MonsterFans

Use Instruction

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Table of content:

1 Introduction 3
1.1 Specifications 3
2 Safety Instructions 3
2.1 Placement & Distances 4
2.2 Checklist 5
3 Parts Overview MonsterFans 6
3.1 Bill of Materials 6
3.2 Required Tools 8
4 Installation & Mounting 8
4.1 Safety Clearances & distance to HVAC systems 9
4.2 Safety Distances to Ventilation Systems 9
4.2 Required Installation Environment 9
4.3 Mounting Sets 10
4.5 Extension elements 12
4.6 Wire rope clamps & Thimbles 13
4.7 Installation of MonsterFans 13
4.8 Electric Connections 16
4.9 Oil Check and Oil Safety Pin 17
5 Frequency converter and connection to SchwankControl Touch 17
5.1 Changing parameters on the frequency converter 19
5.2 Control via SchwankControl Touch display 20
5.2.1 Modbus addressing of the MonsterFans in the SCT menu 21
5.2.2 Functional testing & troubleshooting 21
5.2.3 Operating a MonsterFans control zone 22
5.2.4 Operating modes of MonsterFans zones in SchwankControl Touch 23
5.2.5 Functions of the operating modes in a control zone 23
5.2.6 Temperature difference control (automatic destratification) ΔT 24
5.3 Interlocking with luminous heater control zones 24
5.4 Parameterization of Individual MonsterFans Menu 25
5.5 Remote shut off and interlocking with SCT connection 25
6 Commissioning 26
6.1 Test Run 26
6.2 Warnings 26
6.3 Troubleshooting 26
6.4 Frequency Inverter Error Messages 27
7 Warranty & Maintenance 28
8 Packaging Units 29
9 Acceptance Report for Installation & Commissioning 30
9.1 Acceptance Report of Maintenance 31
10 Declaration of Conformity 32

1 Introduction

Congratulations on your MonsterFan purchase.
The High Volume, Low Speed fans (HVLS) of the MonsterFans series are energy-saving units with high comfort and diameters from 3.6 m (12ft.) to 7.3 m (24 ft.). They move big amounts of air at low rotational speed. The blades are streamlined and ideally engineered according to the principles of aerodynamics.
With a power rating of 1.5 kW, the aluminium blades can move large air masses over a large area and create a comfortable breeze. MonsterFans cool by lowering the ambient temperature. In winter MonsterFans can effectively be used for destratification. Please also note the warning notices for destratification.

1.1 Specifications

Diameter	3.6 m (12 ft)	4.9 m (16 ft)	7.3 m (24 ft)
Article no.	195 80 200	195 80 204	195 80 212
Type	MF-C12	MF-C16	MF-C24
Max. Air Volume	621,000 m^3/h	675,000 m^3/h	783,000 m^3/h
Rounds per Minute	10-95 RPM	10-75 RPM	10-55 RPM
Weight*	104 kg	113 kg	132 kg
Motor Power	1.5 kW / 2 hp		
Max. Electrical Consumption	3.23 A		
Supply Voltage	3~400 V, 50 Hz		
Sound Pressure Level	55 dB measured at max. rotational speed at 5 m distance		
*Notes: The weight specifications refer to the fan without controller and without mounting set or further extension tube.			
Die Inbetriebnahme darf nur bei Temperaturen ab 0° C erfolgen.			

2 Safety Instructions

Read these use instructions carefully before starting the fan. Clear the operating area of the fan from all obstacles to have enough space for the fan.

Before installation and maintenance work on the fan, ensure that the power supply is disconnected.

Ensure that all safety precautions and instructions are followed when installing, operating and maintaining the fan. Failures caused by disregarding these safety precautions can result in serious injury or death. If you do not understand the instructions, please contact your customer service.

Installation, power supply, commissioning, maintenance and repairs may only be carried out by a qualified specialists who are familiar with national and local guidelines for electrical installations and building regulations.

All electrical components are pre-programmed at the factory and ready for use. Follow these installation instructions during installation. Please do not make any changes to components. Install the device completely before putting the device

into operation.

To avoid the risk of electric shock, note the following:
a) Use this device only as intended by the manufacturer. If you have any questions, please contact the manufacturer or your local service partner.
b) Always disconnect the unit from the power before maintenance or cleaning work.

The mounting of the suspension elements must be carried out by a qualified specialist. The fan´s wings must be installed at least 3.5 m above the floor.

Do not operate or install a big fan or individual parts that are damaged. If the fan does not work properly or if there are any unusual movements of the fan, switch off the power supply and contact your customer service.

Make sure that the replacement of safety-related parts, is carried out by the manufacturer, its customer service or a qualified specialist.

Install the safety cables on each fan according to the installation instructions. The MonsterFans must never be operated without a properly installed safety cable. In an emergency, the safety ropes additionally secure the fan. Proper installation of the ropes is also required for the stabilisation during operation. The fan shall not be operated in windy surroundings.

We recommend also securing the floor under the assembly so that attention is drawn to the work on the ceiling. Review all relevant guidelines to ensure that building regulations are followed in accordance with product certifications.

We always recommend having a structural engineer check who confirms the strength of the building and ceiling structure in advance.

If MonsterFans are in closed rooms with heaters with indirect exhaust gas systems (unflued), the parallel operation must be prevented by interlocking it!

2.1 Placement & Distances

Before installing the fans, check compliance with all guidelines for fire alarm systems, sprinkler systems and fans. We strongly recommend consultation with your local safety expert.
If sprinkler systems are installed, the fans must not interfere with the proper operation of these sprinklers. The control unit can also be connected to a fire alarm system so that the fan stops in an emergency.
The digital inputs and the Modbus interface of the control units are used for switching off and interlocking. If possible, do not mount the fan directly under lights to avoid adverse lighting effects from rotating wings.
If the building has a mezzanine, fans should be installed in the way that they are not accessible to people. HVLS fans should not be installed in the immediate vicinity of air supply outlets or suction inlets of other heating, ventilation, or air conditioning units, see chapter 4.2.

2.2 Checklist

☐ **Do you have the right mounting set for your mounting position?**
The standard mounting set supplied with this fan for I-beam, allows the fan to be hung on steel beams. Do not mount the fan on a purlin or a framework.
If you are unsure, please contact customer service.

☐ **Has a structural engineer checked and approved the assembly position?**
The assembly structure must withstand the forces generated by the fan.

☐ The fan is NOT used in parallel with heaters with indirect exhaust gas systems (unflued). Otherwise, parallel operation must be prevented by interlocking it.

☐ **The fan is at a minimum distance from the ceiling in accordance with the specified safety distances.**

☐ **The fan´s wings are installed at least 3.5 m above the floor.**

☐ **The fan is installed with a minimum distance of 2 times the fan diameter from obstacles and building structure, measured from the fan centre.**

☐ **The distance between several fans is at least 2.5 times the fan diameter, measured from the fan centre.**

☐ **The fan is installed that it is not exposed to strong winds and maintains a safety distance of at least 1 time the fan diameter from other heating, ventilation, air conditioning systems or from gates.**

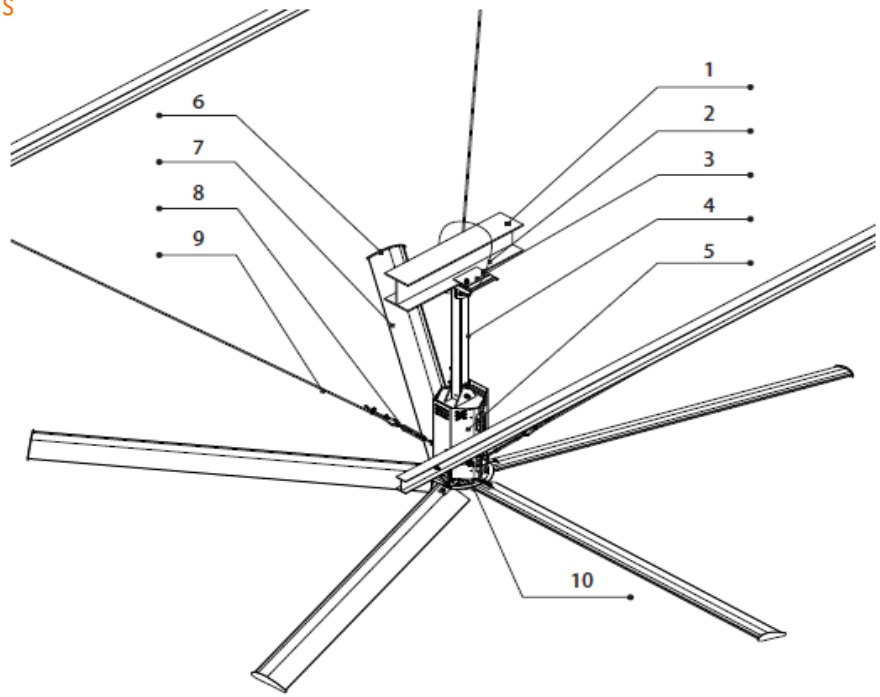
☐ **The supply voltage is selected correctly.**

☐ **The fan can be secured with the supplied safety ropes**
There are mounting points available for the safety ropes.

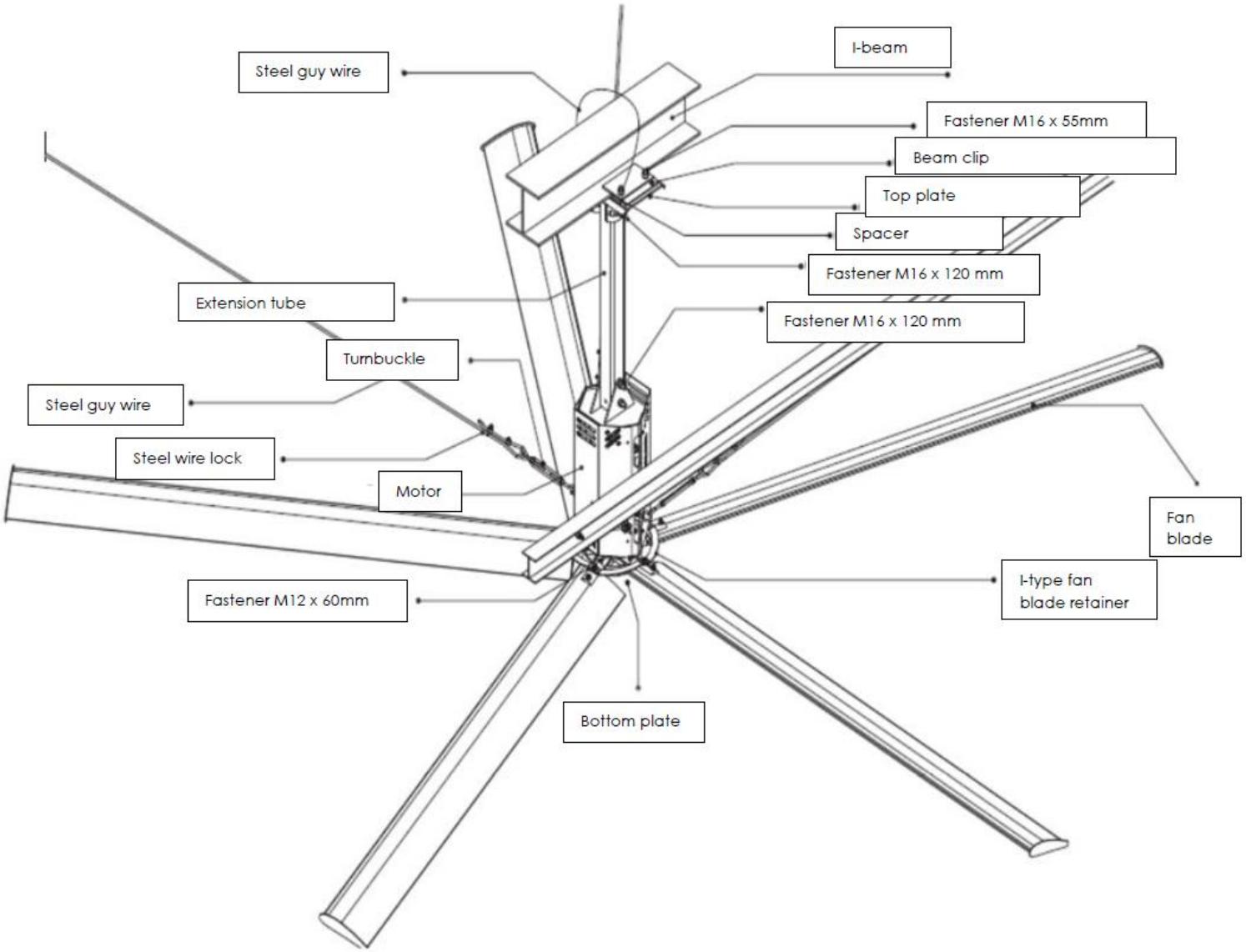
If your fan application does not meet the above requirements, proper operation is at risk. Please contact your customer service.

