MRH

Installation and Operating Instructions for

■ English Originalversion

systemair

Previous issues:

IMO_MRH_en_06_04_2017

Changes:

Chapter 7 changed

App. 4, 6, 7 changed

App. 5 - new

IMO_MRH_en_17_02_2017

Changes:

App. 4: wiring and explanation changed

IMO_MRH_en_31_07_2018

Changes:

Chapters 2.3, 5.1, 10.1: size 1250 added, condensation warning

App. 1 - additional sizes

App. 2 - size 1250 added, installation examples, MRH 1120 and 1250 change of roof angles

App. 3 – wirings added

App. 4, 5 - size 1250 added

App. 4, 5 - end switches functioning scheme added

App. 5 – electrical scheme added, temperature limits changed

IMO_MRH_en_19_11_2019

App. 6 and 9 added

Update of standards and declarations of conformity

IMO_MRH_en_16_08_2021

Description supplement with version with fixed sidebars for flat roof mounting

App. 1, 2 - additional version with fixed sidebars for flat roof mounting

App. 3 - PTC on request only, table with service switches added

App. 7 – inserted app. for future version of control box

App. 8, 9, 10 - update

IMO_MRH_en_18_08_2022

App. 1 – changed dimensions

App. 7 – changed wiring

App 9, 10 - update

Contents

1 General information

1.1 List of information

DANGER

Direct danger
Failure to comply with this warning leads directly to death or to serious bodily harm.

WARNING

Possible danger
Failure to comply with this warning potentially leads to death or to serious bodily harm.

CAUTION

Hazard with a low risk
Failure to comply with this warning potentially leads to moderate injuries.

ATTENTION

Hazard with risk of property damage
Failure to comply with this warning leads to property damage.

NOTE

Useful information and notes

1.1.1 Specific safety symbols

DANGER

Hazard from touching impeller, if not covered with protective grid!
This warning identifies situations with a danger for life from touching impeller. Failure to comply with this warning leads to the risk of death or serious injuries.

DANGER

Hazard from crushing/shearing from closing hatch cover!
This warning identifies situations with a danger for life from closing the hatch cover. Failure to comply with this warning leads to the risk of death or serious injuries.

WARNING

Hazard from electrical current!
This warning identifies situations with a danger for life from electrical current. Failure to comply with this warning leads to the risk of death or serious injuries.

WARNING

Hazard from bursting parts!
This warning identifies situations with a danger from bursting parts. Failure to comply with this warning potentially leads to the risk of serious injuries.

⚠ WARNING

Hazard from hot surface!

This warning identifies situations with a danger from overheating. Failure to comply with this warning potentially leads to property damage.

1.1.2 List of instructions for action

Instruction for action

☞ Carry out this action.

☞ (if applicable, further action)

1.2 Notes on the documentation

⚠ WARNING

Hazard as a result of improper dealing with the device

These operating instructions describe safe use of the device.

- Read the operating instructions carefully! The personnel dealing with the fan must read and understand the operating instructions.
- Keep the operating instructions with the device. They must be permanently available at the place of use.

2 Important safety information

2.1 Safety notes

Designers, installers and operators are responsible for the **proper mounting and intended use**.

- Only use the device in a proper condition.
- Provide generally prescribed electrical and mechanical protective devices.
- During mounting, commissioning, maintenance and control, secure the place of mounting against unauthorised access.
- Observe rules for safe work. Protective working gloves, protective working shoes, safety goggles, safety helmet are part of personal protective equipment. Depending on object, additional protective equipment may be necessary.
- Safety components must not be by-passed or put out of function.
- Keep all the warning signs and nameplates on the device complete and readable.
- Regularly instruct the personnel about safety-conscious behaviour. Requirements for personnel – see 2.2. The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities.

NOTE

We have carried out a risk assessment for the device. However, it can only apply to the device itself. After installation of the device, we recommend to carry out a risk assessment for the whole system. In this way, you have the guarantee that there is no risk potential from the system. Compliance with EMC Directive 2014/30/EC only relates to these products when they have been connected directly to the customary energy supply mains.

2.2 Personnel

2.2.1 Mounting personnel

- Mounting may only be carried out by trained, qualified personnel.

2.2.2 Work on the electrical equipment

- Work on the electrical equipment of the fan may only be done by a qualified electrician or electro technically educated person. This person must know the relevant safety rules to recognise and avoid potentially risks.

2.2.3 Personnel for operation, use, maintenance and cleaning

- Operation, use, maintenance and cleaning may only be carried out by trained and authorized personnel. The operating personnel must have appropriate knowledge about handling with the device. In the case of a malfunction or an emergency, they must react correctly and adequately.

2.3 Intended use

MRH motorised roof hatch with service switches is intended for insertion of smoke and heat extract fan with motor inside air stream (AXC(F), AXC(B), AXC(R)). In case of fire, it is used to extract smoke gases from the room. Ventilated areas and emergency exits contribute to easier evacuation of people and equipment in the event of fire, and to faster and more efficient fire extinguishing; they protect the building structure and equipment against excessive temperatures and decrease fire escalation to the surrounding areas. **In serially available version, the hatch is intended for emergency use only (without EMC protection).** Tested also to Re 10000 (cycles open - close), but **for dual use additional safety elements are needed to reduce risk due to hatch closing (see 9.3, 9.4).** For installation on the top of buildings up to snow load SL 1000 rsp. SL 1250 at size 1250 (EN 12101-3) and wind load WL 1500 (EN 12101-2, 3).

- The fans are suitable for extraction of clean air, air with a low dust and grease content.
- The maximum permissible operating data on the name plate apply for an air density $\rho = 1{,}2\ kg/m^3$ (sea level) and a maximum air moisture of 80 %. **Depending on air moisture a periodical ventilation by opening hatch to prevent condensation on hatch is recommended.**
- Temperature of medium -20 up to 55°C, respectively according temperature/time class of the axial fan.
- In case of fire, all motor protective devices of the fan must be bridged to guarantee functional capability (connection direct to mains). Specific instructions of the inserted axial fan should be observed.

2.4 Improper use

Above all, the improper use means using the fan in a way other than that described. The following points are improper and hazardous:

- Use of a fan with improper identification (temperature/time class in case of smoke extraction);
- Not suitable to exhaust dust containing medium or medium with such dust concentration, that could affect with dust deposits on operation and explosion protection (appropriate filtering necessary);
- Extraction of grease containing media;
- Exhaust from explosion hazardous zones;
- Exhaust aggressive atmosphere;
- Operation without duct system or protective guard (**intake protection**);
- Operation with the air connections closed or in instable area;
- Operation without effective (PTC or other) thermal protection (exception: fire mode). **At AXC(F), AXC(B) AXC(R) fans PTC is optionally built-in!**

3 Warranty

Warranty for our products shall be determined according to the contractual agreements, our quotations and, as a supplement, our General terms and Conditions of Business. Warranty claims shall presuppose that the products are correctly connected, operated and used accordingly to data sheets, and regularly maintained.

4 Transport, storage

4.1 Transport

Each device leaves our plant in an electrically and mechanically proper condition. The devices are delivered in wooden crates or on pallets. We recommend transporting the fans to the installation site in original packaging.

⚠ WARNING

Hazard of impact if the device falls down!

- Load and unload the device carefully in order to avoid possible damage.
- Pay attention to the weight and dimensions of the packaging. The weight of the device is visible from the nameplate.

⚠ CAUTION

Danger from cutting edges!

- Wear protective working gloves when unpacking.

☞ Check the device for obvious defects, which can impair safe operation.

☞ First of all, pay attention for defects on the connection cable, service switch and impeller, cracks in the housing, missing rivets, screws or covering caps.

⚠ WARNING

Electrical hazard from damaged connection cable or connections

- Do not use the connection cable, service switch or impeller for transport or hoisting.

⚠ WARNING

Hazard of impact if the device falls down!

- Transport the device carefully and with appropriate hoisting device!
- Wear a safety helmet and safety goggles!

☞ Only put the device at unpacking on its base plate.

☞ At manual transport observe allowed human lifting respectively carrying forces (see weight on the name plate).

☞ Avoid impacts and distortion of the base plate and other parts of housing.

4.2 Storage

⚠ CAUTION

Hazard due to loss of function of the motor bearings!

- Avoid storing for too long time (recommendation: max. 1 year).
- Turn the impeller manually every three months, wear protective working gloves.
- Before installation, check proper function of the motor bearings

☞ Store the device in the original packaging dustproof, dry and protected against weather.

☞ Avoid effects of extreme heat or cold.

5 Description

The casing is made as a double metal layer with mineral wool insulation. The hatch casing is made of pre-galvanised steel while the hatch cover of AlMg3. Insulation thickness: walls 120 mm (k = 0,29 W/m^{2}K), cover 150 mm. Directly powered impeller from aluminium alloy is arranged with the motor inside the air flow. Impeller is fastened together with hub and secured screw directly on to the motor shaft. Dynamically balanced to BV-3, ISO 14694. Electrically operated spindle actuator for cover opening. MRH comes in two versions:

- Version with **adjustable side bars for flat or inclined roof**
- Version with **fixed side bars for flat roof**

5.1 Technical data

MRH	Impeller diameter*	Max. fan casing length	~ Weight without fan
Size	mm	mm	kg
400 – 630	400 – 630	540	212
710 – 800	710 – 800	700	248
900 - 1000	900 - 1000	700	303
1120	1120	1000	362
1250	1250	1050	414
* Impeller diameter corresponds to MRH size			

5.2 Dimensions and versions

Please see Appendix 1 or www.systemair.com.

6 Installation

6.1 Safety information

⚠ WARNING

Hazard from falling parts!

- Check the roof before installation for load capacity/strength.
- When selecting the hoisting device and fitting material observe the weight, tendency to vibrations and shear forces (weight information on the nameplate).

6.2 Preconditions for installation

- MRH must be installed on roofs.
- They can be mounted on a flat or inclined roof on an appropriate roof frame (observe load capacity, stiffness, insulation).
- The sidebars are adjustable to roof pitch. Possibility to adjust depends on the height position of sidebars.
- Installation on flat surface (e.g. concrete) or through the roof.
- Extremely wind or turbulence exposed places should be avoided.
- During installation the site must be protected from dust, moisture and weather influences.

6.3 Installation

- Ensure secure access to the fan for maintenance and service.
- Installation up to Appendix 2.
- Fit the contact surface between MRH and the roof frame with a sealing tape (not provided with MRH).
- Before and after mounting check manually if the impeller rotates smoothly. Install the fan only, **if the minimum air gap between rotor and nozzle matches the value from the fan`s test protocol.**
- MRH shall be fixed with bolts or studs to the roof frame through the sidebars and position secured with screws.

- Avoid distortions of the casing at installation. **Check the air gap impeller/housing after fixing the MRH, the minimum air gap should remain over allowed minimum from the fan`s test protocol.**
- Ensure unobstructed and uniform intake into the fan as well as free outlet.
- Install connecting ducts and accessories. The suction side of the fan is provided with a connection for flange-type mounting of the air duct according Eurovent 1/2, dimensions see Appendix 1 or www.systemair.com.
- Provide for contact/suction protection and safety distances according to EN ISO 13857.
- Provide flashing. Remove lifting eyes and store them.

NOTE

In some cases, it is better to mount accessories before placing the MRH on the roof.

NOTE

It is recommended to install a flexible connection between the fan and duct to avoid eventual tensions or distortions of the casing (appropriate flexible connection should take eventual thermal extension of connecting parts). Flexible connection has to comply needed temperature/time; also as certified Systemair accessory available.

NOTE

Data of accessories are on-line available (www.systemair.com).

7 Electrical connection

Fan: the wiring diagram of the fan is placed inside the cover of service switch. The quality and installation of cables for electrical connection must ensure uninterrupted energy supply, even in case of fire. Inside fire zone, use only certified cable. Connecting possibility see Appendix 3. Electrical data on the fan`s nameplate must comply with the provided mains connection. Voltage tolerance according to IEC 38: +6%, -10%.

Hatch cover: it is opened by one or two 24 VDC operated spindle actuators with push rod. Indication for opened/closed cover position possible (floating limit switches in actuator). Connection of the hatch cover drive in the actuator`s service switch powered by 24 VDC (see Appendix 4) or **optionally** in control box with service switch powered with 230 VAC (see Appendix 5). The wiring diagram of the hatch cover is placed inside the cover of service switch/control box. Details see Appendix 4/5.

