

Darwin

Mod. 600 - 1200 - 2000 - 3000

- IT Manuale d'istruzioni
- EN *Instructions manual*
- FR Manuel d'instructions
- DE *Handbuch*
- ES Manual d'istrucciones



LOSMA®
WORKING CLEAN, BREATHING HEALTHY

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1. General information

1.1. Manual use

Before undertaking any equipment assembly or maintenance operation on the air filter carefully read the instructions provided in this manual.

1.1.2. Typographic information

Note

The word "NOTE", on the left side of the page, signals important information

Warning!

The word "WARNING", on the left side of the page, indicates those procedures for which the partial or total failure to comply may cause damages to the air filter unit or to the machine tool connected to it.

Danger!

The word "DANGER", on the left side of the page, indicates those procedures for which the total or partial failure to comply may cause injury to the operator.

1.2. Warranty

1. General conditions

Losma S.p.A. (hereinafter known as *Supplier*) undertakes to deliver to the purchaser products conforming to the agreement which are exempt from defects such as to make them unsuitable for the use to which products of the same type are employed and guarantees the products sold for 365 days from the date of delivery with an hourly limit of use equal to 2000 hours.

The guarantee ex-*Supplier's* works is limited to the replacement or repair of the products which, in the unquestionable opinion of the *Supplier*, are defective.

Components not directly constructed by the *Supplier* will be the subject of a guarantee according to the conditions used by his supplier to the *Supplier*.

It remains understood that all the components replaced shall be the property of the *Supplier* or his supplier.

2. Notification of non-conformity to guarantee or defective product

The notification of non-conformity or defect of the product must be communicated in writing to the *Supplier* with a clear indication of its nature within 15 days of the date it was found or could have been found following a thorough examination of the product. In addition, the purchaser, against *Supplier's* request, must place at the disposal of the *Supplier*, the product deemed non conforming and/or allow people assigned by the *Supplier* to carry out all the checks that the *Supplier* deems suitable in order to ascertain the effective non conformity or defect of the product.

The lack of communication of the potential non-conformity or fault of the product in the times indicated and/or if the latter is not made available shall cause the immediate termination of the guarantee. The purchaser also forfeits the guarantee if, the supplier has requested the faulty piece to be returned at his expense and the purchaser omits to return such piece within a short period of the request.

The regulations of articles 40 and 44 of the Vienna Convention shall not be applicable in any case.

3. Repairs or replacements

The *Supplier* shall fulfill the obligations set out in the guarantee by repairing or replacing the non-conforming or defective parts. In order to fulfil the guarantee the *Supplier* can choose:

- to carry out the repairs at his factory: in this case the purchaser is obliged to send at his expense, the products to the factory indicated by the *Supplier* and to collect them ex-factory, after the execution of the guarantee.
- to carry out or have carried out by third parties the repairs and/or replacements in the place where the products are located. In this case the travelling costs, board and lodgings shall be at the expense of the purchaser;
- to have the repair and/or replacement carried out by the purchaser supplying the relative instructions and possibly supplying free of charge, ex the *Supplier's* factory or reimbursement of the spare parts.

The guarantee for the pieces replaced or repaired terminates on the same day as the guarantee of the product.

4. Exclusions

The *Supplier* shall not be held liable for defects or faults pertaining to the product which are directly or indirectly attributable to information, data, projects, materials and to any other tangible or intangible good supplied, indicated or requested by the purchaser or by third parties acting in whatever role, in the name and on behalf of the latter.

Not covered by this guarantee are all the defects directly or indirectly attributable to incorrect, excessive or improper use of the equipment and including all the times the equipment is used in a manner different from that described in the technical

documentation accompanying the product. In addition excluded from the guarantee are all the parts normally subject to wear and tear such as filters, seals, fuses etc.

The guarantee shall terminate if the product is tampered with, modified, repaired by service centres other than that of the *Supplier* and by personnel not directly employed or authorised by the *Supplier* himself and/or in the case of the use of non-original components or consumables (filters, seals etc).

The *Supplier* does not guarantee the inexistence of claims or rights based on industrial or intellectual property of third parties, relating to the product or documentation transmitted to the purchaser.

5. Limitations of the *Supplier's* responsibility (responsibility for damages)

Except in the case of malice or serious malpractice of the *Supplier* the possible reimbursement of any damage to the purchaser cannot however exceed the value of the product relating to the defective part.

The guarantee as per this article includes and replaces the guarantees or responsibilities provided by the law and excludes all other responsibilities of the *Supplier* not originated by the products, in particular the purchaser cannot advance other requests for compensation for damage, price reduction or termination of the contract.

Once the guarantee has expired no claims shall be made to the supplier.

1.3. General delivery notes

The air filters are packed in carton boxes provided with handles. Upon receipt of the unit, open the box and check that:

- The air filter is not damaged.
- The goods correspond to the order specifications (see delivery note).

In the event of damage or missing parts immediately inform the forwarding agent in detail, with copy for information to **LOSMA S.P.A.**

The supply consists of:

- Complete air filter unit
- Spare filter kit and seals
- Four anti-vibration joints, two safety tie-rods and connection screws.
- Instructions manual and enclosures.
- Test certificate.
- EC conformity declaration.

1.4. Optional parts

On request, special accessories are available to facilitate assembly and connection of the air filter to the machine tool. For further details on availability of these accessories please take contact with our export sales office.

1.5. Product modifications

LOSMA S.P.A. reserves the right to make, at any moment and without notice, any change necessary to improve its products or to meet requirements of manufacturing or commercial nature.

1.6. Manufacturer identification data

Headquarters and production plant:

LOSMA S.P.A.	Tel (035) 461.444
Via E. Fermi,16	Fax (035) 461.671
24035 Curno (BG)	E - mail : info@losma.it
Italia	www.losma.it

1.7. Air filter identification data

The air filter is provided with an identification plate positioned on the support frame. We recommend registering the identification data in the following table, as they are needed for spare-parts requests.

• Series:	Darwin
• Model:	
• Part no.:	
• Construction year:	

1.8. General safety information

In the design and construction of this unit, priority has been given to criteria and adaptations suitable to meet the essential safety requirements, as prescribed by the European Directives 73/23/EEC and 89/392/EEC, subsequent modifications (91/368/EEC - 93/44/EEC - 93/68/EEC) and applicable regulations. Please note that, in accordance with the provisions of the machine directive 89/392/EEC, the air filter is to be considered as an integral **part of the machine tool**. Therefore, the air filter cannot be put into operation until the machine, of which it is an integral part (and component), is declared in conformity with the provisions of the directive 89/392/EEC and subsequent modifications. Qualified staff, according to the instructions provided in the present manual in any way by respecting the corresponding rules and laws, must carry out installation and electrical connection operations.

LOSMA S.P.A. recommend following carefully the instructions, procedures and suggestions contained in this manual and in the current "accident prevention regulations".

1.8.1. General safety provisions

Danger!

