

TECHNICAL MANUAL

Smoke exhaust axial fan mcr Monsun



Version: Monsun 23.07.15.1

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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

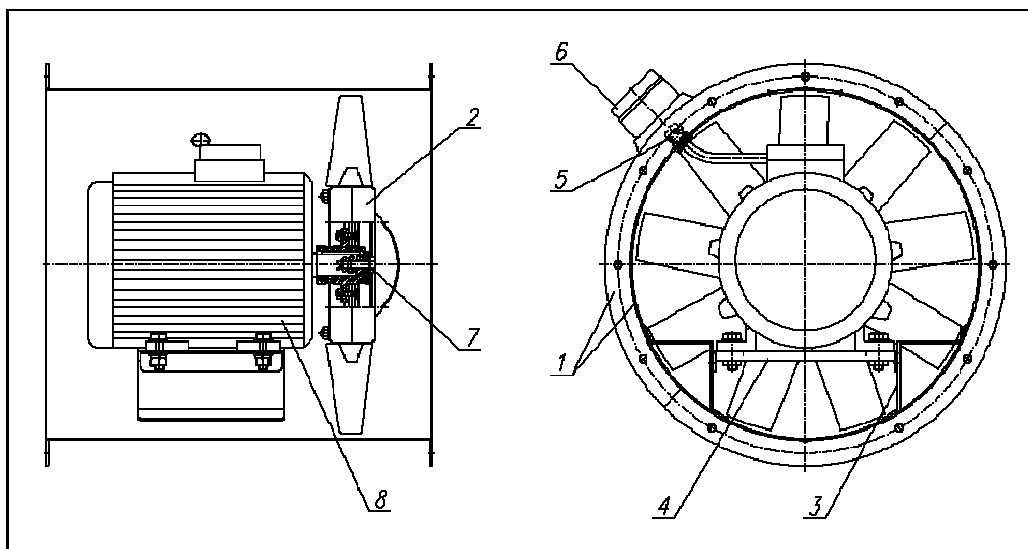
- Class F400 – fire resistance at 400°C for 120 minutes
- Class F300 – fire resistance at 300°C for 60 minutes
- Class F200 – fire resistance at 200°C for 120 minutes

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.