Proper application circuit shall include safety precautions such as protective fuse and an adequate electrical insulation arrangement!

The recommended start of the fan is 20 s after starting actuator for cover opening, to ensure vertical exhaust of hot gases.

NOTE

- If the fan motors have built-in PTC: more than two PTC chains may not be switched in series, as this can lead to undefined cut-outs.
- Maximum check voltage of PTC is 2,5 V (to reduce influence on the result of measurement).
- The wiring diagram see Appendix 3.
- Motor protection must be provided by the installer.
- **At AXC(F) and AXC(B) fans without PTC observe specific instructions of the fan.**

⚠ WARNING

Hazard from electrical voltage!

- Electrical connection only by a trained electrician rsp. trained and instructed qualified personnel!
- Electrical connection in accordance with the valid regulations.
- Prevent the ingress of water into the connection box.
- Observe 5 safety rules for the electrical expert!
  - disconnect from the power supply (all-pole),
  - prevent switching on again,
  - test absence of voltage,
  - earthing and short-circuiting,
  - protect adjacent live parts by covers and barriers and fit a suitable warning notice.

☞ Connect the cable according to wiring diagram.

☞ Tighten the nuts of cable glands well to achieve IP68 protection.

☞ Check, if the cover of service switch is uniformly fastened. If there is a danger of unintended switch off of the service switch, it should be locked to guarantee operation in fire case. Drill a hole into the handle in the “on” position and provide with a padlock (not supplied with the fan). See Appendix 3.

☞ Place the supply cable.

7.1 Residual current circuit breaker

☞ Use universal RCDs type B or B+ in case of speed control with frequency converter. See also specific fan instructions.

7.2 Connection of thermal protection

⚠ CAUTION

Property damage as a result of motor overheating

- The motor can overheat and be destroyed if not secured with thermal protection.
- PTC always connect to a motor protective device!

8 Commissioning

8.1 Preconditions

- Mounting and electrical connection have been correctly performed.
- Installation residuals and foreign objects have been removed from the fan and ducts.
- Inlet and outlet are free.
- The safety devices have been fitted (protection against contact).
- The protective conductor and external earth conductor have been connected.
- The thermal protection is properly connected to the motor protective device:
  - the motor protective device is functional;
  - the thermal protection is functional.
- The cable glands are tight.
- Provided mains connection complies with the data on the nameplate.
- The current (from the nameplate) does not exceed the mains data.
- **Service switch of the fan is in off position and the actuator`s service switch is in (middle) position 0.**
- The device is electrically connected to power supply.
- **Attached instructions of the fan and actuator have been understood.**

8.2 Commissioning

⚠ WARNING

Hazard from electrical voltage!

- Commissioning by trained and instructed qualified personnel only!

☞ **Check: service switch of the fan is in off position and the actuator`s service switch is in 0 (middle) position.**

☞ **Check also the instructions of the fan – since different fans can be built in, different requirements could apply.**

☞ Check if the power supply is provided.

☞ Switch the actuator`s service switch to position 1 (open the cover). It takes up to 30 s to fully open (check).

☞ Switch the fans' service switch on for 2-3 s and immediately off. Check direction of rotation if complies with the arrow on the casing. If not, two phases need to be swapped – either in the service switch or in electrical cabinet.

⚠ DANGER

Hazard from touching impeller, if not covered with protective grid!
The outlet protective grid is serially provided.

⚠ WARNING

Hazard from bursting parts!

- When checking the direction of rotation, wear safety goggles.

⚠ WARNING

Hazard from electrical voltage and flying parts!
Errors occurring can lead to personal and/or property damage!

- Observe 5 safety rules for the electrical expert!
  - disconnect from the power supply (all-pole),
  - prevent switching on again,
  - test absence of voltage,
  - earthing and short-circuiting,
- protect adjacent live parts by covers and barriers and fit a suitable warning notice.

☞ After swapping check:

- the direction of rotation. Switch the fan for a short period on and then off to check the direction of rotation of impeller, if complies with the arrow on the casing.
- leave the fan running, check, if running smoothly (eventual vibrations and noise);
- measure current with appropriate instrument (it may exceed nominal current by a max. 5%);
- tightness of all joints.

☞ Fill in the attached test protocol of the fan and submit it in case of warranty claim.

☞ Switch the actuator`s service switch to position 2 (close the cover). It takes up to 30 s (check).

⚠ DANGER

Hazard from crushing/shearing by the hatch cover!
The hatch cover can be stopped in any position by turning the actuator`s service switch to middle (0) position.

☞ Check the functioning of system – observe instructions of actuator, especially **intermittence** and time of presence of control voltage (see also Appendix 4).
☞ After checking set the actuator`s service switch to position 1 (ready to open) and secure it.

9 Operation

9.1 Operation/use generally

☞ Only use the fan in accordance with this operating instruction and the operating instructions of motor.

☞ Control the fan during operation for correct function.

☞ Switch the fan off as planned.

⚠ WARNING

Hazard from electrical voltage and flying parts!
Errors occurring can lead to personal and/or property damage!

Switch the fan off as planned:

- In cases of a non-typical noise from bearings, vibrations, pressure pulsation.
- In case of overcurrent, overvoltage or temperature (nameplate).

NOTE

At single speed motors with nominal power from incl. 5,5 kW (D 400V) we recommend “star – delta” starting or soft start. For this purpose, all 7 wires are led to connection box/service switch.

9.2 Emergency use (use in case of fire)

Serially equipped MRH is intended for emergency use only. Access to hazardous zone is allowed and possible with observing safety measures for maintenance and service only.

⚠ DANGER

Hazard from touching impeller, if not covered with protective grid!
The outlet protective grid is serially provided.

⚠ DANGER

Hazard from crushing/shearing by the hatch cover!
The hatch cover can be stopped in any position by turning the actuator`s service switch to middle (0) position.

Observing safety measures, it is to assure:

- Safety components must not be bypassed or put out of function.
- Prevent sucking of foreign particles, this can destroy the fan.
- **The fan may operate only within the limits declared on the nameplate.**
- **In case of fire, bridging of motor protective devices is necessary to assure operation. Switch on max. speed even after eventual short supply cut off must be assured.**

9.3 Dual use of hatch + fan (daily powered ventilation + emergency use)

In addition to serially equipped device it is necessary to provide following safety measures:

- **Protective guard** to completely prevent access to opened/closed hatch cover – it is to provide by installer up to roof design.
- **Hazard signs.**

Once safety assured with above measures, it is to observe:

- Safety components must not be bypassed or put out of function.
- Prevent sucking of foreign particles, this can destroy the fan.
- Switching frequency:
  - the fan is intended for S1 continuous operation!
  - the control equipment must not allow any extreme switching!
- **The fan may operate only within the limits declared on the nameplate.**
- **In case of fire, bridging of motor protective devices is necessary to assure operation. Switch on max. speed even after eventual short supply cut off must be assured.**
- **If frequency converter is used for normal ventilation, it must be bridged in case of fire – see also instruction of the fan.**
- In case of speed control via frequency converter - **min. 20 Hz ÷ max. 50 Hz (rsp. 60 Hz, if declared for 60 Hz**), make sure that the voltage peaks on the connection terminals of the fan are lower than allowed in the fan`s instruction.

ATTENTION

Hazard with risk of additional costs

- Check provisions for speed control in the instruction of the fan (usually it is recommended a combination of frequency converter and appropriate all-pole sinus filter or minimum dU/dt filter).
- At frequency controlled units additional EMC protection of cable and service switch could be needed (on request).
- Subsequently fitting of EMC shielded cable from motor to connection box/service switch is connected with disassembly of the fan!
- The motors cannot be voltage-controlled! The motor can overheat due to increased current at lower voltage.

9.4 Dual use of hatch + fan (daily natural ventilation + emergency use)

In addition to serially equipped device it is necessary to provide following safety measures:

- **Protective guard** to completely prevent access to opened/closed hatch cover – it is to provide by installer up to roof design.
- **Hazard signs**

Once safety assured with above measures, it is to observe:

- Safety components must not be bypassed or put out of function.
- Prevent sucking of foreign particles, this can destroy the fan.
- Switching frequency of hatch must be in accordance with the actuator`s instructions, especially **intermittence** and time of presence of control voltage (see also Appendix 4).
- Weather protection devices should be applied to limit use (rain, strong wind).
- **The fan may operate only within the limits declared on the nameplate.**
- **In case of fire, bridging of motor protective devices is necessary to assure operation. Switch on max. speed even after eventual short supply cut off must be assured.**

10 Maintenance/troubleshooting

⚠ DANGER

Hazard from touching impeller, if not covered with protective grid!
The outlet protective grid is serially provided.

At maintenance and service observe:

- Impeller must stand still;
- Electrical circuit must be interrupted and secured against restarting;
- Observe the rules for safe work.

Only then the outlet protective grid can be temporarily removed.

⚠ DANGER

Hazard from crushing/shearing by the hatch cover!
The hatch cover can be stopped in any position by turning the actuator`s service switch to middle (0) position.

⚠ WARNING

Hazard from electrical voltage!

- Trouble setting and service only by a trained electrician or trained and instructed qualified personnel!
- Observe rules for safe work while troubleshooting!
- Observe 5 safety rules for the electrical expert!
  - disconnect from the power supply (all-pole),
  - prevent switching on again,
  - test absence of voltage,
  - earthing and short-circuiting,
  - protect adjacent live parts by covers and barriers and fit a suitable warning notice.

⚠ CAUTION

Danger from hot surfaces!

- During maintenance and cleaning wear protective gloves!

10.1 Malfunctions and troubleshooting (generally)

	Possible reasons	Action
The ventilator does not run	Connection to the mains fault. Thermal protection triggers. Motor fault.	Check connection to the mains and thermal protection. If ok. check electric motor (winding resistance, resistance to ground). If necessary get the electric motor repaired.
Air volume is too low	Wrong direction of rotation. Too high pressure drop in system. Obstacles in duct.	Check the direction of rotation. If wrong, swap the supply connection of any 2 phases. Check if current is similar all phases. If ok. check operating point and system design.
Thermal protection of the fan switches off	Short-circuit. Damage to the bearings. Impeller blocked or grinding.	Compare connection with wiring diagram. Compare the data of electric motor with setting of thermal protection. If ok. check power supply and electric motor. Get the electric motor or if necessary the complete fan repaired.
	Overcurrent	Check the direction of rotation. If wrong, swap any 2 phases. Check if current is similar all phases.
Noise	Damage to the bearings. Impeller blocked or grinding.	Get the electric motor or if necessary the complete fan repaired.
	Loose fit on the base plate or motor support.	Tighten the bolts, look for the cause of vibrations.
Vibrations	The actual pressure drop of the system is higher than supposed, the fan could operate in an unstable area of the fan curve.	Check operating point and system design. Consult customer service of the manufacturer.
	Damage or dust layer on impeller.	Clean the impeller, if necessary balance it or replace it.
The hatch cover doesn`t fully open (~70°) ore fully close	Obstacle. One or both (MRH 1120, 1250) actuators are faulty.	Check, if the actuator is (are) powered. Limit switch indicates, if the end position is reached. Replace faulty actuator.
The hatch cover operation is opposite	Wrong polarity on the actuator`s service switch.	Swap it, check the control cabinet.
Condensation	Saturation	Periodical ventilation by opening hatch for a short time

If the reason for malfunction cannot be clearly determined, consult the customer service of manufacturer.

10.2 Cleaning

Regular cleaning prevents unbalance.

☞ Keep casing and accessories clean and clean them if necessary with a brush (do not use a steel brush or high-pressure cleaner). Do not use any detergents for interior cleaning.

10.3 Maintenance, service

Basically the fan or MRH may be repaired at the manufacturer only! Exceptions are non-relevant components. For further instructions consult the manufacturer.

The fan is by built-in for-life lubricated ball bearings as far as possible low-maintenance product. After their life time (app. 20.000 h up to manufacturer, but expected 30.000 – 40.000 h due to low load), a replacement of the bearings is necessary. Observe attached instructions of motor manufacturer/specific fan instructions.

☞ Pay attention to a non-typical noise from bearings.

☞ For damages (e.g. damage to winding) please contact our Service Department. You will find the address on the back of these operating instructions.

Expected lifetime of actuators is at least 10.000 cycles.

Maintenance and check points of fans similarly to VDMA 24186-1 (type, scope and maintenance intervals to be specified in dependence of use and operating conditions).

