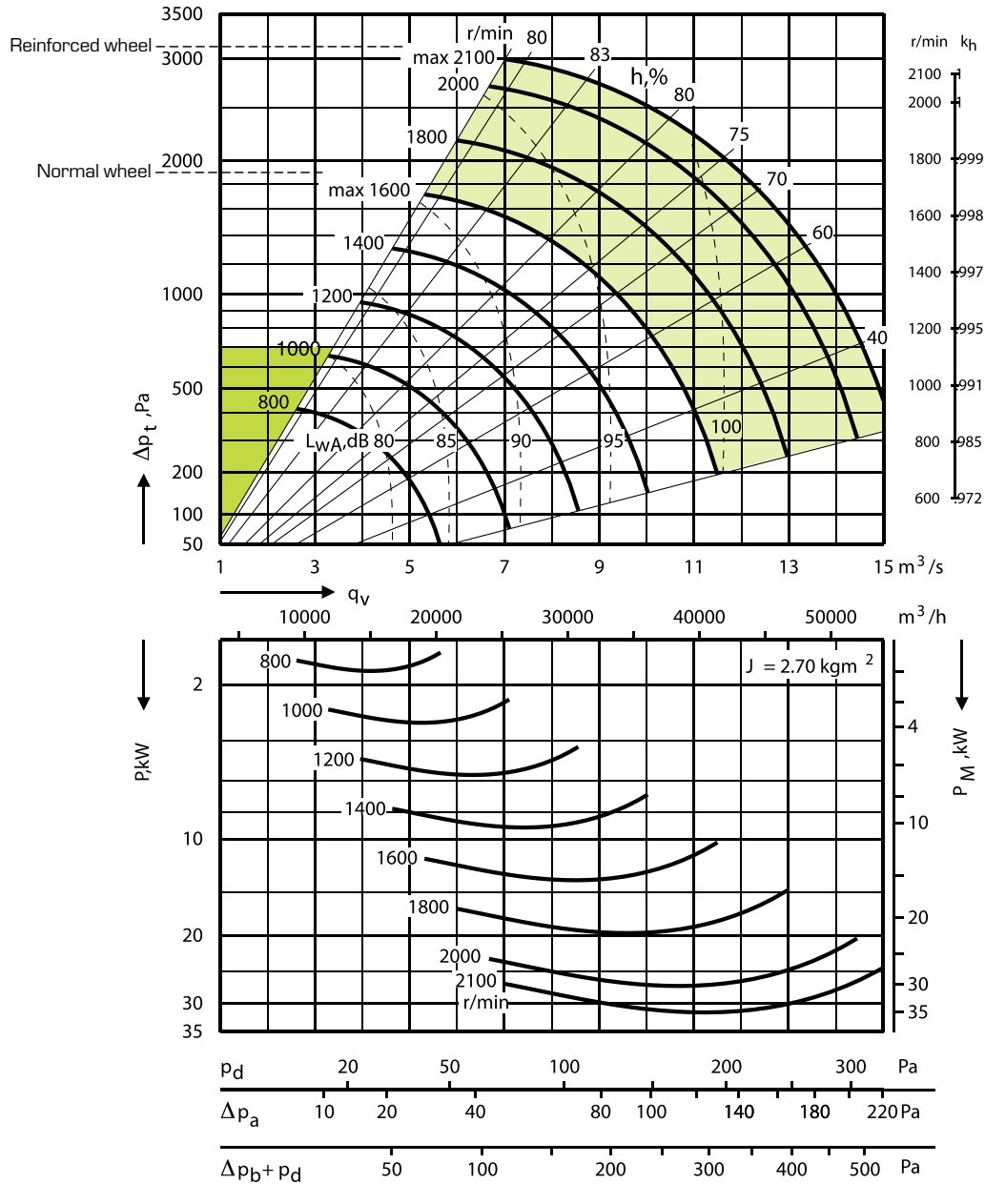


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

EQLR-063-3/068-3/072-3/079-3/090-2

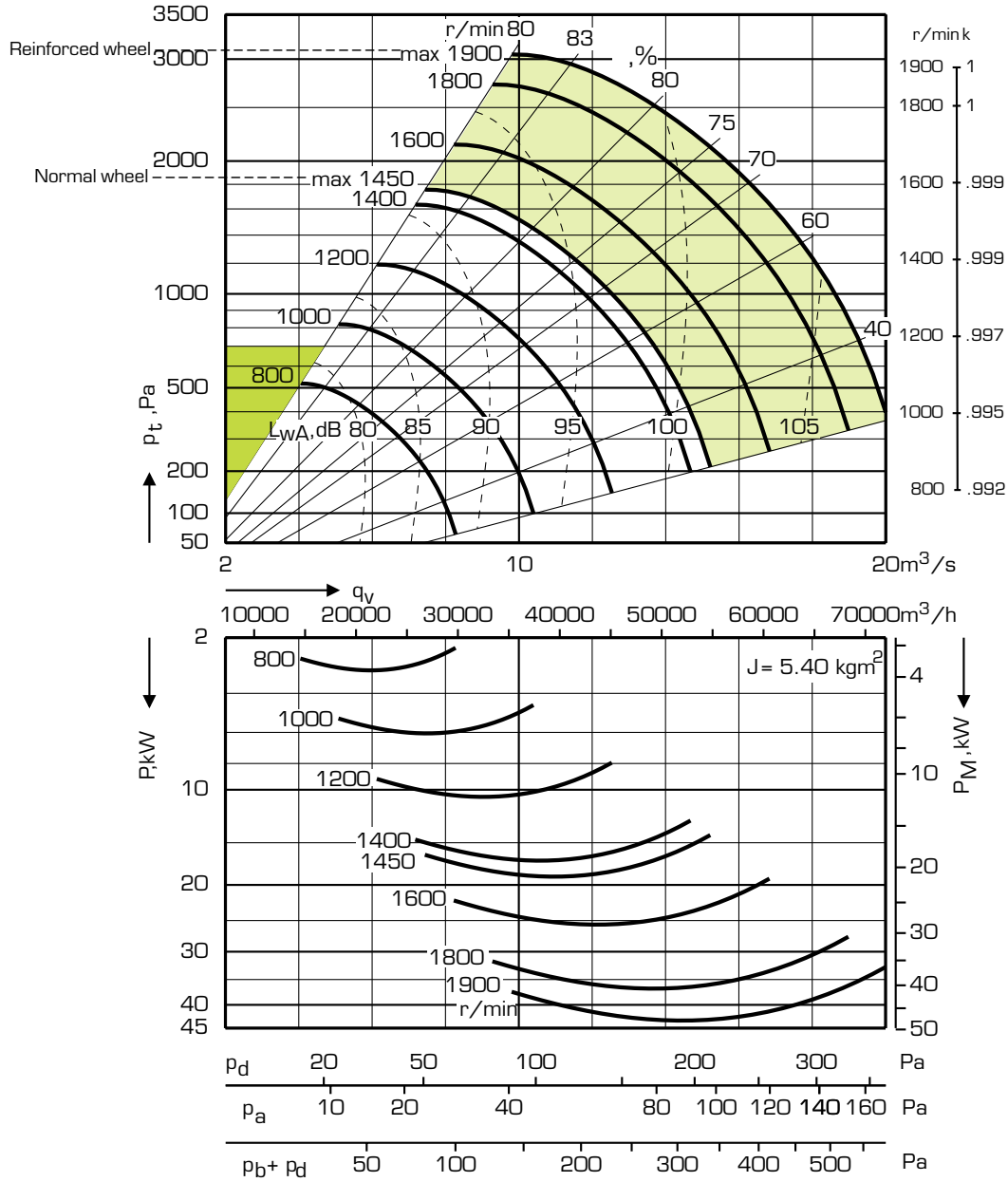


For information about system loss, see product selection tool ACON.

# Fan charts

Radial fan, B-wheel EQLR

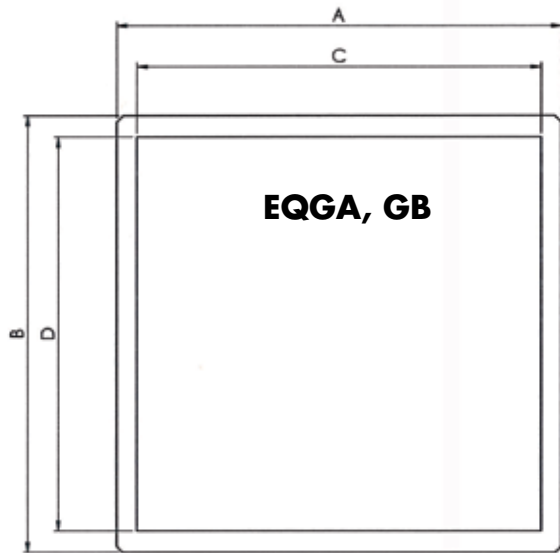
## EQLR-090-3



For information about system loss, see product selection tool ACON.

## Dimensions (mm)

EQGA and EQGB Unit casing (single casing)

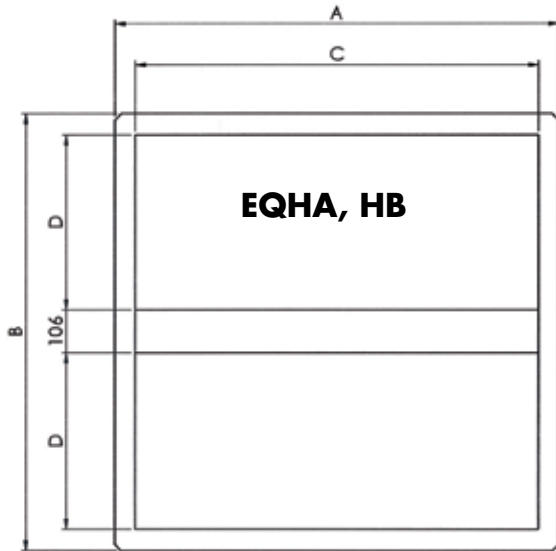


Size	Code	A	B	C	D
005	EQGA	800	476	700	370
008	EQGA	1100	576	1000	470
009	EQGA	800	776	700	670
011	EQGA	1200	676	1100	570
014	EQGA	1100	776	1000	670
018	EQGA	1400	776	1300	670
020	EQGA	1100	1076	1000	970
023	EQGB	1700	926	1600	820
027	EQGA	1400	1076	1300	970
032	EQGB	1800	1026	1700	920
036	EQGA	1400	1376	1300	1270
041	EQGB	2000	1076	1900	970
045	EQGB	1700	1376	1600	1270
047	EQGB	2300	1076	2200	970
050	EQGB	2300	1226	2200	1120
054	EQGB	2000	1376	1900	1270
056	EQGB	1700	1676	1600	1570
063	EQGB	2300	1376	2200	1270
068	EQGB	2000	1676	1900	1570
072	EQGB	2600	1376	2500	1270
079	EQGB	2300	1676	2200	1570
090	EQGB	2600	1676	2500	1570

See product selection tool ACON for information about the weight.

# Dimensions (mm)

EQHA and EQHB Unit casing (double casing)



Size	Code	A	B	C	D
005	EQHA	800	952	700	370
008	EQHA	1100	1152	1000	470
009	EQHA	800	1552	700	670
009*	EQHB	1400	1552	1300	670
011	EQHA	1200	1352	1100	570
014	EQHA	1100	1552	1000	670
014*	EQHB	1400	1552	1300	670
018	EQHA	1400	1552	1300	670
020	EQHB	1100	2152	1000	970
020*	EQHB	1800	2152	1700	970
023	EQHB	1700	1852	1600	820
027	EQHB	1400	2152	1300	970
027*	EQHB	1800	2152	1700	870
032	EQHB	1800	2052	1700	920
036*	EQHB	2400	2752	2300	1270

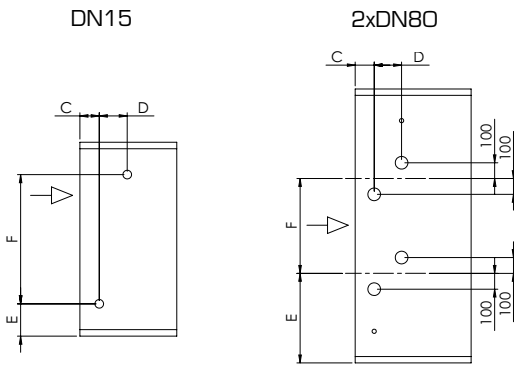
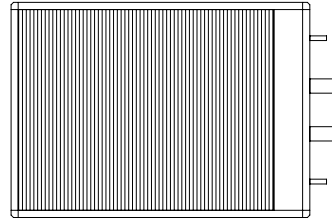
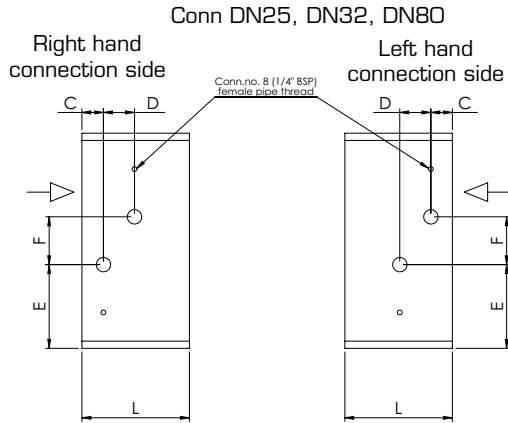
Size	Code	A	B	C	D
036**	EQHB	1400	2752	1300	1270
041	EQHB	2000	2152	1900	970
045*	EQHB	2400	2752	2300	1270
045**	EQHB	1700	2752	1600	1270
047	EQHB	2300	2152	2200	970
050	EQHB	2300	2152	2200	1120
054*	EQHB	2600	2752	2500	1270
054**	EQHB	2000	2752	1900	1270
056*	EQHB	3000	3352	2900	1570
063*	EQHB	2600	2752	2500	1270
063**	EQHB	2300	2752	2200	1270
068*	EQHB	3000	3352	2900	1570
072	EQHB	2600	2752	2500	1270
079*	EQHB	3000	3352	2900	1570
090*	EQHB	3300	3352	3200	1570

\*) Only EQRA, B-rotor

\*\*) Only EQRC Cube

# Dimensions (mm)

## EQEE Air heater for hot water



Unit size	Output variant (b)		
	b=1	b=2	b=3
005	200	250	250
008	200	250	250
011	200	250	250
009, 014, 018	200	250	250
023	200	250	300
032	200	250	300
020, 027, 041, 047	200	250	300
050	250	300	300
036, 045, 054, 063, 072	250	300	300
056, 068, 079, 090	250	300	300

Length, mm

## Dimensions (mm)

### EQEE Air heater for hot water

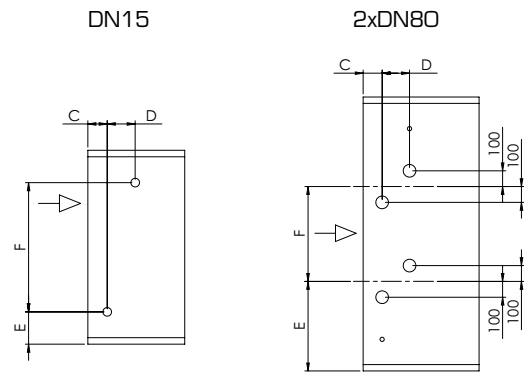
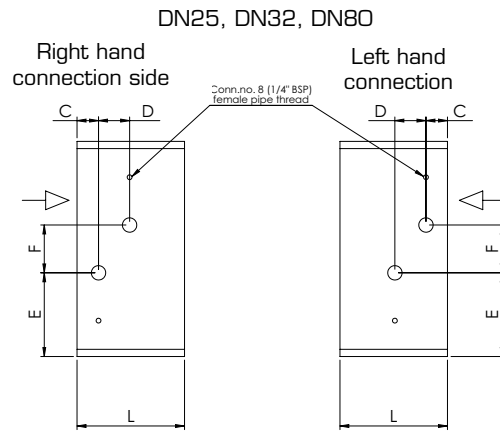
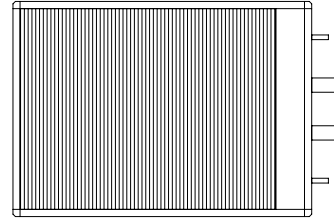
Unit size	Output var.	15		25		32		50		80		2x80	
		W	D	W	D	W	D	W	D	W	D	W	D
005	1	6->	0	2-4	36								
	2	10->	29	4-8	58	2	43						
	3			4-12	58	2	58						
008	1	6->	0	2-4	36		43						
	2	12->	29	4-10	58	2	58						
	3			6-16	58	2-4	58						
011	1	8->	0	2-6	36								
	2			4-14	58			2	68*				
	3			6-20	58	4	58	2	68*				
008, 014, 018	1	10->	0	4-8	36	2	43						
	2			6-16	58	4	58	2	68*				
	3			8-24	58	4-6	58	2	68*				
023	1	12->	0	4-10	36	2	43						
	2			6-20	58	4	58	2	68*				
	3			8-30	58	6	58	4	68*	2	94		
032	1	12->	0	4-10	36	2	43						
	2			6-22	58	4	58	2	68*				
	3			10-34	58	6-8	58	4	68*	2	94		
020, 027, 041, 047	1			4-12	36	2	43						
	2			8-26	58	4-6	58	2	68*				
	3			10-36	58	6-8	58	4	68*	2	94		
050	1			4-14	36			2	68*				
	2			8-28	58	6	58	4	68*	2	94		
	3			12-44	58	8-10	58	4-6	68*	2	94		
036, 045, 054, 063, 072	1			6-16	36	4	43	2	68*				
	2			10-34	58	6-8	58	4	68*	2	94		
	3					6-12	58	4-6	68*	2	94		
056, 068, 079, 090	1			6-22	36	4	43	2	68*				
	2			12-44	58	8-10	58	4-6	68*	2	94		
	3					10-16	58	6-8	68*	4	94	2	94

\*) Copper tubes 58 mm

# Dimensions (mm)

## EQEE Air heater for hot water

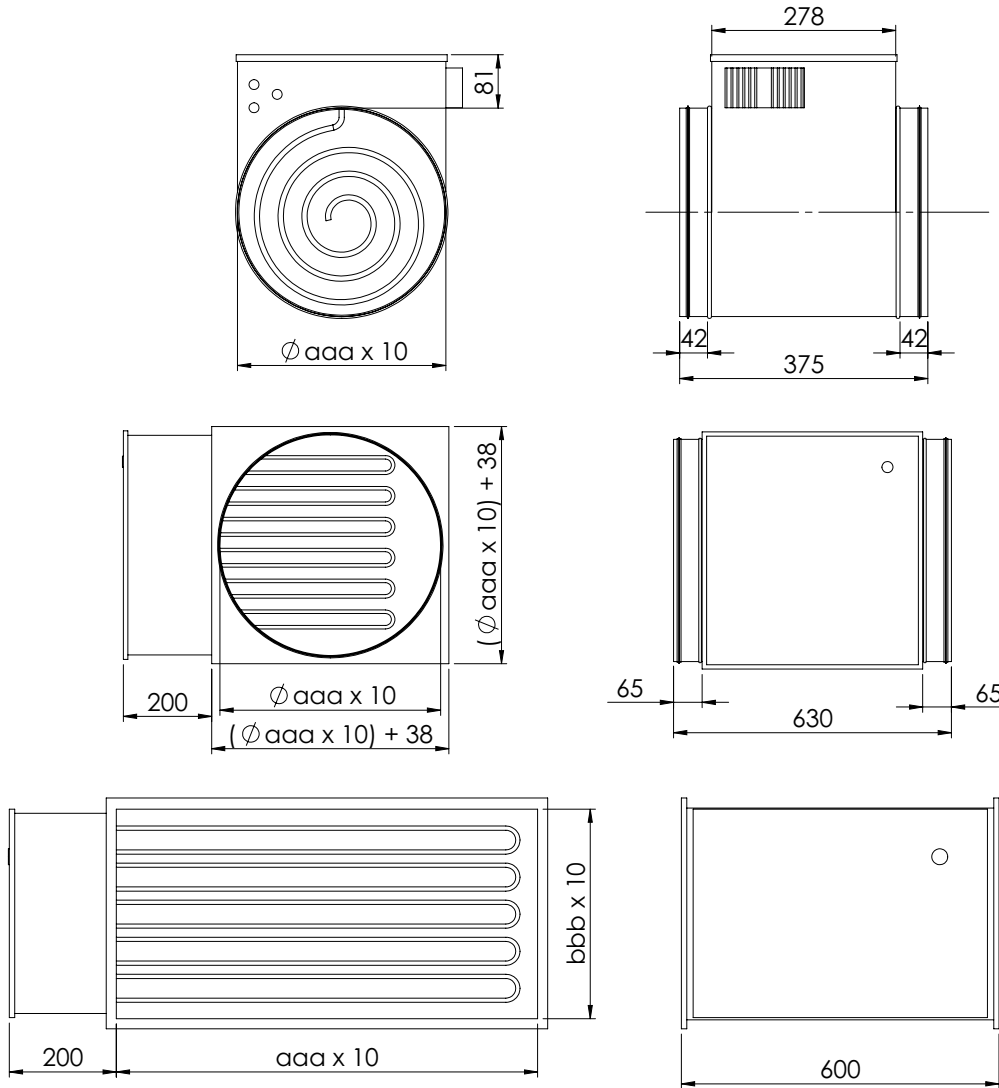
Unit size	E	F
005	178	120 233 1RR/250 2RR
008	228	120 333 1RR/350 2RR DN15
011	238	200 433 DN15
009, 014, 018	288	200 533 DN15
023	363	200 666 DN15
032	413	200 766 DN15
020, 027, 041, 047	438	200
050	513	200
036, 045, 063, 072	588	200
056, 068, 079, 090	738	200 750 (2xDN80)





