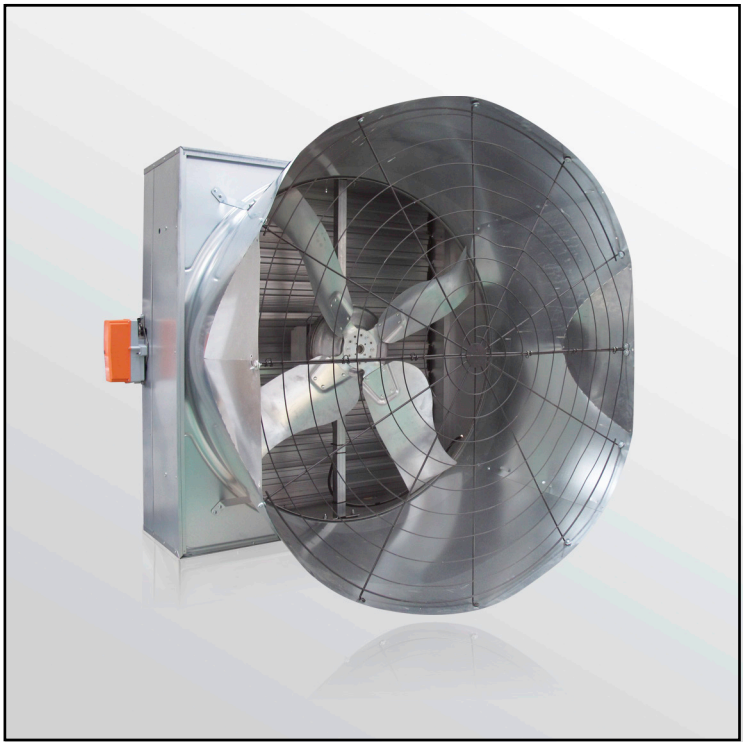
EC52
with
Munters Drive

Manual for use and maintenance



+ CE Declaration of conformity

EC52 with Munters Drive

Exhaust fan

Ag/MIT/UmGB-2345-03/16 Rev. 1.1

Munters

EC52 with Munters Drive

Manual for use and maintenance

Original instructions

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.

Index

chapter		*page*
1.	CE DECLARATION	5
	1.1 Disclaimer	6
	1.2 Introduction	6
	1.3 Notes	6
	1.4 Data for Fan Eco Design Directive	6
	1.5 Attached technical documentation	6
2.	SAFETY ASPECTS	7
3.	BEFORE USING	8
	3.1 Delivery check	8
	3.2 Packaging and transport of assembled fans	8
	3.3 Structure	9
4.	OPERATING CONDITIONS	10
5.	INSTALLATION	11
	5.1 Assembly of the cone	11
	5.2 Assembly of the gear motor	13
	5.3 Placement of fans	14
	5.4 Electrical wiring	15
	5.5 Standard wiring between VFD, motor and juction box	19
	5.6 Reversing Belimo actuator positioning	20
6.	COMMISSIONING	21
7.	TECHNICAL DATA	22
	7.1 Dimensions	22
	7.2 Technical specification	22

8. MAINTENANCE 24

8.1 Introduction 24
8.2 Cleaning 24

9. SPARE PART LIST 25

10. WARRANTY 30

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

(Company registration nr. 00081050080)

DECLARES ON ITS OWN RESPONSIBILITY THAT THE APPARATUS

Designation	Exhaust fan designed for moving air to control temperature and humidity in livestock.
Model	EC52 with Munters Drive
Year of manufacture	2016

CONFORMS WITH THE ESSENTIAL SAFETY REQUIREMENTS STATED BY APPARATUS DIRECTIVE 2006/42/EC, 2004/108/EC, 2006/95/EC AND PERFORMANCE REQUIREMENTS COMPLY WITH THE ERP DIRECTIVE 2009/125/CE.

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), UNI EN ISO 5801:2009

Chiusavecchia, 1st April 2016

Marco Scomparin

Legal representative

1.1 Disclaimer

Munters reserves the right to make alternations 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® EC52 with Munters Drive 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: 2016.
Munters cannot guarantee to inform users about the changes or to distribute new manuals to them.

1.4 Data for Fan Eco Design Directive

Product information requirements* → *(according to ANNEX I - 3.2 of regulation)*	1	2	3	4	optional	5	6a	6b	6c	7	8
Fan description*	Overall efficiency η%	Measurement category	Efficiency category	Efficiency grade	Target efficiency grade 2013 (2015)	VSD must be installed with the fan	Motor power input at optimum energy efficiency [W]	Flow rate at optimum energy efficiency [m^3/h]	Pressure at optimum energy efficiency [Pa]	RPM at optimum energy efficiency	Specific ratio
EC52 with Munters Drive	40.9	A	static	45.5	40	yes	1,926	33,411	79.5	495	1

1.5 Attached technical documentation

The listed documentation is to be considered an integral part of this manual:

- gear motor instruction booklet.

Safety aspects

2.

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 is supplied together with the fan;
- if the safety mesh is not installed, the constructor 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;
- fans should not be installed in places where children aged 14 or less are present.

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.

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 Munters Protect coated steel and it is delivered with packaging.

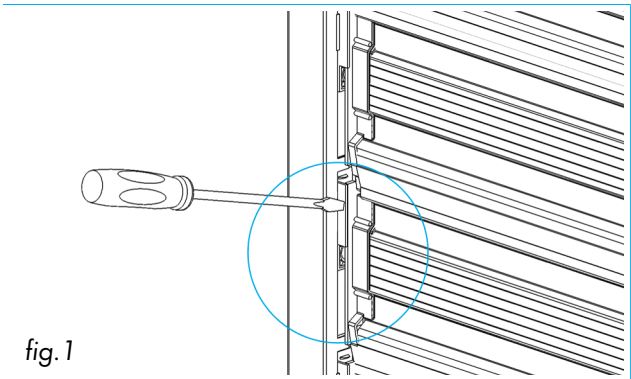


fig.1

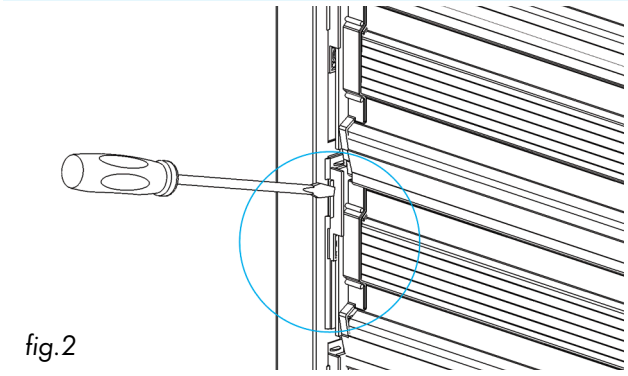


fig.2

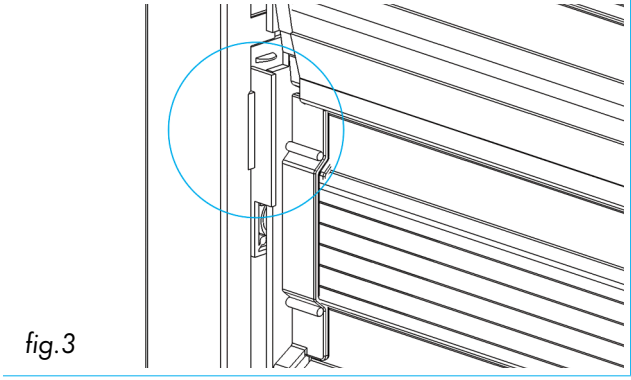


fig.3

Once unpacked check the opening of the shutter manually by rotating the central shutter blade. verify that during transportation the plastic shutter bearings did not fall off from their operation condition. If yes restore them by mean of a screw-driver and re-check the opening of the shutter.

