MFS

Manual for use and maintenance

+ CE Declaration of conformity

MFS

Air circulation fan

Models: MFS36 - MFS52

Ag/MIT/UmGB-2085-04/13 rev1.1

Munters

MFS

Manual for use and maintenance

Revision: No. 1 of 15.04.2013

This manual for use and maintenance is an integral part of the apparatus together with the attached technical documentation and has been produced with reference to Directive 2006/42/EC, paragraph A, Annex II, and to ErP Directive 2009/125/CE Commission Regulation 327/2011.

This document is destined for the user of the apparatus: it may not be reproduced in whole or in part, committed to computer memory as a file or delivered to third parties without the prior authorisation of the assembler of the system.

Munters Italy S.p.A. reserves the right to effect modifications to the apparatus in accordance with technical and legal developments.

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CE Declaration

1.

CE DECLARATION OF CONFORMITY

(complies with Subparagraph A Annex II Directive 2006/42/EC)

Munters Italy S.p.A.

with registered offices in Strada Piani 2 – 18027 Chiusavecchia (IM) – Italy

DECLARES ON ITS OWN RESPONSIBILITY THAT THE APPARATUS

Designation	Circulation fan designed for moving air to control temperature and humidity in livestock.
Model	MFS36 - MFS52
Year of manufacture	2012

CONFORMS WITH THE ESSENTIAL SAFETY REQUIREMENTS STATED BY APPARATUS DIRECTIVE 2006/42/EC

WITH PARTICULAR REFERENCE TO THE FOLLOWING PROVISIONS:

UNI EN 953:2009, UNI EN ISO 12100:2010, UNI EN ISO 12499:2009, UNI EN ISO 13857:2008, CEI EN 60204-1:2006 (CEI 44-5).

Chiusavecchia, 15th April 2013

Marco Scomparin

Legal representative

1.1 Disclaimer

Munters reserves the right to make alterations to specifications, quantities, dimensions etc. for production or other reasons, subsequent to publication. The information contained herein has been prepared by qualified experts within Munters. While we believe the information is accurate and complete, we make no warranty or representation for any particular purposes. The information is offered in good faith and with the understanding that any use of the units or accessories in breach of the directions and warnings in this document is at the sole discretion and risk of the user.

1.2 Introduction

Congratulations on your excellent choice of purchasing an Euroemme® fan!
In order to realize the full benefit from this product it is important that it is installed, commissioned and operated correctly. Before installation or using the fan, this manual should be studied carefully. It is also recommended that it is kept safely for future reference. The manual is intended as a reference for installation, commissioning and day-to-day operation of the Euroemme fans.

1.3 Notes

Date of release: 2012.
Munters cannot guarantee to inform users about the changes or to distribute new manuals to them.

1.4 Data for Fan Eco Design Directive

According to the indication of the ErP Directive 2009/125/CE the MFS fan series as circulator fan (fanjet) are not included in the requirements of the commission regulation 327/2011.

Safety aspects

2.

2.1 General

The safety of fans is assured by Munters in compliance with the safety requirements indicated by the CE label. Safe functioning is assured only when the installation procedure and the instructions for use have been carefully followed. The following points must be stressed:

- proper transport procedure must be followed;
- do not remove the safety mesh guards;
- all fans installed at a height lower than 2.7 m from ground level, must be equipped by extra CE safety kits, which can be ordered;
- if the safety mesh is not installed, the manufacturer is exonerated from all responsability and the use of the fan is considered improper;
- the maintenance operator must be kept informed on maintenance procedures;
- do not operate the fan without the safety mesh properly installed;
- do not operate the fan without having it firmly fixed to the structure or without complying with the safety regulations for the electrical connection;
- do not install the fan in places where there might be explosion hazards as described by EN 60079 rules;
- do not handle any material which might produce explosive powders;
- the emission of harmful particles and / or gases into the atmosphere must be within the limits determined by local authorities;
- the fan is intended to be installed and used by qualified personnel who are familiar with relevant safety requirements;.
- safety equipment necessary for the prevention of accidents at the mounting and operating site shall be provided by the buyer in accordance with the regulations prevailing in the local country;

WARNING **The fan must only be used if it is in perfect operating condition, by personnel, aged more than 14 years who are perfectly aware of the safety measures and possible hazards, and in strict compliance with the instructions given in this manual.**

2.2 Points to observe

The fan must not be driven by impulsive voltage (frequently on/off voltage). This impulse voltage causes an excessive build-up of heat in the motor which can lead to motor failure. The temperature of the outer casing of the motor may be hot to the touch during normal operation.

Before using

3.

3.1 Delivery check

Upon receipt, inspect the fan for external damage and if found, inform the forwarding agent without delay. Check the data on all the rating plates, especially voltage and frequency. After placing the motor in the working position *(see section 5.1)*, turn the propeller by hand while the fan is switched off to verify smooth rotation of the propeller.

3.2 Packaging and transport of assembled fans

The fan has a self-supporting structure in galvanised steel and it is usually delivered without packaging. Upon request fans can be delivered packed in cardboard boxes. Fans should not be permanently stocked one upon the other, regardless if they are delivered with or without packaging. Handling of the fans should not be done manually as the fans have no handles or grips. Consequently one of the following alternatives should be used:

- forklift: before loading, make sure the forks are opened as much as possible to avoid bending of the fan bottom panel;
- crane: fix two bolts in the M8 bushes situated on the sides of the fan housing and hook the lifting cable over the bolts.

WARNING Make sure a steel cable or rope of adequate size is being used when the fan is lifted by crane. Fan weights are shown in the technical specification table *(see section 7.2)*.

3.3 Structure

The fans consist of the following components:

- fan housing in galvanised steel without welding spots;
- propeller with four blades in stainless or galvanised steel; blades are fixed to the propeller by high-strength pop rivets;
- motor: single-phase or three-phases; 50 or 60 Hz; B3 form; F class winding insulation, IP 55 IEC protective class; asynchronous single-speed;
- pyramidal shape and flat meshes for protection on back and front side;
- wall/column mounting system with tilting mechanism (optional extra); to be used when the fan needs to be mounted next to a wall or column;
- tilting mechanism with chain (optional extra); to be used when the fan needs to be suspended from the roof of the structure.

Operating conditions

4.

Circulation fans, such as the MFS, are products to be used to circulate the air inside a structure, thereby creating air movement inside the structure which helps to cool animals down during hot periods.
Normal ambient temperature limits are –25°C to +50°C. Maximum altitude is 1000 m above sea level. Should a fan be required to operate at a higher altitude, the loss in mass flow (heat removing capacity) due to lower air density should be taken into consideration.

Installation

5.

5.1 Assembly of the fans

Fans are delivered with the motor in the transport position to minimise space usage during transportation. To move the motor to its working position, it is necessary to follow the steps indicated below.

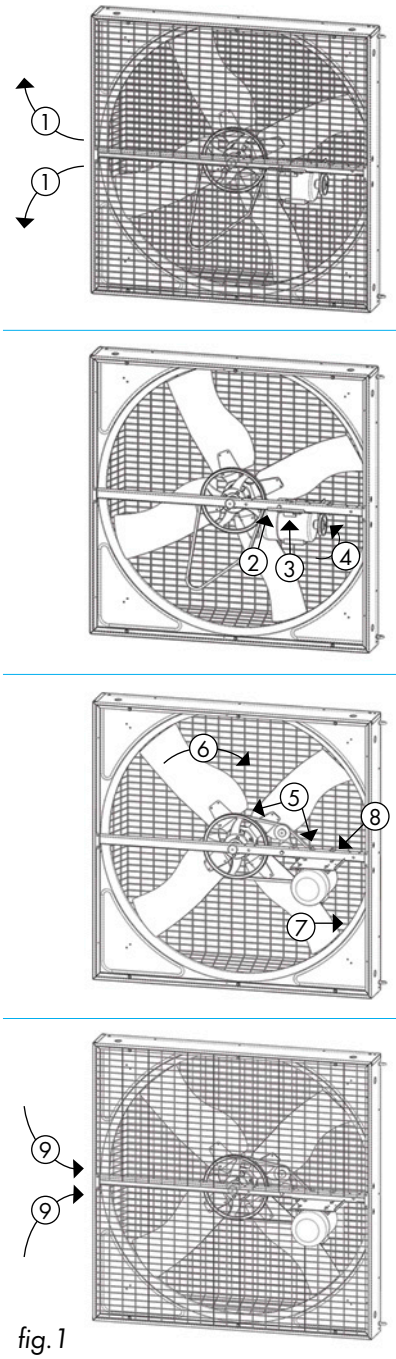
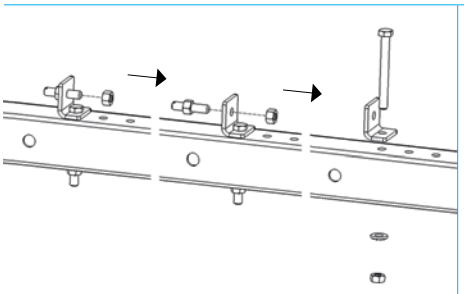


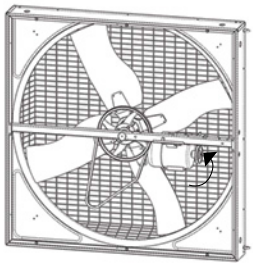
fig.1

1. Unscrew the screws holding the flat safety meshes in place and open the safety meshes.
2. Loosen the bolt in the motor plate closest to the centre of the fan completely and remove it.
3. Loosen the remaining bolt in the motor plate slightly, but do not remove it.
4. Swivel the motor 90° around the remaining bolt in the motor plate and re-insert the bolt that was removed from the motor plate and tighten it slightly.
5. Place the V-belt over the motor pulley and then partially over the central pulley.
6. Rotate the propeller by hand so that the V-belt gets completely into the groove on the central pulley.
7. Push the motor away from the centre of the fan to tighten the V-belt. See *section 8.3* for establishing the correct V-belt tension.
8. Tighten the two bolts in the motor plate so that the V-belt remains in tension.
9. Close the safety meshes, re-insert and tighten the screws.