VDMA 24186-1	Description	Maintenance interval		
		Monthly	**Every 3 months**	**Once a year**
	Fan and electric motor of the fan			
1.1.11	Check the drainage for function			×
6.1.1	Check to dirt, damage, corrosion and fastening		×	
6.1.2	Functional cleaning			×
10.1.6	Check the terminals for tightness			×
10.1.9	Test the fan for function und operational readiness (test run app. 15 min.)		×	
6.1.4	Check the bearings for noise			×
10.1.3	Check impeller for direction of rotation (all speed)			×
6.1.3	Check impeller if damaged or unbalanced (if necessary provide vibration measurement)			×
10.1	Functional test of automatically bridging of all thermal and overcurrent protective devices		×	
10.1.7	Measure the current			×
10.1.12	Test function of protective device		×	
	Triggering device			
	Check it for function	×		
	Test of functions			
	Test all functions of system from control panel as well as signal lights	×		
	Test of hatch opening/closing			
	Check the joints of actuator and hatch cover are properly fastened		×	
	Check if smoothly opens/closes		×	
	Check the safety measures (protective elements, signs, guards)		×	
	Accessories (air ducts, air louvers, flaps, sound attenuators)			
5.5.1	Check accessible ducts inclusive fire protective insulation and fastening for outside damages and corrosion (visually)			×
5.5.4	Check accessible flexible connections for tightness (visually)			×
5.2.1 5.2.3	Flaps and sound attenuators check for dirt, damage and corrosion Check mechanical functionality of the flaps			×
5.1.1	Check air louvres for dirt and damage (visually)			×

10.4 Spare parts

In case of order of spare parts please specify the serial number of the MRH. You can find it on the nameplate or in the test protocol.

Spare parts: electric motor (there is a restriction to use only from the test lab allowed motors), impeller, service switches, actuator.

How to replace electric motor, impeller or actuator - please contact manufacturer for instructions.

11 Uninstalling/dismounting

⚠ DANGER

Hazard from crushing/shearing by the hatch cover!
The hatch cover can be stopped in any position by turning the actuator`s service switch to middle (0) position.

⚠ WARNING

Hazard from electrical voltage!

- Disconnection and uninstalling only by a trained electrician or trained and instructed qualified personnel!
- Observe 5 safety rules for the electrical expert!
  - disconnect from the power supply (all-pole),
  - prevent switching on again,
  - test absence of voltage,
  - earthing and short-circuiting,
  - protect adjacent live parts by covers and barriers and fit a suitable warning notice.

⚠ CAUTION

Danger from cutting edges and impact!

- Wear protective gloves when dismounting!
- Dismount carefully.

⚠ WARNING

Hazard from falling parts!

- When selecting the hoisting device observe the weight (weight information on the name plate).

☞ Carefully disconnect all wires.

☞ Remove the fan from duct. Carefully remove the fastening material.

☞ Lift the MRH with an appropriate hoisting device on the provided lifting eyes. Place the MRH on appropriate pallet.

12 Disposal

12.1 Disposal of the fan

Should the fan be disposed, proceed as follows:

☞ Disassemble the fan into its components.

☞ Separate the parts according to
- reusable material
- material groups to be disposed (metal, plastics, electrical parts, etc.)

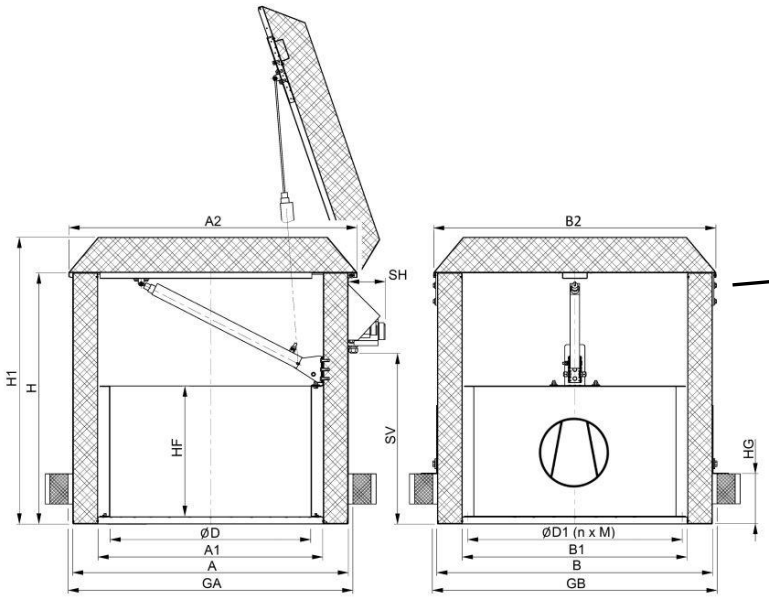
☞ Provide for the recycling of material. Consider the national regulation.

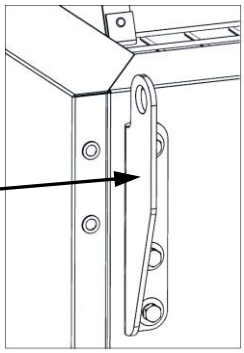
12.2 Disposal of packaging

☞ Provide for the recycling of material. Consider the national regulation.

Appendix 1: Dimensions

MRH for flat or inclined roof, mounting with adjustable sidebars





Lifting eye position; remove them after installation

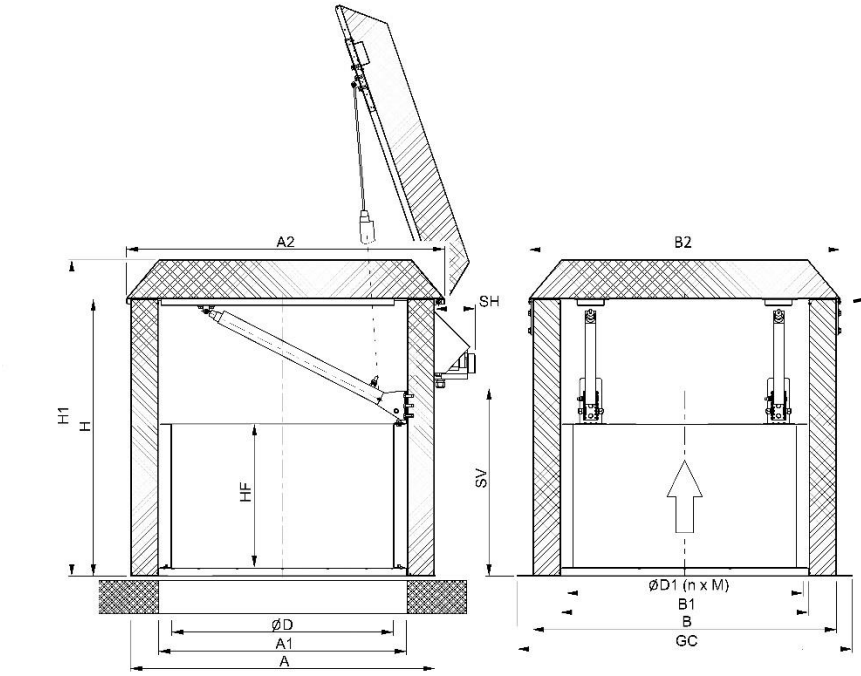
MRH size, item	øD	øD1	n x M*	A	A1	A2	B	B1	B2
MRH 400, 95763	400	450	8 x M8	1010	750	1070	1010	750	1050
MRH 450, 95762	450	500	8 x M8	1010	750	1070	1010	750	1050
MRH 500, 95759	500	560	12 x M8	1010	750	1070	1010	750	1050
MRH 560, 95758	560	620	12 x M8	1010	750	1070	1010	750	1050
MRH-H 560 H=1500, 95778	560	620	12 x M8	1010	750	1070	1010	750	1050
MRH 630, 95757	630	690	12 x M8	1010	750	1070	1010	750	1050
MRH-H 630 H=1500, 95773	630	690	12 x M8	1010	750	1070	1010	750	1050
MRH 710, 95756	710	770	16 x M8	1160	900	1220	1160	910	1200
MRH 800, 95755	800	860	16 x M8	1160	900	1220	1160	910	1200
MRH 900, 95754	900	970	16 x M8	1380	1124	1440	1380	1124	1410
MRH-H 900 H=1500, 95777	900	970	16 x M8	1380	1124	1440	1380	1124	1410
MRH 1000, 95552	1000	1070	16 x M8	1380	1124	1440	1380	1124	1410
MRH-H 1000 H=1500, 95774	1000	1070	16 x M8	1380	1124	1440	1380	1124	1410
MRH 1120, 95553	1120	1190	20 x M10	1540	1284	1597	1650	1394	1677
MRH 1250, 74808	1250	1320	20 x M10	1680	1424	1740	1790	1534	1820

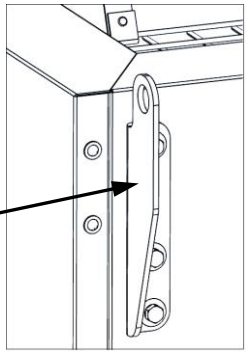
*bolts

MRH size, item	GA	GB	HF	H	H1	SH, ~	SV, ~	HG**
MRH 400, 95763	1050	1050	540	1250	1410	185	850	0, 250, 500
MRH 450, 95762	1050	1050	540	1250	1410	185	850	0, 250, 500
MRH 500, 95759	1050	1050	540	1250	1410	185	850	0, 250, 500
MRH 560, 95758	1050	1050	540	1250	1410	185	850	0, 250, 500
MRH-H 560 H=1500, 95778	1050	1050	790	1500	1660	185	1100	0, 250, 500
MRH 630, 95757	1050	1050	540	1250	1410	185	850	0, 250, 500
MRH-H 630 H=1500, 95773	1050	1050	790	1500	1660	185	1100	0, 250, 500
MRH 710, 95756	1200	1200	700	1250	1410	185	850	0, 250, 500
MRH 800, 95755	1200	1200	700	1250	1410	185	850	0, 250, 500
MRH 900, 95754	1420	1420	700	1250	1410	185	850	0, 250, 500
MRH-H 900 H=1500, 95777	1420	1420	950	1500	1660	185	1100	0, 250, 500
MRH 1000, 95552	1420	1420	700	1250	1430	185	850	0, 250, 500
MRH-H 1000 H=1500, 95774	1420	1420	950	1500	1680	185	1100	0, 250, 500
MRH 1120, 95553	1580	1690	1000	1250	1410	185	850	0, 250, 500
MRH 1250, 74808	1720	1830	1050	1250	1410	185	850	0, 250, 500

**see page 21

MRH for flat roof, mounting with fixed sidebars





Lifting eye position; remove them after installation

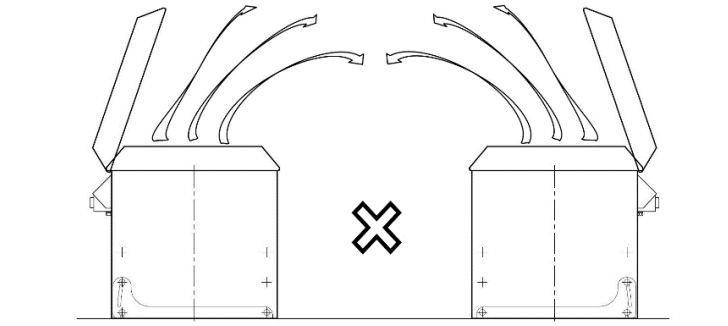
	øD	øD1	n x M*	A	A1	A2	B	B1	B2
MRH 400-2-XX-F400	400	450	8 x M8	1000	747	1070	1000	747	1050
MRH 450-2-XX-F400	450	500	8 x M8	1000	747	1070	1000	747	1050
MRH 500-2-XX-F400	500	560	12 x M8	1000	747	1070	1000	747	1050
MRH 560-2-XX-F400	560	620	12 x M8	1000	747	1070	1000	747	1050
MRH 630-2-XX-F400	630	690	12 x M8	1000	747	1070	1000	747	1050
MRH 710-4-XX-F400	710	770	16 x M8	1150	897	1220	1150	897	1200
MRH 800-4-XX-F400	800	860	16 x M8	1150	897	1220	1150	897	1200
MRH 900-4-XX-F400	900	970	16 x M8	1370	1117	1440	1370	1117	1410
MRH 1000-4-XX-F400	1000	1070	16 x M8	1370	1117	1440	1370	1117	1410
MRH 1000-4-YY-F400	1000	1070	16 x M8	1370	1117	1440	1370	1117	1410
MRH 1120-4-XX-F400	1120	1190	20 x M10	1530	1277	1600	1640	1387	1680
MRH 1250-4-XX-F400	1250	1320	20 x M10	1670	1417	1740	1780	1527	1820