3 Parts Overview MonsterFans

1. Steel structure
2. Safety rope ring
3. Steel structure fastening
4. Extension tube
5. Motor housing
6. Winglets of fan blades
7. Fan blades
8. Turnbuckle & clamps
9. Safety steel rope
10. I-type safety adapting piece

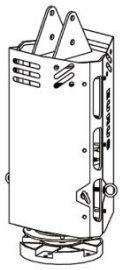


3.1 Bill of Materials

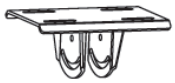


Bill of Materials - MonsterFans

1. Motor Housing

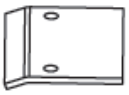


2. Top-Plate



3. Spacer
2x

4. Beam clip
2x



5. Turnbuckle 4x
& 1x replacement

6. I-type fan
blade retainer 5x

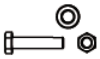
7. Fastener M5 x 12 mm
3x

8. Bottom plate

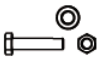
9. Safety steel rope
40m length

10. Steel wire lock
55x

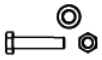
11. Fastener
M12 x 80 mm
10x



12. Fastener
M16 x 55 mm
4x



13. Fastener
M16 x 120 mm
4x

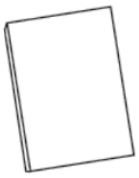


14. Metal joint on
Controller Box
2x

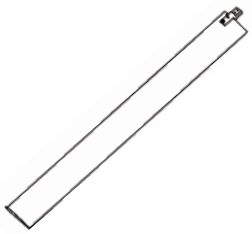
15. Controller Box

16. Techn. Manual
MonsterFans

17. Techn. Manual
Danfoss VFD

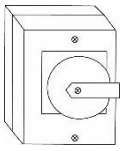


18. Fan blades
5x

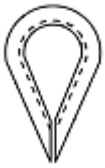


19. Extension Tube
1m length

20. 3-Pole switch-
disconnector



21. Thimbles
16x

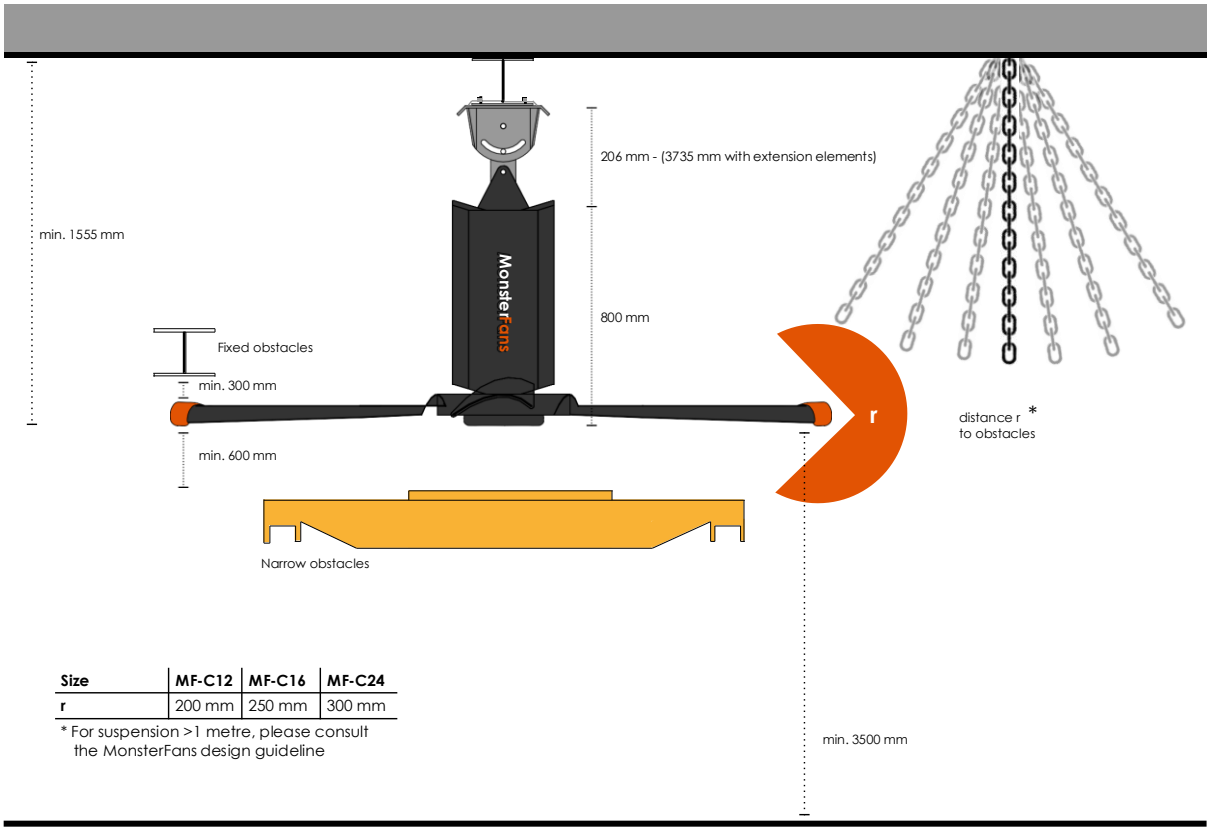


3.2 Required Tools

Spanner Set	Socket Wrench Set	Screwdriver Cross & Slot	Spirit Level	Wire rope shear
Cable Shears	Wire Stripper	Multimeter	Distance Meter	Threadlocker Glue

Please also note the necessary safety precautions for the use of a scissor lift and the general safety precautions. Two specialists are required for the installation.

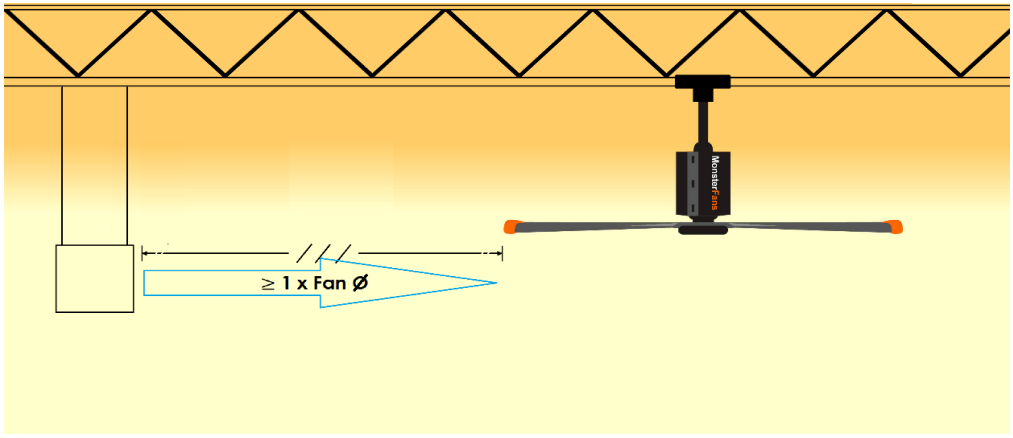
4 Installation & Mounting



Size	MF-C12	MF-C16	MF-C24
r	200 mm	250 mm	300 mm

* For suspension >1 metre, please consult the MonsterFans design guideline

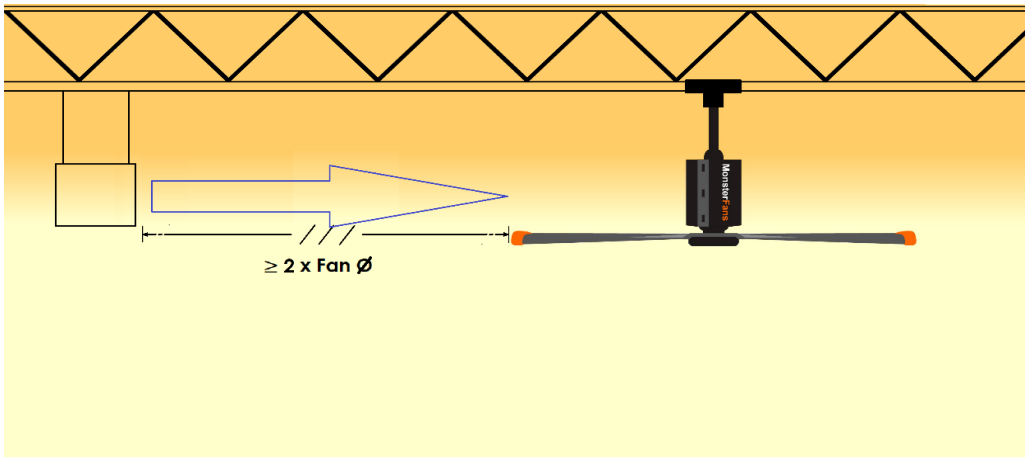
4.1 Safety Clearances & distance to HVAC systems



Safety distance to HVAC systems placed below the blades

If the air supply outlet of a ventilation system is **below** the blades, a minimum distance of 1 times or larger the fan diameter from the blade tip is sufficient.

If the air supply outlet of a ventilation system is located **above** the blades, a minimum distance of 2 times or larger the fan diameter from the blade tip is necessary.



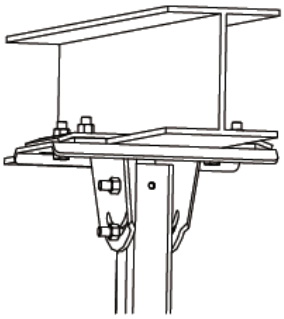
Safety distance to HVAC systems placed above the blades

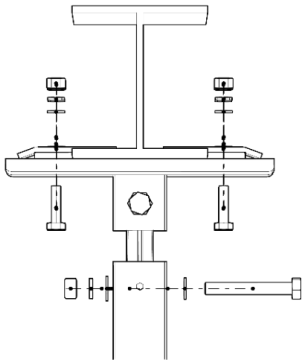
4.2 Required Installation Environment

Installation Environment	Conditions
Installation Location	Inside
Temperature Range	-15 + 55 °C Do not use the product in environments with strong temperature fluctuations. The product must not be exposed to frost.
Humidity	Below 95 % relative humidity
Surrounding	The fan and controller must not be exposed to flammable or corrosive gases. Metal powder, oils, water and other foreign objects must not get into the controller. Distances to hot sources e.g. heaters must be maintained. Please note the manufacturer's safety clearances. If MonsterFans are in closed rooms with heaters with indirect flue gas systems (unflued), parallel operation must be prevented by interlocking it.