• **Before undertaking any cleaning or maintenance operation, disconnect the machine from its power supply, as follows:**

- **Cut off the power by turning the main switch on "OFF". To prevent any sudden starting up, it is advisable to fasten the switch with a padlock.**

- **Turn the main switch (positioned on the machine switch-board) to "OFF" and fasten it with a padlock.**

- **Disconnect the control device from the plug and socket of the air filter.**

- **Wait at least 3 minutes in order to allow the air filter rotor to come to a complete stop.**

• **Check that the external PE protective conductor of the air filter is correctly earthed.**

• **Wear suitable accident prevention clothing during the assembly and maintenance operations.**

• **To reach the unit for assembly or maintenance operations, use only ladders and/or gangways conforming to current accident prevention regulations.**

Note

LOSMA S.P.A. does not accept any responsibility for any direct or indirect damage to persons or things resulting from incorrect or different use of the air filter than those prescribed in the present manual.

1.8.2. Position of "danger and warning labels"

Some of the adhesive labels applied to the machine complete and repeat the instructions of this manual. Should the wear and tear of time make them illegible, replace them with new ones.

See attached enclosure "Position of the warning labels".

1.8.3. Noise level

Noise level data, for each model, is indicated in enclosure **"Technical Specifications"**.

Note

*The noise level data indicated in the **Technical Specifications** has been recorded (as per ISO 3746) with free inlet. These data may change according to the installation conditions of the air filter (assembly on enclosed machine tools or on open cabin, etc.).*

1.9. Personnel qualification

Qualified personnel must undertake installation, maintenance and use of the air filter unit. Exclusively qualified electricians should carry out electrical connection of the unit.

1.10. Different models and uses:

- Darwin mod. **600 M – 1200 M- 2000 M - 3000 M**

Filtration and purification of air containing mist from neat or soluble oil also in presence of small quantities of solid particles.

- Darwin mod. **600 D – 1200 D- 2000 D - 3000 D**

Filtration and purification of air containing mist and vapours from neat or soluble oil also in presence of small quantities of solid particles.

- Darwin mod. **600 T – 1200 T- 2000 T - 3000 T**

Filtration and purification of air containing mist from neat or soluble oil also in presence of a considerable amount of solid particles.

1.11. Non-considered uses

- Suction of substances different from neat or soluble oil mist.
- Suction of corrosive vapours.
- Suction of explosive substances in an explosive atmosphere.

Note

LOSMA S.P.A. declines any responsibility for damage to persons or things caused by "**Non-considered uses**" of the air filter unit.

1.12. Requests of technical assistance

For technical assistance, please contact:

LOSMA S.P.A.

Via E. Fermi, 16
24035 Curno (BG)
Italia
Tel. +39 035 461444
Fax. +39 035 461671
e-mail: assistenza@losma.it

LOSMA GmbH

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D-70806 KORNWESTHEIM-
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Tel. + 49 7154-8160480
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e-mail: info@losma.de

LOSMA INC. –

U.S.A. Branch
231 West Parkway
Pompton Plains NJ 07444 - U.S.A.
tel. +1 973 2480070
fax +1 973 2483280
e-mail: info@losmausa.com

2. Description

2.1. Function and field of application

- The air filter **DARWIN D (double centrifuge)** is suitable for all machine tools for metal production (other than grinders and sharpeners). It specifically eliminates neat or soluble oil mist and vapours, also in the presence of small amounts of solid particles.
- The air filter **DARWIN M (monocentrifuge)** is suitable for all machine tools for metal production (other than grinders and sharpeners) It specifically eliminates neat or soluble oil mist, also in presence of small amounts of solid particles.
- The air filter **DARWIN T (turbine)** is suitable for grinders and sharpeners. It eliminates soluble oil mist, also in presence of relevant amounts of solid, metallic and abrasive particles.

Note

- *The mist of soluble or neat oil (air + liquid pollutant with particle dimensions between 0.8 and 10 μm^*) are generated by the action (purely mechanical) of rotating parts such as tools, pieces being machined, etc.*
- *The vapours from neat or soluble oil (air + liquid pollutant with particle dimensions between 0.5 and 0.8 μm^*) are generated by the thermal actions (friction heat between piece and tools, electrical resistance heat as that generated during hardening treatments) and by pressure (forced atomisation of coolants, high pressure forced lubrication)*

* (The declared values are purely indicative)

Warning! Danger!

The air filters are not suitable for dry dust. They do not absorb this kind of pollutant which, after suction is re-circulated in the air. In case of production generating dry dust, the air filter is not effective and must be disconnected.

2.2. Technical characteristics

See: "Enclosure Technical Specifications".

3. Handling and storage

3.1. Handling of packed units

Every unit is packed in highly resistant carton boxes provided with handles. When the shipment consists of more boxes, they are placed on EUR pallets, firmly tied up with hoops and fully wrapped in polyethylene film.

Warning! Danger!

Forklift operators, crane-operators and other adequately trained personnel must undertake the handling and transportation of the air filter units.

A single carton box containing the air filter can be handled by:

- **Two people, manually, using the two handles on the carton boxes (except Darwin 3000).**
- **A fork-lift**

The EUR pallet with several boxes is to be transported by:

- **A forklift of adequate capacity for the load to be handled.**
- **Cranes, bridge cranes or other lifting means of adequate capacity and with characteristics suited to the weight and form of the load.**

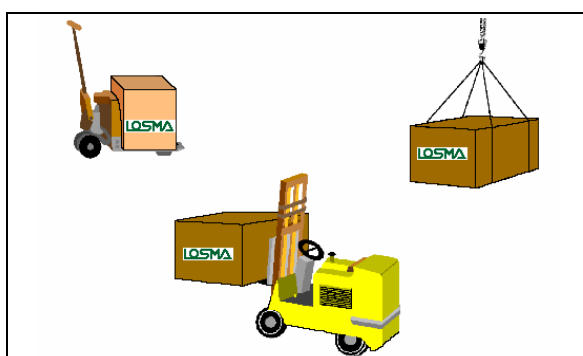


Illustration 1: Lifting and transportation

3.2. Storage

The air filter unit must be stored in a dry place protected from the atmospheric elements and dust. The following environmental features must also be respected:

- Permitted temperature: from 0°C to 40°C +/- 5°C.
- Permitted relative humidity: from 30% to 80% +/- 5%.

Warning!

Do not overturn the boxes (arrow upwards) and do not stock more than 4 boxes on top of each other.