# Dimensions (mm)

EQKK Electric air heater, mounted in duct work



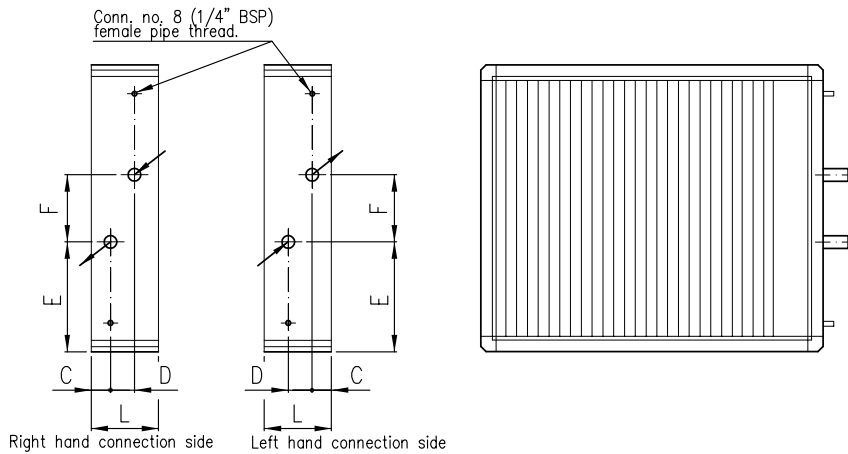
## Dimensions (mm)

EQKK Electric air heater, mounted in duct work

Variant	Width aaa	Height bbb	Output variant c	Effect kW	Picture no.	Execution d	
21	031	000	1	3	1	d=1 2x230 V	
22	031	000	2	6			
23	031	000	3	9			
24	040	000	1	6			
25	040	000	2	9			
26	040	000	3	15			
27	050	000	1	12	2	d=1 3x230 V	
28	050	000	2	17			
29	050	000	3	24			
30	080	040	1	12	3		
31	080	040	2	17			
32	080	040	3	24			
33	110	050	1	17			
34	110	050	2	30			
35	110	050	3	43			
36	140	060	1	20			
37	140	060	2	34			
38	140	060	3	54			
39	140	080	1	30			
40	140	080	2	48			
41	140	080	3	75			
51	031	000	1	3	1		d=2 2x400 V
52	031	000	2	6			
53	031	000	3	9			
54	040	000	1	A			
55	040	000	2	9			
56	040	000	3	15			
57	050	000	1	12	2	d=2 3x400 V	
58	050	000	2	17			
59	050	000	3	24			
60	080	040	1	12	3		
61	080	040	2	17			
62	080	040	3	24			
63	110	050	1	17			
64	110	050	2	30			
65	110	050	3	43			
66	140	060	1	20			
67	140	060	2	34			
68	140	060	3	54			
69	140	080	1	30			
70	140	080	2	48			
71	140	080	3	75			

# Dimensions (mm)

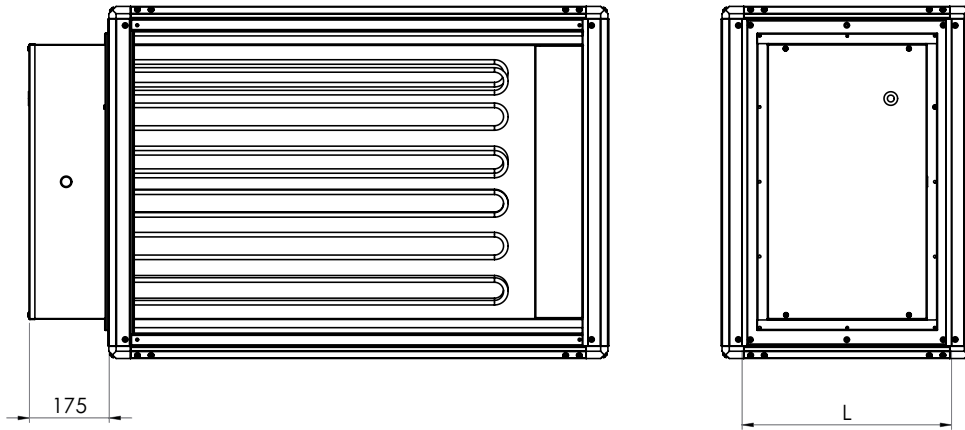
## EQEG Frost coil



Size	L	Weight, kg Cu/Al	Pipe connection size	Volume, litre	C	D	E	F
005	200	14	15	1	70	36	178	120
008	200	20	15	2	70	36	188	200
009	200	20	15	2	70	36	288	200
011	200	24	25	3	70	36	238	200
014	200	24	25	3	70	36	288	200
018	200	28	25	4	70	43	288	200
020	200	32	25	4	70	36	438	200
023	200	38	25	5	70	43	363	200
027	200	39	25	5	70	43	438	200
032	200	46	25	6	70	43	413	200
036	200	48	25	7	70	43	588	200
041	200	52	25	7	70	43	438	200
045	200	57	25	10	70	43	588	200
050	200	64	25	10	70	43	513	200
054	200	66	32	11	70	43	588	200
056	200	67	32	12	70	43	738	200
063	200	72	32	12	70	43	588	200
068	200	77	32	14	70	43	738	200
072	200	78	32	14	70	43	588	200
079	200	84	32	15	70	43	738	200
090	200	95	32	21	70	43	738	200

# Dimensions (mm)

EQEK Air heater, electric

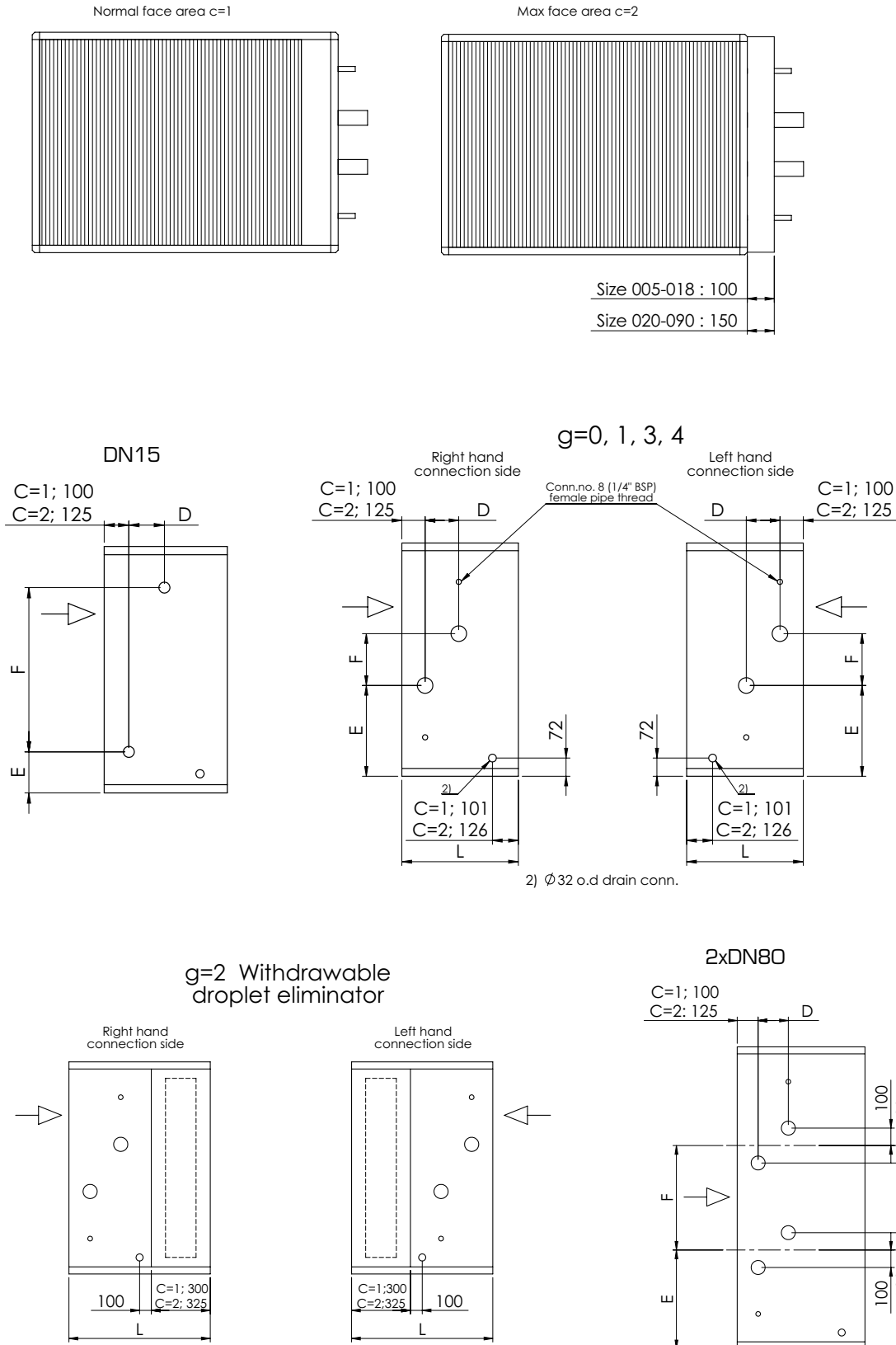


Size	d=1-5	d=6						
		c=2 (3x230 V)			c=4 (3x400 V)			
		L=400	L=600	L=900	L=400	L=600	L=900	
005	All L=400	3-15	17-20	-	3-20	-	-	
008			17-27	-	3-27	-	-	
009		3-24	27-34	-	3-34	-	-	
011			27-37	-	3-37	-	-	
014			27-43	48	3-48	-	-	
018		3-43	48-69	-	3-54	48-59	59	-
020						59-69	-	
023						59-75	-	
027		3-24	27-43	48-75	3-69	59-90	-	
032		3-43	48-90	-		75-108	-	
036		3-59	65-120	-	3-90	108-120	-	
041		3-43	48-108	120-150	3-69	75-150	-	
045		3-59	65-120	150-180	3-90	108-180	-	
047		3-43	48-108	120-180	3-69	75-180	-	
050					3-90	108-180	-	
054		3-59	65-120	150-230	3-108	120-180	230	
056					3-90	108-180	230-280	
063					3-108	120-180		
068					3-90	108-180		
072					3-108	120-180	230-335	
079	3-108				120-180			
090								

Effect Kw

# Dimensions (mm)

## EQNN Air cooler for chilled water



# Dimensions (mm)

## EQNN Air cooler for chilled water

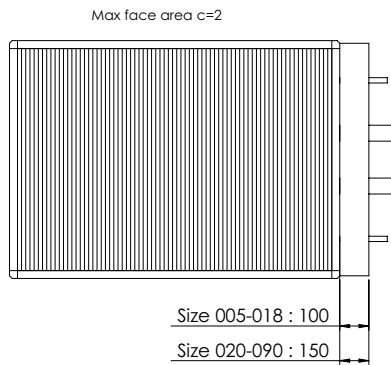
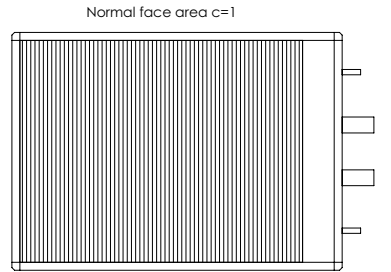
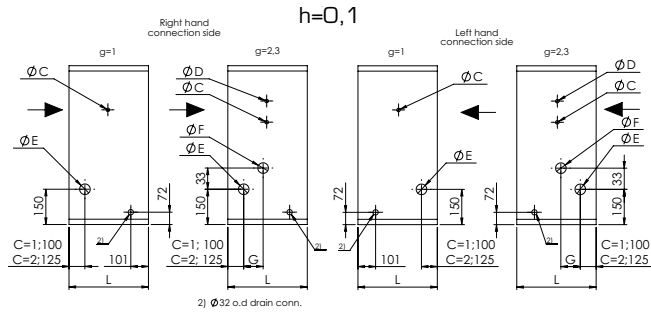
Unit size	E	F	Out-put. var.	Connection dimensions at different number of VV and dimension D between connetions											
				15		25		32		50		80		2x80	
				VV	D	VV	D	VV	D	VV	D	VV	D	VV	D
005	191 109 DN 15	120 283 DN 15	2	10->	29	4-8	58	2	58						
			3	16->	29	4-14	58			2	68*				
			4			6-16	87	4	87						
			6			8-26	144	4-6	144		144				
			8			10-34	205	6-8	205	4	205				
008	201 109 DN 15	200 109 DN 15	2	12->	29	4-10	58	2	58						
			3			6-16	58	4	58	2	68*				
			4			6-22	87	4	87						
			6			10-34	144	6-8	144	4	144				
			8			12-46	205	8-10	205	4-6	205				
011	251	200	2			4-14	58	2	58						
			3			6-22	58	4	58	2	68*				
			4			8-28	87	6	87	4	87				
			6			12-44	144	8-10	144	4-6	144				
			8			16-58	205	10-14	205	6-8	205	2-4	205		
009 014 018	301	200	2			6-16	58	4	58	2	68*				
			3			8-26	58	4-6	58	2	68*				
			4			10-34	87	6-8	87	4	87				
			6			14-52	144	8-12	144	4-6	144				
			8			18-70	205	12-16	205	6-10	205	4	205		
023	368	200	2			6-22	58	4	58	2	68*				
			3			10-32	58	6-8	58	4	68*	2	94		
			4			12-44	87	8-10	87	4-6	87				
			6			18-66	144	10-16	144	6-8	144	2-4	144		
			8					14-22	205	8-12	205	4-6	205		
032	418	200	2			8-24	58	4-6	58	2	68*	2	94		
			3			10-36	58	6-8	58	4	68*				
			4			14-50	87	8-12	87	4-6	87				
			6					12-18	144	6-10	144	4	144		
			8					16-24	205	8-14	205	4-6	205		
020 027 041 047	451	200	2			8-26	58	4-6	58	2	68*				
			3			12-40	58	6-10	58	4	68*	2	94		
			4			14-52	87	8-12	87	4-6	87				
			6					12-20	144	6-10	144	4	144		
			8					16-26	205	8-14	205	4-6	205		
050	518	200	2			8-30	58	6	58	4	68*	2	94		
			3			12-46	58	8-10	58	4-6	68*	2	94		
			4			16-62	87	10-14	87	6-8	87	2-4	101**		
			6					14-22	144	8-12	144	4-6	144		
			8					18-30	205	10-16	205	4-8	205		
036 045 054 063 072	584 384 (2xDN 80)	200 600 (2xDN 80)	2			10-34	58	6-8	58	4	68*	2	94		
			3					8-12	58	4-6	68*	2	94		
			4					12-16	87	6-10	87	4	101**		
			6					16-26	144	8-14	144	4-6	144		
			8							12-20	205	6-10	205	2-4	205
056 068 079 090	751 468 (2xDN 80)	200 766 (2xDN 80)	2			12-44	58	8-10	58	4-6	68*	2	94		
			3					10-16	58	6-8	68*	4	94	2	94
			4					14-22	87	8-12	87	4-6	101**		
			6							10-18	144	6-8	144	2-4	144
			8							14-24	205	6-12	205	4	205
10							18-32	263	8-16	263					

\*] With copper tubes 58 mm

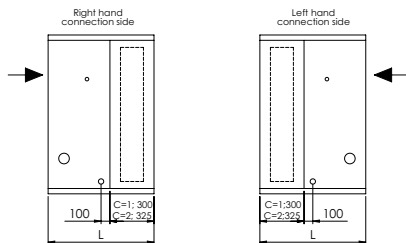
\*\*] 101 mm for connection but 87 mm for nipple

# Dimensions and Weights (mm and kg)

## EQNP Air cooler for evaporative refrigerant



### h=2 withdrawable droplet eliminator



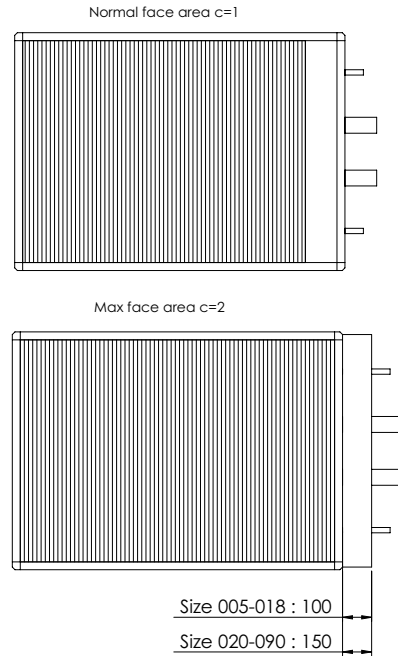
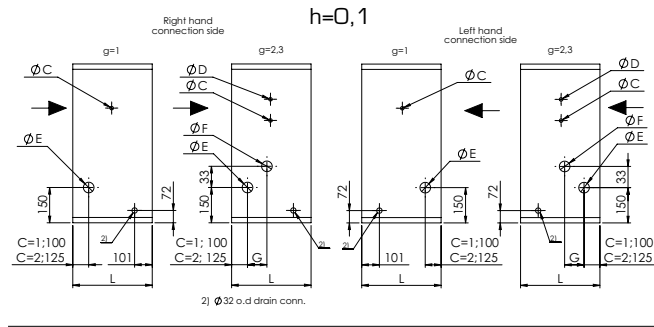
Size	Output variant b=2							Output variant b=3						
	ØC	ØD	ØE	ØF	G	Volume litre	Weight kg	ØC	ØD	ØE	ØF	G	Volume litre	Weight kg
005	15,9	15,9	28,6	28,6	29	3	23	15,9	15,9	28,6	28,6	29	4	26
008	22	15,9	34,9	28,6	34	3	32	15,9	15,9	28,6	28,6	29	5	36
009	15,9	15,9	28,6	28,6	29	4	28	22	15,9	28,6	28,6	29	4	32
011	15,9	15,9	28,6	28,6	29	5	36	15,9	15,9	28,6	28,6	29	7	42
014	15,9	15,9	28,6	28,6	29	5	37	22	15,9	28,6	28,6	29	7	43
018	22	15,9	28,6	34,9	34	6	44	22	15,9	28,6	28,6	29	9	52
020	22	15,9	34,9	28,6	34	6	49	22	15,9	34,9	28,6	34	10	57
023	22	15,9	34,9	28,6	34	9	65	22	15,9	34,9	28,6	34	13	76
027	22	15,9	34,9	28,6	34	19	59	22	22	41,3	28,6	38	13	70
032	22	15,9	34,9	28,6	34	11	73	22	41,3	41,3	28,6	38	16	87
036	22	22	41,3	28,6	38	11	70	22	22	41,3	28,6	38	16	84
041	22	15,9	34,9	28,6	34	13	85	22	15,9	34,9	28,6	34	19	102
045	22	22	41,3	28,6	38	13	86	22	22	41,3	28,6	38	20	103
050	22	15,9	41,3	28,6	38	17	104	22	15,9	41,3	28,6	38	25	125
054	22	22	41,3	28,6	38	16	103	22	22	41,3	28,6	38	24	123
056	22	22	41,3	34,9	40	17	105	22	22	41,3	34,9	40	26	126
063	22	22	41,3	28,6	38	19	112	22	22	41,3	28,6	38	28	136
068	22	22	41,3	34,9	40	21	119	22	22	41,3	34,9	40	31	145
072	22	22	41,3	28,6	38	22	124	22	22	41,3	28,6	38	32	151
079	22	22	41,3	34,9	40	24	132	22	22	41,3	34,9	40	36	161
090	22	22	41,3	34,9	40	28	144	22	22	41,3	34,9	40	41	178

Output variant bb	L	
	h=0.1	h=2
02	400	500
03	400	500
04	500	500

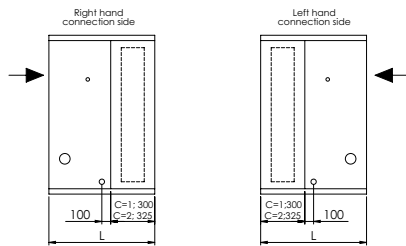
Output variant bb	L	
	h=0.1	h=2
06	500	600
08	500	600

# Dimensions and Weights (mm and kg)

## EQNP Air cooler for evaporative refrigerant



### h=2 withdrawable droplet eliminator



Size	Output variant b=4							Output variant b=6						
	ØC	ØD	ØE	ØF	G	Volume litre	Weight kg	ØC	ØD	ØE	ØF	G	Volume litre	Weight kg
005	15,9	15,9	28,6	28,6	29	5	29	22	22	15,9	28,6	29	6	35
008	15,9	15,9	28,6	28,6	29	7	41	22	15,9	28,6	28,6	29	9	50
009	22	15,9	28,6	28,6	29	4	36	22	15,9	34,9	28,6	34	9	46
011	22	15,9	34,9	28,6	34	8	49	22	15,9	34,9	28,6	34	13	61
014	22	15,9	34,9	28,6	34	9	50	22	15,9	34,9	28,6	34	13	62
018	22	15,9	34,9	28,6	34	12	61	22	15,9	34,9	28,6	34	17	77
020	22	22	41,3	28,6	38	13	66	22	22	41,3	34,9	38	19	83
023	22	15,9	34,9	28,6	34	17	88	22	22	41,3	28,6	34	26	111
027	22	22	41,3	28,6	38	17	81	22	22	41,3	34,9	38	26	104
032	22	41,3	28,6	28,6	29	21	100	22	22	41,3	28,6	38	32	128
036	22	22	41,3	34,9	40	22	98	22	22	54	34,9	50	32	130
041	22	22	41,3	28,6	38	25	118	22	22	41,3	34,9	40	38	150
045	22	22	41,3	34,9	40	27	120	22	22	54	34,9	50	40	159
050	22	22	41,3	34,9	38	34	146	22	22	41,3	34,9	40	50	189
054	22	22	41,3	34,9	38	32	144	22	22	54	34,9	50	48	189
056	22	22	54	34,9	50	34	153	22	22	54	41,3	50	52	196
063	22	22	41,3	34,9	40	38	160	22	22	54	34,9	50	57	212
068	22	22	54	34,9	50	55	217	22	22	54	41,3	50	62	227
072	22	22	41,3	34,9	40	43	178	22	22	54	34,9	50	65	237
079	22	22	54	34,9	50	48	196	22	22	54	41,3	50	72	256
090	22	22	54	34,9	50	55	217	22	22	54	41,3	50	83	285

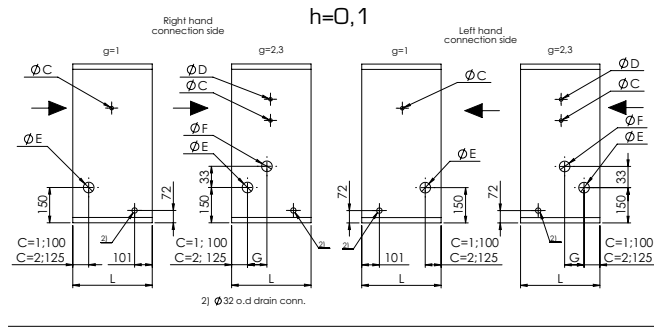
Output variant bb	L	
	h=0,1	h=2
02	400	500
03	400	500
04	500	500