Follow the steps shown in the pictures.

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 Munters Protect coated steel without welding spots;
- propeller with four blades in Munters Protect coated steel; blades are fixed to the propeller by high-strength pop rivets;
- pyramidal shape and flat meshes for protection on back and front side;
- Munters Drive Motor: EC motor plus inverter (VFD).

Operating conditions

4.

Exhaust fans, such as the EC52 with Munters Drive, 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 1000m 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.

WARNING

The metal sheets used for constructing the fan housing and shutter blades have a surface coating made of an alloy of Zinc, Aluminum and Magnesium, classified as ZM120 (equivalent to 9 µm of coating thickness on each side of the panels) which corresponds to a corrosion resistance in salty mist of 1800 hours.
Whenever it is intended to use the fans in ambients characterized by the presence of particularly aggressive agents (ammonia, clavulanic acid, etc.) the user, before installing the fan at the installation site must verify that the environmental conditions are compatible with the intended use of the materials that compose the fan.

Installation

5.

5.1 Assembly of the cone

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

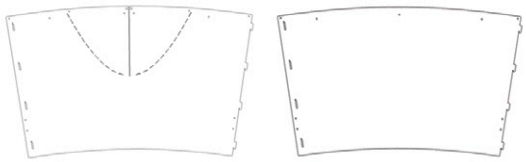


fig.4

1. Take two sectors of the cone, one for each type.

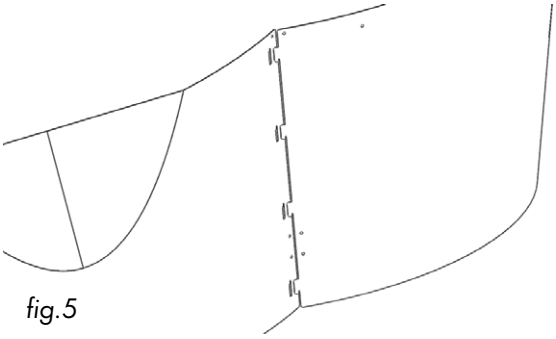


fig.5

2. Align the four fingers of one of the two cone sector to the respective slot of the other.

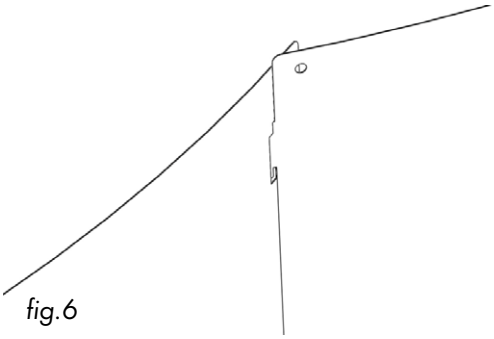


fig.6

3. Insert the fingers in the slots.

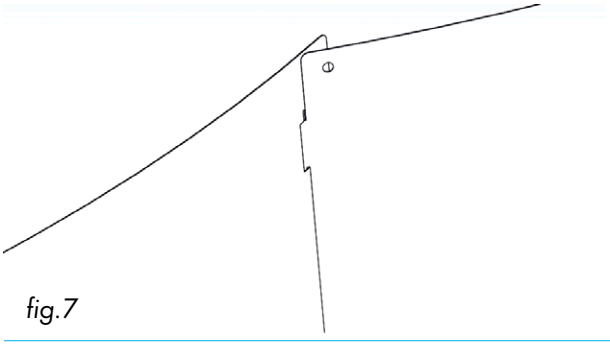


fig.7

4. Slip in the sector with the fingers facing downwards; assuring to aligne the hole for fixing the screw.
5. Repeat from step 2, using the remaining two sectors, steering the fingers on the same side.
6. Close the cone steering the fingers internally.

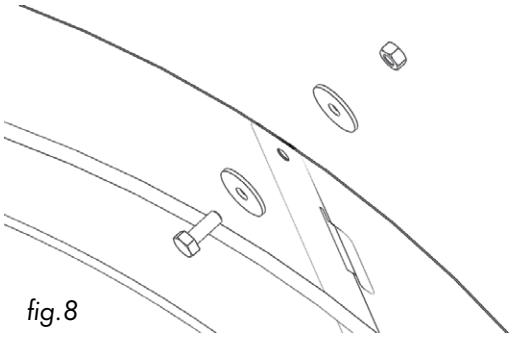


fig.8

7. Bolt the four junction points on the wide area of the cone.

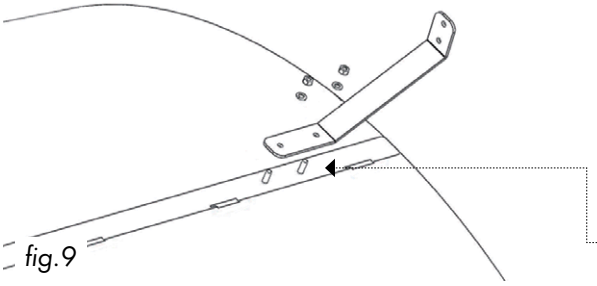


fig.9

8. Mount the four brackets, leaving the M6 screw's head towards the inside of the cone.

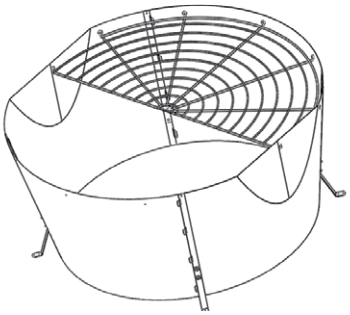


fig.10

9. Draw half a mesh up to the cone's border.

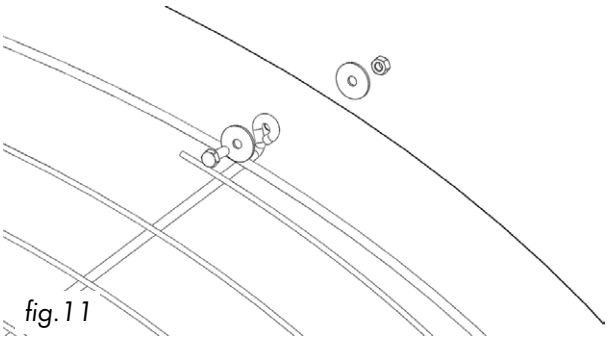


fig.11

10. Bolt all the grommet to the sector.
11. Repeat from step 9 for the latter half a mesh.

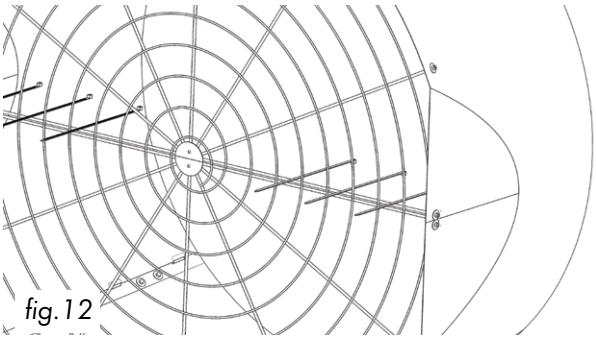


fig.12

12. Bind the semimeshes with the three (plus three) pliable tabs/flaps.

5.2 Assembly of the gear motor

To minimize the space the gear motor is delivered unassembled, as well the plastic arm to open and close the shutter. The latter as to be assembled following the instructions and use the exploded view as support and the video.