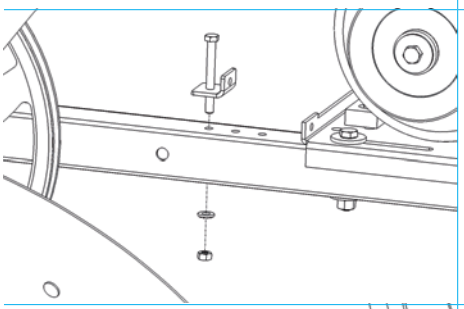
5.2 Tensioning belt adjuster (only for MFS52 model)



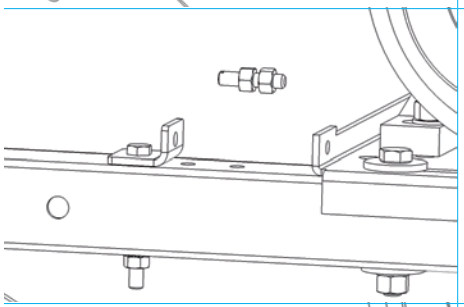
1. Follow steps till n°3 *(see section 5.1)*.
2. Unscrew the M6 nut from the bracket in order to remove the grub screw. Loosen the M6x60 bolt and remove the L bracket.



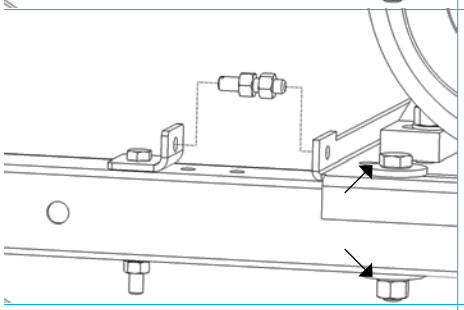
3. Swivel the motor 90° around the remaining bolt in the motor plate and re-insert the bolt that was removed from the motor plate and tighten it slightly.



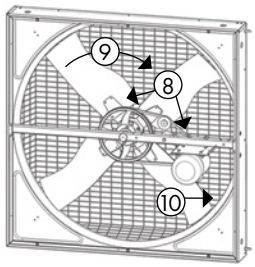
4. Reverse 90° the L bracket having the wide side placed on the central support. Insert the M6x60 bolt trougth the L bracket and the central support as show in the table below.
5. Start fastening the M6x60.



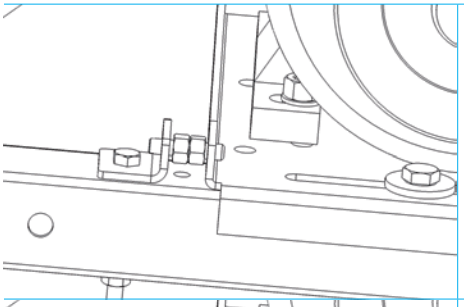
6. Screw again the M6 nut on the M6 grub screw leaving a small gap between them.



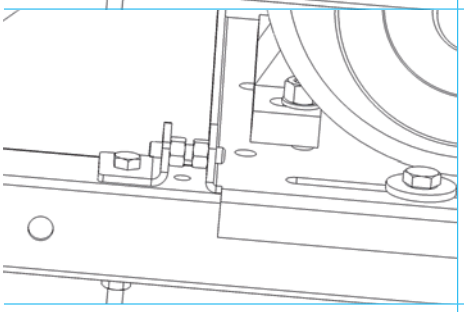
7. Place the grub screw in the two holes, one located on the motor plate and the other located on the L bracket; slide the motor plate in order to be sure to insert the grub screw in both holes. Then finish tightening the M6x60 bolt.



8. Place the V-belt over the motor pulley and then partially over the central pulley.
9. Rotate the propeller by hand so that the V-belt gets completely into the groove on the central pulley.
10. Push the motor away from the centre of the fan to tighten the V-belt. *See section 8.3* for establishing the correct V-belt tension.



11. Be sure to adjust the two M6 nuts and the grub screw, in order to avoid any clearance of it.



12. Tighten the two bolts in the motor plate so that the V-belt remains in tension.

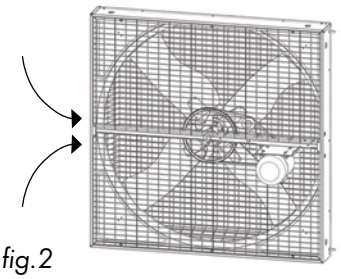


fig.2

13. Close the safety meshes, re-insert and tighten the screws.

Holes for pulley

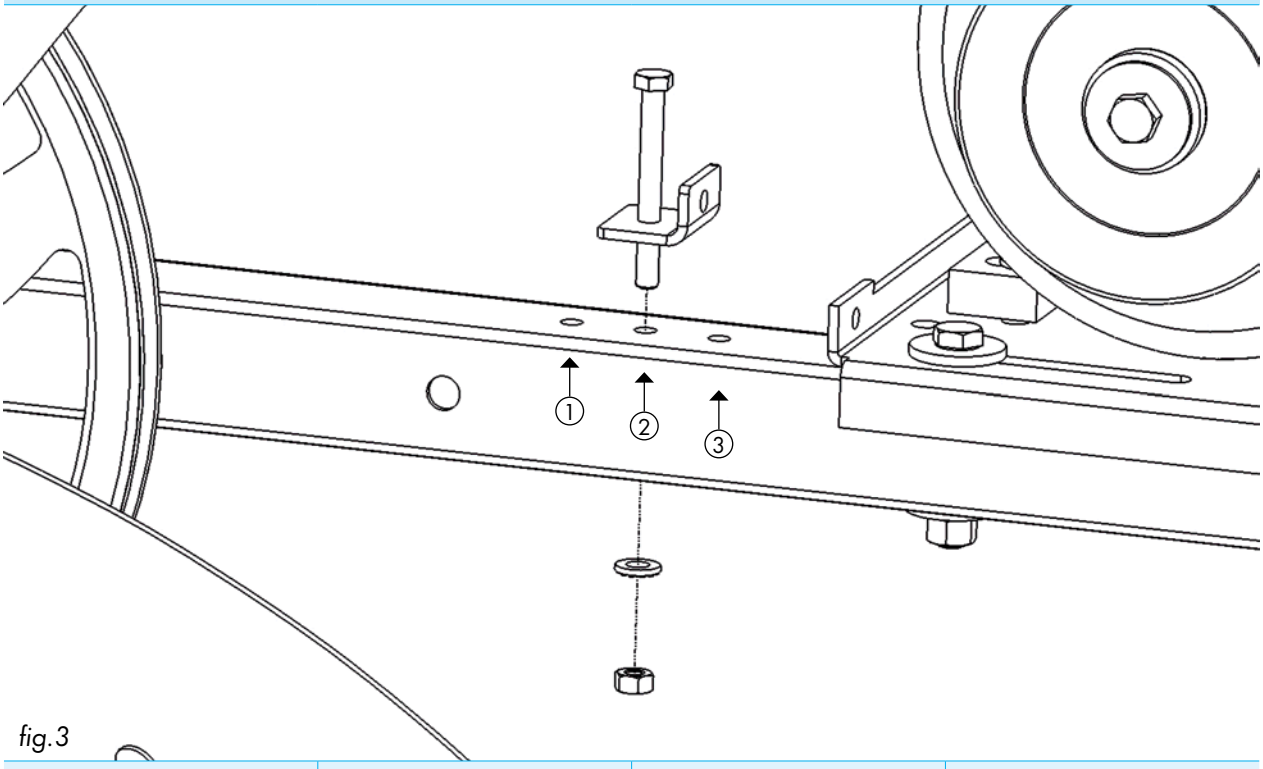


fig.3

Motor [Hp]	Frequency [Hz]	Tensioner	Hole n°
1,0	50	NO	2
1,0	60	NO	3
2,0	50	NO	1
2,0	60	NO	2
1,0	50	YES	2
1,0	60	YES	2
2,0	50	YES	1
2,0	60	YES	1

Note: be sure to adjust the grub screw in order to guarantee the correct belt tensioning, by moving the 2 nuts.

5.3 Belt tensioner (optional)

1. Follow steps till n°4 *(see section 5.1)*.
2. Install the belt tensioner in the hole to the left of the motor base (as seen from the air intake side) and tighten the bolt by hand.
3. Install the new V-belt onto the pulleys. Start by placing the belt onto the motor pulley, then over the idler pulley and then onto the central pulley. Once the V-belt is partially over the pulley, it might be necessary to start rotate the propeller by hand to help pull the V-belt completely onto the pulley.

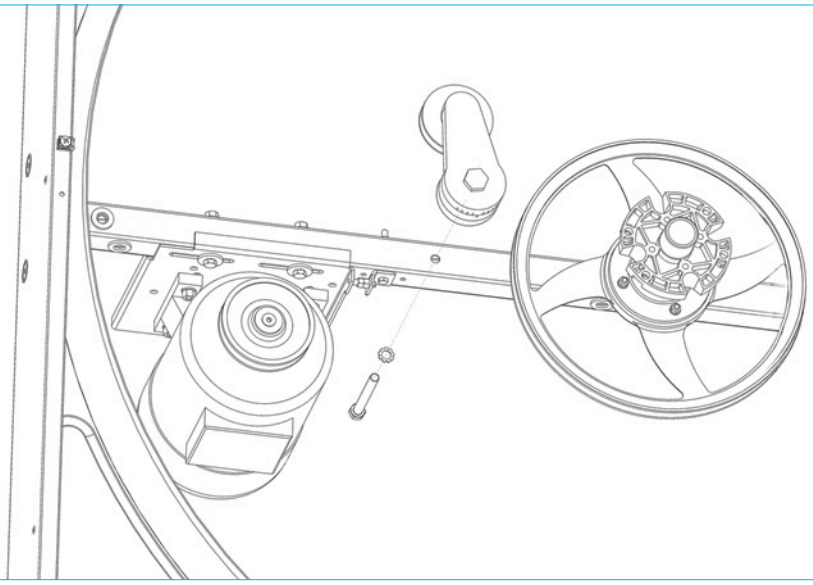


fig.4

4. To torque the belt tensioner to the proper setting place a 24mm wrench onto the 24mm hex on the tensioner. Turn wrench counterclockwise or clockwise (depend on the fan model) until the single mark on one half of the belt tensioner is aligned half way between marks 2 and 3 on the opposite half of the tensioner. Hold tensioner at this setting and tighten the bolt fastening the tensioner to the motor base.