Output variant bb	L	
	h=0,1	h=2
06	500	600
08	500	600

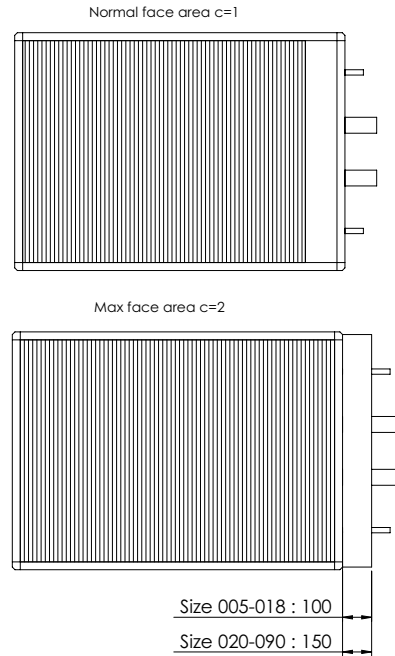
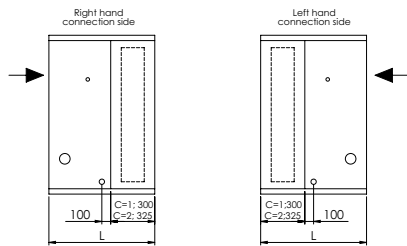


# Dimensions and Weights (mm and kg)

## EQNP Air cooler for evaporative refrigerant



### h=2 withdrawable droplet eliminator



Output variant b=8							
Size	ØC	ØD	ØE	ØF	G	Volume litre	Weight kg
005	22	15,9	34,9	28,6	34	8	41
008	22	15,9	34,9	28,6	34	12	60
009	22	15,9	34,9	28,6	34	12	54
011	22	15,9	34,9	28,6	34	17	73
014	22	15,9	34,9	28,6	34	17	74
018	22	15,9	34,9	28,6	34	23	93
020	22	22	41,3	34,9	40	26	100
023	22	22	41,3	28,6	34	35	134
027	22	22	41,3	34,9	40	34	126
032	22	22	41,3	34,9	40	42	155
036	22	22	54	34,9	50	43	157
041	22	22	41,3	34,9	40	50	183
045	22	22	54	34,9	50	54	193
050	22	22	54	34,9	50	67	235
054	22	22	54	34,9	50	65	230
056	22	22	54	41,3	50	69	239
063	22	22	54	34,9	50	75	259
068	22	22	54	41,3	50	83	278
072	22	22	54	34,9	50	86	291
079	22	22	54	41,3	50	96	315
090	22	22	54	41,3	50	110	353

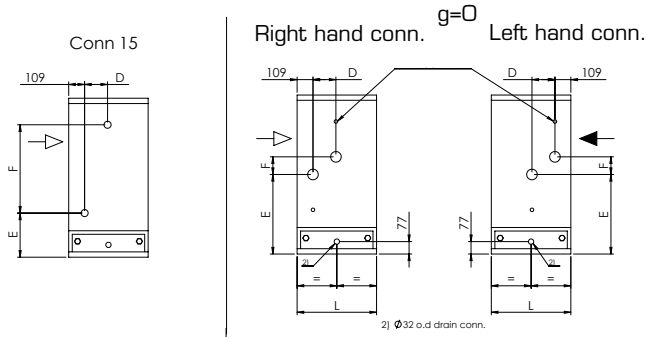
Output variant bb	L	
	h=0,1	h=2
02	400	500
03	400	500
04	500	500

Output variant bb	L	
	h=0,1	h=2
06	500	600
08	500	600

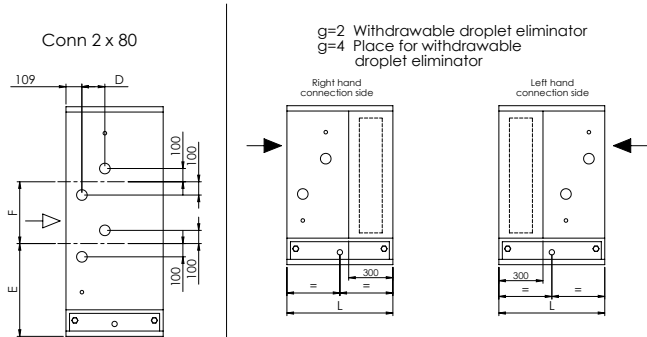
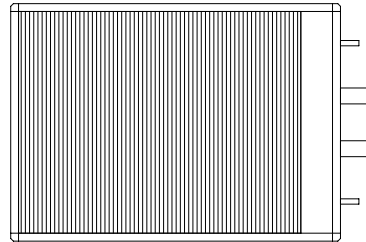
# Dimensions (mm)



## EQHN Air cooler in hygienic design, c=1



Normal face area c=1  
(withdrawable drain tray)



Output variant	L	
	g=0	g=2, 4
02	350	700
03	350	700
04	350	700
06	450	700
08	500	750
10	550	800



# Dimensions (mm)

EQHN Air cooler in hygienic design, c=1

Unit size	E	F	Out-put var	Connection dimensions at different number of VV and dimension D between connetions											
				15		25		32		50		80		2x80	
				VV	D	VV	D	VV	D	VV	D	VV	D	VV	D
008	283	120	2	10->	29	4-8	58	2	58						
			3			4-14	58			2	68*				
			4			6-16	87	4	87						
			6			8-26	144	4-6	144						
			8			10-34	205	6-8	205	4	205				
			10			12-44	263	8-10	263						
011	293	200	2			4-10	58	2	58						
			3			6-16	58	4	58	2	68*				
			4			6-22	87	4	87						
			6			10-34	144	6-8	144	4	144				
			8			12-46	205	8-10	205	4-6	205				
			10			16-58	263	10-14	263	6-8	263				
009, 014, 018	343	200	2			4-14	58	2	58						
			3			6-22	58	4	58	2	68*				
			4			8-28	87	6	87	4	87				
			6			12-44	144	8-10	144	4-6	144				
			8			16-58	205	10-14	205	6-8	205	2-4	205		
			10			20-74	263	12-18	263	6-10	263				
023	410	200	2			6-18	58	4	58	2	68*				
			3			8-28	58	6	58	4	68*	2	94		
			4			10-38	87	6-8	87	4	87				
			6			16-56	144	10-14	144	6-8	144	2-4	144		
			8					12-18	205	6-10	205	4	205		
			10			24-94	263	14-22	263	8-12	263				
032	460	200	2			6-22	58	4	58	2	68*				
			3			10-32	58	6-8	58	4	68*	2	94		
			4			12-44	87	8-10	87	4-6	87				
			6			18-66	144	10-16	144	6-8	144	2-4	144		
			8					14-22	205	8-12	205	4-6	205		
			10					16-26	263	8-14	263				
020, 027, 041, 047	493	200	2			8-24	58	4-6	58	2	68*				
			3			10-36	58	6-8	58	4	68*	2	94		
			4			14-40	87	8-12	87	4-6	87				
			6			20-72	144	12-18	144	6-10	144	4	144		
			8					14-24	205	8-12	205	4-6	205		
			10					18-30	263	10-16	263	4-8	263		
050	560	200	2			8-28	58	6	58	4	68*	2	94		
			3			12-42	58	8-10	58	4-6	68*	2	94		
			4			16-56	87	10-14	87	6-8	87	2-4	101**		
			6					14-20	144	8-12	144	4-6	144		
			8					14-20	205	10-16	205	4-8	205		
			10					24-34	263	12-20	263	4-10	263		
036, 045, 054, 063, 072	643	200	2			10-32	58	6-8	58	4	68*	2	94		
			3					8-12	58	4-6	68*	2	94		
			4			18-66	58	10-16	87	6-8	87	4	101**		
			6					16-24	144	8-14	144	4-6	144		
			8							10-18	205	6-8	205	2-4	205
			10					24-40	263	12-22	263	6-10	263		
056, 068, 079, 090	793	200	2			12-42	58	8-10	58	4-6	68*	2	94		
			3					10-14	58	6-8	68*	2-4	94		
			4					14-20	87	8-12	87	4-6	101**		
			6							10-18	144	4-8	144		
			8							14-24	205	6-12	205	4	205
			10					16-30	263	8-14	263				

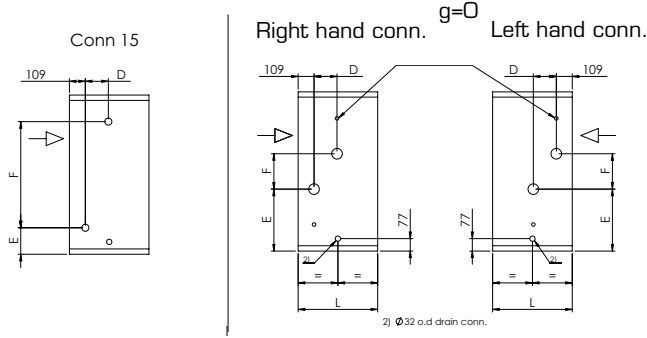
\*) With cupper tubes 58 mm

\*\*\*)101 mm for connection but 87 mm for nipple

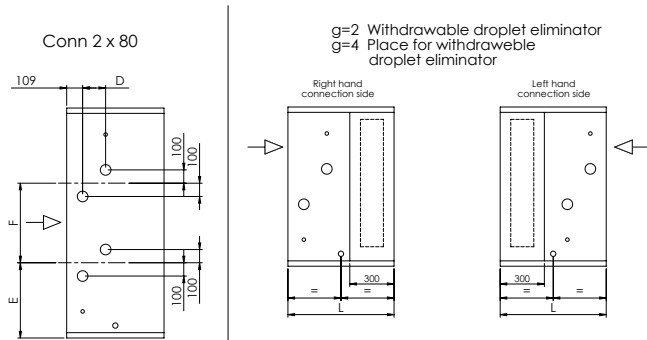
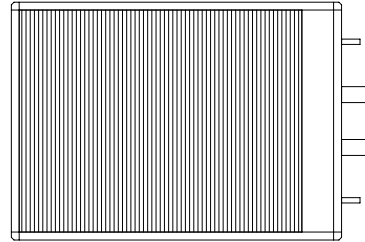
# Dimensions (mm)



## EQHN Air cooler in hygienic design, c=2



Normal face area c=2  
(non-withdrawable drain tray)



Output variant	L	
	g=0	g=2, 4
02	350	700
03	350	700
04	350	700
06	450	700
08	500	750
10	550	800

# Dimensions (mm)



EQHN Air cooler in hygienic design, c=2

Unit size	E	F	Out-put var	Connection dimensions at different number of VV and dimension D between connetions															
				15		25		32		50		80		2x80					
				VV	D	VV	D	VV	D	VV	D	VV	D	VV	D				
008	267	120	2			4-10	58	2	58										
			3			4-14	58			2	68*								
			4			6-20	87	4	87	2	87								
			6			8-30	144	6	144	4	144								
			8			12-40	205	6-10	205	4	205								
			10			12-50	263	8-12	263										
011	277	200	2			4-12	58	2	58										
			3			6-18	58	4	58	2	68*								
			4			6-26	87	4-6	87										
			6			10-38	144	6-8	144	4	144								
			8			14-52	205	8-12	205	4-6	205								
			10			18-64	263	10-16	263	6-8	263								
009, 014, 018	327	200	2			6-16	58	4	58	2	68*								
			3			8-24	58	4-6	58	2	68*								
			4			10-32	87	6-8	87	4	87								
			6			14-48	144	8-12	144	4-6	144								
			8			18-64	205	10-16	205	6-8	205	2-4	205						
			10			22-80	263	12-20	263	6-10	263								
023	393	200	2			6-20	58	4	58	2	68*								
			3			8-30	58	6	58	4	68*	2	94						
			4			12-40	87	6-10	87	4	87	2	101**						
			6			16-60	144	10-14	144	6-8	144	2-4	144						
			8					12-22	205	6-10	205	4	205						
			10				16-24	263	8-14	263									
032	443	200	2			6-22	58	4	58	2	68*								
			3			10-34	58	6-8	58	4	68*	2	94						
			4			12-46	87	8-10	87	4-6	87								
			6			18-68	144	10-16	144	6-8	144	4	144						
			8					14-22	205	8-12	205	4-6	205						
			10				18-28	263	10-16	263	4-8	263							
020, 027, 041, 047	477	200	2			8-24	58	4-6	58	2	68*								
			3			10-36	58	6-8	58	4	68*	2	94						
			4			14-50	87	8-12	87	4-6	87								
			6					12-18	144	6-10	144	4	144						
			8					16-24	205	8-14	205	4-6	205						
			10				18-30	263	10-16	263	4-8	263							
050	543	200	2			8-28	58	6	58	4	68*	2	94						
			3			12-42	58	8-10	58	4-6	68*	2	94						
			4			16-58	87	10-14	87	6-8	87	2-4	101**						
			6					14-20	144	8-12	144	4-6	144						
			8					18-28	205	10-16	205	4-8	205						
			10				22-36	263	12-20	263									
036, 045, 054, 063, 072	627	200	2			8-34	58	6	58	4	68*	2	94						
			3					8-12	58	4-6	68*	2	94						
			4			18-68	87	10-16	87	6-8	87	4	101**						
			6					16-24	144	8-14	144	4-6	144						
			8							10-18	205	4-8	205						
			10				24-42	263	14-22	263	6-12	263							
056, 068, 079, 090	777	200	2			12-42	58	8-10	58	4-6	68*	2	94						
			3					10-16	58	6-8	68*	2-4	94						
			4					14-20	87	8-12	87	4-6	101**						
			6							10-18	144	4-8	144						
			8							14-24	205	6-12	205	4	205				
			10					16-30	263	8-14	263								

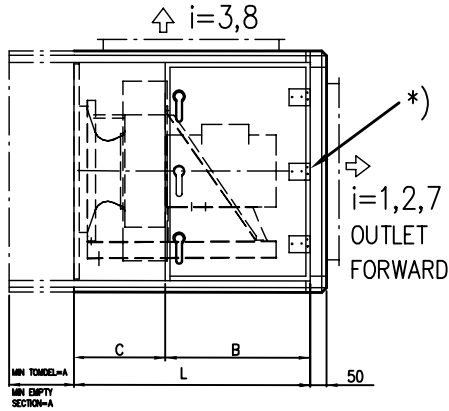
\*) With copper tubes 58 mm

\*\*\*)101 mm for connection but 87 mm for nipple

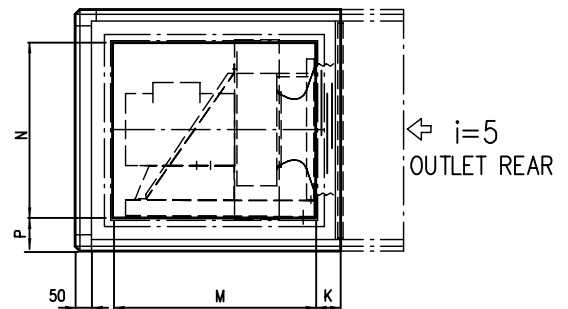
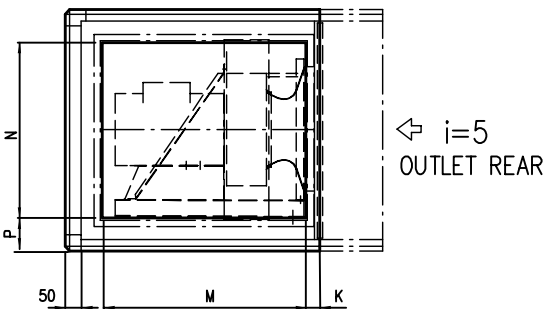
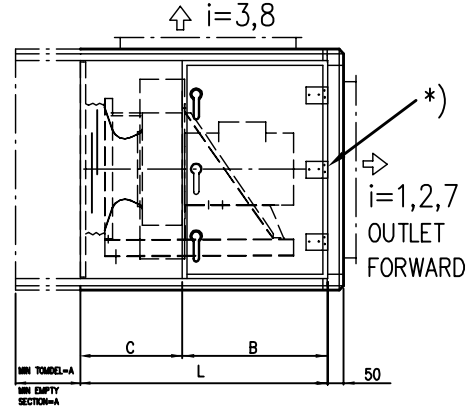
# Dimensions (mm)

## EQLK Plenum fan Centriflow Plus®

e=1



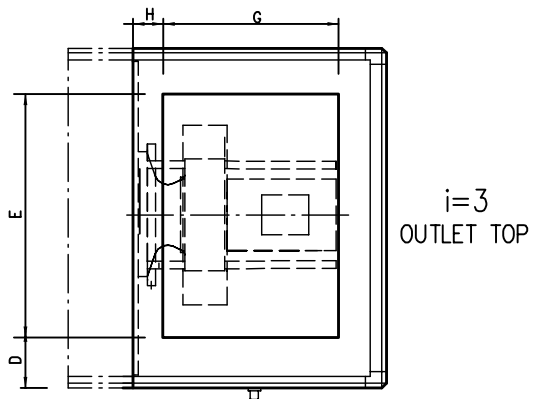
e=2



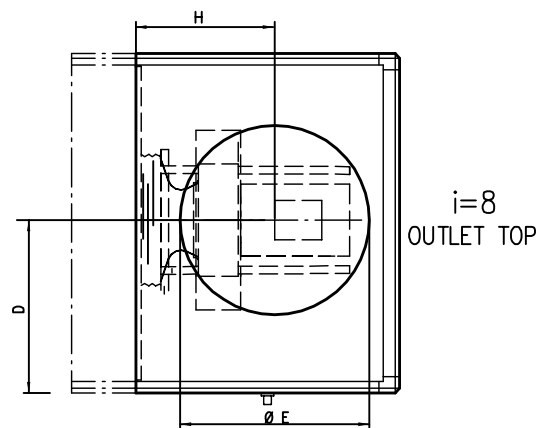
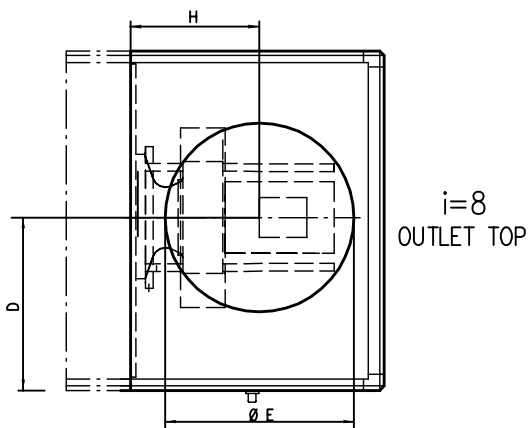
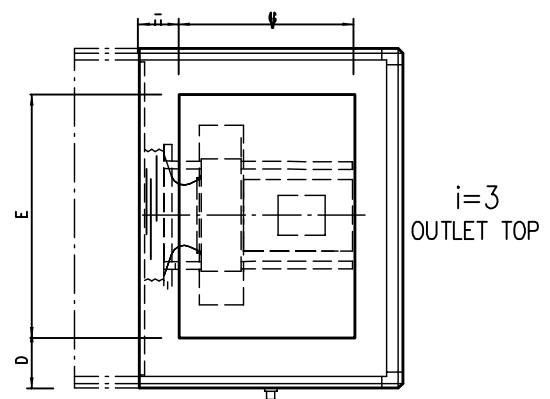
# Dimensions (mm)

