



ziegener+frick



Airknife

Mistral

Ziegner + Frick GmbH
Schillerstraße 50
D-74248 Ellhofen



Translation of the installation instruction

Airknife

MISTRAL





Chapters

1 General

2 Safety

3 Technical data

4 Transport / Installation

5 Operation

6 Maintenance



Content

1	General	2
1.1	Scope	2
1.2	Basic information	2
1.3	Structure of the installation instruction	3
1.3.1	Chapters	3
1.3.2	Guidance	3
1.3.3	Lists and References	4
1.4	Symbols / Safety signs	4
1.5	Note on language	5
1.6	Training	5
1.7	Copyright / Editor	5
1.8	Warranty and Liability	5



1 General

This installation instruction supplements e.g. drawings and parts lists, supplier documentations and so on of the device documentation. Together with this it is to consider as a unit.

This chapter contains general information about the structure and the operation of the installation instruction.

1.1 Scope

The installation instruction applies only to those devices or device parts that are supplied by the company Ziegenger + Frick GmbH.

The "Supplier Documentation A - Z" also belongs to the documentation. There you will find detailed information on the components assembled in the system.

The safety and maintenance instructions in the supplier documentation are not overridden by this installation instruction.

1.2 Basic information

This installation instruction contains important information about safe and correct use of the device.

Observance helps to

- Avoid risks,
- Reduce repair costs,
- Reduce down time and
- Increase the reliability and lifetime of the device.

In case of any error, damage, system malfunctions and resulting loss of production by not following this installation instruction, the company Ziegenger + Frick GmbH assumes no liability.

The installation instruction complies with the European Machinery Directive 2006/42/EC and the DIN EN ISO 12100 part 1 and 2.

The installation instruction is part of the device and is supplied with the device documentation of the company Ziegenger + Frick GmbH.

At handover, the documentation complies with the latest date at the delivery of the device.

The documentation must be retained permanently close to the device and must be readily available to any responsible person.

The content of the installation instruction must be read, understood and complied in all respects by all responsible persons. This is especially for safety instructions which are specially marked in the installation instruction.

In addition to the installation instruction and the locally valid rules for accident-prevention at the place of installation, the generally accepted technical rules and professional work are to be followed.

Technical changes that are necessary for the improvement of the device are reserved for the company Ziegenger + Frick GmbH. Changes to the contents or the visual illustrations in the installation instruction are therefore possible.



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.



1.3 Structure of the installation instruction

Because of the considerably amount, the installation instruction can only seldom be read on the whole. It may be useful to become familiar with the information step by step.

Depending on the area of interest, we suggest reading the following chapters of this installation instruction.

1.3.1 Chapters

The installation instruction is divided into the following chapters:

1 General

Basic instructions,
Structure of the installation instruction,
Symbols / security markings

2 Safety

Detailed explanation of safety markings in the installation instruction and on the device
General safety information
Machine specific safety information
Use according to regulations
Foreseeable misuse

3 Technical data

Nameplate, specifications of the device, sound pressure level

4 Transport / Installation

Delivery, transportation, installation, cleaning, adjustment, storage, resale and disposal of the device

5 Operation

Switch on, operation, switch off

6 Maintenance

Maintenance (service, maintenance, repair) of the device and the components

1.3.2 Guidance

At the beginning of each chapter there is a table of contents.

Number and title of each chapter are listed top right on every page.

The page numbering is bottom right.

Example: 2 / 4

The first number is the page number, the second the total number of pages in the corresponding chapter.



1.3.3 Lists and References

Lists are marked with dashes. Example:

The device consists of:

- Part 1
- Part 2

Action steps are shown with points. Example:

- Action
- Action

Action steps that have to be done in a certain order are marked with numbers. Example:

1. Action 1
2. Action 2

References to other sections are marked with quotes and are underlined. Example:

See safety information in chapter "Safety".

1.4 Symbols / Safety signs

Particularly important information in the installation instruction is indicated with symbols.

Detailed information can be found in chapter "Safety".



Warning

Identifies situations that may cause injury or property- and environmental damage.



Instruction

Indicates instructions to wear personal protective equipment. In the installation instruction multiple symbols with different meanings are applied.



Information

Designates hints and other particularly important information.



Environmental Protection

Indicates notes to environmental protection which can cause hazards to the environment when not observed.



1.5 Note on language

Instructions and installation instructions of complete functional units or purchase parts (e.g. electrical and pneumatic components) can be found in the device documentation under "Supplier Documentation A - Z".

Please note that these manuals are partially written in several languages.

If you do not see your language directly on the cover, then it is possibly to find in a later section of the manual. In case of doubt, scroll the manual observantly.

If the manual (e.g. computer manuals) is enclosed in English instead of your own language, so these are documents that are usually written only in English.

1.6 Training

The implementation of the training is conducted on site by our commissioning staff. As training material is the existing installation instruction.

The training will ensure that the people involved with the device have been informed of the safety requirements of the device.

1.7 Copyright / Editor

This installation instruction is subject to copyright and may only be used for the agreed purpose which means as reference to internal purposes. A transfer to third parties or reproduction by any means is permitted in no instance.

All title and copyrights remain at the company Ziegner + Frick GmbH.

1.8 Warranty and Liability

Basically our „General terms of sale and delivery“ apply

These are available for the operator.

Warranty and liability claims for personal injury and property damage are excluded when one or more of the following causes:

- Improper use of the device.
- Incorrect assembly, commissioning, operation and maintenance of the device.
- Operate the device with defective safety equipment or incorrectly placed or non-functional safety and protection equipment.
- Failure to observe the instructions in installation instruction regarding transport, installation, commissioning, operation, maintenance and setup of the device.
- Unauthorised modifications to the device.
- Unauthorised modifications to the software.
- Inadequate monitoring of device parts subjected to wear.
- Improper repair and force majeure.



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.



Content

2	Safety	2
2.1	Safety signs	2
2.1.1	Warnings	2
2.1.2	Warning and ban symbols	3
2.1.3	Instruction symbols	4
2.2	General safety information	5
2.3	Safety equipment	5
2.4	Organisational measures	6
2.4.1	Fire fighting equipment	6
2.5	Personnel selection and qualification	7
2.5.1	First Aid	7
2.5.2	Fire fighting	7
2.6	Safety information on certain phases of operation	8
2.6.1	Normal operation	8
2.6.2	Maintenance	8
2.6.2.1	Isolate	8
2.6.2.2	Secure against resetting	9
2.6.2.3	Verify isolation	9
2.6.2.4	Cleaning	9
2.7	Notes on specific hazards	10
2.7.1	Electricity	10
2.7.2	Pneumatic	10
2.7.3	Solvents and detergents	10
2.7.4	Oils, greases and other chemical substances	11
2.7.5	Noise	11
2.8	Device-specific safety information	12
2.8.1	Proper use	12
2.8.2	Foreseeable misuse	12
2.8.3	Safety equipment on the device	13
2.8.3.1	Safety covers	13
2.9	Organisational measures of the operator	13



2 Safety

This chapter contains

- Information about the used safety labellings
- General safety information and
- Device-specific safety information

The content of this chapter must be read, understood and complied in all respects by all responsible persons. This is especially for safety information which is specially marked in the installation instruction. This information must be considered exactly in all cases.

2.1 Safety signs

The used symbols, as far as they are standardised, conform to the accident prevention regulation BGV A8 and DIN 4844-2.

2.1.1 Warnings

In the installation instruction the warnings are classified according to seriousness of the danger and likelihood of occurrence.

- The described measures to avoid hazards must be considered implicitly.



DANGER

This symbol warns of an **immediate danger** to the health and life of persons. **Failure to heed** these warnings **leads** to serious personal injury or death.



WARNING

This symbol warns of **potentially dangerous situations** for the health and lives of persons.

Failure to heed these warnings **may** lead to serious personal injuries, even death.



CAUTION

This symbol warns of **potentially dangerous situations** for the health of persons or property- and environmentally damage.

Failure to heed these warnings **may** lead to injury or property- and environmental damage.

In the installation instruction warnings, ban- and instruction symbols with different meanings are used. These symbols can also be mounted on the device.

- All symbols on the device are to be observed implicitly! The symbols must always be readable and complete. Damaged or lost symbols must be replaced true to original.

2.1.2 Warning and ban symbols

These symbols identify hazard areas.

	Warning of a hazard area Life-threatening situation.
	Warning of dangerous electrical voltage Life-threatening voltage.
	Warning of hand injuries Risk of bruises.
	Warning of hot surface Risk of burnings.
	Warning of coldness Risk of frostbite.
	Warning of laser beam Risk of eye injury.
	Prohibition for persons with pacemaker Life-threatening situation caused by malfunction of the pacemaker.
	No entry for unauthorised persons Life-threatening situation.



2.1.3 Instruction symbols

The symbols indicate cross references to separate installation instructions and the personal protective equipment to be worn.

- For the denoted activity, the required personal protective equipment should be worn to avoid injury.



Wear eye protection

The safety glasses avoid eye injury from flying parts or mediums.



Wear protective gloves

Work gloves avoid cuts and bruises to hands and fingers.



Wear protective footwear

Protective footwear avoids bruises to feet and toes.



Wear hearing protection

The hearing protection prevents a damage of the hearing.



Wear protection helmet

The protection helmet prevents head injuries.



Observe the instructions

Observing the instructions avoids injuries caused by improper operation.



2.2 General safety information

The device is built according to the state of the art and accredited safety rules. Nevertheless threats to life and limb of the operator or third party respectively damage of the device and other property may arise by using the device.

Use the device only in perfect technical condition as well as in accordance with regulations, safety- and hazards-conscious considering the installation instruction! In particular failures that may affect safety must be removed immediately.

In addition to the installation instruction and the authoritative regulations for accident prevention in the country and place where it is used you also have to consider the accredited technical regulations for safe and professional work.

The installation instruction must be read and executed by each person that is responsible for working with or on the device and must be available and readily to hand for these persons any time.

The installation instruction must be completed by the operator for instructions regarding existing national regulations for accident prevention and environmental protection (see "Organisational measures of the operator")



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.3 Safety equipment

If the demounting of safety equipment during maintenance and repair is required, reassembly must be done immediately after finishing the maintenance and repair work.



WARNING

Risk of injury from moving parts

It is generally prohibited to stuck items through visual openings of safety equipments in order to reach moving parts. This hazard statement applies to all mechanical safety equipments.

This way there is a high risk of injury from moving parts!

Safety equipments that are connected to the device can be removed only with the help of tools. Before such safety equipments are removed you must switch off the main switch and secure it against restart.

In no way invalidate the safety equipments in its protection function.

No changes, additions or reconstructions to the device, in particular those who could affect the safety without authorisation from the manufacturer! The safety equipments are directly for your safety!

Injury or death hazard by removing / bridging of safety equipments!

This also applies to the installation and adjustment of safety equipments as well as for welding of supporting parts.



2.4 Organisational measures

The installation instruction must always be available and readily to hand near the device for the responsible person (operator, maintenance personnel, repair personnel etc).

In addition to the installation instruction, consider and instruct generally admitted, statutory and other authoritative regulations for accident prevention and environmental protection!

Such obligations may as well concern handling hazardous substances or the hiring / wearing of personal protection equipment.

Complete the installation instruction with instructions including supervisory and reporting duties to account for operational characteristics, such as in terms of work organisation, work processes, employed personnel etc. (see "Organisational measures of the operator").

The responsible personnel working on the device must read and understand the installation instruction, in particular the chapter "Safety", before starting work. During working on the device it is too late. This is especially true for personnel working occasionally on the device such as cleaning, lubrication, maintenance and repair work.

Regularly check the safety- and hazard-conscious work of the personnel in accordance with the manual.

Where necessary or required by regulations, use the personal protective equipment!

For safety regarding malfunctions or changes in the operation, stop the device immediately and report the malfunction to a competent body!

Spare parts must meet the technical requirements specified by the manufacturer. Therefore use only genuine spare parts. The use of other parts may cancel the liability of occurring consequences.

Generally keep animals away from the device.

Never modify the software on programmable control systems without written agreement with the manufacturer!

Adhere to the prescribed or in the installation instruction specified intervals for repeating checks /maintenance.

For the purpose of maintenance work appropriate work shop equipment is essential! For information about eventually necessary special tool please check chapter "Maintenance" in the installation instruction.

2.4.1 Fire fighting equipment

The operator must offer an appropriate fire fighting equipment.

- Advertise location and operation of fire extinguishers
- Note the fire alarm and the fire fighting possibilities

When using improper fire fighting equipment

- harmful gases (fumes) can occur
- risk of shock from electrical components occurs. Risk of injury or death by electric shock!



2.5 Personnel selection and qualification

As the operator of this device you are responsible for the prevention of personal injuries, damage of property and environmental damage.

Therefore please note:

- Employ only qualified personnel. Define the responsibilities of the personnel for operating work, checking, cleaning, maintenance and repair work!
- Consider the required minimum age of 18 years!
- Set operator responsibility and allow him rejecting unsafe instructions by third parties!
- Personnel to be trained, to be instructed or personnel being in a general in-firm training may only work with the device under permanent supervision of a competent person!
- Non-skilled workers, such as for loading and unloading activities, may only be employed under permanent supervision of competent persons. Non-skilled workers must also be trained in all safety regulations.
- The operator must advise all persons working on the device of this installation instruction at least once a year. This is especially for the observation of the safety regulations. This is to confirm by the signature of the personnel.
- Working on the electrical equipment of the device must be done by a qualified electrician or a competent person under direction and supervision of a qualified electrician in accordance with the electrical rules!
- Work on pneumatic systems may only be done by personnel with special knowledge and experiences in pneumatics!

2.5.1 First Aid

In case of accidents please refer to the local and internal regulations.

A sufficient number of workers for First Aid must be trained. This training must be repeated at appropriate time.

2.5.2 Fire fighting

For fire fighting, personnel must be trained to operate with appropriate fire fighting equipment. This training must be repeated at appropriate time.

At the outbreak of a fire you must switch off hazardous and vulnerable parts of the power supply unless they must retain under voltage for fire fighting or other hazards come up by switching it off.



DANGER

Risk of injury or death by electric shock!

Never use water to extinguish electrical equipments. Risk of electrical shock.



2.6 Safety information on certain phases of operation



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.6.1 Normal operation

Use the machine only when all protective and safety devices such as emergency stop devices, sensors, detachable safety devices, noise protection, exhaust equipment etc. are present and functioning!

Refrain from doing any unsafe method of working!

Check the device for external visible damage or defects at least once per shift! Any changes (including those of operating performance) immediately report to the responsible body. If necessary, stop the machine immediately and lock it!

Before switching on / starting the device make sure that no one can be endangered by the starting device!

The operation may only start after an adequately trained person over 18 years has established that the safety precautions have been implemented and are effective.

This person may not have done the works by himself.

2.6.2 Maintenance

Observe the service, maintenance and repair activities which are specified in the installation instruction!

Activities must be carried out only by competent persons!

Refrain from doing any unsafe method of working!

Inform the operator of the machine before beginning with maintenance work! Name a supervisor!

For all work relating to modifying, setting the device and its safety regulations as well as service, maintenance and repair, consider the on and off switching process according to the installation instruction.

Secure the maintenance area, where necessary, spacious!

Close off the working area with a red-and-white barricade and a warning sign!

Use the provided or other safety checked lifts and working platforms when assembly work over height of the head. The climbing of working platforms on a ladder and simultaneous transport of parts with the hands is not allowed.

Don't use device parts as a climbing help!

When working at bigger height use anti-fall guard!

2.6.2.1 Isolate

The device to be worked on must be isolated!

If the supervising or the working person didn't isolate the machine itself, he has to wait for the reporting of the isolation.

Setting a time when the device should be isolated doesn't replace the concrete report that it is actually isolated.



2.6.2.2 **Secure against resetting**

Operating materials for example main switches that have been used for unlocking must be secured from being resetted,

- Main switches off and fix.
- Mount warning sign at the main switch!

2.6.2.3 **Verify isolation**

The voltage isolation may only be established by a qualified electrician or an electro-technical instructed person.

The voltage isolation at the working position must be established at all poles.

2.6.2.4 **Cleaning**

Handles, steps, ladders, railings, platforms, stages, etc. keep free from contamination!



2.7 Notes on specific hazards

2.7.1 Electricity

The electrical equipment of the device is to be checked regularly. Defects such as loose connections or braised cables must be corrected immediately.