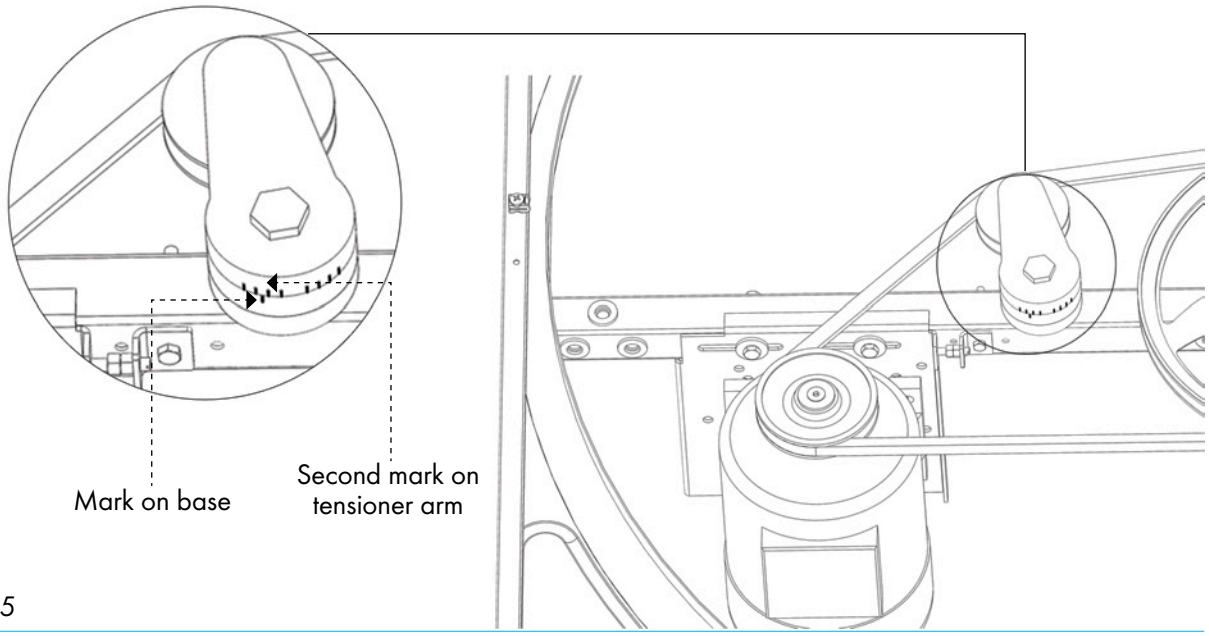


fig.5

Drive alignment

1. Use a straight edge to check the alignment of the pulleys.
2. Check alignment of belt on idler pulley, it should be centered on the idler pulley. The belt tensioner's idler pulley is fixed in position, therefore, alignment must be obtained by adjusting the motor and propeller pulleys.
3. If an adjustment is needed, remove the belt, then loosen the set screws in the pulleys and move them as necessary to achieve proper alignment.
4. Remember to tighten the pulley set screws after making an adjustment.
5. Drive alignment is very important for long belt life and proper operation.

Installation now complete, reconnect power to the motor and install outlet or inlet guard.

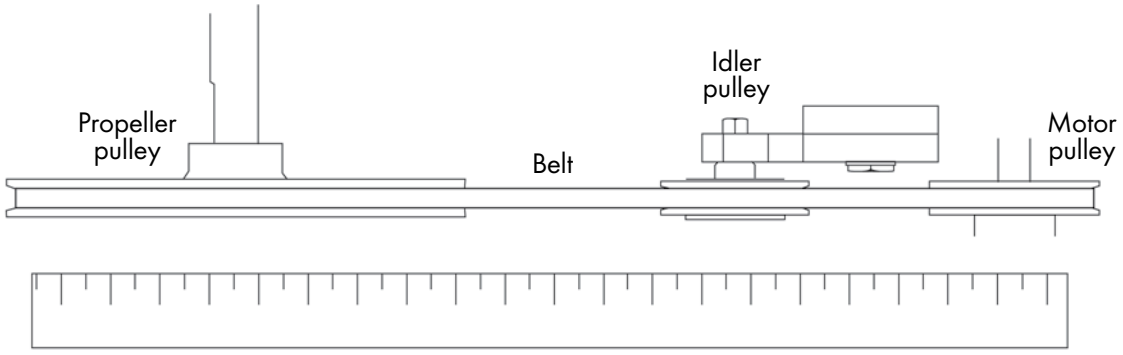
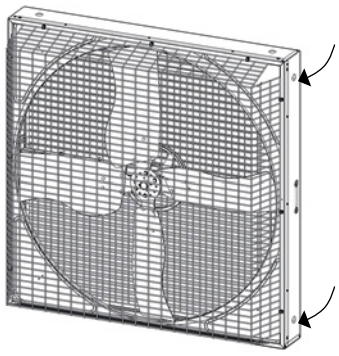


fig.6

5.4 Tilting device

The fan (MFS36-52) can be tilted both in vertical and horizontal as indicated below:

Metal structure



If the fan is directly fixed to a metal structure, M8 bolts - 8.8 type, should be used and screwed into the proper threaded inserts placed on the body (2 on each side).

fig.7

Chain suspension

fig.8

If the fan is used as a circulator chains should be fixed to the M8 eyebolts previously installed on the extremity of the lateral sides by the threaded M8 bushes.

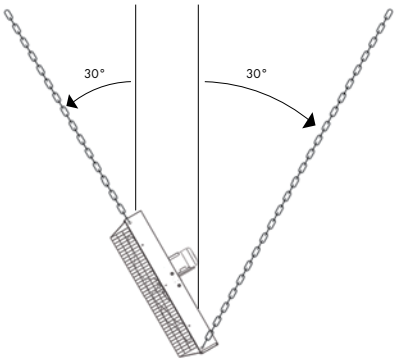


fig.9

Wall/column mounting system

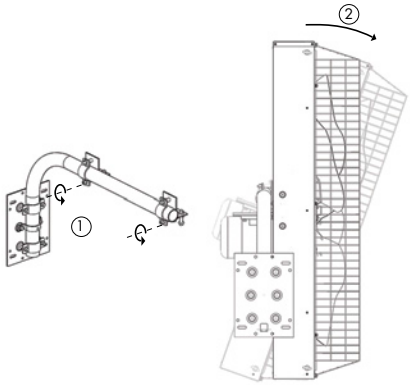


fig.10

VERTICAL TILTING

1. Loosen both the bottom bolts (it is not necessary to remove the bolts completely from the fan).
2. Tilt the fan to the desired angle.
3. Fasten the two bolts from the step 1.

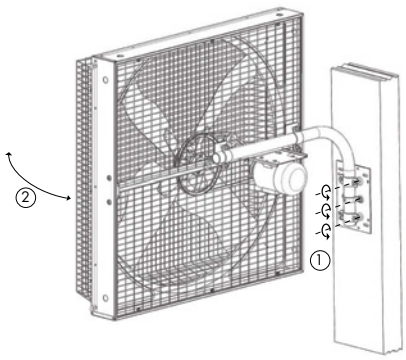


fig.11

HORIZONTAL TILTING

1. Loosen side bolts (it is not necessary to remove the bolts completely from the support).
2. Tilt the fan to the desired angle.
3. Fasten the bolts from the step 1.

5.5 Placement of fans

NOTE

If the MFS is installed near a wall or similar obstacle, a free space at least of 1,500mm should be left open on the fan air intake side.

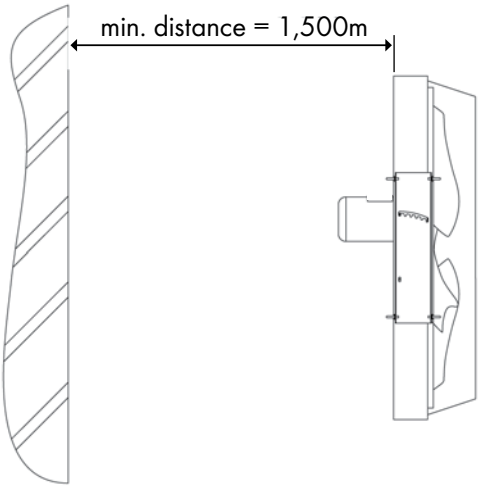


fig.12

NOTE

In order to comply with CE regulations, fans should be mounted so that the bottom of the fan is 2.7m or higher from the floor below it. If the fan is to be installed at a lower height it should be equipped with special safety meshes which are available as an optional extra.

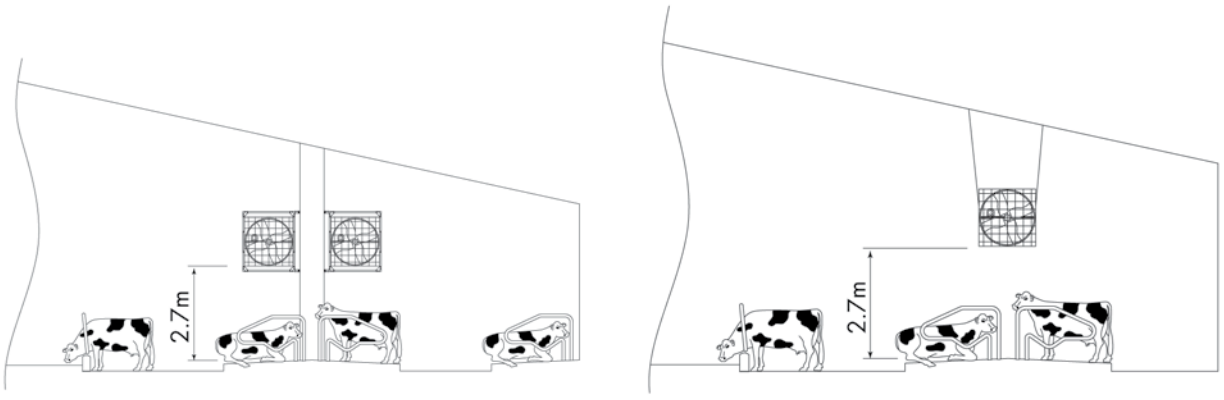


fig.13

5.6 Electrical wiring

The fan is delivered without an electrical control box, but the fan motor comes already wired. Connection to the power supply must be done by means of a thermal overload protection switch, whose size depends on motor power. For safety reasons the overload switch can be locked by a padlock, not supplied by Munters.