XX, YY….kW; *bolts

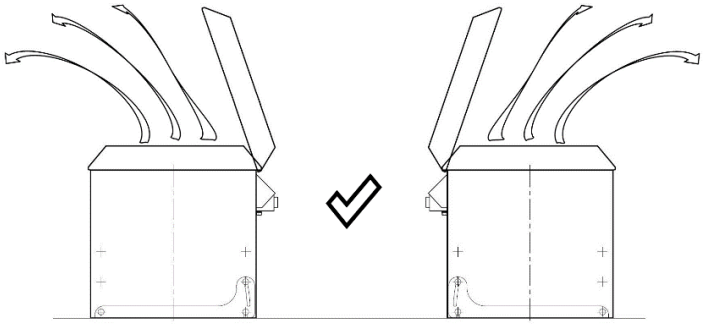
	GC	HF	H	H1	SH, ~	SV, ~	Max. kW
MRH 400-2-XX-F400	1064	450	1250	1410	185	800	1,1
MRH 450-2-XX-F400	1064	500	1250	1410	185	800	1,5
MRH 500-2-XX-F400	1064	540	1250	1410	185	800	2,2
MRH 560-2-XX-F400	1064	500	1250	1410	185	800	4
MRH 630-2-XX-F400	1064	750	1500	1660	185	1050	11
MRH 710-4-XX-F400	1214	700	1250	1410	185	800	5,5
MRH 800-4-XX-F400	1214	700	1250	1410	185	800	7,5
MRH 900-4-XX-F400	1434	640	1250	1430	185	800	7,5
MRH 1000-4-XX-F400	1434	640	1250	1430	185	800	7,5
MRH 1000-4-YY-F400	1434	850	1500	1680	185	1050	22
MRH 1120-4-XX-F400	1704	1000	1250	1430	185	800	30
MRH 1250-4-XX-F400	1844	1050	1250	1430	185	800	37

Appendix 2: Installation examples

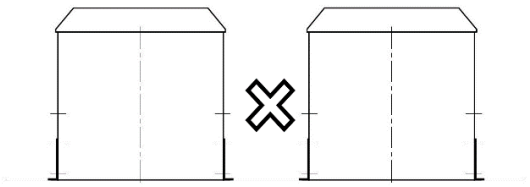
General requirements



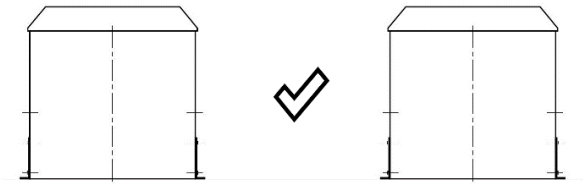
Avoid possible interference of air streams with another MRH!



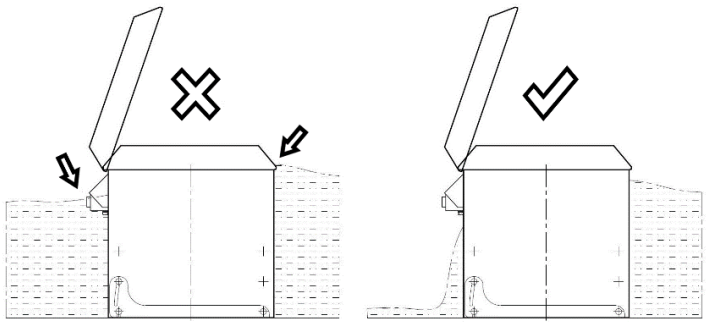
Better installation to avoid possible interference of air streams with another MRH!



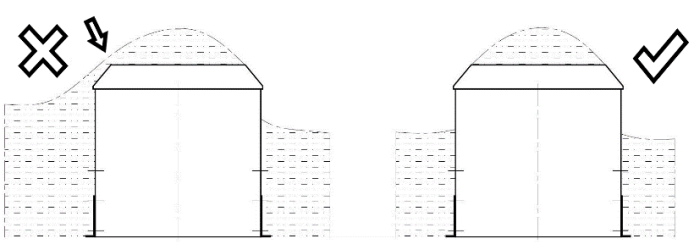
MRH too close to each other – no place for service!



Leave enough place for service – at least B2 between both units (B2 – see dimensions)!

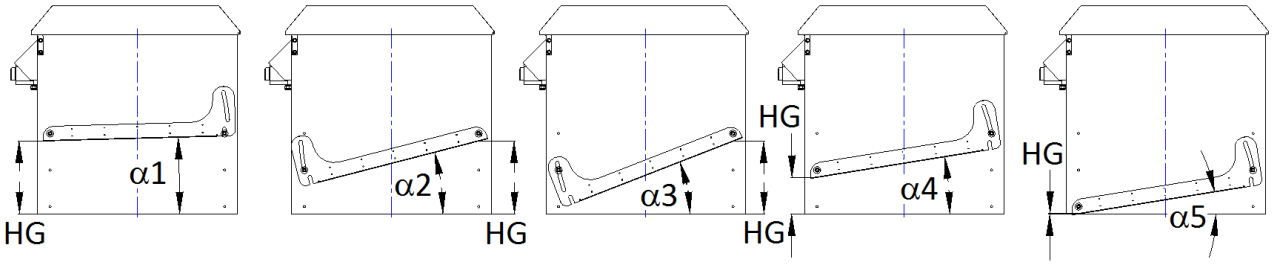


Service switch must not be covered with snow! Keep access to service switch always free of snow!



Hatch allows snow deposit up to SL class. However, its edges mustn`t be covered with snow!

Possible vertical positions and adjustment of sidebars to roof pitch – MRH with adjustable sidebars



MRH	~HG	α1	α2	α3	α4	α5
400 - 630	0					0 – 12°
	250				0 – 12°	
	500	0 – 2°	min 21°	max. 33°		

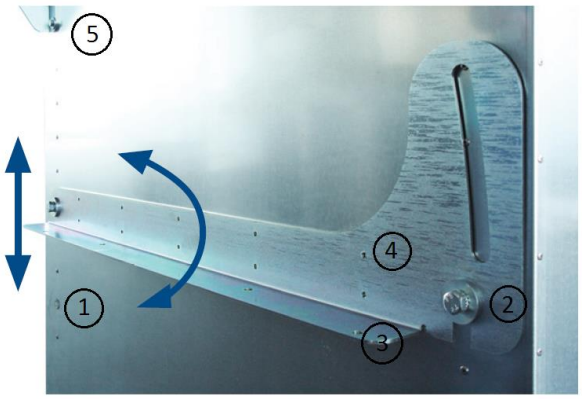
MRH	~HG	α1	α2	α3	α4	α5
710, 800	0					0 – 12°
	250				0 – 12°	
	500	0 – 2°	min 20°	max. 31°		

MRH	~HG	α1	α2	α3	α4	α5
900, 1000	0					0 – 9°
	250				0 – 9°	
	500	0 – 2°	min 14°	max. 21°		

MRH	~HG	α1	α2	α3	α4	α5
1120, 1250	0					0 – 8°
	250				0 – 8°	
	500	0 – 2°	min 12°	max. 19°		

The sidebars can be upon request ordered to meet specific roof pitch.

Mounting of MRH with adjustable sidebars



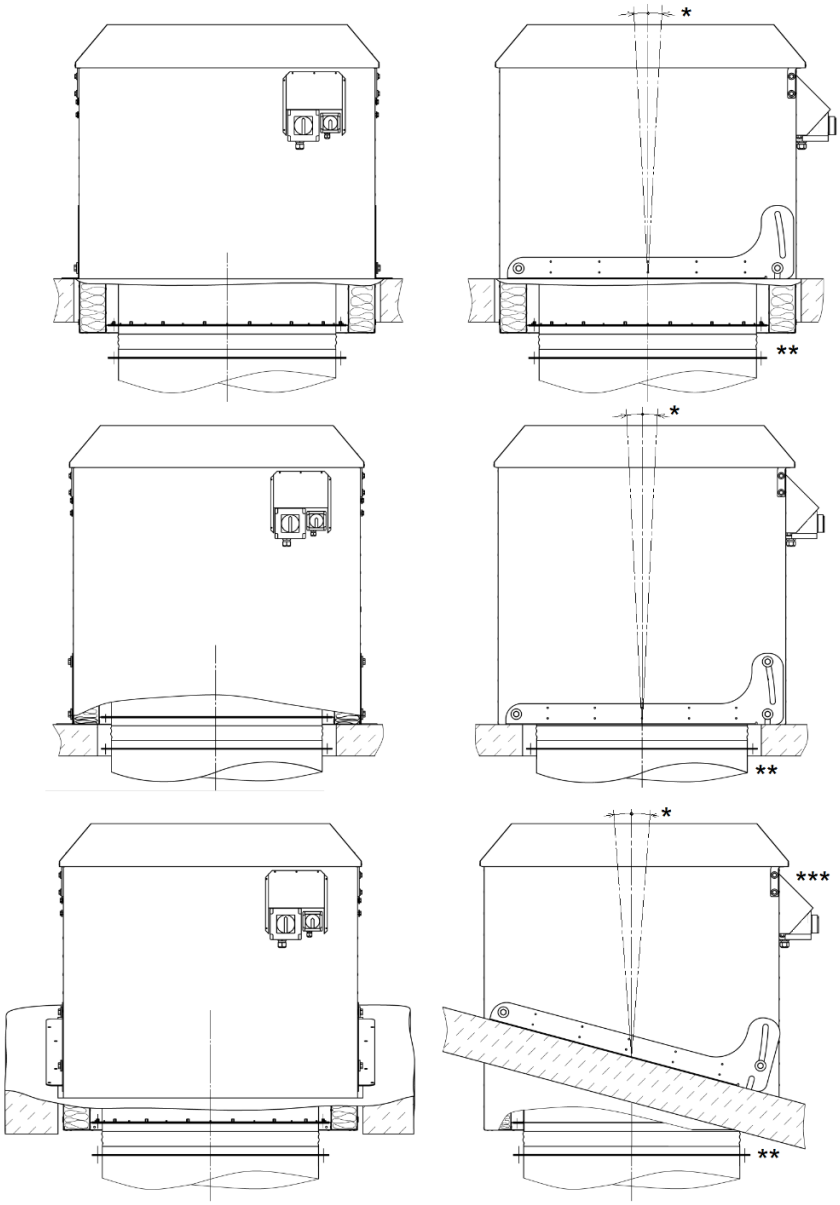
1 - Three height positions of sidebars (0, 250, 500 mm from the bottom);

2 - The sidebars adjust to the roof pitch and fasten all bolts (**2 or 3 bolts each sidebar**, depending on the sidebar position);

3 - Fasten the bars to the roof frame with bolts or studs;

4 - Fasten the sidebar with attached screws to the wall of MRH;

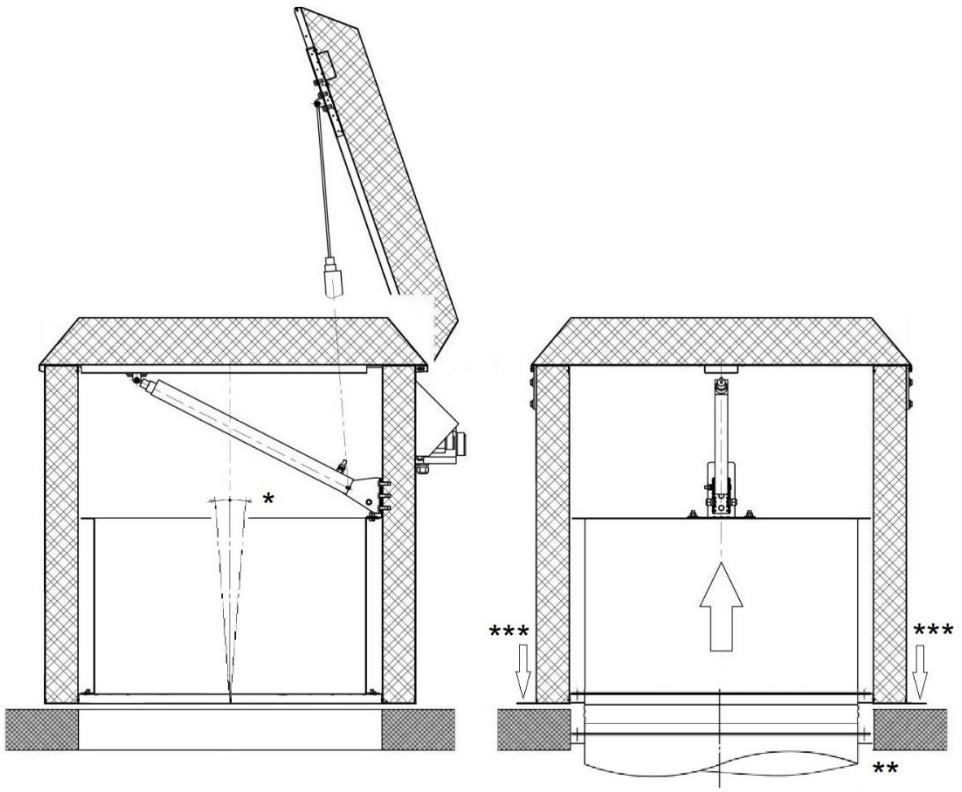
5 - Remove the hinges.