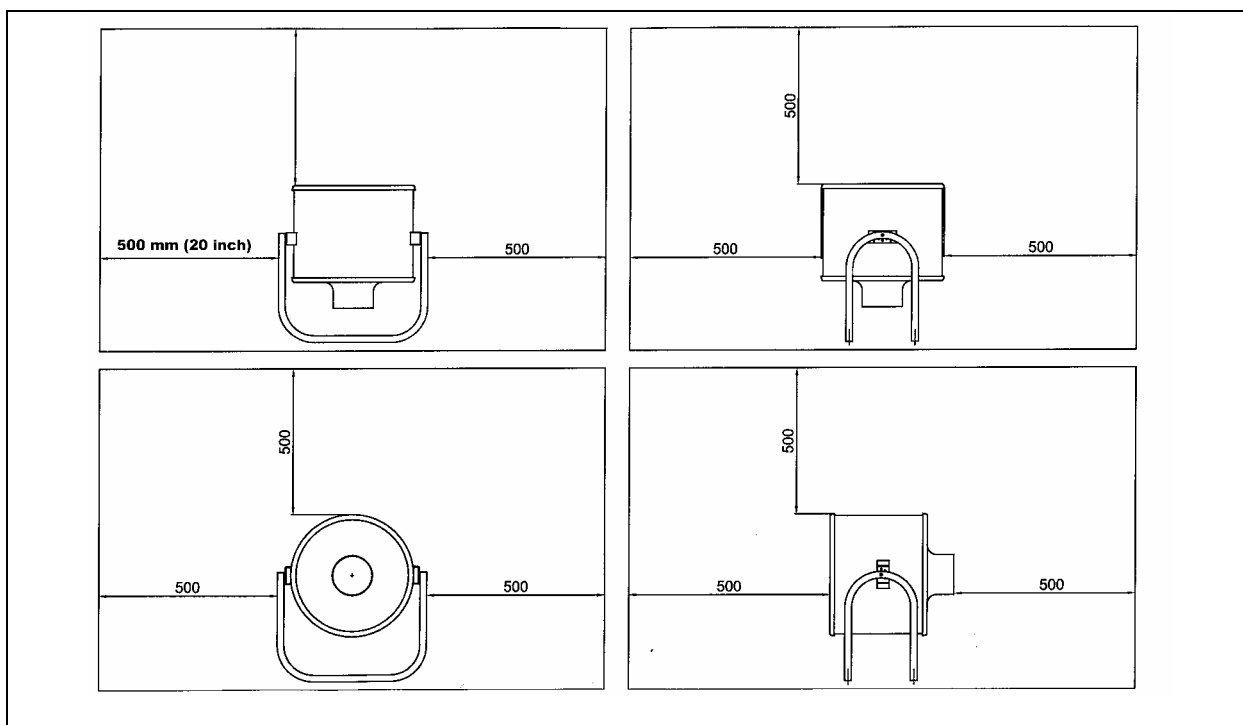
4 Installation

Warning!

Exclusively specialized personnel must install the air filter. Complying with the corresponding laws and regulations.

4.1. Minimum spaces for installation

Before proceeding with the air filter installation, make sure that there is enough space (0.5 m) as indicated in drawing 2, so as to permit the use and maintenance of the air filter in safe conditions.



Drawing 2: Minimum space for installation

4.2. Conditions and operational limits

To obtain maximum efficiency from the air filters of the **Darwin** range the physical characteristics of the air to be purified should preferably respond to the following characteristics:

- Temperature: between 5°C and 40°C.
- Relative humidity: from 30% to 98%.

While the ideal characteristics of the environment where the air filters are installed should be:

- Temperature: from 5°C to 40°C
- Relative humidity: from 30% to 85%
- Maximum installation height: 1000 m a.s.l.

Warning!

LOSMA S.P.A. declines any responsibility for damages to the units installed in working conditions different than those specified above.

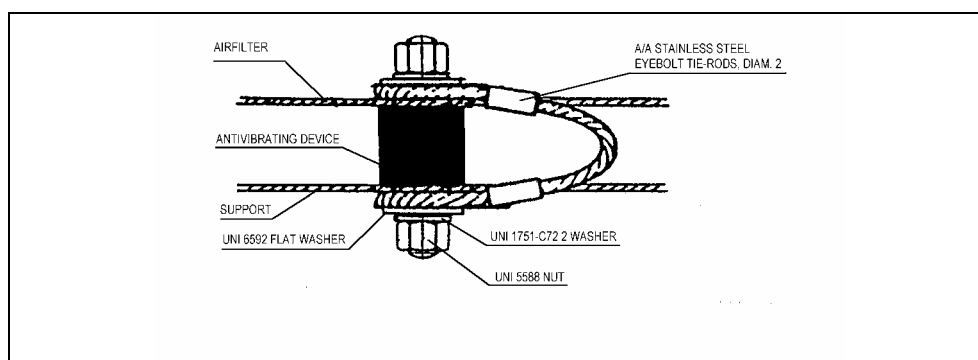
4.3. Installation

To mount the air filter, as well as the material supplied in the assembly kit, the following components are also necessary:

- Flexible suction hose **TFM** of adequate length + 2 hose clamps
- Flexible suction hose diam. 25 mm, **TFD** of adequate length + 1 hose clamp
- In case the machine is enclosed, **PRT** pipe connection plate, nuts and bolts.
- Find a suitable position for the installation of the air filter (on the machine tool or immediate close to it) and decide the position of the air filter (vertical or horizontal) according to the available space or the shape of the machine cabin.
- Drill the necessary holes to position the air filter on the machine cabin, as illustrated in the drilling schemes (enclosure "Drilling schemes").
- If the **PRT** pipe connection plate is necessary, drill the 4 holes, diam. 5, on the machine cabin, as illustrated in enclosure no.3 "Drilling schemes".

Warning!

- In order to avoid dangerous filtering of solid dust and coolant liquids, it is advisable to keep the suction hose away from areas with a considerable presence of solid dust and sprays of coolant liquids.
 - To avoid pressure drop, it is advisable to use a suction pipe with a maximum length of 2 metres. Furthermore, to prevent liquid stagnation inside the flexible pipes, avoid depressions when positioning it.
 - Insert an eyebolt of one of the supplied safety tie-rods, on the threaded pins of the anti-vibration joints.
 - Assemble the 4 anti-vibration joints on the previously drilled support surface, positioning the 2 joints - complete with safety tie-rods - in a diagonal position, as indicated in drawing 3.
- If you have drilled clearance holes, fix the anti-vibration joints to the support surface by means of the washer and nuts supplied.
- If you have drilled threaded holes, screw the anti-vibration joints directly on the support surface.
- If foreseen, fix the **PRT** pipe connection plate to the machine tool cabin
 - Lift the air filter by means of the special eyebolt and position it on the anti-vibration joints.
 - Insert the other end of the 2 safety tie-rods on the threaded pin of the anti-vibration joints.
 - Mount the washers and nuts on the 4 threaded pins of the anti-vibrating joints.
 - Tighten firmly.



Drawing 3: Safety tie-rods assembly scheme

Important!

The packaged equipment is **always shipped with the screws loosened**. This ensures that the Ø6mm screw, which restricts the rotation, does not get damaged during transportation or when the product is being extracted from the packaging.

Once the product has been extracted from the packaging, it is possible to choose the position, as shown in the illustration.

