

TECHNICAL MANUAL

Smoke exhaust axial fan

mcr Monsun



Version: Monsun 26.01.26.4

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CAUTION

All previous issues of this Technical Manual expire on the date of issue hereof.
This Technical Manual does not apply to any fans manufactured prior to this Manual's date of issue.

1. FOREWORD

This Technical Manual is addressed to users/operators of type mcr Monsun smoke exhaust axial fans. This document is intended to provide guidelines on the application, design, commissioning and operation of the product.



Read this Technical Manual thoroughly before installing this equipment at its operating site and commissioning.



If the equipment is found malfunctioning or defective, contact the manufacturer or their Authorised Representative.



Due to the continuous product improvement policy, we reserve the right to change the product design in order to improve its performance and safety.

The design of the ventilators complies with the essential requirements of PN-EN 12101-3:2004 for smoke exhaust fans. The design also meets the state of the art in technology, while assuring health and safety protection.

This equipment has been designed and manufactured according to the following standards:

PN-EN 12101-3:2004	Smoke and heat control systems. Part 3: Specification for powered smoke and heat exhaust fans.
PN-EN ISO 12100-1:2005	Safety of machinery. Basic concepts, general principles for design. Part 1: Basic terminology, methodology.
PN-EN ISO 12100-2:2005	Safety of machinery. Basic concepts, general principles for design. Part 2: Technical principles.
PN-EN 60204-1:2001	Safety of machinery. Electrical equipment of machines. Part 1: General requirements.

The smoke exhaust fan design also meets the state of the art in technology, while assuring health and safety protection.

2. MANUFACTURER'S

DISCLAIMER

- The manufacturer shall not be liable for any consequences of non-intended use or misuse of the equipment.
- DO NOT install any components that are not included in the equipment composition or accessories.
- Unauthorised modifications or alteration of this equipment is strictly prohibited.
- Protect the equipment enclosure (casing) from mechanical damage.
- Before attempting to install this equipment, verify the load bearing capacity of the structural elements to which the equipment is to be fastened. Unreliable fastening may result in damage or

failure of the equipment and/or be hazardous to all nearby personnel.

- This fan is not intended for forcing air with viscous pollutants that may settle on the equipment, and especially on its rotor.
- This fan is not intended for forcing air with corrosive pollutants that may be detrimental to the equipment.
- The maximum actual rotor RPM must never exceed the nominal (rated) RPM speed in operation.
- The manufacturer shall not be liable for any injuries, trauma or other bodily harm caused by misuse of this equipment.

3. SUBJECT

The subject of this Technical Manual is:

- mcr Monsun F400 smoke exhaust axial fans
- mcr Monsun F300 smoke exhaust axial fans
- mcr Monsun F200 smoke exhaust axial fans

4. INTENDED USE

4.1. Application

The type mcr Monsun smoke exhaust axial fans are duct fans intended to remove smoke and heat generated in indoor rooms on fire. The equipment facilitates evacuation of persons from the area on fire, protect the building structure and its furnishing from high temperature, facilitate fire fighting, and inhibit spreading of fire to adjacent fire zones.

The available versions include:

- single-functional with single-speed motors;
- two-functional, i.e. for general and fire ventilation and with two-speed motors.

The fans can be installed indoors or outdoors: on suitable consoles with the motor in the vertical orientation, or on the bottom feet with the motor in the horizontal orientation.

The fan overall compression ratio makes them compatible with ventilation systems characterised by relatively high flow resistance.



The operating temperature range for fans in general ventilation systems is – 20°C to + 40°C.

The fan may force dry air only and with a maximum particulate content of 0.3 g/m³.



This fan is not intended for forcing air with viscous pollutants that may settle on the equipment, and especially on its rotor.



This fan is not intended for forcing air with corrosive pollutants that may be detrimental to the equipment.



The maximum actual rotor RPM must never exceed the nominal (rated) RPM speed in operation.



Following operation in actual fire conditions, the fan will not be fit for further use.

4.2. Fire resistance

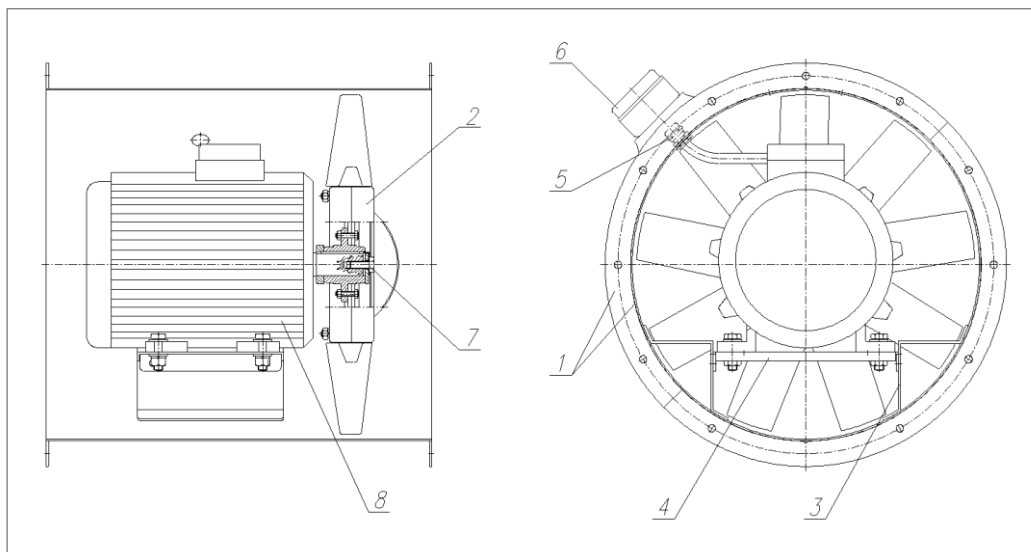
- Class F400 – fire resistance at 400°C for 120 minutes
- Class F300 – fire resistance at 300°C for 60 minutes
- Class F200 – fire resistance at 200°C for 120 minutes

4.3. Versions

- Single-speed single-functional fans
- Two-speed two-functional fans

5. DESIGN AND OPERATING PRINCIPLE

5.1. Design



- 1 - Fan housing
- 2 - Axial rotor
- 3 - Base support
- 4 - Motor base
- 5 - Electrical gland
- 6 - Electric box
- 7 - Rotor safety
- 8 - Motor, fire resistant at the specific temperature class

The smoke exhaust axial fan feature a steel housing in the form of a cylinder with connection flanges at its end, intended for connection with the ventilation system. Inside of the enclosure the motor is located and supported by the motor base. The rotor is set directly on the motor shaft neck. At the rotor intake and in line with its centreline is an aerodynamic cone, which improves the flow performance. The fan can also feature an air stator type KP, located inside of the ventilator casing on the rotor end.

The electric box is installed on the fan casing, to which the electrical wiring of suitable fire resistance is led from the motor.

The rotors with the diameter $D = [355; 400; 450]$ mm feature 9 blades, while the rotors with the diameter $D = [500-560-630-710-800-900-1000]$ mm are available with 12 blades.

The fan may work with various blade angles and numbers. This allows adapting the fan performance to the ventilation system flow resistance characteristics.