***The MRH centreline can deviate from the vertical for max. +/- 5° - this can be combined with the sidebar setting.**
****Avoid additional load to MRH due to weight of eventual duct with flexible connection.**

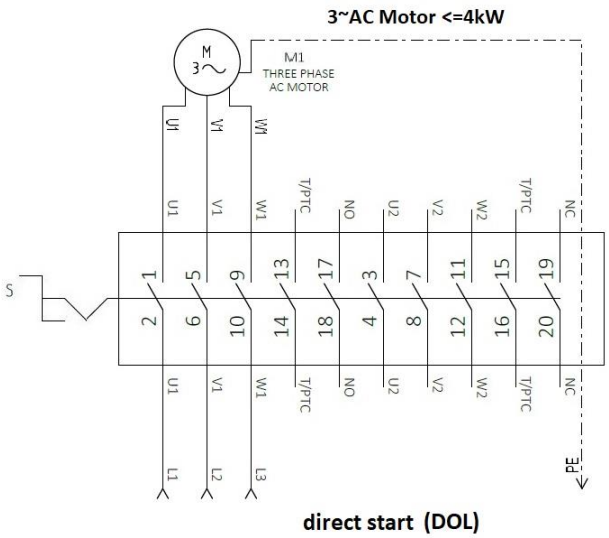
***** Choose the direction of opening to ridge considering access/snow deposition/wind/pitch. Roof insulation and flashing is not shown in the installation examples.**

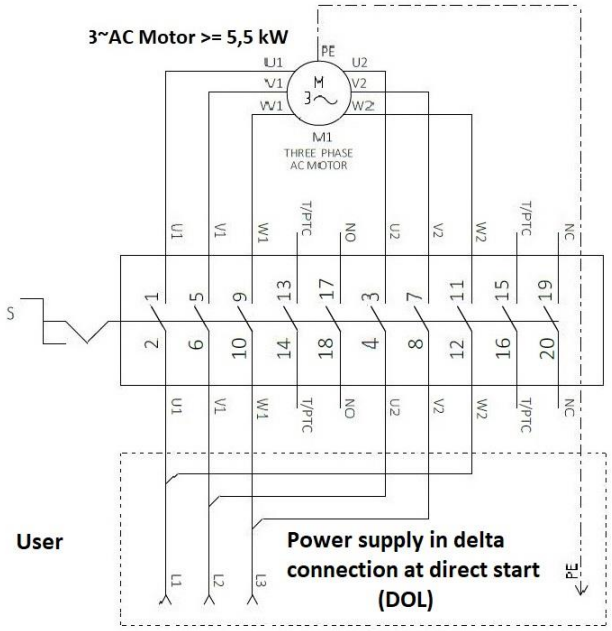
Mounting of MRH with fixed sidebars

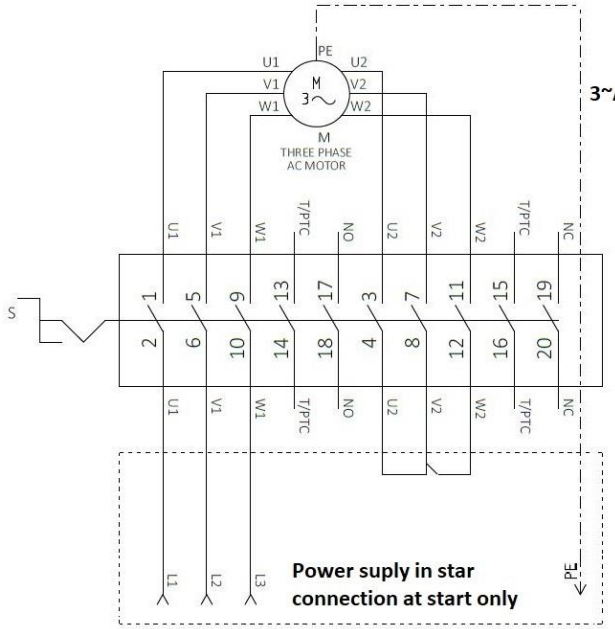


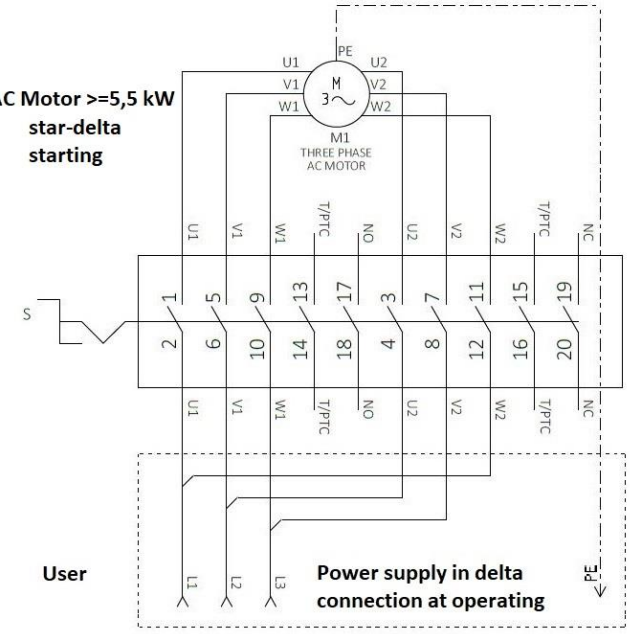
***The MRH centreline can deviate from the vertical for max. +/- 5° .**
****Avoid additional load to MRH due to weight of eventual duct with flexible connection.**
***** Fix MRH with bolts to the roof construction. Roof insulation and flashing is not shown in the installation example.**

Appendix 3: Wiring diagram, connection



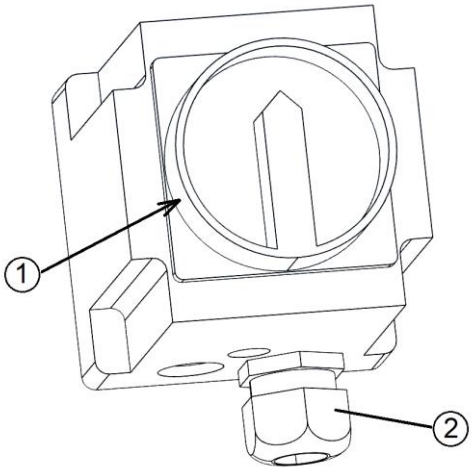




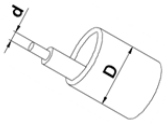


NOTE

1. PTC built-in motor on request only.
2. NO+NC terminals always in switch.
3. PTC terminals may be abandoned in some type of switches.

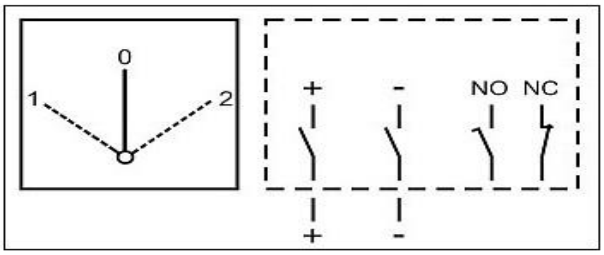


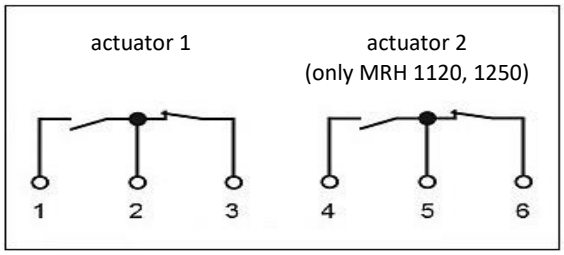
Service switch item (pos. 1)	Terminals	Rated current (A)	Nominal motor power (kW)	d max (mm)	D max (mm)	Serially equipped cable gland (pos. 2)	Additionally possible cable glands by user
9993431	3p + NO + NC	25	<= 4	3	13	1xM20x1,5	1xM20x1,5
930637	8p + NO + NC	25	5,5…7,5	4	16,5	1xM25x1,5	1xM32x1,5 + 1xM16x1,5
930638	8p + NO + NC	32	11	4	16,5	1xM25x1,5	1xM32x1,5 + 1xM16x1,5
939790	6p + NO + NC	50	15…22	6	18	1xM32x1,5	1xM40x1,5 + 1xM20x1,5
9993612	6p + NO + NC	100	30…37	8	28	1xM40x1,5	1xM40x1,5 + 1xM16x1,5



When choosing AES exhaust air and smoke extraction control accessory, please observe serial connecting capability of the fan`s service switch

Appendix 4: Connection of actuator to 24VDC





service switch

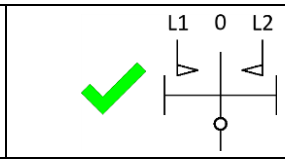
24VDC *

NO, NC - switch position control **

internal floating limit switches – drawn position closed hatch ***

Connection of actuator in the actuator`s service switch
* connect to 24VDC (+30/-20%)
** NO/NC are intended to control position of the actuator`s service switch (ON - OFF)
Warning: the control voltage 24VDC to open or close hatch cover should apply max. 6 minutes! This is to ensure by control system (use actuator`s internal floating limit switches as indication of cover position to cut off the control voltage).

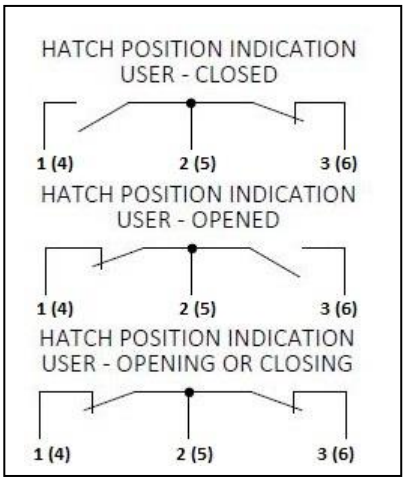
The connection cable to service switch calculate with max. 1V voltage drop at max. load!
Operating mode for peak load at 25°C ambient: S2 1min
Operating mode for continuous load at 40°C ambient: S3 5% (example: open in 30s, then wait 9min 30s)

For the control of the hatch, only use mutually mechanically interlocked ventilation buttons with contactless center positions, "no changeover switch", with independent return from the two switching positions.		

Max. current of actuator(s) at SL 1000 respectively SL 1250 at size 1250 (rated MRH load, 24VDC):
MRH 400, 450, 500, 560, 630: 4A
MRH 710, 800: 6A
MRH 1000: 8A
MRH 1120, 1250: 2x8A=16A

Functions of the actuator`s service switch:
Position 1: open hatch cover (NO – closed contact, NC – opened contact) – WARNING! (recommended ready state)
Position 0: stop (NO – opened contact, NC – closed contact) – SAFETY POSITION
Position 2: close hatch cover (NO – opened contact, NC – closed contact) – DANGER!