The installer must provide a suitable control box in compliance with requirements specified by EN 60204 rules. Electrical earthing must be carried out according to local regulations before the motor is connected to the supply voltage.

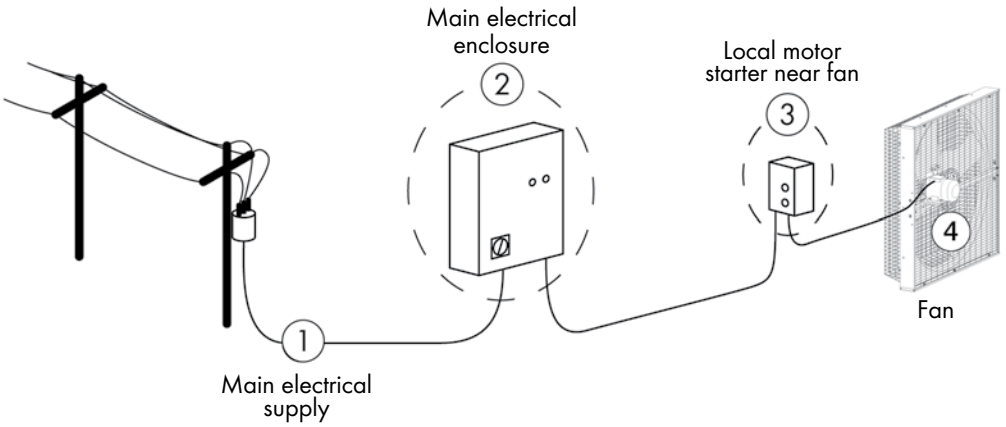


fig.14

Below are suggested wiring diagrams for connecting the fan to the mains electrical supply. These diagrams are however subject to local laws and regulations and should be modified if necessary to comply with such laws and regulations.

3 x 400V
or
3 x 230V

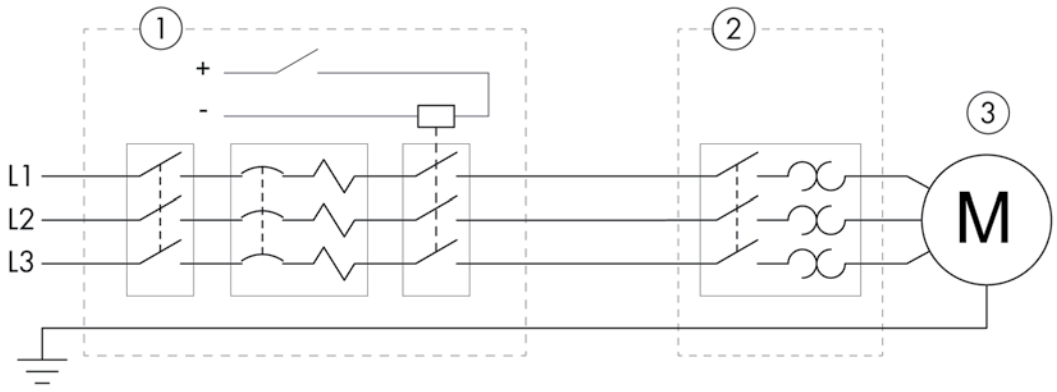


fig.15

1 x 230V

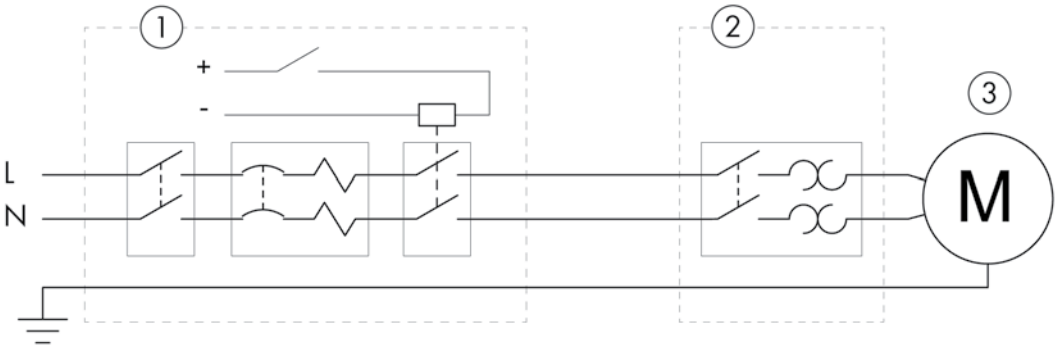


fig.16

(1) = Overload protection switch

(2) = Circuit breaker

(3) = Fan motor

NOTE

Failure to operate the fan with an overload protection device will render the motor guarantee null and void. Such motor overload protection devices can be ordered from Munters and be supplied with the fans.

WARNING

The connection cable must be completely extracted from the fan housing in order to avoid being damaged by moving parts.

To avoid excessive voltage drop, which can be harmful to electrical motors, care must be taken as to the thickness of cables used as well as the distance (D) from the main electrical enclosure to the motor. In the Table below are the maximum allowable distances.

Motor	Phases	Frequency [Hz]	Voltage [V]	Speed	Current [A]	Cross selectional area of cable		
						1.5mm^2	2.5mm^2	4mm^2
						Maximum allowable lenght: D [m]		
2.0hp/ 1.5kW	3	50/60	230	single	6.1	50	90	140
	3	50/60	400	single	3.5	90	150	240
1.0hp/ 0.75kW	1	50	200-230	single/multi	5.2	60	100	160
	1	60	208-230	single	5.6	50	90	140
	3	50/60	230	single/multi	4.3-3.8	90	150	240
	3	50/60	400	single/multi	2.5-2.2	280	460	730
0.75hp/ 0.55kW	1	50	200-230	single/multi	4.5	80	130	210
	1	60	208-230	single	4.4	70	120	190
	3	50/60	230	single	2.8	110	190	300
	3	50/60	400	single	1.6	350	580	920
	3	50/60	230	multi	2.9-2.4	80	140	220
	3	50/60	400	multi	1.65-1.4	260	440	700
0.5hp/ 0.37kW	1	50	200-230	single/multi	3.0	100	170	280
	1	60	208-230	single	2.9	90	160	250
	3	50/60	230	single	2.3	140	230	360
	3	50/60	400	single	1.3	430	710	1,130
	3	50/60	230	multi	2.4-1.9	100	170	280
	3	50/60	400	multi	1.4-1.1	320	540	860

Standard fan motors have the following voltage and frequency:
230/400V three-phase 50 or 60 Hz.

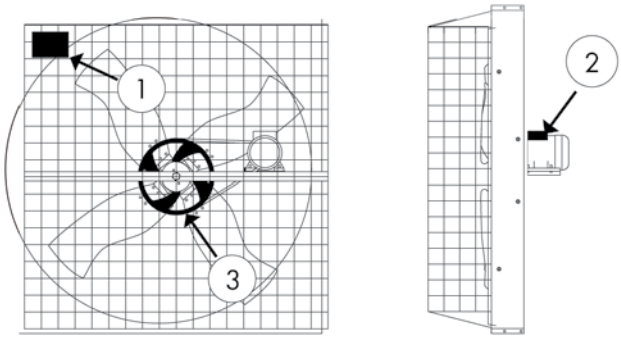


fig.17

Motor specifications are written on the label stuck on the frame and motor *(No. 1 and 2 in diagram)*. Before operating the fan, make sure the motor turns as shown by the arrow on the central pulley *(No. 3 in diagram)*. To change the direction of rotation of a three-phase motor it is necessary to change the connection of two of the phases.

Commissioning

6.

After installation, follow the steps mentioned below to verify that the fan is working properly:

- check if all the fans are secured tightly to the suspension chains or mounting system;
- ensure that all the necessary safety equipment is fitted to the fans;
- ensure that all electrical connections are done properly and comply with local regulations;
- note in which direction the propellers are supposed to turn, by observing the direction of the arrow on the central pulley;
- remove all obstacles from the front and back sides of the fans;
- ensure that all people and animals are standing clear of the fans;
- turn the electrical power to the fans on;
- observe the direction in which the propeller of each of the fans are turning to ensure that it is in the same direction as that of the arrow on the central pulley;
- turn the electrical power to the fans off.

WARNING

Do not attempt to correct any problem observed during the above mentioned steps while the fan is in operation. Wait until the electrical power has been switched off and the fan has come to a complete stand still. Lock the electrical switch in the off position with a pad lock while working on the fan.

Technical data

7.