Each fan features an inspection hatch which permits verification of the rotor sense of rotation.

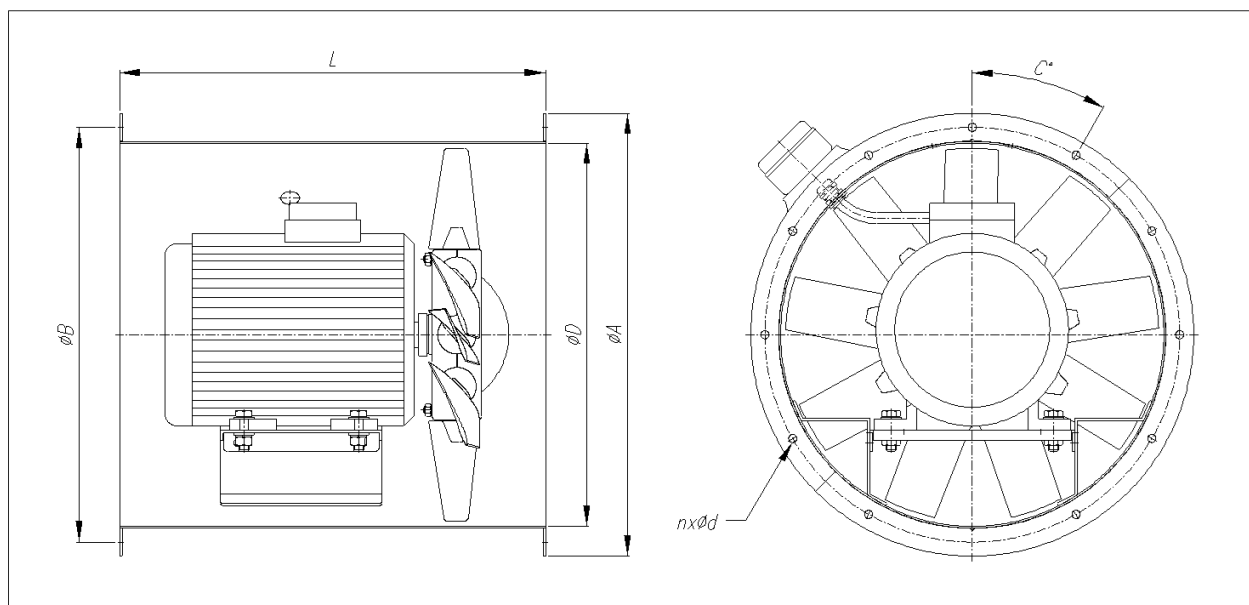
5.2. Function

The single-functional fans do not run in standby. When 3-phase voltage is present on the electric box terminals, the fan is started and running.

The two-functional fans run at low speed (RPM) to handle general ventilation under normal conditions. When the fan receives an alarm signal, it automatically starts running with the second speed, which is higher than the first one.

5.3. Dimensions

mcr Monsun smoke exhaust axial fans - ... - Table of dimensions						
Fan - Type	D [mm]	~A [mm]	~L [mm]	B [mm]	C [°]	nxd [mm]
mcr Monsun 35	355	425	400	395	45	8x9.6
mcr Monsun 40	400	470	500	438	30	12x9.6
mcr Monsun 45	450	520	500	487	30	12x9.6
mcr Monsun 50	500	570	600	541	30	12x9.6
mcr Monsun 56	560	640	700	605	22.5	16x10.5
mcr Monsun 63	630	710	600	674	22.5	16x10.5
mcr Monsun 71	710	790	750	751	22.5	16x10.5
mcr Monsun 80	800	875	750	837	15	24x10.5
mcr Monsun 90	900	975	900	934	15	24x10.5
mcr Monsun 100	1000	1080	1000	1043	15	24x10.5
mcr Monsun 112	1120	1240	1150	1190	15	24 x 14
mcr Monsun 125	1250	1390	1150	1340	15	24 x 14



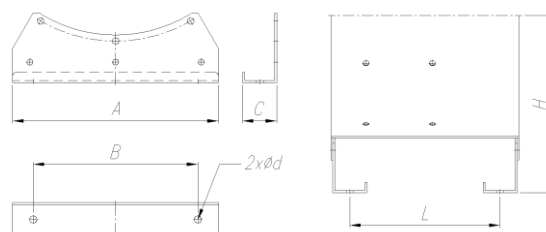
5.4. Accesories

➤ Type SW bottom feet

made of galvanized steel sheet. Powder-coated in standard, or galvanized on custom order. The bottom feet are intended for horizontal installation of the fan [horizontal orientation of the fan axis]. Fasten the feet to the fan housing flange with M8 or M10 bolts, depending on the equipment size. Note that the motor base must be level in the horizontal plane once the fan has been set in place. The openings in the bottom shelf of each feet allow tightening of vibration dampers.

Do not use type SW bottom feet for installation in the vertical orientation.

Type SW bottom foot								
Fan - Type	Type	A [mm]	B [mm]	C [mm]	d [mm]	H [mm]	L [mm]	m [kg]
mcr Monsun 35	SW-35	305	245	50	12.5	260	344	1.1
mcr Monsun 40	SW-40	300	240	50	12.5	280	444	0.9
mcr Monsun 45	SW-45	320	260	50	12.5	320	444	1.1
mcr Monsun 50	SW-50	400	320	50	12.5	350	544	1.4
mcr Monsun 56	SW-56	450	370	50	12.5	375	644	1.7
mcr Monsun 63	SW-63	500	420	50	12.5	425	544	2.1
mcr Monsun 71	SW-71	550	470	50	12.5	475	694	2.4
mcr Monsun 80	SW-80	650	570	50	12.5	525	694	3.1
mcr Monsun 90	SW-90	700	620	60	12.5	575	834	3.4
mcr Monsun 100	SW-100	780	670	70	12.5	650	924	10.2
mcr Monsun 112	SW-112	900	780	75	18	710	1065	15,5
mcr Monsun 125	SW-125	1000	880	75	18	775	1065	17,5

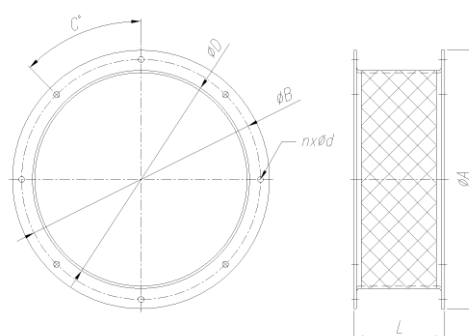


➤ Type KD flexible joint

features a laminar design; it is terminated with a flange with the holes sized and spaced as on the fan housing flange. The special fiberglass silicate textile ensure durability at 400°C for 120 min.

Type KD flexible joint is used to eliminate the vibrations transmitted from the fan to the ventilation system. It acts as a vibration damper. It is also used to compensate for thermal elongation. The fan integrated in a ventilation system should feature the flexible joint on the suction and pressure sides.