4.3 Mounting Sets

The fans are usually connected to an I-beam
Accordingly, this element as standard is included in every packaging unit.



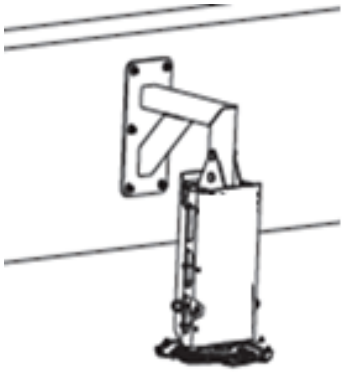


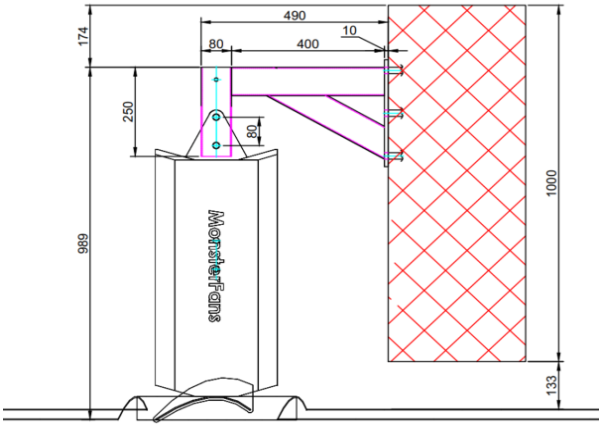
Standard Mounting Set
(for I-Beam)

Article no
19580220

Weight: 14 kg

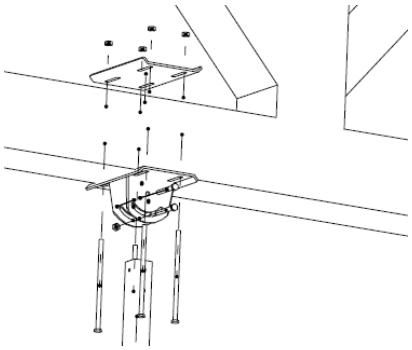
Optional lateral suspension for concrete structures article no. 19580223 Weight: 16 kg

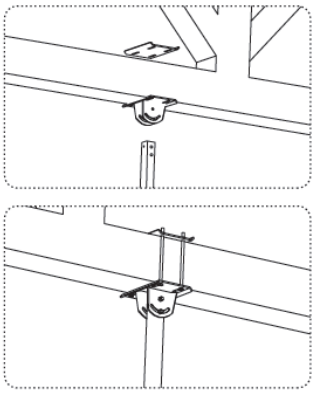


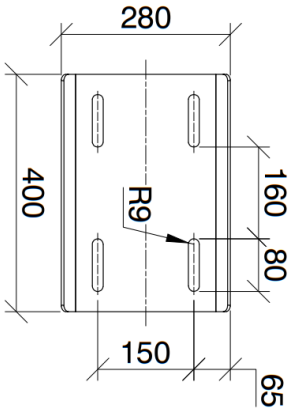


Halterung 19580223 am MonsterFans Motorkörper

Optional suspension for beam elements article no. 19580225 Weight: 26 kg



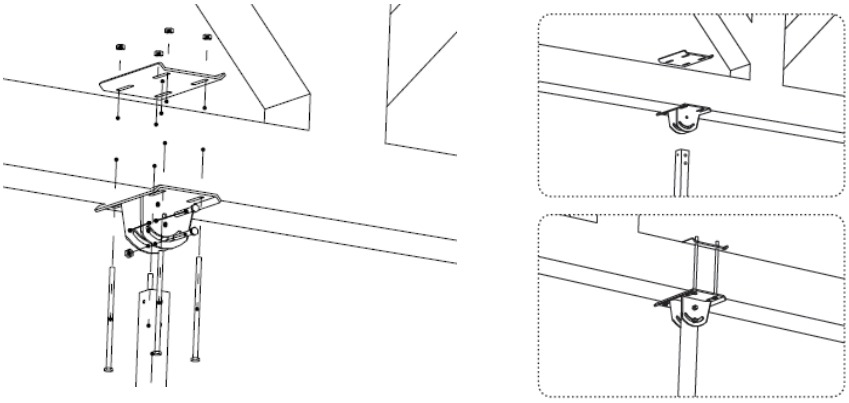




Mounting plate from set 19580225

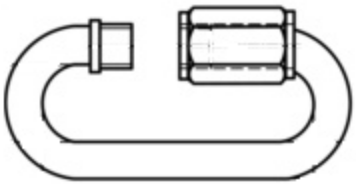
This optional suspension is suitable for beam widths up to 300 mm. The delivery consists of a mounting plate for T-beam brackets (19580220) and matching screws, as well as four M16 threaded rods with a length of 1000 mm.
The included standard bracket 19580220 is used for this option.

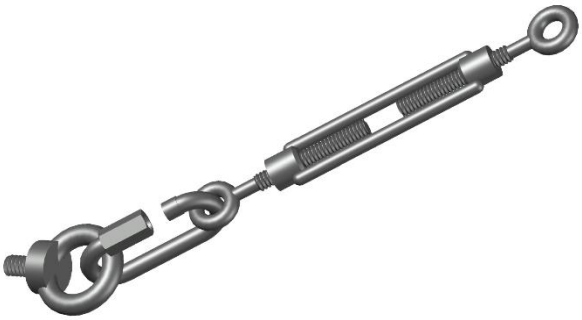
Optional suspension for beam elements up to 500 mm Item no. 19580226 Weight: 41 kg



This optional suspension is suitable for beam widths up to 500 mm and consists of a mounting bracket with a connecting element for the MonsterFans motor body and a matching mounting plate. Screws and 4 M16 threaded rods with a length of 1000 mm are included.

Optional assembly aid – M10 quick-release chain fastener Item no. 19580242 Weight: 0.1 kg





Installation situation for M10 quick-release chain fastener

The M10 quick-release chain fastener assembly aid is used to connect the turnbuckle and MF motor body directly.
The item number includes 1 piece.
Four quick-release chain fasteners are required per MonsterFan.

4.5 Extension elements

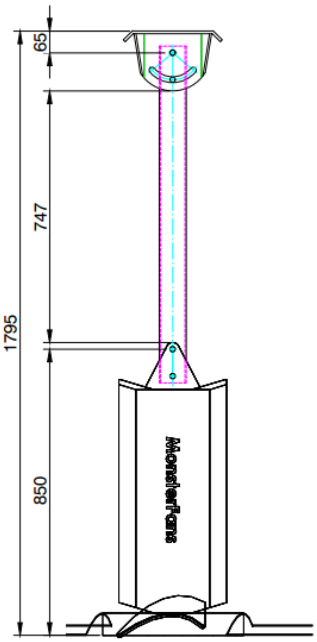
The MonsterFans fans are delivered ex-works with a hanging element of standard 1m. Optionally, we offer another 1 m and 2 m extension element and a connection piece to connect two extension elements.
The max. length of these extension elements must not exceed 3 m consisting of max. 2 elements. Likewise, only one connection set may be used to connect two extension elements. Otherwise, the stability of the fan can be influenced.

Extension tube
1 m standard length
Article no: 19580230
Weight: 8 kg

Optional Extension tube 1,5 m length
Article no 19580231
Weight: 12 kg

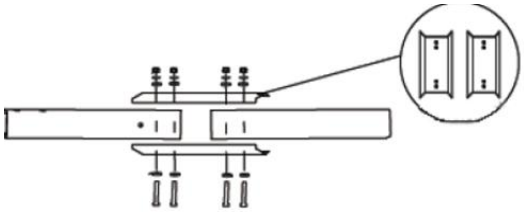
Optional Extension tube 2 m length
Article no 19580232
Weight: 16 kg

Optional Extension tube 265 mm length
Article no 19580233
Weight: 2 kg

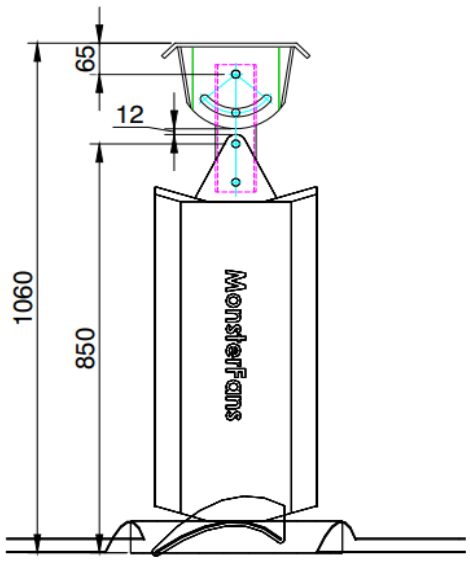


Detail 1 metre extension element

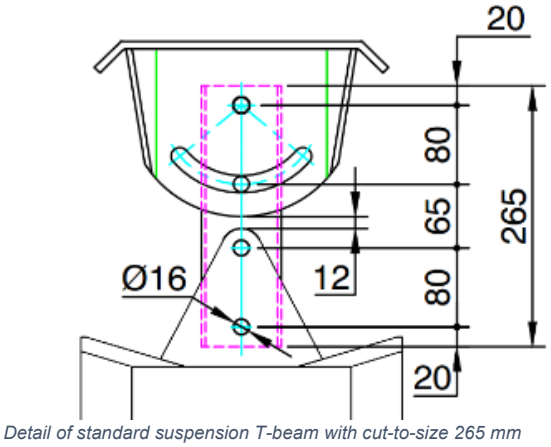
Connecting piece for extension tubes incl. bolts & screws:
Article no. 19580239
Weight: 3 kg



The connecting element can be shortened to the desired mounting position. If the standard suspension for T-beams is selected, a total device length from the mounting point to the hub of the MonsterFan can be achieved by using the recommended 265 mm connecting element cut (Article no: 19580233) to 1060 mm.



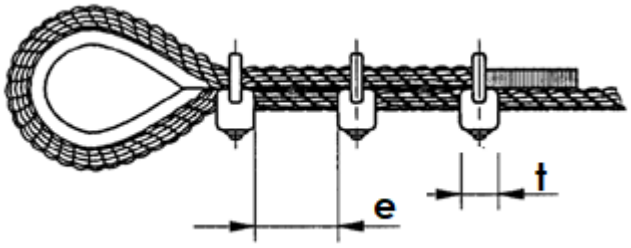
MonsterFans motor body with recommended cut-out 265 mm



Detail of standard suspension T-beam with cut-to-size 265 mm

4.6 Wire rope clamps & Thimbles

EN 13411-5:2009-02 stipulates the use of at least 3 wire rope clamps and thimbles for end connections for steel wire ropes of nominal size 5 mm.
The first wire rope clamp should be attached directly to the thimble. The clamp should always be attached to the loaded part of the rope.



The distance "e" between the wire rope clamps should be at least 1.5 "t" and not more than 3 "t", where "t" is the width of the clamp jaw.

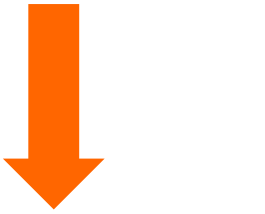
When making the connection and before commissioning, the collar nuts should be tightened to a torque of 2 Nm. The recommended tightening torque applies to wire rope clamps where the contact surfaces and threads of the nuts have been lubricated.