Use only original fuses with the specified current. In case of malfunctions in the electrical power supply turn off the device immediately!

Work on electrical devices or operating materials may only be executed by a qualified electrician or by a competent person under direction and supervision of a qualified electrician according to electrical engineering rules!

If required you must set device parts to zero potential where inspections, cleaning work, lubrication, maintenance and repair work will be performed. The zero potential set parts first check for no voltage, then short-circuit and ground them and isolate nearby parts being under voltage!

Components being worked on may only be under voltage when it is explicitly required.



DANGER

Warning of dangerous electrical voltage

Never assume that an electric circuit is dead.

- For safety reasons please check the electric circuit always before starting work!

Operate only with appropriate measuring instruments and non-conductive tools.

The main switch is also under voltage when it is turned off.

If maintenance on live components with voltage is necessary, please call a second person who can in case of an emergency switch off the main switch and thereby cut off the voltage.

2.7.2 Pneumatic

System sections and pressure pipes that have to be open must be depressurised before beginning with installation and maintenance work.

Work on pneumatic devices may only be arranged by persons with special knowledge and experience in pneumatics.



DANGER

Risk of injury from escaping compressed air!

Before working on the device it must be ensured that the power supply is interrupted.

- It is therefore not only to turn off and secure the main switch, but also shut off the pressure pipe.

2.7.3 Solvents and detergents

Detergents can contain solvents and are depending on flash point in liquid state (<21 °C) easily flammable or (>21 °C) flammable. While using them explosion and fire hazard can occur! All general rules to avoid explosions and fires have to be observed.

Solvents and detergents can lead to health damage if swallowed, inhaled or absorbed through the skin!

With the removal of the fat in the skin during unprotected handling solvents and detergents, the skin gets cracked and dry. This enables pathogens to penetrate and abets the emergence of skin diseases.

It is essential to pay attention to a skin care program which is well adapted to the solvents and detergents used during operation.

Incidental substances must be retained, recycled or disposed properly.

Ensure safe and environmentally disposal of operating supply items and additives!

2.7.4 Oils, greases and other chemical substances

When working with oils, greases and other chemical substances, please observe the product safety regulations!

Incidental substances (e.g. oil) must be retained, recycled or disposed properly.



CAUTION

Environmental hazard

With improper disposal, operating supply items and additives can lead to environmental damage.

- Provide a safe and environmentally disposal of operating supply items, additives and replacement parts.
 - Conform to the existing national and regional regulations.
-

2.7.5 Noise

The noise protection equipment at the device must be in prescribed protective position during operation.



WARNING

Risk of hearing damage

- In the designated areas, the prescribed personal hearing protection must be worn!
-



2.8 Device-specific safety information



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.8.1 Proper use

Purpose of use

The device may only be used for dusting (cleaning) and drying of contractually defined parts.

Operating conditions

- The device must be installed only in enclosed spaces.
- The electrical equipment is designed for a maximum height of 1000 m above sea level.
- Ambient temperature + 5 °C to + 35 °C
- The average temperature in the vicinity of the electrical components must not exceed the value of + 35 °C within 24 hours.
If these conditions cannot be complied reliably, the customer has to provide an appropriate climatisation.
- Humidity max. 90 % at + 20 °C and 50 % at + 35 °C
- Further it must be assured that no short-term temperature fluctuations occur in such a manner that at any time the temperature falls below the dew point and condensate is produced.

Any other or further use of the device is considered unauthorized. The manufacturer is not liable for damage from improper use. Such risk lies entirely with the user.

2.8.2 Foreseeable misuse

The following are examples for foreseeable misuse:

- Cleaning or blow off of not contractually defined parts and surfaces, for example: freshly varnished surfaces.
- Operate the device with faulty or incorrectly fitted or not operational safety and protection equipment.
- Installation and operation of the device in rooms with high humidity.
- Unauthorized modification to the device or modifying the software.
- Failure to observe the instructions in the installation instruction regarding transport, installation, commissioning, operation and maintenance of the device
- Use by private users without technical training and education.



2.8.3 Safety equipment on the device



DANGER

Mortal danger due to not fixed safety equipment!

Safety equipment performs a personal protection function! They must not be bridged, removed or rendered ineffective in other ways in any case.

2.8.3.1 Safety covers

The assembled protective covers prevent the achievement of moving parts or parts under voltage during operation.

Protective covers provide a personal protection function. They may not be removed or circumvented ulteriorly.

2.9 Organisational measures of the operator

Please complement the installation instruction here with instructions regarding:

- Internal organisation of work
- Workflows
- Relevant responsible staff
- location and operation of fire extinguishers
- Fire detection and fire fighting facilities etc.



Content

3	Technical Data	2
3.1	Equipment Data	2
3.1.1	Dimensions and Material	2
3.1.2	Connections and Adjustment Possibilities	2
3.1.3	Performance Data	2
3.1.4	Operating Temperature	2
3.1.5	Weight	2
3.1.6	Pneumatic Connection	2
3.1.7	Noise Level	2
3.2	Rating Plate	3
3.3	Manufacturer	3
3	Technical Data	2
3.1	Equipment Data	2
3.1.1	Dimensions and Material	2
3.1.2	Connections and Adjustment Possibilities	2
3.1.3	Performance Data	2
3.1.4	Operating Temperature	2
3.1.5	Weight	2
3.1.6	Pneumatic Connection	2
3.1.7	Noise Level	2
3.2	Rating Plate	3
3.3	Manufacturer	3



3 Technical Data

This chapter informs of equipment data, sound pressure level, rating plate, and manufacturer addresses.

3.1 Equipment Data

3.1.1 Dimensions and Material

Type	Material	Dimensions of profile cross-section	Max. profile length	Nozzle slot adjustable from ... to
SS1	V2A / V4A	70 x 90 mm	6000 mm	0.5 ... 5.0 mm
SS2	V2A / V4A	107 x 87 mm	6000 mm	0.5 ... 5.0 mm
SS2L	V2A / V4A	165 x 87 mm	6000 mm	0.5 ... 5.0 mm
ALU	ALU anodized	107 x 77 mm	6000 mm	0.5 ... 3.0 mm
SS1D	V2A / V4A	70 x 90 mm	6000 mm	0.5 ... 5.0 mm

3.1.2 Connections and Adjustment Possibilities

Type	Adjustable nozzle slot	Air connections
SS1	0.5 ... 5.0 mm	Left (optionally right)
SS2	0.5 ... 5.0 mm	Left (optionally right, rear, or top)
SS2L	0.5 ... 5.0 mm	Left (optionally right, rear, or top)
ALU	0.5 ... 3.0 mm	Left (optionally right or front)
SS1D	0.5 ... 5.0 mm	Left (optionally right)

3.1.3 Performance Data

Air outlet velocity
(nozzle slot 1mm, pressure 200 mbars, nozzle slot length 200mm) up to more than 180 m/s

3.1.4 Operating Temperature

Depends on the setting of the nozzle slot approximately 20°C ... 100°C

3.1.5 Weight

Depends on the size of the unit

3.1.6 Pneumatic Connection

Air connection ø 60.3 mm

The unit may only be used with air that satisfies the requirements to ISO 8573.1.

3.1.7 Noise Level

Unit in operation 72 dB (A)



3.2 Rating Plate



NOTE

A rating plate is a document that must never be modified or removed.

- A damaged or lost rating plate must be replaced by a genuine one.



ziegener + frick

Ziegner + Frick GmbH
Schillerstraße 50
D-74248 Ellhofen
07134/13992-0
[www. ziegner-frick.de](http://www.ziegner-frick.de)

Air knife

Model: **Mistral**

Year of build: **2012**

3.3 Manufacturer

Ziegner + Frick GmbH
Schillerstraße 50
D-74248 Ellhofen

Phone: +49-7134-13992-0
Fax: +49-07134-13992-93
Mail: kontakt@ziegener-frick.de
web: [www. ziegner-frick.de](http://www.ziegner-frick.de)



Content

4	Transport / Startup	2
4.1	Safety Instructions	2
4.2	Transporting the Unit	2
4.2.1	Transport Preparations	2
4.2.2	Transport	2
4.3	Installing the Unit	3
4.3.1	Required Characteristics of the Installation Site	3
4.3.2	Securing the Profile	3
4.3.3	Adjusting the Nozzle Slot	4
4.3.4	Joint to Adjust the Outlet Angle (Accessory)	5
4.4	Connecting the Unit	6
4.4.1	Notes for Applications in Potentially Explosive Atmospheres	7
4.4.2	Connecting a Side Channel Blower	7
4.5	Starting up the Unit	7
4.6	Storing the Unit	8
4.6.1	Preparation for Storage	8
4.6.2	Storage	8
4.7	Disposal	8
4	Transport / Startup	2
4.1	Safety Instructions	2
4.2	Transporting the Unit	2
4.2.1	Transport Preparations	2
4.2.2	Transport	2
4.3	Installing the Unit	3
4.3.1	Required Characteristics of the Installation Site	3
4.3.2	Securing the Profile	3
4.3.3	Adjusting the Nozzle Slot	4
4.3.3.1	Mistral ALU Type	4
4.3.3.2	Mistral SS1 / SS1D / SS2 / SS2L / SSHD Types	4
4.3.4	Joint to Adjust the Outlet Angle (Accessory)	5
4.3.4.1	Installing the Joint on Mistral ALU	5
4.3.4.2	Installing the Joint on Mistral SS1 / SS1D / SS2 / SS2L / SSHD	5
4.4	Connecting the Unit	6
4.4.1	Notes for Applications in Potentially Explosive Atmospheres	7
4.4.2	Connecting a Side Channel Blower	7
4.5	Starting up the Unit	7
4.6	Storing the Unit	8
4.6.1	Preparation for Storage	8
4.6.2	Storage	8
4.7	Disposal	8

4 Transport / Startup

This chapter informs of transport, installation, connection, startup, and storage of the unit. The unit is transported and started up by experts from Ziegner + Frick GmbH.



NOTE

Furthermore, observe the following information:

- The safety instructions in the chapter "Safety" and, in particular, the operating conditions in the section "Intended Use."
- Dimensions and weight of the unit in chapter "Technical Data".

4.1 Safety Instructions



DANGER

Risk of death from dropping loads!

Risk of death when standing under suspended loads. Loads can drop.

- Never stand under a suspended load.
- Transport loads as close to the floor as possible.

All transport work must be done by skilled and authorized personnel.

Industrial trucks must comply with the accident prevention regulations.

Take the unit weight into consideration when you select an industrial truck (see chapter "Technical Data").

4.2 Transporting the Unit

4.2.1 Transport Preparations

If you want to transport a unit that has already been put into operation:

- Put the unit properly out of operation.
- De-pressurize all supply lines.
- Disconnect all supply and connecting lines, and secure them safely to the unit.
- Install the transport locks. All moving components of the unit that can freely be moved when the system is without pressure and/or electric power must be secured with adhesive tape or straps.

4.2.2 Transport

- At least two persons are required to lift the unit carefully for the transport.

Secure the unit against falling when you transport it with a crane or an industrial truck.



DANGER

Risk of death from toppling machine and assemblies!

A falling unit or component can lead to serious injuries, or to serious damage to the unit.

4.3 Installing the Unit

4.3.1 Required Characteristics of the Installation Site

A rack is required to install / secure the unit.

The rack must be stable to ensure a secure attachment and alignment of the unit. The unit does not require any separate foundation.

The individual components on the unit must be accessible.

There must be sufficient free space around the unit for operators and service staff.

There must be sufficient space for the air supply connection (if necessary, order profile end plates with elbow joints).

4.3.2 Securing the Profile

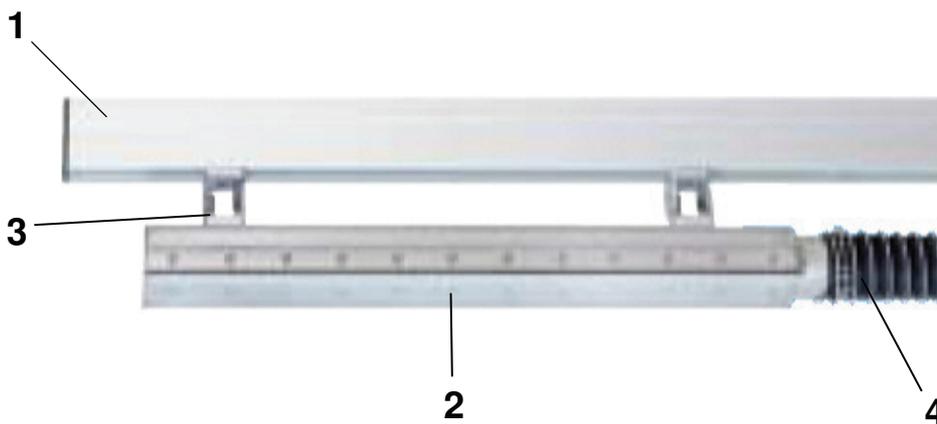


CAUTION

Risk of crushing!

Remove transport locks only when the unit is at the intended place of installation. This makes sure that no assemblies will come off.

- Remove the transport locks only after the machine has been installed.



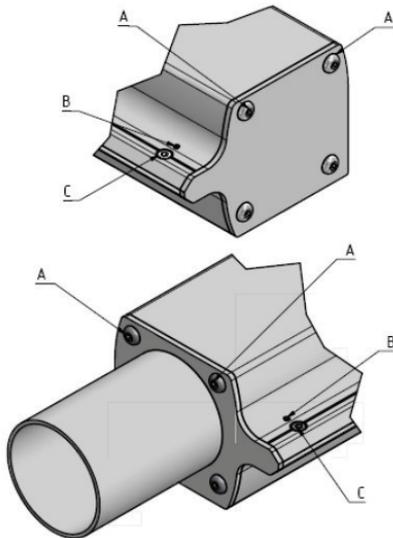
1 Rack (e.g. aluminium profile)
2 Mistral profile

3 Attachment to the rack (here with articulation)
4 Air connection (here straight)

- Secure the unit with the fastening hardware, and align it.
- If necessary, check the alignment with a machine spirit level.
- Set up any assemblies that are transported separately, and attach them as necessary.
- Remove the transport locks (such as adhesive tape or lashing straps).
- Reinstall all components that were removed for the transport.

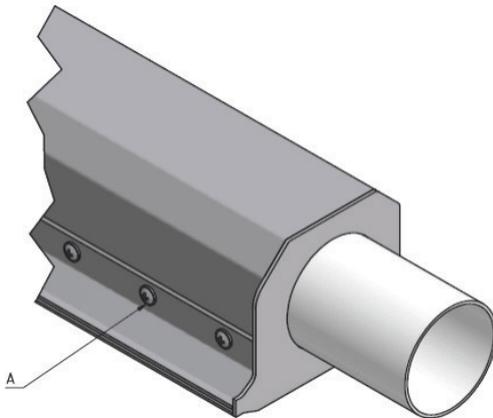
4.3.3 Adjusting the Nozzle Slot

4.3.3.1 Mistral ALU Type



- Release the screws "A" at both sides of the profile (do not remove the screws).
- Release screw "C".
- Turning screw "B" increases the gap.
- Turning screw "C" reduces the gap (release screw "B" first).
- After adjustment, tighten the screws "A" at both sides.

4.3.3.2 Mistral SS1 / SS1D / SS2 / SS2L / SSHD Types



- Release the screws "A" at the oblong holes of the profile.
- Adjust the gap with a gauge or a metre stick.
- After adjustment, tighten the screws "A".

4.3.4 Joint to Adjust the Outlet Angle (Accessory)

To adjust the outlet angle to the workpiece that is to be cleaned, you can install individually adjustable joints that are available as accessories.

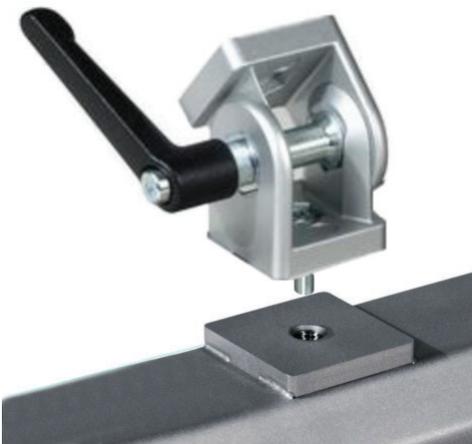
Release the handle to adjust the profile outlet angle steplessly.