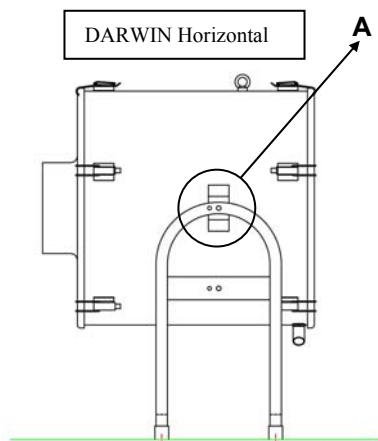


Fig. A

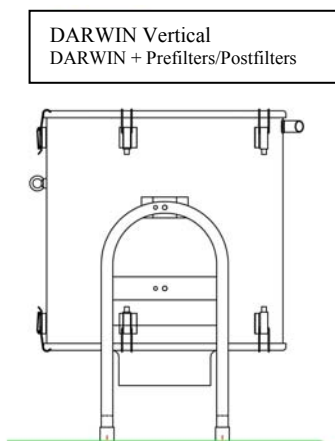


Fig. B

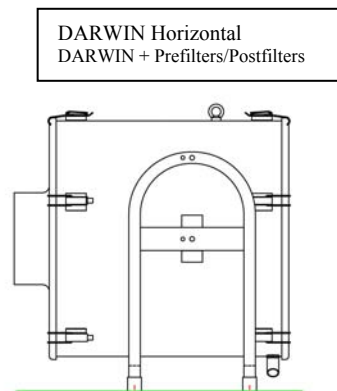


Fig. C

The three illustrations show the possible positions taken on by the product: horizontal or vertical.

In fig. C, provided for the assembly of the Darwin with pre-filters and post-filters, the body of the aspirator must be released from its support (cradle) and moved on holes prepared in the underlying transverse beam (except for the Darwin 600, in which there is only one transverse beam).

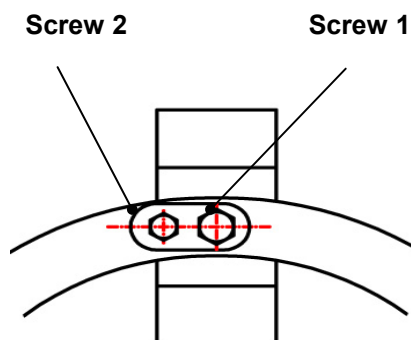
In this position, the aspirator can only be used in a horizontal position.

4.3.1. Determination of the functioning position: Horizontal or Vertical

In order to rotate the equipment, having the N°2 Ø8 screws as a fulcrum, “screw 1” must be slightly loosened to enable movement, after which “screw 2” must be unscrewed, making it exit from the seat made in the body of the aspirator.

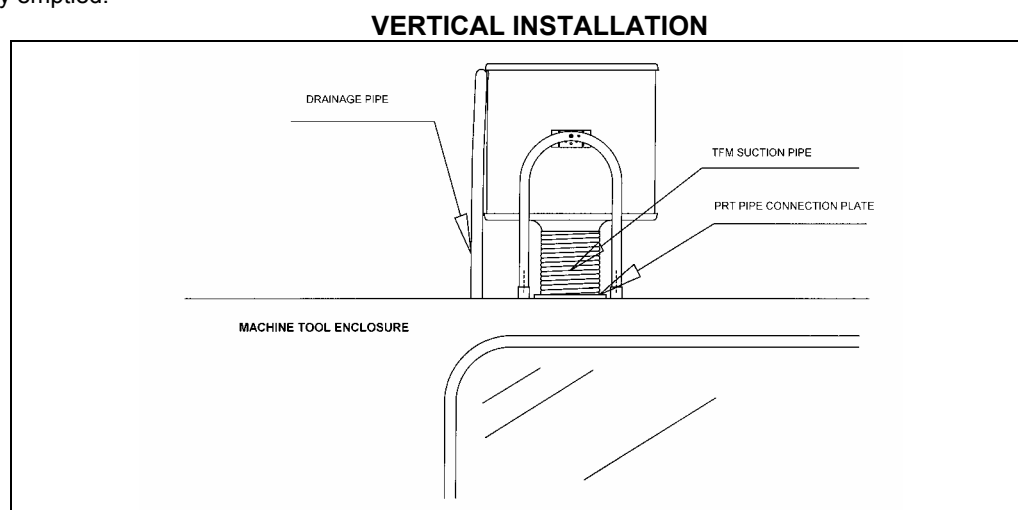
Once the required rotation has been carried out (either Vertical or Horizontal), re-screw “screw 2”, making it return back to the appropriate seat and tighten completely “screw 1”.

Enlargement A



Installation in vertical position (drawing 4)

- Insert the pipe **TFM** on the connection plate **PRT** and secure it using a hose clamp. In alternative, the pipe can be inserted directly into the hole made on the machine tool cabin.
- Insert the other end of the pipe into the suction mouth of the **DARWIN** and secure it using a hose clamp.
- Insert the oil drainage pipe **TFD** in the oil discharge pipe of the **DARWIN** and secure it using a hose clamp.
- Insert the other end of the drainage pipe into the hole made on the machine tool cabin. In alternative, in case you prefer not to re-use the re-condensed oil, insert the other end of the drainage pipe into an open container to be regularly emptied.



Drawing 4: Vertical installation

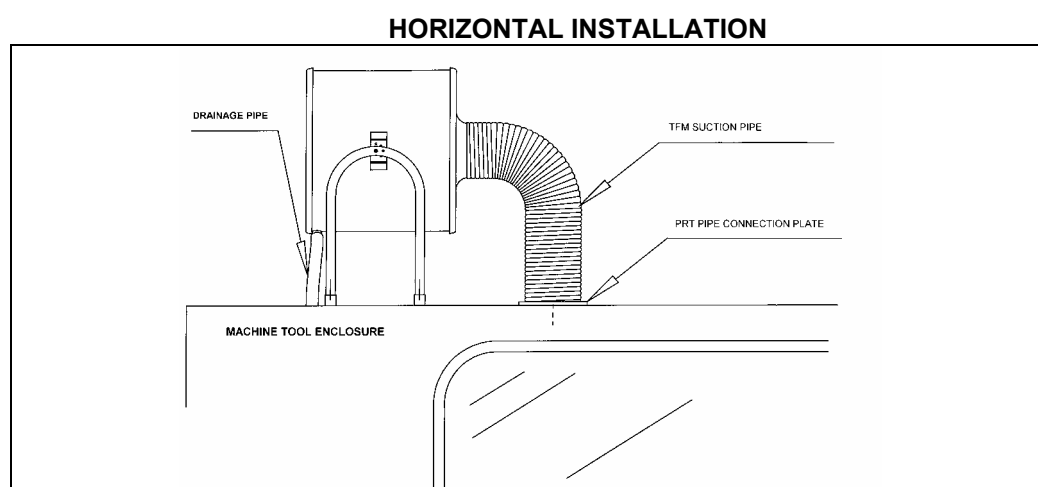
Installation in horizontal position (drawing 9)

- Insert the pipe **TFM** on the connection plate **PRT** and secure it using a hose clamp. In alternative, the pipe can be inserted directly into the hole made on the machine tool cabin.
 - Insert the other end of the pipe into the suction mouth of the **DARWIN** and secure it using a hose clamp.
 - Insert the oil drainage pipe **TFD** in the oil discharge pipe of the **DARWIN** and secure it using a hose clamp.
- Insert the other end of the drainage pipe into the hole made on the machine tool cabin. In alternative, in case you prefer not to re-use the re-condensed oil, insert the other end of the drainage pipe into an open container to be regularly emptied.

Note!

To ensure optimum functioning of the **DARWIN** in both mounting positions:

- Do not obstruct the inlet
- Do not obstruct the exit of the drainage hose.



Drawing 5: Horizontal installation

4.4. Electrical connections

It is advisable to keep the air filter in operation during the entire work shift, in order to avoid frequent starting and stopping. In this way the air filter ensures the best performance and is not subject to unnecessary and detrimental thermal and mechanical stress.