7.1 Dimensions

MFS36

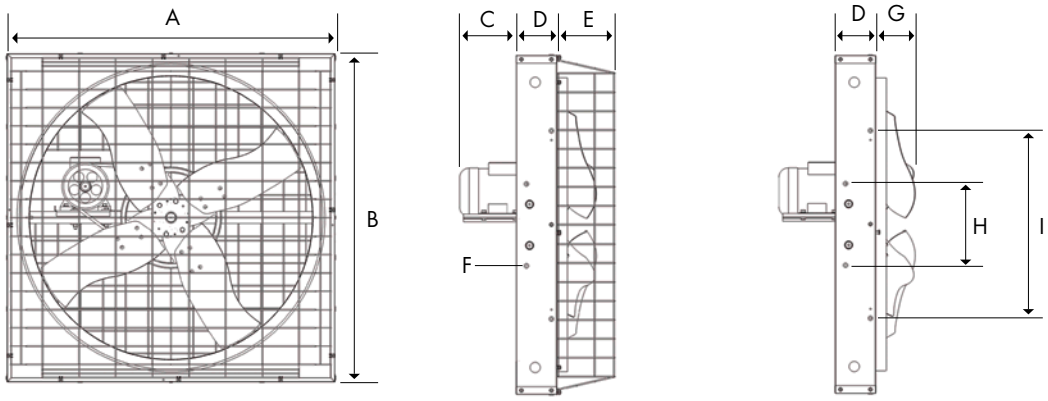


fig.18

MFS52

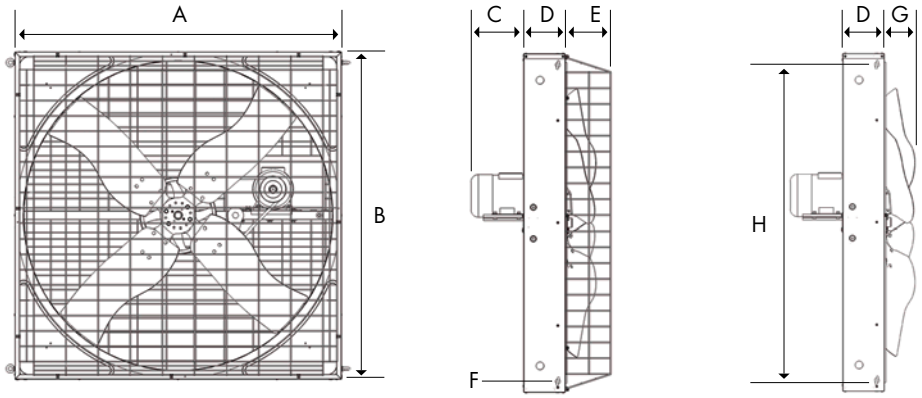


fig.19

Fan dimensions [mm]

Model	A	B	C	D	E	F	G	H	I
MFS36	1,085	1,085	180*	130	200	M8	130	260	600
MFS52	1,425	1,425	220*	176	190	M8	125	1,330	-

* *Distance may vary according to the type motor installed.*

Mounting kit dimensions for MFS52

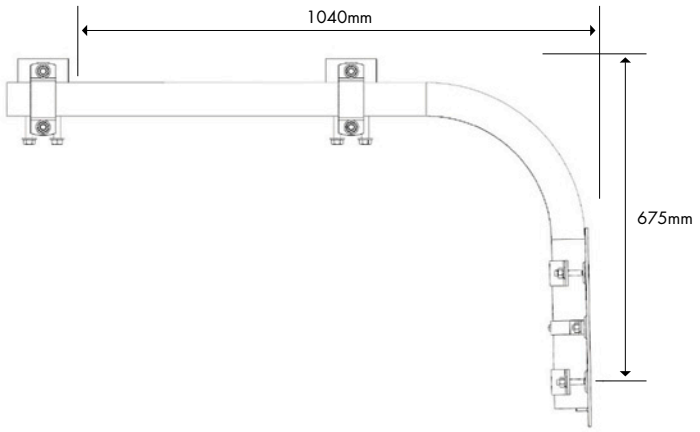


fig.20

7.2 Technical specifications

		MFS36			MFS52	
		0.5hp	0.75hp	1.0 & 1.2hp	1.0 & 1.2hp	2.0hp
Number of blades		4				
Propeller diameter	mm [inch]	915 [36]			1,320 [52]	
Weight of fully equipped fan*	[kg]	38	38.5	41.5	43	47
Airflow at 0 Pa	m^3/h [cfm]	16,740 [9,853]	19,770 [11,636]	21,973 [12,933]	37,638 [22,153]	44,803 [26,370]
Specific performance at 0 Pa	m^3/h /W [cfm/W]	33.3 [19.6]	26.7 [15.7]	21.6 [12.7]	33.5 [19.7]	25.3 [14.9]
Max. operating temperature	°C [°F]	50 [122]				
Nominal propeller speed	[rpm]	479	570	636	406	461
IEC protective class of electric motor		IP55				
Electric motor winding insulation grade		F				

**Excludes safety kit for installation below 2.7m above the floor.*

7.3 Motor specifications

Code	Nominal Power [W]	[Hp]	Phases	Speed	Frequency [Hz]	Voltage [V]	Current [A]	rpm
MFS36								
a	370	0.5	1	single	50	200/230	3	1,350
b	370	0.5	1	multi	50	200/230	3	1,350
c	370	0.5	1	single	60	208/230	2.9	1,680
d	370	0.5	3	single	50	230/400	2.3/1.3	1,400
e	370	0.5	3	single	60	230/400	2.3/1.3	1,700
f	370	0.5	3	multi	50	230/400	2.4/1.4	1,360
g	370	0.5	3	multi	60	230/400	1.9/1.1	1,630
h	550	0.75	1	single	50	200/230	4.5	1,380
i	550	0.75	1	multi	50	200/230	4.5	1,380
j	550	0.75	1	single	60	208/230	4.4	1,660
k	550	0.75	3	single	50	230/400	2.8/1.6	1,400
l	550	0.75	3	single	60	230/400	2.8/1.6	1,700
m	550	0.75	3	multi	50	230/400	2.9/1.65	1,380
n	550	0.75	3	multi	60	230/400	2.4/1.4	1,630
o	735	1.0	1	single	50	200/230	5.2	1,350
p	735	1.0	1	multi	50	200/230	5.2	1,350
q	735	1.0	1	single	60	208/230	5.6	1,660
r	735	1.0	3	single	50	230/400	3.5/2	1,400
s	735	1.0	3	single	60	230/400	3.5/2	1,700
t	880	1.2	3	multi	50	230/400	4.3/2.5	1,380
u	880	1.2	3	multi	60	230/400	3.8/2.2	1,640
MFS52								
a	735	1.0	1	single	50	200/230	5.2	1,350
b	735	1.0	1	multi	50	200/230	5.2	1,350
c	735	1.0	1	single	60	208/230	5.6	1,660
d	735	1.0	3	single	50	230/400	3.5/2	1,400
e	735	1.0	3	single	60	230/400	3.5/2	1,700
f	880	1.2	3	multi	50	230/400	4.3/2.5	1,380
g	880	1.2	3	multi	60	230/400	3.8/2.2	1,640
h	1,500	2.0	3	single	50	230/400	6.1/3.5	1,400
i	1,500	2.0	3	single	60	230/400	5.5/3.2	1,680

Maintenance

8.

8.1 Introduction

Maintenance must only be carried out by qualified personnel only using suitable tools and working methods. Before any maintenance steps are taken, make sure the power switch is in the off position and locked by a padlock. Make sure the propeller is at a complete standstill.

WARNING The capacitor in single-phase motors can retain a charge which appears across the motor terminals even when the motor has reached standstill.

Fans do not contain parts needing periodic lubrication, as moving parts are either manufactured from self lubricating materials, or are sealed with lifetime lubrication.

8.2 Cleaning

Inspect the fan at regular intervals and keep it clean. It is advised to perform periodic cleaning of safety mesh guards. Dust on the safety mesh guards causes extra power consumption; severe dust on the motor can cause overheating and subsequent motor failure.

WARNING Keep motor body clean. Dust deposit on motor body will lead to overheating and failure of bearings and motor itself.
Do not use water for motor cleaning. Use compressed air only. Water spraying will cause rust inside the bearings and lead to their failure.

8.3 Belt tensioning check up (without belt tensioner)

Check V-belt tension at regular intervals, the correct tension is obtained when maximum deflection (half-way from motor and central pulley) is about 10 mm, when pushed in by thumb.

WARNING Tighten fan belt after this fan has been running for 3 days. Without adjusting the tension, transmission components can wear out early.

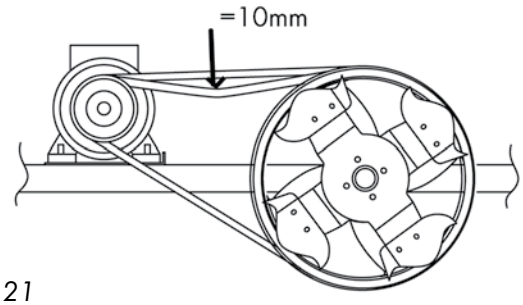
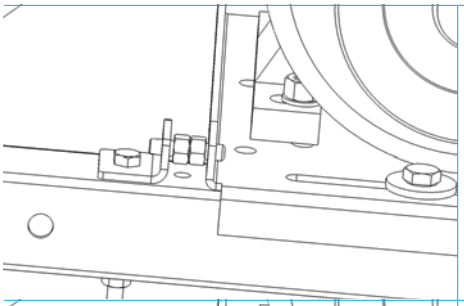


fig.21

To reset the correct tension:

- open the safety mesh guards;
- unscrew motor slide fixing screws (without removing them);
- using the tensioning belt adjuster instruction tighten the V-belt by pushing the motor sideways;
- tighten the fixing screws adequately;
- fix the safety meshes guard to the fan housing.

8.4 Tensioning belt adjuster



1. Be sure to adjust the two M6 nuts and the grub screw, in order to avoid any clearance of it.

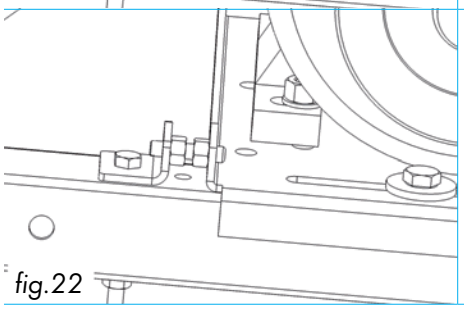


fig.22

2. Tighten the two bolts in the motor plate so that the V-belt remains in tension.

WARNING

Do not operate the fan with the safety protections removed: safety meshes can be removed only with specific tools by qualified technicians when the fan reaches a complete standstill.
The fixing sytems of the safety protections are not interchangeable with other devices. Therefore, if for maintenance reasons the user damages or loses any component, this must be definetely ordered from the manufacturer as spare parts and it cannot just be replaced with other components, even similar, not supplied by the manufacturer itself. In this particular event the manufacturer refuses all responsibility on consequent damages caused to things and people and considers any kind of warranty lost.