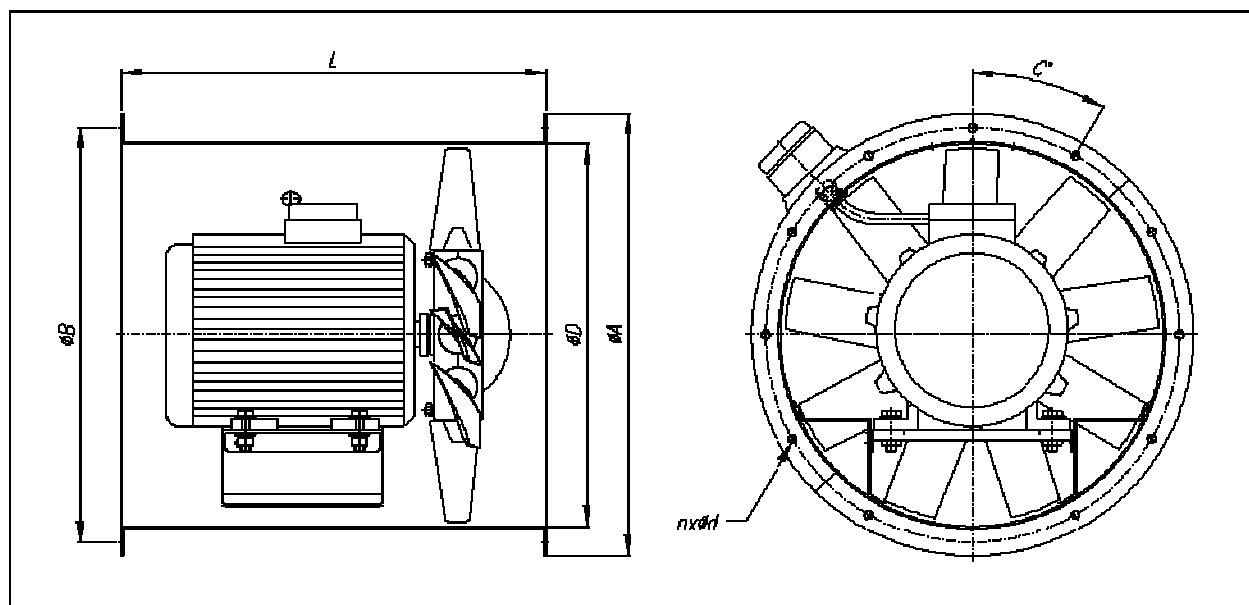
5.2. Function

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



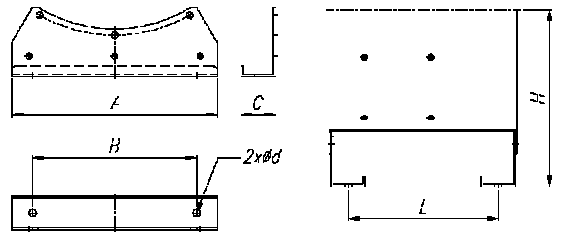
5.4. Accesories

➤ 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.

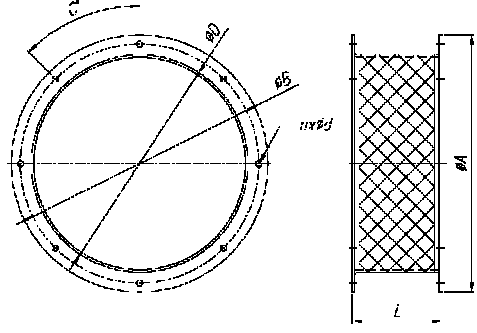
Type SW bottom foot								
Fan - Type	Type	A [mm]	B [mm]	C [mm]	d [mm]	H [mm]	L [mm]	m [kg]
mcr Monsun 35	SW-35	305	245	50	12.5	260	344	1.1
mcr Monsun 40	SW-40	300	240	50	12.5	280	444	0.9
mcr Monsun 45	SW-45	320	260	50	12.5	320	444	1.1
mcr Monsun 50	SW-50	400	320	50	12.5	350	544	1.4
mcr Monsun 56	SW-56	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



➤ 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.

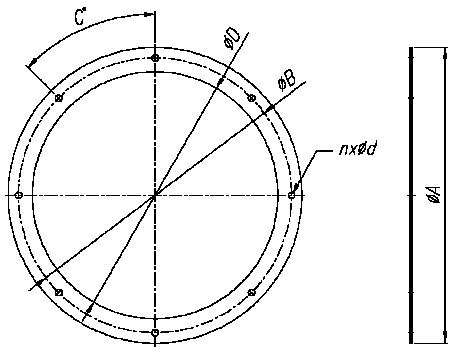
Type KD flexible joint								
Fan - Type	Type	D [mm]	~A [mm]	B [mm]	L [mm]	C	nxd [mm]	m [kg]
mcr Monsun 35	KD-35	355	425	395	150	45	8x9.6	1.1
mcr Monsun 40	KD-40	400	470	438	150	30	12x9.6	1.3
mcr Monsun 45	KD-45	450	520	487	150	30	12x9.6	1.4
mcr Monsun 50	KD-50	500	570	541	150	30	12x9.6	1.6
mcr Monsun 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



➤ 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.

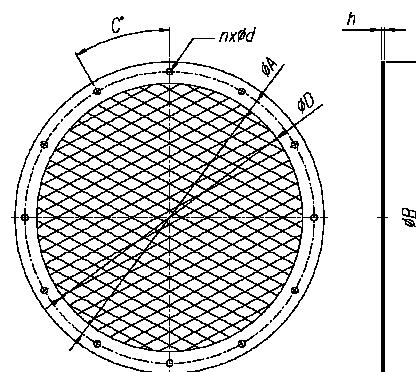
Type PK counterflange							
Fan - Type	Type	D [mm]	~A [mm]	B [mm]	C	nxd [mm]	m [kg]
mcr Monsun 35	PK-35	359	425	395	45	8x9.6	0.9
mcr Monsun 40	PK-40	404	470	438	30	12x9.6	1.0
mcr Monsun 45	PK-45	454	520	487	30	12x9.6	1.2
mcr Monsun 50	PK-50	504	570	541	30	12x9.6	1.3
mcr Monsun 56	PK-56	564	640	605	22.5	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



➤ 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.

