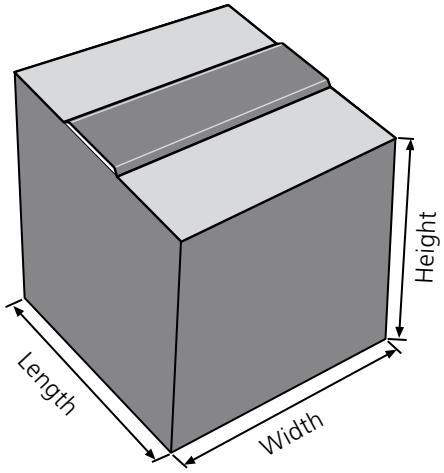
Contents

Quick Guide

Dimensions and Weights



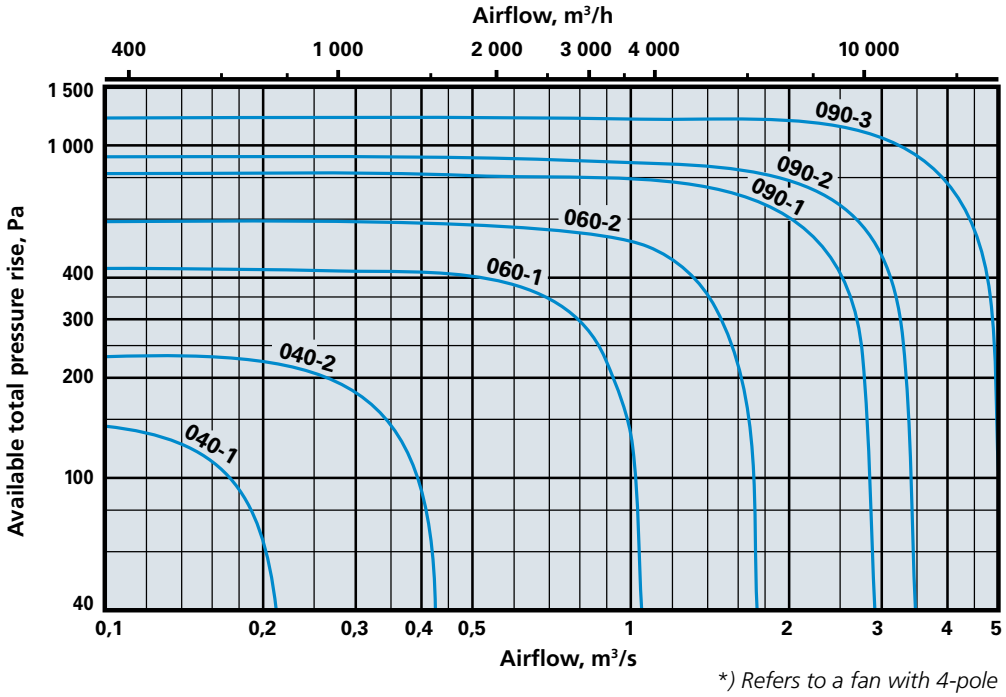
Size	Length	Width	Height	Max. Weight*
LTCW 040	495	495	430	46 kg
LTCW 060	695	695	600	85 kg
LTCW 090	995	995	850	200 kg

**) Equipped with the largest impeller and heaviest motor.*

Design Data

Size	Fan impeller	Motor poles	Motor kW	Max. flow m^3/s	Available pressure, Pa
LTCW 040	1	4	0,25	0,22	150
LTCW 040	2	4	0,25	0,45	240
LTCW 060	1	4	1,1	1,1	420
LTCW 060	1	6	0,75	0,75	180
LTCW 060	2	4	1,5	1,8	580
LTCW 060	2	6	0,75	1,2	260
LTCW 090	1	4	2,2	3,1	820
LTCW 090	1	6	1,5	2,1	370
LTCW 090	1	8	0,75	1,6	210
LTCW 090	2	4	3	3,6	910
LTCW 090	2	6	1,5	2,5	410
LTCW 090	2	8	1,1	1,8	230
LTCW 090	3	4	7,5	5,4	1200
LTCW 090	3	6	3	3,5	520
LTCW 090	3	8	2,2	2,7	300

General Survey Diagram



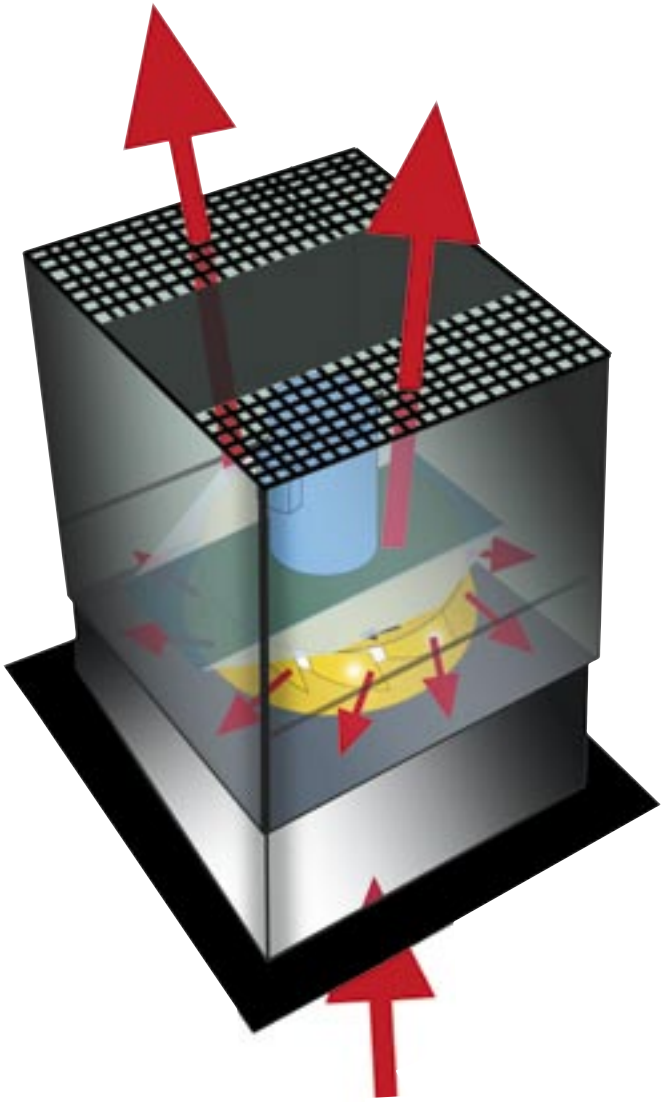
**) Refers to a fan with 4-pole motorr*

Operates quietly and saves on energy

During the middle of the 1990s Swegon introduced the new Wing axi-centrifugal fan into the GOLD air handling system. Since then, this type of fan, of patented design, has undergone further development and has been used to an ever increasing extent in our product mix.

Swegon has now also renewed its roof fan series. By introducing the new Sky Wing, all the advantages the Wing fans have to offer are utilized in this sector of our product mix as well, offering maximum benefit to clients. Wing features include low fan-generated noise level – especially in the lower frequencies, which are most difficult to attenuate in ventilation systems.

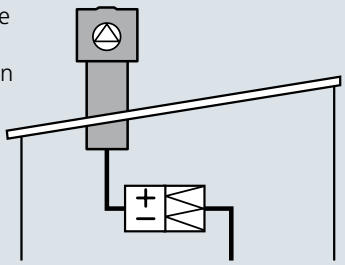
The fan is well-suited for speed control and therefore conforms to market demands on adjusting the airflow to meet present needs.



Advantages of the Sky Wing

- The Wing fan impeller offers quiet and energy-saving performance.
- Its high discharge capacity allows for large duct systems and connected functional sections.
- Enables demand-controlled ventilation by controlling the fan speed, keeping the air pressure constant and compensating variations in outdoor air temperature.
- Service-friendly – the fan can be raised on hinges and has a removable upper section as well as removable side panels.
- Measurement tappings for pressure/airflow readings enable correct commissioning and periodic performance checks.
- Its modest design fits well in a variety of environments.

Tips!
Thanks to its high discharge capacity the Sky Wing can be used as an extract air fan in ventilation systems with heat recovery – either with coil heat exchangers in a liquid-coupled heat recovery system or in ventilation systems with an extract air heat pump.