Warning! Danger!

Before making the electrical connection of the air filter cut off the power supply (main switch). Exclusively qualified electricians must carry out all operations.

A power supply automatic cut off must be used as the protection system from indirect contact (refer to the norm EN 60204-1 and 1998-04; For this reason the oilmist filter must be equipped with an equipotent protection circuit that must include a protection switch to avoid problems in case of power supply failure as. Refer to the requirements indicated in 413.1 of the publication IEC 60364-4-41

The **DARWIN** air filter in its STANDARD configuration is supplied with power cable and multi-polar plug and socket. The last one simplifies the disassembling operations of the rear filter during regular maintenance operations.

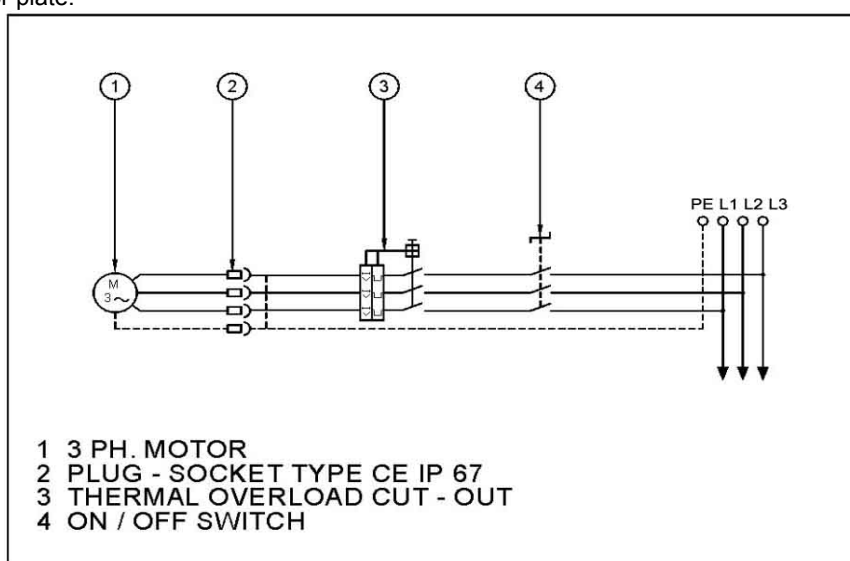
As accessory a Stop/running switch is available on request.

It is advisable to protect the electric motor of the air filter by using a magneto thermal switch.

Note!

For Darwin 3000 with 60 Hz motor, the protection is:

- a) a thermal switch for $3 \div 12$ A with cycle time 20 seconds
 - b) a magnetic switch for 8 A running current.
- Check that the connection voltage indicated on the test sheet on the unit corresponds to that of the power supply network.
 - Read the motor plate information to select the correct connection materials (cable section, fuses, magneto thermal switch, etc.)
 - Make the electrical connection from the electric switchboard of the machine tool to the DARWIN power cables (see drawing 6) inserting the multi-polar socket/plug. This will speed up and facilitate future maintenance operations.
 - Assemble the chosen motor protection device inside the machine tool switch-board (magneto thermal switch for starting the motors).
 - Electrical connections must be carried out as illustrated in drawing 6 and, in any case, in compliance with applicable norms in order to carry out a professional installation.
 - Start up the air filter, following the applicable safety regulations.
 - Check through the suction mouth that the direction of rotation of the air filter rotor corresponds to that indicated by the arrow-label (the rotor must rotate in a clockwise direction).
 - Should the direction of rotation be contrary to that indicated in the arrow, invert the connection between the two phases.
 - Check that the motor-protector switch calibration complies with the power absorption characteristics of the motor indicated on the motor plate.



Drawing 6: Electrical connection

4.5 Inspection

Each air filter is carefully inspected at the factory. The inspection certificate is delivered together with the present manual.

5. Use

Danger!

Do not start the air filter if the synthetic rear filter is missing.

5.1. Starting up and stopping

On request a running/stop switch is available to be mounted on the machine tool control panel. This switch may be used to exclude the air filter.

However, it is advisable to start and stop the air filter only at the beginning and ending of each work shift.

5.1.1. Emergency stop

For the emergency stop procedures consult the instructions' manual of the machine tool on which the air filter is mounted.

5.2. Advice for correct use

It is advisable to avoid, as far as possible, repeated starts and stops of the Darwin, as it may result in:

- Short motor life
- Anomalous stress on the rotor (centrifugal or turbine).

Introduction into the working atmosphere of the pollutant contained in the air, which is sucked but not purified.

Note

It is suggested to stop the Darwin only during the halts between work-shifts, with the machine tool at a standstill.

6. Maintenance

Warning! Danger!

- **Respect carefully the programmed maintenance timetable illustrated in the present manual.**
- **Only use ladders and/or gangways that comply with the current accident prevention regulations to reach the air filter units on which maintenance is to be done**
- **Use only original spare parts.**

Danger!

Before beginning the maintenance procedure:

- **Position the general switch of the machine tool to "OFF" and lock it.**
- **Wait at least 3 minutes in order to allow the rotor to come to a complete stop.**
- **Disconnect the control device from the plug and socket of the air filter**
- **Place on the machine tool the apposite sign "Maintenance in progress".**
- **Wear goggles and protective clothing (gloves, safety shoes, etc.).**

6.1. Operator qualification

Qualified personnel, familiar with the procedures and precautions to be adopted, must undertake the programmed maintenance operations.

6.2. External cleaning

- Position the general switch of the machine tool to **"OFF"** and lock it.

Every 1000 hours of operation, and more often if the working conditions require it, clean the exterior and the suction mouth of the Darwin

6.3. Programmed maintenance

In order to ensure the maximum efficiency of the air filter it is necessary to undertake a preventive programmed maintenance at regular intervals.

The programmed and preventive maintenance operations consist in the periodic cleaning or substitution of filters, seals, etc.

Note

Consult enclosure **"Spare parts list"** for the exact location of the filters, seals, etc.

6.3.1. Programmed maintenance table

DARWIN				
	500 h	1000 h	1500 h	2000 h
<u>DARWIN T</u>				
FPS / FPSE	Clean / replace	Replace	Clean / replace	Replace
GTI				Replace
GSM				Replace
TURBINE	Clean	Clean	Clean	Clean
<u>DARWIN M</u>				
FCS / FCSE		Replace		Replace
FPS / FPSI / FPSE		Replace		Replace
GTI				Replace
GSM				Replace
CENTRIFUGE		Clean		Clean
<u>DARWIN D</u>				
FCSE / FCS		Replace		Replace
FCSI		Replace		Replace
FPS / FPSI/FPSE		Replace		Replace
GTI				Replace
GSM				Replace
CENTRIFUGE		Clean		Clean

Note

FCS - FCSI - FCSE - FPS - FPSI - FPSE filters can be cleaned rather than replaced at the above-mentioned intervals, provided that their structure is fully integral.

In case of installation of the machine in smaller areas, maintenance is required more often.