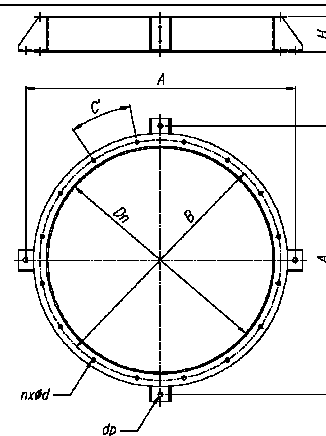
Type SO safety mesh								
Fan - Type	Type	D [mm]	A [mm]	~B [mm]	~h [mm]	C	nxd [mm]	m [kg]
mcr Monsun 35	SO-35	355	395	425	5	45	8x9.6	1.2
mcr Monsun 40	SO-40	400	438	470	5	30	12x9.6	1.3
mcr Monsun 45	SO-45	450	487	520	5	30	12x9.6	1.5
mcr Monsun 50	SO-50	500	541	570	5	30	12x9.6	1.7
mcr Monsun 56	SO-56	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



➤ 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.

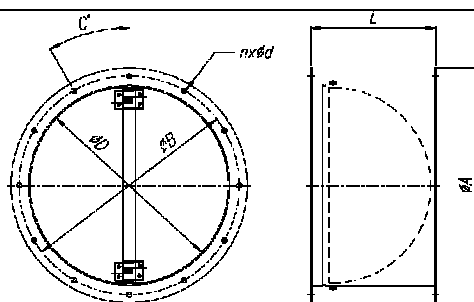
Type PP vertical support									
Fan - Type	Type	Dn [mm]	dp [mm]	A [mm]	H [mm]	B [mm]	nxd [mm]	C [°]	m [kg]
mcr Monsun 35	PP-35	355	12.2	479	50	395	8x9.6	45	5.4
mcr Monsun 40	PP-40	400	12.2	524	50	438	12x9.6	30	5.8
mcr Monsun 45	PP-45	450	12.2	574	50	487	12x9.6	30	6.3
mcr Monsun 50	PP-50	500	12.2	624	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



➤ 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

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

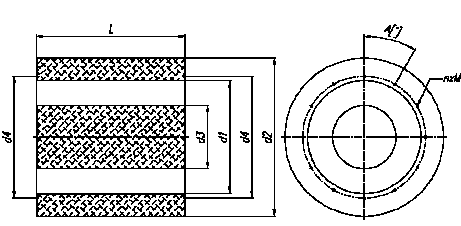
Type KS-V automatic non-return damper is intended for vertical installation [with the damper blade in the horizontal].

➤ 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.

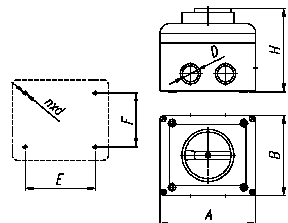
Type TH noise muffler										
Fan - Type	Type	d1 [mm]	d2 [mm]	d3 [mm]	d4 [mm]	L [mm]	A [°]	nxM	m [kg]	
mcr Monsun 35	TH-35	359	550	200	395	950	45	8xM8	41	
mcr Monsun 40	TH-40	404	600	220	438	950	30	12xM8	53	
mcr Monsun 45	TH-45	454	650	250	487	950	30	12xM8	56	
mcr Monsun 50	TH-50	504	700	280	541	950	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	

➤ 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.

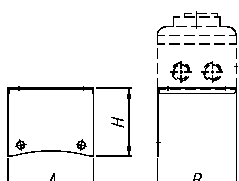
Install the service switch at a minimum distance of 9 cm from the fan body, i.e. on a console attached to e.g. the casing flange.

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



Technical drawing of the Type WS service switch. The drawing includes a side view and a top view. The side view shows the switch with dimensions A (width), B (height), E (base width), F (base height), and H (total height). The top view shows the switch with dimensions A (width) and B (height). A detail of the switch mechanism is shown with a 2x2 scale.