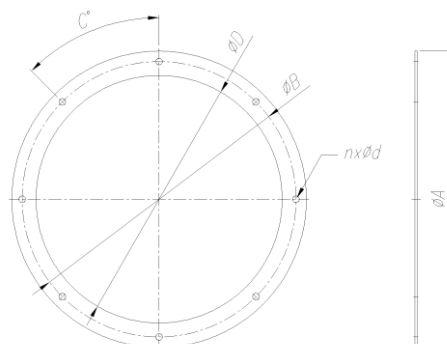
Type KD flexible joint								
Fan - Type	Type	D [mm]	~A [mm]	B [mm]	L [mm]	C	nxd [mm]	m [kg]
mcr Monsun 35	KD-35	355	425	395	150	45	8x9.6	1.1
mcr Monsun 40	KD-40	400	470	438	150	30	12x9.6	1.3
mcr Monsun 45	KD-45	450	520	487	150	30	12x9.6	1.4
mcr Monsun 50	KD-50	500	570	541	150	30	12x9.6	1.6
mcr Monsun 56	KD-56	560	640	605	150	22.5	16x10.5	1.8
mcr Monsun 63	KD-63	630	710	674	200	22.5	16x10.5	2.0
mcr Monsun 71	KD-71	710	790	751	200	22.5	16x10.5	2.3
mcr Monsun 80	KD-80	800	875	837	200	15	24x10.5	2.6
mcr Monsun 90	KD-90	900	975	934	200	15	24x10.5	2.9
mcr Monsun 100	KD-100	1000	1080	1043	200	15	24x10.5	3.2
mcr Monsun 112	KD-112	1120	1240	1190	200	15	24x14	3,5
mcr Monsun 125	KD-125	1250	1370	1320	200	15	24x14	3,8



➤ Type PK counterflange

made of galvanized steel sheet. Powder-coated in standard, or galvanized on custom order. This fitting is first used for installation of type KD flexible joints on the fan and to connect the ventilation system to the ventilator.

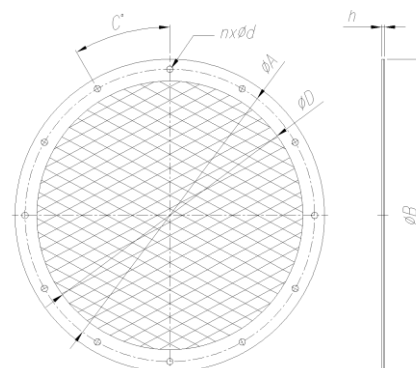
Type PK counterflange							
Fan - Type	Type	D [mm]	~A [mm]	B [mm]	C	nxd [mm]	m [kg]
mcr Monsun 35	PK-35	359	425	395	45	8x9.6	0.9
mcr Monsun 40	PK-40	404	470	438	30	12x9.6	1.0
mcr Monsun 45	PK-45	454	520	487	30	12x9.6	1.2
mcr Monsun 50	PK-50	504	570	541	30	12x9.6	1.3
mcr Monsun 56	PK-56	564	640	605	22.5	16x10.5	1.6
mcr Monsun 63	PK-63	634	710	674	22.5	16x10.5	1.8
mcr Monsun 71	PK-71	716	790	751	22.5	16x10.5	2.0
mcr Monsun 80	PK-80	806	875	837	15	24x10.5	2.1
mcr Monsun 90	PK-90	906	975	934	15	24x10.5	2.2
mcr Monsun 100	PK-100	1006	1080	1043	15	24x10.5	2.8
mcr Monsun 112	PK-112	1126	1240	1190	15	24x14	8,1
mcr Monsun 125	PK-125	1256	1370	1320	15	24x14	9,1



➤ Type SO safety mesh

made of galvanized steel sheet and galvanized wire mesh. Powder-coated in standard, or galvanized on custom order. The fitting protects the fan from ingress of foreign bodies. The product is designed for direct mounting on the fan housing flange with free-flow suction and forcing. Periodically check that the safety mesh is clean and clean it when necessary.

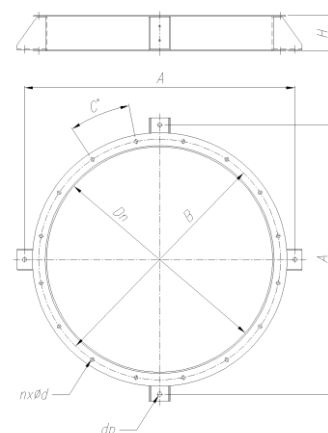
Type SO safety mesh								
Fan - Type	Type	D [mm]	A [mm]	~B [mm]	~h [mm]	C	nxd [mm]	m [kg]
mcr Monsun 35	SO-35	355	395	425	5	45	8x9.6	1.2
mcr Monsun 40	SO-40	400	438	470	5	30	12x9.6	1.3
mcr Monsun 45	SO-45	450	487	520	5	30	12x9.6	1.5
mcr Monsun 50	SO-50	500	541	570	5	30	12x9.6	1.7
mcr Monsun 56	SO-56	560	605	640	5	22.5	16x10.5	2.2
mcr Monsun 63	SO-63	630	674	710	5	22.5	16x10.5	2.5
mcr Monsun 71	SO-71	710	751	790	5	22.5	16x10.5	2.9
mcr Monsun 80	SO-80	800	837	875	5	15	24x10.5	3.1
mcr Monsun 90	SO-90	900	934	975	5	15	24x10.5	3.5
mcr Monsun 100	SO-100	1000	1043	1080	5	15	24x10.5	4.4
mcr Monsun 112	SO-112	1120	1190	1240	7	15	24x14	12,9
mcr Monsun 125	SO-125	1250	1320	1370	7	15	24x14	14,6



➤ Type PP vertical support

made of galvanized steel sheet. Powder-coated in standard, or galvanized on custom order. The product is designed for installing the fan in the vertical orientation. Set the support on e.g. a foundation structure indirectly with vibration dampers bolted to the 4 holders at the support circumference.

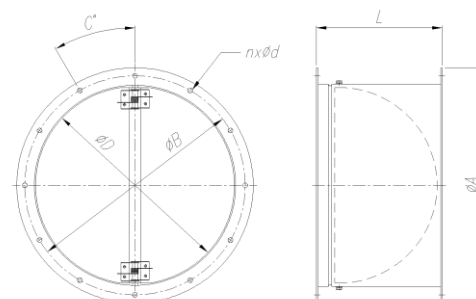
Type PP vertical support									
Fan - Type	Type	Dn [mm]	dp [mm]	A [mm]	H [mm]	B [mm]	nxd [mm]	C [°]	m [kg]
mcr Monsun 35	PP-35	355	12.2	479	50	395	8x9.6	45	5.4
mcr Monsun 40	PP-40	400	12.2	524	50	438	12x9.6	30	5.8
mcr Monsun 45	PP-45	450	12.2	574	50	487	12x9.6	30	6.3
mcr Monsun 50	PP-50	500	12.2	624	50	541	12x9.6	30	6.8
mcr Monsun 56	PP-56	560	12.2	684	50	605	16x10.5	22.5	7.8
mcr Monsun 63	PP-63	630	12.2	754	100	674	16x10.5	22.5	9.1
mcr Monsun 71	PP-71	710	12.2	836	100	751	16x10.5	22.5	11.6
mcr Monsun 80	PP-80	800	12.2	926	100	837	24x10.5	15	12.4
mcr Monsun 90	PP-90	900	12.2	1026	100	934	24x10.5	15	13.3
mcr Monsun 100	PP-100	1000	12.2	1126	100	1043	24x12.2	15	15.2
mcr Monsun 112	PP-112	1120	12.2	1190	100	1190	24x14	15	24
mcr Monsun 125	PP-125	1250	12.2	1460	100	1320	24x14	15	28



➤ Automatic non-return damper: type KS [horizontal] and KS-V [vertical]

the damper body is made of galvanized steel sheet. Powder-coated in standard, or galvanized on custom order. The damper blade is made of aluminium sheet. Type KS and KS-V automatic non-return dampers are installed to prevent air circulation and heat losses when the fan is in standstill. The damper needs to be truly level to operate correctly.