Connection of actuator`s internal floating limit switches in the actuator`s service switch (1 actuator up to MRH 1000)
*** drawn position - closed hatch
1-2 opened, 2-3 closed in closed hatch position
1-2 closed, 2-3 opened in opened hatch position
1-2 closed, 2-3 closed in any intermediary position of the hatch cover
Potential free NC contacts, load capacity 24VDC/1A



Connection of actuator`s internal floating limit switches in the actuator`s service switch (2 act. at MRH 1120, 1250)
*** drawn position - closed hatch
1-2, 4-5 opened, 2-3, 5-6 closed in closed hatch position
1-2, 4-5 closed, 2-3, 5-6 opened in opened hatch position
1-2, 4-5 closed, 2-3, 5-6 closed in any intermediary position of the hatch cover
Potential free NC contacts, load capacity 24VDC/1A

Appendix 5: Connection of actuator to 230VAC

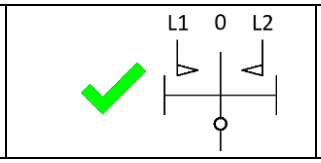
Power supply MRH 400÷1000 230VAC and Power supply MRH 1120÷1250 230VAC with service switch are optionally available pre-mounted to control via 230VAC (50/60 Hz) the position of hatch of MRH with adjustable sidebars. **It is serially mounted on MRH for flat roof mounting with fixed sidebars**. Inside control box there are also terminals for monitoring the position of the hatch and service switch. Product must be protected from direct influence of precipitation.
Temperature of ambient without switching: -40 ÷ 55°C, IP 65. Switching: -32 ÷ 55°C
In case of fire, all protective devices must be bridged to guarantee functional capability.

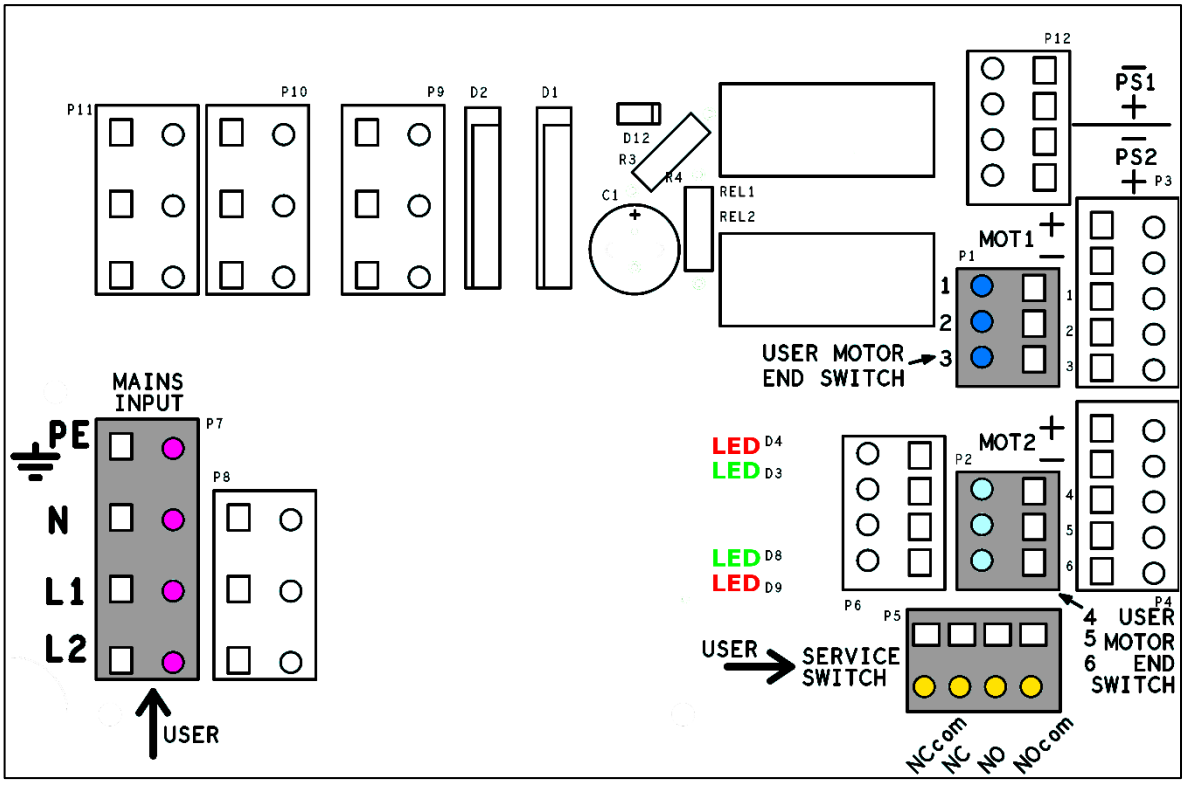
Functions:

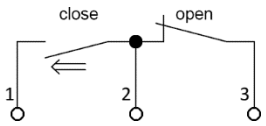
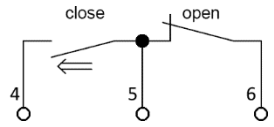
- Service switch position monitoring via normally opened NO and normally closed NC contacts.
- Hatch position monitoring via actuator`s internal floating limit switch (potential free contacts, load capacity 24VDC/1A).

Precautions:

- **Power supply L1 and L2 must be of the same AC source, line voltage 230V, frequency and phase shift! L1 and L2 must NOT be L1 and L2 of three-phase system (LINE-LINE)!**
- **Electrical installation must include protective slow blow fuses at L1 and L2 power supply line.**
- **Power shall not be supplied simultaneously to line L1 and L2!** In case that L1 and L2 are both supplied L2 has a priority and actuator will CLOSE the hatch. Be aware of priority during alarm state!
- When **power is fed to line L1**, actuator shall **OPEN** hatch (green LED inside control box lights up).
- When **power is fed to line** L2, actuator shall **CLOSE** hatch (red LED inside control box lights up).
- **Minimum time of 15 s pause is required before switching the direction via L1, L2 or service switch** (open/close). Not observing this can lead to defects.

For the control of the hatch, only use mutually mechanically interlocked ventilation buttons with contactless center positions, "no changeover switch", with independent return from the two switching positions.		



Color	No.	Description	Pin*	Pin function
		Connectors for user		
	P7	*Mains power supply 220-240 VAC***	*1* *2* *3* *4*	*PE* *N – neutral* *L1 – live 1, 230 VAC:* ***OPEN*** *L2 – live 2, 230 VAC:* ***CLOSE***
	P5	*NO and NC information about actuators position of Service switch for monitoring purpose ****	*1* *2* *3* *4*	*NC com* *NC* *NO* *NO com*
	P1	*Actuator 1 – position information - internal floating limit switch **** (hatch position information)* *drawn position "CLOSED"*	*1* *2* *3*	
	P2	*Actuator 2 (only MRH 1120, 1250) – position information - internal floating limit switch ***** (hatch position information)* *drawn position "CLOSED"*	*4* *5* *6*	

* Pin numbers counted from top to bottom and left to right.

****** The control voltage L1 or L2 to open or close hatch cover should apply max. 6 minutes! This is to ensure by control system (use actuator`s internal floating limit switches as indication of cover position to cut off the control voltage).
Operating mode for peak load at 25°C ambient: S2 1min.
Operating mode for continuous load at 40°C ambient: S3 5% (example: open in 30s, then wait 9min 30s)

***** Service switch is used during service / repair / maintenance / review of ventilation unit.**

1 – Normal operation (**recommended ready state**): switch shall be in this position during normal operation (NO – closed contact, NC – opened contact) – **WARNING**!

0 – Disconnects power SAFETY POSITION (NO – opened contact, NC – closed contact) (during service / repair / maintenance…)

2 – Reverse operation of position 1 (NO – opened contact, NC – closed contact) – **DANGER**! (during service / repair / maintenance…)
When changing actuator`s direction (means when feeding power is changed from L1 – 0 – L2 or vice versa with service switch or by the central) the **position 0 keep for a minimum time of 15 s** (L1 → 0 or L2 → 0).

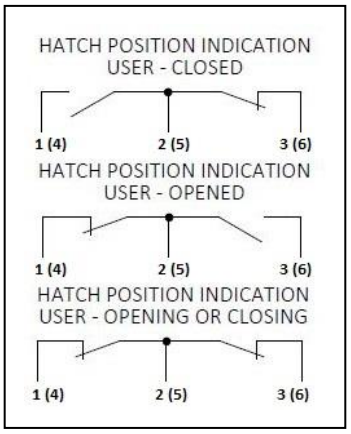
**** Circuit diagram: drawn position “CLOSED” (Potential free NC contacts, load capacity 24VDC/1A)

Connection of actuator`s internal floating limit switches in the control box (1 actuator up to MRH 1000)

1-2 opened, 2-3 closed in closed hatch position

1-2 closed, 2-3 opened in opened hatch position

1-2 closed, 2-3 closed in any intermediary position of the hatch cover



***** Instruction regarding Actuator 2 is relevant for MRH 1120 and MRH 1250 only

Connection of actuator`s internal floating limit switches in the control box (2 actuators at MRH 1120, 1250)

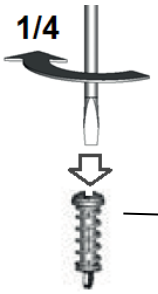
1-2, 4-5 opened, 2-3, 5-6 closed in closed hatch position

1-2, 4-5 closed, 2-3, 5-6 opened in opened hatch position

1-2, 4-5 closed, 2-3, 5-6 closed in any intermediary position of the hatch cover

Emergency (Fire) mode recommendations for MRH:

1. Bypass non-vital protection and security devices.
2. Switch on L1 (power on L1 with 230V) for hatch opening of MRH. If service switch is in recommended ready state in position 1 → hatch is opening.
3. Wait for 20s. The recommended start of the fan is 20 s after starting actuator for cover opening, to ensure vertical exhaust of hot gases.
4. Start axial fan.
5. Switch off L1 (power off L1) when hatch is fully opened (check limit switch 1-2, 4-5 closed, 2-3, 5-6 opened in opened hatch position).



Power supply

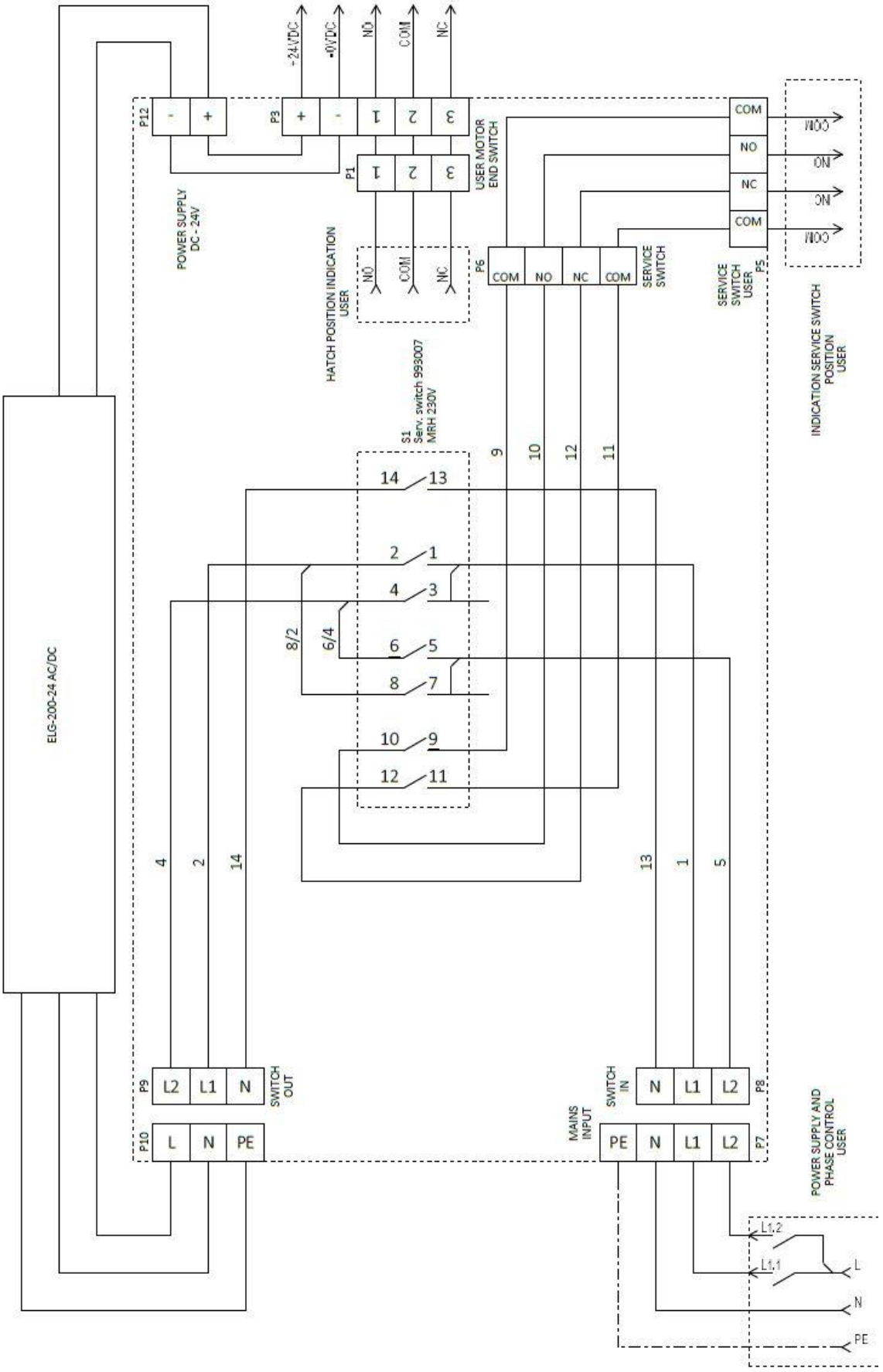
1 or 2 Pcs

Control box with service switch

Shown example for MRH 400-1000

Power supply MRH 400÷1000 (1120÷1250) 230VAC consists of:	MRH 400÷1000	MRH 1120, 1250
1. Control box with service switch 230V for MRH hatch actuator	1 pcs.	1 pcs.
2. Power supply 230VAC → 24VDC	1 pcs. 230VAC → 24VDC, 8A	2 pcs. 230VAC → 24VDC, 8A (2x8=16A)