Specification

Sky Wing power roof ventilator — LTCW-1-aaa-b-c-d-e-f

Size
- 040 =040
- 060 =060
- 090 =090

Fan impeller
- 1 =1
- 2 =2
- 3 (for aaa = 090 only) =3

No. of poles
- 4 =4
- 6 (not for aaa = 090) =6
- 8 (for aaa = 090 only) =8

Voltage
- 3x230/400V =1
- 3x400/690 =2
- 3x500V =3
- 3x230/400V Thermostatic contacts (not required if TBCW control system is fitted) =8

Motor
- Standard =1
- Fire-proof version =2

Pressure tappings, fitted
- Without =0
- With =1

Mechanical Accessories

Roof duct for ventilator — LTSA-1-aaa

Size: 040 / 060 / 090

Mounting frame	**LTSZ-A-aaa**
Jointing duct	**LTSZ-B-aaa**
Bottom duct	**LTSZ-C-aaa**
Blank cover	**LTSZ-E-aaa**
Automatic shutter	**LTSZ-F-aaa**
Louvre damper, type 3	**LTSZ-J-aaa-3**

Size: 040 / 060 / 090

Control System

Protective motor contactor, enclosed (Q1) — TBCW-101-aaa
For constant speed

Rated current:
- 0,63 - 1,0 A = 010
- 1,0 - 1,6 A = 016
- 1,6 - 2,5 A = 025
- 2,5 - 4,0 A = 040
- 4,0 - 6,3 A = 063
- 6,3 - 9,0 A = 090
- 9,0 - 12,5 A = 125
- 12,5-16,0 A = 160
- 20,0-25,0 A = 250

Control Equipment — TBCW-12-a-bb-c-dd
For controlling the fan speed

Control function:
- Q2 = 2
- Q3 = 3
- Q4 = 4
- Q5 = 5

Max. permissible motor output:
- 0.75 kW = 07
- 1.1 kW = 11
- 1.5 kW = 15
- 2.2 kW = 22
- 3.0 kW = 30
- 7.5 kW = 75

Frequency inverter:
- unmounted = 0
- mounted =1

(not applicable to LTCW-040-2)

Pressure Control:
- No pressure control (Q2 and Q3 only) = 00
- 0- 300 Pa = 03
- 0- 500 Pa = 05
- 0- -1000 Pa = 10
- 0- -1600 Pa = 16

Frequency inverter, 0.37-1.5 kW, 1x230 V in, 3x230 V out
Frequency inverter 2.2-7.5 kW, 3x400 V

Control System Accessories

Control panel	**KPA-1-200**
Timer, 0-2 hours	**TBLZ-1-406-a**
Surface-mounted = 1 / Flush-mounted = 2	
Safety switch	**ELQZ-1-401-01**

Technical Description

Range of Application
The Sky Wing is an extract air fan, designed for use in most extract air systems, in which the air has a low content of impurities.

The fan should preferably be mounted on an LTSA roof duct. This provides a fire-resistant and sound-absorbent extraction passage through the roof and a tight connection to the extract air duct.

Design
The Sky Wing is made of aluminium-zinc plated sheet steel and has and external casing made of black Prelac painted sheet metal. Other colours are available to special order. From an anti-corrosion aspect, the Sky Wing complies with the provisions of Environmental Class C4 in accordance with BSK 99 and SS-EN-ISO 12944-2 Standards.

The fan impeller is of Swegon's patented Wing type with axi-centrifugal throughput. Characteristics are extremely low noise level and insignificant system losses. The design of the fan and the way it is suspended in the casing also enable an extremely low level of vibration.

The fan can be raised on hinges for the best possible access for cleaning the duct system or cleaning the impeller, for example. The upper part of the hood can easily be removed for access to the motor.

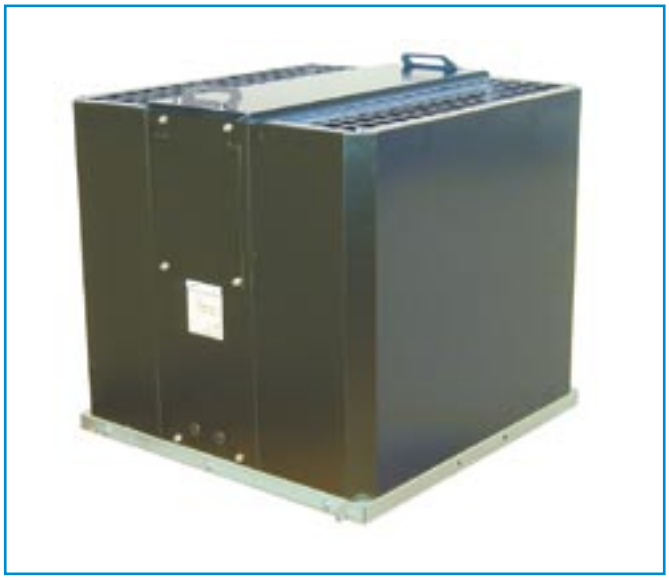
On delivery, the fan is equipped with lifting lugs, that should be removed after lifting.

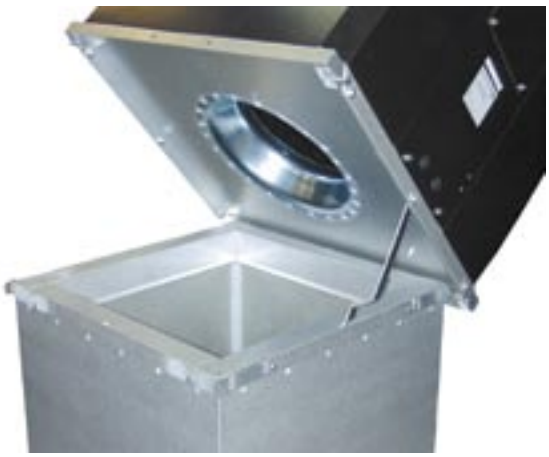
Motors
The motors installed in the Sky Wing are flange motors with specifications to IEC Standard. They conform to degree of protection IP55.

The motor is fitted outside the airflow and is easily accessible for wiring, cleaning and servicing. The highest permissible ambient temperature for standard motors is +40°C. The technical details specified are applicable to the rated voltage and rated frequency. The motors are normally supplied for a 3-phase 230/400 V power supply without thermostatic contacts; however they can also be supplied with such, as well as for a 3-phase 500 V power supply.

Sizes
The Sky Wing power roof ventilator is fabricated in three physical sizes: 040, 060 and 090. By combining various sizes of impeller and motor, a pressure/flow range of 0.1 – 5.0 m^3/s can be achieved.

Pressure/flow measurements
The power roof ventilator is equipped with external tappings for pressure/airflow measurement with an inaccuracy of ±5%.





The Sky Wing is easy to inspect and clean. The upper section is simple to remove and mounted on the roof duct, the power roof ventilator can also be opened by raising it on its hinges.

Technical Description

The Sky Wing units are tested for fire resistance.

For applications in which the Sky Wing power roof ventilator must be capable of transporting air with higher-than-normal temperature for a limited period, the ventilator can be ordered with a special motor designed to operate under high temperature conditions. The purpose of this version is to enable occupants to safely evacuate a burning building, by using the ventilator for smoke and combustion gas extraction. Ventilators in the high temperature version are tested for fire resistance and withstand 300°C for three hours, provided that they are not operated at speeds higher than their max. permissible speed. See Table below.

Fan size	Max. permissible fan speed
060-1	2000 r/min.
060-2	1670 r/min.
090-1	1420 r/min.
090-2	1420 r/min.
090-3	1470 r/min.

Important! Does not apply to ventilators with built-in control equipment.

To the right: Certificate based on fire-resistance test conducted by the Emergency (SOS) Service in Finspång, Sweden. Below: Excerpt from the Test Report.

RÄDDNINGSTJÄNSTEN FINSPÅNG

Datum 03-10-22

PM-LUFT
Koppargatan 19
602 23 Norrköping
Att: Keit Ohlsson

INTYG

Provning av brandgasfläkt 03-10-07
Modell LTCW-1-060-1-4-1 med ordernummer 204 825

Fläkten klarade av att fungera utan problem i en temperatur av 300 grader Celsius i 180 minuter.

Fläkten klarade av att fungera utan problem i en Temperatur av 400 grader Celsius i 60 minuter

Jan Karlsson
Stf Räddningschef

Adress Räddningstjänsten Bergslagsvägen 21 612 30 Finspång
Telefon Växel 0122-850 80, Telefon direkt 0122-850 79, mobil 070 338 54 14 Telefax 0122-151 33
E-mail jan-erik.karlsson@kommun.finspong.se

Description of Test with Combustion-gas Fan

Test of an LTCW-1-060-1-4-1 Power roof ventilator, in the combustion-gas version, Order no. 204 825

The test was conducted in the Emergency (SOS) Service container facilities at the Flampunkten (Flash-point) Testing Ground.
The fan was mounted on a container that is connected to a fire caisson made of steel surrounded by cement stone. The fan was wired to a three-phase power supply and was started up. Pallets were burned inside the caisson and a type TM-916 temperature gauge was used for continuously measuring the temperature.
The fan operated throughout the heating period (see Appendix 1). When the temperature reached 300 degrees Celsius, test events were timed until 120 minutes had elapsed. Throughout the period, we sought to obtain smallest possible differences.
(See Appendix 2)

When 120 minutes had elapsed, Test no. 2 started and this involved keeping the temperature at about 400 degrees Celsius for 60 minutes. Maintaining a constant temperature of 400 degrees proved difficult since we obtained substantial differences in temperature.
It is quite clear to us that the fan has passed the test, among other factors, because the temperature was up to 475 degrees at the most and because the fan had managed to operate for 120 minutes impelling 300-degree gas during the previous test.
(See Appendix 3)
In our opinion, the fan managed to operate for 180 minutes impelling 300-degree-Celsius gas during the first test since the temperature was considerably higher during the last 60 minutes.