4.3.4.1 Installing the Joint on Mistral ALU



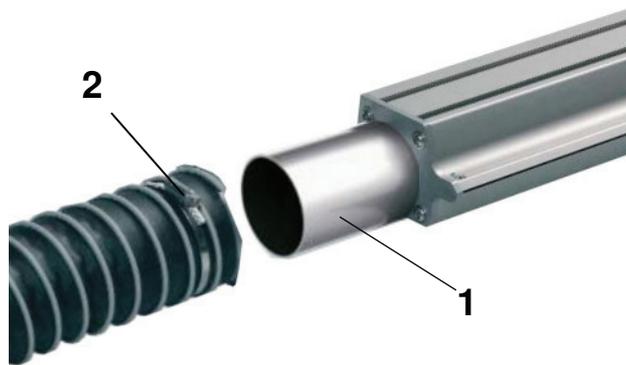
- Remove the lateral screws from one side of the profile.
- Remove the lid from the end face of the profile.
- Remove the screw for the slot stone on the joint to the extent that the slot stone can be inserted into the profile.
- Insert the required number of joints into the profile, and align them.
- Tighten the screws in the slot stones.
- Reinstall the lid on the profile.
- Adjust the outlet angle.

4.3.4.2 Installing the Joint on Mistral SS1 / SS1D / SS2 / SS2L / SSHD



- Secure the joint with an M8 bolt to the weld-on plates.
- Screw the required number of joints to the profile.
- Adjust the outlet angle.

4.4 Connecting the Unit



- 1 Air connection on the profile (here straight)
- 2 Air hose with hose clamp

- Connect the hose to the air connection of the profile.
- Slip the hose on the socket until it hits the stop.
- Tighten the hose clamp.

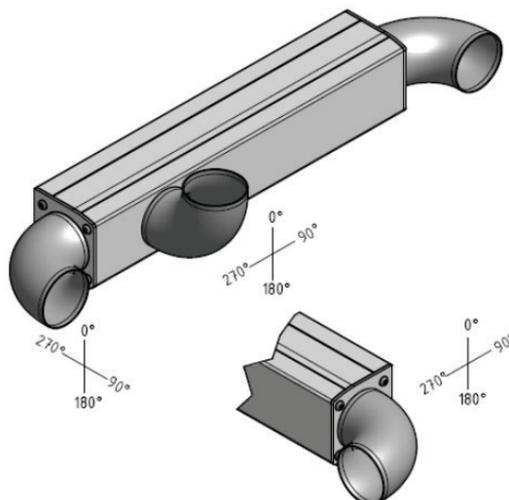


NOTE

The hoses for the air connections must be routed such that they are neither squeezed nor kinked. Kinking and squeezing causes malfunctions and increased noise.

Observe the minimum bending radii when you lay hoses and cables.

- You may already order the end plates of the profiles and/or the housing connections with the required pipe bends when you plan and order the unit.



Typical air connections with pipe bends.

- Connect all supply and connecting lines in accordance with the regulations.
- Check the firm seating of all connections.
- Check the operating pressures, and adjust them as necessary.

4.4.1 Notes for Applications in Potentially Explosive Atmospheres



DANGER

Explosion hazards from unsuitable operating material

Only equipment and operating material that are approved for potentially explosive areas are allowed to be used in a potentially explosive atmosphere.

Only qualified persons are allowed to establish the connections and put the unit into operation in a potentially explosive atmosphere.

All components must properly be earthed.

4.4.2 Connecting a Side Channel Blower

If you want to connect the profile to a side channel blower, you must follow the instructions from the device manufacturer for connection and adjustment.



CAUTION

Risk of injuries from non-observance of instructions

Observe the notes and instructions from the device manufacturer when you connect the unit to a side channel blower.

4.5 Starting up the Unit



DANGER

An incomplete machine may only be put into operation after you have established that the machine / system into which you want to incorporate the incomplete machine complies with the requirements of the Machine Directive 2006/42/EC.

Prior to starting up the machine, check whether:

- The unit has correctly been installed and aligned.
- All screwed connections are tight.
- All lines have correctly been connected.



DANGER

Risk of death when the safety installations are not in place!

Prior to starting up the unit you must check the proper functioning of all guards. Never start up a unit that shows any sign of a defect.

- Carry out a functional test.



Warning of hot surfaces

The surface can be very hot during operation.

Wear protective gloves.

Risk of burn injuries.



4.6 Storing the Unit

4.6.1 Preparation for Storage

- Depressurize all lines and disconnect the connections.
- Disassemble the unit into the components required for transport.
- Treat all uncoated parts with a preservation agent.

4.6.2 Storage

- Store the unit in a dry, well ventilated room, and protect it against contamination.
 - Temperature range + 5 °C ... + 35 °C
 - Humidity 30 ... 95 %, non-condensating
 - Protect the stored machine against ozone, UV radiation, vibration and shock.

Notes on storing electric components:

- Electronic components, e.g. electronic cards, must be stored or kept in appropriate electrostatic protective sleeves. Remove them from their sleeves only immediately before installation.

Prior to putting the unit into operation, you must store all electrical components at a dry place and expose them for 24 hours to the temperature range and atmospheric conditions that are permissible for the operation of the unit. During transportation and storage, too, you must ensure that the equipment - not or no longer in packaging material - will not be exposed to temperatures below dew point, and that no condensation takes place.

After removing the electrical components from rooms with a temperature below + 10 °C, allow them to heat up to at least + 20 °C before you start them up in the unit.



CAUTION

Never warm up the components with heating devices. For stabilization, they must be allowed to warm up over a minimum period of 3 hours.

4.7 Disposal



CAUTION

Risk of damage to the environment!

Comply with the applicable national and regional regulations and the manufacturers' information regarding the disposal of the machine.

- Sort the packaging material by components, and dispose of them separately.
- Sort the operating and auxiliary materials by ingredients, and dispose of them correctly.
- Sort the unit components by material, and dispose of them correctly.



Content

5	Design / Function / Operation	2
5.1	Design	2
5.2	Function	3
5.3	Operation	3
5.3.1	Switching the Unit ON / OFF	3
5.4	Malfunctions	4
5	Design / Function / Operation	2
5.1	Design	2
5.2	Function	3
5.3	Operation	3
5.3.1	Switching the Unit ON / OFF	3
5.4	Malfunctions	4

5 Design / Function / Operation

This chapter informs of design, function, and operation of the unit, and of any malfunctions.



NOTE

Furthermore, observe the following information:

- The safety notes in chapter "Safety";

5.1 Design

The "Mistral" air knife consists of a hollow profile with a nozzle gap. It is used for blowing off parts that are to be cleaned. There are different application-related versions. The base function is the same for all versions.

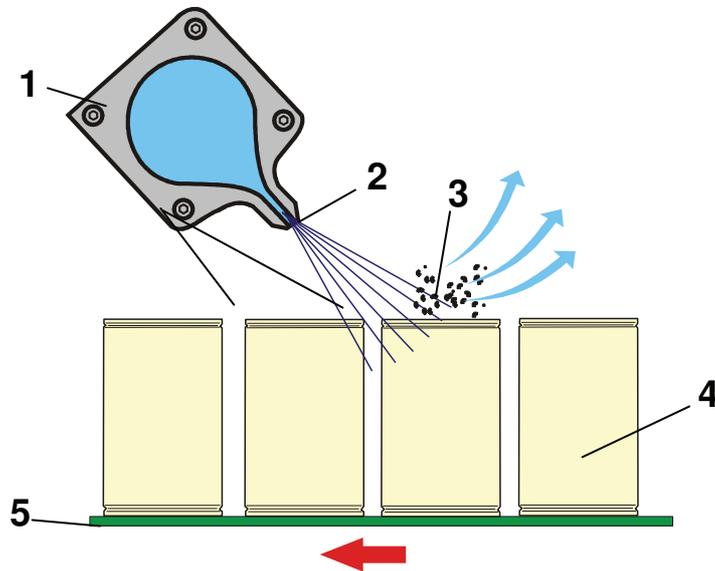
The profiles are installed with fastening devices to a unit or a frame. The nozzle gap is directed to the object that is to be cleaned.



- 1 "MISTRAL" air knife
- 2 Air hose
- 3 Outlet slot
- 4 Rack
- 5 Attachment to the rack
- 6 Product to be cleaned

5.2 Function

The "MISTRAL" air knife employs a sharp air jet to blow particles (dust, production residues, water, etc.) off workpieces.



- | | | | |
|---|--------------------------|---|---------------------|
| 1 | "MISTRAL" air knife | 4 | Workpiece / product |
| 2 | Nozzle slot with air jet | 5 | Conveyor belt |
| 3 | Removed particles | | |

5.3 Operation

The "MISTRAL" air knife is installed in an existing system, and integrated into the operation of the system.



DANGER

An incomplete machine may only be put into operation after you have established that the machine / system into which you want to incorporate the incomplete machine complies with the requirements of the Machine Directive 2006/42/EC.



Warning of hot surfaces

The surface can be very hot during operation.

Wear protective gloves.

Risk of burn injuries.

5.3.1 Switching the Unit ON / OFF

The air supply of the unit is switched on / off with the operating elements of the machine into which the unit has been incorporated.



5.4 Malfunctions

Item	Malfunction	Cause	Remedial action
1	No air at the nozzle slot	No compressed air available	Check the air supply for correct connections and leaks
2	Poor blow-off performance	Outlet angle incorrectly adjusted	Adjust the outlet angle to the workpiece
		Nozzle slot too large or too small	Adjust the nozzle slot
		Air pressure too low	Check the air supply
		Hose kinked or squeezed	Route the hose properly



Translation of the installation instruction

Airknife

MISTRAL





Chapters

1 General

2 Safety

3 Technical data

4 Transport / Installation

5 Operation

6 Maintenance



Content

1	General	2
1.1	Scope	2
1.2	Basic information	2
1.3	Structure of the installation instruction	3
1.3.1	Chapters	3
1.3.2	Guidance	3
1.3.3	Lists and References	4
1.4	Symbols / Safety signs	4
1.5	Note on language	5
1.6	Training	5
1.7	Copyright / Editor	5
1.8	Warranty and Liability	5



1 General

This installation instruction supplements e.g. drawings and parts lists, supplier documentations and so on of the device documentation. Together with this it is to consider as a unit.

This chapter contains general information about the structure and the operation of the installation instruction.

1.1 Scope

The installation instruction applies only to those devices or device parts that are supplied by the company Ziegenger + Frick GmbH.

The "Supplier Documentation A - Z" also belongs to the documentation. There you will find detailed information on the components assembled in the system.

The safety and maintenance instructions in the supplier documentation are not overridden by this installation instruction.

1.2 Basic information

This installation instruction contains important information about safe and correct use of the device.

Observance helps to

- Avoid risks,
- Reduce repair costs,
- Reduce down time and
- Increase the reliability and lifetime of the device.

In case of any error, damage, system malfunctions and resulting loss of production by not following this installation instruction, the company Ziegenger + Frick GmbH assumes no liability.

The installation instruction complies with the European Machinery Directive 2006/42/EC and the DIN EN ISO 12100 part 1 and 2.

The installation instruction is part of the device and is supplied with the device documentation of the company Ziegenger + Frick GmbH.

At handover, the documentation complies with the latest date at the delivery of the device.

The documentation must be retained permanently close to the device and must be readily available to any responsible person.

The content of the installation instruction must be read, understood and complied in all respects by all responsible persons. This is especially for safety instructions which are specially marked in the installation instruction.

In addition to the installation instruction and the locally valid rules for accident-prevention at the place of installation, the generally accepted technical rules and professional work are to be followed.

Technical changes that are necessary for the improvement of the device are reserved for the company Ziegenger + Frick GmbH. Changes to the contents or the visual illustrations in the installation instruction are therefore possible.



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.



1.3 Structure of the installation instruction

Because of the considerably amount, the installation instruction can only seldom be read on the whole. It may be useful to become familiar with the information step by step.

Depending on the area of interest, we suggest reading the following chapters of this installation instruction.

1.3.1 Chapters

The installation instruction is divided into the following chapters:

1 General

Basic instructions,
Structure of the installation instruction,
Symbols / security markings

2 Safety

Detailed explanation of safety markings in the installation instruction and on the device
General safety information
Machine specific safety information
Use according to regulations
Foreseeable misuse

3 Technical data

Nameplate, specifications of the device, sound pressure level

4 Transport / Installation

Delivery, transportation, installation, cleaning, adjustment, storage, resale and disposal of the device

5 Operation

Switch on, operation, switch off

6 Maintenance

Maintenance (service, maintenance, repair) of the device and the components

1.3.2 Guidance

At the beginning of each chapter there is a table of contents.

Number and title of each chapter are listed top right on every page.

The page numbering is bottom right.

Example: 2 / 4

The first number is the page number, the second the total number of pages in the corresponding chapter.



1.3.3 Lists and References

Lists are marked with dashes. Example:

The device consists of:

- Part 1
- Part 2

Action steps are shown with points. Example:

- Action
- Action

Action steps that have to be done in a certain order are marked with numbers. Example:

1. Action 1
2. Action 2

References to other sections are marked with quotes and are underlined. Example:

See safety information in chapter "Safety".

1.4 Symbols / Safety signs

Particularly important information in the installation instruction is indicated with symbols.

Detailed information can be found in chapter "Safety".



Warning

Identifies situations that may cause injury or property- and environmental damage.



Instruction

Indicates instructions to wear personal protective equipment. In the installation instruction multiple symbols with different meanings are applied.



Information

Designates hints and other particularly important information.



Environmental Protection

Indicates notes to environmental protection which can cause hazards to the environment when not observed.



1.5 Note on language

Instructions and installation instructions of complete functional units or purchase parts (e.g. electrical and pneumatic components) can be found in the device documentation under "Supplier Documentation A - Z".

Please note that these manuals are partially written in several languages.

If you do not see your language directly on the cover, then it is possibly to find in a later section of the manual. In case of doubt, scroll the manual observantly.

If the manual (e.g. computer manuals) is enclosed in English instead of your own language, so these are documents that are usually written only in English.

1.6 Training

The implementation of the training is conducted on site by our commissioning staff. As training material is the existing installation instruction.

The training will ensure that the people involved with the device have been informed of the safety requirements of the device.

1.7 Copyright / Editor

This installation instruction is subject to copyright and may only be used for the agreed purpose which means as reference to internal purposes. A transfer to third parties or reproduction by any means is permitted in no instance.

All title and copyrights remain at the company Ziegner + Frick GmbH.

1.8 Warranty and Liability

Basically our „General terms of sale and delivery“ apply

These are available for the operator.

Warranty and liability claims for personal injury and property damage are excluded when one or more of the following causes:

- Improper use of the device.
- Incorrect assembly, commissioning, operation and maintenance of the device.
- Operate the device with defective safety equipment or incorrectly placed or non-functional safety and protection equipment.
- Failure to observe the instructions in installation instruction regarding transport, installation, commissioning, operation, maintenance and setup of the device.
- Unauthorised modifications to the device.
- Unauthorised modifications to the software.
- Inadequate monitoring of device parts subjected to wear.
- Improper repair and force majeure.



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.



Content

2	Safety	2
2.1	Safety signs	2
2.1.1	Warnings	2
2.1.2	Warning and ban symbols	3
2.1.3	Instruction symbols	4
2.2	General safety information	5
2.3	Safety equipment	5
2.4	Organisational measures	6
2.4.1	Fire fighting equipment	6
2.5	Personnel selection and qualification	7
2.5.1	First Aid	7
2.5.2	Fire fighting	7
2.6	Safety information on certain phases of operation	8
2.6.1	Normal operation	8
2.6.2	Maintenance	8
2.6.2.1	Isolate	8
2.6.2.2	Secure against resetting	9
2.6.2.3	Verify isolation	9
2.6.2.4	Cleaning	9
2.7	Notes on specific hazards	10
2.7.1	Electricity	10
2.7.2	Pneumatic	10
2.7.3	Solvents and detergents	10
2.7.4	Oils, greases and other chemical substances	11
2.7.5	Noise	11
2.8	Device-specific safety information	12
2.8.1	Proper use	12
2.8.2	Foreseeable misuse	12
2.8.3	Safety equipment on the device	13
2.8.3.1	Safety covers	13
2.9	Organisational measures of the operator	13



2 Safety

This chapter contains

- Information about the used safety labellings
- General safety information and
- Device-specific safety information

The content of this chapter must be read, understood and complied in all respects by all responsible persons. This is especially for safety information which is specially marked in the installation instruction. This information must be considered exactly in all cases.