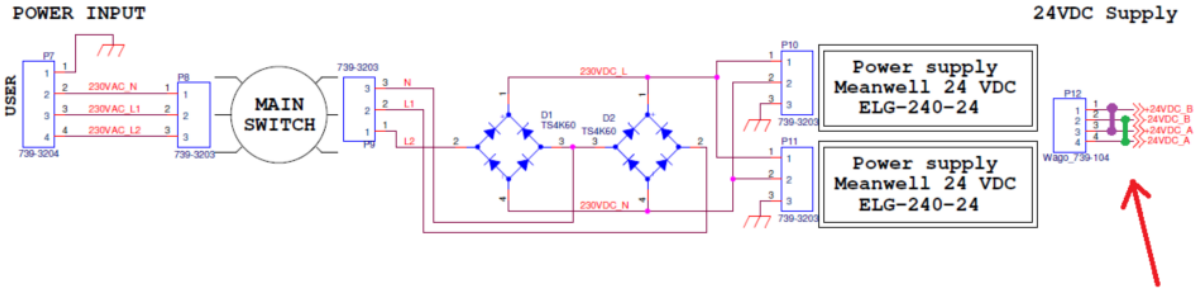
	MRH 400÷1000	MRH 1120, 1250
Recommended fuses, slow blow type	2,5A	4A


+24VDC
-0VDC
NO
COM
NC
P12
P3
P1
POWER SUPPLY DC - 24V
USER MOTOR END SWITCH
HATCH POSITION INDICATION USER
P6
SERVICE SWITCH
SERVICE SWITCH USER
P5
INDICATION SERVICE SWITCH POSITION USER
S1 Serv. switch 993007 MRH 230V
ELG-200-24 AC/DC
P9
L2
L1
N
SWITCH OUT
P10
L
N
PE
SWITCH IN
P8
MAINS INPUT
P7
POWER SUPPLY AND PHASE CONTROL USER
L1.2
L1.1
L
N
PE

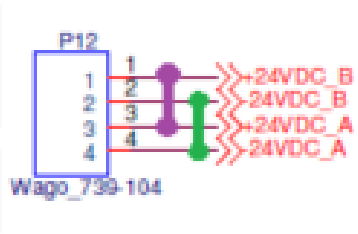
Improvement at power supplies 230VAC MRH 1120÷1250 (2 power supplies each MRH)

To avoid start delays between both actuators at deliveries after 13.04.2021 (serial No. > 46700) following change was introduced at control box. The parallel connection of power supplies on the secondary side (24V output) has been shown to be a significant improvement in operational reliability. In case of failure one of the relays or power supplies the basic functionality remains.

Change:

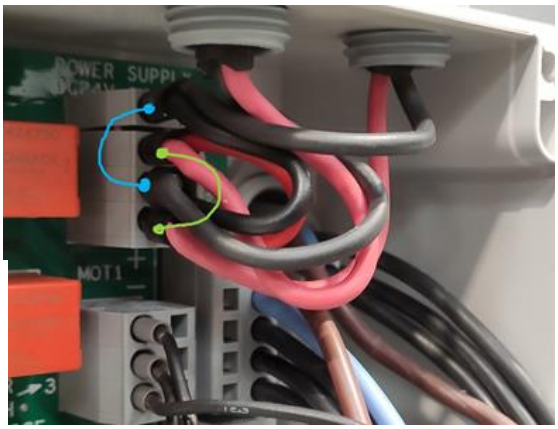


Bridges:

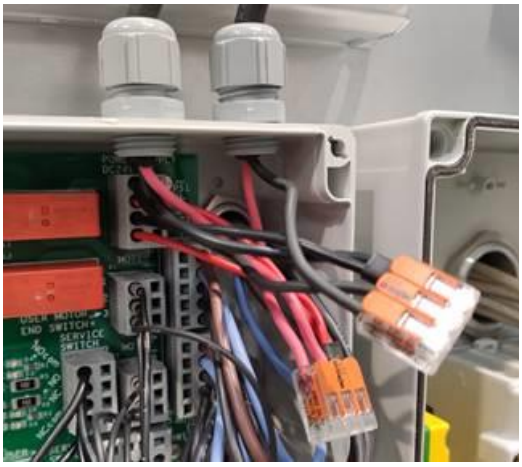


How to make wiring at serial number of the fan with serial No. < 46700:

1. Needed material: 1x wire, black color (1,5mm^2, 10 cm long), 1x wire, red color (1,5mm^2, 10 cm long), 4x double ferrule (1,5mm^2):



2. Using 3 pin WAGO connectors:



Appendix 7: Connection of actuators to 230VAC

NOTE
This chapter is intended for future use. Consult Systemair support.

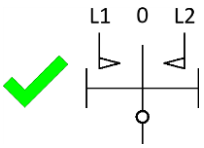
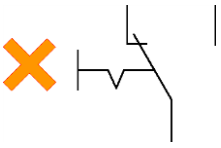
Power supply MRH 400÷1000 230VAC and Power supply MRH 1120÷1250 230VAC are pre-mounted to control via 230VAC (50/60 Hz) the position of hatch of MRH hatch. Inside control box there are also terminals for monitoring the position of the hatch and service switch. Product must be protected from direct influence of precipitation. Temperature of ambient without switching: -40 ÷ 55°C, IP 65. Switching: -32 ÷ 55°C
In case of fire, all protective devices must be bridged to guarantee functional capability.

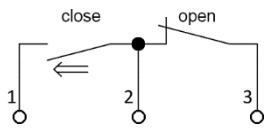
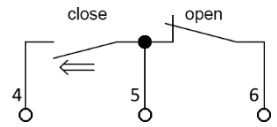
Functions:

- Service switch position monitoring via normally opened NO and normally closed NC contacts.
- Hatch position monitoring via actuator`s internal floating limit switch (potential free contacts, load capacity 24VDC/1A).

Precautions:

- **Power supply L1 and L2 must be of the same AC source, line voltage 230V, frequency and phase shift! L1 and L2 must NOT be L1 and L2 of three-phase system (LINE-LINE)!**
- **Electrical installation must include protective slow blow fuses at L1 and L2 power supply line.**
- **Power shall not be supplied simultaneously to line L1 and L2!** In case that L1 and L2 are both supplied L2 has a priority and actuator will OPEN the hatch. Be aware of priority during alarm state!
- When **power is fed to line L1**, actuator shall **OPEN** hatch.
- When **power is fed to line L2**, actuator shall **CLOSE** hatch.
- **Minimum time of 15 s pause is required before switching the direction via L1, L2 or service switch** (open/close). Not observing this can lead to defects.

For the control of the hatch, only use mutually mechanically interlocked ventilation buttons with contactless center positions, "no changeover switch", with independent return from the two switching positions.		

Description	*Mark*	*Function*
*Mains power supply 220-240 VAC***	*PE* *BU* *BN* *BE*	*PE* *N – neutral* *L1 – live 1, 230 VAC:* ***OPEN*** *L2 – live 2, 230 VAC:* ***CLOSE***
*NO and NC information about actuators position of Service switch for monitoring purpose ****	*23* *22* *20* *21*	*NC com* *NC* *NO* *NO com*
*Actuator 1 – position information - internal floating limit switch **** (hatch position information)* *drawn position "CLOSED"*	*1* *2* *3*	
*Actuator 2 (only MRH 1120, 1250) – position information - internal floating limit switch ***** (hatch position information)* *drawn position "CLOSED"*	*4* *5* *6*	

****** The control voltage L1 or L2 to open or close hatch cover should apply max. 6 minutes! This is to ensure by control system (use actuator`s internal floating limit switches as indication of cover position to cut off the control voltage).
Operating mode for peak load at 25°C ambient: S2 1min.
Operating mode for continuous load at 40°C ambient: S3 5% (example: open in 30s, then wait 9min 30s)

***** Service switch is used during service / repair / maintenance / review of ventilation unit.**

1 – Normal operation (**recommended ready state**): switch shall be in this position during normal operation (NO – closed contact, NC – opened contact) – **WARNING**!

0 – Disconnects power SAFETY POSITION (NO – opened contact, NC – closed contact) (during service / repair / maintenance…)

2 – Reverse operation of position 1 (NO – opened contact, NC – closed contact) – **DANGER**! (during service / repair / maintenance…)
When changing actuator`s direction (means when feeding power is changed from L1 – 0 – L2 or vice versa with service switch or by the central) the **position 0 keep for a minimum time of 15 s** (L1 → 0 or L2 → 0).

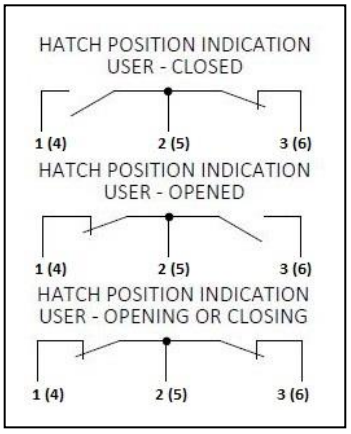
**** Circuit diagram: drawn position “CLOSED” (Potential free NC contacts, load capacity 24VDC/1A)

Connection of actuator`s internal floating limit switches in the control box (1 actuator up to MRH 1000)

1-2 opened, 2-3 closed in closed hatch position

1-2 closed, 2-3 opened in opened hatch position

1-2 closed, 2-3 closed in any intermediary position of the hatch cover



***** Instruction regarding actuator 2 is relevant for MRH 1120 and MRH 1250 only

Connection of actuator`s internal floating limit switches in the control box (2 actuators at MRH 1120, 1250)

1-2, 4-5 opened, 2-3, 5-6 closed in closed hatch position

1-2, 4-5 closed, 2-3, 5-6 opened in opened hatch position

1-2, 4-5 closed, 2-3, 5-6 closed in any intermediary position of the hatch cover

Emergency (Fire) mode recommendations for MRH:

6. Bypass non-vital protection and security devices.
7. Switch on L1 (power on L1 with 230V) for hatch opening of MRH. If service switch is in recommended ready state in position 1 → hatch is opening.
8. Wait for 20s. The recommended start of the fan is 20 s after starting actuator for cover opening, to ensure vertical exhaust of hot gases.
9. Start axial fan.
10. Switch off L1 (power off L1) when hatch is fully opened (check limit switch 1-2, 4-5 closed, 2-3, 5-6 opened in opened hatch position).