Date: Oct. 22, 2003

PM-LUFT AB
Koppargatan 19
602 23 Norrköping, Sweden
For the attention of: Keit Ohlsson

CERTIFICATE

The combustion-gas resistant power roof ventilator was tested on Oct. 7, 2003
Model LTCW-1-060-1-4-1, Order no. 204 825

The ventilator was able to discharge gas having a temperature of 300 degrees Celsius for 180 minutes without problems.

The ventilator was able to discharge gas having a temperature of 400 degrees Celsius for 60 minutes without problems.

Jan Karlsson
Assistant Chief

Address: Emergency (SOS) Service, Bergslagsvägen 21, 612 30 Finspång
Phone: Switchboard 0122-850 80, Direct phone: 0122-850 79, Mobile: 070 338 54 14, Fax: 0122-151 33
E-mail: jan-erik.karlsson@kommun.finspong.se

LTSA Roof duct

Range of Application

The LTSA duct is a roof duct that can be used as a ventilation chimney for the LTCW power roof ventilator.

The roof duct is a simple and inexpensive alternative to a site-fabricated chimney made of some other building material.

It is sound-attenuating and therefore reduces the noise level in the ventilation chimney.

The roof duct can be fitted among other fixtures with a jointing duct and bottom duct (see extra accessories).

Design

The LTSA roof duct consists of a galvanized sheet-steel duct, internally insulated with 50 mm thick mineral wool slabs and lined with perforated sheet steel. The insulation meets the provisions of Fire-resistance Class EI 30.

The duct is equipped with pivotable mounting brackets on two sides. The angle brackets can be positioned to suit the slope of the roof.

The duct is equipped with a cable conduit.

Extra Accessories

Mounting frame	LTSZ-A
Jointing duct	LTSZ-B
Bottom duct	LTSZ-C
Blank cover	LTSZ-E (for the LTSZ-C bottom duct)
Automatic shutter	LTSZ-F
Louvre damper, type 3	LTSZ-J

LTSA

LTSZ-B

LTSZ-C

LTSZ-A

LTSA Roof duct

Installation Examples

1. 50 mm thick insulation conforming to Fire-resistance Class EI 30, internally lined with perforated sheet steel.

2. Conduit for electric cable.

3. Structural panel (not supplied by Swegon).

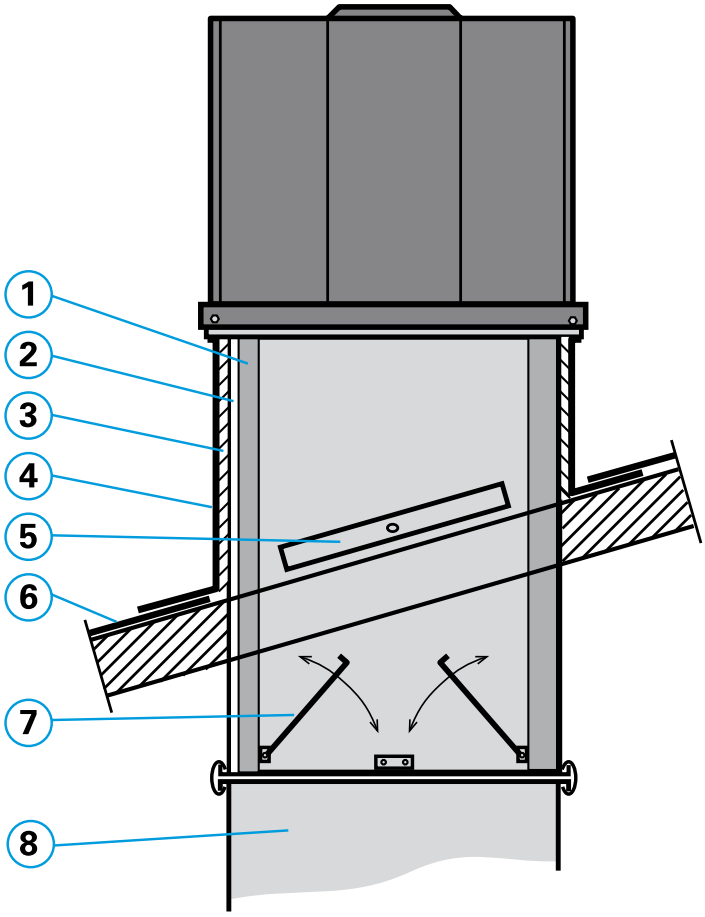
4. Roofing felt, sheet sheel or similar weather-proof roofing material (not supplied by Swegon).

5. Pivotable mounting brackets.

6. Existing roofing material (not supplied by Swegon).

7. LTSZ-F Automatic shutter that automatically opens when the fan is operating. Automatically shuts if the fan stops to prevent cold down-flow air currents.

8. LTSZ-B Jointing duct, LTSZ-B Bottom duct, LTSZ-J Louvre damper or Extract air duct.



Electrical and Control Equipment

Electrical and Control Equipment

The ventilator is produced as standard with a single-speed motor. If speed control is not desirable, the ventilator should be wired across an enclosed TBCW-101 protective motor contactor, (Q1 starter).

Fan-speed control functions Q2, Q3, Q4 and Q5 are available for adjusting the airflow to meet current needs.

The KPA-1-200 control panel is used for setting all the set points and parameters. Since this panel is only used for programming in conjunction with commissioning and if the operating conditions change, only one is required for each ventilation system.

If another item of equipment is used for speed control, the ventilator can be supplied with built-in thermostatic contacts in the motor windings for maximal protection, if required.

KPA-1-200 Control panel

Control Equipment

A number of alternative solutions are available for controlling the Sky Wing power roof ventilator. The alternatives are summarized below. A ore detailed description is given in the next section entitled: Control Equipment.

Equipment variant Q1
In the simplest applications, the ventilator can be wired to the power supply across an enclosed protective motor contactor.

Equipment variant Q2
The control system with frequency inverter, programmed for one constant speed or two constant speeds (high-speed or low-speed fan performance).

Equipment variant Q3
The control system with frequency inverter, programmed for variable speed in response to a 0 – 10 V signal or via an external potentiometer.

Equipment variant Q4
Control system with frequency inverter, programmed for pressure control.

Equipment variant Q5
Control system with frequency inverter, programmed for outdoor air temperature compensated pressure control.

The frequency inverter can either be supplied fitted inside the roof ventilator casing (sizes 060 and 090 only) or loose for installation at an optional location in the building. An extra protective roof is always supplied with the roof ventilator to upgrade the design to degree of protection IP21. The frequency inverter permits use under ambient temperature conditions ranging from -20 to +50°C.

Important! Wiring to a 230 V mains supply
If the unit is wired to a 230 V mains supply, control equipment variants Q2, Q3, Q4 or Q5 can be used only if the fan motor output is 1.5 kW or lower. If the motor output is higher, a different external frequency inverter, or an external transformer must be used.

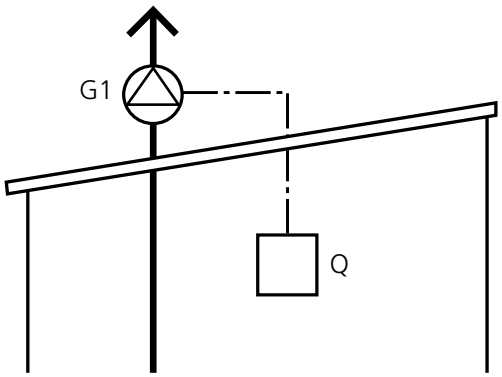
Several different control equipment options are available. The frequency inverter can be mounted inside the fan casing of the size 060 and 090 roof ventilators.