## EQLK Plenum fan Centriflow Plus®

e=1



e=2



# Dimensions and Weights (mm and kg)

## EQLK Plenum fan Centriflow Plus®

			Empty section	Door	Door	Panel	Panel	i=3							Weight
Size aaa	b	Fan size	A	e=1 B	e=2 B	e=1 C	e=2 C	D	E	G	e=1 H	e=2 H	e=1 L	e=2 L	
005	2	025	50	400	400	150	250	185	500	300	100	200	550	650	23
008	2	028	100	400	400	150	250	185	800	400	100	200	550	650	32
	3	031	100	400	400	200	300						600	700	34
009	2	028	100	400	400	150	250	185	500	400	100	200	550	650	30
	3	031	100	400	400	200	300						600	700	32
011	2	035	100	400	400	250	350	200	800	400	100	200	650	750	48
	3	040	100	400	500	300	300						700	800	50
014	2	035	200	400	500	300	300	185	800	500	100	200	700	800	48
	3	040	200	400	500	300	300						700	800	50
018	2	040	200	400	500	300	300	185	1100	500	100	200	700	800	56
	3	045	200	450	550	300	300						750	850	66
020	2	040	200	400	500	300	300	185	800	600	50	150	700	800	54
	3	045	200	450	550	300	300				75	175	750	850	64
023	2	050	200	500	600	350	350	185	1400	600	100	200	850	950	79
	3	056	200	600	700	300	300						900	1000	95
027	2	050	250	500	600	350	350	185	1100	600	100	200	850	950	79
	3	056	300	600	700	300	300				150	250	900	1000	94
032	2	056	300	600	700	300	300	200	1400	800	50	150	900	1000	98
	3	063	300	600	700	350	350				75	175	950	1050	109
036	2	056	300	600	700	300	300	185	1100	800	50	150	900	1000	99
	3	063	300	600	700	350	350				75	175	950	1050	109
041	2	063	300	600	700	350	350	185	1700	800	75	175	950	1050	115
	3	071	350	600	700	400	400				100	200	1000	1100	134
045	2	063	300	600	700	450	450	185	1400	800	150	250	1050	1150	114
	3	071	400	600	700	550	550				1150	1250	129		
050	2	071	300	600	700	550	550	185	2000	800	150	250	1150	1250	140
	3	080	300	700	700	500	600				200	300	1200	1300	155
054	2	071	400	600	700	550	550	185	1700	1000	75	175	1150	1250	138
	3	080	400	700	700	500	600				100	200	1200	1300	152
056	2	071	400	600	700	550	550	185	1400	1000	75	175	1150	1250	135
	3	080	400	700	700	500	600				100	200	1200	1300	150
063	2	071	400	600	700	550	550	185	2000	1000	100	200	1150	1250	156
	3	080	400	700	700	500	600				1200	1300	157		
068	2	080	400	700	700	550	550	185	1700	1000	100	200	1200	1300	159
	3	090	400	700	700	500	600				1200	1300	193		
072	2	071	400	600	700	550	550	200	2200	1000	75	175	1150	1250	152
	3	080	400	700	700	500	600				100	200	1200	1300	165
079	2	080	400	700	700	500	600	185	2000	1000	100	200	1200	1300	203
	3	090	400	700	700	750	850				200	300	1400	1500	241
090	2	090	400	700	700	750	850	200	2200	1200	100	200	1400	1500	211
	3	100	400	700	700	850	950				1450	1550	253		

e=1 Rubber anti vibration

e=2 Steel spring anti vibration



# Dimensions and Weights (mm and kg)

## EQLK Plenum fan Centriflow Plus®

			Empty section	Door	Door	Panel	Panel	i=5							
Size aaa	b	Fan size	A	e=1 B	e=2 B	e=1 C	e=2 C	P	N	M	e=1 K	e=2 K	e=1 L	e=2 L	Weight
005	2	025	50	400	400	150	250	88	300	400	75	175	550	650	23
008	2	028	100	400	400	150	250	88	400	400	75	175	550	650	32
	3	031	100	400	400	200	300						600	700	34
009	2	028	100	400	400	150	250	88	600	400	75	175	550	650	30
	3	031	100	400	400	200	300						600	700	32
011	2	035	100	400	400	250	350	88	500	500	75	175	650	750	48
	3	040	100	400	500	300	300						700	800	50
014	2	035	200	400	500	300	300	88	600	600	50	150	700	800	48
	3	040	200	400	500	300	300						700	800	50
018	2	040	200	400	500	300	300	88	600	600	50	150	700	800	56
	3	045	200	450	550	300	300				75	175	750	850	66
020	2	040	200	400	500	300	300	138	800	600	50	150	700	800	54
	3	045	200	450	550	300	300				75	175	750	850	64
023	2	050	200	500	600	350	350	163	600	600	100	200	850	950	79
	3	056	200	600	700	300	300						900	1000	95
027	2	050	250	500	600	350	350	138	800	600	100	200	850	950	79
	3	056	300	600	700	300	300						900	1000	94
032	2	056	300	600	700	300	300	113	800	800	50	150	900	1000	98
	3	063	300	600	700	350	350				75	175	950	1050	109
036	2	056	300	600	700	300	300	188	1000	800	50	150	900	1000	99
	3	063	300	600	700	350	350				75	175	950	1050	109
041	2	063	300	600	700	350	350	138	1000	800	75	175	950	1050	115
	3	071	350	600	700	400	400				100	200	1000	1100	134
045	2	063	300	600	700	450	450	88	1200	800	100	200	1050	1150	114
	3	071	400	600	700	550	550						1150	1250	129
050	2	071	300	600	700	550	550	113	1000	1000	75	175	1150	1250	140
	3	080	300	700	700	500	600				100	200	1200	1300	155
054	2	071	400	600	700	550	550	88	1200	1000	75	175	1150	1250	138
	3	080	400	700	700	500	600				100	200	1200	1300	152
056	2	071	400	600	700	550	550	138	1400	1000	75	175	1150	1250	135
	3	080	400	700	700	500	600				100	200	1200	1300	150
063	2	071	400	600	700	550	550	88	1200	1000	75	175	1150	1250	156
	3	080	400	700	700	500	600				100	200	1200	1300	157
068	2	080	400	700	700	550	550	138	1400	1000	100	200	1200	1300	159
	3	090	400	700	700	500	600						1350	1450	193
072	2	071	400	600	700	550	550	88	1200	1000	75	175	1150	1250	152
	3	080	400	700	700	500	600				100	200	1200	1300	165
079	2	080	400	700	700	500	600	138	1400	1000	100	200	1200	1300	203
	3	090	400	700	700	750	850						1450	1550	241
090	2	090	400	700	700	750	850	138	1400	1200	100	200	1450	1550	211
	3	100	400	700	700	850	950						1550	1650	253

e=1 Rubber anti. vibration

e=2 Steel spring anti-vibration

# Dimensions and Weights (mm and kg)

EQLK Plenum fan Centriflow Plus® with EC motor

Unit size		Fan size	Empty section A	Door		Panel		i=3						Weight	
aaa	b			e=1 B	e=2 B	e=1 C	e=2 C	D	E	G	e=1 H	e=2 H	e=1 L		e=2 L
005	2	025	50	450	550	0	0	150	500	300	100	200	450	550	21
008	2	028	50	500	600	0	0	150	800	300	100	200	500	600	28
	3	031	50	500	600	0	0						500	600	29
009	2	028	100	500	600	0	0	150	500	300	100	200	500	600	26
	3	031	100	500	600	0	0						500	600	27
011	2	035	100	550	650	0	0	300	800	400	100	200	550	650	41
	3	040	100	600	700	0	0						600	700	43
014	2	035	150	400	500	300	300	200	800	400	100	200	700	800	40
	3	040	150	400	500	300	300						700	800	42
018	2	040	150	400	500	300	300	200	1100	400	100	200	700	800	49
	3	045	150	-	-	-	-						-	-	-
020	2	040	200	400	500	300	300	200	800	600	50	150	700	800	46
	3	045	200	-	-	-	-						-	-	-
023	2	050	150	-	-	-	-	-	-	-	-	-	-	-	-
027	2	050	250	-	-	-	-	-	-	-	-	-	-	-	-

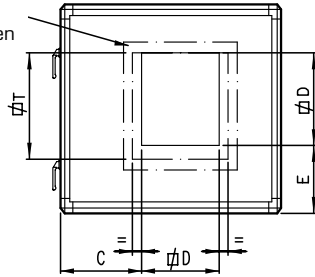
Unit size		Fan size	Empty section A	Door		Panel		i=5						Weight	
aaa	b			e=1 B	e=2 B	e=1 C	e=2 C	P	N	M	e=1 K	e=2 K	e=1 L		e=2 L
005	2	025	50	450	550	0	0	88	300	300	75	175	450	550	21
008	2	028	50	500	600	0	0	88	400	300	100	200	500	600	28
	3	031	50	500	600	0	0						500	600	29
009	2	028	100	500	600	0	0	88	600	300	100	200	500	600	26
	3	031	100	500	600	0	0						500	600	27
011	2	035	100	550	650	0	0	88	500	400	75	175	550	650	41
	3	040	100	600	700	0	0						600	700	43
014	2	035	150	400	500	300	300	88	600	500	100	200	700	800	40
	3	040	150	400	500	300	300						700	800	42
018	2	040	150	400	500	300	300	88	600	500	100	200	700	800	49
	3	045	150	-	-	-	-						-	-	-
020	2	040	200	400	500	300	300	138	800	600	50	150	700	800	46
	3	045	200	-	-	-	-						-	-	-
023	2	050	150	-	-	-	-	-	-	-	-	-	-	-	-
027	2	050	250	-	-	-	-	-	-	-	-	-	-	-	-

Unit size		Fan size	i=8						
aaa	b		D	E	G	e=1 H	e=2 H	e=1 L	e=2 L
005	2	025	400	Ø315	-	225	325	450	650
008	2	028	550	Ø400	-	275	375	550	650
	3	031						600	700
009	2	028	400	Ø500	-	275	375	550	650
	3	031						600	700

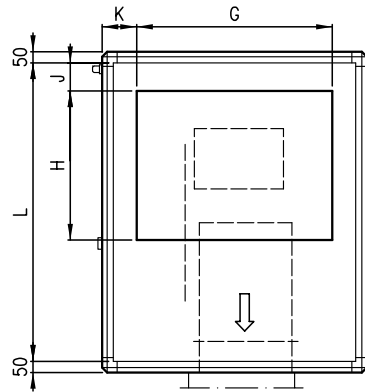
# Dimensions (mm)

## EQLR Centrifugal fan, belt driven

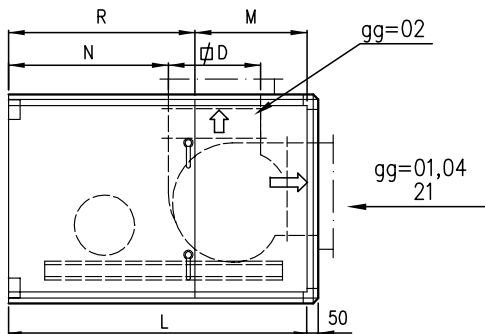
- EQAZ-25 Flexible connection
- EQAZ-26 Duct connection piece
- EQAZ-27 Counter-flange
- EQAZ-28 Protective screen



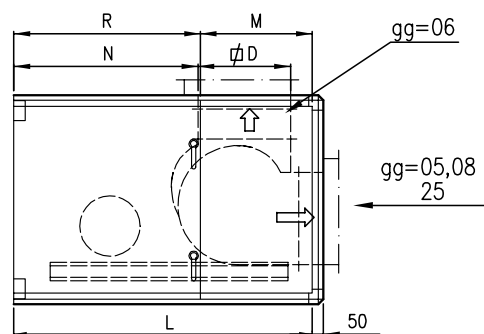
Fan with top inlet  
Fan section viewed from above



gg=01,02,04,21



gg=05,06,08,25



# Dimensions and Weights (mm and kg)

EQLR Centrifugal fan, belt driven

Size		Fan size	Outlet forward																Weight
			gg=21,25						gg=01, 21		gg=04		gg=05, 25		gg=08				
aaa	b	C	D	G	H	J	K	E*	E**	L	M	L	M	L	M	L	M		
008	3	022	405	290	800	500	100	150	-	97	950	250	1000	300	950	250	1000	300	85
009	2	022	255	290	500	500	100	150	231	97	950	250	1000	300	950	250	1000	300	85
	3	025	240	320					234	110	1000	300	1050	350	1000	300	1000	300	95
011	2	025	440	320	800	500	100	200	234	110	1000	300	1050	350	1000	300	1000	300	95
014	2-	028	370	360	800	500	100	150	244	101	1050	350	1100	400	1050	350	1050	350	109
	3-	031	348	404					252	98	1100	400	1100	400	1050	350	1100	400	114
018	2-	031	498	404	800	500	100	300	252	98	1100	400	1100	400	1050	350	1100	400	143
020	2-	031	348	404	800	800	100	150	252	98	1100	400	1100	400	1050	350	1100	400	128
	3	035	323	454					286	100	1300	600	1300	600	1300	600	1350	650	160
023	2s	035	890	454	1100	800	100	300	373	189	1100	400	1100	400	1100	400	1100	400	190
	3	040	598	504					324	123	1400	500	1400	500	1400	500	1400	500	200
027	2	035	473	454	1100	800	100	150	286	100	1300	400	1300	400	1300	400	1350	450	186
	3	040	448	504					309	108	1400	500	1400	500	1400	500	1400	500	200
032	2s	040	917	504	1100	800	100	350	421	189	1150	450	1150	450	1150	450	1150	450	195
	3	045	615	570					356	133	1500	600	1500	600	1500	600	1500	600	225
036	2	040	448	504	1100	1000	100	150	309	108	1400	500	1400	500	1400	500	1400	500	221
	3	045	415	570					331	108	1500	600	1500	600	1500	600	1500	600	225
041	2s	045	970	570	1100	800	100	450	407	183	1200	300	1200	300	1200	300	1200	300	280
	3	050	680	640					332	98	1600	700	1600	700	1600	700	1600	700	300
045	2s	045	820	570	1100	1000	100	300	397	173	1200	300	1200	300	1200	300	1200	300	280
	3	050	530	640					1400	150	367	133	1600	700	1600	700	1600	700	1600
047	2s	045	1120	570	1400	1000	100	450	407	173	1200	300	1200	300	1200	300	1200	300	280
	3	050	830	640					332	98	1600	700	1600	700	1600	700	1600	700	335
050	2s	050	1124	640	1400	1000	100	450	477	251	1300	400	1300	400	1300	400	1300	400	335
	3	056	793	714					406	133	1800	900	1800	900	1800	900	1800	900	425
054	2s	050	974	640	1400	1000	100	300	477	251	1300	400	1300	400	1300	400	1300	400	417
	3s	056	939	714					540	266	1500	600	1500	600	1500	600	1500	600	380
056	2	050	530	640	1400	1200	100	150	367	133	1600	700	1600	700	1600	700	1600	700	313
	3	056	493	714					406	133	1800	900	1800	900	1800	900	1800	900	410
063	2s	056	1121	714	1400	1200	100	450	540	266	1500	600	1500	600	1500	600	1500	600	450
	3	063	750	800					453	144	1900	1000	1900	1000	1900	1000	1900	1000	460
068	2s	056	939	714	1400	1200	100	300	540	266	1500	600	1500	600	1500	600	1500	600	411
	3	063	600	800					1600	200	453	144	1900	1000	1900	1000	1900	1000	1900
072	2s	056	1271	714	1400	1000	50	600	530	256	1500	600	1500	600	1500	600	1500	600	405
	3	063	900	800					443	134	1900	1000	1900	1000	1900	1000	1900	1000	465
079	2s	056	1121	714	1400	1400	50	450	569	296	1500	600	1500	600	1500	600	1500	600	424
	3	063	1050	800					606	296	1500	600	1500	600	1500	600	1500	600	463
090	2s	063	1200	800	1400	1400	50	100	606	296	1500	600	1500	600	1500	600	1500	600	463
	3	071	1173	900					653	296	1600	700	1600	700	1600	700	1600	700	524

\*) gg=01,02,04,21

\*\*) gg=05,06,08,25

## Dimensions and Weights (mm and kg)

EQLR Centrifugal fan, belt driven

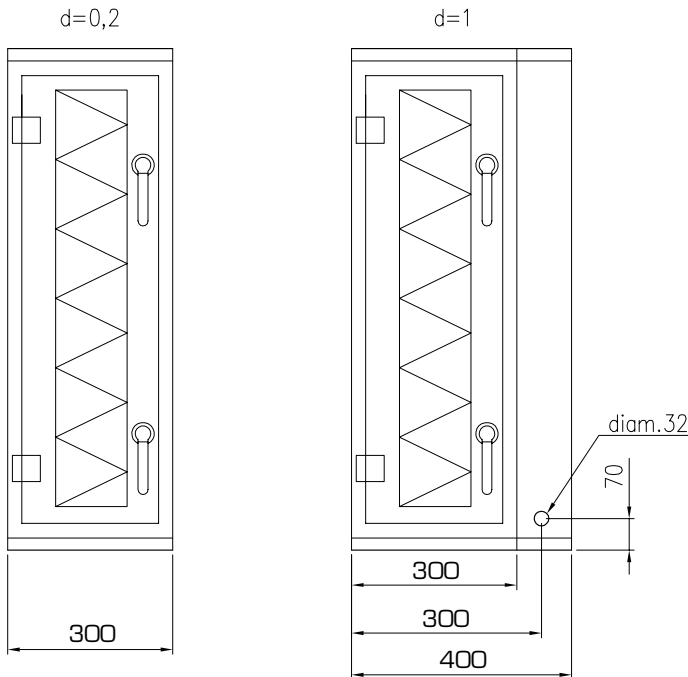
Outlet up											
Size aaa b		Fan size	gg=02			gg=06			Weight	R	T
			L	M	N*	L	M	N**			
008	3	022	950	250	512	1000	300	660	85	700	300
009	2	022	950	250	512	1000	300	660	85	700	300
	3	025	1000	300	516	1000	300	625	95		400
011	2	025	1000	300	516	1000	300	625	95	700	400
014	2-	028	1100	400	544	1150	450	750	115	700	400
	3-	031	1100	400	544	1150	450	686	120		500
018	2-	031	1150	450	531	1150	450	686	150	700	500
020	2-	031	1150	450	531	1150	450	686	135	700	500
	3	035	1300	600	607	1350	650	841	160		
023	2s	035	1100	400	407	1100	400	571	190	700	500
	3	040	1400	500	629	1400	500	836	200	900	600
027	2	035	1300	400	607	1350	450	841	186	900	500
	3	040	1400	500	629	1450	550	886	200		600
032	2s	040	1150	450	504	1150	450	566	195	700	500
	3	045	1500	600	634	1500	600	870	225	900	600
036	2	040	1400	500	629	1450	550	886	221	900	600
	3	045	1500	600	634	1550	650	920	250		
041	2s	045	1300	400	434	1300	400	650	280	900	600
	3	050	1600	700	642	1600	700	910	300		800
045	2s	045	1300	400	434	1300	400	650	280	900	600
	3	050	1600	700	642	1600	700	910	275		800
047	2s	045	1300	400	434	1300	400	650	280	900	600
	3	050	1600	700	642	1600	700	910	335		800
050	2s	050	1300	400	346	1300	400	595	335	900	800
	3	056	1800	900	736	1800	900	1021	425		
054	2s	050	1300	400	346	1300	400	595	417	900	800
	3s	056	1500	600	406	1500	600	711	380		
056	2	050	1600	700	642	1600	700	905	313	900	800
	3	056	1800	900	736	1800	900	1021	410		
063	2s	056	1500	600	406	1500	600	711	450	900	800
	3	063	1900	1000	708	1900	1000	1045	460	900	1000
068	2s	056	1500	600	406	1500	600	711	411	900	800
	3	063	1900	1000	708	1900	1000	1045	460		1000
072	2s	056	1500	600	406	1500	600	711	405	900	800
	3	063	1900	1000	708	1900	1000	1045	465		1000
079	2s	056	1500	600	406	1500	600	711	425	900	800
	3	063	1600	700	384	1600	700	733	475		1000
090	2s	063	1600	700	384	1600	700	733	475	900	1000
	3	071	1800	900	460	1800	900	820	550		1000

\*) gg=01,02,04,21

\*\*) gg=05,06,08,25

# Dimensions and Weights (mm and kg)

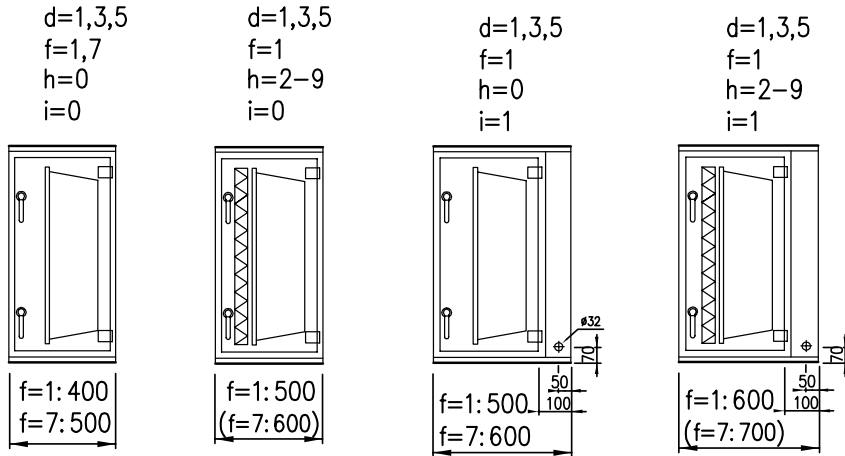
## EQPA Panel filter



Size	Weight (kg)	
	d=0, 2	d=1
005	15	18
008	18	22
009	20	22
011	22	25
014	25	30
018	30	35
020	35	40
023	35	40
027	35	40
032	45	50
036	45	50
041	45	50
045	50	50
050	55	60
054	55	60
056	60	60
063	65	75
068	70	80
072	65	75
079	75	85
090	85	95

# Dimensions and Weights (mm and kg)

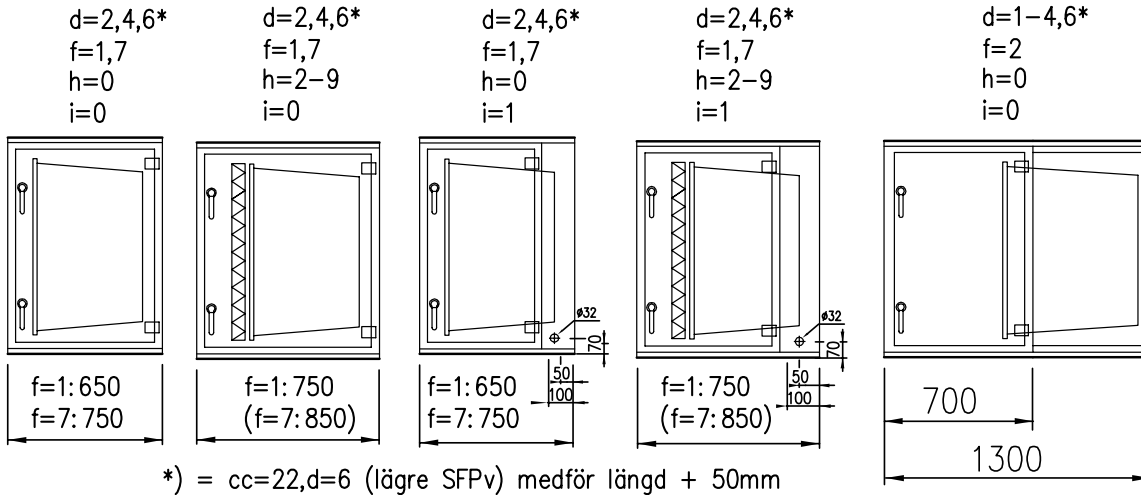
## EQPB Filter



d=1,3,5 f=1,7				
	h=0, i=0	h=2-9, i=0	h=0, i=1	h=2-9, i=1
Size	Weight, kg	Weight, kg	Weight, kg	Weight, kg
005	10	10,5	13	14
008	10	11	14	16
009	11	11,5	14	15
011	12	13	16,5	18,5
014	13	14	17	19
018	19	20,5	24,5	26,5
020	19	20	23	25
023	19	20,5	25,5	28
027	25	27,5	30,5	33,5
032	26	29	33	38
036	27	29,5	32,5	35,5
041	29	32,5	36,5	41,5
045	33	26	39,5	33,5
050	33	37,5	42	48
054	40	43,5	47,5	52,5
056	40	43,5	46,5	50,5
063	41	45,5	50	56
068	51	55	58,5	64
072	42	47	52	59
079	52	56,5	61	67
090	59	65	69	77