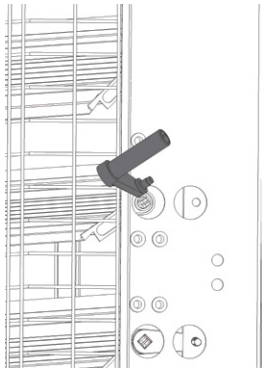


fig.13

The first step is to insert the plastic arm *(ref.33)*, keeping the shutter half opened.

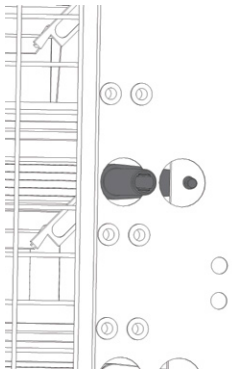


fig.14

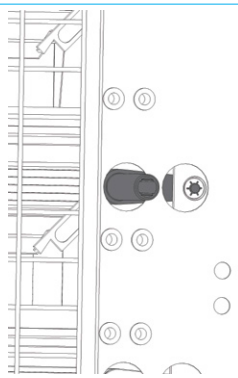


fig.15

The second step is to insert the pin of the plastic arm in the tie rod *(ref.24)* and the the stop collar *(ref.25)*.

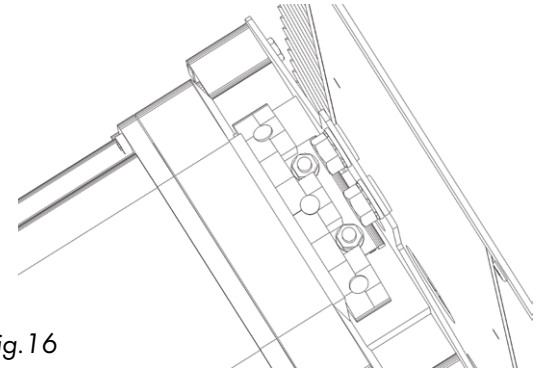


fig.16

Once you put in place the arm you can mount the gear motor by means of 4 M8x16 screws *(ref.45)*, plain washer *(ref.43)* and Ø8 ext thooted washer *(ref.44)*. Taking care to tighten the gear motor (Belimo) on to the plastic arm, while the shutter is closed.

For the wiring see the following pages.

5.3 Placement of fans

NOTE

The EC52 with Munters Drive is installed on a wall or structure and a free space at least of 2,500mm should be left open on inlet and outlet sides of the fan.

Wall stucture

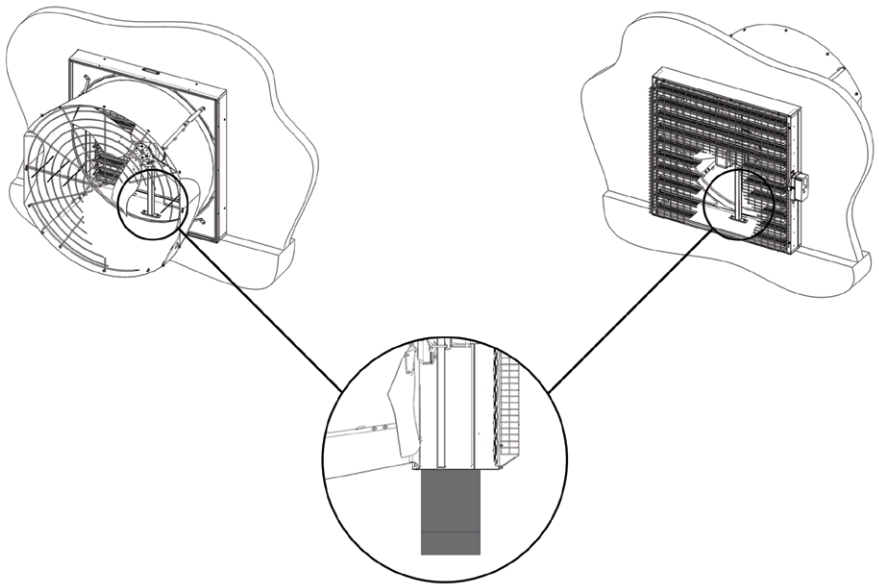


fig.17

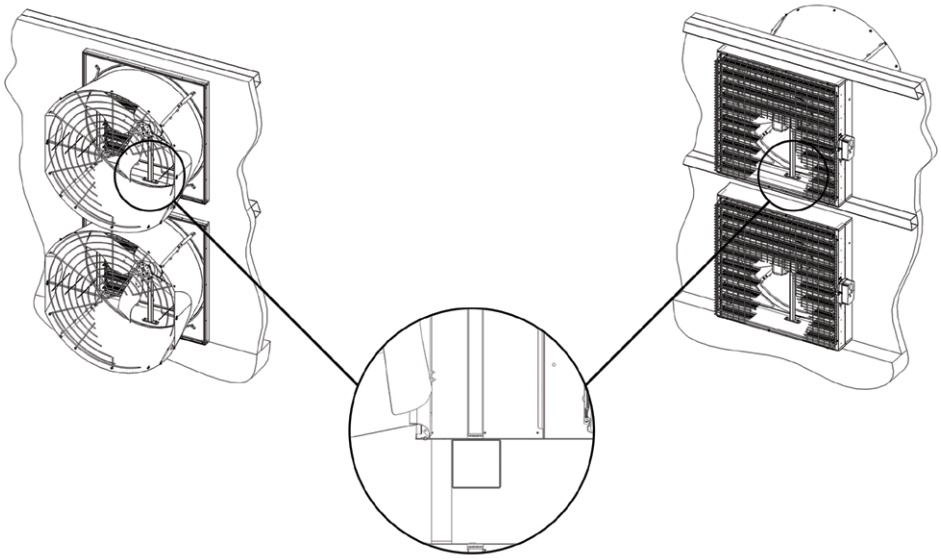


fig.18

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 supplied together with the fan.

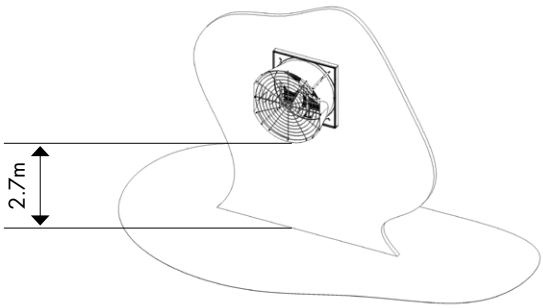


fig.19

> *WARNING*
>
> Fans have to be installed taking care to have central support placed in correspondence of a concrete wall or a dedicated metal frame, which has to be strong enough to support the weight of the fan. This is mandatory for guaranteeing the correct functioning of the fans eliminating vibrations and avoiding possible malfunctioning.