2.1 Safety signs

The used symbols, as far as they are standardised, conform to the accident prevention regulation BGV A8 and DIN 4844-2.

2.1.1 Warnings

In the installation instruction the warnings are classified according to seriousness of the danger and likelihood of occurrence.

- The described measures to avoid hazards must be considered implicitly.



DANGER

This symbol warns of an **immediate danger** to the health and life of persons. **Failure to heed** these warnings **leads** to serious personal injury or death.



WARNING

This symbol warns of **potentially dangerous situations** for the health and lives of persons.

Failure to heed these warnings **may** lead to serious personal injuries, even death.



CAUTION

This symbol warns of **potentially dangerous situations** for the health of persons or property- and environmentally damage.

Failure to heed these warnings **may** lead to injury or property- and environmental damage.

In the installation instruction warnings, ban- and instruction symbols with different meanings are used. These symbols can also be mounted on the device.

- All symbols on the device are to be observed implicitly! The symbols must always be readable and complete. Damaged or lost symbols must be replaced true to original.

2.1.2 Warning and ban symbols

These symbols identify hazard areas.

	Warning of a hazard area Life-threatening situation.
	Warning of dangerous electrical voltage Life-threatening voltage.
	Warning of hand injuries Risk of bruises.
	Warning of hot surface Risk of burnings.
	Warning of coldness Risk of frostbite.
	Warning of laser beam Risk of eye injury.
	Prohibition for persons with pacemaker Life-threatening situation caused by malfunction of the pacemaker.
	No entry for unauthorised persons Life-threatening situation.



2.1.3 Instruction symbols

The symbols indicate cross references to separate installation instructions and the personal protective equipment to be worn.

- For the denoted activity, the required personal protective equipment should be worn to avoid injury.



Wear eye protection

The safety glasses avoid eye injury from flying parts or mediums.



Wear protective gloves

Work gloves avoid cuts and bruises to hands and fingers.



Wear protective footwear

Protective footwear avoids bruises to feet and toes.



Wear hearing protection

The hearing protection prevents a damage of the hearing.



Wear protection helmet

The protection helmet prevents head injuries.



Observe the instructions

Observing the instructions avoids injuries caused by improper operation.



2.2 General safety information

The device is built according to the state of the art and accredited safety rules. Nevertheless threats to life and limb of the operator or third party respectively damage of the device and other property may arise by using the device.

Use the device only in perfect technical condition as well as in accordance with regulations, safety- and hazards-conscious considering the installation instruction! In particular failures that may affect safety must be removed immediately.

In addition to the installation instruction and the authoritative regulations for accident prevention in the country and place where it is used you also have to consider the accredited technical regulations for safe and professional work.

The installation instruction must be read and executed by each person that is responsible for working with or on the device and must be available and readily to hand for these persons any time.

The installation instruction must be completed by the operator for instructions regarding existing national regulations for accident prevention and environmental protection (see "Organisational measures of the operator")



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.3 Safety equipment

If the demounting of safety equipment during maintenance and repair is required, reassembly must be done immediately after finishing the maintenance and repair work.



WARNING

Risk of injury from moving parts

It is generally prohibited to stuck items through visual openings of safety equipments in order to reach moving parts. This hazard statement applies to all mechanical safety equipments.

This way there is a high risk of injury from moving parts!

Safety equipments that are connected to the device can be removed only with the help of tools. Before such safety equipments are removed you must switch off the main switch and secure it against restart.

In no way invalidate the safety equipments in its protection function.

No changes, additions or reconstructions to the device, in particular those who could affect the safety without authorisation from the manufacturer! The safety equipments are directly for your safety!

Injury or death hazard by removing / bridging of safety equipments!

This also applies to the installation and adjustment of safety equipments as well as for welding of supporting parts.



2.4 Organisational measures

The installation instruction must always be available and readily to hand near the device for the responsible person (operator, maintenance personnel, repair personnel etc).

In addition to the installation instruction, consider and instruct generally admitted, statutory and other authoritative regulations for accident prevention and environmental protection!

Such obligations may as well concern handling hazardous substances or the hiring / wearing of personal protection equipment.

Complete the installation instruction with instructions including supervisory and reporting duties to account for operational characteristics, such as in terms of work organisation, work processes, employed personnel etc. (see "Organisational measures of the operator").

The responsible personnel working on the device must read and understand the installation instruction, in particular the chapter "Safety", before starting work. During working on the device it is too late. This is especially true for personnel working occasionally on the device such as cleaning, lubrication, maintenance and repair work.

Regularly check the safety- and hazard-conscious work of the personnel in accordance with the manual.

Where necessary or required by regulations, use the personal protective equipment!

For safety regarding malfunctions or changes in the operation, stop the device immediately and report the malfunction to a competent body!

Spare parts must meet the technical requirements specified by the manufacturer. Therefore use only genuine spare parts. The use of other parts may cancel the liability of occurring consequences.

Generally keep animals away from the device.

Never modify the software on programmable control systems without written agreement with the manufacturer!

Adhere to the prescribed or in the installation instruction specified intervals for repeating checks /maintenance.

For the purpose of maintenance work appropriate work shop equipment is essential! For information about eventually necessary special tool please check chapter "Maintenance" in the installation instruction.

2.4.1 Fire fighting equipment

The operator must offer an appropriate fire fighting equipment.

- Advertise location and operation of fire extinguishers
- Note the fire alarm and the fire fighting possibilities

When using improper fire fighting equipment

- harmful gases (fumes) can occur
- risk of shock from electrical components occurs. Risk of injury or death by electric shock!



2.5 Personnel selection and qualification

As the operator of this device you are responsible for the prevention of personal injuries, damage of property and environmental damage.

Therefore please note:

- Employ only qualified personnel. Define the responsibilities of the personnel for operating work, checking, cleaning, maintenance and repair work!
- Consider the required minimum age of 18 years!
- Set operator responsibility and allow him rejecting unsafe instructions by third parties!
- Personnel to be trained, to be instructed or personnel being in a general in-firm training may only work with the device under permanent supervision of a competent person!
- Non-skilled workers, such as for loading and unloading activities, may only be employed under permanent supervision of competent persons. Non-skilled workers must also be trained in all safety regulations.
- The operator must advise all persons working on the device of this installation instruction at least once a year. This is especially for the observation of the safety regulations. This is to confirm by the signature of the personnel.
- Working on the electrical equipment of the device must be done by a qualified electrician or a competent person under direction and supervision of a qualified electrician in accordance with the electrical rules!
- Work on pneumatic systems may only be done by personnel with special knowledge and experiences in pneumatics!

2.5.1 First Aid

In case of accidents please refer to the local and internal regulations.

A sufficient number of workers for First Aid must be trained. This training must be repeated at appropriate time.

2.5.2 Fire fighting

For fire fighting, personnel must be trained to operate with appropriate fire fighting equipment. This training must be repeated at appropriate time.

At the outbreak of a fire you must switch off hazardous and vulnerable parts of the power supply unless they must retain under voltage for fire fighting or other hazards come up by switching it off.



DANGER

Risk of injury or death by electric shock!

Never use water to extinguish electrical equipments. Risk of electrical shock.



2.6 Safety information on certain phases of operation



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.6.1 Normal operation

Use the machine only when all protective and safety devices such as emergency stop devices, sensors, detachable safety devices, noise protection, exhaust equipment etc. are present and functioning!

Refrain from doing any unsafe method of working!

Check the device for external visible damage or defects at least once per shift! Any changes (including those of operating performance) immediately report to the responsible body. If necessary, stop the machine immediately and lock it!

Before switching on / starting the device make sure that no one can be endangered by the starting device!

The operation may only start after an adequately trained person over 18 years has established that the safety precautions have been implemented and are effective.

This person may not have done the works by himself.

2.6.2 Maintenance

Observe the service, maintenance and repair activities which are specified in the installation instruction!

Activities must be carried out only by competent persons!

Refrain from doing any unsafe method of working!

Inform the operator of the machine before beginning with maintenance work! Name a supervisor!

For all work relating to modifying, setting the device and its safety regulations as well as service, maintenance and repair, consider the on and off switching process according to the installation instruction.

Secure the maintenance area, where necessary, spacious!

Close off the working area with a red-and-white barricade and a warning sign!

Use the provided or other safety checked lifts and working platforms when assembly work over height of the head. The climbing of working platforms on a ladder and simultaneous transport of parts with the hands is not allowed.

Don't use device parts as a climbing help!

When working at bigger height use anti-fall guard!

2.6.2.1 Isolate

The device to be worked on must be isolated!

If the supervising or the working person didn't isolate the machine itself, he has to wait for the reporting of the isolation.

Setting a time when the device should be isolated doesn't replace the concrete report that it is actually isolated.



2.6.2.2 **Secure against resetting**

Operating materials for example main switches that have been used for unlocking must be secured from being resetted,

- Main switches off and fix.
- Mount warning sign at the main switch!

2.6.2.3 **Verify isolation**

The voltage isolation may only be established by a qualified electrician or an electro-technical instructed person.

The voltage isolation at the working position must be established at all poles.

2.6.2.4 **Cleaning**

Handles, steps, ladders, railings, platforms, stages, etc. keep free from contamination!



2.7 Notes on specific hazards

2.7.1 Electricity

The electrical equipment of the device is to be checked regularly. Defects such as loose connections or braised cables must be corrected immediately.

Use only original fuses with the specified current. In case of malfunctions in the electrical power supply turn off the device immediately!

Work on electrical devices or operating materials may only be executed by a qualified electrician or by a competent person under direction and supervision of a qualified electrician according to electrical engineering rules!

If required you must set device parts to zero potential where inspections, cleaning work, lubrication, maintenance and repair work will be performed. The zero potential set parts first check for no voltage, then short-circuit and ground them and isolate nearby parts being under voltage!

Components being worked on may only be under voltage when it is explicitly required.



DANGER

Warning of dangerous electrical voltage

Never assume that an electric circuit is dead.

- For safety reasons please check the electric circuit always before starting work!

Operate only with appropriate measuring instruments and non-conductive tools.

The main switch is also under voltage when it is turned off.

If maintenance on live components with voltage is necessary, please call a second person who can in case of an emergency switch off the main switch and thereby cut off the voltage.

2.7.2 Pneumatic

System sections and pressure pipes that have to be open must be depressurised before beginning with installation and maintenance work.

Work on pneumatic devices may only be arranged by persons with special knowledge and experience in pneumatics.



DANGER

Risk of injury from escaping compressed air!

Before working on the device it must be ensured that the power supply is interrupted.

- It is therefore not only to turn off and secure the main switch, but also shut off the pressure pipe.

2.7.3 Solvents and detergents

Detergents can contain solvents and are depending on flash point in liquid state (<21 °C) easily flammable or (>21 °C) flammable. While using them explosion and fire hazard can occur! All general rules to avoid explosions and fires have to be observed.

Solvents and detergents can lead to health damage if swallowed, inhaled or absorbed through the skin!

With the removal of the fat in the skin during unprotected handling solvents and detergents, the skin gets cracked and dry. This enables pathogens to penetrate and abets the emergence of skin diseases.

It is essential to pay attention to a skin care program which is well adapted to the solvents and detergents used during operation.

Incidental substances must be retained, recycled or disposed properly.

Ensure safe and environmentally disposal of operating supply items and additives!

2.7.4 Oils, greases and other chemical substances

When working with oils, greases and other chemical substances, please observe the product safety regulations!

Incidental substances (e.g. oil) must be retained, recycled or disposed properly.



CAUTION

Environmental hazard

With improper disposal, operating supply items and additives can lead to environmental damage.

- Provide a safe and environmentally disposal of operating supply items, additives and replacement parts.
 - Conform to the existing national and regional regulations.
-

2.7.5 Noise

The noise protection equipment at the device must be in prescribed protective position during operation.



WARNING

Risk of hearing damage

- In the designated areas, the prescribed personal hearing protection must be worn!
-

2.8 Device-specific safety information



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.8.1 Proper use

Purpose of use

The device may only be used for dusting (cleaning) and drying of contractually defined parts.

Operating conditions

- The device must be installed only in enclosed spaces.
- The electrical equipment is designed for a maximum height of 1000 m above sea level.
- Ambient temperature + 5 °C to + 35 °C
- The average temperature in the vicinity of the electrical components must not exceed the value of + 35 °C within 24 hours.
If these conditions cannot be complied reliably, the customer has to provide an appropriate climatisation.
- Humidity max. 90 % at + 20 °C and 50 % at + 35 °C
- Further it must be assured that no short-term temperature fluctuations occur in such a manner that at any time the temperature falls below the dew point and condensate is produced.

Any other or further use of the device is considered unauthorized. The manufacturer is not liable for damage from improper use. Such risk lies entirely with the user.

2.8.2 Foreseeable misuse

The following are examples for foreseeable misuse:

- Cleaning or blow off of not contractually defined parts and surfaces, for example: freshly varnished surfaces.
- Operate the device with faulty or incorrectly fitted or not operational safety and protection equipment.
- Installation and operation of the device in rooms with high humidity.
- Unauthorized modification to the device or modifying the software.
- Failure to observe the instructions in the installation instruction regarding transport, installation, commissioning, operation and maintenance of the device
- Use by private users without technical training and education.



2.8.3 Safety equipment on the device



DANGER

Mortal danger due to not fixed safety equipment!

Safety equipment performs a personal protection function! They must not be bridged, removed or rendered ineffective in other ways in any case.

2.8.3.1 Safety covers

The assembled protective covers prevent the achievement of moving parts or parts under voltage during operation.

Protective covers provide a personal protection function. They may not be removed or circumvented ulteriorly.

2.9 Organisational measures of the operator

Please complement the installation instruction here with instructions regarding:

- Internal organisation of work
- Workflows
- Relevant responsible staff
- location and operation of fire extinguishers
- Fire detection and fire fighting facilities etc.



Content

3	Technical Data	2
3.1	Equipment Data	2
3.1.1	Dimensions and Material	2
3.1.2	Connections and Adjustment Possibilities	2
3.1.3	Performance Data	2
3.1.4	Operating Temperature	2
3.1.5	Weight	2
3.1.6	Pneumatic Connection	2
3.1.7	Noise Level	2
3.2	Rating Plate	3
3.3	Manufacturer	3
3	Technical Data	2
3.1	Equipment Data	2
3.1.1	Dimensions and Material	2
3.1.2	Connections and Adjustment Possibilities	2
3.1.3	Performance Data	2
3.1.4	Operating Temperature	2
3.1.5	Weight	2
3.1.6	Pneumatic Connection	2
3.1.7	Noise Level	2
3.2	Rating Plate	3
3.3	Manufacturer	3



3 Technical Data

This chapter informs of equipment data, sound pressure level, rating plate, and manufacturer addresses.

3.1 Equipment Data

3.1.1 Dimensions and Material

Type	Material	Dimensions of profile cross-section	Max. profile length	Nozzle slot adjustable from ... to
SS1	V2A / V4A	70 x 90 mm	6000 mm	0.5 ... 5.0 mm
SS2	V2A / V4A	107 x 87 mm	6000 mm	0.5 ... 5.0 mm
SS2L	V2A / V4A	165 x 87 mm	6000 mm	0.5 ... 5.0 mm
ALU	ALU anodized	107 x 77 mm	6000 mm	0.5 ... 3.0 mm
SS1D	V2A / V4A	70 x 90 mm	6000 mm	0.5 ... 5.0 mm

3.1.2 Connections and Adjustment Possibilities

Type	Adjustable nozzle slot	Air connections
SS1	0.5 ... 5.0 mm	Left (optionally right)
SS2	0.5 ... 5.0 mm	Left (optionally right, rear, or top)
SS2L	0.5 ... 5.0 mm	Left (optionally right, rear, or top)
ALU	0.5 ... 3.0 mm	Left (optionally right or front)
SS1D	0.5 ... 5.0 mm	Left (optionally right)

3.1.3 Performance Data

Air outlet velocity
(nozzle slot 1mm, pressure 200 mbars, nozzle slot length 200mm) up to more than 180 m/s

3.1.4 Operating Temperature

Depends on the setting of the nozzle slot approximately 20°C ... 100°C

3.1.5 Weight

Depends on the size of the unit

3.1.6 Pneumatic Connection

Air connection ø 60.3 mm

The unit may only be used with air that satisfies the requirements to ISO 8573.1.