# Dimensions and Weights (mm and kg)

## EQPB Filter



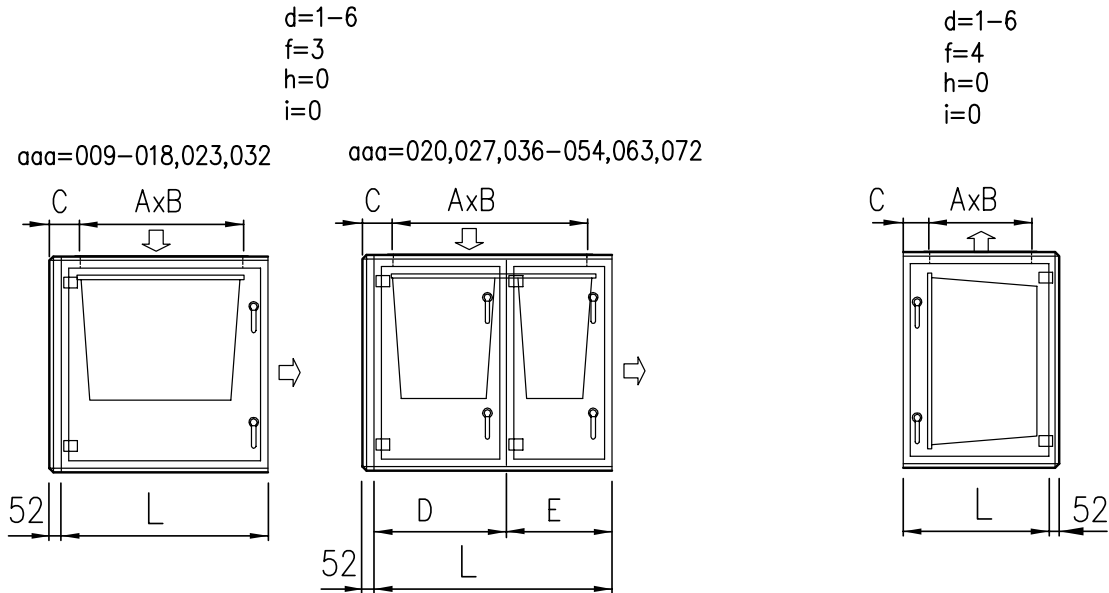
	d=2,4,6 f=1,7*				d=1-4.6 f=2
	h=0, i=0	h=2-9, i=0	h=0, i=1	h=2-9, i=1	h=0, i=0
Size	Weight, kg	Weight, kg	Weight, kg	Weight, kg	Weight, kg
005	10	10,5	13,5	15	10
008	10	11	15	17	10
009	11	11,5	14,5	16	11
011	12	13	17,5	19,5	12
014	13	14	18	20	13
018	19	20,5	25	28,5	19
020	19	20	24	26	19
023	19	20,5	26,5	30	19
027	25	27,5	31	35,5	25
032	26	29	34	30	26
036	27	29,5	33	37,5	27
041	29	32,5	38	44	29
045	33	26	40,5	35,5	33
050	33	37,5	43,5	50,5	33
054	40	43,5	49	55	40
056	40	43,5	47,5	53	40
063	41	45,5	50,5	58,5	41
068	51	55	60	66,5	51
072	42	47	54	62	42
079	52	56,5	62,5	69,5	52
090	59	65	71	80	59

\*) Function extended 100 mm



# Dimensions and Weights (mm and kg)

## EQPB Filter



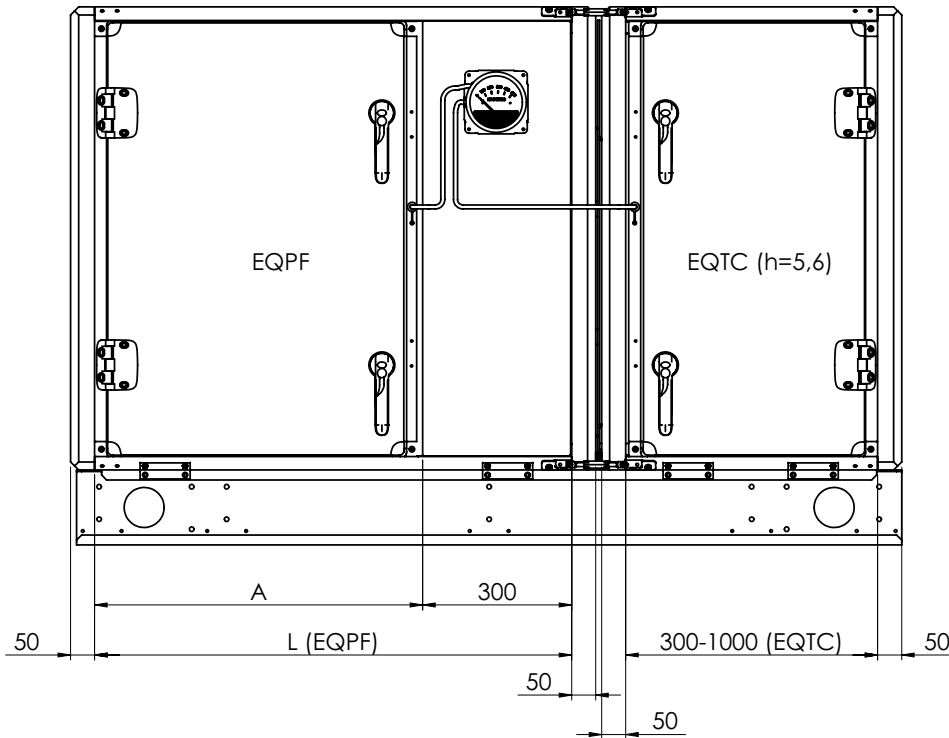
Size	d=1-6 f=3							d=1-6 f=4				
	A	B	L	C	D	E	Weight, kg	A	B	C	L	Weight, kg
005*	-	-	-	-	-	-	-	Ø350	-	300**	700	10
005	-	-	-	-	-	-	-	Ø300	700	200	700	10
008*	Ø400	-	550	300**	550	-	10	Ø400	-	325**	700	11
008	300	880	-	200	550	-	10	Ø400	-	325**	700	10
009*	Ø500	-	750	350*	750	-	11	Ø500	-	375**	700	11
009	500	500	750	200	750	-	11	Ø500	-	375**	700	11
011	400	800	650	200	650	-	12	400	800	125	700	12
014	500	800	750	200	750	-	13	500	800	125	700	13
018	500	1100	750	200	750	-	19	500	1100	125	700	19
020	800	800	1150	300	750	400	19	600	800	125	900	19
023	600	1400	750	150	750	-	19	600	1400	125	900	19
027	800	1100	1150	300	750	400	25	600	1200	125	900	25
032	800	1400	950	150	950	-	26	600	1400	125	900	26
036	1000	1100	1450	300	750	700	27	600	1200	125	900	27
041	800	1700	1150	300	750	400	29	600	1700	125	900	29
045	1000	1400	1450	300	750	400	33	600	1400	125	900	33
050	800	2000	1250	300	650	600	33	600	2000	125	900	33
054	1000	1700	1450	300	750	700	40	600	1700	125	900	40
056	-	-	-	-	-	-	-	600	1400	125	900	40
063	1000	2000	1450	300	750	700	41	600	2000	125	900	41
068	-	-	-	-	-	-	-	600	1700	125	900	51
072	1000	2200	1450	300	750	700	42	600	2200	125	900	42
079	-	-	-	-	-	-	-	600	2000	125	900	52
090	-	-	-	-	-	-	-	600	2200	125	900	59

\* ) Round connection  
 \*\* ) To the centre of the hole

# Dimensions and Weights (mm and kg)



## EQPF HEPA filter



Unit size	Weight, kg
005	14.5
009	21.3
014	32.4
018	35.9
020	43.2
027	47.9
036	54.4
041	67.1
045	75.2
047	77.0
054	79.8
056	94.7
063	97.0
068	100.8
072	102.3
079	128.3
090	128.6

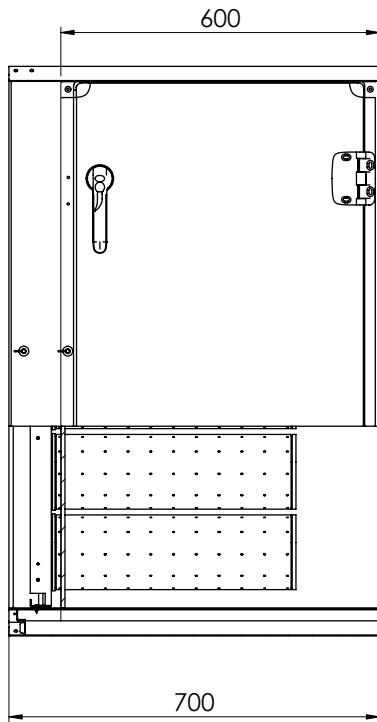
EQPF should always be ordered together with EQTC (h=5,6) on a common base frame EQAZ-04.  
Both EQPF and EQTC must have casing EQGB.

Code bb	A	L
09	600	900
10	700	1000
11	800	1100
12	900	1200

# Dimensions and Weights (mm and kg)



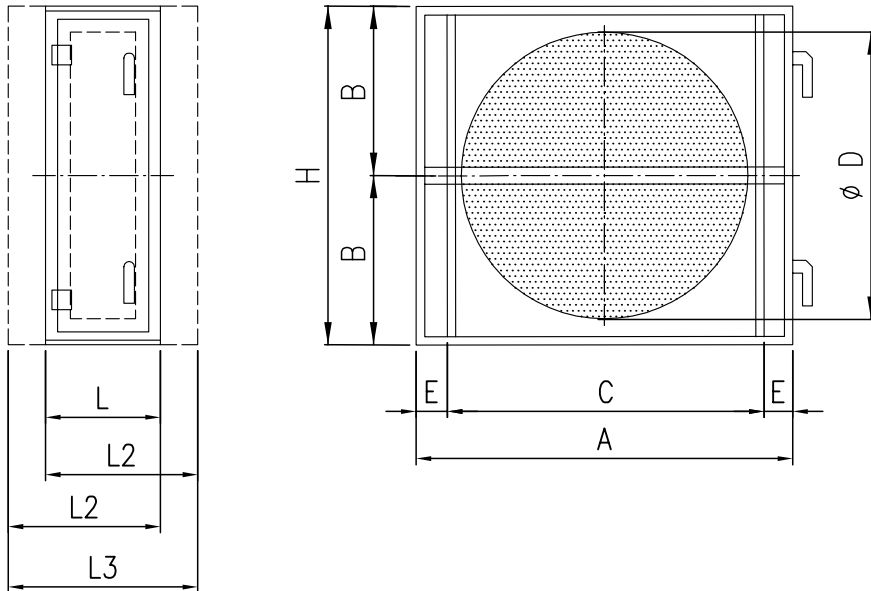
## EQPK Carbon filter



Unit size	Weight, kg
005	26
008	56
009	51
011	66
014	75
018	100
020	112
023	155
027	149
032	159
036	199
041	223
045	248
047	260
050	303
054	297
056	309
063	346
068	371
072	395
079	432
090	493

## Dimensions and Weights (mm and kg)

### EQRB Rotary heat exchanger REGOTERM®

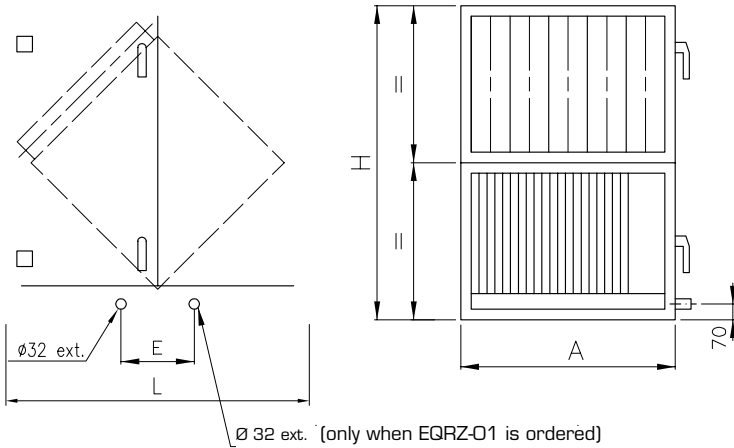


Size	A	B	C	D	E	H	L	L2	L3	Weight, kg
005	-	476	800	600	-	952	300	350	400	44
008	-	576	1100	900	-	1152	300	350	400	77
009*	1400	776	800	1200	300	1552	300	-	-	162
011	-	676	1200	1000	-	1352	300	400	500	95
014*	1400	776	1100	1200	150	1552	300	-	-	150
018	-	776	1400	1200	-	1552	300	450	600	128
020*	1800	1076	1100	1600	350	2152	300	-	-	274
023	-	926	1700	1530	-	1852	300	450	600	190
027*	1800	1076	1400	1600	200	2152	300	-	-	256
032	-	1026	1800	1630	-	2052	300	550	800	217
036*	2400	1376	1400	2200	500	2752	350	-	-	480
041	-	1076	2000	1830	-	2152	350	-	-	262
045*	2400	1376	1700	2200	350	2752	350	-	-	456
047	-	1076	2300	1800	-	2152	350	-	-	277
050	-	1226	2300	2130	-	2452	350	-	-	344
054*	2600	1376	2000	2400	300	2752	350	-	-	503
056	3000	1676	1700	2700	600	3352	350	-	-	895
063*	2600	1376	2300	2400	150	2752	350	-	-	479
068	3000	1676	2000	2700	450	3352	350	-	-	870
072	-	1376	2600	2400	-	2752	350	-	-	434
079	3000	1676	2300	2700	300	3352	350	-	-	845
090	3300	1676	2600	3000	300	3352	350	-	-	930

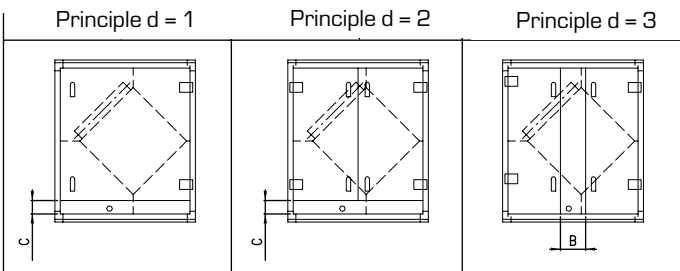
\* eQ PLUS

# Dimensions and Weights (mm and kg)

EQRC Plate heat exchanger  
RECUTERM®



Principle for inspection doors

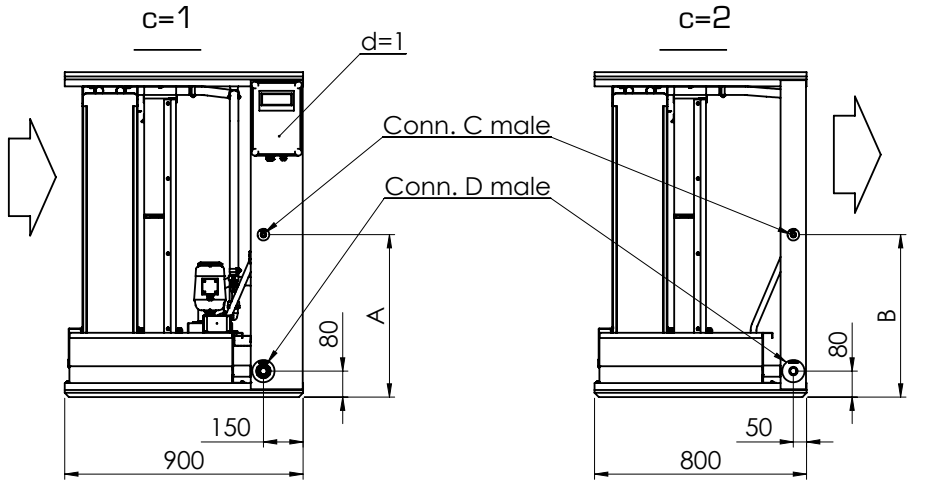


Size	A	B		C		E		H	L		Weight, kg		Insp.principle D	
		Standard	Small	Standard	Small	Standard	Small		Standard	Small	Standard	Small		
005	800	-	-	180	-	275	-	952	750	-	35	-	1	-
008	1000	-	-	130	130	415	275	1152	1000	750	65	35	2	1
009	800	-	-	180	180	560	415	1552	1400	1000	70	45	2	2
011	1200	-	-	130	130	415	-	1352	1000	900	80	55	2	2
014	1100	-	-	180	180	560	415	1552	1400	1000	90	60	2	2
018	1400	-	-	180	180	560	415	1552	1400	1000	115	80	2	2
020	1100	800	-	-	100	-	560	2152	190	100	190	100	3	2
023	1700	-	-	180	180	560	560	1852	130	120	130	120	2	2
027	1400	800	-	-	100	-	560	2152	240	100	240	100	3	2
032	1800	800	-	-	200	-	560	2052	280	130	280	130	3	2
036	1400	800	650	-	-	-	-	2752	260	220	260	220	3	3
041	2000	800	-	-	100	-	560	2152	320	160	320	160	3	2
045	1700	1000	650	-	-	-	-	2752	320	270	320	270	3	3
047	2300	800	-	-	100	-	-	2152	370	180	370	180	3	2
050	2300	700	700	-	-	-	-	2452	370	235	370	235	3	3
054	2000	1000	650	-	-	-	-	2752	385	330	385	330	3	3
063	2300	1000	650	-	-	-	-	2752	440	370	440	370	3	3
072	2600	1000	650	-	-	-	-	2752	500	410	500	410	3	3

# Dimensions and Weights (mm and kg)



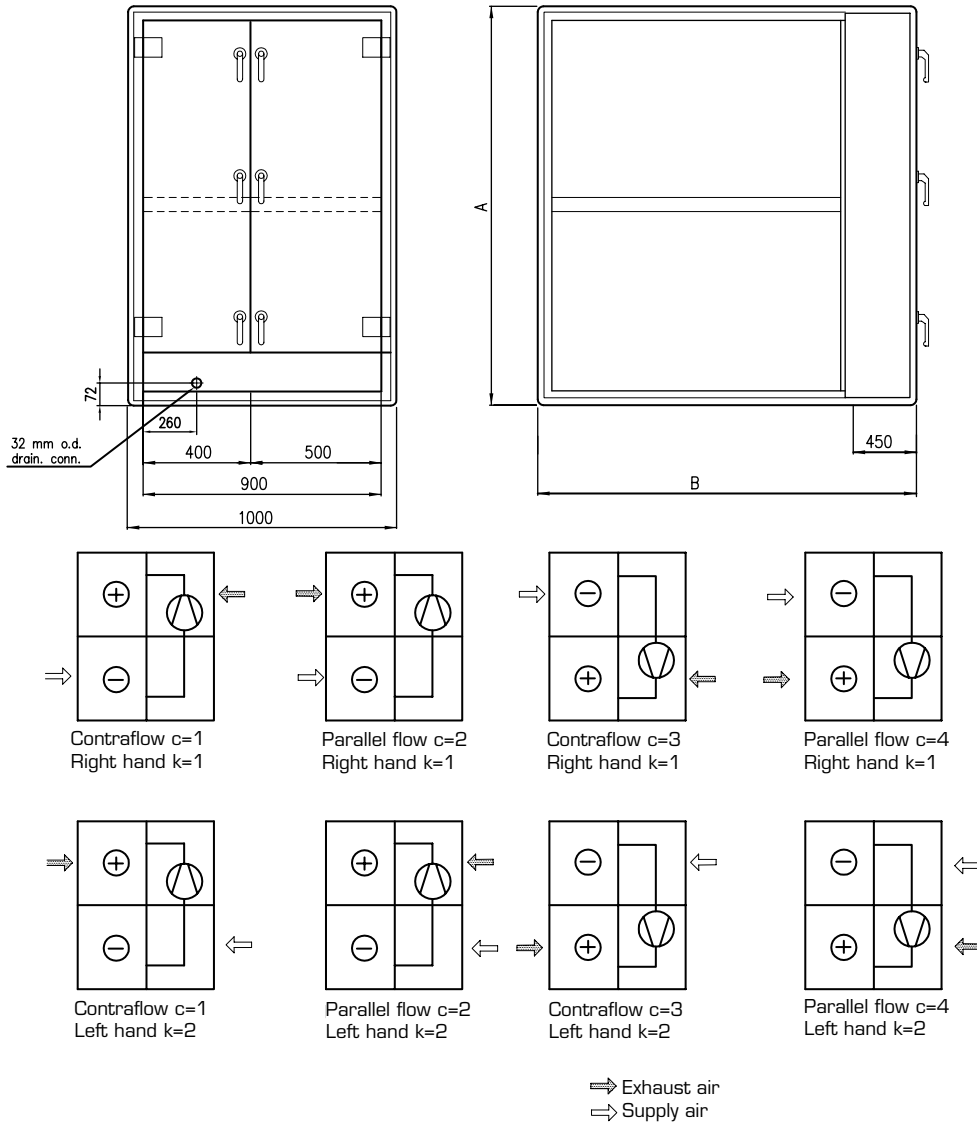
## EQQA Humidifier



Size	Water supply			Water draining	c=1 Weight	c=2 Weight	Area humid.fill
	A	B	C	D	Kg	Kg	M <sup>2</sup>
009	300	450	15 (1/2")	Ø 32	60	48	0.230
011	300	450	15 (1/2")	Ø 32	74	62	0.315
014	300	450	15 (1/2")	Ø 32	85	74	0.339
018	300	450	15 (1/2")	Ø 32	74	62	0.459
020	550	550	15 (1/2")	Ø 32	87	75	0.594
023	550	550	15 (1/2")	Ø 32	101	89	0.750
027	550	550	15 (1/2")	Ø 32	118	106	0.804
032	550	550	15 (1/2")	Ø 32	110	98	0.960
036	550	550	15 (1/2")	Ø 32	138	126	1.091
041	550	550	15 (1/2")	Ø 32	157	145	1.170
045	550	550	15 (1/2")	Ø 32	119	107	1.351
047	550	550	15 (1/2")	Ø 32	125	114	1.365
050	550	550	20 (3/4")	2 x Ø 32	154	142	1.575
054	550	550	15 (1/2")	Ø 32	175	163	1.636
056	550	550	15 (1/2")	Ø 32	163	141	1.778
063	550	550	20 (3/4")	2 x Ø 32	170	157	1.890
068	550	550	15 (1/2")	Ø 32	187	175	2.153
072	550	550	20 (3/4")	2 x Ø 32	206	194	2.160
079	550	550	20 (3/4")	2 x Ø 32	197	184	2.511
090	550	550	20 (3/4")	2 x Ø 32	225	212	2.870