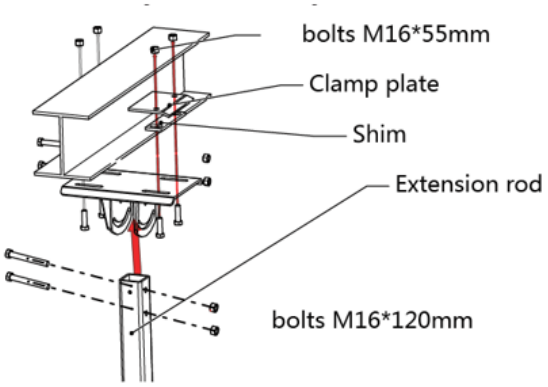
After the first application of the load the tightening torque should be checked again and corrected if necessary.

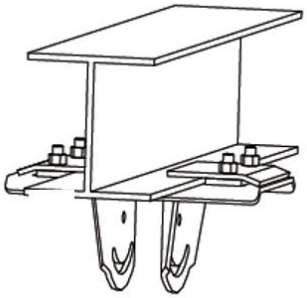
4.7 Installation of MonsterFans

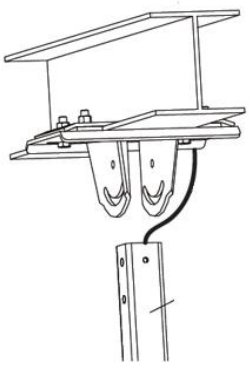
Start by installing the mounting element on the ceiling.

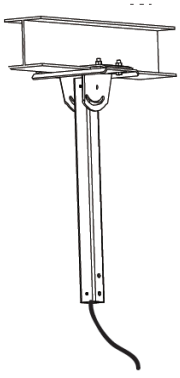
Attachment of the suspension & extension element



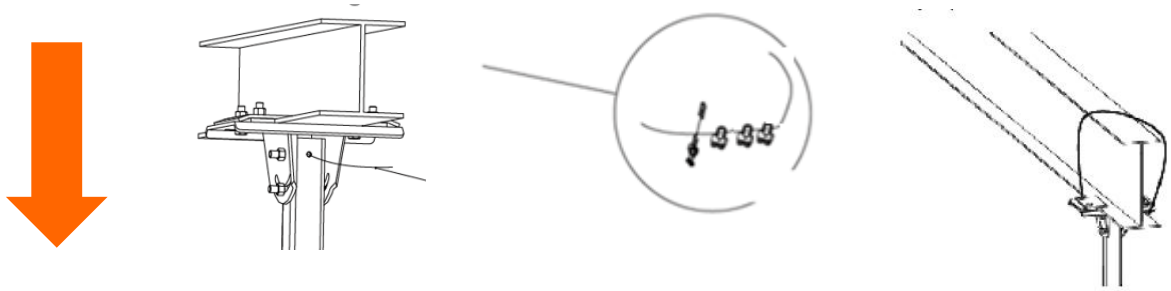




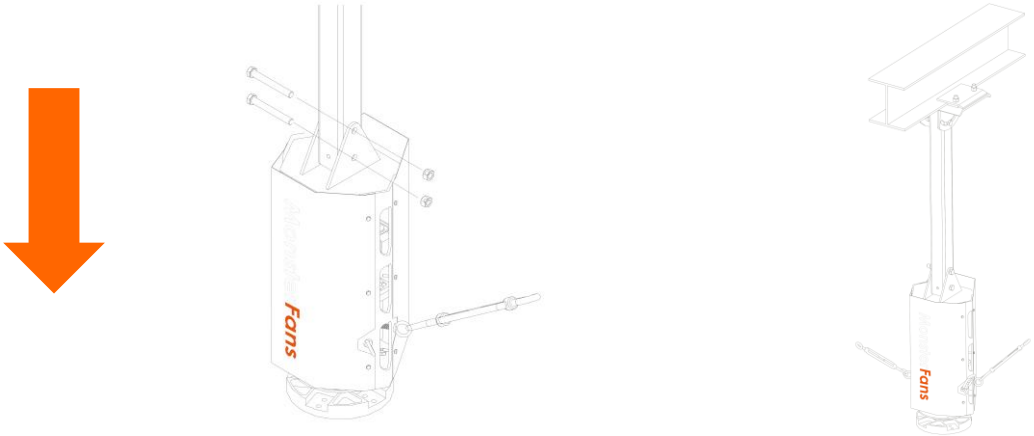




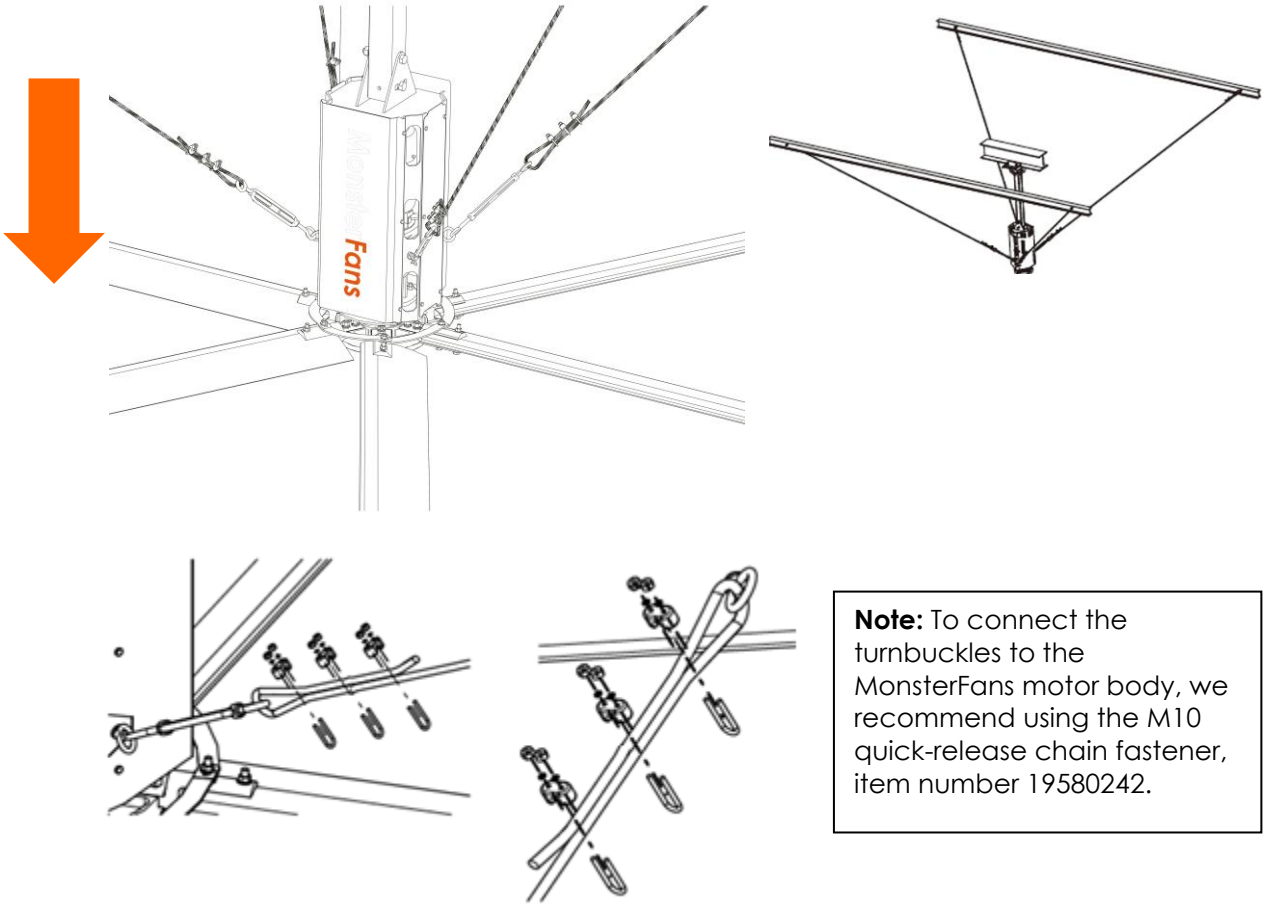
Pull your electrical cable through the extension tube.
Then attach the safety steel rope (parts list no 9) and secure it with the steel wire lock (no 10).
Observe the notes on wire rope clamp connections.



Mount the motor housing with the motor on the extension element.
Use the M16 x 120 mm screws for this. Pay attention to an exactly horizontal alignment.



Note: The safety steel ropes must be aligned symmetrically for the same load, then tightened evenly, use the turnbuckles and a threadlocker glue at the end.

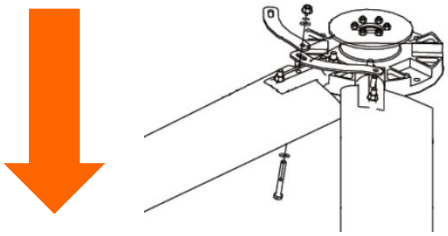


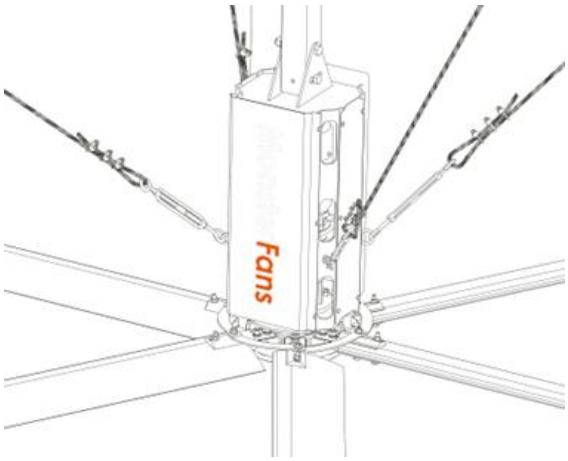
Note: To connect the turnbuckles to the MonsterFans motor body, we recommend using the M10 quick-release chain fastener, item number 19580242.

Connect the motor supply cable to the motor terminal box. Observe the instructions in chapter 4.8 Electrical connections.

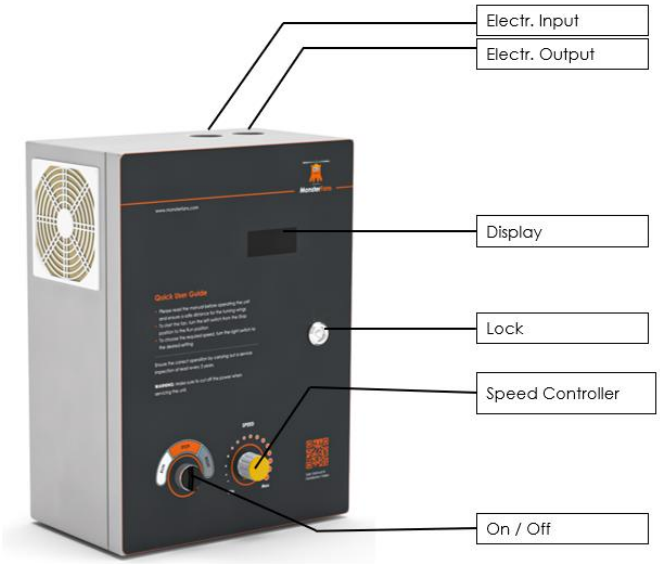
To connect the motor, remove the MonsterFans cover from the motor housing above the motor connection box. Use two M10 spanners for this.
Now loosen the cover from the motor connection box and feed the motor connection cable through the included EMC screw connection, paying attention to the position of the shielding braid. **Observe the instructions in chapter 4.8 - Electrical connections.**

Now, with two people, mount the fan blades. Use the M10 x 100 mm screws for this. Ensure that the blades are precisely aligned. During assembly, ensure that all retaining brackets (parts list section 3 no. 6) are connected to each other. Then install the base plate (section 3 no. 8) using the M5 x 12 mm screws (section 3 no. 7).