Electrical and Control Equipment

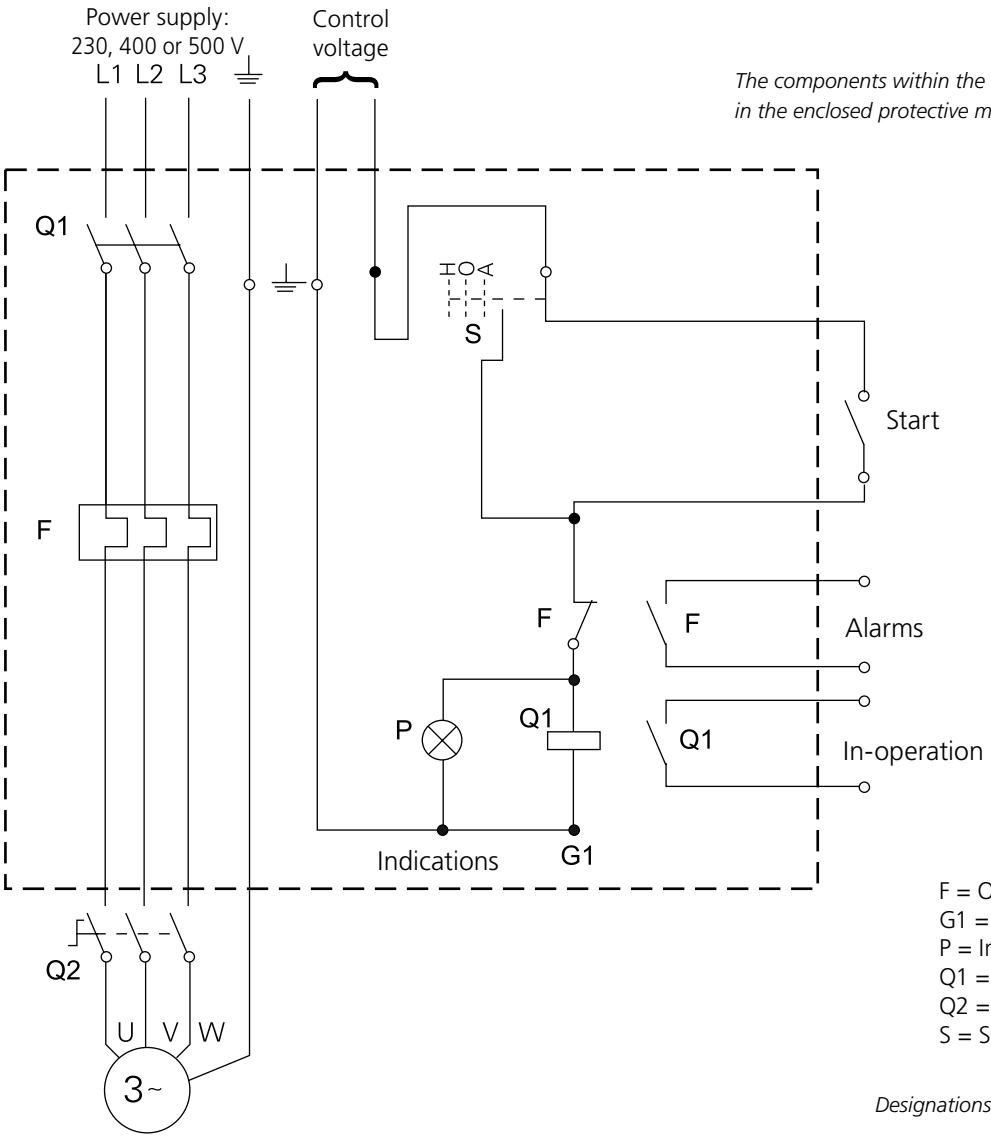
Control functions
Q1: Direct power roof ventilator connection via enclosed protective motor contactor

Function
G1 = Extract air fan
Q = Starter

Start/stop via external timer or selector switch. Constant speed. Alarm in the event of excess current.



Electric Power Connections



The components within the dashed box are included in the enclosed protective motor contactor.

F = Overload protector
G1 = Extract air fan
P = Indicating lamp
Q1 = Contactor
Q2 = Safety switch
S = Selector switch

Designations used are according to EN 61346-2:2000

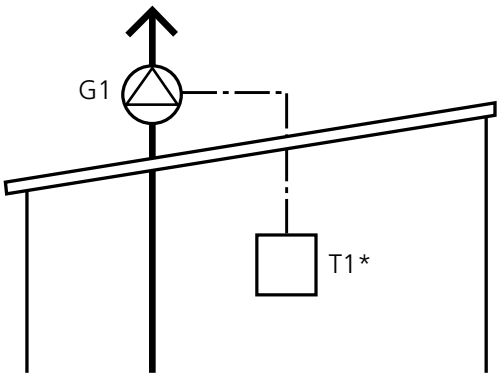
Electrical and Control Equipment

Control functions

Q2: Control system with frequency inverter*, programmed for constant speed. (1- or 2-speed operation)

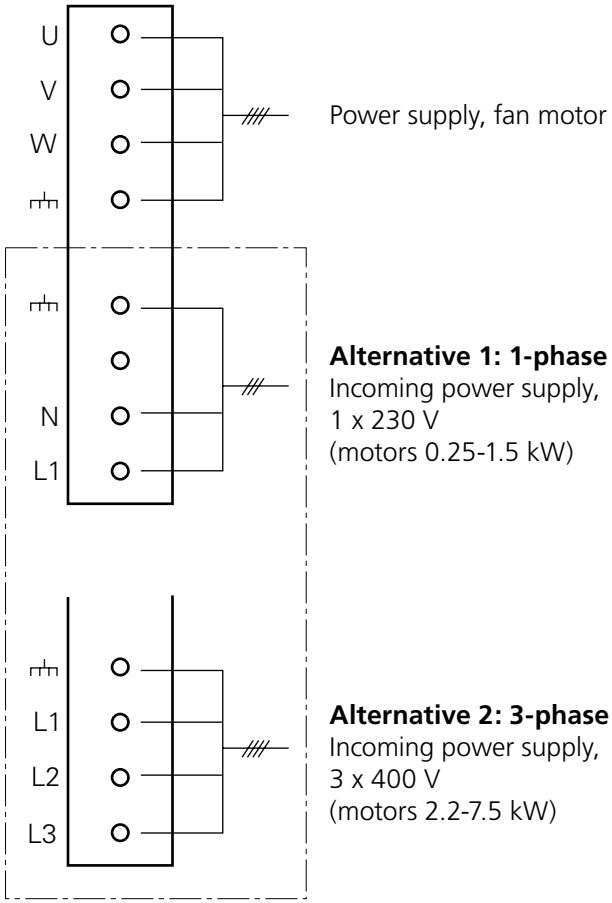
Function

G1 = Extract air fan
T1 = Frequency inverter
The extract air fan is started and stopped via frequency inverter T1*.
The desired speed(s) can be preset from the KP-1-200 control panel.
One or two constant speeds.
Start via closure between 7-8 and 7-9.
Speed 1: 7-10 open.
Speed 2: 7-10 closed.
Alarms can be reset by briefly isolating the power supply to the ventilator or by interrupting the circuit at terminals 7 – 8.
Provision is available for forwarding alarms.



Electrical Connections

Power supply (wiring terminal X1)



Power supply, fan motor

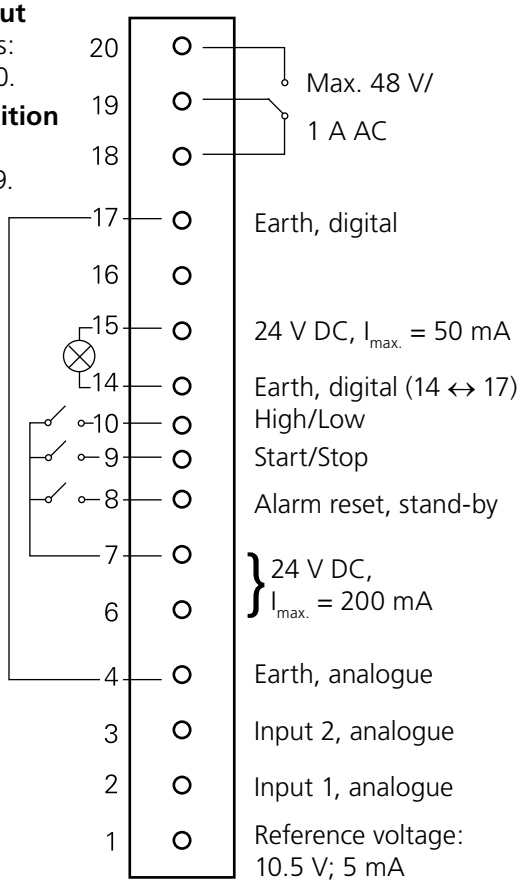
Alternative 1: 1-phase
Incoming power supply,
1 x 230 V
(motors 0.25-1.5 kW)

Alternative 2: 3-phase
Incoming power supply,
3 x 400 V
(motors 2.2-7.5 kW)

Control functions (wiring terminal X2)

Alarm output
Active alarms:
closure 19-20.
Normal position
No alarm:
closure 18-19.

In-operation indications



* The frequency inverter can either be supplied mounted inside the fan casing (size 060 and 090) or loose for indoor installation. Important! If it is installed indoors, a shielded cable must be used between T1 and G1. To avoid damage to the wiring terminals of the frequency inverter, cable conductors should not be connected if the temperature is below -10 °C.

Electrical and Control Equipment

Control functions

Q3: The control system with frequency inverter*, programmed for variable speed via 0 – 10 V signal or via an external potentiometer.

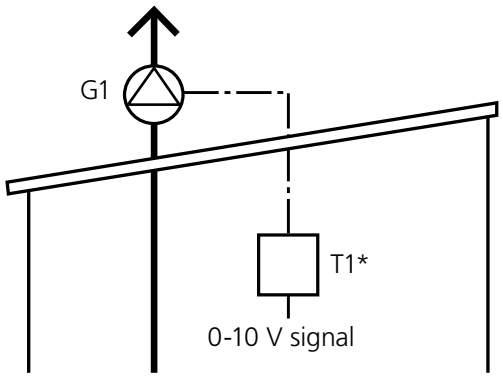
Function

G1 = Extract air fan
T1 = Frequency inverter

Extract air fan, G1, is controlled between 0 and max. speed via an external 0-10 V signal, connected G0 to terminal 4 and signal to terminal 2.