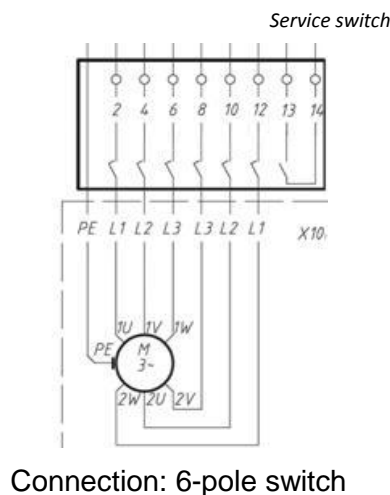
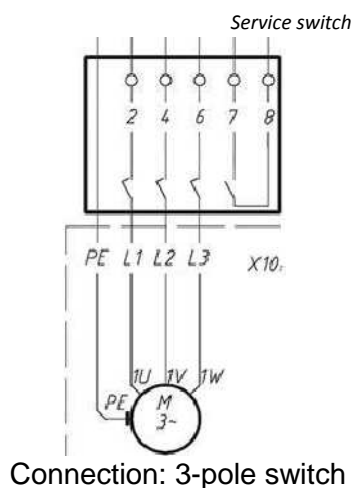
Type WW service switch console			
Type	A [mm]	B [mm]	H [mm]
WW-16	90	90	~100
WW-32	116	100	
WW-63	170	155	
WS-100	200	180	



The technical drawing illustrates the dimensions of the Type WW service switch console. The side view (left) shows a rectangular profile with a curved bottom edge, featuring two mounting holes. Dimension A represents the width, and dimension H represents the height. The top view (right) shows a rectangular footprint with two mounting holes, where dimension B represents the width.

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										
Fan - Type	Type	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									

The technical drawing illustrates the Type AM/BM vibration damper from two perspectives: a side view and a top view. The side view shows the damper's profile with dimensions A (total width), B (width at the base), C (width of the mounting flange), E (height from base to mounting flange), F (height from base to the top of the mounting flange), M (height from base to the top of the mounting flange), S (height from base to the top of the mounting flange), d (height from base to the top of the mounting flange), and m (height from base to the top of the mounting flange). The top view shows the damper's footprint with dimensions A (total width), B (width at the base), C (width of the mounting flange), and d (height from base to the top of the mounting flange).

➤ Type DWS intake nozzle

made of galvanized steel sheet. The nozzle equalizes the air jet at the fan intake.

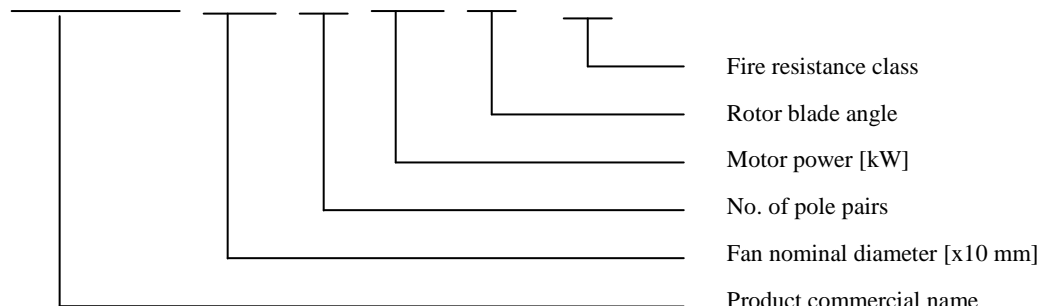
Type DWS tapered intake nozzle							
Type	D [mm]	A [mm]	~C [mm]	B [mm]	nxd [mm]	E [mm]	
DWS-35	355	425	502	395	8x10 [every 45°]	93	
DWS-40	400	470	547	438	12x10 [every 30°]	93	
DWS-45	450	520	597	487	12x10 [every 30°]	93	
DWS-50	500	570	647	541	12x10 [every 30°]	93	
DWS-56	560	640	716	605	16x11 [every 22.5°]	98	
DWS-63	630	710	806	674	16x11 [every 22.5°]	108	
DWS-71	710	790	890	751	16x11 [every 22.5°]	110	
DWS-80	800	875	907	837	24x11 [every 15°]	112	
DWS-90	900	975	1009	934	24x11 [every 15°]	114	
DWS-100	1000	1080	1109	1043	24x11 [every 15°]	114	

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.