8.5 Replacement of V-belt

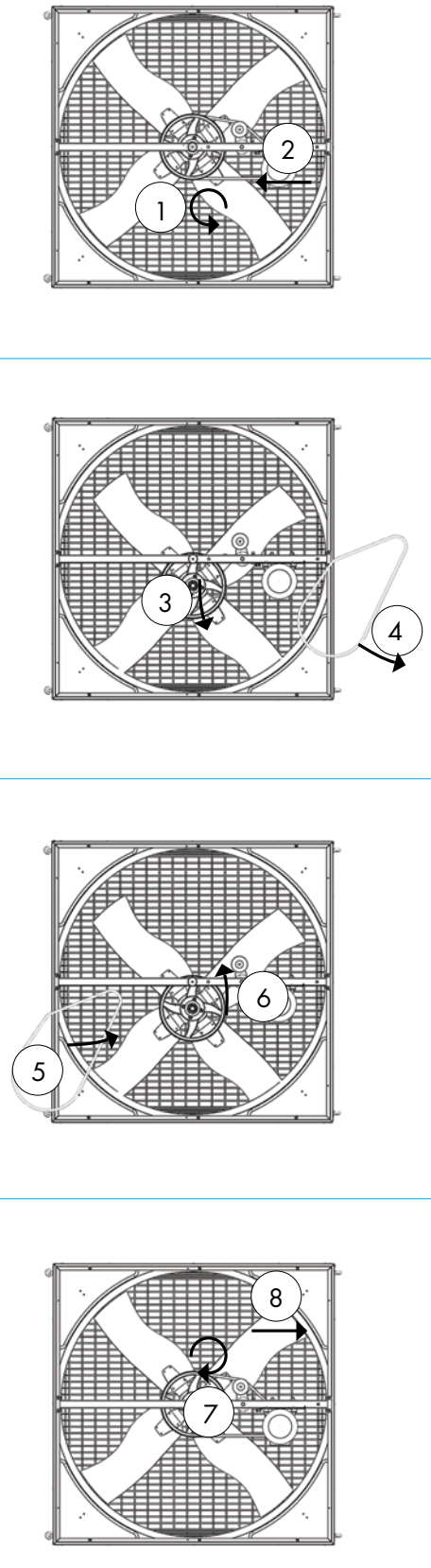


fig.23

If the V-belt should be damaged in any way, it has to be replaced. How to replace the V-belt:

1. open the safety mesh guards and loosen the bolts of the motor frame; slide the motor frame towards the centre of the fan to release any tension on the V-belt;
2. undo the 25mm hexagonal nut holding the propeller assembly to fan body;
3. carefully remove the propeller assembly from the fan body and let it rest on the bottom of the fan body;
4. remove the old V-belt;
5. insert the new V-belt.
6. replace the propeller assembly into the fan body;
7. fasten the 25mm hexagonal nut onto the shaft of the propeller assembly;
8. tighten the V-belt by pushing the motor away from the centre of the fan and then tighten the bolts on the motor frame.

8.6 Fan bearing lubrication

Bearings are properly sized, with double sealed protection (2RS) and lubricated for life, therefore they do not require any additional lubrication.

8.7 Propeller replacement

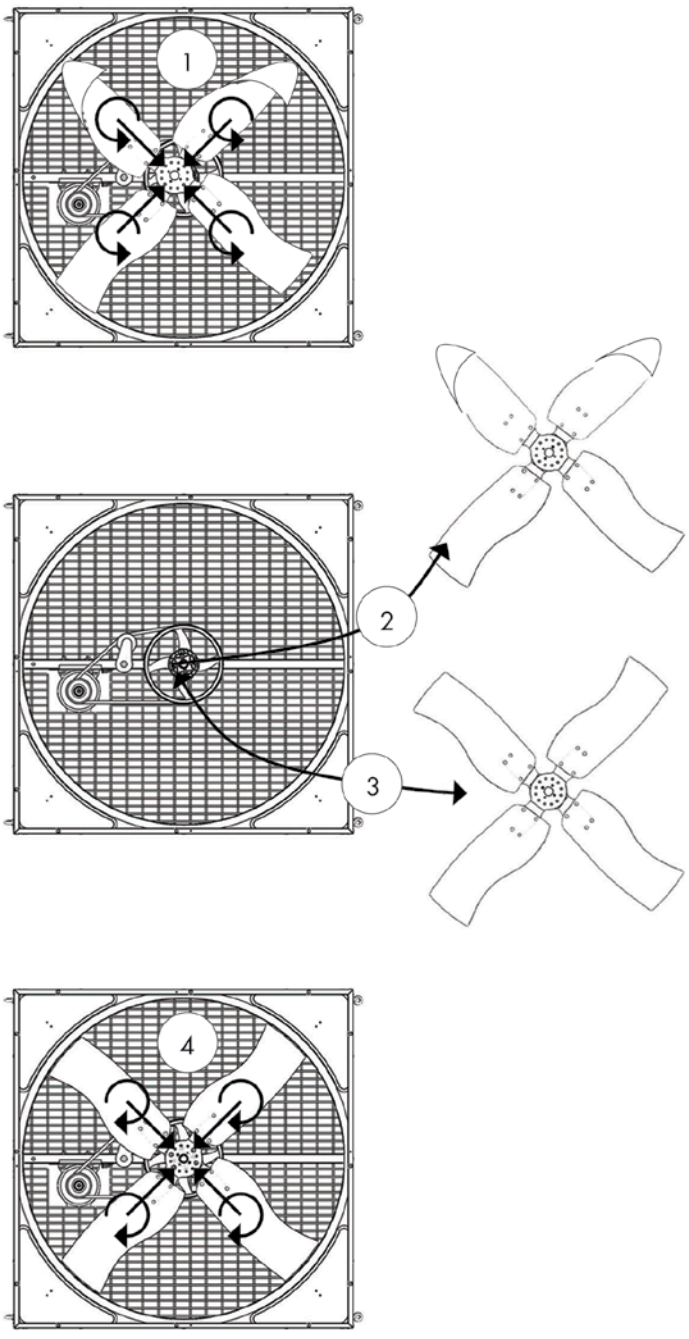


fig.24

If damage occurs to the propeller, it is necessary to replace the whole propeller because of the difficulty to balance it in the field. How to replace the propeller:

1. remove the pyramidal safety mesh and unscrew the four M8 bolts holding the propeller to the fan;
2. remove the propeller;
3. insert the new propeller;
4. tighten the four M8 bolts holding the propeller to the fan and re-install the pyramidal safety mesh.

Spare part list

9.

MFS36

GROUPS 1: Safety Meshes 2: Body 3: Propeller 4: Pulley 5: Belt 6: Motor

fig.25

REF.	DESCRIPTION	QUANTITY
	GROUP 1: SAFETY MESHES	
1	KIT SAFETY MESHES	1
1.1	PYRAMIDAL SAFETY MESH 1,333.5X1,333.5 121X61 GALV.	1
1.2	SELF TAPPING SCREW 6,3X19 GALV.	24
1.3	PLASTIC CLIP FOR MESH	24
1.4	REAR SAFETY MESH 1,045.5X1,045.5 M74.5X74.5 GALV.	1
	GROUP 2: BODY	
2	GALV. FRAME	1
2.1	HEXAGON BOLT M8X30 8,8 UNI 5739 GALV.	4
2.2	PLAIN WASHER D8,4X15 UNI 6798	4
2.3	HEXAGON BOLT M8X65 8.8 UNI 5737 GALV.	2
2.4	EXTERNALLY THOOTED WASHER D10,5X18 UNI 5589	4
2.5	TICK HEXAGON NUT M10X10 UNI 5587 GALV.	4
2.6	CUP COVER NUT	1
2.7	LARGE PLAIN WASHER D6,7X24 UNI 659	1
2.8	SELF TAPPING SCREW 6,3X19 GALV.	1
2.9	HEXAGON SOCKET SCREW M10X30 10.9 UNI 5933	4
2.10	OVAL PLATE	2
2.11	CENTRAL SUPPORT GALV.	1
2.12	TICK HEXAGON NUT M8X8 UNI 5587 GALV.	6
2.13	LARGE PLAIN WASHER D8X32 DIN 126	4
2.14	TOP/BOTTOM PANEL 1,133X194X0,6 GALV.	2
2.15	POP RIVET D4,8X7	12
2.16	LONG THREADED BUSH D8X17,5 M8 GALV.	8
2.17	EPDM STRIP 15X3mm	3,3m
2.18	HEXAGON THREADED BUSH M8	4
2.19	SIDE PANEL 1,078X194X1 GALV.	2
2.20	VENTURI GALV.	1
2.21	EUROEMME STICKER18X131	1
2.22	STICKER NO HIGH PRESSURE 42X118	2
2.23	STICKER 95X115	2
2.24	WARNING STICKER B-1997 70X105	2
	GROUP 3: PROPELLER	
3	PROPELLER INOX/GALV.	1
	GROUP 4: PULLEY	
4	CENTRAL PULLEY	1
4.1	TICK HEXAGON NUT M6X6 UNI 5587 GALV.	4
4.2	PLAIN WASHER D6,4X12,5 UNI 659	4
4.3	CENTRAL PULLEY DP325X1A	1

4.4	HEXAGON BOLT M6X30 8,8 UNI 5739 GALV.	4
4.5	WATERPROOF DISTANCE PIECE	1
4.6	HUB	1
4.7	THIN HEXAGON NUT M25X10 UNI 5589	1
	GROUP 5: BELT	
5	V-BELT A53	1
	GROUP 6: MOTOR	
6	SEE MOTOR TABLE	1
	GROUP 7: KIT OPZIONALI	
7A	CHAIN SUSPENSION KIT	1
7B	WALL/COLUMN MOUNTING SYSTEM	1
	MOTOR	