3.1.7 Noise Level

Unit in operation 72 dB (A)



3.2 Rating Plate



NOTE

A rating plate is a document that must never be modified or removed.

- A damaged or lost rating plate must be replaced by a genuine one.



ziegener + frick

Ziegner + Frick GmbH
Schillerstraße 50
D-74248 Ellhofen
07134/13992-0
[www. ziegner-frick.de](http://www.ziegner-frick.de)

Air knife

Model: **Mistral**

Year of build: **2012**

3.3 Manufacturer

Ziegner + Frick GmbH
Schillerstraße 50
D-74248 Ellhofen

Phone: +49-7134-13992-0
Fax: +49-07134-13992-93
Mail: kontakt@ziegener-frick.de
web: [www. ziegner-frick.de](http://www.ziegner-frick.de)



Content

4	Transport / Startup	2
4.1	Safety Instructions	2
4.2	Transporting the Unit	2
4.2.1	Transport Preparations	2
4.2.2	Transport	2
4.3	Installing the Unit	3
4.3.1	Required Characteristics of the Installation Site	3
4.3.2	Securing the Profile	3
4.3.3	Adjusting the Nozzle Slot	4
4.3.4	Joint to Adjust the Outlet Angle (Accessory)	5
4.4	Connecting the Unit	6
4.4.1	Notes for Applications in Potentially Explosive Atmospheres	7
4.4.2	Connecting a Side Channel Blower	7
4.5	Starting up the Unit	7
4.6	Storing the Unit	8
4.6.1	Preparation for Storage	8
4.6.2	Storage	8
4.7	Disposal	8
4	Transport / Startup	2
4.1	Safety Instructions	2
4.2	Transporting the Unit	2
4.2.1	Transport Preparations	2
4.2.2	Transport	2
4.3	Installing the Unit	3
4.3.1	Required Characteristics of the Installation Site	3
4.3.2	Securing the Profile	3
4.3.3	Adjusting the Nozzle Slot	4
4.3.3.1	Mistral ALU Type	4
4.3.3.2	Mistral SS1 / SS1D / SS2 / SS2L / SSHD Types	4
4.3.4	Joint to Adjust the Outlet Angle (Accessory)	5
4.3.4.1	Installing the Joint on Mistral ALU	5
4.3.4.2	Installing the Joint on Mistral SS1 / SS1D / SS2 / SS2L / SSHD	5
4.4	Connecting the Unit	6
4.4.1	Notes for Applications in Potentially Explosive Atmospheres	7
4.4.2	Connecting a Side Channel Blower	7
4.5	Starting up the Unit	7
4.6	Storing the Unit	8
4.6.1	Preparation for Storage	8
4.6.2	Storage	8
4.7	Disposal	8

4 Transport / Startup

This chapter informs of transport, installation, connection, startup, and storage of the unit. The unit is transported and started up by experts from Ziegner + Frick GmbH.



NOTE

Furthermore, observe the following information:

- The safety instructions in the chapter "Safety" and, in particular, the operating conditions in the section "Intended Use."
- Dimensions and weight of the unit in chapter "Technical Data".

4.1 Safety Instructions



DANGER

Risk of death from dropping loads!

Risk of death when standing under suspended loads. Loads can drop.

- Never stand under a suspended load.
- Transport loads as close to the floor as possible.

All transport work must be done by skilled and authorized personnel.

Industrial trucks must comply with the accident prevention regulations.

Take the unit weight into consideration when you select an industrial truck (see chapter "Technical Data").

4.2 Transporting the Unit

4.2.1 Transport Preparations

If you want to transport a unit that has already been put into operation:

- Put the unit properly out of operation.
- De-pressurize all supply lines.
- Disconnect all supply and connecting lines, and secure them safely to the unit.
- Install the transport locks. All moving components of the unit that can freely be moved when the system is without pressure and/or electric power must be secured with adhesive tape or straps.

4.2.2 Transport

- At least two persons are required to lift the unit carefully for the transport.

Secure the unit against falling when you transport it with a crane or an industrial truck.



DANGER

Risk of death from toppling machine and assemblies!

A falling unit or component can lead to serious injuries, or to serious damage to the unit.



4.3 Installing the Unit

4.3.1 Required Characteristics of the Installation Site

A rack is required to install / secure the unit.

The rack must be stable to ensure a secure attachment and alignment of the unit. The unit does not require any separate foundation.

The individual components on the unit must be accessible.

There must be sufficient free space around the unit for operators and service staff.

There must be sufficient space for the air supply connection (if necessary, order profile end plates with elbow joints).

4.3.2 Securing the Profile

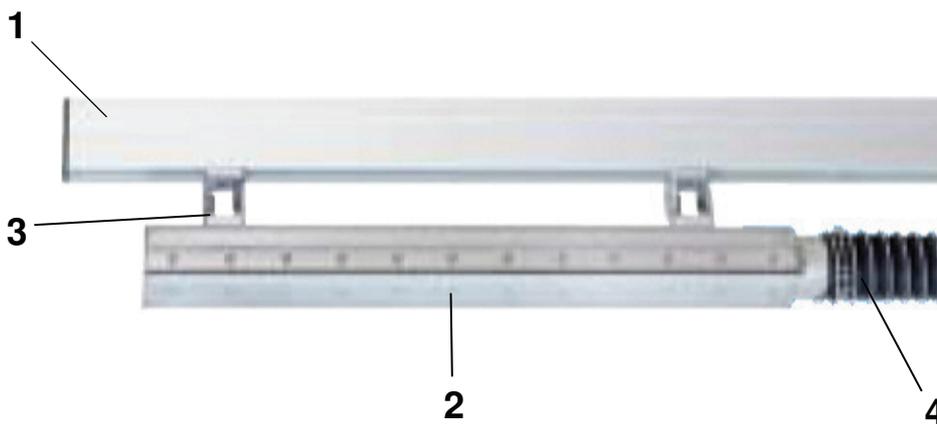


CAUTION

Risk of crushing!

Remove transport locks only when the unit is at the intended place of installation. This makes sure that no assemblies will come off.

- Remove the transport locks only after the machine has been installed.



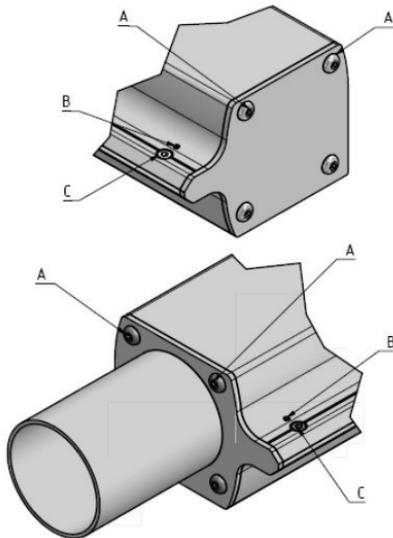
1 Rack (e.g. aluminium profile)
2 Mistral profile

3 Attachment to the rack (here with articulation)
4 Air connection (here straight)

- Secure the unit with the fastening hardware, and align it.
- If necessary, check the alignment with a machine spirit level.
- Set up any assemblies that are transported separately, and attach them as necessary.
- Remove the transport locks (such as adhesive tape or lashing straps).
- Reinstall all components that were removed for the transport.

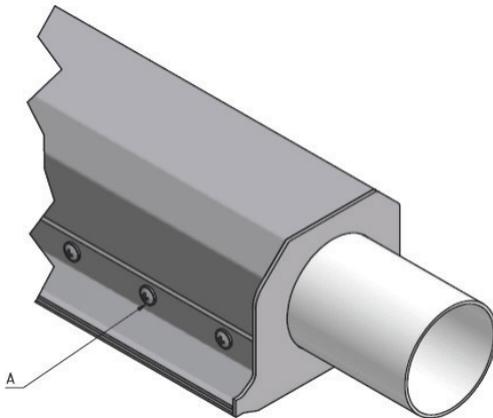
4.3.3 Adjusting the Nozzle Slot

4.3.3.1 Mistral ALU Type



- Release the screws "A" at both sides of the profile (do not remove the screws).
- Release screw "C".
- Turning screw "B" increases the gap.
- Turning screw "C" reduces the gap (release screw "B" first).
- After adjustment, tighten the screws "A" at both sides.

4.3.3.2 Mistral SS1 / SS1D / SS2 / SS2L / SSHD Types



- Release the screws "A" at the oblong holes of the profile.
- Adjust the gap with a gauge or a metre stick.
- After adjustment, tighten the screws "A".

4.3.4 Joint to Adjust the Outlet Angle (Accessory)

To adjust the outlet angle to the workpiece that is to be cleaned, you can install individually adjustable joints that are available as accessories.

Release the handle to adjust the profile outlet angle steplessly.

4.3.4.1 Installing the Joint on Mistral ALU



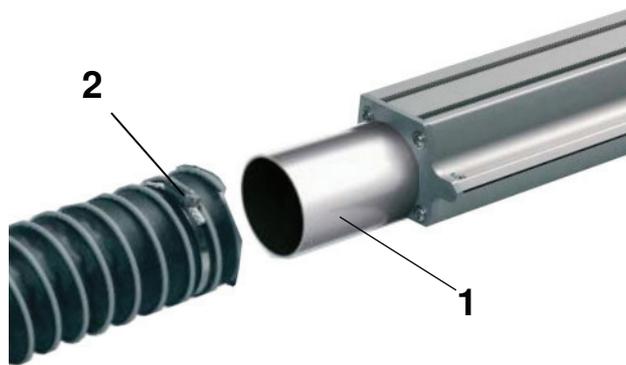
- Remove the lateral screws from one side of the profile.
- Remove the lid from the end face of the profile.
- Remove the screw for the slot stone on the joint to the extent that the slot stone can be inserted into the profile.
- Insert the required number of joints into the profile, and align them.
- Tighten the screws in the slot stones.
- Reinstall the lid on the profile.
- Adjust the outlet angle.

4.3.4.2 Installing the Joint on Mistral SS1 / SS1D / SS2 / SS2L / SSHD



- Secure the joint with an M8 bolt to the weld-on plates.
- Screw the required number of joints to the profile.
- Adjust the outlet angle.

4.4 Connecting the Unit



- 1 Air connection on the profile (here straight)
- 2 Air hose with hose clamp

- Connect the hose to the air connection of the profile.
- Slip the hose on the socket until it hits the stop.
- Tighten the hose clamp.

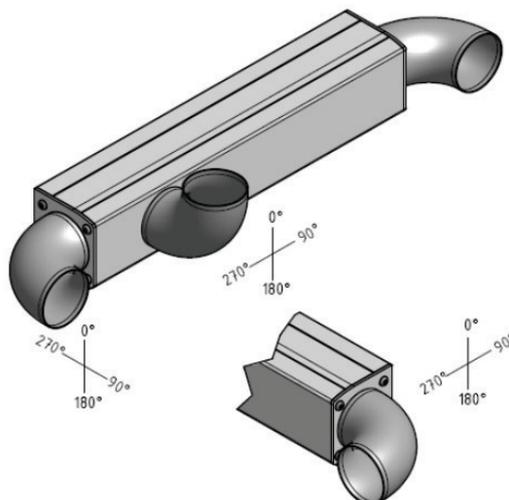


NOTE

The hoses for the air connections must be routed such that they are neither squeezed nor kinked. Kinking and squeezing causes malfunctions and increased noise.

Observe the minimum bending radii when you lay hoses and cables.

- You may already order the end plates of the profiles and/or the housing connections with the required pipe bends when you plan and order the unit.



Typical air connections with pipe bends.

- Connect all supply and connecting lines in accordance with the regulations.
- Check the firm seating of all connections.
- Check the operating pressures, and adjust them as necessary.

4.4.1 Notes for Applications in Potentially Explosive Atmospheres



DANGER

Explosion hazards from unsuitable operating material

Only equipment and operating material that are approved for potentially explosive areas are allowed to be used in a potentially explosive atmosphere.

Only qualified persons are allowed to establish the connections and put the unit into operation in a potentially explosive atmosphere.

All components must properly be earthed.

4.4.2 Connecting a Side Channel Blower

If you want to connect the profile to a side channel blower, you must follow the instructions from the device manufacturer for connection and adjustment.



CAUTION

Risk of injuries from non-observance of instructions

Observe the notes and instructions from the device manufacturer when you connect the unit to a side channel blower.

4.5 Starting up the Unit



DANGER

An incomplete machine may only be put into operation after you have established that the machine / system into which you want to incorporate the incomplete machine complies with the requirements of the Machine Directive 2006/42/EC.

Prior to starting up the machine, check whether:

- The unit has correctly been installed and aligned.
- All screwed connections are tight.
- All lines have correctly been connected.



DANGER

Risk of death when the safety installations are not in place!

Prior to starting up the unit you must check the proper functioning of all guards. Never start up a unit that shows any sign of a defect.

- Carry out a functional test.



Warning of hot surfaces

The surface can be very hot during operation.

Wear protective gloves.

Risk of burn injuries.



4.6 Storing the Unit

4.6.1 Preparation for Storage

- Depressurize all lines and disconnect the connections.
- Disassemble the unit into the components required for transport.
- Treat all uncoated parts with a preservation agent.

4.6.2 Storage

- Store the unit in a dry, well ventilated room, and protect it against contamination.
 - Temperature range + 5 °C ... + 35 °C
 - Humidity 30 ... 95 %, non-condensating
 - Protect the stored machine against ozone, UV radiation, vibration and shock.

Notes on storing electric components:

- Electronic components, e.g. electronic cards, must be stored or kept in appropriate electrostatic protective sleeves. Remove them from their sleeves only immediately before installation.

Prior to putting the unit into operation, you must store all electrical components at a dry place and expose them for 24 hours to the temperature range and atmospheric conditions that are permissible for the operation of the unit. During transportation and storage, too, you must ensure that the equipment - not or no longer in packaging material - will not be exposed to temperatures below dew point, and that no condensation takes place.

After removing the electrical components from rooms with a temperature below + 10 °C, allow them to heat up to at least + 20 °C before you start them up in the unit.



CAUTION

Never warm up the components with heating devices. For stabilization, they must be allowed to warm up over a minimum period of 3 hours.

4.7 Disposal



CAUTION

Risk of damage to the environment!

Comply with the applicable national and regional regulations and the manufacturers' information regarding the disposal of the machine.

- Sort the packaging material by components, and dispose of them separately.
- Sort the operating and auxiliary materials by ingredients, and dispose of them correctly.
- Sort the unit components by material, and dispose of them correctly.



Content

5	Design / Function / Operation	2
5.1	Design	2
5.2	Function	3
5.3	Operation	3
5.3.1	Switching the Unit ON / OFF	3
5.4	Malfunctions	4
5	Design / Function / Operation	2
5.1	Design	2
5.2	Function	3
5.3	Operation	3
5.3.1	Switching the Unit ON / OFF	3
5.4	Malfunctions	4

5 Design / Function / Operation

This chapter informs of design, function, and operation of the unit, and of any malfunctions.



NOTE

Furthermore, observe the following information:

- The safety notes in chapter "Safety";

5.1 Design

The "Mistral" air knife consists of a hollow profile with a nozzle gap. It is used for blowing off parts that are to be cleaned. There are different application-related versions. The base function is the same for all versions.

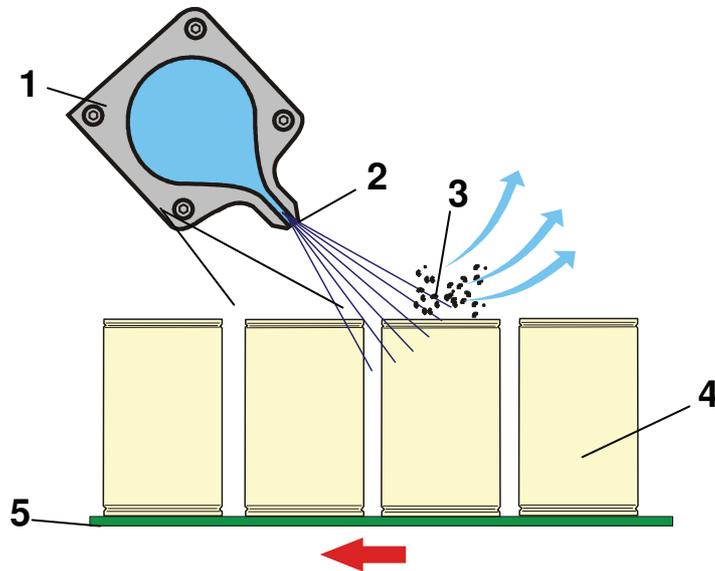
The profiles are installed with fastening devices to a unit or a frame. The nozzle gap is directed to the object that is to be cleaned.