Automatic non-return damper; type KS, KS-V								
Fan - Type	Type	D [mm]	~A [mm]	B [mm]	L [mm]	C	nxd [mm]	m [kg]
mcr Monsun 35	KS[V]-35	355	425	395	240	45	8x9.6	6.6
mcr Monsun 40	KS[V]-40	400	470	438	250	30	12x9.6	7.6
mcr Monsun 45	KS[V]-45	450	520	487	290	30	12x9.6	9.5
mcr Monsun 50	KS[V]-50	500	570	541	320	30	12x9.6	11.3
mcr Monsun 56	KS[V]-56	560	640	605	350	22.5	16x10.5	14.0
mcr Monsun 63	KS[V]-63	630	710	674	360	22.5	16x10.5	16.2
mcr Monsun 71	KS[V]-71	710	790	751	430	22.5	16x10.5	20.8
mcr Monsun 80	KS[V]-80	800	875	837	470	15	24x10.5	24.8
mcr Monsun 90	KS[V]-90	900	975	934	540	15	24x10.5	30.9
mcr Monsun 100	KS[V]-100	1000	1080	1043	580	15	24x10.5	37.4
mcr Monsun 112	KS[V]-112	1120	1240	1190	650	15	24x14	90
mcr Monsun 125	KS[V]-125	1250	1370	1320	700	15	24x14	107



Type KS automatic non-return damper is intended for horizontal installation [with the damper blade in the vertical].

Type KS-V automatic non-return damper is intended for vertical installation [with the damper blade in the horizontal].

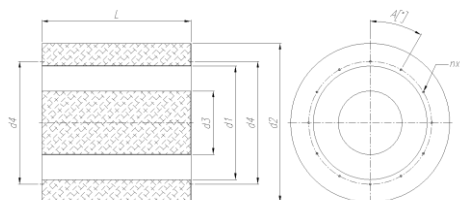
➤ Type TH noise muffler

the noise muffler body is made of galvanized steel sheet. The inner core is made of perforated galvanized metal sheet. The muffling part is made of non-flammable sound-proofing wool.

The threaded holes in the noise muffler allow direct fastening on the fan housing flange. Seal the joint interface with high-temperature silicone.

Type TH noise muffler dampens the noise generated by the fan.

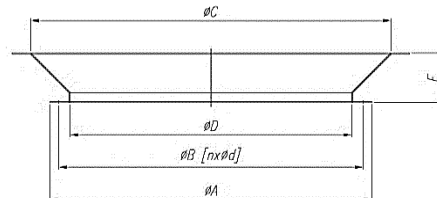
Type TH noise muffler									
Fan - Type	Type	d1 [mm]	d2 [mm]	d3 [mm]	d4 [mm]	L [mm]	A [°]	nxM	m [kg]
mcr Monsun 35	TH-35	359	550	200	395	950	45	8xM8	41
mcr Monsun 40	TH-40	404	600	220	438	950	30	12xM8	53
mcr Monsun 45	TH-45	454	650	250	487	950	30	12xM8	56
mcr Monsun 50	TH-50	504	700	280	541	950	30	12xM8	62
mcr Monsun 56	TH-56	564	760	315	605	950	22.5	16xM8	69
mcr Monsun 63	TH-63	634	830	355	674	950	22.5	16xM8	78
mcr Monsun 71	TH-71	716	960	400	751	1400	22.5	16xM8	122
mcr Monsun 80	TH-80	806	1050	450	837	1400	15	24xM10	138
mcr Monsun 90	TH-90	906	1150	500	934	1400	15	24xM10	155
mcr Monsun 100	TH-100	1006	1250	560	1043	1400	15	24xM10	170
mcr Monsun 112	TH-112	1126	1370	480	1190	1400	15	24xM12	200
mcr Monsun 125	TH-125	1256	1500	480	1320	1400	15	24xM12	250



➤ Type DS nozzle with safety mesh

the nozzle with safety mesh is made of galvanized steel sheet. The product is designed to equalize the air stream entering the fan.

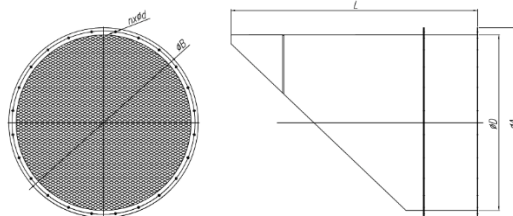
Dysza ssawna osiatkowana DS							
wentylator - typ	typ	D [mm]	A [mm]	~C [mm]	B [mm]	nx d [mm]	E [mm]
mcr Monsun 35	DS-35	355	425	500-700	395	8x10 [co 45 °]	80-200
mcr Monsun 40	DS-40	400	470	540-740	438	12x10 [co 30 °]	80-200
mcr Monsun 45	DS-45	450	520	590-790	487	12x10 [co 30 °]	80-200
mcr Monsun 50	DS-50	500	570	640-840	541	12x10 [co 30 °]	80-200
mcr Monsun 56	DS-56	560	640	710-910	605	16x11 [co 22,5 °]	80-200
mcr Monsun 63	DS-63	630	710	800-1000	674	16x11 [co 22,5 °]	100-300
mcr Monsun 71	DS-71	710	790	890-1090	751	16x11 [co 22,5 °]	100-300
mcr Monsun 80	DS-80	800	875	900-1200	837	24x11 [co 15 °]	100-300
mcr Monsun 90	DS-90	900	975	1000-1300	934	24x11 [co 15 °]	100-400
mcr Monsun 100	DS-100	1000	1080	1100-1400	1043	24x11 [co 15 °]	100-400
mcr Monsun 112	DS-112	1120	1240	1220-1500	1190	24x14 [co 15 °]	150-500
mcr Monsun 125	DS-125	1250	1370	1350-1600	1320	24x14 [co 15 °]	150-500



➤ Type WO outlet nozzle with safety mesh

the nozzle with safety mesh is made of galvanized steel sheet. The product is designed to equalize the air stream exhaust from the fan.