Now wire the cable to the Controller box. Use your own electrical cable for this.
Now install the Controller Box. We recommend installing it at a height of approx. 1.6 m.
The 3-pole switch disconnector (parts list no. 20) must be mounted and integrated in the direct vicinity of the Controller Box. Operation is only permitted with an emergency stop mechanism! The switch-disconnector may only be operated in emergency situations. An interruption of the power supply during operation can damage the frequency inverter as well as the motor!



MonsterFans Controller Box and Shut-off Device

Use an adequately dimensioned and EMC-compliant power cable for the motor connection, such as: *LAPP ÖLFLEX® CLASSIC 110 CY 4 G 2.5* [or equivalent].

To avoid electromagnetic interference or noise from the frequency converter, we recommend a maximum motor supply cable length of 15 m. By using a sine filter, e.g. TDK B84143V*R227, the cable length can be extended to 50 metres.

4.8 Electric Connections

Apply the supply voltage, 3 ph + PE, to the "control supply line" terminals. The motor supply cable is connected directly to the frequency Inverter, the shielding next to the strain relief is connected to the PE. The start command of the frequency inverter can be brought out and interrupted via the remote release contact.

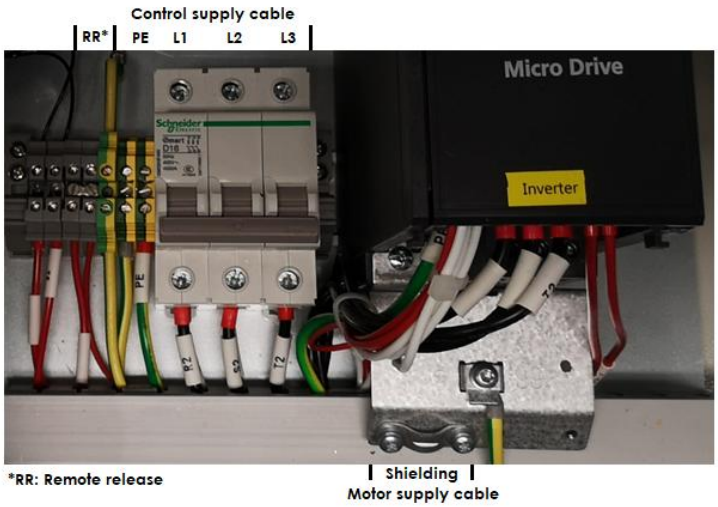


Figure: Controller Connection

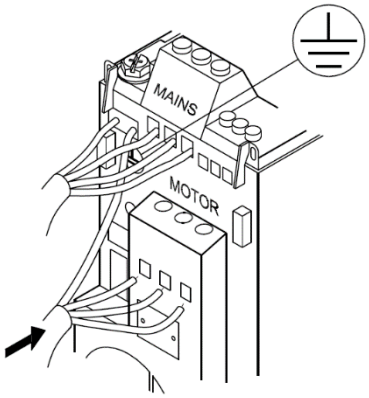
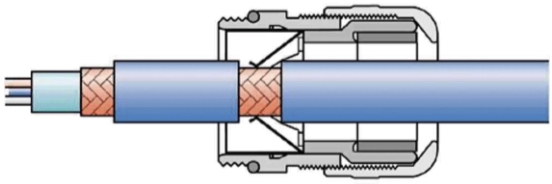


Figure: Inverter connection

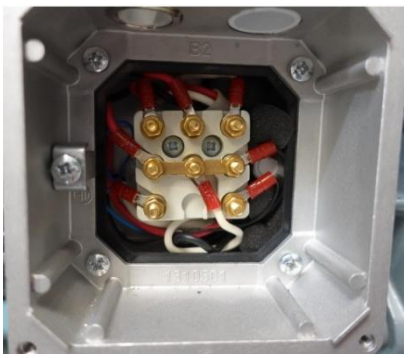
Figure: LAPP Skintop MS-SC EMC Cable Gland



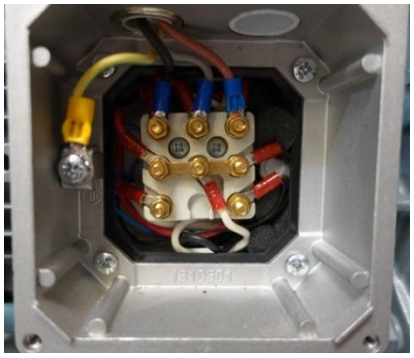
Schematic Shielding Connection

Then wire the motor in star cabling according to the connection diagram above. The fan is operated exclusively with 3 phases, 400 volts AC.

Nord Motor Wiring



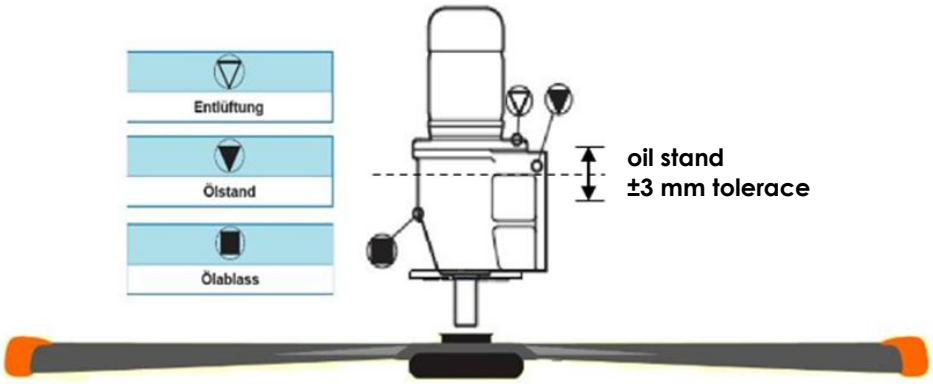
Clamps with a Star Connection Stud



Wiring Fan Motor

4.9 Oil Check and Oil Safety Pin

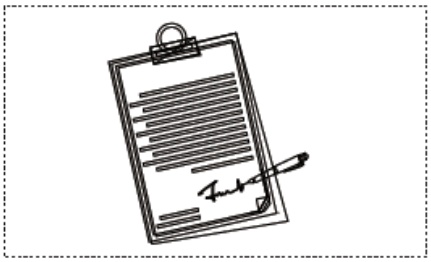
Please check the oil level before commissioning. The oil level should reach the bottom edge of the threaded opening; a tolerance of ±3 mm is permitted. A safety pin is fitted to the vent screw. The safety pin must be removed before initial commissioning. The motor is filled with synthetic oil (lubricant: Synth ISO VG 680, quantity: 3.1 litres).

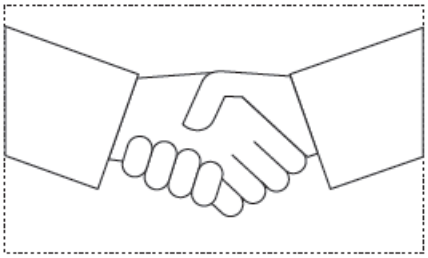


The safety pin is provided with a cable tie ex works to make the safety pin visible and to make it easier to remove the safety pins.

Once the electrical installation is complete and all mechanical connections have been checked, the power supply can be turned on. Make sure that no people or objects are within the fan's danger zone. First, perform a test run at low speed and check the fan's operation for any vibrations or unusual noises. Then gradually increase the speed to the maximum operating speed and perform a test run for at least 10 minutes.

If the operation of the fan works properly, instruct the operator and please use the handover protocol for a formal handover.

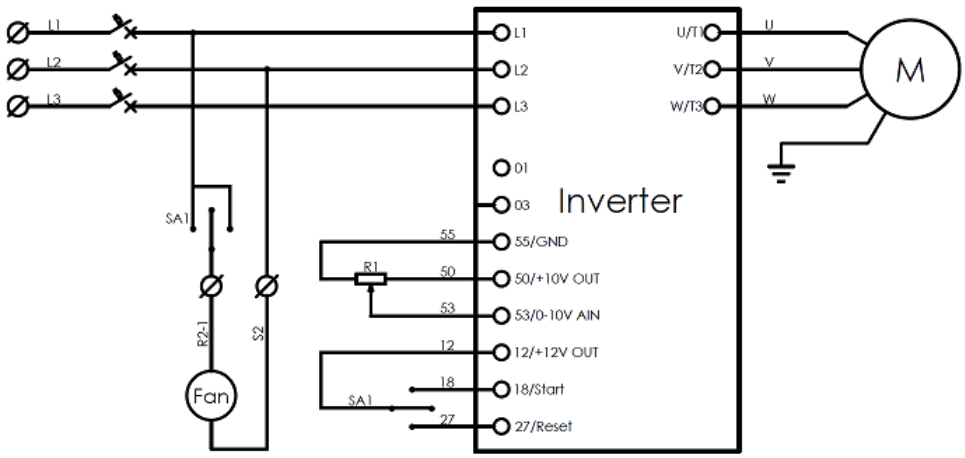




5 Frequency converter and connection to SchwankControl Touch

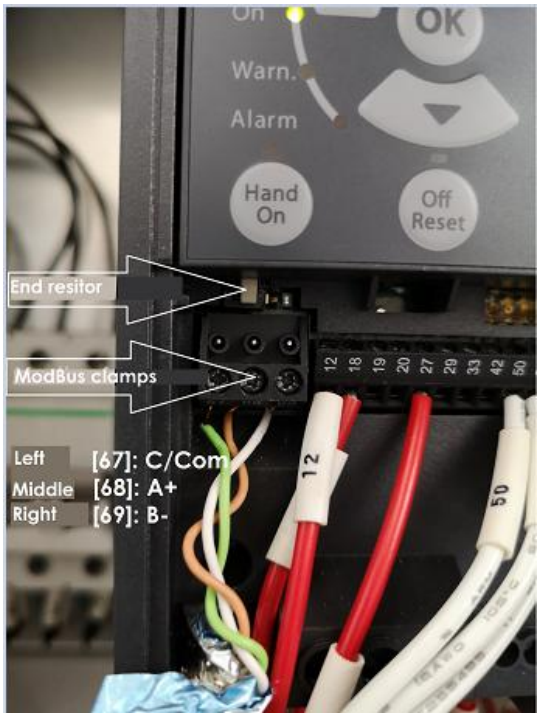
A variable frequency drive is integrated in the MonsterFans Controller Box. You will find detailed technical instructions from the manufacturer attached. The frequency Inverter is pre-programmed at the factory and ready for operation.

You will also find the following **Wiring Diagram (3~400V, 50 Hz)** printed inside the Controller Box.



The SchwankControl Touch control unit from Schwank is the optimized central control unit for the operation of up to 32 MonsterFans in up to 4 control zones. For more information about the product SchwankControl touch, please consult the technical manual.