KEY	
FCS	Synthetic centrifugal filter
FCSI	Internal synthetic centrifugal filter
FCSE	External synthetic centrifugal filter
FPS	Rear synthetic filter
FPSI	Rear internal synthetic filter
FPSE	Rear external synthetic filter
GTI	Covering tubular seal
GSM	Motor support seal

All filters are available in two different materials:

- **Standard**, black, for normal functioning conditions.
- **Special**, light blue, for particularly aggressive liquids and emulsions.

6.3.2. Rotor, seal and filter maintenance

Warning!

Do not forget any objects or tools inside the air filter.

DARWIN M

- Release and remove the rear lid.
- Extract the **FPS** filter (for **D 3000: FPSE**, the net and **FPSI**) and the net from the rear lid.
- Remove all deposits (metal, grease, etc.) from the drainage ring of the rear lid and from the air filter shell (see 6.3.4).
- Replace seals **GSM** and **GTI** if necessary
- Clean or replace the **FPS** (for **D 3000: FPSE** and **FPSI**) filter (see 6.3.3).
- Insert the **FPS** (for **D 3000: insert FPSI**, the net and **FPSE**) filter on the net of the rear lid.
- Reassemble and secure the rear lid.
- Remove the two safety pins mounted on hooks of the front lid.
- Release and remove the front lid.
- Extract filter **FCSE (FCS for D 600)** from the inside of the centrifuge.
- Clean or replace the **FCSE (FCS for D 600)** filter (see 6.3.3).
- Remove all deposits from the surface of the centrifuge (metallic dust, grease, etc. see 6.3.4.)
- Reposition filter **FCSE (FCS for D 600)** inside the centrifuge
- Replace the **GTI** seal if necessary
- Reassemble and secure the front lid inserting the two safety pins into the hooks.

DARWIN D

- Release and remove the rear lid.
- Extract the **FPS** filter (for **D 3000: FPSE**, the net and **FPSI**) and the net from the rear lid.
- Remove all deposits (metal, grease, etc.) from the drainage ring of the rear lid and from the air filter shell (see 6.3.4).
- Replace seals **GSM** and **GTI** if necessary
- Clean or replace the **FPS** (for **D 3000: FPSE** and **FPSI**) filter (see 6.3.3).
- Insert the **FPS** (for **D 3000: insert FPSI** the net and **FPSE**) filter on the net of the rear lid.
- Reassemble and secure the rear lid.
- Remove the two safety pins mounted on hooks of the front lid.
- Release and remove the front lid.
- Extract filter **FCSE (FCS for D 600)** and **FCSI** from the inside of the centrifuge.
- Clean or replace the **FCSE (FCS for D 600)** filter (see 6.3.3).
- Remove all deposits from the surface of the centrifuge (metallic dust, grease, etc. see 6.3.4.)
- Reposition filter **FCSE (FCS for D 600)** and **FCSI** inside the centrifuge
- Replace the **GTI** seal if necessary
- Reassemble and secure the front lid inserting the two safety pins into the hooks.

DARWIN T

- Release and remove the rear lid.
- Extract the **FPS** filter (for **D 3000: FPSE**, the net and **FPSI**) and the net from the rear lid.
- Remove all deposits (metal, grease, etc.) from the drainage ring of the rear lid and from the air filter shell (see 6.3.4).
- Replace seals **GSM** and **GTI** if necessary
- Clean or replace the **FPS** (for **D 3000: FPSE** and **FPSI**) filter (see 6.3.3).
- Insert the **FPS** (for **D 3000: insert FPSI**, the net and **FPSE**) filter on the net of the rear lid.
- Reassemble and secure the rear lid.
- Remove the two safety pins mounted on hooks of the front lid.
- Release and remove the front lid.
- Remove all deposits from the surface of the centrifuge (metallic dust, grease, etc. see 6.3.4.)
- Replace the **GTI** seal if necessary
- Reassemble and secure the front lid inserting the two safety pins into the hooks.

6.3.3. Filter cleaning

Note

*The used filters and the liquids used for washing are special waste. Take this waste to **authorised collection and disposal centres**.*

It is advisable to regularly replace the synthetic filters as indicated in the Programmed Maintenance Table (item **6.3.1**). If the filters structure is fully integral, it is possible to regenerate them (instead of replacing them) by putting them into a solution of industrial detergent and water for about 12 hours. Before re-assembling the filters, dry them with a jet of compressed air or leave them to dry naturally.

Danger!

The used filters and the seals are special waste. While waiting for disposal, they must be kept in hermetically closed containers, which must be located far from the working areas.

6.3.4. Internal cleaning

Careful and regular cleaning of all the internal parts (shell, drainage pipe, drainage ring, etc.) ensures high performance and long life of the air filter.

It is of fundamental importance to periodically check the inside of the centrifuge or the blades of the turbine to eliminate eventual deposits of metal particles, sludge or other material which could cause loss of balance of the centrifuge or of the turbine.

Warning

The functioning of the air filter with unbalanced turbine or centrifuge (even if for a short time) could seriously damage the air filter components.

For the internal cleaning of the air filter and the rotors (either turbine or centrifuge) use a clean brush saturated in a mild industrial detergent solution. Alternatively standard liquid soaps can be used.

Should the dirt be very resistant, it is advisable to remove the rotor (for rotor dismantling see 6.4) and use the following alternative cleaning solutions:

- A jet of steam at a temperature of over 100° C.
- An industrial detergent solution in water, soaking the rotor for at least 12 hours.

Allow the centrifugal device to dry in the open air or dry with a jet of compressed air.

6.4. Special maintenance

Danger!

The special maintenance operations are to be undertaken by qualified technicians only. Skilled electricians should carry out work on the electrical parts.

Before beginning the maintenance procedure:

- Position the general switch of the machine tool to **"OFF"** and lock it.
- Wait at least 3 minutes in order to allow the rotor to come to a complete stop.
- Disconnect the control device from the plug and socket of the air filter.
- Place on the machine tool the apposite sign **"Maintenance in progress"**.
- Wear goggles and protective clothing (gloves, safety shoes, etc.).

6.4.1. General disassembly and reassembly

Warning! Danger!

During the re-assembly and before starting up the air filter again make sure that all the components are correctly secured and mounted.

In particular, check:

- The correct tightening of the screws connecting the motor to the relative support.
- The correct tightening of the screw connecting the rotor to the motor shaft.

- The correct assembly of filters and seals.
 - The correct assembly of electrical connections.
 - That there are no objects or tools inside the air filter.
 - Check through the suction mouth that the direction of rotation of the air filter rotor corresponds to that indicated by the arrow-label (the rotor must rotate in a clockwise direction).
 - Reassemble and secure the front lid inserting the two safety pins into the hooks.
-
- Disconnect the air filter from the machine tool. To remove and lift it up use the apposite eyebolt. Place the air filter on a workbench.
 - Remove the two safety pins mounted on the hooks of the front lid.
 - Release and remove the front lid.
 - Release and remove the rear lid.
 - Unscrew the blocking screws of the rotor.
 - Using the special extractor remove the rotor from the motor shaft.
 - Loosen the 4 screws, which fix the motor to the support and remove the motor.
 - Unscrew the 4 nuts and the eyebolt and remove the 5 screws securing the support to the air filter shell.
 - Extract the support from the shell.