Type WO outlet nozzle with safety mesh						
wentylator – typ	typ	D [mm]	A [mm]	B [mm]	nxd [mm]	L [mm]
mcr Monsun 35	WO-35	355	425	395	8x10 [co 45 °]	1D-3D
mcr Monsun 40	WO-40	400	470	438	12x10 [co 30 °]	1D-3D
mcr Monsun 45	WO-45	450	520	487	12x10 [co 30 °]	1D-3D
mcr Monsun 50	WO-50	500	570	541	12x10 [co 30 °]	1D-3D
mcr Monsun 56	WO-56	560	640	605	16x11 [co 22,5 °]	1D-3D
mcr Monsun 63	WO-63	630	710	674	16x11 [co 22,5 °]	1D-3D
mcr Monsun 71	WO-71	710	790	751	16x11 [co 22,5 °]	1D-3D
mcr Monsun 80	WO-80	800	875	837	24x11 [co 15 °]	1D-3D
mcr Monsun 90	WO-90	900	975	934	24x11 [co 15 °]	1D-3D
mcr Monsun 100	WO-100	1000	1080	1043	24x11 [co 15 °]	1D-3D
mcr Monsun 112	WO-112	1120	1240	1190	24x14 [co 15 °]	1D-3D
mcr Monsun 125	WO-125	1250	1370	1320	24x14 [co 15 °]	1D-3D

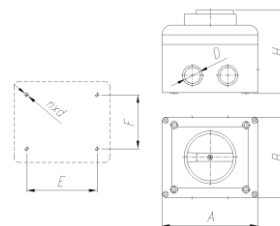


➤ Type WS service switch

Designed to cut-off electric power from the fan when inspection or maintenance work is necessary. Each service switch features an auxiliary contact which indicates the power off position.

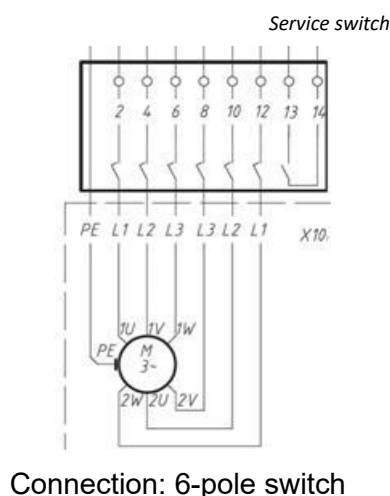
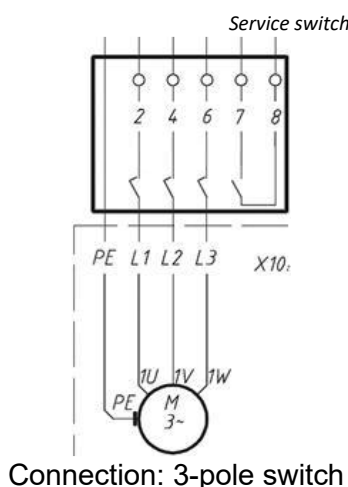
Install the service switch at a minimum distance of 9 cm from the fan body, i.e. on a console attached to e.g. the casing flange.

Type WS service switch										
Type	A [mm]	B [mm]	E [mm]	F [mm]	H [mm]	nxd [mm]	U [V]	I [A]	Glands [D]	Comments
WS-16/3	90	90	67	48	95	4x4	690	16	M20[x4]	3-pole
WS-16/6	90	90	67	48	95	4x4	690	16	M20[x4]	3-pole
WS-32/6	116	100	90	52	108	4x4	690	32	M25[x4]	6-pole
WS-63/6	170	155	105	95	185	4x6	690	63	M25/M32[x4]	6-pole
WS-100/6	200	180	130	125	200	4x6	690	100	M32/M40[x4]	6-pole



The 3-pole service switch is designed for motors rated at 230/400 V [single-speed versions].

The 6-pole service switch is designed for single- and two-speed motors rated at 400/690 V and two-speed motors rated at 230/400 V.



➤ **Type AM/BM vibration damper**

cap-type vibration damper. The fitting is designed for flexible anchoring of the fan on the substrate, level the equipment and limit the transmission of vibrations to the substrate [by accumulating the vibration energy].

The vibration dampers are bolted to type SW bottom feet or type PP vertical support holders.

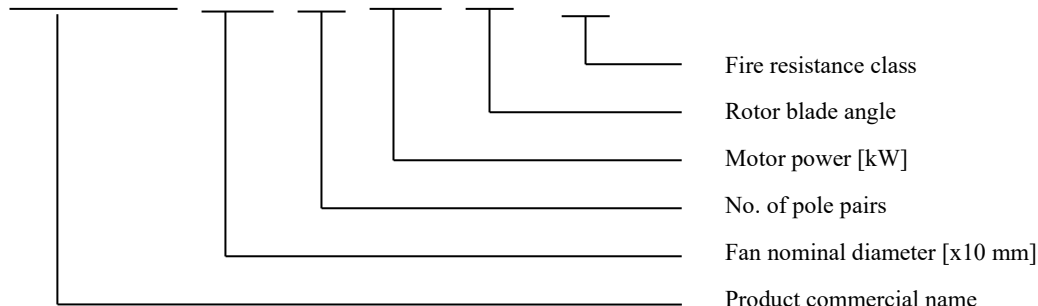
Type AM/BM vibration damper										
wentylator - typ	typ	A[mm]	B[mm]	C[mm]	E[mm]	F[mm]	M	S[mm]	d[mm]	m[kg]
mcr Monsun 35	AM-35	136	80	108	85	135	M12	7	10	0,6
mcr Monsun 40	AM-40									
mcr Monsun 45	AM-45									
mcr Monsun 50	AM-50									
mcr Monsun 56	AM-56									
mcr Monsun 63	AM-63									
mcr Monsun 71	AM-71									
mcr Monsun 80	AM-80									
mcr Monsun 90	AM-90									
mcr Monsun 100	AM-100									
mcr Monsun 112	AM-112									
mcr Monsun 125	AM-125									

6. IDENTIFICATION

MARKING

Example of smoke exhaust fan identification:

mcr Monsun - 50 / 4 - 1.5 - 5 / F400



7. INSTALLATION

The mcr Monsun smoke exhaust axial fan is designed for vertical and horizontal installation. The equipment can be installed indoors or outdoors.

7.1. Pre-assembly inspection

Each smoke exhaust fan is factory inspected by the manufacturer prior to packing and shipping. Upon unpacking the delivered smoke exhaust fan, visually examine it for any damage in transport.

The motor shaft should rotate with the rotor without evident resistance or scraping.

7.2. Location and assembly

The mcr Monsun smoke exhaust fan can be installed horizontally or vertically. Prior to installation, verify the load bearing capacity of the roof, floor, wall or ceiling where the equipment is to be located.

If the smoke exhaust fan is to be installed vertically on a roof, prepare and secure an opening in the roof slope at a diameter that fits the equipment. Set a special roof fan base over and aligned with the opening, and suitable for the roof type, the fan weight and the fan diameter. Level out and anchor the roof fan base to the roof slope. Put the fan on the roof fan base. Fasten both the equipment to the base with bolts. Secure the fan exhaust with a roof exhaust vent assembly to prevent rain water and snow from entering the building through the ducting.

When installing the smoke exhaust fan vertically on a baseplate, put the equipment on type PP vertical support. It is recommended to bolt vibration dampers to the support in order to reduce the vibration from the fan operation.

When installing the smoke exhaust fan horizontally, fasten type SW bottom feet to the fan housing flange with bolts. Set the finished assembly on previously prepared vibration dampers, which have been previously anchored to the substrate or a framework. The anchor and bolt diameter and length must match the equipment size.