Power supply

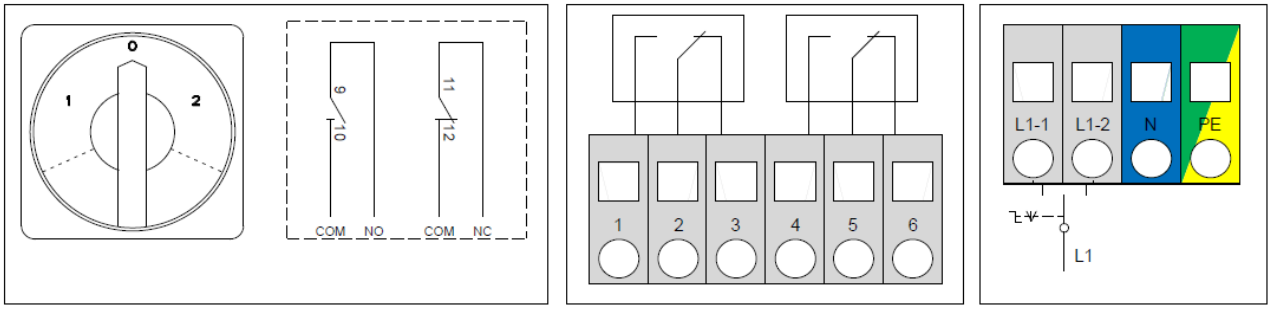
1 or 2 Pcs

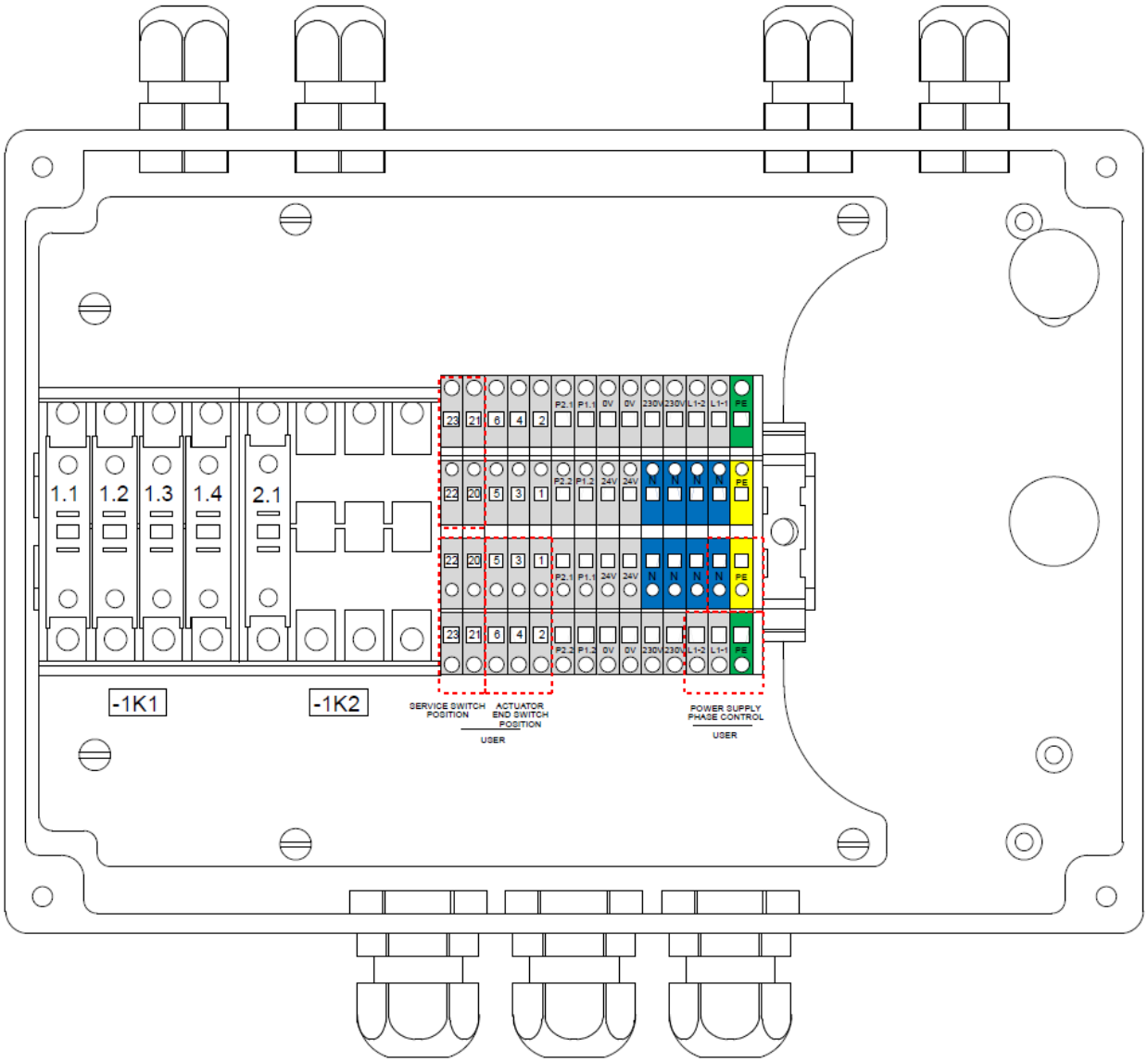
Control box with service switch

Shown example for MRH 400-1000

Power supply MRH 230VAC consists of:	MRH 400÷1000	MRH 1120, 1250
1. *Control box item 9994809 with service switch 230V for MRH hatch actuator*	1 pcs.	1 pcs.
2. *Power supply item 993011, 230VAC → 24VDC*	1 pcs. 230VAC → 24VDC, 8A	2 pcs. 230VAC → 24VDC, 8A (2x8=16A)

	MRH 400÷1000	MRH 1120, 1250
Recommended fuses, slow blow type	2,5A	4A


0
1
2
9
10
11
12
COM
NO
COM
NC
1
2
3
4
5
6
L1-1
L1-2
N
PE
L1


1.1
1.2
1.3
1.4
2.1
-1K1
-1K2
SERVICE SWITCH POSITION
ACTUATOR END SWITCH POSITION
USER
POWER SUPPLY PHASE CONTROL
USER

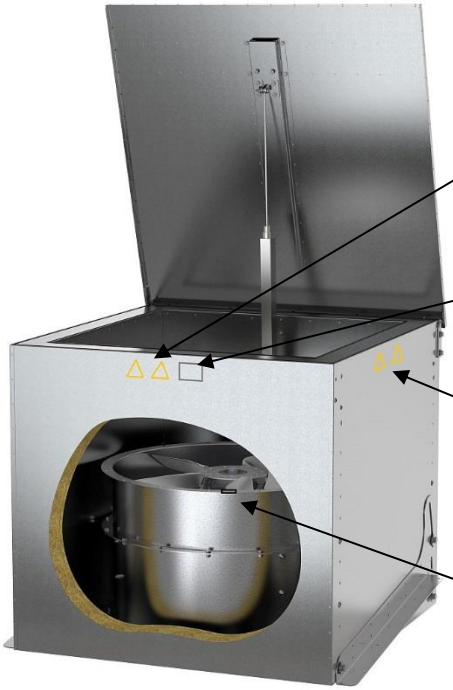
Appendix 8: Mechanical hazards, safety warnings

⚠ DANGER

Hazard from touching impeller, if not covered with protective grid!
The outlet protective grid is serially provided.

⚠ DANGER

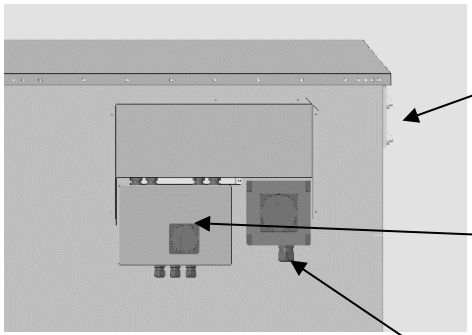
Hazard from crushing/shearing by the hatch cover!
The hatch cover can be stopped in any position by turning the actuator`s service switch to middle (0) position.



ATTENTION!

Intended use:
Emergency use only!

ROTATION



Alternatively in case of pre-mounted Power supply MRH 230VAC

ATTENTION!

At installation, commissioning, use and maintenance consider attached instructions!

Actuator´s service switch 24 VDC

0 - hatch cover stops - SAFETY POSITION
1 - hatch cover opens - WARNING!
2 - hatch cover closes - DANGER!

Control box with service switch 230V for MRH hatch actuator

1 – Normal operation (recommended ready state)
0 – Disconnects power
2 – Reverse movement regarding position 1

- Function: L1 - live 230VAC → OPEN; (L2 - live 230VAC → CLOSE) (recommended ready state)
- Power supply L1 and L2 must be of the **same AC source**, frequency and phase shift! L1 and L2 must NOT be L1 and L2 of three phase system!
- Power shall **not** be supplied **simultaneously** to line L1 and L2.
- **Minimum time of 15 s pause** required before changing the direction via L1, L2 or service switch (L1-0-L2 or vice versa).
- The control voltage L1 or L2 to open or close hatch cover should apply **max. 6 minutes**!
- Operating mode for peak load at 25°C ambient: **S2 1min**.
- Operating mode for continuous load at 40°C ambient: **S3 5%** (example: open in 30s, then wait 9min 30s).
- Proper application circuitry shall include safety precautions such as protective fuse and an adequate electrical insulation arrangement!

N106AA.02

ATTENTION!

At installation, commissioning, use and maintenance consider attached instructions!

Fan´s service switch

systemair

Appendix 9: EU-Declaration of Conformity

The Manufacturer: **Systemair d.o.o.**
Špelina 2, SI-2000 Maribor
Tel.: +386 2 4601 801

Certifies herewith that the following products:	**MRH + Smoke and heat extract fan AXC(B), AXC(F), AXC(R)**

ensure all relevant requirements of following directives:

EC Machinery Directive (2006/42/EC)
Electromagnetic compatibility directive (2014/30/EU)
Low Voltage Directive (2014/35/EU)
Regulation (EU) No 305/2011 (CPR)
Commission Regulation (EC) No 2019/1781 (Ecodesign)
Commission Regulation (EU) No 327/2011 (Fans)
Commission Regulation (EU) No 1253/2014
Directive (EU) 2015/863 (RoHS 3)

Applied harmonized standards, in particular:

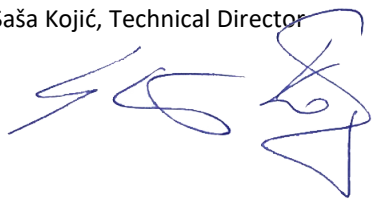
EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 13857	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 12101-3	Smoke and heat control systems – part 3: Specification for powered smoke and heat exhaust ventilators

***Note1**: Compliance with EC Machinery Directive and EN ISO 13857 refers to the mounted protective guards on the inlet of the fan, as far they are in the extent of delivery. For the fully accordance with mentioned requirements (protective guards or safety assurance in other way) the performer is responsible.*

***Note2**: Compliance with EMC Directive 2014/30/EC only relates to this product if it has been connected directly to the customary electricity mains. If this product is integrated into a system or completed and operated with other components (e.g. regulation and control appliances), the manufacturer or operator of the overall system is responsible for compliance with EMC Directive 2014/30/EC.*

Maribor, 24.11.2023

Saša Kojić, Technical Director



Anton Zupančič, Director

Appendix 10: UKCA-Declaration of Conformity

The Manufacturer: **Systemair d.o.o.**
Špelina 2, SI-2000 Maribor
Tel.: +386 2 4601 801

Certifies herewith that the following products:	**MRH + Smoke and heat extract fan AXC(B), AXC(F), AXC(R)**

ensure all relevant requirements of following directives:

The Supply of Machinery (Safety) Regulations 2008
The Electromagnetic Compatibility Regulations 2016
The Electrical Equipment (Safety) Regulations 2016
The Construction Products (Amendment etc.) (EU Exit) Regulations 2019
The Ecodesign for Energy-Related Products and Energy Information (Amendment) (EU Exit) Regulations 2020
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Applied harmonized standards, in particular:

EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 13857	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 12101-3	Smoke and heat control systems – part 3: Specification for powered smoke and heat exhaust ventilators

Compliance with Supply of Machinery (Safety) Regulations 2008 and EN ISO 13857 refers to the mounted protective guards on the inlet of the fan, as far they are in the extent of delivery. For the fully accordance with mentioned requirements (protective guards or safety assurance in other way) the performer is responsible.

***Note2**: Compliance with Electromagnetic Compatibility Regulations 2016 only relates to this product if it has been connected directly to the customary electricity mains. If this product is integrated into a system or completed and operated with other components (e.g. regulation and control appliances), the manufacturer or operator of the overall system is responsible for compliance with Electromagnetic Compatibility Regulations 2016.*

Maribor, 24.11.2023
Saša Kojić, Technical Director

Anton Zupančič, Director