# Dimensions and Weights (mm and kg)

## EQKA COOLER

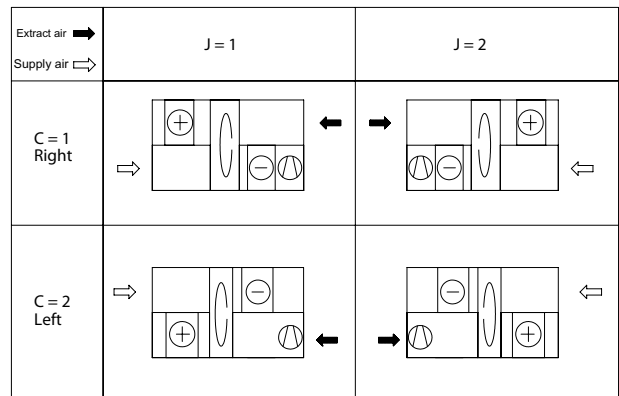
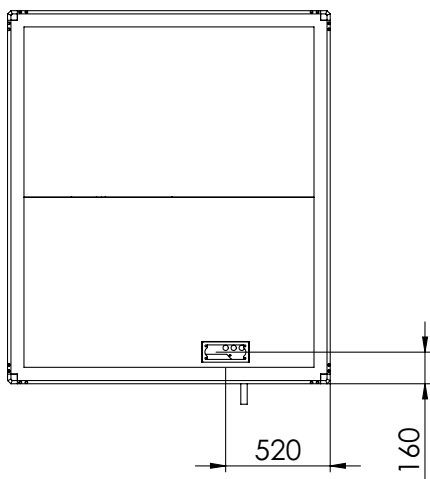
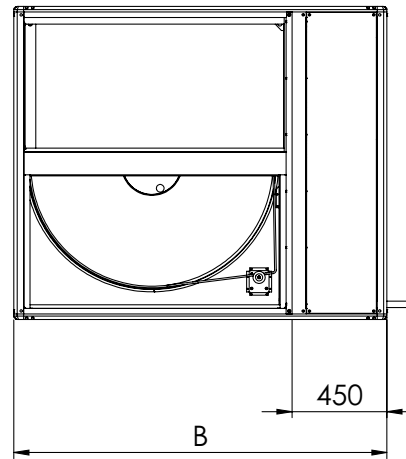
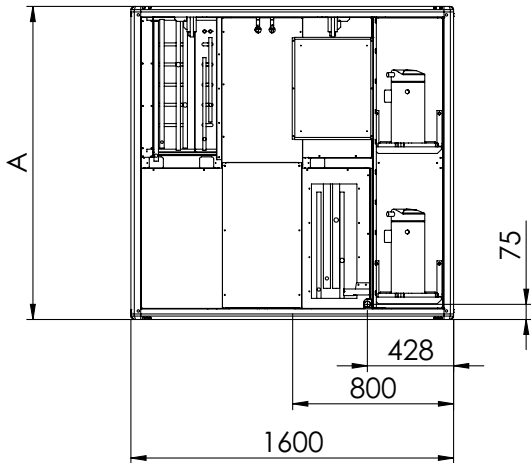


Size	A	B	Weight, kg	
			Output variant 1	Output variant 2
008	1152	1550	178	193
011	1352	1650	206	232
018	1552	1850	248	326
023	1852	2150	336	443
032	2052	2250	380	476
041	2152	2450	484	623
050	2452	2750	631	701
072	2752	3050	841	1024

# Dimensions and Weights (mm and kg)



## EQKB ReCooler



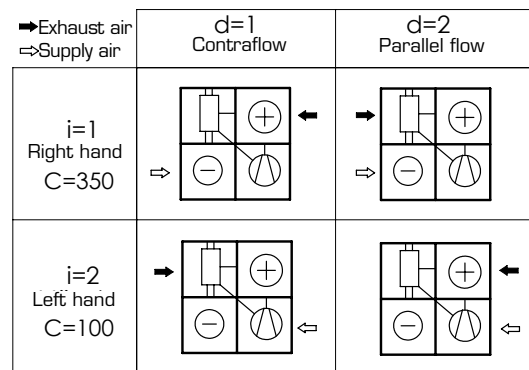
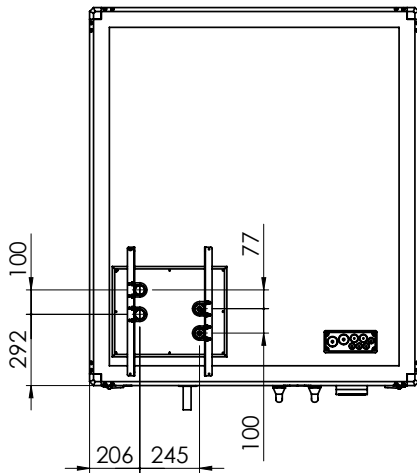
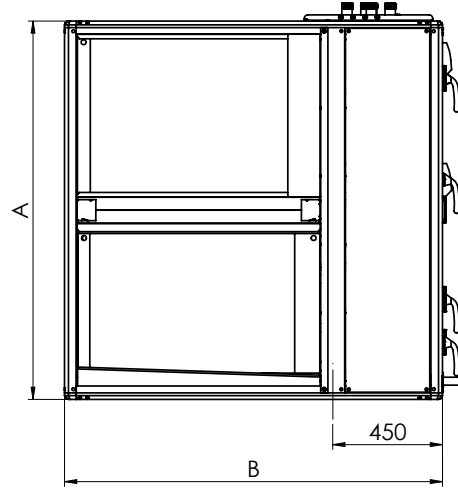
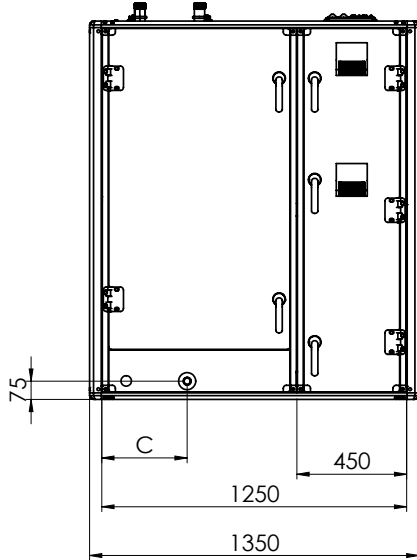
Size	A	B	Weight kg (excl. casing)
008	1152	1550	300
011	1352	1650	400
018	1552	1850	500
023	1852	2150	600
032	2052	2250	700
041	2152	2450	800
050	2452	2750	1000
072	2752	3050	1300



# Dimensions and Weights (mm and kg)



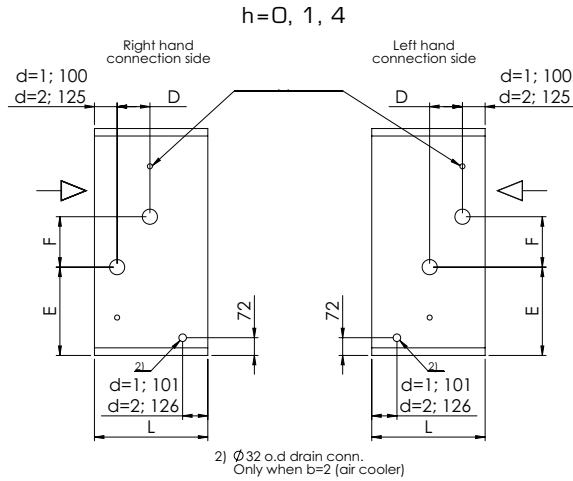
## EQKC Combi Cooler



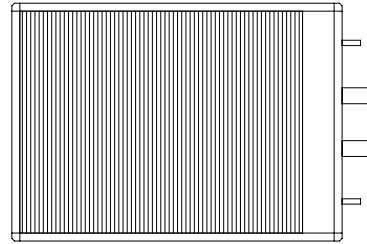
Storlek	A	B	Weight kg (excl. casing)
014	1552	1550	330 - 385
018	1552	1850	385 - 440
023	1852	2150	475 - 555
032	2052	2250	555 - 730
041	2152	2450	690 - 815

# Dimensions (mm)

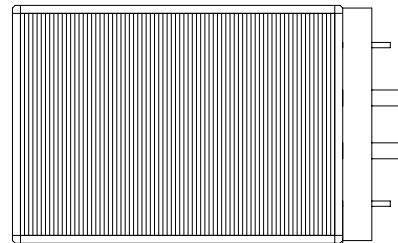
## EQRF ECOTERM®



Normal face area c=1



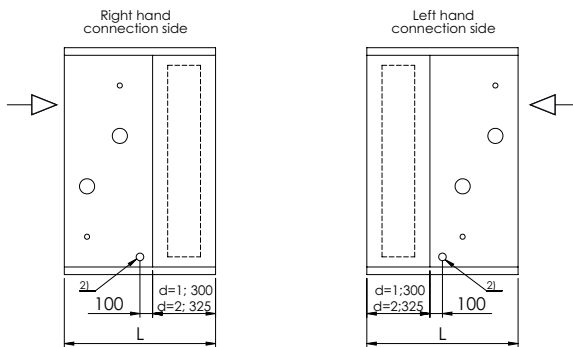
Max face area c=2



Size 005-018 : 100

Size 020-090 : 150

h=2 withdrawable droplet eliminator



Output variant c (rr)	L							
	b=1 (heater)	c=1 (normal size)			b=1 (värmare)	c=2 (full size)		
		b=2 (cooler)				b=2 (cooler)		
		h=0	h=1,4	h=2		h=0	h=1,4	h=2
1 (4)	500	500	500	600	550	550	550	650
2 (6)	500	500	600	650	550	550	650	700
3 (8)	500	600	600	750	550	650	650	800
4 (10)	500	600	700	800	550	650	750	850

Dimensions on next page.

# Dimensions (mm)

## EQRF ECOTERM®

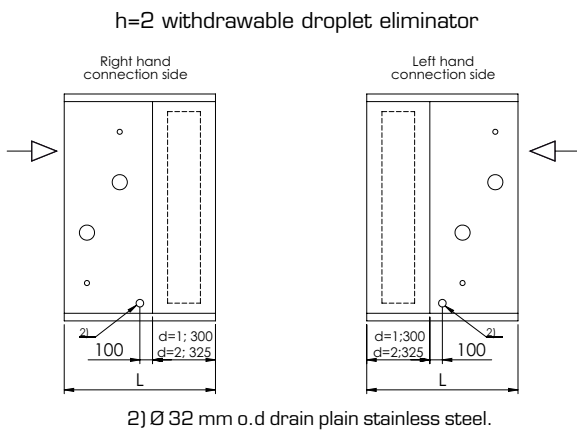
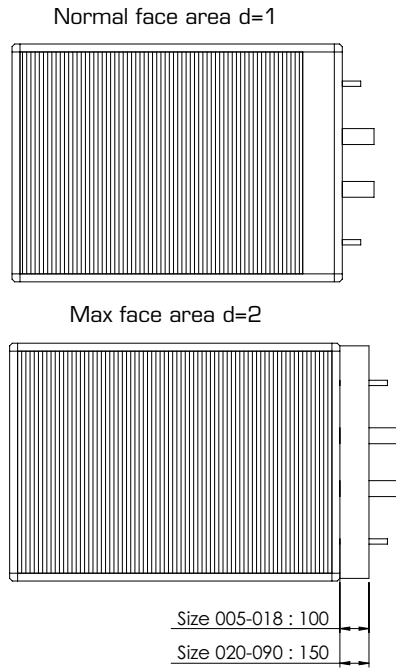
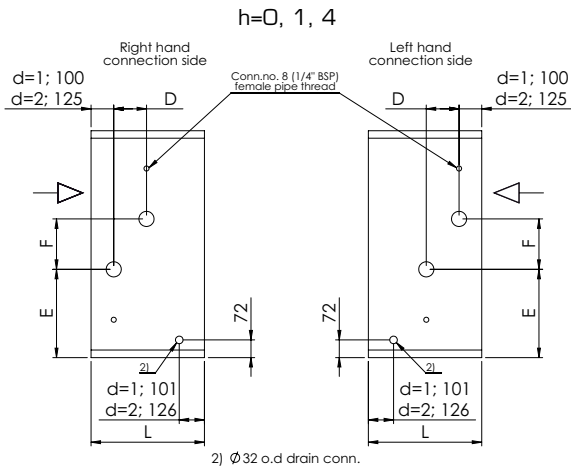
Unit size	E	F	Output var.	Connection dimensions at different number of VV and dimension D between connetions							
				25		32		50		80	
				VV	D	VV	D	VV	D	VV	D
005	191	120	1	6-18	87						
			2	8-28	144						
			3	10-38	205	6-8	205				
			4	14-48	263	8-12	263				
008	201	200	1	8-24	87						
			2	10-38	144	6-8	144				
			3	14-50	205	8-12	205				
			4	18-64	263	10-16	263	6-8	263		
011	251	200	1	8-30	87						
			2	12-46	144	8-10	144				
			3	16-62	205	10-14	205	6-8	205		
			4	20-78	263	12-18	263	6-10	263		
009, 014, 018	301	200	1	10-36	87	6-8	87				
			2	16-56	144	10-14	144	6-8	144		
			3	20-74	205	12-18	205	6-10	205		
			4	24-94	263	14-22	263	8-12	263		
023	368	200	1	12-46	87	8-10	87				
			2	18-68	144	10-16	144	6-8	144		
			3	24-92	205	14-22	205	8-12	205		
			4	30->	263	18-28	263	10-16	263	4-8	263
032	418	200	1	14-52	87	8-12	87				
			2	20-78	144	12-18	144	6-10	144		
			3	28->	205	16-26	205	8-14	205		
			4	34->	263	20-32	263	10-18	263	6-8	263
020, 027, 041, 047	451	200	1	14-54	87	8-12	87				
			2	22-82	144	12-20	144				
			3	28->	205	16-26	205	8-14	205		
			4	36->	263	20-34	263	10-18	263	6-8	263
050	518	200	1	18-64	87	10-16	87	6-8	87		
			2	26->	144	14-24	144	8-12	144		
			3	34->	205	20-32	205	10-18	205	4-8	205
			4	42->	263	24-40	263	12-22	263	6-10	263
036, 045, 054, 063, 072	584	200	1	20-72	87	12-18	87	6-10	87		
			2	28->	144	16-26	144	8-14	144		
			3	38->	205	22-36	205	12-20	205	6-10	205
			4	46->	263	26-44	263	14-24	263	6-12	263
056, 068, 079, 090	751	200	1	24-90	87	14-22	87	8-12	87		
			2	36->	144	20-34	144	10-18	144	6-8	144
			3	46->	205	28-44	205	14-26	205	6-12	205
			4	58->	263	34-56	263	18-32	263	8-16	263

Output variants 1, 2, 3 and 4		
Size	E	F
006	192	120
008	202	
009	302	200
011	252	
014	302	200
018	302	200
020	452	200
023	377	
027	452	200
032	427	
036	585	200
041	452	200
045	585	200
050	527	
054	585	200
063	585	

The connections have male pipe threads.  
For detailed information about flanges, see Accessories.  
Connections tolerance is  $\pm 4$  mm.

# Dimensions (mm)

## EQRT ECONET®



Output variant c (rr)	L					
	d=1 (normal size)			d=2 (full size)		
	h=0	h=1,4	h=2	h=0	h=1,4	h=2
1 (4)	400	500	650	450	550	700
2 (6)	400	500	650	450	550	700
3 (8)	500	600	750	550	650	800
4 (10)	500	600	800	550	650	850
5 (12)	600	700	850	650	750	900

Dimensions on next page.

# Dimensions (mm)

## EQRT ECONET®

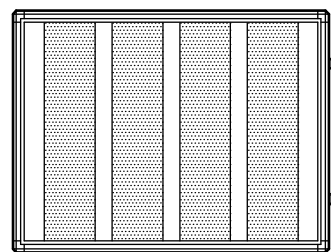
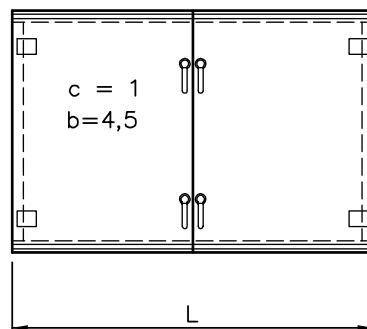
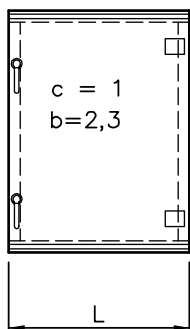
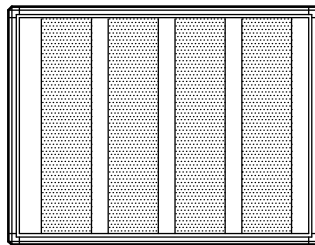
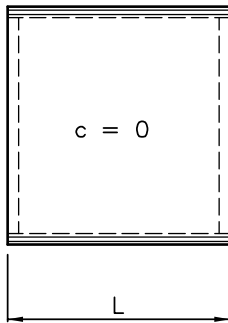
Unit size	E	F	Output var.	Connection dimensions at different number of VV and dimension D between connetions					
				25		32		50	
				VV	D	VV	D	VV	D
008	201	200	1	8-24	87				
			2	10-38	144				
			3	14-50	205				
			4	18-64	263				
			5	20-76	321				
011	251	200	1	8-30	87				
			2	12-46	144				
			3	16-62	205				
			4	20-78	263				
			5	24-94	321				
009, 014, 018	301	200	1	10-36	87				
			2	16-56	144				
			3	20-74	205				
			4	24-94	263				
			5	30->	321				
023	301	200	1	12-46	87				
			2	18-68	144				
			3	24-92	205				
			4	30->	263				
			5	36->	321				
032	368	200	1			8-12	87		
			2			12-18	144		
			3			16-26	205		
			4			20-32	263		
			5			24-38	321		
020, 027	418	200	1	14-54	87				
			2	22-82	144				
			3	28->	205				
			4	36->	263				
			5	42->	321				
041, 047	451	200	1			8-12	87		
			2			12-20	144		
			3			16-26	205		
			4			20-34	263		
			5			24-40	321		
050	518	200	1					6-8	87
			2					8-12	144
			3					10-18	205
			4					12-22	263
			5					14-26	321
036, 045	584	200	1			12-18	87		
			2			16-26	144		
			3			22-36	205		
			4			26-44	263		
			5			32-54	321		
054, 063 072	584	200	1					6-10	87
			2					8-14	144
			3					12-20	205
			4					14-24	263
			5					16-30	321

The connections have male pipe threads.  
For detailed information about flanges, see Accessories.  
Connections tolerance is  $\pm 4$  mm.

Output variants 1,2,3,4,5	
Size	E
008	202
009	302
011	252
014	302
018	302
020	452
023	377
027	452
032	427
036	585
041	452
045	585
050	527
054	585
063	602
072	602

# Dimensions and Weights (mm and kg)

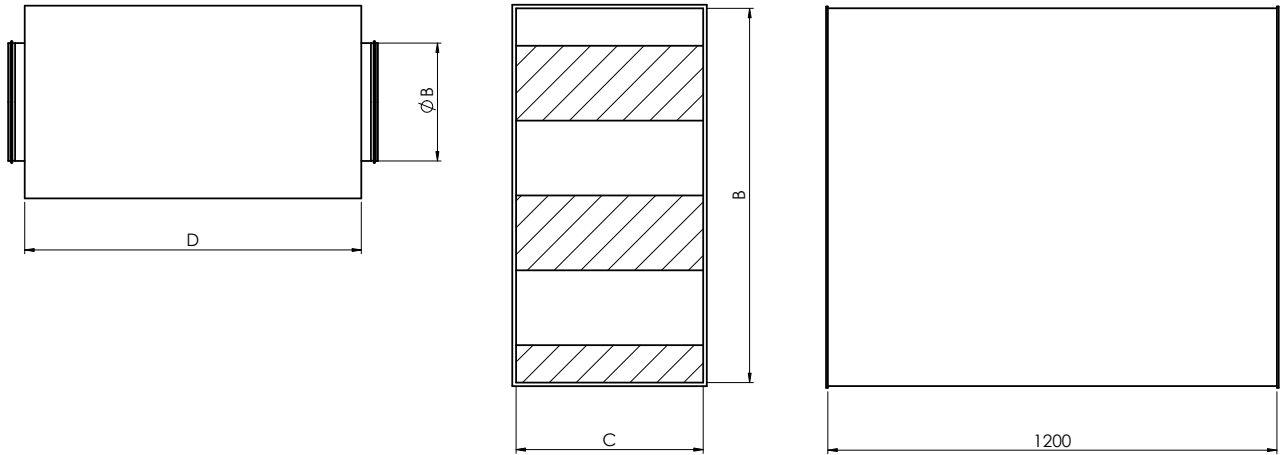
## EQSA Silencer



Size	Weight (kg)			
	L=500 (b=2)	L=900 (b=3)	L=1300 (b=4)	L=1700 (b=5)
005	10	14	20	26
008	18	24	33	45
009	14	22	28	36
011	14	30	39	51
014	21	33	42	54
018	28	44	56	72
020	30	42	54	69
023	40	65	85	110
027	40	56	72	92
032	45	65	85	110
036	48	68	88	112
041	60	84	108	138
045	60	85	110	140
050	77	105	140	182
054	72	102	132	168
056	70	100	135	165
056	70	100	135	165
063	84	119	154	196
068	84	120	162	198
072	96	136	176	224
079	98	140	189	231
090	112	160	162	198

## Dimensions and Weights (mm and kg)

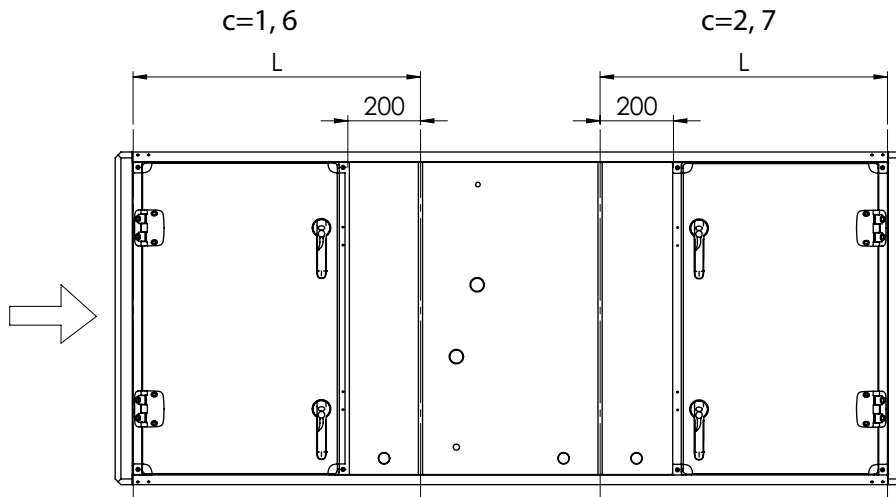
EQSD Sound attenuator, mounted in duct work