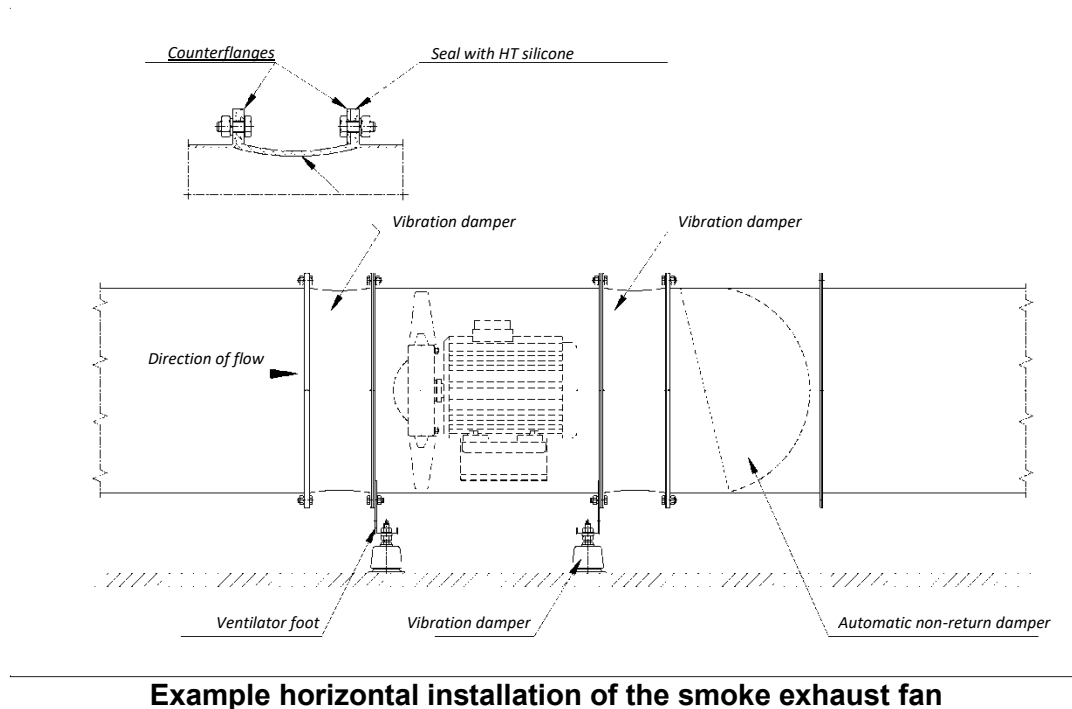
When installing the smoke exhaust fan below a ceiling, do this on a suitable support structure. Install the vibration dampers and bottom feet on the support structure, then place the smoke exhaust fan there. The anchor and bolt diameter and length must match the equipment size.

Connecting the smoke exhaust fan to the (smoke exhaust) ventilation system:

Connect the ventilation duct to the smoke exhaust fan via type PK counterflanges. Use type KD flexible joints, which need to be fastened to the smoke exhaust fan to reduce the vibration transmission to the ducting. This assembly is installed by sealing the joint interfaces [with high-temperature silicone] and tightening the two parts with the bolts sized according to the fan size. The ventilation duct must not exert loads on the smoke exhaust fan or other components of the assembly. The ventilation duct must be supported by independent bearing slings. If the suction and forcing is free-flow, secure the smoke exhaust fan intake and exhaust with type SO safety mesh. If the smoke exhaust fan is operated within a ventilation

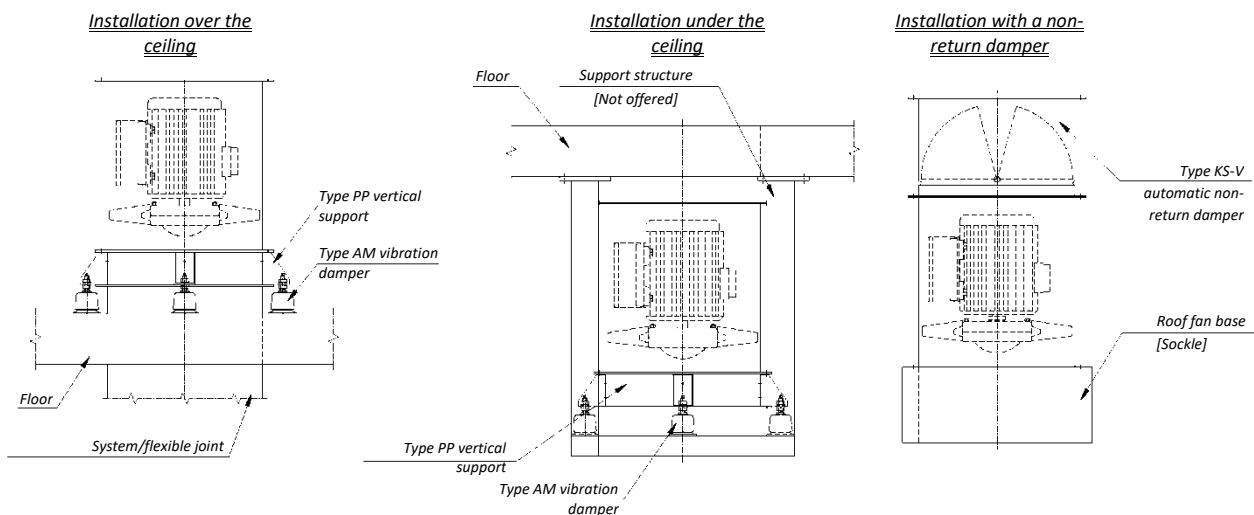
system, secure the intake and exhaust sides from entrainment of foreign bodies or accidental entry of persons, animals, etc.

When installing the smoke exhaust fan, secure the installation site and all involved structures, and prepare passage and access ways for all personnel not involved in the installation. The smoke exhaust fan must be assured to enable inspection and servicing.



Notes:

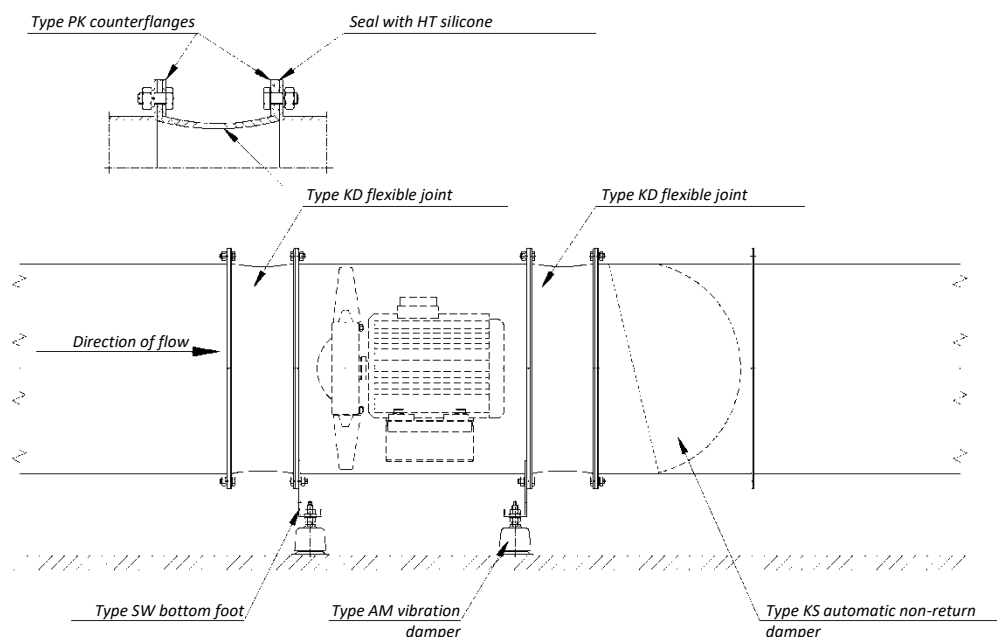
- Secure the system against entrainment of foreign bodies and accidental entry of persons, animals, etc.
- Ensure that the fan is aligned with the system components.
- The automatic non-return damper must be levelled for good performance.
- Install a straight duct section with a min. length of $2.5 \times D$ on the fan pressure side.
- Seal the system joints with silicone or other high-temperature compound.



Example vertical installation of the smoke exhaust fan

Notes:

- The support structure must carry the load of the fan weight



Example installation of accesories

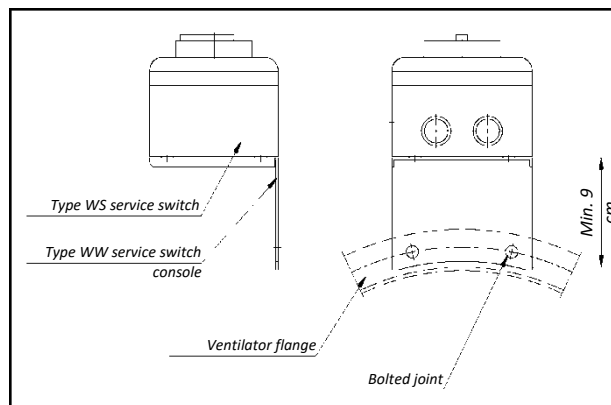
7.3. Electrical connections

Having properly located, placed and fastened the smoke exhaust fan, connect the equipment to the relevant electrical system wiring. Lead the wiring through the gland and into the electric box on the fan housing; then connect the wiring to the terminals according to the diagram shown in the box. The electrical wire with the proper fire resistance rating is installed in standard by the manufacturer between the fan motor and the electric box. Each fan motor must be connected to the electrical power system over a safety switch. The safety level must be present according to the nominal current draw of the fan motor. The protective earth shall be made according to relevant electrical engineering standards.

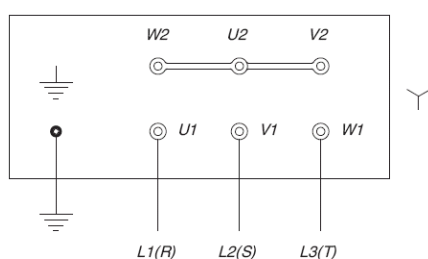
Once the smoke exhaust fan has been commissioned as a part of the system, measure the current draw and verify that it meets the motor rating plate data. The smoke exhaust fan current draw in steady operation must not exceed 1.1 times the current ratings.

The electrical power supply from the control cabinet to the fan power junction box must guarantee uninterrupted operation in the case of a fire. This can be achieved with high temperature resistant wiring or with protective tubing and proper safe routing of the electrical power system. No external service/maintenance switches are to be used, which is to prevent inadvertent shutdown of the smoke exhaust fan (with the sole exception of the fan-dedicated service switch with remote indication of current circuit switching). The smoke exhaust fan control cabinets must be powered directly from main switchboards with guaranteed uninterrupted power supply, even if the entire building is cut off from the power grid. If a main fireman's switch is installed to isolate power from the entire building, the smoke exhaust fan power supply must be independent from that solution and assure normal operation in the case of a fire.

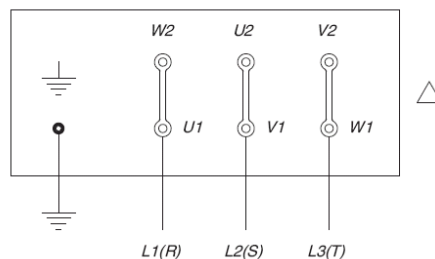
If the system uses the service switch, install it outside of the fan casing, i.e. at a min. distance of 9 cm, on a bracket bolted to e.g. the fan casing flange [see the figure below].



Electrical wiring connections must only be made by electricians with valid licenses.



Connections for 230/400V motors



Connections for 400/690V motors

7.4. Commissioning

Before commissioning your installed smoke exhaust fan, do the following:

- Check that the smoke exhaust fan is properly and firmly fastened.
- Check all seals for tightness.
- Check that all electrical wiring is properly and firmly connected.
- Check that the phase connection sequence and PE/neutral wiring is properly connected.
- Check that the smoke exhaust fan and its connected ducting are free of foreign bodies.
- Check that all protective/safety components have been installed.
- If the checks are positive, start the fan and do a functional test.
- When starting the smoke exhaust fan, verify the motor sense of rotation against the direction arrow on the enclosure.

8. TRANSPORT & STORAGE CONDITIONS

During transport and storage, the mcr Monsun smoke exhaust fans are placed on pallets. Do not topple or throw the packaging during loading and transport. The smoke exhaust fans can be handled and shipped on any means of transport, provided that they are secured against weather and elements. The smoke exhaust fans on transport vehicles must be secured against shifting. Visually inspect each piece of equipment following transport and handling.

Store in sheltered rooms, where:

- there is no exposure to dust particulates, gases, corrosive vapours and other aggressive chemical emissions detrimental to insulation parts and structural components of the ventilator and/or its motor;
- the maximum relative humidity is 80% at +20°C;
- the ambient temperature does not exceed the range of -20°C to + 40°C;
- no vibrations are present.

9. SAFETY MANUAL

Read and understand this Technical Manual before commissioning and servicing the product.

The smoke exhaust fan is not hazardous when firmly attached to a ventilation system and the ventilator support structure.

Make the electrical connections according to the enclosed electrical wiring diagram and the guidelines in Section 7.3. Electrical connections shall be made by personnel with relevant qualifications which have been certified as required by current laws.

Inspect the PE wire connection of the smoke exhaust ventilator during the operating life.

Disconnect the smoke exhaust fan from electrical power before any inspections or checks.

CAUTION:

1. Do not clean smoke exhaust fans of deposits with pressure or steam washers.
2. Loss of seal at the fan connections or flexible ends may result in hazards due to release of the forced medium and requires immediate replacement of leaking components.

If the equipment is malfunctioning (e.g. excessive noise, vibration and/or erratic operation is found), disconnect the fan from electrical power supply, and call the manufacturer's technical service or an inspection and repair contractor authorised by the manufacturer.

10. MAINTENANCE & SERVICING

The equipment from MERCOR L&V require periodic technical inspection and maintenance at least every 12 months throughout its operating life, i.e. during the warranty and post-warranty period. Inspection and maintenance may only be carried out by the manufacturer or contractors authorised by MERCOR L&V to service its products.