- 1 "MISTRAL" air knife
- 2 Air hose
- 3 Outlet slot
- 4 Rack
- 5 Attachment to the rack
- 6 Product to be cleaned

5.2 Function

The "MISTRAL" air knife employs a sharp air jet to blow particles (dust, production residues, water, etc.) off workpieces.



- | | | | |
|---|--------------------------|---|---------------------|
| 1 | "MISTRAL" air knife | 4 | Workpiece / product |
| 2 | Nozzle slot with air jet | 5 | Conveyor belt |
| 3 | Removed particles | | |

5.3 Operation

The "MISTRAL" air knife is installed in an existing system, and integrated into the operation of the system.



DANGER

An incomplete machine may only be put into operation after you have established that the machine / system into which you want to incorporate the incomplete machine complies with the requirements of the Machine Directive 2006/42/EC.



Warning of hot surfaces

The surface can be very hot during operation.

Wear protective gloves.

Risk of burn injuries.

5.3.1 Switching the Unit ON / OFF

The air supply of the unit is switched on / off with the operating elements of the machine into which the unit has been incorporated.



5.4 Malfunctions

Item	Malfunction	Cause	Remedial action
1	No air at the nozzle slot	No compressed air available	Check the air supply for correct connections and leaks
2	Poor blow-off performance	Outlet angle incorrectly adjusted	Adjust the outlet angle to the workpiece
		Nozzle slot too large or too small	Adjust the nozzle slot
		Air pressure too low	Check the air supply
		Hose kinked or squeezed	Route the hose properly



Translation of the installation instruction

Airknife

MISTRAL





Chapters

1 General

2 Safety

3 Technical data

4 Transport / Installation

5 Operation

6 Maintenance



Content

1	General	2
1.1	Scope	2
1.2	Basic information	2
1.3	Structure of the installation instruction	3
1.3.1	Chapters	3
1.3.2	Guidance	3
1.3.3	Lists and References	4
1.4	Symbols / Safety signs	4
1.5	Note on language	5
1.6	Training	5
1.7	Copyright / Editor	5
1.8	Warranty and Liability	5



1 General

This installation instruction supplements e.g. drawings and parts lists, supplier documentations and so on of the device documentation. Together with this it is to consider as a unit.

This chapter contains general information about the structure and the operation of the installation instruction.

1.1 Scope

The installation instruction applies only to those devices or device parts that are supplied by the company Ziegenger + Frick GmbH.

The "Supplier Documentation A - Z" also belongs to the documentation. There you will find detailed information on the components assembled in the system.

The safety and maintenance instructions in the supplier documentation are not overridden by this installation instruction.

1.2 Basic information

This installation instruction contains important information about safe and correct use of the device.

Observance helps to

- Avoid risks,
- Reduce repair costs,
- Reduce down time and
- Increase the reliability and lifetime of the device.

In case of any error, damage, system malfunctions and resulting loss of production by not following this installation instruction, the company Ziegenger + Frick GmbH assumes no liability.

The installation instruction complies with the European Machinery Directive 2006/42/EC and the DIN EN ISO 12100 part 1 and 2.

The installation instruction is part of the device and is supplied with the device documentation of the company Ziegenger + Frick GmbH.

At handover, the documentation complies with the latest date at the delivery of the device.

The documentation must be retained permanently close to the device and must be readily available to any responsible person.

The content of the installation instruction must be read, understood and complied in all respects by all responsible persons. This is especially for safety instructions which are specially marked in the installation instruction.

In addition to the installation instruction and the locally valid rules for accident-prevention at the place of installation, the generally accepted technical rules and professional work are to be followed.

Technical changes that are necessary for the improvement of the device are reserved for the company Ziegenger + Frick GmbH. Changes to the contents or the visual illustrations in the installation instruction are therefore possible.



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.



1.3 Structure of the installation instruction

Because of the considerably amount, the installation instruction can only seldom be read on the whole. It may be useful to become familiar with the information step by step.

Depending on the area of interest, we suggest reading the following chapters of this installation instruction.

1.3.1 Chapters

The installation instruction is divided into the following chapters:

1 General

Basic instructions,
Structure of the installation instruction,
Symbols / security markings

2 Safety

Detailed explanation of safety markings in the installation instruction and on the device
General safety information
Machine specific safety information
Use according to regulations
Foreseeable misuse

3 Technical data

Nameplate, specifications of the device, sound pressure level

4 Transport / Installation

Delivery, transportation, installation, cleaning, adjustment, storage, resale and disposal of the device

5 Operation

Switch on, operation, switch off

6 Maintenance

Maintenance (service, maintenance, repair) of the device and the components

1.3.2 Guidance

At the beginning of each chapter there is a table of contents.

Number and title of each chapter are listed top right on every page.

The page numbering is bottom right.

Example: 2 / 4

The first number is the page number, the second the total number of pages in the corresponding chapter.



1.3.3 Lists and References

Lists are marked with dashes. Example:

The device consists of:

- Part 1
- Part 2

Action steps are shown with points. Example:

- Action
- Action

Action steps that have to be done in a certain order are marked with numbers. Example:

1. Action 1
2. Action 2

References to other sections are marked with quotes and are underlined. Example:

See safety information in chapter "Safety".

1.4 Symbols / Safety signs

Particularly important information in the installation instruction is indicated with symbols.

Detailed information can be found in chapter "Safety".



Warning

Identifies situations that may cause injury or property- and environmental damage.



Instruction

Indicates instructions to wear personal protective equipment. In the installation instruction multiple symbols with different meanings are applied.



Information

Designates hints and other particularly important information.



Environmental Protection

Indicates notes to environmental protection which can cause hazards to the environment when not observed.



1.5 Note on language

Instructions and installation instructions of complete functional units or purchase parts (e.g. electrical and pneumatic components) can be found in the device documentation under "Supplier Documentation A - Z".

Please note that these manuals are partially written in several languages.

If you do not see your language directly on the cover, then it is possibly to find in a later section of the manual. In case of doubt, scroll the manual observantly.

If the manual (e.g. computer manuals) is enclosed in English instead of your own language, so these are documents that are usually written only in English.

1.6 Training

The implementation of the training is conducted on site by our commissioning staff. As training material is the existing installation instruction.

The training will ensure that the people involved with the device have been informed of the safety requirements of the device.

1.7 Copyright / Editor

This installation instruction is subject to copyright and may only be used for the agreed purpose which means as reference to internal purposes. A transfer to third parties or reproduction by any means is permitted in no instance.

All title and copyrights remain at the company Ziegner + Frick GmbH.

1.8 Warranty and Liability

Basically our „General terms of sale and delivery“ apply

These are available for the operator.

Warranty and liability claims for personal injury and property damage are excluded when one or more of the following causes:

- Improper use of the device.
- Incorrect assembly, commissioning, operation and maintenance of the device.
- Operate the device with defective safety equipment or incorrectly placed or non-functional safety and protection equipment.
- Failure to observe the instructions in installation instruction regarding transport, installation, commissioning, operation, maintenance and setup of the device.
- Unauthorised modifications to the device.
- Unauthorised modifications to the software.
- Inadequate monitoring of device parts subjected to wear.
- Improper repair and force majeure.



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.



Content

2	Safety	2
2.1	Safety signs	2
2.1.1	Warnings	2
2.1.2	Warning and ban symbols	3
2.1.3	Instruction symbols	4
2.2	General safety information	5
2.3	Safety equipment	5
2.4	Organisational measures	6
2.4.1	Fire fighting equipment	6
2.5	Personnel selection and qualification	7
2.5.1	First Aid	7
2.5.2	Fire fighting	7
2.6	Safety information on certain phases of operation	8
2.6.1	Normal operation	8
2.6.2	Maintenance	8
2.6.2.1	Isolate	8
2.6.2.2	Secure against resetting	9
2.6.2.3	Verify isolation	9
2.6.2.4	Cleaning	9
2.7	Notes on specific hazards	10
2.7.1	Electricity	10
2.7.2	Pneumatic	10
2.7.3	Solvents and detergents	10
2.7.4	Oils, greases and other chemical substances	11
2.7.5	Noise	11
2.8	Device-specific safety information	12
2.8.1	Proper use	12
2.8.2	Foreseeable misuse	12
2.8.3	Safety equipment on the device	13
2.8.3.1	Safety covers	13
2.9	Organisational measures of the operator	13



2 Safety

This chapter contains

- Information about the used safety labellings
- General safety information and
- Device-specific safety information

The content of this chapter must be read, understood and complied in all respects by all responsible persons. This is especially for safety information which is specially marked in the installation instruction. This information must be considered exactly in all cases.

2.1 Safety signs

The used symbols, as far as they are standardised, conform to the accident prevention regulation BGV A8 and DIN 4844-2.

2.1.1 Warnings

In the installation instruction the warnings are classified according to seriousness of the danger and likelihood of occurrence.

- The described measures to avoid hazards must be considered implicitly.



DANGER

This symbol warns of an **immediate danger** to the health and life of persons. **Failure to heed** these warnings **leads** to serious personal injury or death.



WARNING

This symbol warns of **potentially dangerous situations** for the health and lives of persons.

Failure to heed these warnings **may** lead to serious personal injuries, even death.



CAUTION

This symbol warns of **potentially dangerous situations** for the health of persons or property- and environmentally damage.

Failure to heed these warnings **may** lead to injury or property- and environmental damage.

In the installation instruction warnings, ban- and instruction symbols with different meanings are used. These symbols can also be mounted on the device.

- All symbols on the device are to be observed implicitly! The symbols must always be readable and complete. Damaged or lost symbols must be replaced true to original.

2.1.2 Warning and ban symbols

These symbols identify hazard areas.

	Warning of a hazard area Life-threatening situation.
	Warning of dangerous electrical voltage Life-threatening voltage.
	Warning of hand injuries Risk of bruises.
	Warning of hot surface Risk of burnings.
	Warning of coldness Risk of frostbite.
	Warning of laser beam Risk of eye injury.
	Prohibition for persons with pacemaker Life-threatening situation caused by malfunction of the pacemaker.
	No entry for unauthorised persons Life-threatening situation.



2.1.3 Instruction symbols

The symbols indicate cross references to separate installation instructions and the personal protective equipment to be worn.

- For the denoted activity, the required personal protective equipment should be worn to avoid injury.



Wear eye protection

The safety glasses avoid eye injury from flying parts or mediums.



Wear protective gloves

Work gloves avoid cuts and bruises to hands and fingers.



Wear protective footwear

Protective footwear avoids bruises to feet and toes.



Wear hearing protection

The hearing protection prevents a damage of the hearing.



Wear protection helmet

The protection helmet prevents head injuries.



Observe the instructions

Observing the instructions avoids injuries caused by improper operation.



2.2 General safety information

The device is built according to the state of the art and accredited safety rules. Nevertheless threats to life and limb of the operator or third party respectively damage of the device and other property may arise by using the device.

Use the device only in perfect technical condition as well as in accordance with regulations, safety- and hazards-conscious considering the installation instruction! In particular failures that may affect safety must be removed immediately.

In addition to the installation instruction and the authoritative regulations for accident prevention in the country and place where it is used you also have to consider the accredited technical regulations for safe and professional work.

The installation instruction must be read and executed by each person that is responsible for working with or on the device and must be available and readily to hand for these persons any time.

The installation instruction must be completed by the operator for instructions regarding existing national regulations for accident prevention and environmental protection (see "Organisational measures of the operator")



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.3 Safety equipment

If the demounting of safety equipment during maintenance and repair is required, reassembly must be done immediately after finishing the maintenance and repair work.



WARNING

Risk of injury from moving parts

It is generally prohibited to stuck items through visual openings of safety equipments in order to reach moving parts. This hazard statement applies to all mechanical safety equipments.

This way there is a high risk of injury from moving parts!

Safety equipments that are connected to the device can be removed only with the help of tools. Before such safety equipments are removed you must switch off the main switch and secure it against restart.

In no way invalidate the safety equipments in its protection function.

No changes, additions or reconstructions to the device, in particular those who could affect the safety without authorisation from the manufacturer! The safety equipments are directly for your safety!

Injury or death hazard by removing / bridging of safety equipments!

This also applies to the installation and adjustment of safety equipments as well as for welding of supporting parts.



2.4 Organisational measures

The installation instruction must always be available and readily to hand near the device for the responsible person (operator, maintenance personnel, repair personnel etc).

In addition to the installation instruction, consider and instruct generally admitted, statutory and other authoritative regulations for accident prevention and environmental protection!

Such obligations may as well concern handling hazardous substances or the hiring / wearing of personal protection equipment.

Complete the installation instruction with instructions including supervisory and reporting duties to account for operational characteristics, such as in terms of work organisation, work processes, employed personnel etc. (see "Organisational measures of the operator").

The responsible personnel working on the device must read and understand the installation instruction, in particular the chapter "Safety", before starting work. During working on the device it is too late. This is especially true for personnel working occasionally on the device such as cleaning, lubrication, maintenance and repair work.

Regularly check the safety- and hazard-conscious work of the personnel in accordance with the manual.

Where necessary or required by regulations, use the personal protective equipment!

For safety regarding malfunctions or changes in the operation, stop the device immediately and report the malfunction to a competent body!

Spare parts must meet the technical requirements specified by the manufacturer. Therefore use only genuine spare parts. The use of other parts may cancel the liability of occurring consequences.

Generally keep animals away from the device.

Never modify the software on programmable control systems without written agreement with the manufacturer!

Adhere to the prescribed or in the installation instruction specified intervals for repeating checks /maintenance.

For the purpose of maintenance work appropriate work shop equipment is essential! For information about eventually necessary special tool please check chapter "Maintenance" in the installation instruction.

2.4.1 Fire fighting equipment

The operator must offer an appropriate fire fighting equipment.

- Advertise location and operation of fire extinguishers
- Note the fire alarm and the fire fighting possibilities

When using improper fire fighting equipment

- harmful gases (fumes) can occur
- risk of shock from electrical components occurs. Risk of injury or death by electric shock!

2.5 Personnel selection and qualification

As the operator of this device you are responsible for the prevention of personal injuries, damage of property and environmental damage.

Therefore please note:

- Employ only qualified personnel. Define the responsibilities of the personnel for operating work, checking, cleaning, maintenance and repair work!
- Consider the required minimum age of 18 years!
- Set operator responsibility and allow him rejecting unsafe instructions by third parties!
- Personnel to be trained, to be instructed or personnel being in a general in-firm training may only work with the device under permanent supervision of a competent person!
- Non-skilled workers, such as for loading and unloading activities, may only be employed under permanent supervision of competent persons. Non-skilled workers must also be trained in all safety regulations.
- The operator must advise all persons working on the device of this installation instruction at least once a year. This is especially for the observation of the safety regulations. This is to confirm by the signature of the personnel.
- Working on the electrical equipment of the device must be done by a qualified electrician or a competent person under direction and supervision of a qualified electrician in accordance with the electrical rules!
- Work on pneumatic systems may only be done by personnel with special knowledge and experiences in pneumatics!

2.5.1 First Aid

In case of accidents please refer to the local and internal regulations.

A sufficient number of workers for First Aid must be trained. This training must be repeated at appropriate time.

2.5.2 Fire fighting

For fire fighting, personnel must be trained to operate with appropriate fire fighting equipment. This training must be repeated at appropriate time.

At the outbreak of a fire you must switch off hazardous and vulnerable parts of the power supply unless they must retain under voltage for fire fighting or other hazards come up by switching it off.



DANGER

Risk of injury or death by electric shock!

Never use water to extinguish electrical equipments. Risk of electrical shock.



2.6 Safety information on certain phases of operation



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.6.1 Normal operation

Use the machine only when all protective and safety devices such as emergency stop devices, sensors, detachable safety devices, noise protection, exhaust equipment etc. are present and functioning!

Refrain from doing any unsafe method of working!

Check the device for external visible damage or defects at least once per shift! Any changes (including those of operating performance) immediately report to the responsible body. If necessary, stop the machine immediately and lock it!