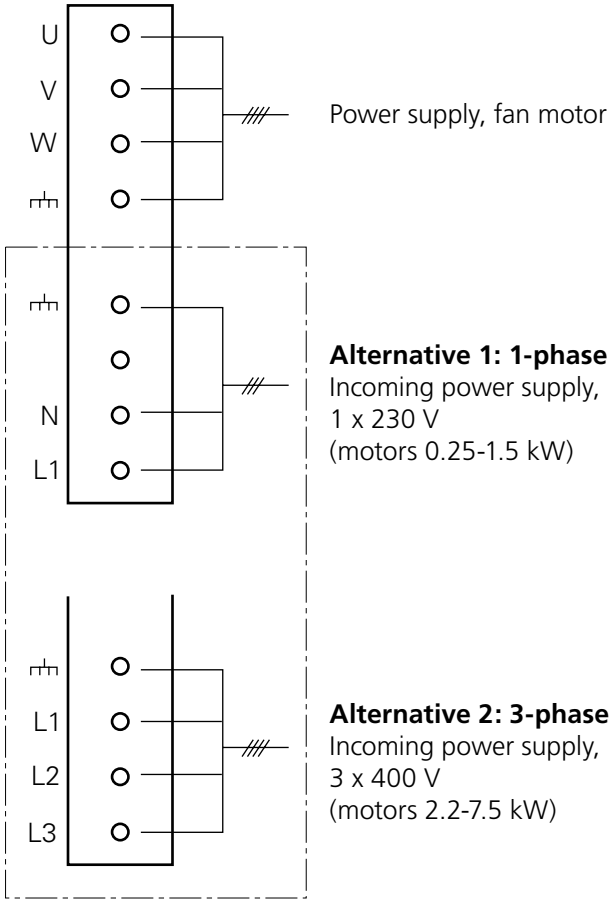
Start via closure between 7-8 and 7-9. The alarm can be reset by isolating the power supply to the ventilator or by opening the circuit between 7-8.

Provision is available for forwarding alarms.

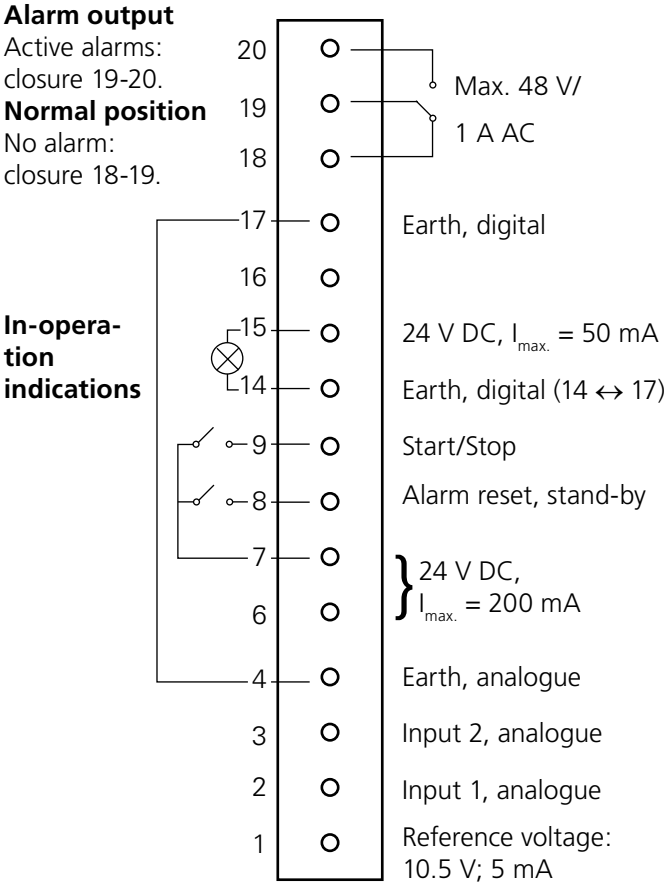


Electrical Connections

Power supply (wiring terminal X1)



Control functions (wiring terminal X2)

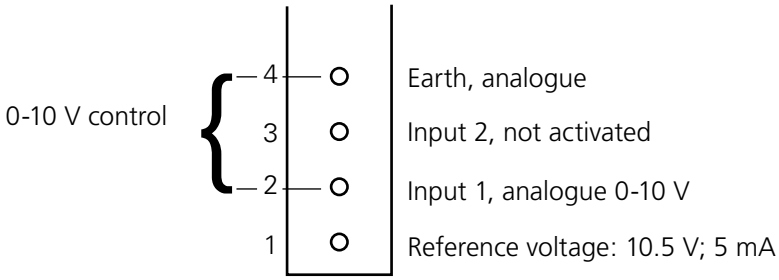


* The frequency inverter can either be supplied mounted inside the fan casing (size 060 and 090) or loose for indoor installation. Important! If it is installed indoors, a shielded cable must be used between T1 and G1. To avoid damage to the wiring terminals of the frequency inverter, cable conductors should not be connected if the temperature is below -10 °C.

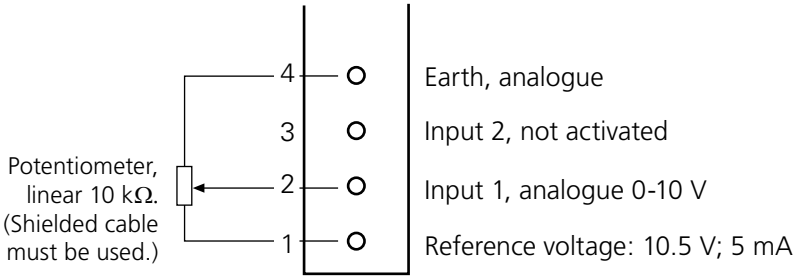
Electrical and Control Equipment

Control functions
Continued, Q3, Alternatives

Alternative 1
0-10 V control signal



Alternative 2
Control via potentiometer



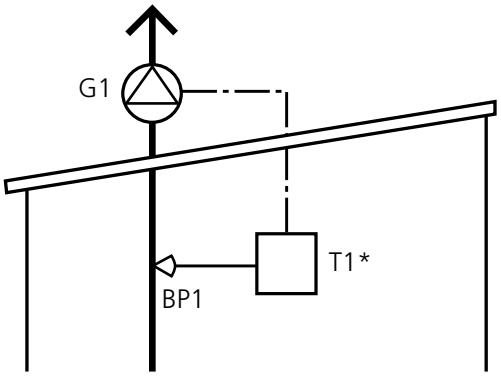
Electrical and Control Equipment

Control functions

Q4: The control system with frequency inverter*, programmed for pressure control.

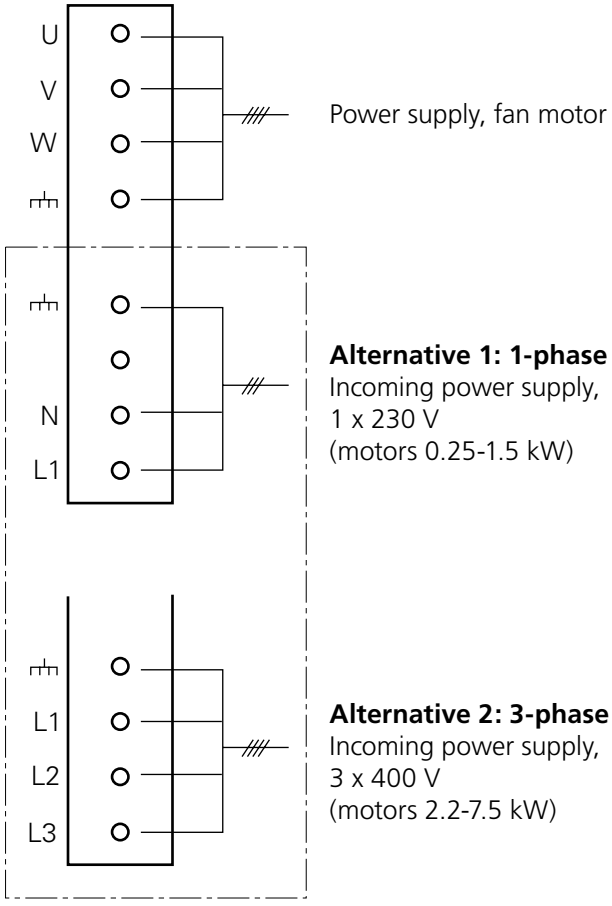
Function
G1 = Extract air fan
T1 = Frequency inverter
BP1 = Pressure transmitter

The speed of the extract air fan, G1, is controlled via a 4-10 mA signal from active pressure transmitter BP1, connected to terminals 6 and 2.
Start via closure between 7-8 and 7-9.
Alarms can be reset by briefly isolating the power supply to the ventilator or by interrupting the circuit at terminals 7 – 8.
Provision is available for forwarding alarms.