B	C	D	Weight, kg
Ø 031	-	900	28
Ø 040	-	1200	42
Ø 050	-	1200	71
080	040	1200	36
110	050	1200	53
140	060	1200	75
140	080	1200	83
170	080	1200	100
200	080	1200	120
200	100	1200	130
240	100	1200	155

# Dimensions (mm)

EQTB Empty section

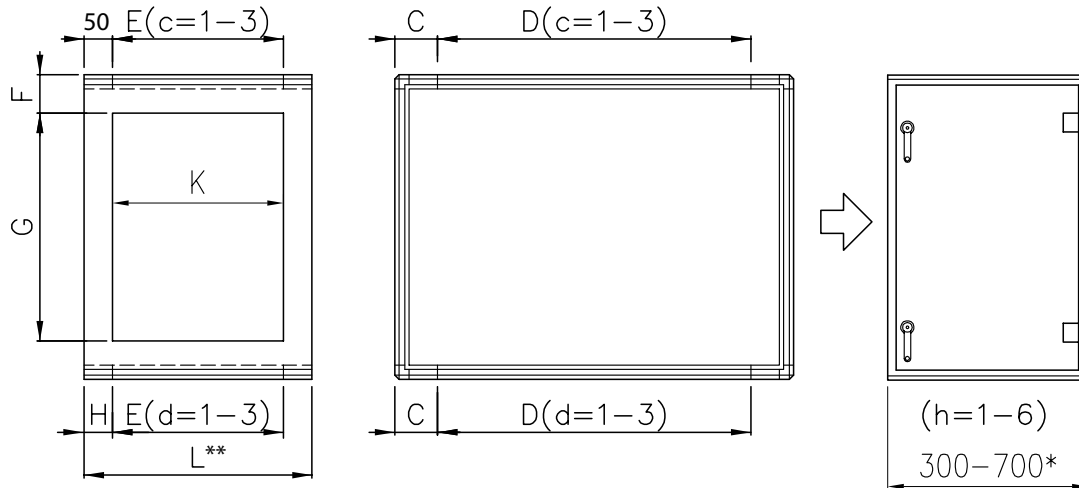


B	L
6	600
7	700
8	800
9	900



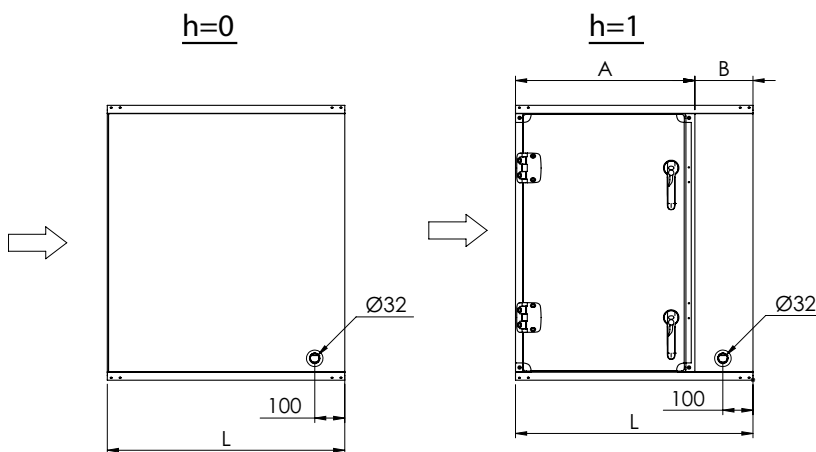
# Dimensions (mm)

EQTC Empty section  
g=0, without drain tray



- \* ) When L is bigger than 700, a door (700) is positioned first in the air flow, then there is fixed panel
- \*\* ) When hole on side or with internal damper (EQAZ-12) an EQTC L=100 is needed before this empty section

EQTC Empty section  
g=2, with drain tray



h=0	h=1		
L	L	A	B
300	-	-	-
350	-	-	-
400	-	-	-
450	-	-	-
500	-	-	-
550	-	-	-
600	600	400	200
650	650	450	200
700	700	500	200
750	750	550	200
800	800	600	200
850	850	650	200
900	900	700	200
950	950	700	250
1000	1000	700	300
1050	1050	700	350
1100	1100	700	400
1150	1150	700	450
1200	1200	700	500
1250	1250	700	550
1300	1300	700	600

## Dimensions (mm)

EQTC Empty section with holes other than for mixing section, g=0  
c, d, e, f = 1 – 3

L	E	K
50	-	-
100	-	-
150	-	-
200	-	-
250	-	-
300	-	-
350	-	-
400	300	-
450	300	-
500	400	-
550	400	400
600	500	500
650	500	500
700	600	600
750	600	600
800	700	700
850	700	700
900	800	800
950	800	800
1000	900	900
1050	900	900
1100	1000	1000
1150	1000	1000
1200	1100	1100

L	E	K
1350	-	-
1400	-	-
1450	-	-
1500	-	-
1550	-	-
1600	-	-
1650	-	-
1700	-	-
1750	-	-
1800	-	-
1850	-	-
1900	-	-
1950	-	-
2000	-	-
2050	-	-
2100	-	-
2150	-	-
2200	-	-
2250	-	-
2300	-	-
2350	-	-
2400	-	-
2450	-	-
2500	-	-
2550	-	-

## Dimensions (mm)

EQTC Empty section, when used as mixing section, g=0

	When used as mixing section Connect. end wall (internal damper)	When used as mixing section Connection ceiling/base			
<b>Size</b>	<b>L</b>	<b>L</b>	<b>C</b>	<b>D</b>	<b>E</b>
005	200	350	400	Ø315	-
008	200	500	550	Ø400	-
009	200	550	450	Ø500	-
011	200	400	200	800	300
014	200	400	185	800	300
018	200	400	185	1100	300
020	300	500	185	800	400
023	300	500	185	1400	400
027	300	600	185	1100	500
032	300	600	200	1400	500
036	300	700	185	1100	600
041	300	500	185	1700	400
045	300	700	185	1400	600
050	300	600	185	2000	500
054	300	700	185	1700	600
056	300	900	200	1400	800
063	300	700	185	2000	600
068	300	900	185	1700	800
072	300	700	200	2000	600
079	300	900	185	2000	800
090	300	900	200	2000	800

## Dimensions (mm)

EQTC Empty section, g=0

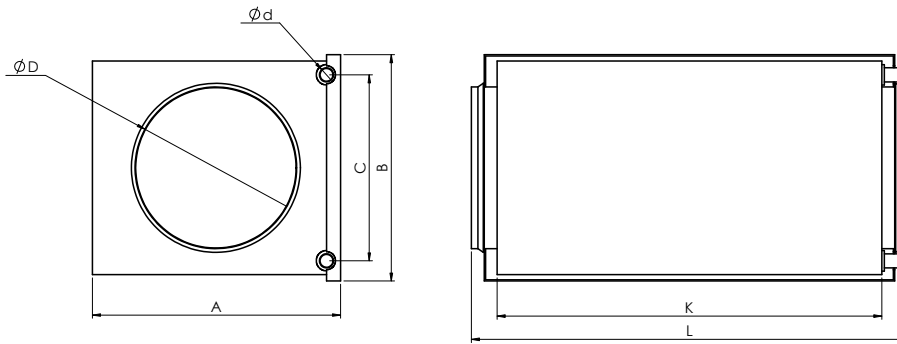
For connection of entire unit

c, d, e, f = 4

Size	Connection in ceiling c, d = 4	Connection in side e, f = 4							
	L	L	C	D	E	F	G	H	K
005	500	900	100	600	400	78	320	150	700
008	600	1200	100	900	500	78	420	150	1000
009	800	900	100	600	700	78	620	150	700
011	700	1300	100	1000	600	78	520	150	1100
014	800	1200	100	900	700	78	620	150	1000
018	800	1500	100	1200	700	78	620	150	1300
020	1100	1200	100	900	1000	78	920	150	1000
023	1000	1800	100	1500	900	78	770	150	1600
027	1100	1500	100	1200	1000	78	920	150	1300
032	1100	1900	100	1600	1000	78	870	150	1700
036	1400	1500	100	1200	1300	78	1220	150	1300
041	1100	2100	100	1800	1000	78	920	150	1900
045	1400	1800	100	1500	1300	78	1220	150	1600
050	1300	2400	100	2100	1200	78	1070	150	2200
054	1400	2100	100	1800	1300	78	1220	150	1900
056	1700	1800	100	1500	1600	78	1520	150	1600
063	1400	2400	100	2100	1300	78	1220	150	2200
068	1700	2100	100	1800	1600	78	1520	150	1900
072	1400	2700	100	2400	1300	78	1220	150	2500
079	1700	2400	100	2100	1600	78	1520	150	2200
090	1700	2700	100	2400	1600	78	1520	150	2500

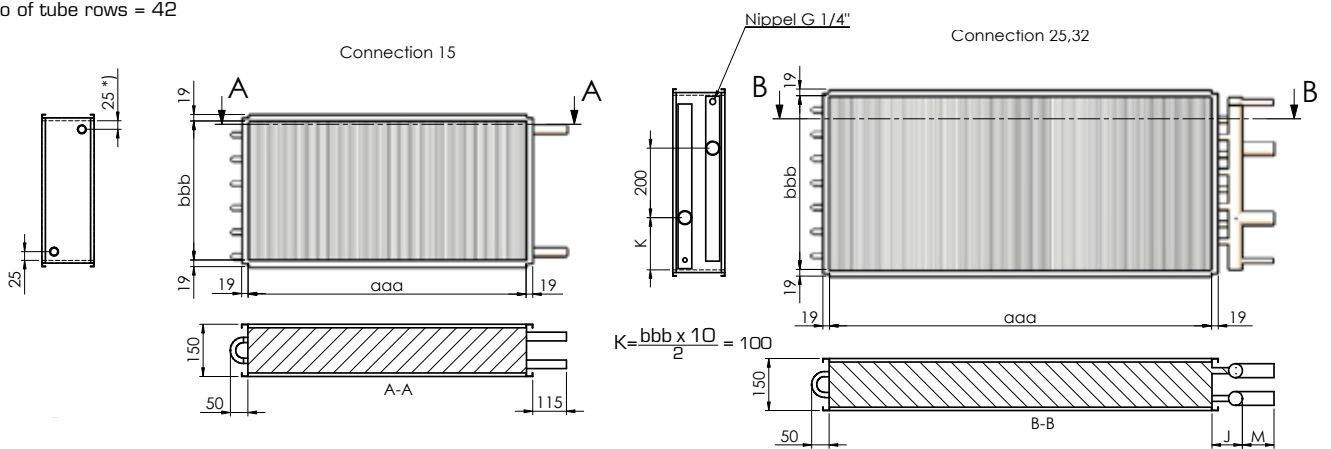
# Dimensions (mm)

EQKE Air heater for hot water, mounted in duct work



aaa	A	B	C	K	L	Ø D cm	Ø d (mm)
031	460	408	365	300	380	315	22
040	540	483	420	300	440	400	22
050	690	533	425	335	475	500	22

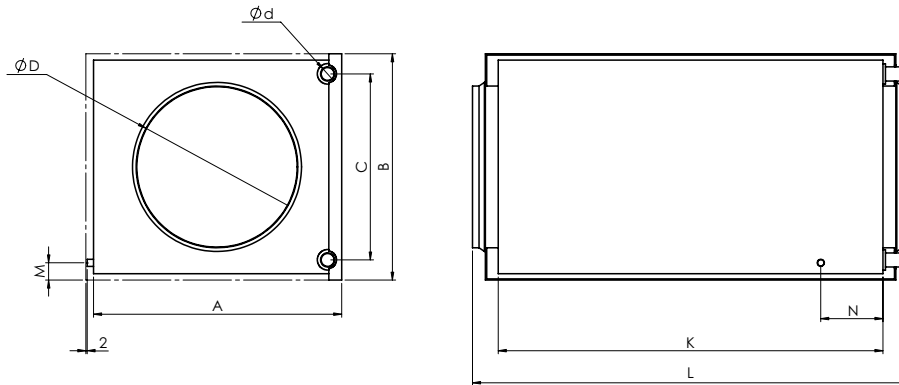
\*) no of tube rows = 42



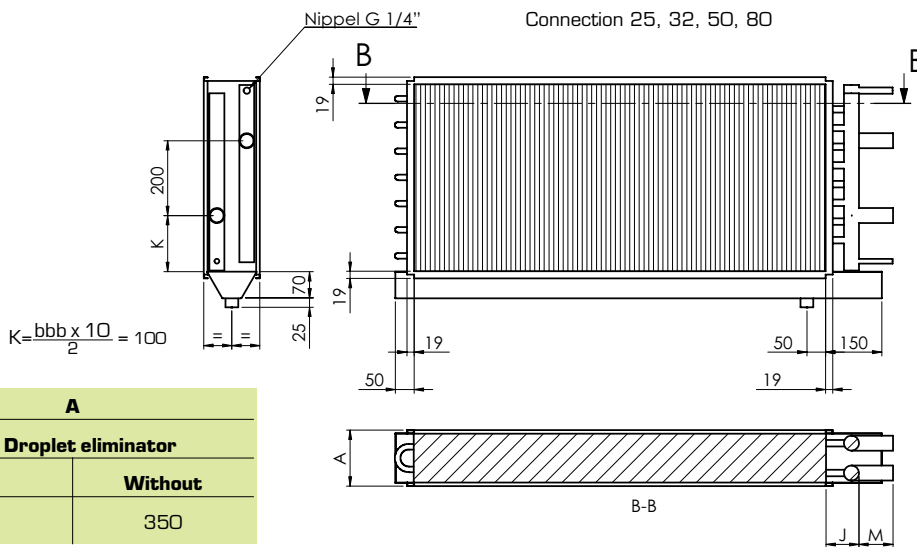
-aaa	-bbb	Output variant Cap. Var.	Conn. Output variant 1	Conn. output variant 2
080	040	1,2	15	25
110	050	1,2	25	25
140	060	1,2	25	25
140	080	1,2	25	25
170	080	1,2	25	25
200	080	1,2	25	32
200	100	1,2	32	32

# Dimensions (mm)

EQKN, EQKP Air cooler, mounted in duct work



aaa	A	B	C	K	L	M	N	Ø D cm	Ø d (mm)
040	690	536	425	335	475	39	114	400	22
050	690	536	425	335	475	39	114	500	22

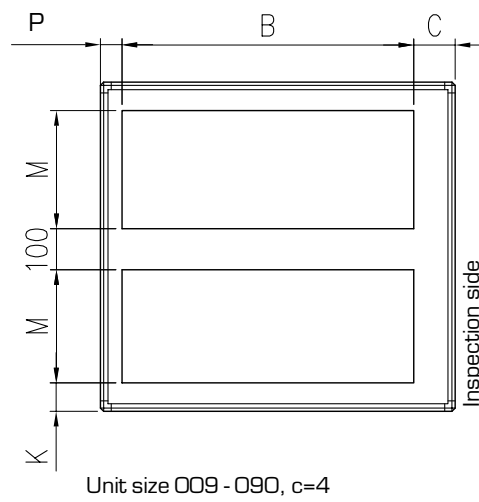
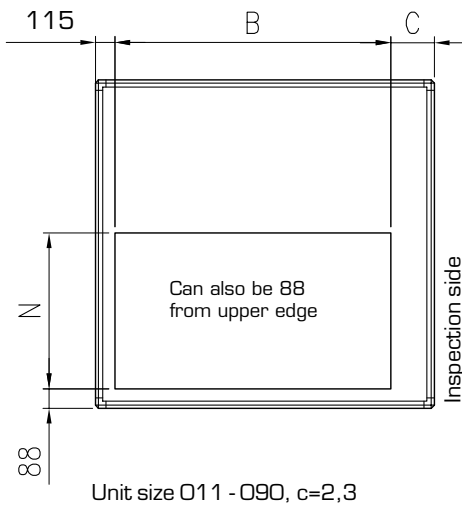
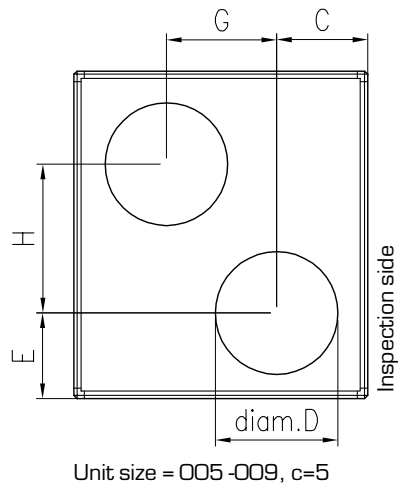
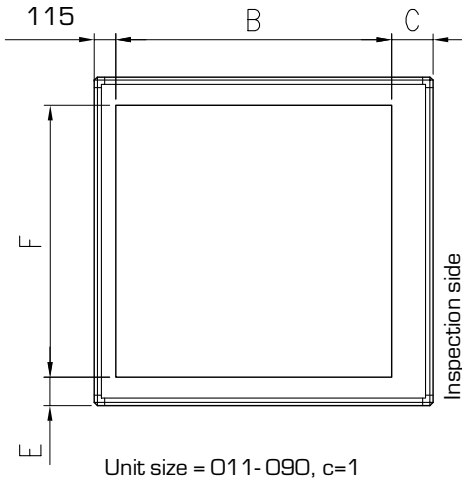


A	
Droplet eliminator	
With	Without
300	350

-aaa	-bbb	Output variant Cap. Var.	Conn. Output variant 1	Conn. Output variant 2
080	040	1,2	25	25
110	050	1,2	25	32
140	060	1,2	32	50
140	080	1,2	50	50
170	080	1,2	50	50
200	080	1,2	50	50
200	100	1,2	50	80
240	100	1,2	80	80

# Dimensions (mm)

EQVA Casing end wall  
Unit size 005-090, c=1, c=5



## Dimensions and Weights (mm and kg)

EQVA Casing end wall (EQGA/EQGB, EQHA/EQHB), c=1-4, rectangular connection

Stk	B	C	E	F	K	M	P	N	Weight, kg b=1-4			Weight, kg
									c=0	c=1.4	c=2.3	
005	500	200	88	300	-	-	-	200	4	3	-	2
008	800	200	88	400	-	-	-	300	7	5	-	3,5
009	500	200	88	600	138	200	115	400	7	4	6	3
011	800	200	138	400	91	200	200	300	9,5	4,5	7	3
014	800	200	138	500	138	200	115	300	10	4	7,5	3
018	1100	200	138	500	138	200	115	300	13	5	10	3,5
020	800	200	138	800	88	400	115	400	14,5	5	10	3,5
023	1400	200	163	600	113	300	115	400	20	9	14	6
027	1100	200	138	800	88	400	115	500	19	6	11	4
032	1400	200	113	800	63	400	200	500	23,5	6,5	13	7
036	1100	200	188	1000	238	400	115	600	25	8,5	18,5	5,5
041	1700	200	138	800	88	400	115	400	27,5	7	17	5
045	1400	200	188	1000	238	400	115	600	30,5	9,5	22	6,5
050	2000	200	213	800	163	400	115	500	37	17	26	10,5
054	1700	200	188	1000	238	400	115	600	36	12	26,5	7,5
056	1400	200	238	1200	188	600	115	800	38	15	26	8,5
063	2000	200	188	1000	238	400	115	600	42	14	30,5	8
068	1700	200	238	1200	188	600	115	800	45	17	30,5	9,5
072	2200	200	188	1000	238	400	200	600	48	21	36,5	12
079	2000	200	238	1200	188	600	115	800	52	19	35	10,5
090	2200	300	138	1400	138	600	200	800	59	20	42	11,5

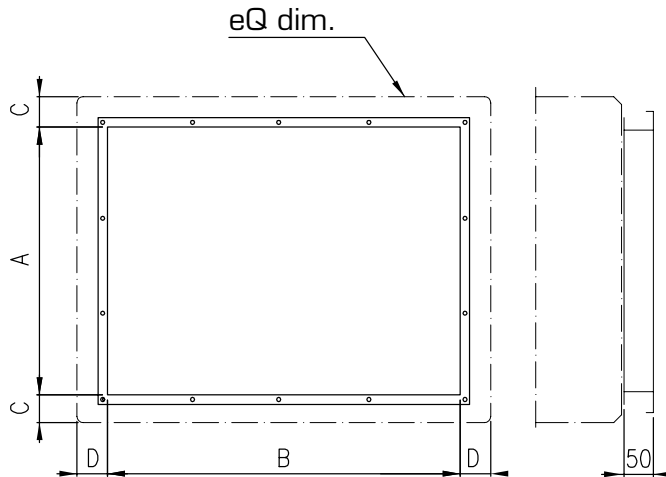
EQVA Casing end wall (EQHA), c=5, round connection

Size	C	D	E	G	H	Weight, kg
005	250	Ø315	238	300	476	3,5
008	350	Ø400	288	400	576	6
009	450	Ø500	388	-	776	5