To remount the air filter undertake the dismantling operations in reverse order using new safety pins, seals, washer and self-blocking nuts.

It is also advisable to block the threads of the bolts connecting the motor support to the shell using thread-blocking substance "**Arexons sistem forte 52A70**" or an equivalent product.

6.4.2. Motor maintenance

At regular intervals and, in any case, during normal maintenance of other components of the air filter, it is advisable to regularly check that the motor shaft rotates freely and does not produce anomalous sounds.

Anomalous noises coming from the electric motor are usually an indication that the ball bearings are worn. In this case replace them following the instructions provided below.

-
- On reassembly of the bearings and the sealing ring, avoid using inadequate tools which may damage these components.
- On reassembling the motor install all components in their original and correct position.
- At the end of reassembly check that the shaft rotates freely and that the new bearings installed do not make any noise.

Note

The dismantling operations indicated may vary according to the type of electric motor mounted on the air filter. The instructions provided below is only a general indication of the recommended dismantling order of the electric motor components.

- Dismantle the electric motor from the air filter, see paragraph 6.4.1
- Remove the tab from the electric motor shaft.
- Remove the fixture screws of the fan-cover and the cooling fan
- Loosen the 4 or 8 closure screws of the electric motor cover.
- If the motor has a rear or front bearing, unscrew the two blocking screws.
- With the aid of a plastic mallet, remove the front and rear covering. Pay particular attention to the positioning of the pre-load washers mounted in the coverings.
- Remove the electric motor shaft.
- Dismantle the bearings using a special extractor.
- Dismantle the oil-protection bearings using a special extractor

For reassembly undertake the operations as indicated above in reverse order replacing all worn parts.

6.5. Structural checks

- **Each year:**

Check that the nuts of the anti-vibration joints are firmly tightened.

- **Every 2 years:**

Check the condition of the safety tie rods.

Check the good condition of the Darwin shell.

- **Every 4 years:**

Replace the anti-vibration joints.

7. Disposal

Danger!

Solely adequately trained and equipped personnel must carry out the machine disconnection and disposal operations.

The used filters, the internal parts in rubber and all components with oil residuals are special waste to be disposed through authorized organizations.

To allow for the reutilization of the raw materials it is also advisable to separate:

- The metal parts.
- The electric motor.
- The rubber parts.
- The synthetic material parts.

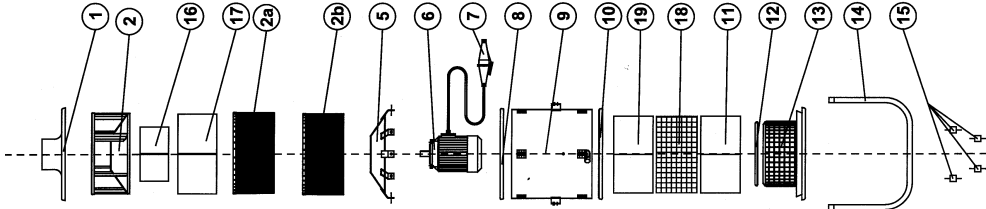
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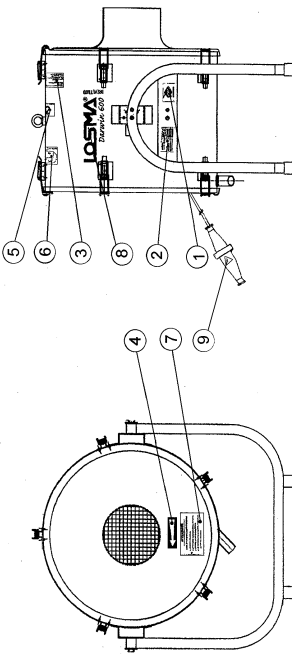


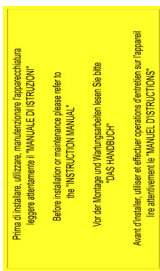
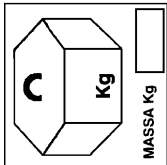
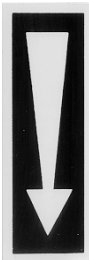


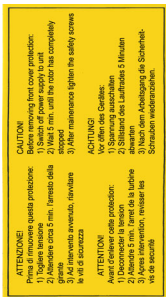
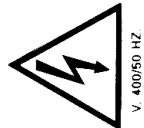
LOSMA S.P.A. does not assume any responsibility for damage to persons or things resulting from reutilization of individual parts of the machine for operations or in assembly condition others than the original ones for which the machine was designed.

Allegato IV Parti di ricambio Attachment IV Spare Parts Annexe IV Pièces de réchange
Anlage IV Ersatzteile Anexo IV Piezas de repuesto