5.4 Electrical wiring

The fan is delivered with inverter (VFD) and motor wired but the gear motor has to be mounted and installed as shown in the following schemes. Once installed the fan needs 2 lines of power supply (400Vac triphase for the motor and 230Vac single phase for the gear motor). A 0-10Vdc signal line is requested for speed adjusting. Power supplies and signal must be wired as follows. For safety reason and regulations compliance, connection to the power supply must be done by mean of:

- a thermal overload protection both the gear motor and the VFD;
- a protective equipment against surge of atmospheric origin;
- a disconnecting devices and protective interlock;
- any other device necessary to safety, according to the typology of installation chosen.

For further information about markings and warning signals of VFD, please refer to the Yaskawa manual. These devices are not supplied by Munters.

A network filter (type FIN3755.007.M), compulsory to comply with European EMC requirements and supplied by Munters upon request in a dedicate box, is also needed and must be wired upstream of the VFD. Moreover, a toroid, is already wired by Munters on the line between VFD and motor.

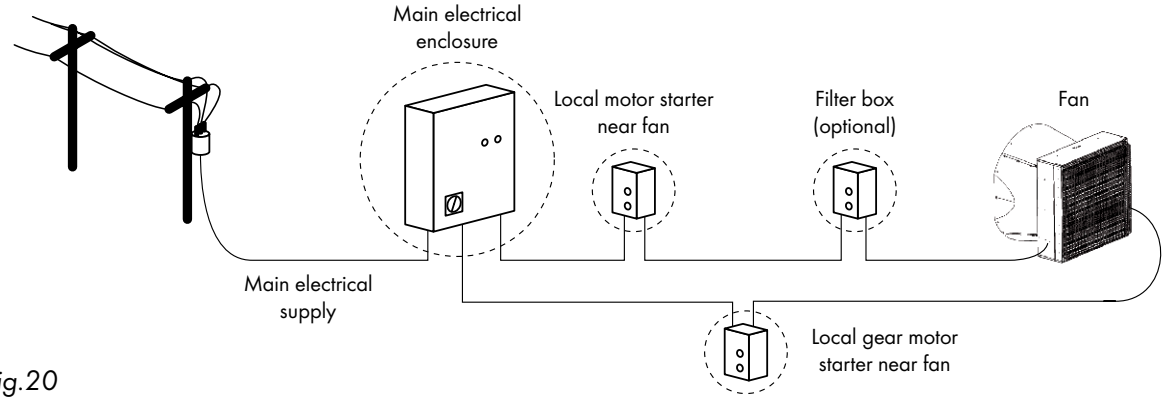
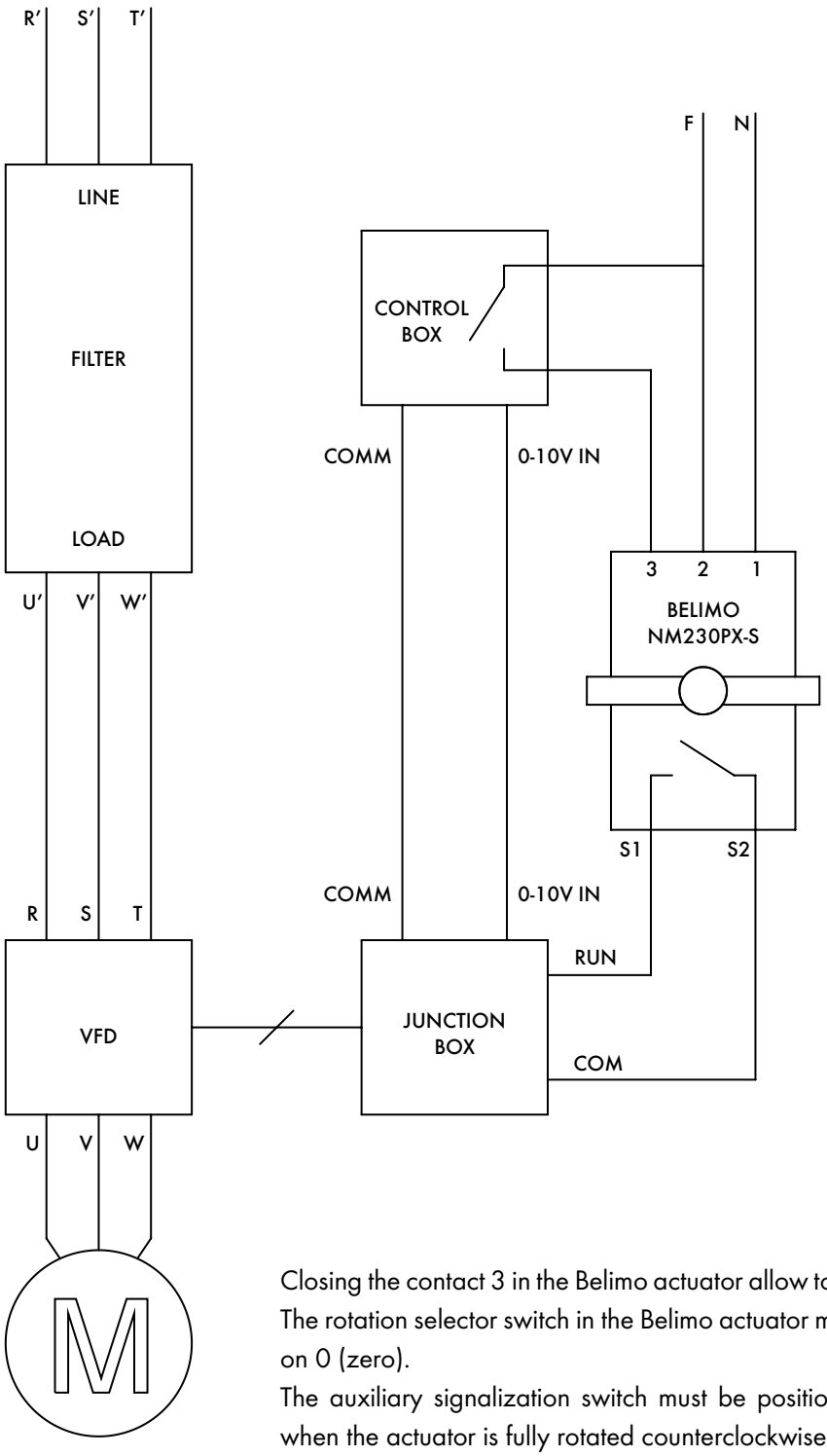


fig.20

Below are suggested wiring diagrams. These diagrams are however subject to local laws and regulations and should be modified if necessary to comply with such laws and regulations.



Closing the contact 3 in the Belimo actuator allow to open the shutter.
The rotation selector switch in the Belimo actuator must be positioned on 0 (zero).
The auxiliary signalization switch must be positioned at 3 o'clock when the actuator is fully rotated counterclockwise.
The auxiliary signalization switch must be positioned at 9 o'clock when the actuator is fully rotated clockwise.

fig.21

To operate the Munters Drive Off/Variable speed with a 0-10V signal, slide the 'ON' switch, located on the circuit board in the junction box, away from the 'ON' position. Now wire the S2 command from the gear motor to the COMMOM command in the junction box and wire the S1 command from the gear motor to the RUN command in the junction box. Also, connect wires from the '0-10V IN' and '0-10V COMMON' terminals in the junction box to the 0-10V output in the control.