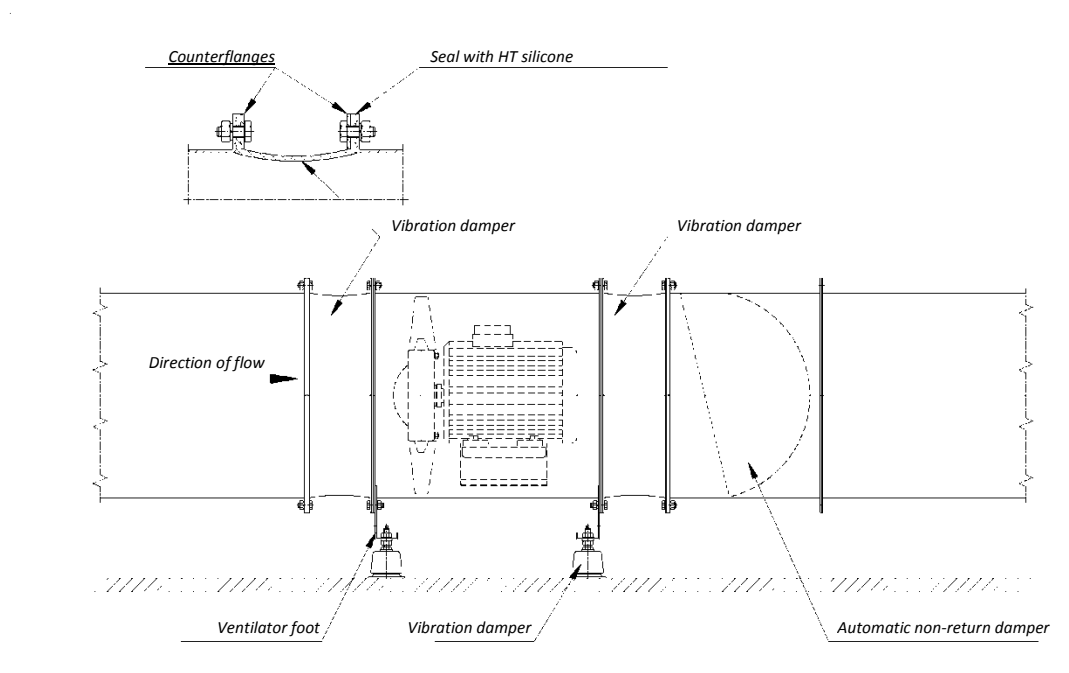
When installing the smoke exhaust fan below a ceiling, do this on a suitable support structure. Install the vibration dampers and bottom feet on the support structure, then place the smoke exhaust fan there. The anchor and bolt diameter and length must match the equipment size.

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.

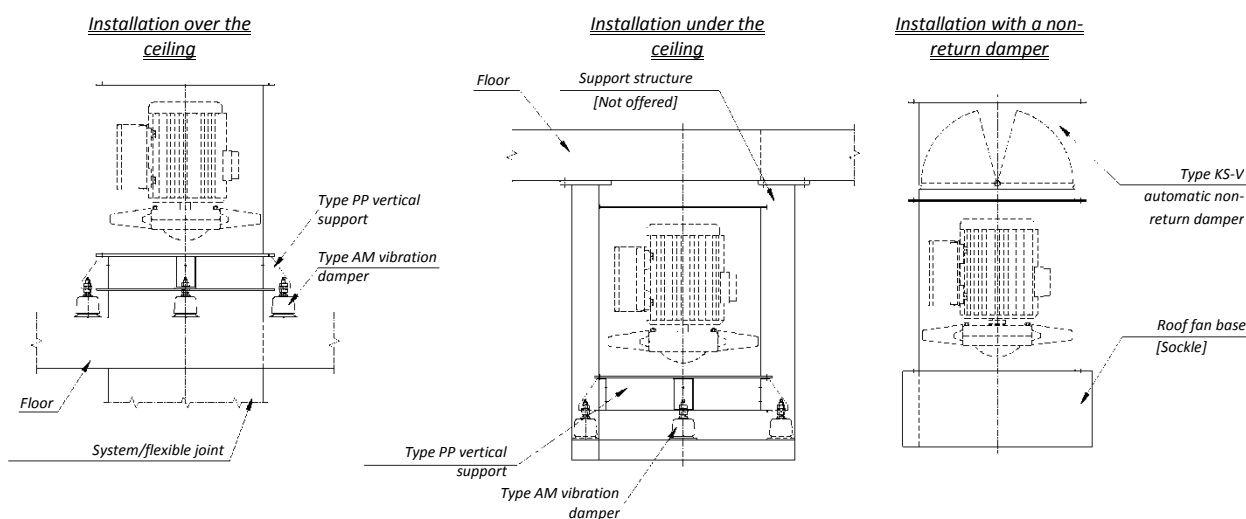
When installing the smoke exhaust fan, secure the installation site and all involved structures, and prepare passage and access ways for all personnel not involved in the installation. The smoke exhaust fan must be assured to enable inspection and servicing.