Darwin 600-1200-2000-3000

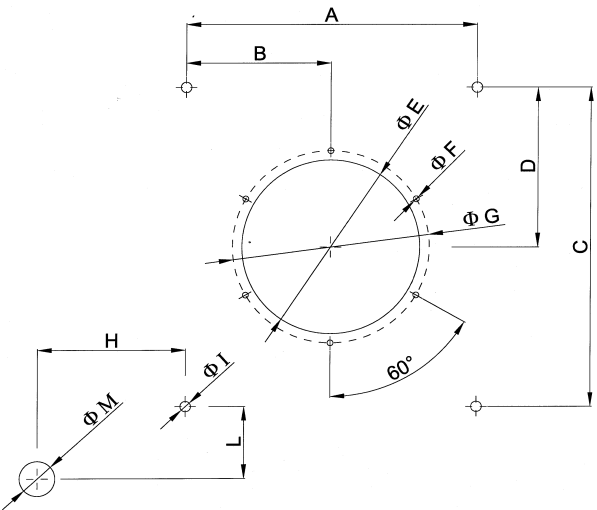
RIF.	DESCRIZIONE	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	DESCRIPCIÓN
8	GUARNIZIONE COPERCHIO ANTERIORE	FRONT COVER GASKET	JOINT COUVERCLE AVANT	DICHTUNG DECKEL VORNE	JUNTA TAPA ANTERIOR
12	GUARNIZIONE SUPPORTO MOTORE	MOTOR SUPPORT GASKET	JOINT SUPPORT MOTEUR	DICHTUNG MOTORHALTERUNG	JUNTA SOPORTE MOTOR
10	GUARNIZIONE COPERCHIO POSTERIORE	BACK COVER GASKET	JOINT COUVERCLE ARRIERE	DICHTUNG DECKEL HINTEN	JUNTA TAPA POSTERIOR
	KIT COIGLIE GANCI	SAFETY PINS	KIT 2 GOUPILLES POUR CROCHET	SICHERUNGSSPLINTE	KIT DE PASADORES
10 +12+ 8	KIT GUARNIZIONI	SEALS KIT	KIT JOINTS	DICHTUNGSSATZ	KIT JUNTAS
7	PRESA-SPINA	PLUG & SOCKET	PRISE ET CONTREPRISE	STECKER/GEGENSTECKER	ENCHUFES
15	KIT ANTIVIBRANTI	ANTIVIBRATION KIT	KIT ANTIVIBRATIONS	SATZ VIBRATIONSDÄMPFER	KIT ANTIVIBRANTE
14	SUPPORTO ASPIRATORE	UNIT BRACKET	SUPPORT EPURATEUR	GERÄTEHALTERUNG	SOPORTE ASPIRADOR
1 + 8	COPERCHIO ANTERIORE	FRONT LID	COUVERCLE AVANT	DECKEL VORNE MIT DICHTUNG	TAPA ANTERIOR
2	TURBINA	TURBINE	TURBINE	TURBINE	TURBINA
2a	MONOCENTRIFUGA	MONOCENTRIFUGE	MONOCENTRIFUGE	MONOZENTRIFUGE	CENTRIFUGA
2b	DOPPIACENTRIFUGA	DOUBLE CENTRIFUGE	DOUBLE CENTRIFUGE	DOPPELZENTRIFUGE	DOBLE CENTRIFUGA
8 + 9 + 10	KIT INVOLUCRO	SHELL KIT	KIT CARTER	GEHÄUSE MIT DICHTUNGEN	KIT CARCASA
5	KIT SUPPORTO MOTORE	MOTOR SUPPORT KIT	KIT SUPPORT MOTEUR	BEFESTIGUNGSSATZ MOTOR	KIT SOPORTE MOTOR
6	MOTORE	MOTOR	MOTEUR	MOTOR	MOTOR
11+16+17+ 19	KIT FILTRI (Azzurri)	FILTERS KIT (Blue)	KIT FILTRES (Bleu)	FILTERSATZ KOMPLETT, BLAU	KIT FILTROS AZUL
11+16+17+ 19	KIT FILTRI (Neri)	FILTERS KIT (Black)	KIT FILTRES (Noir)	FILTERSATZ KOMPLETT, SCHWARZ	KIT FILTROS NEGROS
12+13	COPERCHIO POSTERIORE	BACK LID	COUVERCLE ARRIERE	HINTERER DECKEL	TAPA POSTERIOR
	ETICHETTE INVOLUCRO	SHELL LABELS	PLAQUE CARTER	AUFKLEBER GAHÄUSE	ETIQUETAS CARCASA
	ETICHETTE COPERCHIO ANTERIORE	FRONT COVER LABELS	ETIQUETTES COUVERCLE AVANT	AUFKLEBER GAHÄUSE	ETIQUETAS TAPA ANTERIOR
18	RETE COPERCHIO POSTERIORE	BACK COVER NET	GRILLE COUVERCLE ARRIERE	NETZ FÜR DECKEL HINTEN	RED TAPA POSTERIOR
	Pos. 16 solo per Darwin D	Pos. 16 only for Darwin D	Pos. 16 seulement pour Darwin D	Pos. 16 nur für Darwin D	Pos.16 esclusivam. para Darwin D
	Pos. 17 solo per Darwin D ed M	Pos. 17 only for Darwin D and M	Pos. 17 seulement pour Darwin D et M	Pos. 17 nur für Darwin D und M	Pos.17 esclusivam. para Darwin D y M
	Pos. 18 -19 solo per Darwin 3000	Pos. 18 -19 only for Darwin 3000	Pos. 18 -19 seulement pour Darwin 3000	Pos. 18 -19 nur für Darwin 3000	Pos.18-19 esclusivamente para Darwin 3000
	Pos. 2 solo per Darwin T	Pos. 2 only for Darwin T	Pos. 2 seulement pour Darwin T	Pos. 2 nur für Darwin T	Pos.2 esclusivamente para Darwin T
	Pos. 2a solo per Darwin M	Pos. 2a only for Darwin M	Pos.2 seulement pour Darwin T	Pos. 2a nur für Darwin M	Pos.2 esclusivamente para Darwin T
	Pos. 2b solo per Darwin D	Pos. 2b only for Darwin D	Pos.2a seulement pour Darwin M	Pos. 2b nur für Darwin D	Pos.2a esclusivam. para Darwin M
			Pos.2b seulement pour Darwin D		Pos.2b esclusivam. para Darwin D



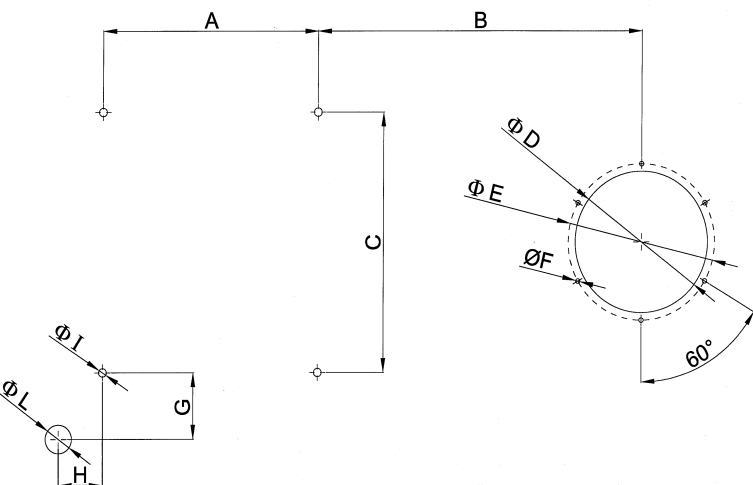
Allegato I Disposizione delle targhette di pericolo e attenzione – Attachement I Position of danger and warning labels – Anlage I Sicherheitsvorrichtungen - Annexe I Disposition des plaquettes signalétiques – Anexo I Disposición avisos de peligro y atención			
NR	Etichetta/Label/Aufkleber/ Plaquette/Placas	NR	Etichetta/Label/Aufkleber/ Plaquette/Placas
		1	
		2	
3		6	
4		8	
5		7	
9			

SCHEMA DI FORATURA - DRILLING SCHEME - BOHRSCHEMA - SCHEMA DE PERCAGE - TABLA DE TALADRADO

Montaggio verticale/vertical installation/verticale Ausrichtung/montage verticale/montaje vertical

	Mod.	A	B	C	D	ϕ E	ϕ F	ϕ G	H	ϕ I	L	ϕ M
	D 600	170	85	180	90	100	5	118	100	M 8/ ϕ 10	20	30
	D 1200	245	122,5	275	137,5	150	5	168	125	M 8/ ϕ 10	20	30
	D 2000	245	122,5	275	137,5	150	5	168	125	M 8/ ϕ 10	20	30
	D 3000	245	122,5	275	137,5	200	5	218	150	M 8/ ϕ 10	20	30

Montaggio orizzontale/horizontal installation/horizontale Ausrichtung/montage horizontal/montaje horizontal

	Mod.	A	B	C	ϕ D	ϕ E	ϕ F	G	H	ϕ I	ϕ L
	D 600	170	350	180	100	118	5	20	60	M 8/ ϕ 10	30
	D 1200	245	370	275	150	168	5	20	60	M 8/ ϕ 10	30
	D 2000	245	370	275	150	168	5	20	60	M 8/ ϕ 10	30
	D 3000	245	530	275	200	218	5	20	80	M 8/ ϕ 10	30

Le dimensioni sono espresse in mm. All dimensions are expressed in mm. Les dimensions sont en mm. Die Massen sind in mm. Las dimensiones son en mm



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