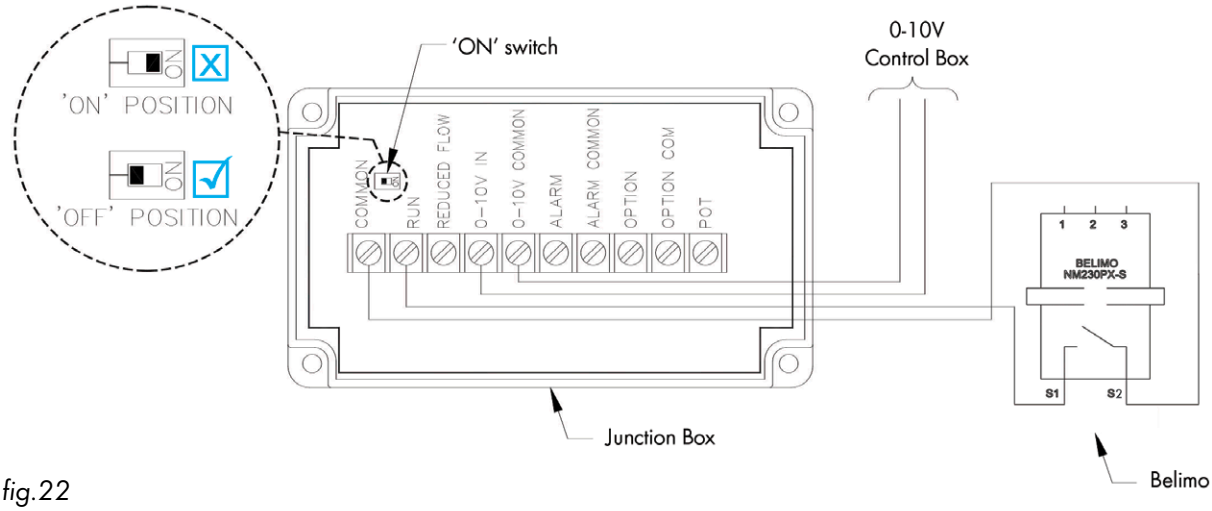


fig.22

The Munters Drive motor consists of different elements which interact for obtaining a smooth and reliable working: the permanent magnet motor, the VFD, the gear motor for shutter opening, the network filter (supplied on request). Here a sequence of the connections and the working sequence of the EC52 with Munters Drive:

Electrical connections

VFD have to be connected to a 3 phase powers supply. The line has to be protected by a overload switch dimensioned to guarantee the safe operation of the machine.

The gear motor has to be connected to a 2 phase power supply, a 3rd wire with line, operated by the control box relay, has to be supplied for changing the direction of the movement of the shutter.

A 0-10 Volts signal has to be connected as input to VFD for regulating the speed of propeller of the fan. 10 Volts is the max speed, while 0 volts is the minimum speed.

Operation sequence

Normally the shutters of the fans are closed, this is obtained by supplying two phases only to gear motor. When the logic of control box decides to start the fan, then the relay of control box closes and connects a third wire to a live phase of the power supply. In this way the gear motor will start to rotate for opening the shutter blades. When the opening of the shutter has reached 80%, a contact located inside gear motor will close and, consequently, the propeller will start to spin. The spinning speed is determined by the value of the 0-10 Volts applied by the control box. The 3rd wire needs to be connected to the gear motor whenever when the fans is required to operate. This is not dangerous for the gear motor.

When there is the need to stop the fan, the control box will open the contact of the 3rd wire to the live line by deactivating the dedicated relay. The gear motor will start to close the shutter. At 20% of the closing, the internal contact of the gear motor will open and consequently the Munters Drive will start its stopping process. The gear motor will continue to rotate till the shutter will be completely closed. There is no need to remove the power from the gear motor when the shutter reaches its full closing since the gear motor is designed for operating with power supply constantly connected.

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 excess of lenght of 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.

Cross selectional area of cable		
1.5mm^2	2.5mm^2	4mm^2
Maximum allowable lenght: D [m]		
90	150	240

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

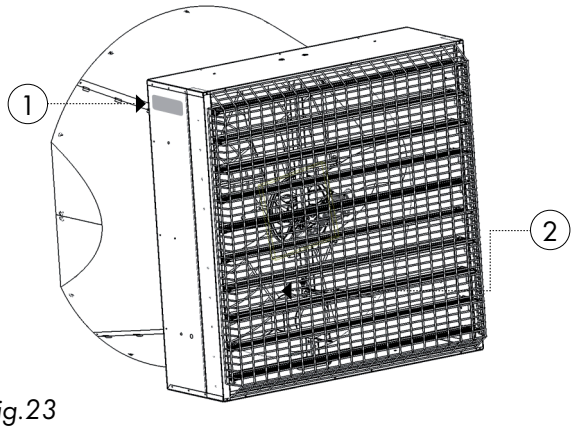


fig.23

Motor specifications are written on the label stuck on the frame and motor *(no. 1 and 2 in diagram)*. Warning labels and marking control are positioned in the inlet part of the fan.

WARNING	In case of line failure we recommend to set up in the control box with a shutdown cycle and restart cycle.

5.5 Standard wiring between VFD, motor and junction box

Junction box, DC motor and VFD are already wired by Munters. If, for some reason, wiring is unplugged follow the schemes.

Power Terminal Block (line, VFD, Motor):
R,S,T for input 3 phase
U,V,W for the output to the motor

Control Circuit Terminal Block (junction box, VFD):
Common - black - SC
Run - red - S1
Reduced flow - white - S7
0-10V in - blue - A1
0-10V common - green - AC
Alarm - purple - MB
Alarm common - grey - MC
Option - yellow - MP
Option common - orange - AC
Pot - brown - +V