Electrical Connections

Power supply (wiring terminal X1)



Power supply, fan motor

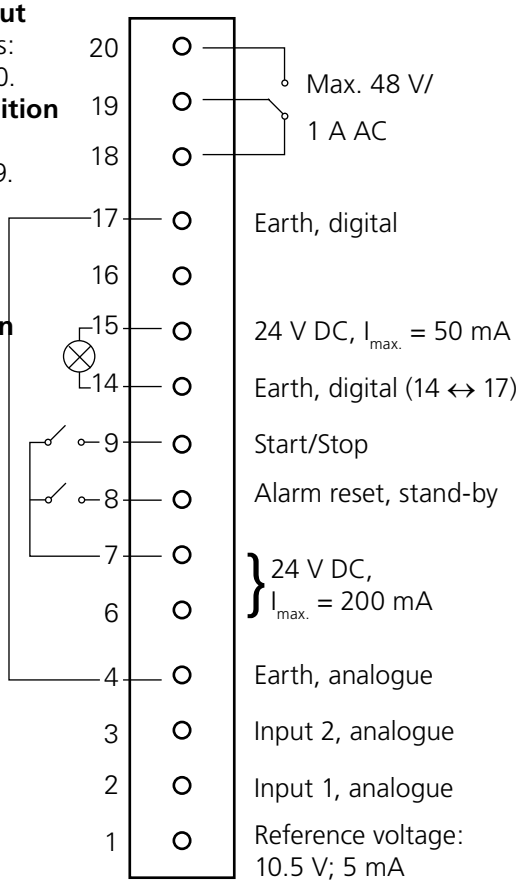
Alternative 1: 1-phase
Incoming power supply,
1 x 230 V
(motors 0.25-1.5 kW)

Alternative 2: 3-phase
Incoming power supply,
3 x 400 V
(motors 2.2-7.5 kW)

Control functions (wiring terminal X2)

Alarm output
Active alarms:
closure 19-20.
Normal position
No alarm:
closure 18-19.

In-operation indications

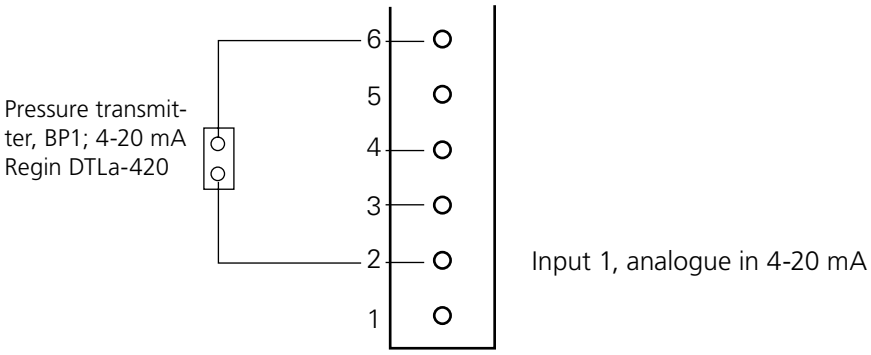


* The frequency inverter can either be supplied mounted inside the fan casing (size 060 and 090) or loose for indoor installation. Important! If it is installed indoors, a shielded cable must be used between T1 and G1. To avoid damage to the wiring terminals of the frequency inverter, cable conductors should not be connected if the temperature is below -10 °C.

Electrical and Control Equipment

Control functions
Continued, Q4, Alternatives

Control via external pressure transmitter



Analogue input 1 can be reprogrammed with parameter 180 to 0-10 V or 0-20 mA for use of another pressure transmitter.

Electrical and Control Equipment

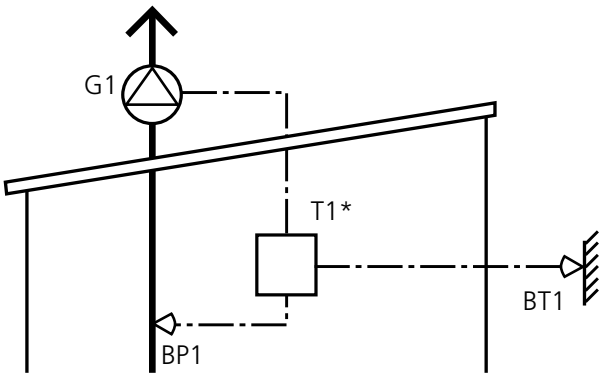
Control functions

Q5: The control system with frequency inverter*, programmed for outdoor temperature-compensated pressure control.

Function

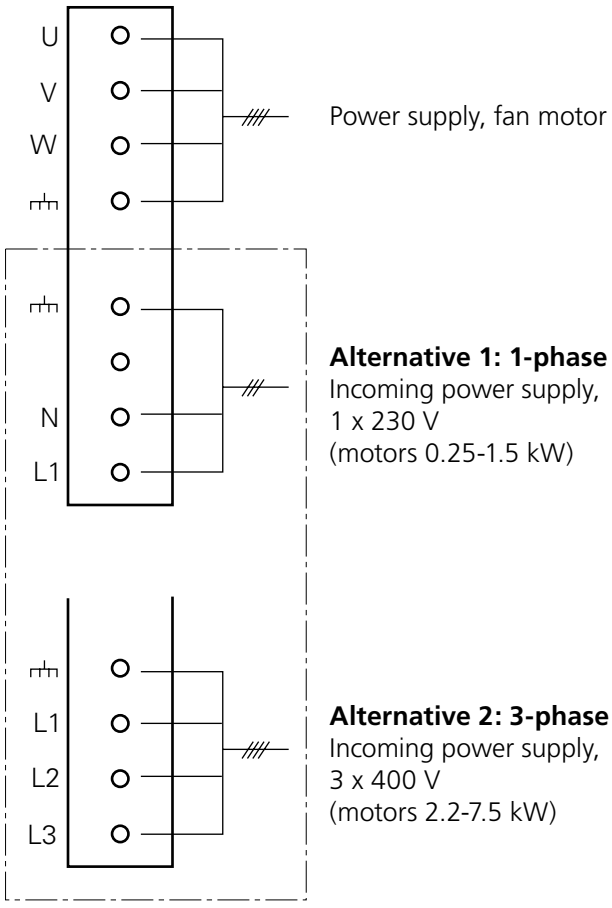
G1 = Extract air fan
T1 = Frequency inverter
BP1 = Pressure transmitter
BT1 = Outdoor temperature sensor

The speed of the extract air fan, G1, is controlled via a 4-10 mA signal from active pressure transmitter BP1, connected to terminals 6 and 2.
The set point is outdoor-temperature-compensated between -25°C and + 25°C.
Connect the outdoor temperature sensor, BT1, conductors to terminals 6, 4 and 3.
Start via closure between 7-8 and 7-9.
Alarms can be reset by briefly isolating the power supply to the ventilator or by interrupting the circuit at terminals 7 – 8.
Provision is available for forwarding alarms.



Electrical Connections

Power supply (wiring terminal X1)



Power supply, fan motor

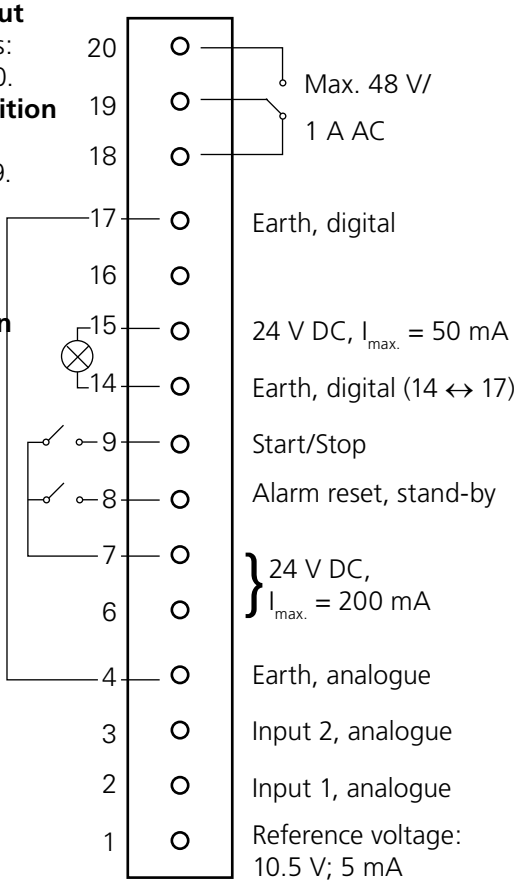
Alternative 1: 1-phase
Incoming power supply,
1 x 230 V
(motors 0.25-1.5 kW)

Alternative 2: 3-phase
Incoming power supply,
3 x 400 V
(motors 2.2-7.5 kW)

Control functions (wiring terminal X2)

Alarm output
Active alarms:
closure 19-20.
Normal position
No alarm:
closure 18-19.

In-operation indications

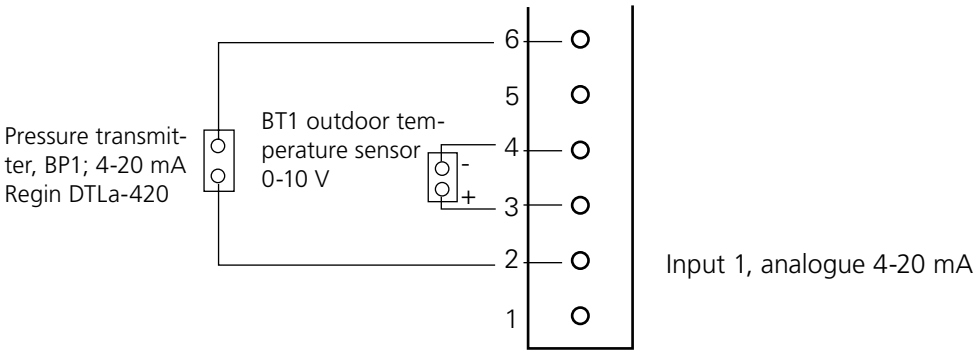


* The frequency inverter can either be supplied mounted inside the fan casing (size 060 and 090) or loose for indoor installation. Important! If it is installed indoors, a shielded cable must be used between T1 and G1. To avoid damage to the wiring terminals of the frequency inverter, cable conductors should not be connected if the temperature is below -10 °C.