Example horizontal installation of the smoke exhaust fan

Notes:

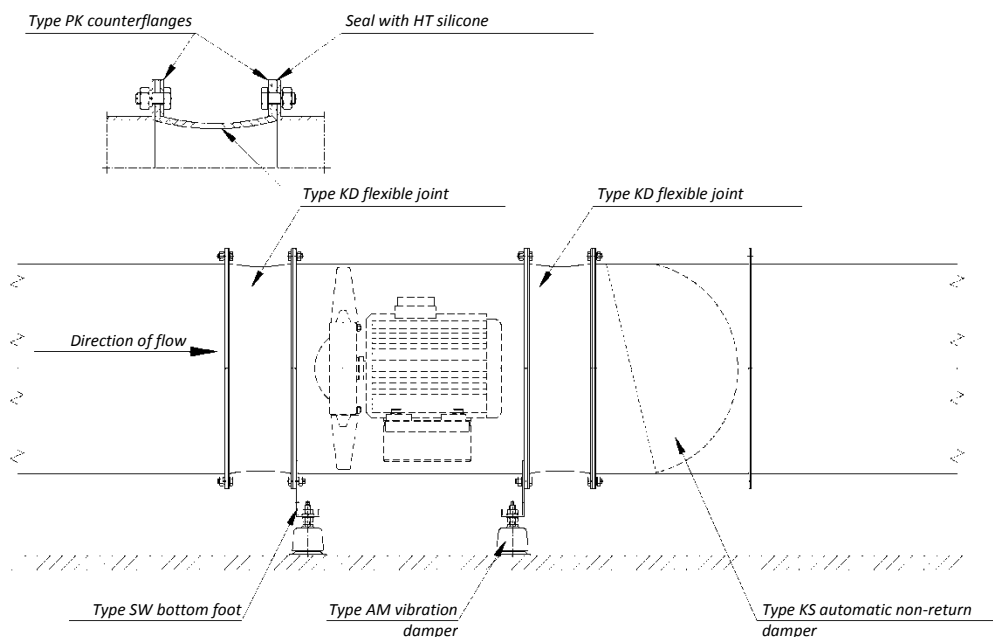
- Secure the system against entrainment of foreign bodies and accidental entry of persons, animals, etc.
- Ensure that the fan is aligned with the system components.
- The automatic non-return damper must be levelled for good performance.
- Install a straight duct section with a min. length of $2.5 \times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

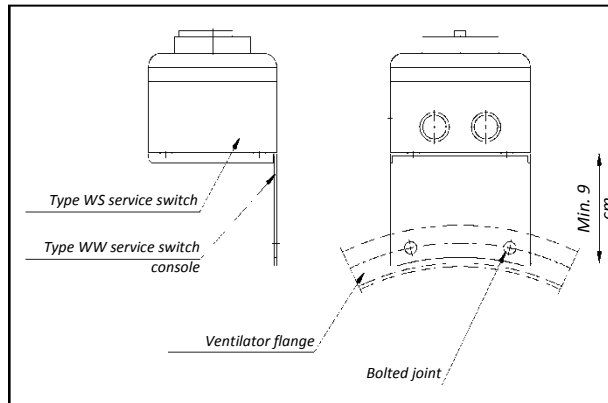
7.3. Electrical connections

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.

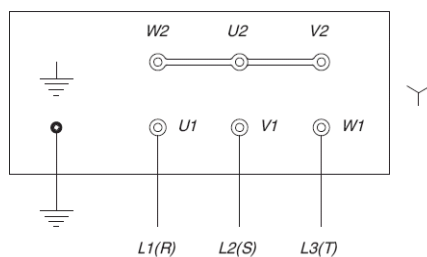
Once the smoke exhaust fan has been commissioned as a part of the system, measure the current draw and verify that it meets the motor rating plate data. The smoke exhaust fan current draw in steady operation must not exceed 1.1 times the current ratings.

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.