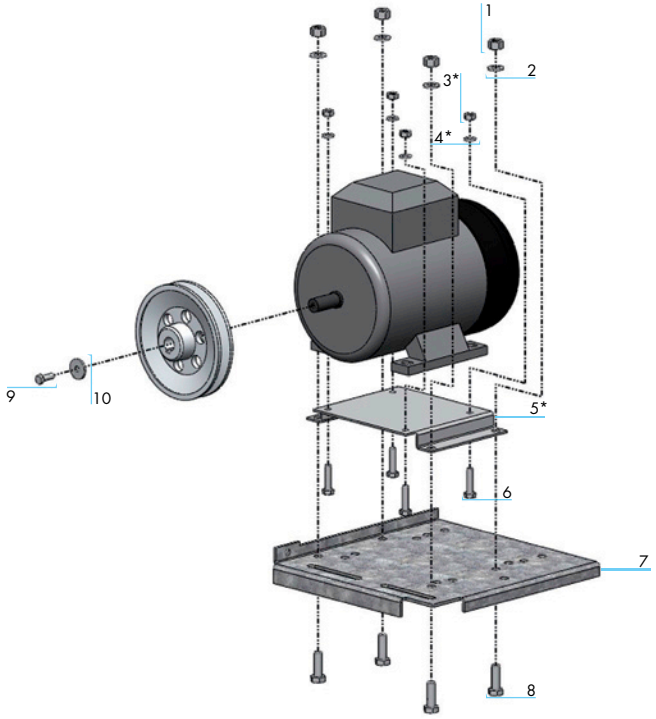


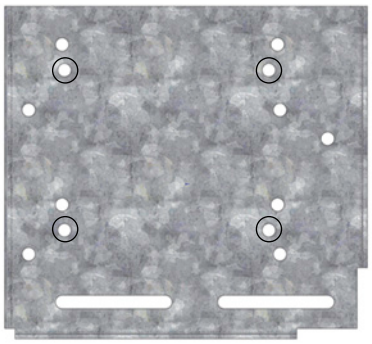
fig.26

**only for 0.5/0.75 Hp motors*

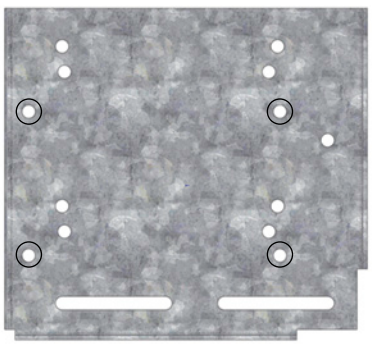
MOTOR PULLEY PITCH DIAMETER AND HOLE								
	3-PHASE				SINGLE PHASE			
	ONE SPEED		MULTI SPEED		ONE SPEED		MULTI SPEED	
	50 HZ	60 HZ	50 HZ	60 HZ	50 HZ	60 HZ	50 HZ	60 HZ
HP0.5	PD110 H14	PD90 H14	PD110 H14	PD90 H14	PD110 H19	PD90 H14	PD110 H19	-
HP0.75	PD130 H14	PD105 H14	PD130 H14	PD105 H14	PD130 H19	PD105 H19	PD130 H19	-
HP1.0	PD150 H19	PD125 H19	PD150 H19	PD125 H19	PD150 H19	PD125 H19	PD150 H19	-

BOLTS&NUTS		
MODELS HP0.5/0.75 - 50/60HZ		
1	TICK HEXAGON NUT M8X8 UNI 5587 GALV.	4
2	PLAIN WASHER D8,4X17 UNI 659	4

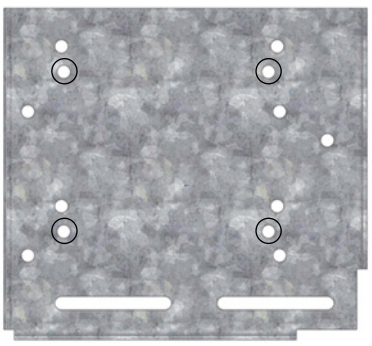
3	TICK HEXAGON NUT M6X6 UNI 5587 GALV.	4
4	PLAIN WASHER D6,4X12,5 UNI 659	4
5	MOTOR PLATE ADAPTOR FOR MEC71 200X119X2	1
6	HEXAGON BOLT M6X25 8,8 UNI 5739 GALV.	4
7	MOTOR PLATE 222X244X3 GALV.	1
8	HEXAGON BOLT M8X25 8,8 UNI 5739 GALV.	4
9	HEXAGON BOLT M5X16 8,8 UNI 5739 GALV.	1
10	PLAIN WASHER D5X20 GALV.	1
	MODELS HP1.0 - 50/60HZ	
1	TICK HEXAGON NUT M8X8 UNI 5587 GALV.	4
2	PLAIN WASHER D8,4X17 UNI 659	4
7	MOTOR PLATE 222X244X3 GALV.	1
8	HEXAGON BOLT M8X25 8,8 UNI 5739 GALV.	4
9	HEXAGON BOLT M6X20 8,8 UNI 5739 GALV.	1
10	PLAIN WASHER D6,7X24 UNI 659	1
	HOLES FOR MOTOR	



◯ = HOLES FOR 0.5HP MOTORS



◯ = HOLES FOR 0.75HP MOTORS



◯ = HOLES FOR 1.0HP MOTORS

fig.27

MFS52

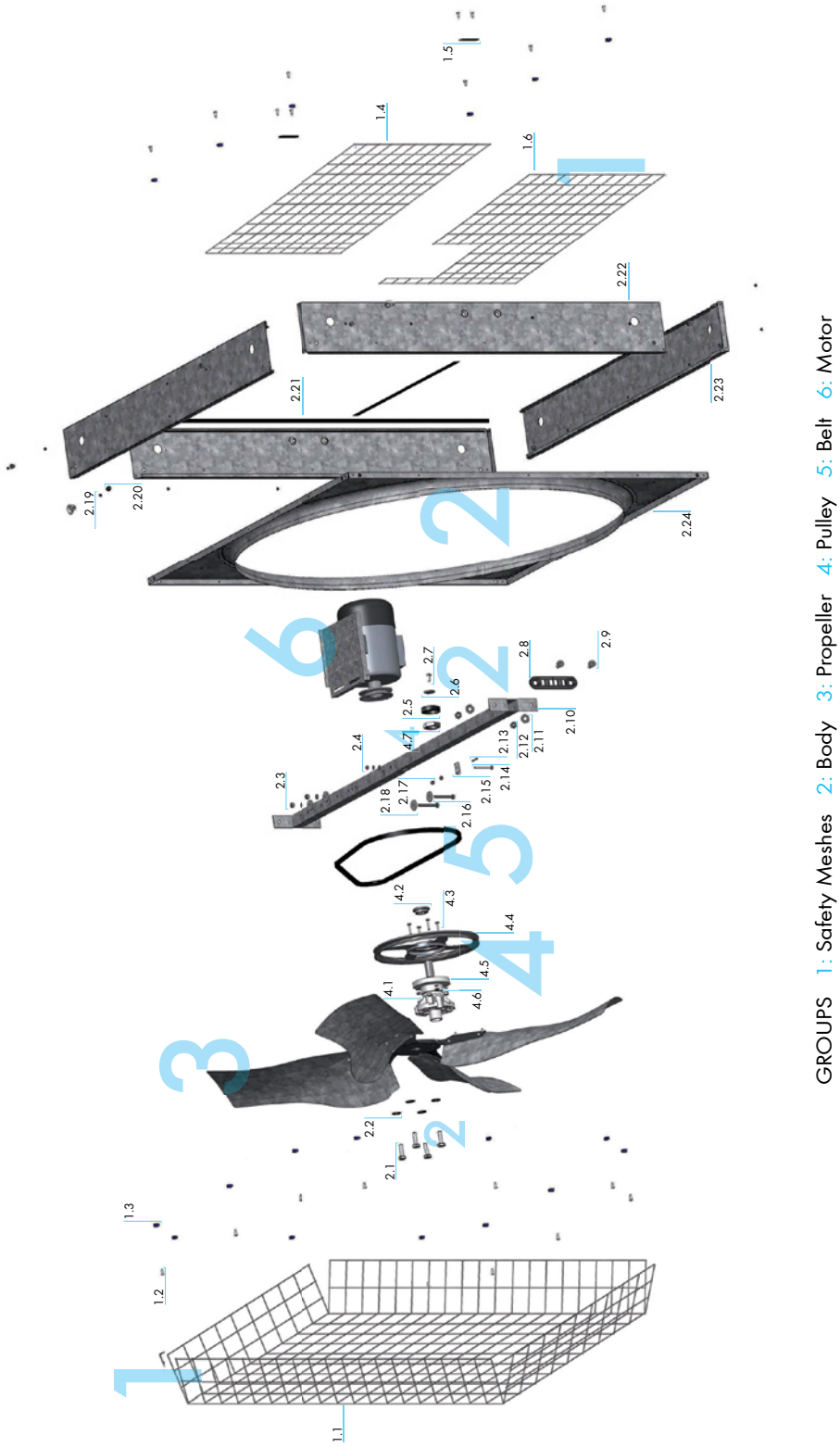


fig.28

REF.	DESCRIPTION	QUANTITY
	GROUP 1: SAFETY MESHES	
1	KIT SAFETY MESHES	1
1.1	PYRAMIDAL SAFETY MESH 1665X1660 126X66 GALV.	1