Electrical and Control Equipment

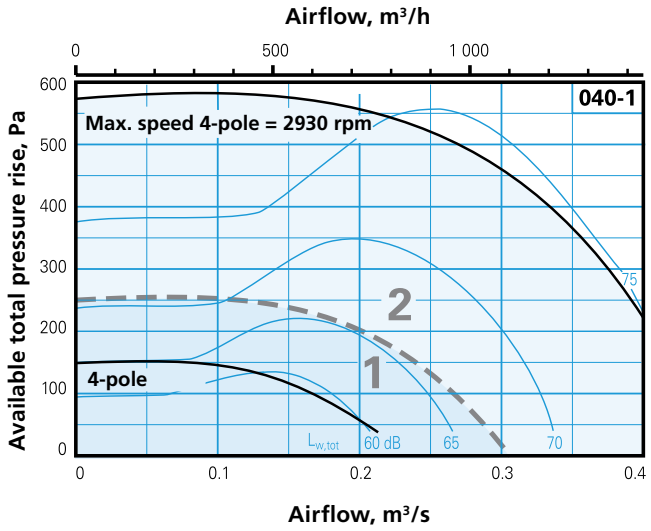
Control functions
Continued, Q5, Alternatives

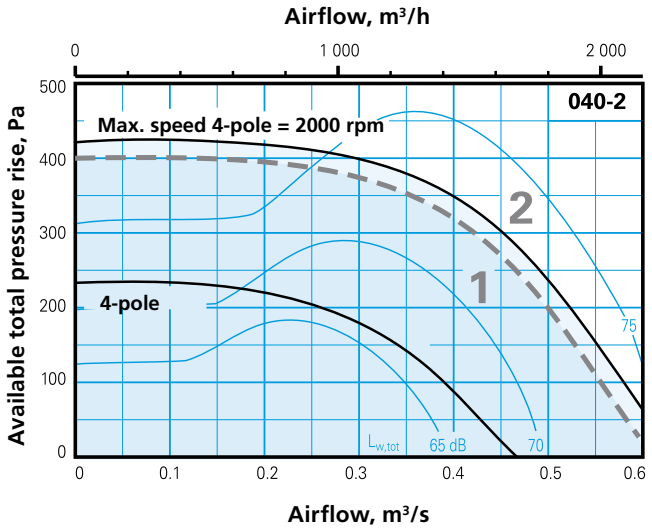
Control via external pressure transmitter Outdoor temperature compensation of the pressure set point.



Analogue input 1 can be reprogrammed with parameter 180 to 0-10 V or 0-20 mA for use of another pressure transmitter.

Sizing, Size 040





Motor Data

Motor option	Motor output kW	Max. current A	Speed - r/min.*	Effi-ciency %	Voltage V
4-pole	0,25	1,2/0,69	1400(2930)	65,2	3x230Δ /3x400 star

*( ) = Max. speed with frequency inverter.

Motor Data

Motor option	Motor output kW	Max. current A	Speed - r/min.*	Effi-ciency %	Voltage V
4-pole	0,25	1,2/0,69	1400(2000)	65,2	3x230Δ /3x400 star

*( ) = Max. speed with frequency inverter.

Important! Sky Wing, size 040, cannot be supplied with built-in frequency inverter.

Acoustic Calculations

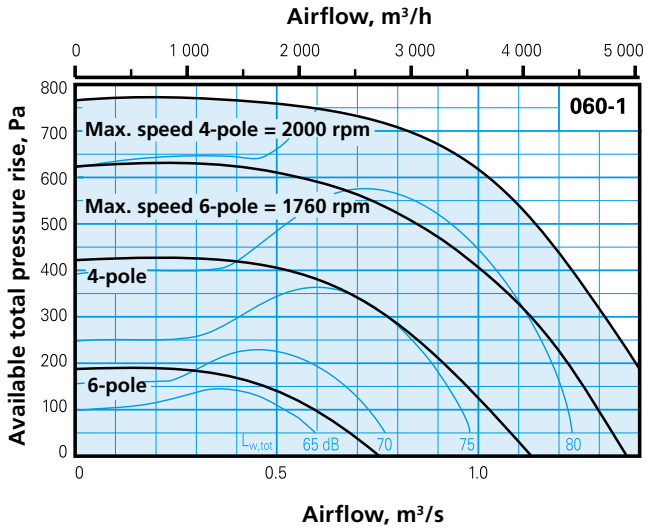
The sound power level emitted to the surroundings has been obtained from measurements in accordance with the ISO 3741 method and the sound power level emitted to the ducting has been obtained from measurements in accordance with the ISO 5136 method.

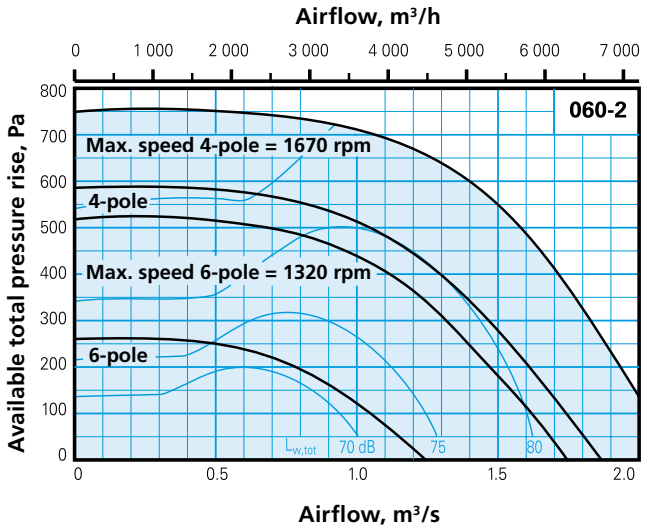
The totalThe total sound power level emitted to the surroundings, $L_{W, tot}$ can be read in each fan chart. The following formula can be used for breaking down the total sound power level into octave bands: $L_{w, ok} = L_{w, tot} + K_{ok}$. From the table below: K_{ok} . dB(A)corrected sound power level to the surroundings can be calculated using the following formula: $L_{wA} = L_{w, tot} + K_A$.

Correction factor K_{ok} for various sound paths and for calculating the sound pressure level in dB(A) to the surroundings.

Sound path	Range in chart	Octave band, no. / mid-frequency, Hz								dB (A)
		1 63	2 125	3 250	4 500	5 1000	6 2000	7 4000	8 8000	
To the surroundings	1	-7	-6	-5	-9	-9	-13	-20	-24	-5
	2	-17	-13	-11	-5	-3	-12	-23	-19	-1
To the the duct	1	-11	-6	-5	-12	-16	-11	-13	-20	
	2	-9	-13	-11	-5	-7	-11	-10	-15	

Sizing, Size 060





Motor Data

Motor option	Motor output kW	Max. current A	Speed - r/min.*	Effi-ciency %	Voltage V
4-pole	1,1	4,35/2,51	1440(2000)	77	3x230Δ /3x400 star
6-pole	0,75	3,35/1,95	910(1760)	72	3x230Δ /3x400 star

*( ) = Max. speed with frequency inverter.

The size 060 Sky Wing can either be supplied with built-in or loose frequency inverter.

Motor Data

Motor option	Motor output kW	Max. current A	Speed - r/min.*	Effi-ciency %	Voltage V
4-pole	1,5	5,51/3,18	1420(1670)	80,5	3x230Δ /3x400 star
6-pole	0,75	3,38/1,95	910(1320)	72	3x230Δ /3x400 star

*( ) = Max. speed with frequency inverter.

Acoustic Calculations

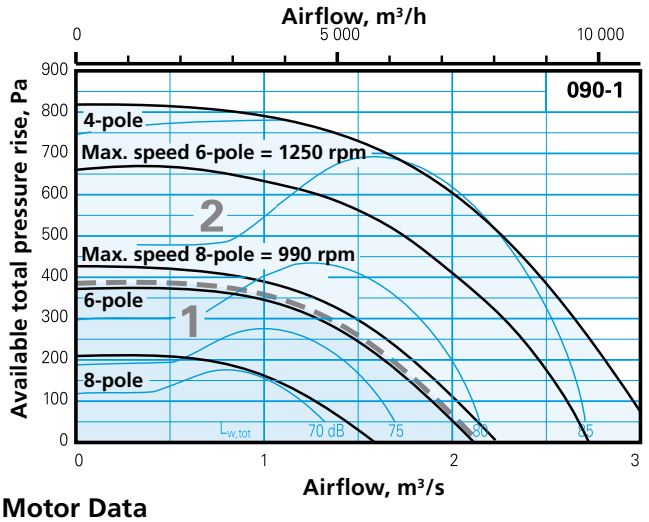
The sound power level emitted to the surroundings has been obtained from measurements in accordance with the ISO 3741 method and the sound power level emitted to the ducting has been obtained from measurements in accordance with the ISO 5136 method.