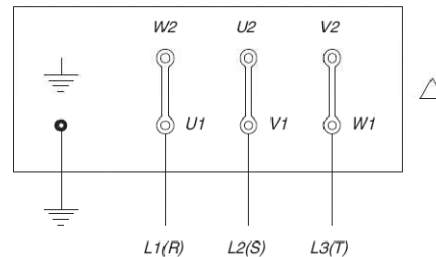
If the system uses the service switch, install it outside of the fan casing, i.e. at a min. distance of 9 cm., on a bracket bolted to e.g. the fan casing flange [see the figure below].



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 SA 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 SA 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 SA Service Department, serwis@mercors.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 SA grants 12 months of warranty for the equipment quality from the date of purchase, unless the sales contract states otherwise.
2. If physical defects of equipment are discovered during the warranty period, MERCOR SA warrants and represents to remove them in 21 days from serving the written warranty claim with the proof of purchase or sales contract, subject to Item 6.
3. MERCOR SA has the right to extend the time of repair if the defect removal is complicated or requires purchase of custom components or spare parts.

4. The warranty liability only covers all defects arising from causes present in the equipment at the date of sale.
5. Defects caused by improper operation or otherwise as listed in Item 6 herein, the buyer / warranty beneficiary will be charged with the costs of their removal.
6. This warranty does not cover the following:
 - Any damage or failure of the equipment caused by improper operation, tampering, failure to conduct periodic technical inspection and/or maintenance established in the Technical Manual "Servicing and Maintenance".
 - Any damage beyond reasonable control of MERCOR SA, and specifically: caused by force majeure, such as torrential rainfall, flooding, hurricanes, inundation, lightning strike, power grid overvoltage, explosion, hail, collision with aircraft, fire, avalanche, landslide and indirect damage due to those causes. Torrential rainfall is understood as any rainfall with the effectiveness factor of 4 or higher according to the definition of the Polish Institute of Meteorology and Water Management - National Research Institute (IMGW-PIB). If the effectiveness factor value specified in the preceding sentence cannot be reasonably established, the actual condition and extent of damage shall be considered at the site of their origin as the action of torrential rain. Hurricane is understood as any wind with a minimum speed of 17.5 m/s (and damage shall be recognised as caused by hurricanes if the action of such weather phenomenon has been found in the direct vicinity of the damaged property).
 - Damage due to failure to immediately report any defect found.
 - Deterioration in the quality of coatings due to natural weathering/ageing.
 - Defects caused by abrasive or aggressive cleaning agents.
 - Damage caused by aggressive external influence, specifically chemical or biological in nature, or when the origin of which is related to the production processing or activity carried out within the facility protected by the equipment or in its direct vicinity.
 - Wearing parts and consumables (e.g. gaskets/seals), unless they have defects of workmanship and/or material.
 - Damage caused by improper transport, handling, unloading and/or storage of the equipment.
 - Damage caused by installation of the equipment in violation of this Technical Manual and/or good construction practice.
 - The equipment and/or parts thereof with removed or damaged nameplate (rating plate) and/or warranty seals.
7. Submit each warranty claim to MERCOR SA in 7 days from the date of discovery of a warranty eligible defect.
8. Warranty claims may be submitted by calling at: tel. +48 58 341 42 45, by fax: +48 58 341 39 85, by e-mail: reklamacje@mercor.com.pl or by traditional mail: MERCOR SA, ul. Grzegorza z Sanoka 2, 80-408 Gdańsk, Poland.
9. The buyer/warranty beneficiary is required to operate the equipment properly and carry out technical inspection and maintenance according to the Technical Manual "Servicing and Maintenance".
10. This warranty shall be made immediately void and null if:
 - The buyer/warranty beneficiary modifies the product design without prior authorisation from MERCOR SA.
 - Periodic technical inspection and/or maintenance are not carried out per schedule and/or are carried out by unauthorised personnel or service providers not authorised to do so by MERCOR SA and/or the equipment has not been properly operated.
 - Unauthorised personnel attempts any intervention in the product outside of the normal operation and maintenance of this equipment.
11. Any circumstances listed in Item 10 will relieve MERCOR SA from the obligation of surety.
12. The defects may be removed if the warranty claimant provides free access to facilitate this, especially to the rooms where the equipment has been installed, and provides the necessary inspection access, removal of thermal insulation systems, suspended ceiling, and any other installations which obstruct access to the equipment, etc.

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 SA
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