Shortcut bridge - black - between HC and H1

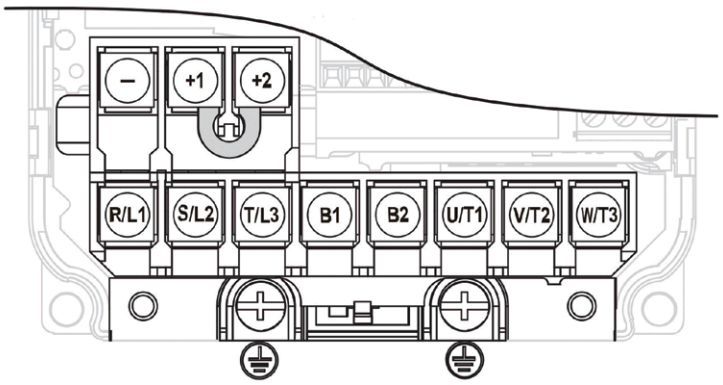


fig.24

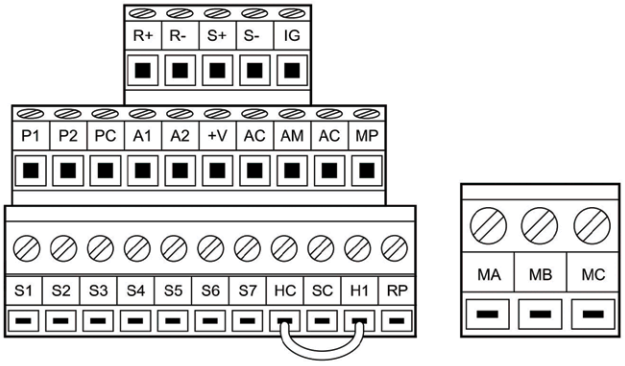


fig.25

5.6 Reversing Belimo actuator positioning

In case you need to move the gear motor to the opposite side of the fan you have to unassemble the gear motor *(ref.46)*, remove the stop collar *(ref.25)*, remove the plastic arm for shutter *(ref.33)*, remove the cover plate *(ref.14)*, remove the cover plate *(ref.16)*, remove the central shutter blade *(ref.32)* with the 2 plastic bearings *(ref.27 and ref.29)*.
Then you need to replace on the shutter blade the old right bearing (formed by 2 pcs) with a new one (formed by 3pcs) and do the same for the left (old formed by 3 pcs, new formed by 2 pcs).
Once you have all set up you have to insert the shutter blade with the plastic bearings, taking care to insert the plastic bearing on to the tie rod *(ref.24)* on the right side. On the left side the plastic arm will be insert afterwards *(see section 5.2)*.
With the shutter assembled, you have now to insert the 2 cover plates (flipping them). Now you can insert the plastic arm, with the new stop collar and assembly the gear motor *(see section 5.2)*.
After the mechanical installation you need also to set correctly the wiring.
In the junction box you have to change the connection from RUN - S1 and COMM - S2 to RUN - S1 and COMM - S3.
After that, by removing the IP gear motor cover you have to switch the rotation selector from 0 (zero) to 1.

Commissioning

6.

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

1. check if all the fans are secured tightly to the wall or metal structure;
2. ensure that all the necessary safety equipment is fitted to the fans;
3. once unpacked check the opening of the shutter manually by rotating the central shutter blade and verify that during transportation the plastic shutter bearings did not fall off from their operation condition; if yes restore them by mean of a screw-driver and re-check the opening of the shutter *(see chapter 3.2)*;
4. ensure that all electrical connections are done properly and comply with local regulations;
5. remove all obstacles from the front and back sides of the fans;
6. ensure that all people and animals are standing clear of the fans;
7. turn the electrical power to the fans on;
8. 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

Dimensions

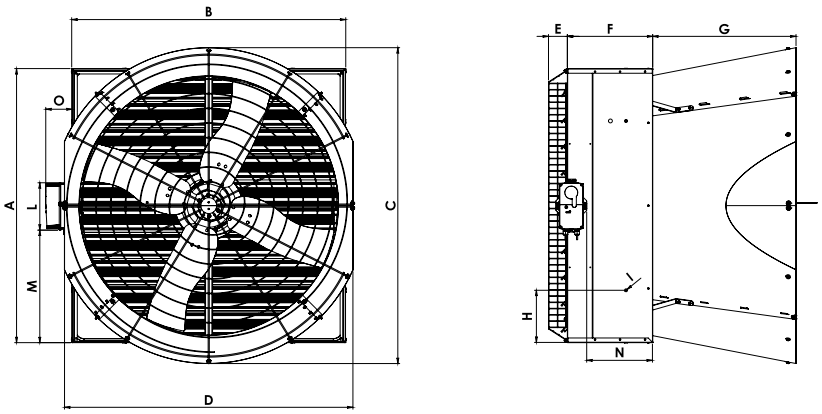


fig.26

A	B	C	D	E	F	G	H	I	L	M	N	O
1,425	1,425	1,640	1,500	95	445	745	275	M8	250	585	345	140

All measurements are in millimiters.

7.2 Technical specifications

Technical specifications				
		260 rpm	370rpm	495 rpm
Number of blades		4		
Propeller diameter	mm [inch]	1,335 [52]		
Weight of fully equipped fan [1]	[kg]	120		
Airflow at 0 Pa [2]	m^3/h [cfm]	28,500 [16,800]	40,700 [24,000]	53,200 [31,300]
Airflow at 12 Pa [2]	m^3/h [cfm]	24,300 [14,300]	37,700 [22,200]	51,400 [30,200]
Airflow at 25 Pa [2]	m^3/h [cfm]	15,200 [8,900]	34,600 [20,400]	49,400 [29,100]
Specific performance at 12 Pa [2]	m^3/h /W [cfm /W]	81.2 [47.8]	49.9 [29.4]	30.6 [18.0]

Specific performance at 25 Pa [2]	m^3/h /W [cfm /W]	48.0 [28.3]	43.8 [25.8]	28.4 [16.7]
Max. operating temperature	°C [°F]	40 [104]		
Max. operating pressure	Pa	50		
Electric motor winding insulation grade		B		

[1] *Includes safety kit for installation below 2.7m above the floor.*
[2] *All declared values are measured and certified by Bess Lab (test #16701). Airflow data are measured at standard conditions (20°C, 1,013 hPa).*

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.
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.

WARNING

Even if the components are water resistant we recommend to avoid to use high pressure water to clean the system.

WARNING

All the components and spare parts MUST be storaged in dry and clean environment.

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. Safety protection are placed on both inlet and outlet part of the fans and the pourpose is to avoid to reach rotatin and moving components.
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.