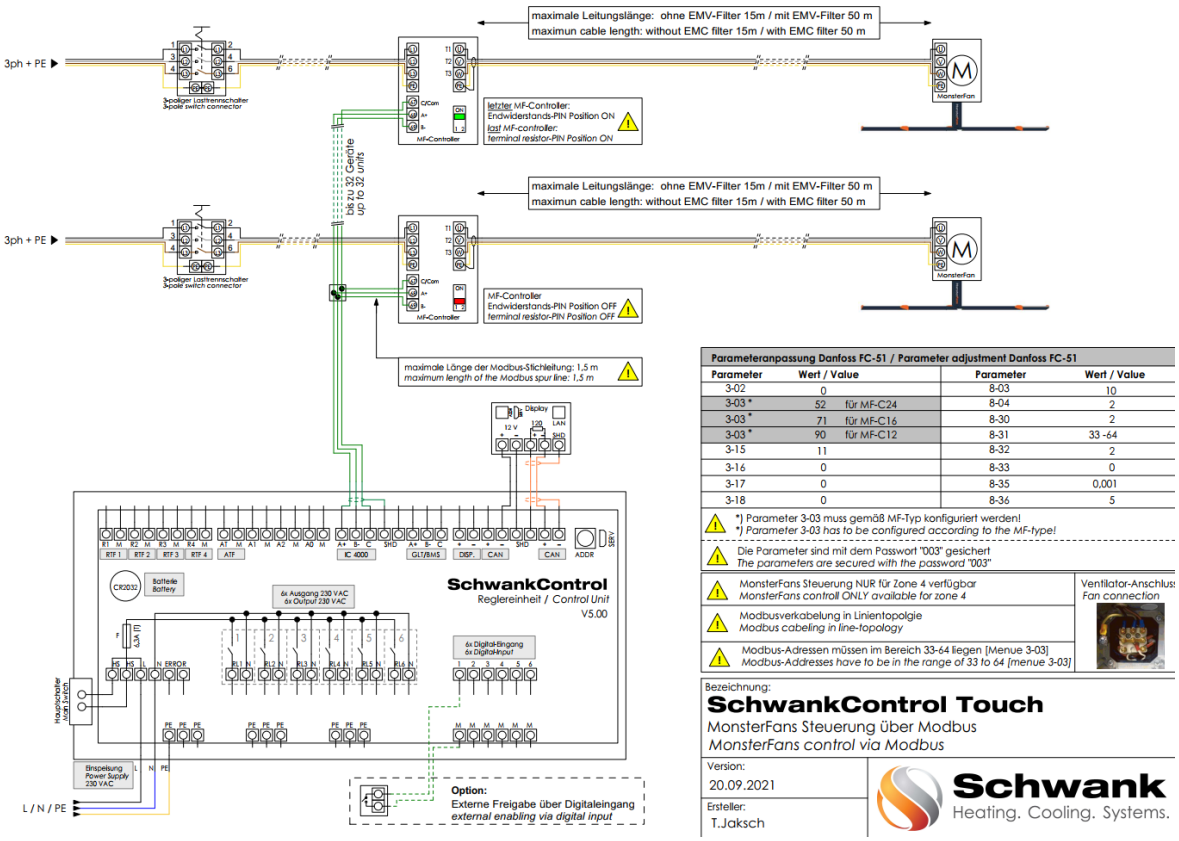
From software version ControlUnit v88 & DisplayUnit V1.53 of the SchwankControl Touch, central control of the MonsterFans via the SchwankControl Modbus is possible.



The Modbus is laid as a ring cable, with 3 wires from the SCT to the last frequency converter (FC). The end resistor must be set at the last FC. The frequency converter is in the MonsterFans controller box, a cable gland must be fitted to the controller housing.

Stub lines should be kept as short as possible, and the shielding of the Modbus lines is only connected in the SCT.

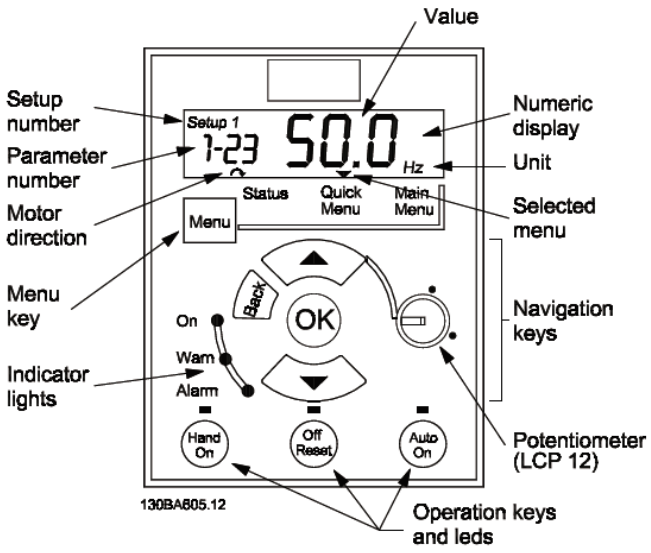
C/Com =>	Terminal 67 (left)
A+ =>	Terminal 68 (middle)
B- =>	Terminal 69 (right)



Monsterfans connection to SchwankControl Touch

5.1 Changing parameters on the frequency converter

To set up the Modbus communication (RS485) of the FC-51 via the IC 4000 bus of the SCT, parameters of the FI **must** be adjusted according to the table.
parameters of the FC **must** be adjusted according to the table:



Parameter change:

Select the main menu **(not quick menu)** by pressing the menu key twice.

Select the parameter chapter (first number), e.g. (3), using the arrow keys.
Select OK.

Select parameter e.g. (15), press OK (if necessary, enter password "003").

Change the value according to the table, e.g. (11) => Confirm with OK.

Note: The parameters are secured in the factory with the password "003".

Parameter	Value	Description
3-02	0	Lower setpoint range limit, for all types
3-03	52	Upper setpoint for MF-C24
3-03	71	Upper setpoint for MF-C16
3-03	90	Upper setpoint for MF-C12
3-15	11	Reference only via Modbus
3-16	0	Reference deactivated
3-17	0	Reference deactivated
3-18	0	Reference deactivated
4-10	2	Both directions of rotation permitted
8-03	10	Timeout in sec.
8-04	2	Watchdog (Timeout) set to STOP
8-30	2	Modbus protocol
8-31	65 - 96	Individual Modbus address of the FC, no double assignment!
8-32	2	Baud rate 9600
8-33	0	Parity even (even) and 1 stop bit
8-35	0,001	Response time min. delay in sec.
8-36	5	Response time max. delay in sec.
14-01	2	Change clock frequency to [4] in case of background noise

Table Parameters Danfoss FC 51 – Adjustments for connection to SchwankControl Touch

Attention: Parameter 3-03 must be configured according to MF type!
Parameter 8-31: Each FU must have its own address (from 65 to 96). *
*** Re-address MF-SCT systems with software versions before DU1.75 & CU97!**

After completing the parameter changes, the drive must be restarted.
To do this, switch off the FU using the main switch for at least 11 seconds.

5.2 Control via the SchwankControl Touch display

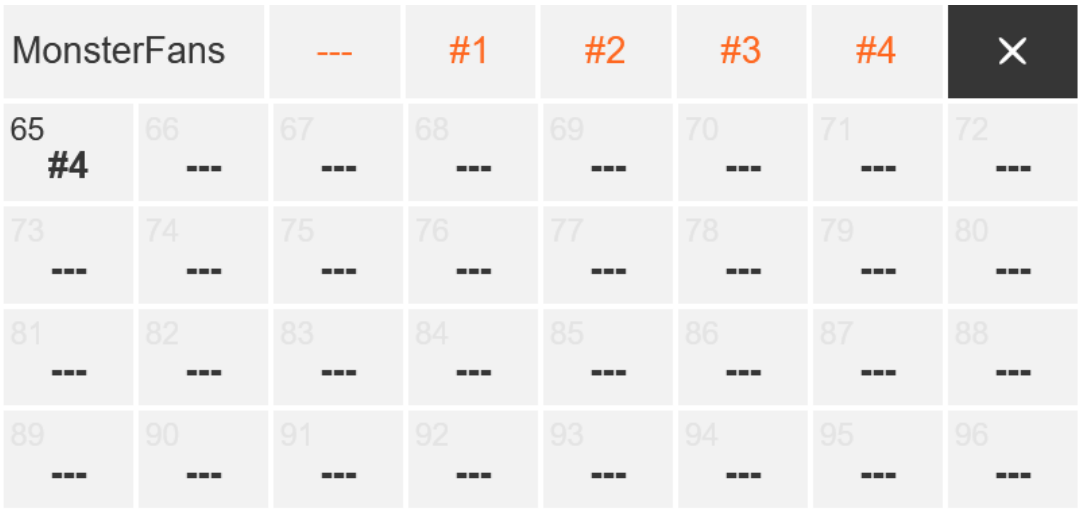
The Modbus-guided control of the MonsterFans via the central control system SchwankControl Touch offers the advantages of zone division with individual time programs and combined operation with heating and cooling units from Schwank GmbH and a BMS connection.
Please consult the technical instructions for the SchwankControl Touch.

5.2.1 Modbus addressing of the MonsterFans in the SCT menu

Analogous to Modbus radiator addressing, the MFs are assigned to a control loop here. The menu is hidden behind the expert menu => Configuration => Modbus control zone assignment:

Modbus control loop mapping screen

By touching the "Heaters" field, the screen changes to "MonsterFans":



New menu screen MonsterFans Modbus addressing

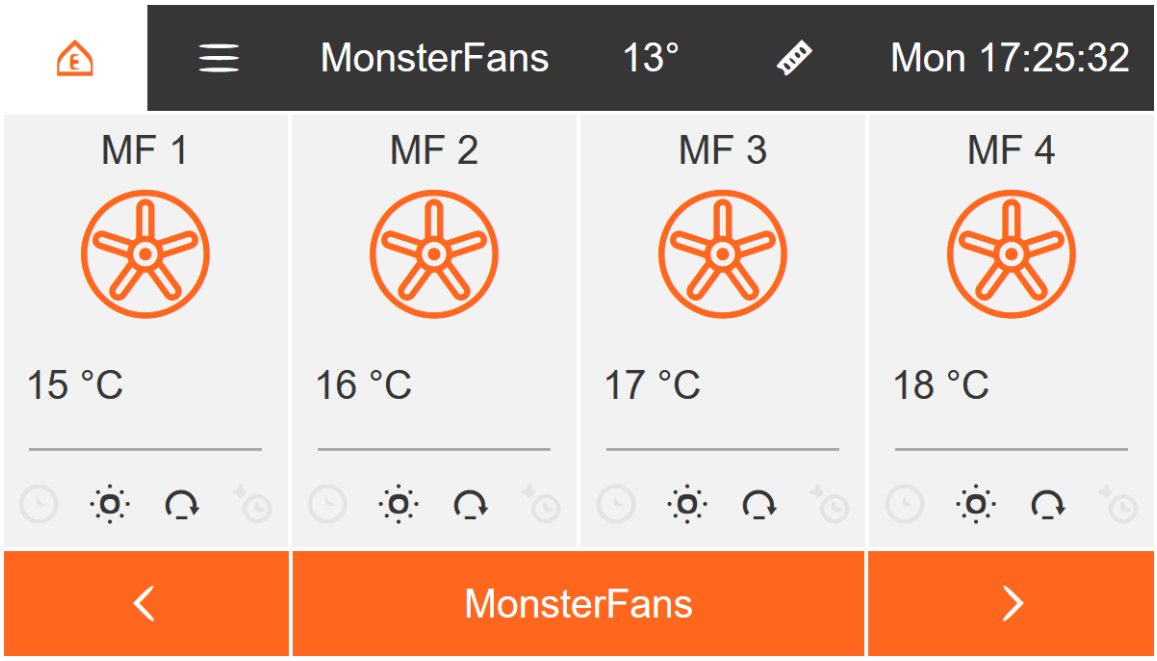
The Modbus initialization is complete when the address is highlighted in black (Ex. No. 65). A previous assignment of the addresses in control loops supports the initialization

5.2.2 Functional testing & troubleshooting

When all parameters according to the table Parameters Danfoss FC 51 (p.19) have been set and saved, the knobs on the MF controller are out of function. The FU is in "Auto On" mode and the green LED on the bottom right of the control panel lights up. The MonsterFans control loop only responds to the commands of the SchwankControl Touch.