Before switching on / starting the device make sure that no one can be endangered by the starting device!

The operation may only start after an adequately trained person over 18 years has established that the safety precautions have been implemented and are effective.

This person may not have done the works by himself.

2.6.2 Maintenance

Observe the service, maintenance and repair activities which are specified in the installation instruction!

Activities must be carried out only by competent persons!

Refrain from doing any unsafe method of working!

Inform the operator of the machine before beginning with maintenance work! Name a supervisor!

For all work relating to modifying, setting the device and its safety regulations as well as service, maintenance and repair, consider the on and off switching process according to the installation instruction.

Secure the maintenance area, where necessary, spacious!

Close off the working area with a red-and-white barricade and a warning sign!

Use the provided or other safety checked lifts and working platforms when assembly work over height of the head. The climbing of working platforms on a ladder and simultaneous transport of parts with the hands is not allowed.

Don't use device parts as a climbing help!

When working at bigger height use anti-fall guard!

2.6.2.1 Isolate

The device to be worked on must be isolated!

If the supervising or the working person didn't isolate the machine itself, he has to wait for the reporting of the isolation.

Setting a time when the device should be isolated doesn't replace the concrete report that it is actually isolated.



2.6.2.2 **Secure against resetting**

Operating materials for example main switches that have been used for unlocking must be secured from being resetted,

- Main switches off and fix.
- Mount warning sign at the main switch!

2.6.2.3 **Verify isolation**

The voltage isolation may only be established by a qualified electrician or an electro-technical instructed person.

The voltage isolation at the working position must be established at all poles.

2.6.2.4 **Cleaning**

Handles, steps, ladders, railings, platforms, stages, etc. keep free from contamination!



2.7 Notes on specific hazards

2.7.1 Electricity

The electrical equipment of the device is to be checked regularly. Defects such as loose connections or braised cables must be corrected immediately.

Use only original fuses with the specified current. In case of malfunctions in the electrical power supply turn off the device immediately!

Work on electrical devices or operating materials may only be executed by a qualified electrician or by a competent person under direction and supervision of a qualified electrician according to electrical engineering rules!

If required you must set device parts to zero potential where inspections, cleaning work, lubrication, maintenance and repair work will be performed. The zero potential set parts first check for no voltage, then short-circuit and ground them and isolate nearby parts being under voltage!

Components being worked on may only be under voltage when it is explicitly required.



DANGER

Warning of dangerous electrical voltage

Never assume that an electric circuit is dead.

- For safety reasons please check the electric circuit always before starting work!

Operate only with appropriate measuring instruments and non-conductive tools.

The main switch is also under voltage when it is turned off.

If maintenance on live components with voltage is necessary, please call a second person who can in case of an emergency switch off the main switch and thereby cut off the voltage.

2.7.2 Pneumatic

System sections and pressure pipes that have to be open must be depressurised before beginning with installation and maintenance work.

Work on pneumatic devices may only be arranged by persons with special knowledge and experience in pneumatics.



DANGER

Risk of injury from escaping compressed air!

Before working on the device it must be ensured that the power supply is interrupted.

- It is therefore not only to turn off and secure the main switch, but also shut off the pressure pipe.

2.7.3 Solvents and detergents

Detergents can contain solvents and are depending on flash point in liquid state (<21 °C) easily flammable or (>21 °C) flammable. While using them explosion and fire hazard can occur! All general rules to avoid explosions and fires have to be observed.

Solvents and detergents can lead to health damage if swallowed, inhaled or absorbed through the skin!

With the removal of the fat in the skin during unprotected handling solvents and detergents, the skin gets cracked and dry. This enables pathogens to penetrate and abets the emergence of skin diseases.

It is essential to pay attention to a skin care program which is well adapted to the solvents and detergents used during operation.

Incidental substances must be retained, recycled or disposed properly.

Ensure safe and environmentally disposal of operating supply items and additives!

2.7.4 Oils, greases and other chemical substances

When working with oils, greases and other chemical substances, please observe the product safety regulations!

Incidental substances (e.g. oil) must be retained, recycled or disposed properly.



CAUTION

Environmental hazard

With improper disposal, operating supply items and additives can lead to environmental damage.

- Provide a safe and environmentally disposal of operating supply items, additives and replacement parts.
 - Conform to the existing national and regional regulations.
-

2.7.5 Noise

The noise protection equipment at the device must be in prescribed protective position during operation.



WARNING

Risk of hearing damage

- In the designated areas, the prescribed personal hearing protection must be worn!
-



2.8 Device-specific safety information



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.

2.8.1 Proper use

Purpose of use

The device may only be used for dusting (cleaning) and drying of contractually defined parts.

Operating conditions

- The device must be installed only in enclosed spaces.
- The electrical equipment is designed for a maximum height of 1000 m above sea level.
- Ambient temperature + 5 °C to + 35 °C
- The average temperature in the vicinity of the electrical components must not exceed the value of + 35 °C within 24 hours.
If these conditions cannot be complied reliably, the customer has to provide an appropriate climatisation.
- Humidity max. 90 % at + 20 °C and 50 % at + 35 °C
- Further it must be assured that no short-term temperature fluctuations occur in such a manner that at any time the temperature falls below the dew point and condensate is produced.

Any other or further use of the device is considered unauthorized. The manufacturer is not liable for damage from improper use. Such risk lies entirely with the user.

2.8.2 Foreseeable misuse

The following are examples for foreseeable misuse:

- Cleaning or blow off of not contractually defined parts and surfaces, for example: freshly varnished surfaces.
- Operate the device with faulty or incorrectly fitted or not operational safety and protection equipment.
- Installation and operation of the device in rooms with high humidity.
- Unauthorized modification to the device or modifying the software.
- Failure to observe the instructions in the installation instruction regarding transport, installation, commissioning, operation and maintenance of the device
- Use by private users without technical training and education.



2.8.3 Safety equipment on the device



DANGER

Mortal danger due to not fixed safety equipment!

Safety equipment performs a personal protection function! They must not be bridged, removed or rendered ineffective in other ways in any case.

2.8.3.1 Safety covers

The assembled protective covers prevent the achievement of moving parts or parts under voltage during operation.

Protective covers provide a personal protection function. They may not be removed or circumvented ulteriorly.

2.9 Organisational measures of the operator

Please complement the installation instruction here with instructions regarding:

- Internal organisation of work
- Workflows
- Relevant responsible staff
- location and operation of fire extinguishers
- Fire detection and fire fighting facilities etc.



Content

3	Technical Data	2
3.1	Equipment Data	2
3.1.1	Dimensions and Material	2
3.1.2	Connections and Adjustment Possibilities	2
3.1.3	Performance Data	2
3.1.4	Operating Temperature	2
3.1.5	Weight	2
3.1.6	Pneumatic Connection	2
3.1.7	Noise Level	2
3.2	Rating Plate	3
3.3	Manufacturer	3
3	Technical Data	2
3.1	Equipment Data	2
3.1.1	Dimensions and Material	2
3.1.2	Connections and Adjustment Possibilities	2
3.1.3	Performance Data	2
3.1.4	Operating Temperature	2
3.1.5	Weight	2
3.1.6	Pneumatic Connection	2
3.1.7	Noise Level	2
3.2	Rating Plate	3
3.3	Manufacturer	3



3 Technical Data

This chapter informs of equipment data, sound pressure level, rating plate, and manufacturer addresses.

3.1 Equipment Data

3.1.1 Dimensions and Material

Type	Material	Dimensions of profile cross-section	Max. profile length	Nozzle slot adjustable from ... to
SS1	V2A / V4A	70 x 90 mm	6000 mm	0.5 ... 5.0 mm
SS2	V2A / V4A	107 x 87 mm	6000 mm	0.5 ... 5.0 mm
SS2L	V2A / V4A	165 x 87 mm	6000 mm	0.5 ... 5.0 mm
ALU	ALU anodized	107 x 77 mm	6000 mm	0.5 ... 3.0 mm
SS1D	V2A / V4A	70 x 90 mm	6000 mm	0.5 ... 5.0 mm

3.1.2 Connections and Adjustment Possibilities

Type	Adjustable nozzle slot	Air connections
SS1	0.5 ... 5.0 mm	Left (optionally right)
SS2	0.5 ... 5.0 mm	Left (optionally right, rear, or top)
SS2L	0.5 ... 5.0 mm	Left (optionally right, rear, or top)
ALU	0.5 ... 3.0 mm	Left (optionally right or front)
SS1D	0.5 ... 5.0 mm	Left (optionally right)

3.1.3 Performance Data

Air outlet velocity
(nozzle slot 1mm, pressure 200 mbars, nozzle slot length 200mm) up to more than 180 m/s

3.1.4 Operating Temperature

Depends on the setting of the nozzle slot approximately 20°C ... 100°C

3.1.5 Weight

Depends on the size of the unit

3.1.6 Pneumatic Connection

Air connection ø 60.3 mm

The unit may only be used with air that satisfies the requirements to ISO 8573.1.

3.1.7 Noise Level

Unit in operation 72 dB (A)



3.2 Rating Plate



A rating plate is a document that must never be modified or removed.

- A damaged or lost rating plate must be replaced by a genuine one.

NOTE



ziegener + frick

Ziegner + Frick GmbH
Schillerstraße 50
D-74248 Ellhofen
07134/13992-0
[www. ziegner-frick.de](http://www.ziegner-frick.de)

Air knife

Model: **Mistral**

Year of build: **2012**

3.3 Manufacturer

Ziegner + Frick GmbH
Schillerstraße 50
D-74248 Ellhofen

Phone: +49-7134-13992-0
Fax: +49-07134-13992-93
Mail: kontakt@ziegener-frick.de
web: [www. ziegner-frick.de](http://www.ziegner-frick.de)



Content

4	Transport / Startup	2
4.1	Safety Instructions	2
4.2	Transporting the Unit	2
4.2.1	Transport Preparations	2
4.2.2	Transport	2
4.3	Installing the Unit	3
4.3.1	Required Characteristics of the Installation Site	3
4.3.2	Securing the Profile	3
4.3.3	Adjusting the Nozzle Slot	4
4.3.4	Joint to Adjust the Outlet Angle (Accessory)	5
4.4	Connecting the Unit	6
4.4.1	Notes for Applications in Potentially Explosive Atmospheres	7
4.4.2	Connecting a Side Channel Blower	7
4.5	Starting up the Unit	7
4.6	Storing the Unit	8
4.6.1	Preparation for Storage	8
4.6.2	Storage	8
4.7	Disposal	8
4	Transport / Startup	2
4.1	Safety Instructions	2
4.2	Transporting the Unit	2
4.2.1	Transport Preparations	2
4.2.2	Transport	2
4.3	Installing the Unit	3
4.3.1	Required Characteristics of the Installation Site	3
4.3.2	Securing the Profile	3
4.3.3	Adjusting the Nozzle Slot	4
4.3.3.1	Mistral ALU Type	4
4.3.3.2	Mistral SS1 / SS1D / SS2 / SS2L / SSHD Types	4
4.3.4	Joint to Adjust the Outlet Angle (Accessory)	5
4.3.4.1	Installing the Joint on Mistral ALU	5
4.3.4.2	Installing the Joint on Mistral SS1 / SS1D / SS2 / SS2L / SSHD	5
4.4	Connecting the Unit	6
4.4.1	Notes for Applications in Potentially Explosive Atmospheres	7
4.4.2	Connecting a Side Channel Blower	7
4.5	Starting up the Unit	7
4.6	Storing the Unit	8
4.6.1	Preparation for Storage	8
4.6.2	Storage	8
4.7	Disposal	8

4 Transport / Startup

This chapter informs of transport, installation, connection, startup, and storage of the unit. The unit is transported and started up by experts from Ziegner + Frick GmbH.



NOTE

Furthermore, observe the following information:

- The safety instructions in the chapter "Safety" and, in particular, the operating conditions in the section "Intended Use."
- Dimensions and weight of the unit in chapter "Technical Data".

4.1 Safety Instructions



DANGER

Risk of death from dropping loads!

Risk of death when standing under suspended loads. Loads can drop.

- Never stand under a suspended load.
- Transport loads as close to the floor as possible.

All transport work must be done by skilled and authorized personnel.

Industrial trucks must comply with the accident prevention regulations.

Take the unit weight into consideration when you select an industrial truck (see chapter "Technical Data").

4.2 Transporting the Unit

4.2.1 Transport Preparations

If you want to transport a unit that has already been put into operation:

- Put the unit properly out of operation.
- De-pressurize all supply lines.
- Disconnect all supply and connecting lines, and secure them safely to the unit.
- Install the transport locks. All moving components of the unit that can freely be moved when the system is without pressure and/or electric power must be secured with adhesive tape or straps.

4.2.2 Transport

- At least two persons are required to lift the unit carefully for the transport.

Secure the unit against falling when you transport it with a crane or an industrial truck.



DANGER

Risk of death from toppling machine and assemblies!

A falling unit or component can lead to serious injuries, or to serious damage to the unit.



4.3 Installing the Unit

4.3.1 Required Characteristics of the Installation Site

A rack is required to install / secure the unit.

The rack must be stable to ensure a secure attachment and alignment of the unit. The unit does not require any separate foundation.

The individual components on the unit must be accessible.

There must be sufficient free space around the unit for operators and service staff.

There must be sufficient space for the air supply connection (if necessary, order profile end plates with elbow joints).

4.3.2 Securing the Profile

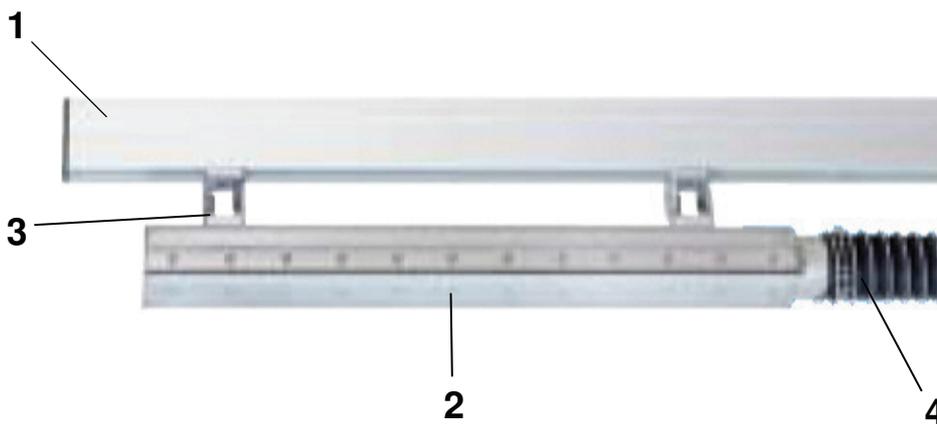


CAUTION

Risk of crushing!

Remove transport locks only when the unit is at the intended place of installation. This makes sure that no assemblies will come off.

- Remove the transport locks only after the machine has been installed.



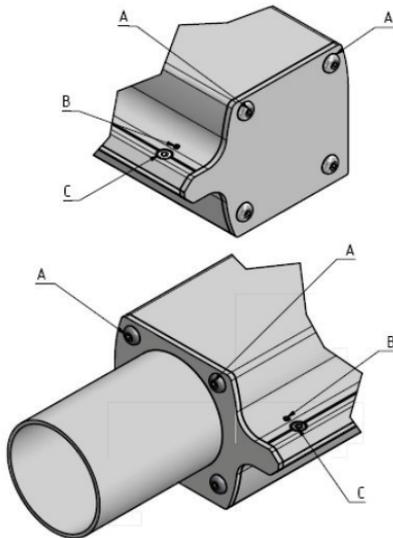
1 Rack (e.g. aluminium profile)
2 Mistral profile

3 Attachment to the rack (here with articulation)
4 Air connection (here straight)

- Secure the unit with the fastening hardware, and align it.
- If necessary, check the alignment with a machine spirit level.
- Set up any assemblies that are transported separately, and attach them as necessary.
- Remove the transport locks (such as adhesive tape or lashing straps).
- Reinstall all components that were removed for the transport.