Regular service inspections of fire protection equipment is mandatory in Poland according to § 3 Section 3 of the Polish Regulation of the Ministry of the Interior and Administration of 7 June 2010 on the fire protection of buildings, other structures and areas (Polish Journal of Laws, Year 2010, No. 109 Item 719).

Do these recommended actions in the inspection intervals:

- Check the electrical connections, especially for all mechanical damage.
- Check the equipment casing, especially for all mechanical damage.
- Check for any obstructions to proper performance of the equipment.

To facilitate the activities under service inspection, servicing and warranty claim response, e.g. visual inspection or repairs, the equipment user/operator shall provide physical access to the equipment by removing thermal insulation, suspended ceiling, and other installations, as required and applicable to warrant unobstructed access.

In the case of roof mounted equipment, provide access to the area (via ladders or elevated platforms).

If the equipment is only operated for smoke exhaust during fire, test run it for ca. 10 minutes every 3 months.

Refer all matters related to technical inspection, maintenance and servicing of this equipment to the MERCOR L&V Service Department, serwis@mercor.com.pl, tel. +48 58 341 42 45 ext. 170, fax: +48 58 341 39 85, from 8 AM to 4 PM (Mo-Fri).

11. WARRANTY TERMS & CONDITIONS

1. MERCOR L&V provides a 12-month quality guarantee and warranty for the equipment, counting from the date of purchase, unless the contract stipulates otherwise.
2. The purchaser is obliged to check the Products in terms of quality and quantity upon receipt.
3. Any defects, shortages or damage noticed must be entered in the receipt documents or on the consignment note and reported in writing to MERCOR L&V, with all damage to the shipment or product documented with photographs.
4. Reports of damage to the shipment, product or quantity shortages must be sent in writing to MERCOR L&V within 24 hours of the date of receipt of the shipment.

5. Defects not visible at the time of delivery must be reported immediately to MERCOR L&V together with photographic documentation, and reports of quality defects must be made no later than within 5 working days of the date of receipt of the Products.
6. MERCOR L&V reserves the right not to consider the above-mentioned reports in the event of failure to provide (receive) photographic documentation or after the above-mentioned deadlines have been exceeded.
7. Complaints can be made by telephone: 58/341-42-45, by fax: 58/341-39-85, by e-mail: reklamacje@mercor.com.pl or by sending a letter to the following address: MERCOR L&V, ul. Grzegorza z Sanoka 2, 80-408 Gdańsk.
8. If, during the warranty and guarantee period, physical defects covered by the warranty and/or guarantee become apparent, MERCOR L&V undertakes to remove them as soon as possible, counting from the date of receipt of a written notification and delivery of proof of purchase (contract, invoice, delivery document), subject to point 14.
9. MERCOR L&V reserves the right to extend the repair time in the case of complex repairs or repairs requiring the purchase of non-standard components or spare parts.
10. Liability under the warranty and guarantee covers only defects arising from causes inherent in the equipment sold.
11. In the case of defects arising as a result of improper use of the equipment (not in accordance with the technical documentation) or other reasons specified in point 14, the Buyer/warranty holder may be charged with the costs of their removal.
12. The condition for the removal of defects is that the reporting party provides full access to the work site, in particular ensuring: a lift in the case of devices installed at a height of more than 3 m, free access to the rooms where the devices are installed and the necessary inspections, removal of thermal insulation, removal of suspended ceilings, removal of other installations if they prevent free access to the device.
13. If it is not possible to repair the device at the place where it is installed, MERCOR L&V reserves the right to dismantle it, deliver it to the address indicated by MERCOR L&V and reassemble it. The cost of this operation shall be borne by the purchaser/warranty holder.
14. The warranty and guarantee do not cover:
 - damage and failure of devices caused by improper operation (not in accordance with the technical documentation), interference by the user or persons not authorised by MERCOR L&V, lack of periodic technical inspections, failure to perform maintenance activities described in the 'MAINTENANCE AND SERVICE' section of this document;
 - damage to equipment caused by reasons other than those attributable to MERCOR L&V, in particular: random events such as torrential rain, flooding, hurricanes, flooding, lightning strikes, power surges, explosions, hail, aircraft crashes, fire, avalanches, landslides and secondary damage resulting from the above causes. Torrential rain is defined as rain with a yield coefficient of at least 4, as determined by the Institute of Meteorology and Water Management (IMiGW). If it is not possible to determine the coefficient referred to in the preceding sentence, the actual condition and extent of damage at the place where it occurred, which will indicate the effect of torrential rain, will be taken into account. A hurricane is considered to be wind with a speed of not less than 17.5 m/s (damage is considered to have been caused by a hurricane if hurricane activity has been confirmed in the immediate vicinity);
 - damage resulting from failure to comply with the obligation to immediately report a discovered defect;
 - deterioration in the quality of coatings caused by natural ageing processes;
 - defects caused by the use of abrasive or aggressive cleaning agents;
 - damage caused by aggressive external factors, in particular chemical and biological factors, or whose origin is related to production processes and activities carried out in the facility or in its immediate vicinity, where the equipment was installed;
 - parts subject to natural wear and tear during operation (e.g. seals), unless they have a manufacturing defect;
 - damage caused by improper transport, unloading or storage of the equipment;
 - damage caused by installation that does not comply with the technical documentation and good construction practice;
 - devices or their parts in the event of breakage or damage to the nameplate or warranty seals.

15. The warranty and guarantee shall expire with immediate effect if:
- The buyer/warranty and guarantee beneficiary makes structural changes on their own without prior agreement with MERCOR L&V,
 - periodic technical inspections and maintenance activities were not performed on time or were performed by unauthorised persons or a service provider not authorised by MERCOR L&V, or if the equipment was operated incorrectly,
 - there has been any interference by persons not authorised by MERCOR L&V – apart from activities falling within the scope of normal operation of the equipment.
16. The purchaser/warranty and guarantee holder is obliged to operate the equipment properly (in accordance with the technical documentation) and to carry out periodic technical inspections and maintenance activities in accordance with the rules described in this document in the section 'MAINTENANCE AND SERVICE'.

The relevant provisions of the Polish Civil Code shall apply to all matters not regulated in these Warranty Terms & Conditions.

FAN MEASUREMENT REPORT

FAN TYPE	
SERIAL NUMBER	
INSTALLATION SITE	
RATED CURRENT	

Once the fan has been installed at its intended operating site and all electrical connections have been made, immediately measure the current draw in steady-state operation of the equipment.

MEASUREMENT RESULTS [A]

U1	V1	W1	U2	V2	W2

NOTES:

Full name of the measuring technician	Date measured	Signature

Return this Report immediately after completion of measurements to:

MERCOR Light&Vent Sp. z o.o. (MERCOR L&V)

Fire Ventilation Systems
Ul. Grzegorza z Sanoka 2
80-408 Gdańsk

and not later than in 8 weeks from the date of equipment purchase (equivalent to the date of the VAT sales invoice).

THE EQUIPMENT WARRANTY BECOMES ENFORCEABLE UPON RETURN OF THIS MEASUREMENT REPORT