The totalThe total sound power level emitted to the surroundings, $L_{W, tot}$ can be read in each fan chart. The following formula can be used for breaking down the total sound power level into octave bands: $L_{w, ok} = L_{w, tot} + K_{ok}$. From the table below: K_{ok}. dB(A)corrected sound power level to the surroundings can be calculated using the following formula: $L_{wA} = L_{w, tot} + K_A$.

Correction factor K_{ok} for various sound paths and for calculating the sound power level in dB(A) emitted to the surroundings.

Sound path	Octave band, no. / mid-frequency, Hz								dB
	1	2	3	4	5	6	7	8	
	63	125	250	500	1000	2000	4000	8000	(A)
To the surroundings	-7	-6	-5	-9	-9	-13	-20	-24	-5
To the ducting	-11	-6	-5	-12	-16	-11	-13	-20	

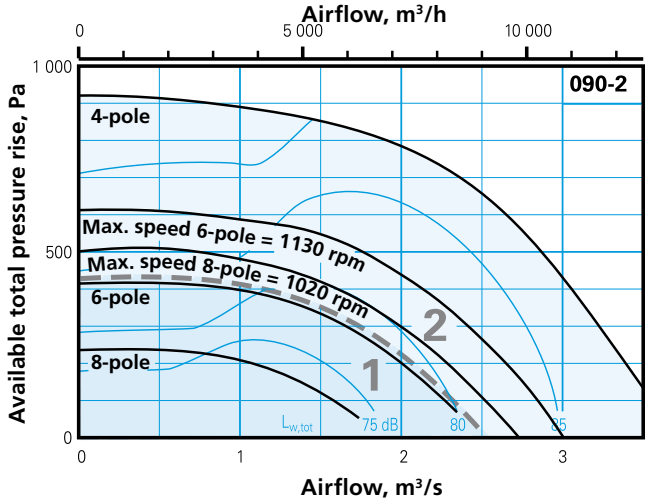
Sizing, Size 090



Motor Data

Motor option	Motor output kW	Max. current A	Speed - r/min.*	Effi-ciency %	Voltage V
4-pole	2,2	7,87/4,54	1420(1420[1])	83	3x230Δ /3x400 star
6-pole	1,5	7,45/4,3	940(1250)	77,5	3x230Δ /3x400 star
8-pole	0,75	4,0/2,33	700(990)	72,6	3x230Δ /3x400 star

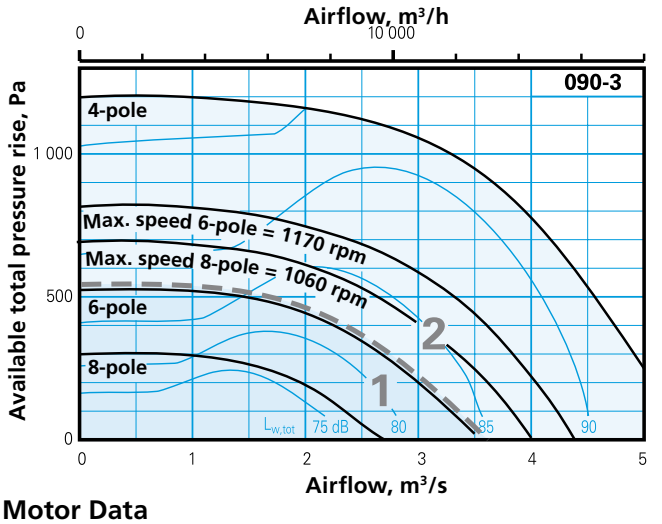
*( ) = Max. speed with frequency inverter.
[1]) Max. frequency from frequency inverter out to 4-pole motor: 50 Hz.



Motor Data

Motor option	Motor output kW	Max. current A	Speed - r/min.*	Effi-ciency %	Voltage V
4-pole	3	10,3/5,94	1420(1420[1])	83,5	3x230Δ /3x400 star
6-pole	1,5	7,45/4,3	940(1130)	77,5	3x230Δ /3x400 star
8-pole	1,1	5,7/3,3	700(1020)	74	3x230Δ /3x400 star

*( ) = Max. speed with frequency inverter.
[1]) Max. frequency from frequency inverter out to 4-pole motor: 50 Hz.



Motor Data

Motor option	Motor output kW	Max. current A	Speed - r/min.*	Effi-ciency %	Voltage V
4-pole	7,5	14,2	1470(1470[1])	88,6	3x230Δ/3x400 star
6-pole	3	12,1/7	935(1170)	82,5	3x230Δ /3x400 star
8-pole	2,2	9,4/5,4	710(1060)	84	3x230Δ /3x400 star

*( ) = Max. speed with frequency inverter.
[1]) Max. frequency from frequency inverter out to 4-pole motor: 50 Hz.

Acoustic Calculations

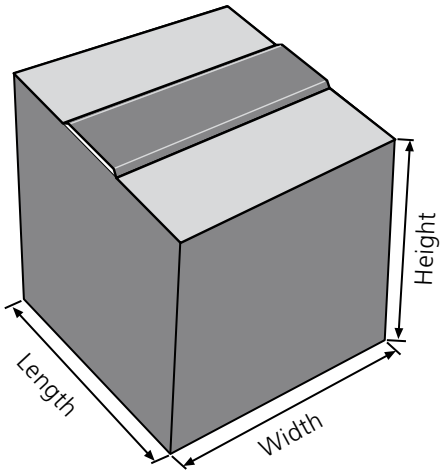
The sound power level emitted to the surroundings has been obtained from measurements in accordance with the ISO 3741 method and the sound power level emitted to the ducting has been obtained from measurements in accordance with the ISO 5136 method.

The totalThe total sound power level emitted to the surroundings, $L_{W, tot}$ can be read in each fan chart. The following formula can be used for breaking down the total sound power level into octave bands: $L_{w, ok} = L_{w, tot} + K_{ok}$. From the table below: K_{ok}. dB(A)corrected sound power level to the surroundings can be calculated using the following formula: $L_{wA} = L_{w, tot} + K_A$.

Correction factor K_{ok} for various sound paths and for calculating the sound power level in dB(A) emitted to the surroundings.

Sound path	Range in chart	Octave band, no. / mid-frequency, Hz 1	2	3	4	5	6	7	8	dB (A)
		63	125	250	500	1000	2000	4000	8000	
To the surroundings	1	-10	-10	-12	-3	-8	-15	-19	-19	-5
	2	-7	-6	-5	-9	-9	-13	-20	-24	-5
To the the duct	2	1 -11	-8 -6	-8 -5	-10 -12	-8 -16	-13 -11	-15 -13	-19 -20	-14

Dimensions



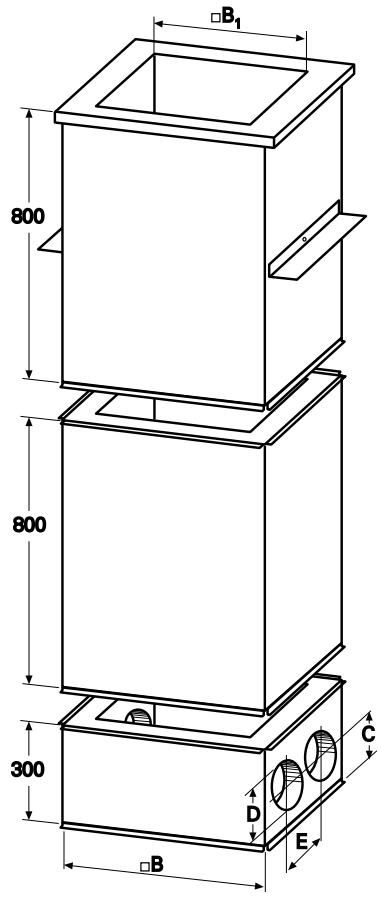
Size	Length	Width	Height	Max weight
LTCW 040-1 LTCW 040-2	495 495	495 495	430 430	44 kg 46 kg
LTCW 060-1 LTCW 060-2	695 695	695 695	600 600	80 kg 85 kg
LTCW 090-1 LTCW 090-2 LTCW 090-3	995 995 995	995 995 995	850 850 850	145 kg 155 kg 200 kg

Accessories

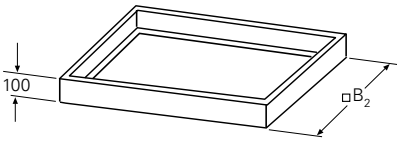
Roof duct
LTSA

Jointing duct
LTSZ-B

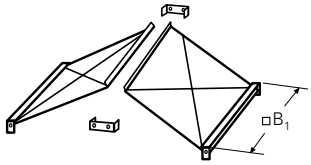
Bottom duct
LTSZ-C



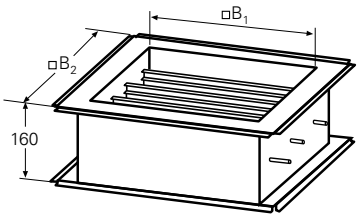
Mounting frame
LTSZ-A



Automatic shutter
LTSZ-F



Louvre damper, type 3
LTSZ-J



Size	B	B_1	B_2	C	D	E	Weight	
							LTSA LTSZ-B	LTSZ-C
040	400	300	412	167	203	–*	29	12
060	600	500	612	167	203	290	46	21
090	900	800	912	167	203	400	63	40

**) Size 040 has 1 connection on each side, centred sideways.*