EC52 with Munters Drive

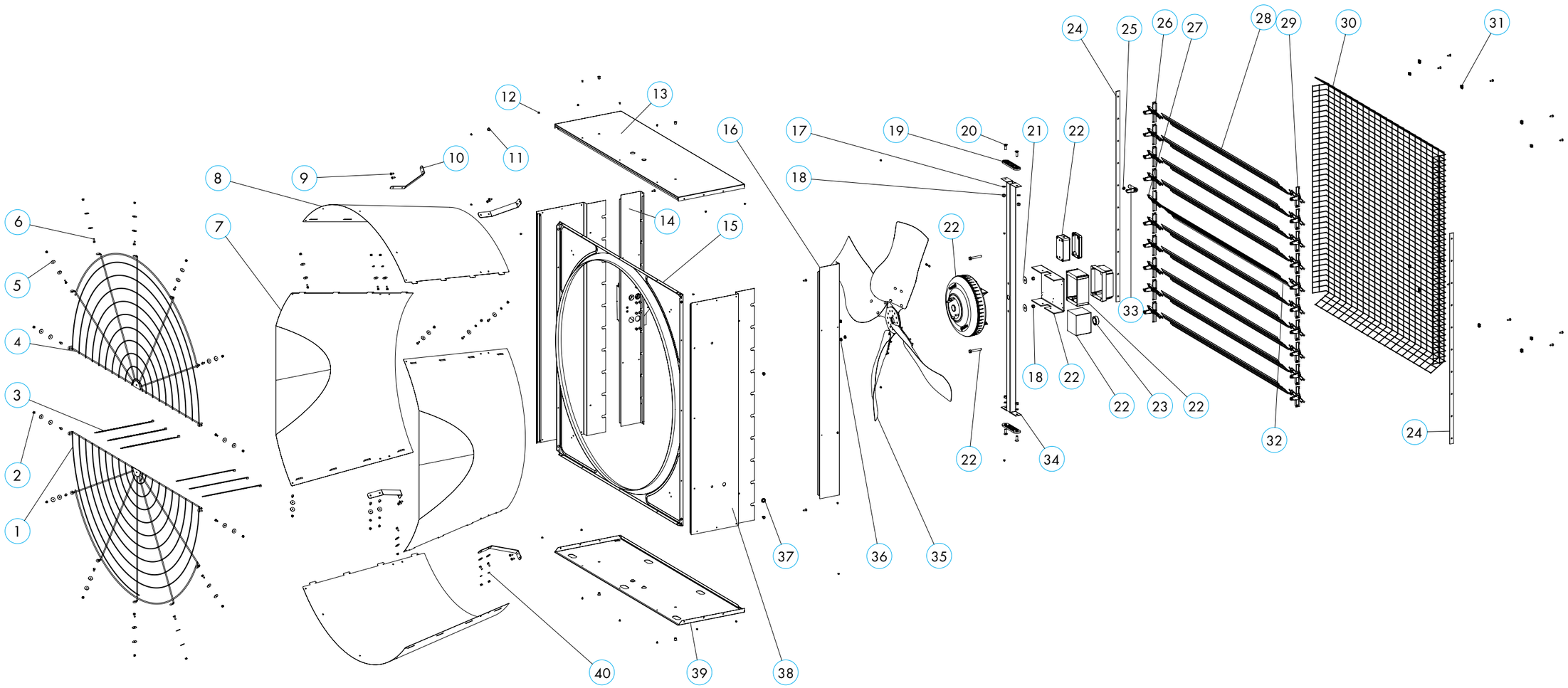


fig.27

VIEW A - BELIMO MOUNTING

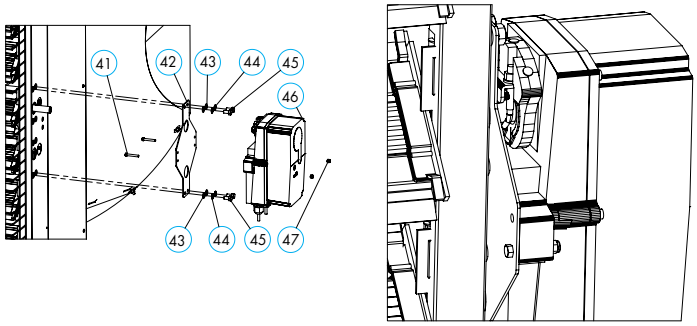


fig.28

VIEW B - ELECTRICAL BOX

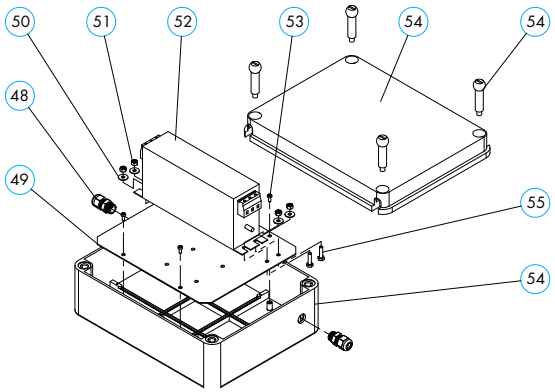


fig.29

Spare parts

Ref.	Description	Quantity
	EC52 WITH MUNTERS DRIVE	
1	LOWER SAFETY MESH	1
2	M06 HEX NUT THICK	26
3	PLASTIC TIE LEGRAND MM9X357	6
4	UPPER SAFETY MESH	1
5	Ø6×24 WASHER	44
6	M06X16 HEX SCREW	26
7	CONE SECTOR CUT	2
8	CONE SECTOR NORMAL	2
9	Ø6,3×19 SELF-TAPPING SCREW	22
10	CONE BRACKETS	4
11	THREADED BUSH M8X12.5	16
12	POP UP RIVET 4.9X7 STEEL	26

13	TOP PANEL	1
14	COVER PLATE EC52 MD	1
15	CONVEYOR	1
16	COVER PLATE	1
17	EXT TOOTHED WASHER D10,5X18	4
18	M10 HEX NUT	6
19	OVAL PLATE	2
20	M10×30 SCREW	4
21	PLAIN WASHER D10X40	2
22	MUNTERS DRIVE MOTOR	1
23	TOROID	1
24	PLASTIC TIE ROD	2
25	STOP COLLAR	1
26	RIGHT BEARING FOR EC SERIES	9
27	CENTRAL BEARING EC52 MD	1
28	SHUTTER BLADE	9
29	LEFT BEARING FOR EC SERIES	10
30	PYRAMIDAL SAFETY MESH	1
31	PLASTIC CLIP FOR MESH	10
32	CENTRAL SHUTTER BLADE	1
33	PLASTIC ARM FOR SHUTTER	1
34	CENTRAL SUPPORT	1
35	PROPELLER	1
36	M08 HEX NUT W/FLANGE	4
37	RUBBER FOR CABLE	1
38	SIDE PANEL	2
39	BOTTOM PANEL	1
40	Ø6 SPRING WASHER	8
41	HEX SCREW M5X35	2
42	BRACKET FOR BELIMO NM230P-S	1
43	Ø8X16 WASHER	4
44	Ø8 EXT THOOTED WASHER	4
45	HEX SCREW M08X16	4
46	BELIMO NM230S-P	1
47	M5 SELF-LOCKING NUT	2
48	PG11 GLAND	2
49	PLATE FOR ELECTRIC BOX	1
50	PLAIN WASHER D4X12	4
51	M04 HEX NUT THICK	4
52	3 PHASE FILTER	1

53	SELF TAPPING SCREW	4
54	GEWISS BOX GW44428	1
55	M04×16 HEX SCREW	4
56*	EUROEMME® STICKER 24.6X180	2
57*	WARNING STICKER A-1997 35X210	1
58*	WARNING STICKER B-1997 70X105	1
59*	PRODUCT LABEL G-1998 95X115	1
60*	NO HIGH PRESSURE STICKER 42X118	2
61*	MUNTERS PROTECT STICKER 70X46	1
62*	QUALITY CHECK LABELS	2

**References not appearing in the exploded view.*

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 1 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 EC52 with Munters Drive, (for example gear motor, VFD, 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
info@munters.it

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Euroemme® EC52 with Munters Drive extraction fan is developed and produced by Munters Italy S.p.A., Italy

www.munters.com

Australia Phone +61 2 8843 1594, agh.info@munters.com.au, Brazil Phone +55 41 3317 5050, contato@munters.com, Canada Phone +1 517 676 7070, aghort.info@munters.com, China Phone +86 10 8048 3493, marketing@munters.cn, Denmark Phone +45 98 623 311, aghort@munters.dk, India Phone +91 20 6681 8900, info@munters.in, Indonesia Phone +66 2 642 2670, info@munters.co.th, Italy Phone +39 0183 5211, info@munters.it, Japan Phone +81 3 5970 0021, mkk@munters.jp, Korea Phone +82 2 7618 701, munters@munters.co.kr, Mexico Phone +52 818 2625 400, dhinfo@munters.com, Singapore Phone +65 7 446 828, info@munters.com.sg, South Africa and Sub-Sahara Countries Phone +27 11 997 2000, info@munters.co.za Spain Phone +39 0183 5211, info@munters.it, Sweden Phone +46 8 6266 300, info@munters.se, Thailand Phone +66 2 6422 670, info@munters.co.th, Turkey Phone +90 262 7513 750, info@muntersform.com, USA Phone +1 517 676 7070, aghort.info@munters.com, Export & Other countries Phone +39 0183 5211, info@munters.it