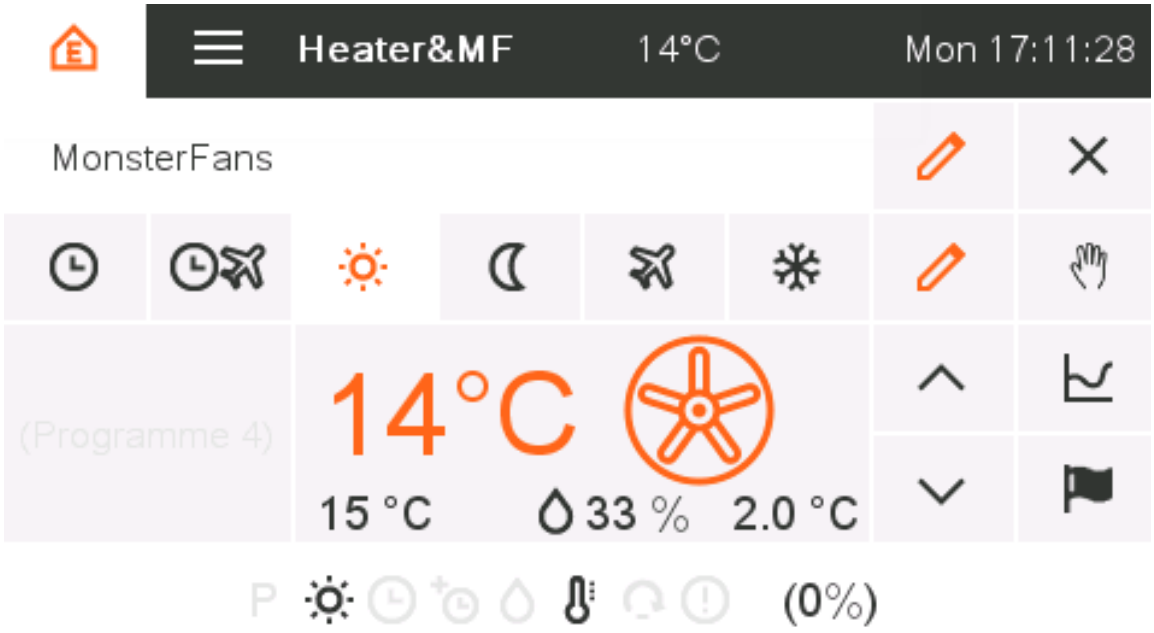
If the initialization is not successful after 2 minutes, all parameters of the table must be checked again. An assignment of the addresses in the SCT screen "MonsterFans Modbus Addressing" supports initialization.
Prior commissioning via the rotary controls on the MF controller can make Modbus initialization more difficult.

5.2.3 Operating a MonsterFans control zone



SCT display with 4 MF control zones

By touching it, the screen switches to the respective control zone screen.



Control Zone Screen MonsterFans

All settings selected here only affect the selected control loop.
An operating mode can be activated directly by touching the MonsterFan control loop screen. In the example, 'Day' mode is activated with the ΔT 2.0 °C function.

By touching the lower pencil field, you switch to the menu of the MF operating modes.

5.2.4 Operating modes of MonsterFans zones in SchwankControl Touch

For more details, see Chapter 5.3 "Control Loop Details" of the technical manual SchwankControl Touch (tA-SCT).

Operating mode	Function	Rotation dir.	Setpoint
Day			< 2.0 °C >
Night			< 40 % >
Holiday			< 0 % >
Frost protection			< 1.0 °C >
Manual	%		< 100 % >
Humidity	%		< 60 % >

Operation modes and functions of the SCT in the "Temperature settings" menu

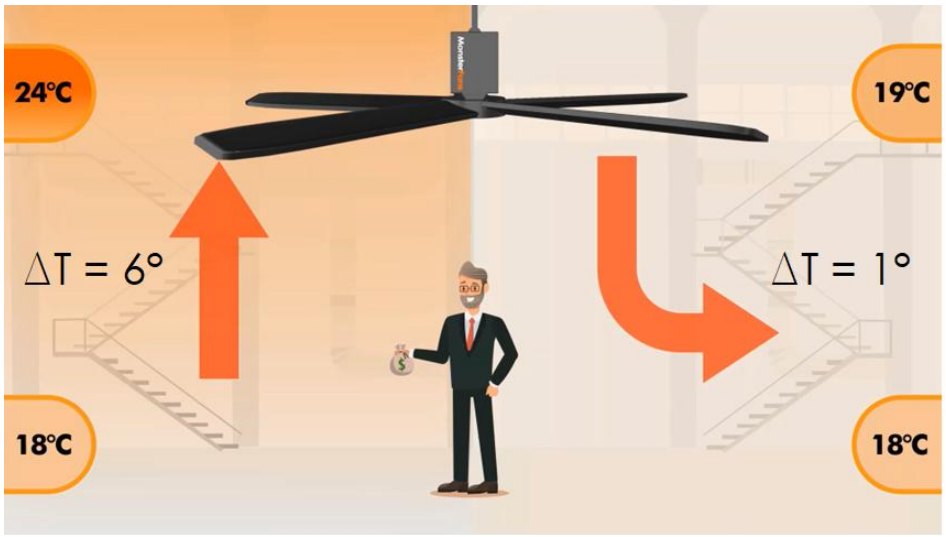
The operating modes day, night, holiday and frost protection correspond to known heating operating modes and can be activated via time programs (see Kp. 5.4.1. tA-SCT).
Manual operation is a classic "expert" mode of operation and is intended for maintenance purposes. The "humidity" operating mode represents an additional switch-on condition. The set value forms a threshold value above which the monster fans of this zone are activated according to the active operating mode (day, night, vacation or frost protection).
This function is used to "ventilate" humidity and requires the additional article no. 70000142 – humidity sensor.

5.2.5 Functions of the operating modes in a control zone

For each operating mode in an MF control loop, the function (ΔT, fan operation or off), the direction of rotation and the setpoint (temperature difference or percentage speed) Adjustable.

Pictogramm	Function/Explanation	Setpoint range
	ΔT, Temperature Difference Control	0 to 18 °C in 0.5 ° steps
	Fan operation	0 to 100 %
	Off	
	Direction of rotation "clockwise"	The phase position at the FU determines the direction of rotation!
	Direction of rotation "against the clock"	The phase position at the FU determines the direction of rotation!

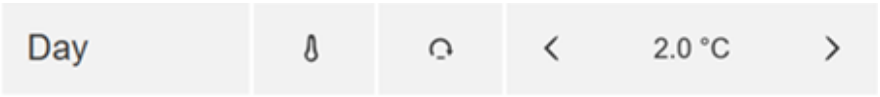
5.2.6 Temperature difference control (automatic destratification) ΔT



Temperature difference control with T-"top" & T-"down"

An MF control area now expects two temperature information, one for T-"down" and one for T-"up", analogous to the heating zones. In temperature-controlled mode ΔT, a differential temperature is specified in 0.5° steps, which leads to the start of the MF. The controller uses a PID algorithm to determine the correct rotation speed and travel time for the zone. In this way, the controller "oscillates" to the environment and continuously optimizes the energy consumption until optimized destratification.

In the example, the temperature difference mode is assigned to a setpoint of 2° K ΔT in "Day" mode and the MonsterFan rotates against the direction of rotation.



For more detailed information on the time-program-guided change from day mode to night mode, please refer to the tA SchwankControl Touch Chapter 5.4.

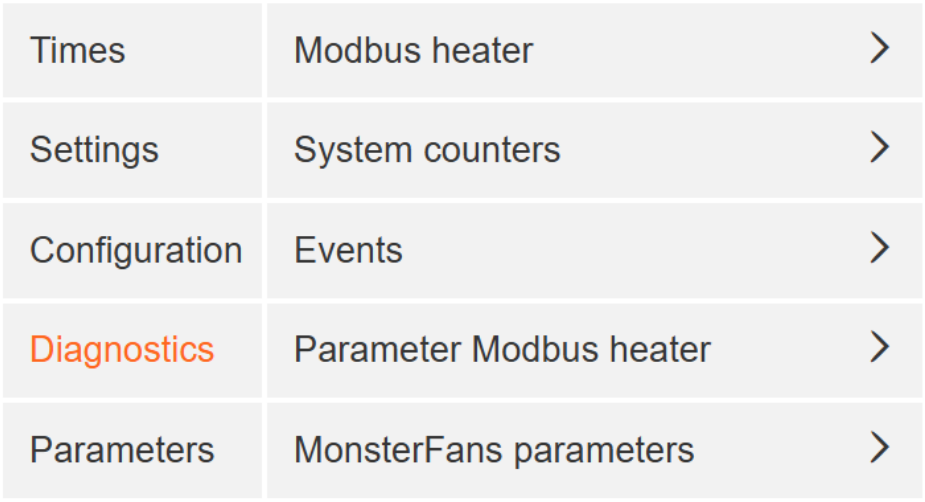
5.3 Interlocking with luminous heater control zones

To prevent possible turbulence of the exhaust gases from luminous heater control zones, parallel operation is locked for the running time of the luminous heater and the run-on time of the exhaust fans. This function only works if the only luminous heater control zone forms the preceding reference zone for the MonsterFans zone.
A combination with more than one luminous heater control zone must not be put into operation.

5.4 Parameterization of Individual MonsterFans Menu

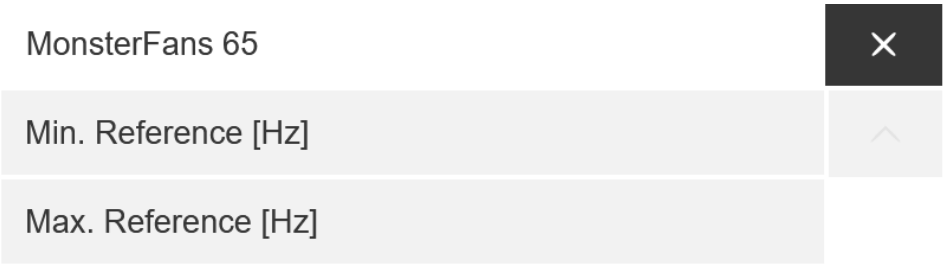
For further optimization of the temperature differential operation and throttling of individual MonsterFans, the upper and lower speed can be set in the SCT Expert Menu MonsterFans parameters. This is only possible within the fixed limits of the respective model.

Menu MonsterFans parameters



Diagnostics Menu MonsterFans Parameter

This menu can be used to set device-specific min and max speeds in Hz within the framework of the fixed limits.



Parameter Menu MF with Modbus address Nr. 65

5.5 Remote shut off and interlocking with SCT connection

Remote shutdown or locking is possible via the digital inputs, with the zone-command "Off" or via the BMS interface.

6 Commissioning

6.1 Test Run

Ideally, test the fan for 10 minutes to see if there is any unusual noise, vibration from the device or from the safety steel ropes.
Also make sure that the fan runs safely with a sufficient safety distance to all possible obstacles.