## Dimensions and Weights (mm and kg)

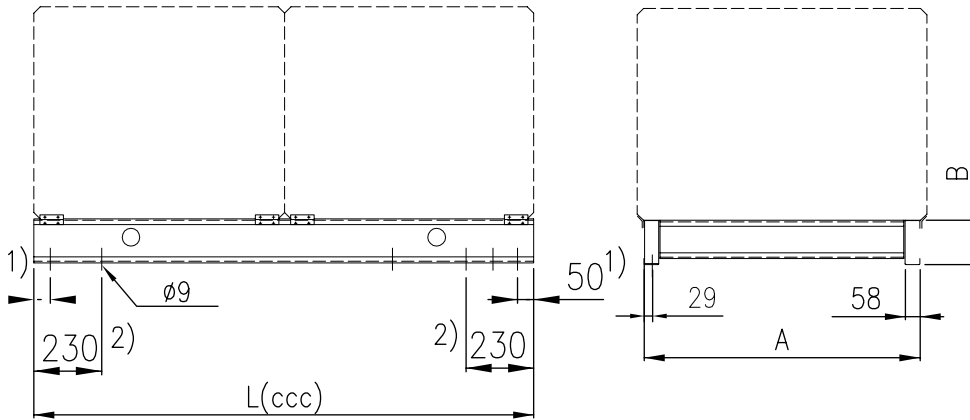
EQVT Connection frame full area



Size	A	B	C	D	Weight, kg
005	400	600	38	100	3
008	500	1000	38	50	5
009	600	600	88	100	5
011	600	1000	38	100	6
014	600	1000	88	50	6
018	600	1300	88	50	7
020	1000	1000	38	50	5
023	800	1600	63	50	6
027	1000	1300	38	50	6
032	800	1600	113	100	6
036	1200	1300	88	50	8
041	1000	1800	38	100	9
045	1200	1600	88	50	10
050	1000	2200	113	50	12
054	1200	1800	88	100	12
056	1600	1600	38	50	9
063	1200	2200	38	50	12
068	1600	1800	38	100	11
072	1200	2400	88	100	13
079	1600	2200	38	50	12
090	1600	2400	38	100	13

# Dimensions and Weights (mm and kg)

## EQAZ-O4 Base frame



L(ccc) = 300 mm min. – 9600 mm max.  
 in step of 50 mm.  
 1) Holes for the adjustable feet. (d=1,2)  
 2) Existing holes for L=500\_9600 mm. (d=1,2)

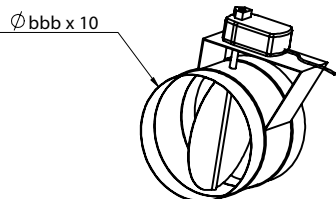
d	B
1	150
2	300
3	200

Unit size	Weight, kg					Width
	030-065	070-105	110-225	230-550	600-960	A
005,009	0.30 x ccc	0.22 x ccc	0.20 x ccc	0.20 x ccc	0.17 x ccc	774
008,014,020	0.40 x ccc	0.25 x ccc	0.21 x ccc	0.20 x ccc	0.18 x ccc	1074
011	0.40 x ccc	0.30 x ccc	0.23 x ccc	0.23 x ccc	0.19 x ccc	1174
018,027,036	0.45 x ccc	0.33 x ccc	0.26 x ccc	0.25 x ccc	0.20 x ccc	1374
023,045,056	0.60 x ccc	0.38 x ccc	0.30 x ccc	0.27 x ccc	0.24 x ccc	1674
032	0.65 x ccc	0.43 x ccc	0.31 x ccc	0.29 x ccc	0.26 x ccc	1774
041,054,068	0.70 x ccc	0.46 x ccc	0.34 x ccc	0.30 x ccc	0.27 x ccc	1974
050,063,079	0.80 x ccc	0.50 x ccc	0.38 x ccc	0.33 x ccc	0.28 x ccc	2274
072,090	0.90 x ccc	0.52 x ccc	0.40 x ccc	0.35 x ccc	0.29 x ccc	2574

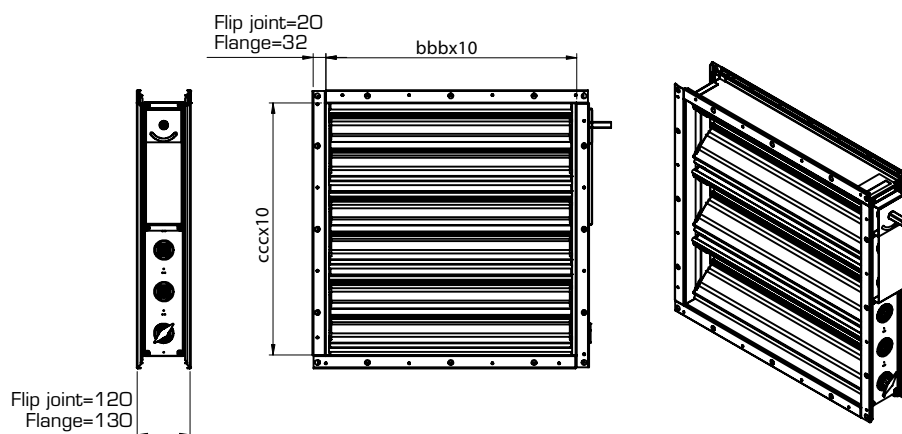
# Dimensions (mm)

## EQAZ-12 Damper

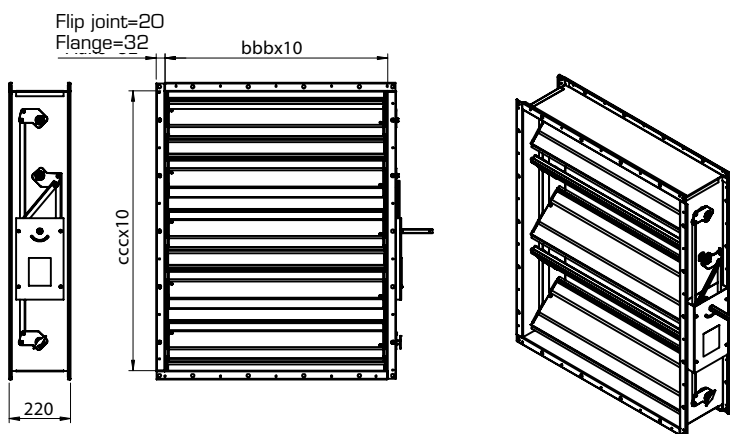
h=0 Round damper



h=1 Rectangular damper, 100 mm blade



h=2 Rectangular damper, 200 mm blade



## Dimensions and Weights (mm and kg)

### EQAZ-12 Damper

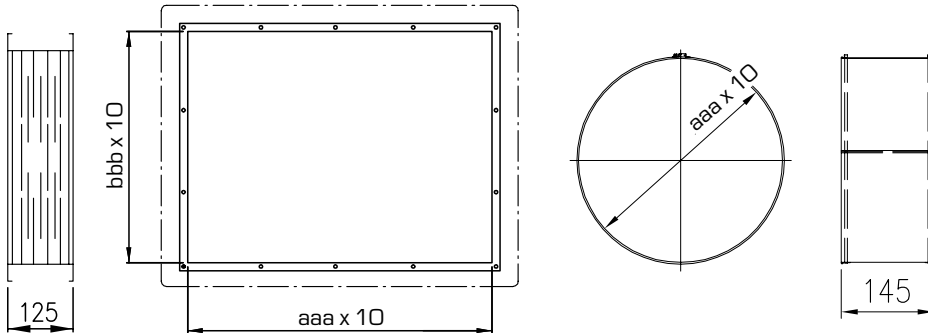
Weight circular damper		
	Damper only	With damper motor
031	2	7,3
040	3,7	10,7
050	5	13,3

Weight 100 mm damper						
ccc						
bbb		020	030	040	050	060
	020	4.5	5.1	6.5	7	7.6
	030	5.1	6.5	8	9	10
	040	6.5	8	9	10.5	12
	050	7	9	10.5	12	14
	060	7.6	10	12	14	16
	070	8.5	11	13.5	16	17
	080	9.2	12	14.5	17	19.5
	090	10	13	16	19	22
	100	11	14	17	20	23
	110	11.5	15	18	21.5	24
	120	12	16	19	23	25
	130	13	17	20	24	27
	140	15.5	18	22	25	29

Weight 200 mm damper													
ccc													
bbb		020	030	040	050	060	080	100	120	140	160	180	200
	020	4,5	5,5	6,5	7	7,5	9	10,5	12	13,5	14	16	17,5
	030	5	6	7	8,5	10	12	14	17	19	19,5	20	22
	040	6,5	7,5	9	11	12,5	14	17	19	21	23	25	26
	050	7	9	10,5	13	16	18	20	23	26	28	30	34
	060	8	10	12	14	18	20	23	26	30	32	34	38
	070	8,5	11	13,5	15	19	22	25	28	33	35	38	42
	080	9	12	15	17	19,5	23	27	30	36	39	42	46
	090	9,5	13	16	18	21	24	30	34	38	42	47	50
	100	10,5	14	17	20	22,5	26	33	36	40	45	50	54
	110	11	15	18	21	23,5	29	36	40	44	49	54	58
	120	12	16	20	22,5	25	31	37	42	47	52	57	62
	130	12,5	17	21	23,5	26,5	33	39	45	52	57	62	65
	140	13	18	22	24	28	35	41	48	56	61	65	70
	150	13,5	19	23,5	26	30	37	43	52	59	65	72	76
	160	14	19,5	24	28	33	39	45	55	63	68	76	79
	170	14,5	20	24,5	29	34	41	47	57	65	72	78	82
	180	16	20,5	25	30	35	43	50	58	66	75	80	88
	190	17	21	26,5	32	36,5	45	54	62	69	78	84	95
200	18	22	28	34	38	48	56	65	72	77	88	100	
220	18	23	30	35	40	50	58	67	76	90	95	110	

# Dimensions and Weights (mm and kg)

## EQAZ-25 Flexible connection



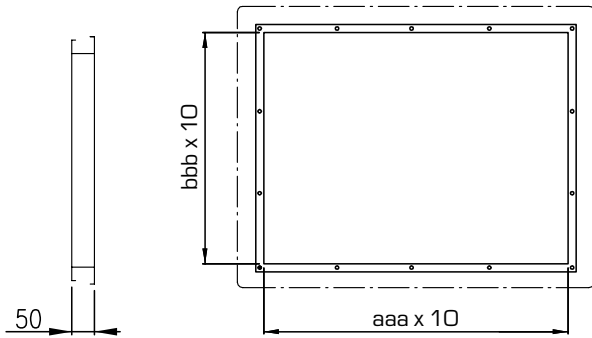
	Width bbb																					
Height aaa	020	025	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220
020	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9
025	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
030	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9
040	3	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10
050	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10
060	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10
070	4	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11
080	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	11
090	4	5	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	11	11
100	5	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12
110	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12
120	5	6	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12
130	6	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13
140	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13
150	6	7	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13
160	7	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14
170	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14
180	8	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	15
190	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	15	15
200	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	15	15	15
210	9	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	15	15	15	16
220	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	15	15	15	16	16

**Weight, kg.**

Circular connections		
aaa	Diameter	Weight, kg
031	315	1
040	400	2
050	500	

# Dimensions and Weights (mm and kg)

## EQAZ-26 Duct connection piece

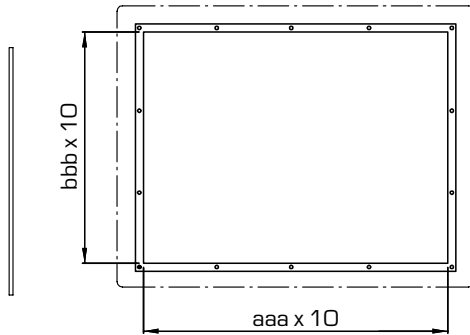


	Width bbb																						
Height aaa	020	025	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220	
020	2	2	2	2	2	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	
025	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7
030	2	2	2	2	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7	
040	2	2	2	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	
050	2	3	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	
060	3	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	
070	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	
080	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	
090	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9	
100	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9	9	
110	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9	9	9	
120	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9	9	9	10	
130	5	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9	9	9	10	10	
140	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9	9	9	10	10	10	
150	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9	9	9	10	10	10	10	
160	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9	9	9	10	10	10	10	11	
170	6	6	6	6	6	7	7	7	7	8	8	8	9	9	9	9	10	10	10	10	11	11	
180	6	6	6	6	7	7	7	7	8	8	8	9	9	9	9	10	10	10	10	11	11	11	
190	6	6	6	7	7	7	7	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	
200	6	7	7	7	7	7	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	
210	7	7	7	7	7	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	
220	7	7	7	7	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	

Weight, kg.

# Dimensions and Weights (mm and kg)

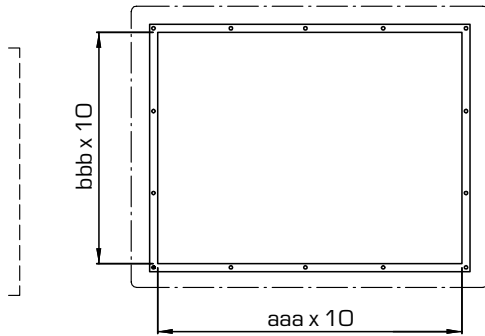
## EQAZ-27 Counter-flange



	Width bbb																					
Height aaa	020	025	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220
020	2	2	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7
025	2	2	2	2	3	3	3	3	4	4	4	5	5	5	5	6	6	6	7	7	7	7
030	2	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8
040	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8
050	2	3	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8
060	3	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	8
070	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9
080	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9
090	4	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	9
100	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	9	10
110	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	9	10	10
120	4	5	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10
130	5	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10	10
140	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10	10	11
150	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10	10	11	11
160	6	6	6	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10	10	11	11	11
170	6	6	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10	10	11	11	11	11
180	6	6	6	7	7	7	8	8	8	8	9	9	9	10	10	10	10	11	11	11	11	12
190	6	7	7	7	7	8	8	8	8	9	9	9	10	10	10	10	11	11	11	11	12	12
200	7	7	7	7	8	8	8	8	9	9	9	10	10	10	10	11	11	11	11	12	12	12
210	7	7	7	8	8	8	8	9	9	9	10	10	10	10	11	11	11	11	12	12	12	13
220	7	7	8	8	8	8	9	9	9	10	10	10	10	11	11	11	11	12	12	12	13	13
<b>Weight, kg.</b>																						

# Dimensions and Weights (mm and kg)

## EQAZ-28 Protective screen

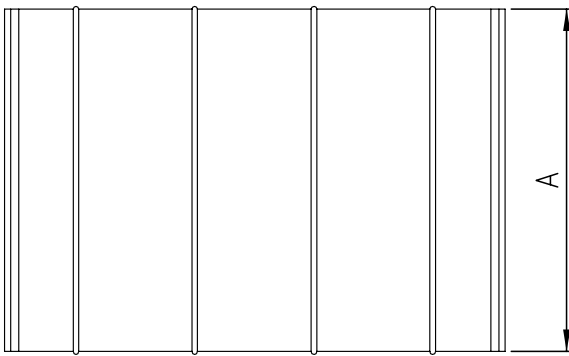
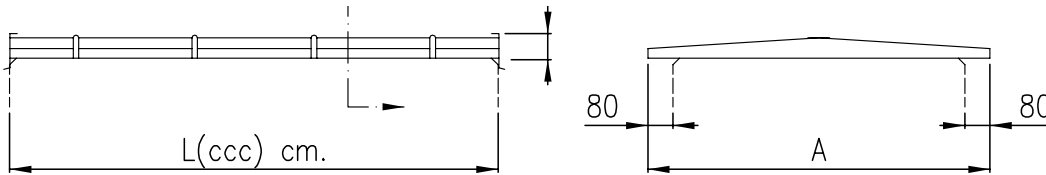


	Width bbb																					
Height aaa	020	025	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220
020	2	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	7	7	8
025	2	2	2	2	3	3	3	4	4	4	5	5	5	5	6	6	6	7	7	7	8	8
030	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8
040	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8
050	3	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	9
060	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9
070	3	3	4	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9
080	4	4	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9	10
090	4	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10
100	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10
110	4	5	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10	10
120	5	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10	10	11
130	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10	10	11	11
140	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10	10	11	11	11
150	6	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10	10	11	11	11	12
160	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12
170	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12
180	7	7	7	7	7	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12	13
190	7	7	7	7	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12	13	13
200	7	7	7	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12	13	13	13
210	7	8	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12	13	13	13	13
220	8	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12	13	13	13	13	14
<b>Weight, kg.</b>																						



# Dimensions and Weights (mm and kg)

## EQBZ-01 Roof

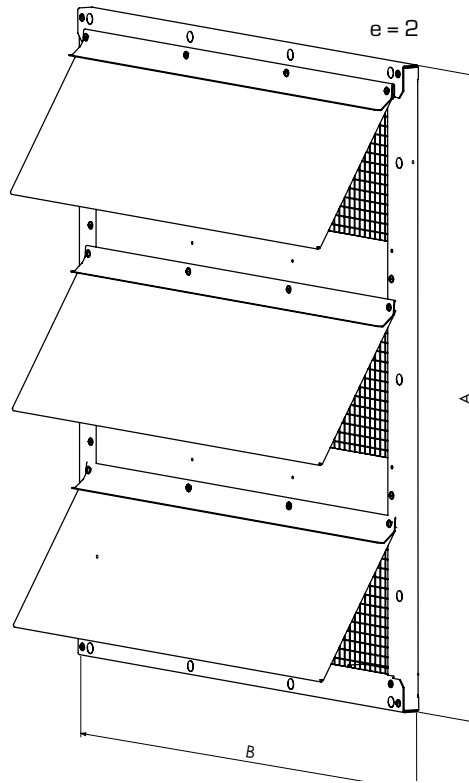
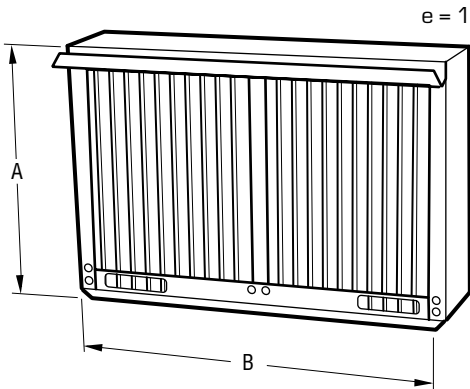


L(ccc) = 200 mm min. – 9600 mm max.  
in steps of 50 mm.

	Width	
Size	A	Weight, kg
005,009	960	0,12 x ccc + 6
008,014,020	1260	0,15 x ccc + 8
011	1360	0,16 x ccc + 9
018,027,036	1560	0,17 x ccc + 10
023,045,056	1860	0,19 x ccc + 12
032	1960	0,20 x ccc + 13
041,054,068	2160	0,22 x ccc + 14
050,063,079	2460	0,25 x ccc + 16
072,090	2760	0,27 x ccc + 17

# Dimensions and Weights (mm and kg)

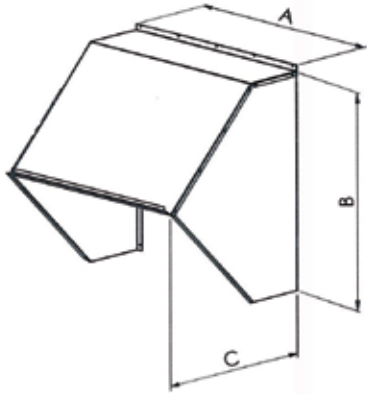
## EQBZ-09 Louvered shutter



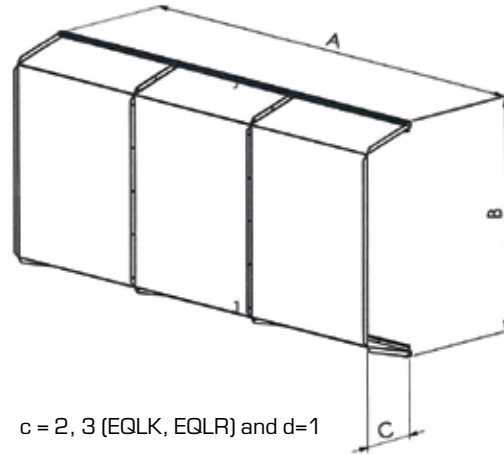
Size	Dimension				Weight, kg	
	e=1		e=2		e=1	e=2
	A	B	A	B		
005			396	564	9	5
008	505	840	496	864	14	5
009	705	540	696	564	20	5
011	505	840	496	864	20	5
014	605	840	596	864	24	5
018	605	1140	596	1164	29	10
020	905	840	896	864	31	10
023	705	1440	696	1464	35	10
027	905	1140	896	1164	41	10
032	905	1440	896	1464	43	10
036	1105	1140	1096	1164	50	15
041	905	1740	896	1764	60	10
045	1105	1440	1096	1464	60	15
050	905	2040	896	2064	66	20
054	1105	1740	1096	1764	76	20
056	1305	1440	1296	1464	75	20
063	1105	2040	1096	2064	88	20
068	1305	1740	1296	1764	88	25
072	1105	2240	1096	2264	97	20
079	1305	2040	1296	2064	105	25
090	1505	2240	1495	2264	135	25

# Dimensions (mm)

EQBZ-10 Hood for inlet and outlet in the gable



c = 1, 2 (EQLK, EQVA) and d=2  
c = 3 (EQLR) and d=2



c = 2, 3 (EQLK, EQLR) and d=1

For c=1,2 (EQLK, EQVA) and d=2			
Stlk	A	B	C
005	580	325	370
008	1080	325	370
009	580	550	400
011	880	325	370
014	880	550	400
018	1180	550	400
020	880	750	550
023	140	550	400
027	1180	750	550
032	1480	750	550
036	1180	950	690
041	1780	750	550
045	1480	950	690
047,050	2080	750	550
054	1780	950	690
056	1480	1150	850
063	2080	950	690
068	1780	1150	850
072	2280	950	690
079	2080	1150	850
090	2280	1150	850

For c=3 (EQLR) and d=2			
Stlk	A	B	C
008,009,011	456	450	400
014,018	656	550	400
020,023	656	650	550
027,032,036,041	756	750	550
045,050	956	950	690
054,056,063,068,072	1056	1050	690
079,090	1156	1150	850

For c=2,3 (EQLK, EQLR) and d=1			
Stlk	A	B	C
005	770	393	99
008	1070	506	147
009	770	706	147
011	1170	506	147
014	1070	612	147
018	1370	635	161
020	1070	919	199
023	1698	694	199
027	1398	885	199
032	1800	902	258
036	1398	1102	258
041	1998	902	258
045	1698	1102	258
047,050	2298	980	290
054	1998	1330	290
056	1698	1330	290
063	2298	1130	290
068	1998	1337	314
072	2598	1130	290
079	2298	1337	314
090	2598	1556	386

## Dimensions and Weights (mm and kg)



### EQLZ-25 Telpher beam

Size	Weight, kg
008, 014, 020	11
011	12
018, 027, 036	15
023, 045, 056	18
032	19
041, 054	23
047, 050, 063	26
072	30
068	52
079	60
090	68

### EQLZ-25 Telpher

Size	Weight, kg
068, 079, 090	70

For length, see product selection tool ACON.

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# Notes

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