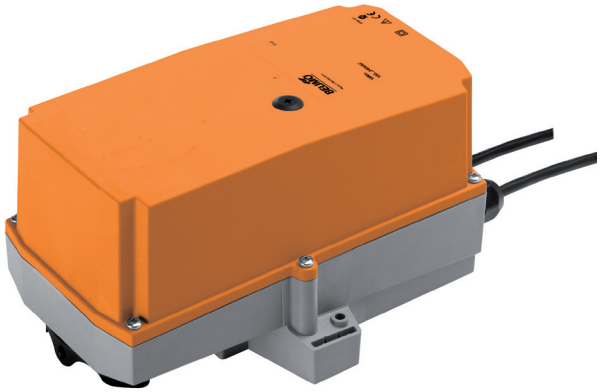
Ag/MIT/UmGB-2345-03/16 Rev. 1.1

BELIMO

Technical data sheet NM230P-S

RobustLine damper actuator for adjusting dampers in industrial plants and in technical building installations

- **Damper size up to approx. 2 m²**
- **Nominal torque 10 Nm**
- **Nominal voltage AC 230 V**
- **Control: Open-close, 3-point**
- **With integrated auxiliary switch**
- **Optimum protection against corrosion and chemical influences, UV radiation, moisture and condensation**



Technical data

Electrical data	Nominal voltage	AC 230 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 85...265 V
	Power consumption in operation	2.5 W
	Power consumption at rest	0.6 W
	Power consumption for wire sizing	6 VA
	Auxiliary switch	1 x SPDT, 0...100%
	Switching capacity auxiliary switch	1 mA ... 3 (0.5) A, AC 250V (II protective insulated)
	Connection supply	Cable 3 m, 3 x 0.75 mm² (halogen-free)
	Connection auxiliary switch	Cable 3 m, 3 x 0.75 mm² (halogen-free)
Functional data	Torque motor	Min. 10 Nm
	Direction of rotation motor	As an option with switch 0 (counter-clockwise rotation) / 1 (clockwise rotation)
	Manual override	Gear disengagement with push-button, can be locked
	Angle of rotation	Max. 95°
	Running time motor	45 s / 90°
	Sound power level motor max.	35 dB (A)
	Spindle driver	Universal spindle clamp 10...20 mm
	Position indication	Mechanical, pluggable
Safety	Protection class IEC/EN	II protective insulated
	Degree of protection IEC/EN	IP66 + IP67
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Principle of operation	Type 1.B
	Rated impulse voltage supply	2.5 kV
	Rated impulse auxiliary switch	2.5 kV
	Control pollution degree	4
	Ambient temperature	-30°C ... 50°C
	Non-operating temperature	-40°C ... 80°C
	Ambient humidity	100% r.h.
	Maintenance	Maintenance-free
Weight	Weight approx.	1.3 kg

Safety notes

- The actuator is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- The cover of the protective housing may be opened for adjustment and servicing. When it is closed afterwards, the housing must seal tight (see installation instructions).
- The device on the inside may be opened only at the manufacturer's factory. It does not contain any parts that can be replaced or repaired by the user.

Safety notes

- The cable must not be removed from the device.
- When calculating the torque required, the specifications supplied by the damper manufacturers (cross-section, construction, place of installation), and the ventilation conditions must be observed.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- The information on chemical resistance refers to laboratory tests with raw materials and finished products and to trials in the field in the fields of application indicated.

- The materials used may be subjected to external influences (temperature, pressure, constructional fastening, effect of chemical substances etc.) that cannot be simulated in laboratory tests or field trials.
- The information regarding fields of application and resistance can therefore only serve as a guideline. In case of doubt, we definitely recommend that you carry out a test. This information does not imply any legal entitlement. Belimo will not be held liable and will provide no warranty. The chemical or mechanical resistance of the materials used is not alone sufficient for judging the suitability of a product. Regulations pertaining to combustible liquids such as solvents etc. must be taken into account with special reference to explosion protection.

Product features

Resistances
Noxious gas test EN 60068-2-60 (Fraunhofer Institut ICT / DE)
Salt fog spray test EN 60068-2-52 (Fraunhofer Institut ICT / DE)
Ammoniac test DIN 50916-2 (Fraunhofer Institut ICT / DE)
Climate test IEC60068-2-30 (Trikon Solutions AG / CH)
Disinfectant (animals) (Trikon Solutions AG / CH)
UV Test (Solar radiation at ground level) EN 60068-2-5, EN 60068-2-63 (Quinel / Zug CH)

Used materials
Actuator housing polypropylene (PP)
Cable glands / hollow shaft polyamide (PA)
Connecting cable FRNC
Spindle clamp / screws in general Steel 1.4404
Seals EPDM
Form-fit insert aluminium anodised

Direct mounting
Simple direct mounting on the damper spindle with a universal spindle clamp, supplied with a universal mounting bracket to prevent the actuator from rotating.

Manual override
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

Adjustable angle of rotation
Adjustable angle of rotation with mechanical end stops. Standard setting 0 ... 90°. The housing cover must be removed to set the angle of rotation.

High functional reliability
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Flexible signalization
Flexible signalization with adjustable auxiliary switch (0 ... 100%).

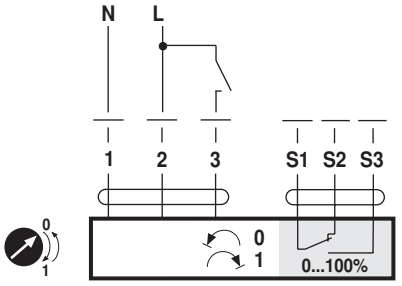
Electrical installation

Notes

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.

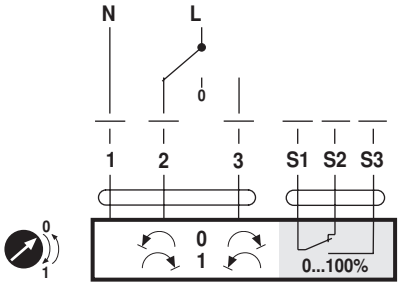
Wiring diagrams

AC 100 ... 240V, open-close



Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

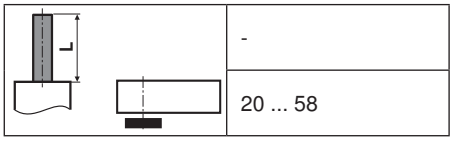
AC 100 ... 240V, 3-point



Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

Dimensions [mm]

Spindle length



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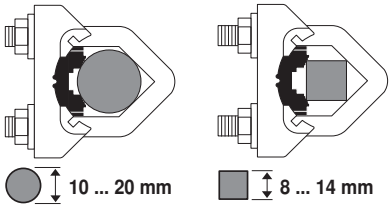
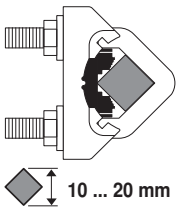
20 ... 58	

Clamping range





Dimensional drawings