Commissioning;

1. Make sure that the fan can run free of obstacles.
2. Check the direction of rotation of the blades, regular operation is counter-clockwise.
3. Make sure that the input voltage is correct and meets the requirements.
4. Set the speed controller to the minimum position.
5. Switch on the fan and turn the switch from STOP to RUN.
6. After the fan has started, set the speed control knob to the desired speed.

Caution:

1. It is prohibited to interrupt the power supply during fan operation.
2. The fan is not designed for reverse operation.
3. The direction of rotation can only be changed by phase rotation on the frequency converter.

6.2 Warnings

- A change in shape or the bending of rotor blades is strictly prohibited.
- Please do not carry out any work or repairs while the device is switched on to avoid an electric shock.
- Please do not change the original technical structure of the fan.
- Please do not open the switch box / controller box during operation to avoid an electric shock.
- Do not operate devices with malfunctions as this can lead to serious injuries.
- Structural or parameter changes to the electrical control box are strictly prohibited, as this can lead to equipment damage, injuries or death due to improper use.
- After disconnecting the power supply, there may still be a residual voltage in the controller box. Wait 2 minutes until the contacts are de-energised. Switching off the display is not an indication that there is no voltage.
- The installation and laying of the electrical cabling must be carried out by a qualified specialist.
- Please use the device components enclosed and specified by MonsterFans.
- Do not interrupt the power supply while the fan is running. Otherwise, the fan will be damaged. The power supply may only be switched off, after the rotating blades have stopped completely.

6.3 Troubleshooting

Common causes of incorrect operation:

- The supply voltage is incorrectly selected or switched off.
- If the fan does not work, please check first if the speed controller is at MIN and check also the Run/Stopp button.
- Unauthorised personnel must not open the Controller Box. Our local service partner will send you a trained specialist for repairs or adjustments.
- If you notice that the fan or Controller Box is damaged or has unusual noises, stop using it with immediate effect. Switch off the power supply and contact your service partner.
- A damage of the device caused by improper use is not covered by the warranty.

6.4 Frequency Inverter Error Messages

Number	Description	Warning	Alarm	TripLock	Error	Cause of problem
2	Live zero error	X	X			Signal on terminal 53 or 60 is less than 50% of the value set in: • *parameter 6-10 Terminal 53 Low Voltage* • *parameter 6-12 Terminal 53 Low Current* • *parameter 6-22 Terminal 54 Low Current*
4	Mains phase loss 1)	X	X	X		Missing phase on supply side, or too high voltage imbalance. Check supply voltage.
7	DC over voltage 1)	X	X			DC-link voltage exceeds the limit.
8	DC under voltage 1)	X	X			DC-link voltage drops below the voltage warning limit.
9	Inverter overloaded	X	X			More than 100% load for too long.
10	Motor ETR overtemp.	X	X			Motor is too hot. The load has exceeded 100% for too long.
11	Motor thermistor overtemp.	X	X			Thermistor or thermistor connection is disconnected.
12	Torque limit	X				Torque exceeds value set in either parameter *4-16 Torque Limit Motor Mode* or *4-17Torque Limit Generator Mode*.
13	Overcurrent	X	X	X		Inverter peak current limit is exceeded.
14	Ground fault	X	X	X		Discharge from output phases to ground.
16	Short Circuit		X	X		Short circuit in motor or on motor terminals.
17	Control word time-out	X	X			No communication to frequency converter.
25	Brake resistor short-circuited		X	X		Brake resistor is short-circuited, thus the brake function is disconnected.
27	Brake chopper short-circuited		X	X		Brake transistor is short-circuited, thus the brake function is disconnected.
28	Brake check		X			Brake resistor is not connected/working.
29	Power board over temp	X	X	X		Heat sink cut-out temperature has been reached.
30	Motor phase U missing		X	X		Motor phase U is missing. Check the phase.
31	Motor phase V missing		X	X		Motor phase V is missing. Check the phase.
32	Motor phase W missing		X	X		Motor phase W is missing. Check the phase.
38	Internal fault		X	X		Contact local Danfoss supplier.
44	Ground fault		X	X		Discharge from output phases to ground.
47	Control Voltage Fault		X	X		24 V DC is overloaded.
51	AMA check U_{nom} and I_{nom}		X			Wrong setting for motor voltage and/or motor current.
52	AMA low I_{nom}		X			Motor current is too low. Check settings.
59	Current limit	X				Frequency converter overload.
63	Mechanical Brake Low		X			Actual motor current has not exceeded the release brakecurrent within the start delay-time window.
80	Frequency Converter Initialised to Default Value		X			All parameter settings are initialised to default settings.
84	Connection b/w frequency converter and LCP is lost				X	No communication between LCP and frequency converter.
85	Key disabled				X	See parameter group *0-4* LCP*.
86	Copy fail				X	An error occurred while copying from frequency converter to LCP, or from LCP to frequency converter.
87	LCP data invalid				X	Occurs when copying from LCP if the LCP contains erroneous data - or if no data was uploaded to the LCP.
88	LCP data not compatible				X	Occurs when copying from LCP if data are moved between frequency converters with major differences in software
89	Parameter read only				X	Occurs when trying to write to a read-only parameter.
90	Parameter database busy				X	LCP and RS485 connection are trying to update parameters simultaneously.
91	Parameter value is not valid in this mode				X	Occurs when trying to write an illegal value to a parameter.
92	Parameter value exceeds the min/max limits				X	Occurs when trying to set a value outside the range.
nw run	Not While Runnin				X	Parameters can only be changed when the motor is stopped.
Fehler Par.	A wrong password was entered				X	Occurs when using a wrong password for changing a password-protected parameter.
1) These faults are caused by mains distortions. Install a Danfoss line filter to rectify this problem.						

7 Warranty & Maintenance

Our quality assurance applies to the entire fan.
The warranty period begins on the date of acceptance by the customer after professional installation and commissioning. This ends with the statutory warranty period. The following causes are not covered by the warranty:

1. Improper use, incorrect installation, incorrect commissioning and unauthorized maintenance.
2. Operator assembles / disassembles the product independently.
3. Force majeure (lightning, earthquake, terror, flood etc.).

To ensure a long service life, we recommend regular maintenance and professional inspection.

Intervals	**Maintenance Work**
Yearly	1. Check the correct rotation of the fan.
	Disconnect the fan from power supply for further maintenance work! **Secure the maintenance area on the floor as well.**
	2. Check all safety bracing devices. 3. Check all fastening screws and connecting elements 4. Check the electrical connections and cabling. 5. Check the gearbox for oil leakage. 6. Check all suspension and connection elements. 7. Check the wing connection bolts under the base plate 8. Check the wings and engine components for damage. 9. Check all fan components for signs of corrosion, discoloration, pitting and metal spalling. 10. Check the guy wires for damage or abrasion. 11. Removal of dust and dirt particles from wings and motor.

Every five years (or every 20,000 operating hours)

- Check the oil level, carry out and oil change if necessary.

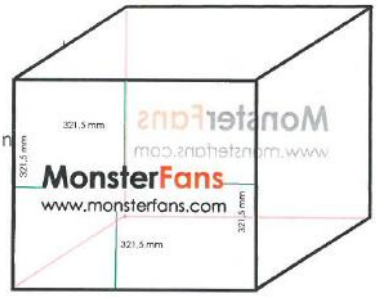
If a fan runs with strong unusual noises or vibrations, this indicates that the mechanical parts are damaged. Switch off the fan immediately and carry out a comprehensive inspection and maintenance.

In the event of faults within the warranty period, please do not try to correct them yourself. Please contact your manufacturer.

8 Packaging Units

A MonsterFan is delivered in two wooden boxes.

Picture: Wooden Box Fan Blades



Picture: Wooden Box Motor

Type	Diameter	Dimensions	Weight	Total
MF-C24	7.3 m (24 ft.)	Box Motor: 950 mm*830 mm*520 mm Box fan blades: 3700 mm*420 mm*450 mm	180 kg 127 kg	307 kg
MF-C16	4.9 m (16 ft.)	Box Motor: 950 mm*830 mm*520 mm Box fan blades: 2500 mm*420 mm*450 mm	180 kg 107 kg	287 kg
MF-C12	3.6 m (12 ft.)	Box Motor: 950 mm*830 mm*520 mm Box fan blades: 2100 mm*420 mm*450 mm	180 kg 97 kg	277 kg

9 Acceptance Report for Installation & Commissioning

Customer		Date	
Street		Service techn.	
Postal code		Order No.	
Contact Person		Phone	
E-Mail		Cell phone	

Product type (s)		No. of Fans	
Serial no.		Hub height	
RCD usage		Kind of RCD	
Special conditions		Adjustment of frequencies	

Verification by Customer

Delivery of the technical instructions	Yes ☐	No ☐
The fan has been put into operation without any problems. (No vibrations, no noise, no error messages)	Yes ☐	No ☐
The wing surfaces are undamaged.	Yes ☐	No ☐
The product has been introduced/ instructed by a specialist.	Yes ☐	No ☐
10 min. test run without abnormalities	Yes ☐	No ☐
Installation was carried out according to customer drawings and customer requirements	Yes ☐	No ☐

Date	Name / Signature (Customer)	Name / Signature (Technician)

9.1 Acceptance Report of Maintenance

Customer		Date	
Street		Service techn.	
Postal code		Order No.	
Contact Person		Phone	
E-Mail		Cell phone	
Product type(s)		No. of Fans	

Annual Maintenance (Tick Boxes Accordingly)	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. check the correct fan rotation					
2. check all wire rope connections					
3. check all fixing screws & connecting elements					
4. check the electrical connections					
5. check the gearbox for oil leakage & oil level check					
6. check all suspension and connection elements					
7. check the wing connecting screws under the base plate					
8. check the wings and engine components for damage					
9. examination of all fan components for signs of corrosion, discolouration, pitting and metal spalling					
10. check the wire rope connections for damage or abrasion					
11. removal of dust and dirt particles on wings and motor					
Every five years additionally:					
1. checking the engine functions					
2. check the quality of the oil, carry out an oil change if necessary					
Signature					

10 Declaration of Conformity

Schwank
Heating. Cooling. Systems.

Konformitätserklärung / *Certificate of Compliance*

Hiermit erklären wir, dass das nachfolgend bezeichnete Gerät aufgrund seiner Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits und Gesundheitsanforderungen der EG Richtlinien entspricht.
We hereby declare that the device described below, due to its design and construction and in the version marketed by us, complies with the relevant basic safety and health requirements of the EC directives.

Produkt / *Product:*	MonsterFans HVLS Fans & Controller box
Modell(e) / *Model(s):*	MF-C12, MF-C16, MF-C20, MF-C24
Hersteller / Producer :	Schwank GmbH Bremerhavener Straße 43 D-50735 Cologne/Germany

EU-Richtlinien / *EG Guidelines:*
2006/42/EG Maschinenrichtlinie / *Machinery directive*
2014/30/EU Elektromagnetische Verträglichkeit / *Electromagnetic compability*
2011/65/EU RoHS
2009/125/EG ErP

Folgende harmonisierten Normen wurden berücksichtigt:
The following harmonized standards have been applied:
DIN EN ISO 12100:2013 Sicherheit von Maschinen / *Safety of machinery*
DIN EN 60204-1:2010 Sicherheit von Maschinen / *Safety of machinery*
DIN EN 61000-6-1:2007 Elektromagnetische Verträglichkeit / *Electromagnetic compability*

Oliver Schwank Geschäftsführer / CEO Schwank GmbH Cologne, 24. of November 2020

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Oliver Schwank
Prof. Dr.-Ing. Friedhelm Schröder

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