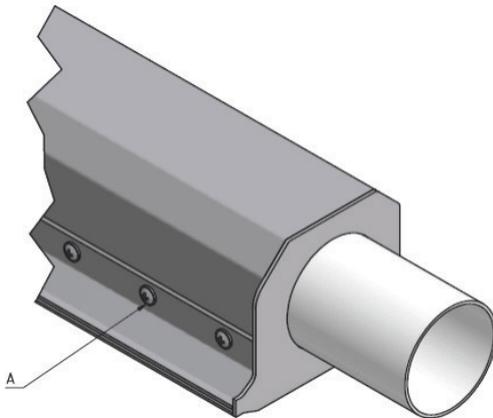
4.3.3 Adjusting the Nozzle Slot

4.3.3.1 Mistral ALU Type



- Release the screws "A" at both sides of the profile (do not remove the screws).
- Release screw "C".
- Turning screw "B" increases the gap.
- Turning screw "C" reduces the gap (release screw "B" first).
- After adjustment, tighten the screws "A" at both sides.

4.3.3.2 Mistral SS1 / SS1D / SS2 / SS2L / SSHD Types



- Release the screws "A" at the oblong holes of the profile.
- Adjust the gap with a gauge or a metre stick.
- After adjustment, tighten the screws "A".



4.3.4 Joint to Adjust the Outlet Angle (Accessory)

To adjust the outlet angle to the workpiece that is to be cleaned, you can install individually adjustable joints that are available as accessories.

Release the handle to adjust the profile outlet angle steplessly.

4.3.4.1 Installing the Joint on Mistral ALU



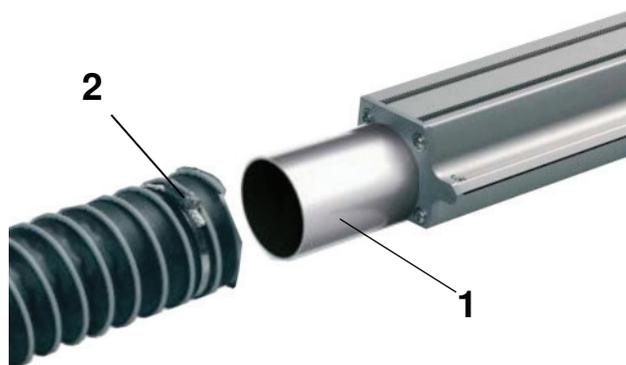
- Remove the lateral screws from one side of the profile.
- Remove the lid from the end face of the profile.
- Remove the screw for the slot stone on the joint to the extent that the slot stone can be inserted into the profile.
- Insert the required number of joints into the profile, and align them.
- Tighten the screws in the slot stones.
- Reinstall the lid on the profile.
- Adjust the outlet angle.

4.3.4.2 Installing the Joint on Mistral SS1 / SS1D / SS2 / SS2L / SSHD



- Secure the joint with an M8 bolt to the weld-on plates.
- Screw the required number of joints to the profile.
- Adjust the outlet angle.

4.4 Connecting the Unit



- 1 Air connection on the profile (here straight)
2 Air hose with hose clamp

- Connect the hose to the air connection of the profile.
- Slip the hose on the socket until it hits the stop.
- Tighten the hose clamp.

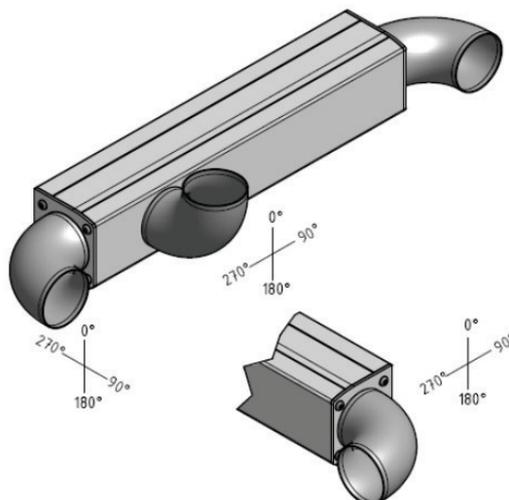


NOTE

The hoses for the air connections must be routed such that they are neither squeezed nor kinked. Kinking and squeezing causes malfunctions and increased noise.

Observe the minimum bending radii when you lay hoses and cables.

- You may already order the end plates of the profiles and/or the housing connections with the required pipe bends when you plan and order the unit.



Typical air connections with pipe bends.

- Connect all supply and connecting lines in accordance with the regulations.
- Check the firm seating of all connections.
- Check the operating pressures, and adjust them as necessary.

4.4.1 Notes for Applications in Potentially Explosive Atmospheres



DANGER

Explosion hazards from unsuitable operating material

Only equipment and operating material that are approved for potentially explosive areas are allowed to be used in a potentially explosive atmosphere.

Only qualified persons are allowed to establish the connections and put the unit into operation in a potentially explosive atmosphere.

All components must properly be earthed.

4.4.2 Connecting a Side Channel Blower

If you want to connect the profile to a side channel blower, you must follow the instructions from the device manufacturer for connection and adjustment.



CAUTION

Risk of injuries from non-observance of instructions

Observe the notes and instructions from the device manufacturer when you connect the unit to a side channel blower.

4.5 Starting up the Unit



DANGER

An incomplete machine may only be put into operation after you have established that the machine / system into which you want to incorporate the incomplete machine complies with the requirements of the Machine Directive 2006/42/EC.

Prior to starting up the machine, check whether:

- The unit has correctly been installed and aligned.
- All screwed connections are tight.
- All lines have correctly been connected.



DANGER

Risk of death when the safety installations are not in place!

Prior to starting up the unit you must check the proper functioning of all guards. Never start up a unit that shows any sign of a defect.

- Carry out a functional test.



Warning of hot surfaces

The surface can be very hot during operation.

Wear protective gloves.

Risk of burn injuries.



4.6 Storing the Unit

4.6.1 Preparation for Storage

- Depressurize all lines and disconnect the connections.
- Disassemble the unit into the components required for transport.
- Treat all uncoated parts with a preservation agent.

4.6.2 Storage

- Store the unit in a dry, well ventilated room, and protect it against contamination.
 - Temperature range + 5 °C ... + 35 °C
 - Humidity 30 ... 95 %, non-condensating
 - Protect the stored machine against ozone, UV radiation, vibration and shock.

Notes on storing electric components:

- Electronic components, e.g. electronic cards, must be stored or kept in appropriate electrostatic protective sleeves. Remove them from their sleeves only immediately before installation.

Prior to putting the unit into operation, you must store all electrical components at a dry place and expose them for 24 hours to the temperature range and atmospheric conditions that are permissible for the operation of the unit. During transportation and storage, too, you must ensure that the equipment - not or no longer in packaging material - will not be exposed to temperatures below dew point, and that no condensation takes place.

After removing the electrical components from rooms with a temperature below + 10 °C, allow them to heat up to at least + 20 °C before you start them up in the unit.



CAUTION

Never warm up the components with heating devices. For stabilization, they must be allowed to warm up over a minimum period of 3 hours.

4.7 Disposal



CAUTION

Risk of damage to the environment!

Comply with the applicable national and regional regulations and the manufacturers' information regarding the disposal of the machine.

- Sort the packaging material by components, and dispose of them separately.
- Sort the operating and auxiliary materials by ingredients, and dispose of them correctly.
- Sort the unit components by material, and dispose of them correctly.



Content

5	Design / Function / Operation	2
5.1	Design	2
5.2	Function	3
5.3	Operation	3
5.3.1	Switching the Unit ON / OFF	3
5.4	Malfunctions	4
5	Design / Function / Operation	2
5.1	Design	2
5.2	Function	3
5.3	Operation	3
5.3.1	Switching the Unit ON / OFF	3
5.4	Malfunctions	4

5 Design / Function / Operation

This chapter informs of design, function, and operation of the unit, and of any malfunctions.



NOTE

Furthermore, observe the following information:

- The safety notes in chapter "Safety";

5.1 Design

The "Mistral" air knife consists of a hollow profile with a nozzle gap. It is used for blowing off parts that are to be cleaned. There are different application-related versions. The base function is the same for all versions.

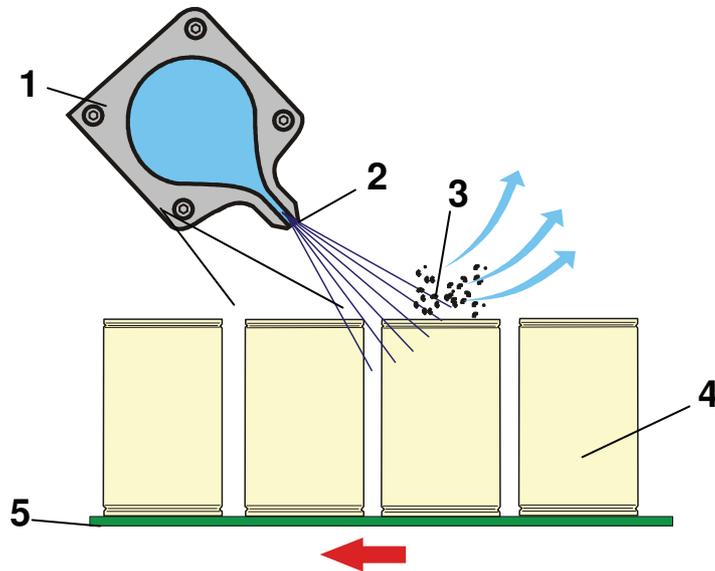
The profiles are installed with fastening devices to a unit or a frame. The nozzle gap is directed to the object that is to be cleaned.



- 1 "MISTRAL" air knife
- 2 Air hose
- 3 Outlet slot
- 4 Rack
- 5 Attachment to the rack
- 6 Product to be cleaned

5.2 Function

The "MISTRAL" air knife employs a sharp air jet to blow particles (dust, production residues, water, etc.) off workpieces.



- | | | | |
|---|--------------------------|---|---------------------|
| 1 | "MISTRAL" air knife | 4 | Workpiece / product |
| 2 | Nozzle slot with air jet | 5 | Conveyor belt |
| 3 | Removed particles | | |

5.3 Operation

The "MISTRAL" air knife is installed in an existing system, and integrated into the operation of the system.



DANGER

An incomplete machine may only be put into operation after you have established that the machine / system into which you want to incorporate the incomplete machine complies with the requirements of the Machine Directive 2006/42/EC.



Warning of hot surfaces

The surface can be very hot during operation.

Wear protective gloves.

Risk of burn injuries.

5.3.1 Switching the Unit ON / OFF

The air supply of the unit is switched on / off with the operating elements of the machine into which the unit has been incorporated.



5.4 Malfunctions

Item	Malfunction	Cause	Remedial action
1	No air at the nozzle slot	No compressed air available	Check the air supply for correct connections and leaks
2	Poor blow-off performance	Outlet angle incorrectly adjusted	Adjust the outlet angle to the workpiece
		Nozzle slot too large or too small	Adjust the nozzle slot
		Air pressure too low	Check the air supply
		Hose kinked or squeezed	Route the hose properly



Content

6	Maintenance	2
6.1	Safety information	2
6.1.1	Switch off the device and secure against restart	3
6.1.2	Cleaning	3
6.1.3	Lubrication	3
6.1.4	Maintenance	4
6.1.4.1	Electricity	4
6.1.4.2	Pneumatic	4
6.1.5	Disposal of operating supply items and additives	4
6.2	Structuring of the maintenance	5
6.2.1	Service	5
6.2.2	Maintenance	5
6.2.3	Repair	5

6



7 Maintenance

This chapter provides information about service, maintenance and repair of the device and its components as well as the maintenance plan.



DANGER

The partly complete machine must not be put into operation till it is determined that the machine / equipment in which the partly complete machine should be installed in confirms to the regulations of the Machinery Directive 2006/42/EC.



INFORMATION

Also consider:

- The safety information in chapter "Safety".
- Die "Supplier documentation" in the device documentation.

7.1 Safety information

In the installation instruction you find general information about service, maintenance and repair which have to be observed.

For purchased parts such as engines, gears, pneumatic cylinders, linear guides etc. you must additionally consider the „Supplier documentation” in the device documentation.

Maintenance work must be done only by competent persons.

The maintenance personnel must be instructed by the operator and be acquainted with the installation instruction of the device and the valid safety and accident prevention regulations.

For all works, the maintenance personnel should view the drawings, parts lists and circuit diagrams.

Inform operating personnel before beginning with maintenance work! Call a supervisor!

Secure maintenance area wide-ranging. Indicate the work with appropriate signs. Especially mount information signs at the main switch, electrical enclosure, control elements and accessions.

When exchanging components and bigger assembly groups, mount and secure them carefully on lifting tool so that there is no danger from these parts. Use only suitable and technically correct lifting tools and load handling devices with sufficient carrying capacity! Do not stand or work under pending loads!

Use the provided or other safety checked lifts and working platforms when assembly work over height of the head. The climbing of working platforms on a ladder and simultaneous transport of parts with the hands is not allowed.

Don't use device parts as a climbing help!

When working at bigger height use anti-fall guard!

After completion of maintenance work and before each restarting, review the presence and function of the safety equipments.



7.1.1 Switch off the device and secure against restart

The supervisor must only allow the maintenance work, or the maintenance personnel may only begin working, if the following measures were taken:

- Turn off the device and all supply lines.
- Unlock.
- Secure against restart. Therefore turn off the main switch and lock it with a padlock. Keep the key safe or carry it! Mount a warning sign on the main switch!
- Verify voltage isolation. The voltage isolation may only be established by a qualified electrician or electro technical instructed person.
- Depressurise pneumatic pipes and secure against resetting (e.g. gate valve with padlock)

7.1.2 Cleaning

The device must be cleaned regularly in order to achieve trouble-free operation and a high quality of the products.

Use fibre-free cleaning cloths.

Do not use aggressive cleaning agents.

When using the cleaning agents you must observe the specifications of the manufacturer and the operator. Improper cleaning agents can damage or destroy components. They may also cause production problems.

When cleaning or removing of dirt, do not blow off the components with compressed air but aspirate the dirt or wipe it clean with fibre free cleaning cloths.

7.1.3 Lubrication

If parts must be lubricated, use only approved lubricants according to the specifications of the manufacturer and operator.

In no case different types of oils and fats may be mixed.



7.1.4 Maintenance

7.1.4.1 Electricity

When the electrical connection is completed, the direction of rotation of the motors must be tested.

Basically the electrician connecting the components should view the circuit diagram.

7.1.4.2 Pneumatic

Check all cables, hoses and fittings regularly for leaks and obvious damage. Repair damages immediately!

Lay and mount the compressed air lines professionally. Do not mix up the connections! Fittings, length and quality of the hoses must meet the requirements.

Before performing maintenance work on the pneumatic equipment, the piping system must be depressurised. Therefore lock the compressed air supply.

7.1.5 Disposal of operating supply items and additives

All operating supply items, for example used oil (also biologically degradable), filters, batteries, additives etc. must be separated carefully and disposed from other waste.

In order to keep the disposal costs as low as possible, used oils of the different categories should be collected separately.



CAUTION

Environmental hazard

With improper disposal, operating supply items and additives can lead to environmental damage.

- Provide a safe and environmentally disposal of operating supply items, additives and replacement parts.
- Conform to the existing national and regional regulations.

7.2 Structuring of the maintenance

The maintenance works are divided into the following measures:

1. Service (Measures to determine the actual condition)
2. Maintenance (Measure to preserve the nominal condition)
3. Repair (Measures to restore the nominal condition)

7.2.1 Service

Service includes the control of adjustment, function and wear.

Following things must be controlled:

- Mechanical damages, worn out bearings and guides, loosening parts, leaks in the hydraulic-pneumatic- and lubrication circuit.
- Visible damages of cables, hoses, fittings. Repair damages immediately.
- Remove defects in the electrical equipment immediately, such as loose connections or scorched cables.
- Regular functional testing of the safety equipment. Also of the equipment in which control the device is included.
- Foreign material, such as for example spare parts or tools, must be removed from the device.

7.2.2 Maintenance

Maintenance consists of cleaning and tightening of loose parts.

Cleaning:

- Clean the entire device regularly.
- After cleaning check all supply lines for leaks, loose connections and chafe marks. Repair defects immediately!

7.2.3 Repair

Repair involves the replacement of defective parts.



INFORMATION

The installation of new components happens, as far as not indicated in another way, in analogously reverse order of disassembly.

Defective components must only be replaced by original spare parts! When installing other components or components not decontrolled by Ziegner + Frick, the warranty of the company Ziegner + Frick GmbH expires.

The following parts must be replaced:

- All worn out, bent or defective parts.
- When screw fittings were loosening during maintenance work, retighten them with the specified locking torque.