1.2	SELF TAPPING SCREW 6,3X19 GALV.	32
1.3	PLASTIC CLIP FOR MESH	28
1.4	REAR SAFETY MESH 685X1,390 126X62	1
1.5	CENTRAL CLIP FOR MESH	2
1.6	REAR SAFETY MESH 685X1,390 126X62 MOTORSIDE	1
	GROUP 2: BODY	
2	GALV. FRAME	1
2.1	HEXAGON BOLT M8X30 8,8 UNI 5739 GALV.	4
2.2	PLAIN WASHER D8,4X15 UNI 6798	6
2.3	TICK HEXAGON NUT M8X8 UNI 5587 GALV.	6
2.4	SPRING WASHER D6,4X11,4	1
2.5	CUP COVERNUT	1
2.6	PLAIN WASHER D6,7X24 GALV.+SEALANT	1
2.7	SELF TAPPING SCREW 6,3X19 GALV.	1
2.8	OVAL PLATE	2
2.9	HEXAGON SOCKET SCREW M10X30 UNI 5933	4
2.10	CENTRAL SUPPORT GALV.	1
2.11	PLAIN WASHER D10,5X18 UNI 5589	4
2.12	TICK HEXAGON NUT M10X10 UNI 5587 GALV.	4
2.13	GRUB SCREW M6X30 UNI 5923 GALV.	1
2.14	HEXAGON BOLT M6X60 8,8 GALV.	1
2.15	L STAFF FOR BELT TENSIONER	1
2.16	HEXAGON BOLT M8X65 8.8 UNI 5737 GALV.	2
2.17	TICK HEXAGON NUT M6X6 ALTO 5587 GALV.	3
2.18	PLAIN WASHER D8X32 DIN 126	4
2.19	POP RIVET D4,9X7 GALV.	24
2.20	HEXAGON THREADED BUSH M8	8
2.21	EPDM STRIP 15X3mm	5m
2.22	SIDE PANEL DX/SX 1,420X175.5X0.8 GALV.	2
2.23	TOP/BOTTOM PANEL 1,420X175.5X0.8 GALV.	2
2.24	VENTURI GALV.	1
2.25	EUROEMME STICKER 18X131	1
2.26	EUROEMME STICKER 24,6X180	1
2.27	STICKER NO HIGH PRESSURE 42X118	2
2.28	STICKER 95X115	1
2.29	WARNING STICKER 70X105	2
	GROUP 3: PROPELLER	
3	PROPELLER INOX/GALV.	1
	GROUP 4: PULLEY	
4	CENTRAL PULLEY	1

4.1	PLAIN WASHER D6,4X12,5 UNI 659	4
4.2	WATERPROOF DISTANCE PIECE	1
4.3	HEXAGON BOLT M6X30 8,8 UNI 5739 GALV.	4
4.4	CENTRAL PULLEY DP325X1A	1
4.5	HUB	1
4.6	TICK HEXAGON NUT M6X6 UNI 5587 GALV.	4
4.7	THIN HEXAGON NUT M25X10 UNI 5589	1
GROUP 5: BELT		
5	V-BELT A61-1510	1
GROUP 6: MOTOR		
6	SEE MOTOR TABLE	1
GROUP 7: OPTIONAL KITS		
7A	CHAIN SUSPENSION KIT	1
7B	WALL/COLUMN MOUNTING SYSTEM	1
7C	TENSIONER	1
7C1	PLASTIC ADAPTOR FOR BELT TENSIONER	1
7C2	SPRING WASHER D10.5 UNI 8842A	1
7C3	HEX BOLT M10X90X26N ISO 4014	1
MOTOR		

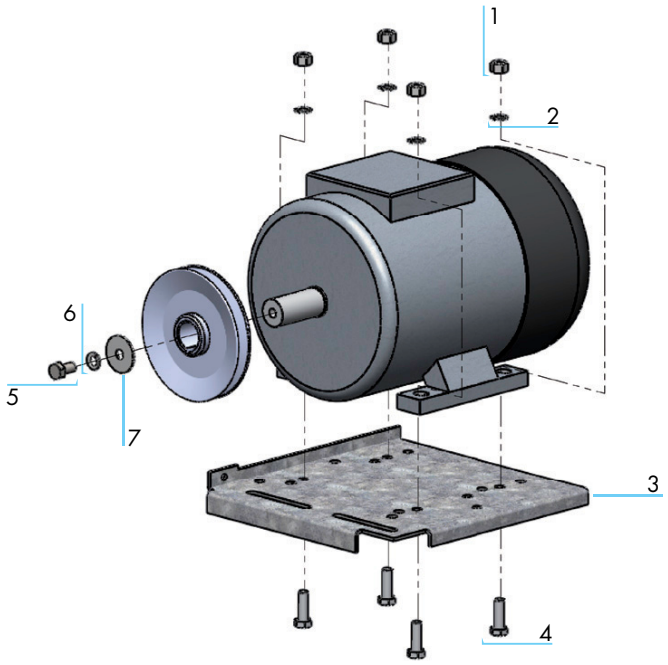
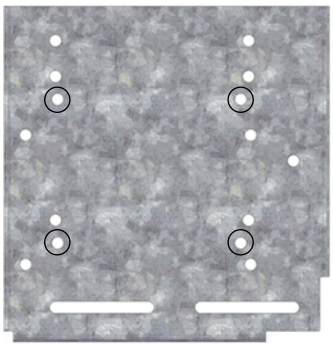


fig.29

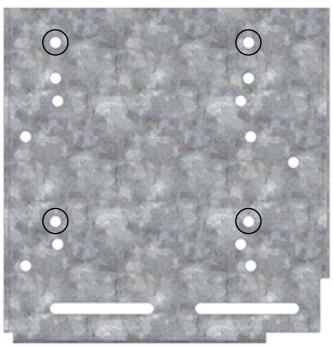
MOTOR PULLEY PITCH DIAMETER AND HOLE								
	3-PHASE				SINGLE PHASE			
	ONE SPEED		MULTI SPEED		ONE SPEED		MULTI SPEED	
	50 HZ	60 HZ	50 HZ	60 HZ	50 HZ	60 HZ	50 HZ	60 HZ
HP1.0	PD90 H19	PD75 H19	PD90 H19	PD75 H19	PD90 H19	PD75 H19	PD90 H19	-
HP2.0	PD106 H24	PD90 H24	-	-	-	-	-	-

BOLTS&NUTS		
MODELS HP1.0 - 50/60HZ		
1	TICK HEXAGON NUT M8X8 UNI 5587 GALV.	4
2	PLAIN WASHER D8,4X17 UNI 659	4
3	MOTOR PLATE 234X228X3 GALV.	1
4	HEXAGON BOLT M8X25 8,8 UNI 5739.	4
5	HEXAGON BOLT M6X20 8,8 UNI 5739	1
6	SPRING WASHER D6,4X11,4 UNI 1751	1
7	PLAIN WASHER D6,7X24 UNI 659	1
MODELS HP2.0 - 50/60HZ		
1	TICK HEXAGON NUT M8X8 UNI 5587 GALV.	4
2	PLAIN WASHER D8,4X17 UNI 659	4
3	MOTOR PLATE 234X228X3 GALV.	1
4	HEXAGON BOLT M8X25 8,8 UNI 5739.	4
5	HEXAGON BOLT M8X20 8,8 UNI 5739	1
6	SPRING WASHER D8,4X14,4 UNI 1751	1
7	PLAIN WASHER D8X32 DIN 126	1

HOLES FOR MOTOR



◯ = HOLES FOR 1.0HP MOTORS



◯ = HOLES FOR 2.0HP MOTORS

fig.30

Warranty

10.

Warranty and technical assistance

Munters products are designed and built to provide reliable and satisfactory performance but cannot be guaranteed free of faults; although they are reliable products they can develop unforeseenable defects and the user must take this into account and arrange adequate emergency or alarm systems if failure to operate could cause damage to the articles for which the Munters plant was required: if this is not done, the user is fully responsible for the damage which they could suffer.
Munters extends this limited warranty to the first purchaser and guarantees its products to be free from defects originating in manufacture or materials for one year from the date of delivery, provided that suitable transport, storage, installation and maintenance terms are complied with. The warranty does not apply if the products have been repaired without express authorisation from Munters, or repaired in such a way that, in Munters' judgement, their performance and reliability have been impaired, or incorrectly installed, or subjected to improper use. The user accepts total responsibility for incorrect use of the products.
The warranty on products from outside suppliers fitted to MFS, (for example electric motors, belts, etc.) is limited to the conditions stated by the supplier: all claims must be made in writing within eight days of the discovery of the defect and within 12 months of the delivery of the defective product. Munters has thirty days from the date of receipt in which to take action, and has the right to examine the product at the customer's premises or at its own plant (carriage cost to be borne by the customer).
Munters at its sole discretion has the option of replacing or repairing, free of charge, products which it considers defective, and will arrange for their despatch back to the customer carriage paid. In the case of faulty parts of small commercial value which are widely available (such as bolts, etc.) for urgent despatch, where the cost of carriage would exceed the value of the parts, Munters may authorise the customer exclusively to purchase the replacement parts locally; Munters will reimburse the value of the product at its cost price.

Munters will not be liable for costs incurred in demounting the defective part, or the time required to travel to site and the associated travel costs. No agent, employee or dealer is authorised to give any further guarantees or to accept any other liability on Munters' behalf in connection with other Munters products, except in writing with the signature of one of the Company's Managers.

WARNING

In the interests of improving the quality of its products and services, Munters reserves the right at any time and without prior notice to alter the specifications in this manual.

The liability of the manufacturer Munters ceases in the event of:

- dismantling the safety devices;
- use of unauthorised materials;
- inadequate maintenance;
- use of non-original spare parts and accessories.

Barring specific contractual terms, the following are directly at the user's expense:

- preparing installation sites;
- providing an electricity supply (including the protective equipotential bonding (PE) conductor, in accordance with CEI EN 60204-1, paragraph 8.2), for correctly connecting the equipment to the mains electricity supply;
- providing ancillary services appropriate to the requirements of the plant on the basis of the information supplied with regard to installation;
- tools and consumables required for fitting and installation;
- lubricants necessary for commissioning and maintenance.

It is mandatory to purchase and use only original spare parts or those recommended by the manufacturer.
Dismantling and assembly must be performed by qualified technicians and according to the manufacturer's instructions.
The use of non-original spare parts or incorrect assembly exonerates the manufacturer from all liability.

Requests for technical assistance and spare parts must be made directly to the manufacturer, at the following address:

Munters Italy S.p.A
Strada Piani, 2
18027 Chiusavecchia (IM), Italy
Tel: +39 0183 52 11
Fax: +39 0183 521 333

Euroemme® MFS circulation fan is developed and produced by Munters Italy S.p.A., Italy

www.munters.com

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