

Ransburg ICE-BELL 2 - High Rotation Atomizers



Model: IB-30XXX, IB-57XXX

IMPORTANT: Before using this equipment, carefully read SAFETY PRECAUTIONS and all instructions in this manual. Keep this Service Manual for future reference.

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SAFETY

SAFETY PRECAUTIONS

Before operating, maintaining or servicing any electrostatic coating system, read and understand all of the technical and safety literature for your products. This manual contains information that is important for you to know and understand. This information relates to **USER SAFETY** and **PREVENTING EQUIPMENT PROBLEMS**. To help you recognize this information, we use the following symbols. Please pay particular attention to these sections.

WARNING

A **WARNING!** states information to alert you to a situation that might cause serious injury if instructions are not followed.

CAUTION

A **CAUTION!** states information that tells how to prevent damage to equipment or how to avoid a situation that might cause minor injury.

NOTE

A **NOTE** is information relevant to the procedure in progress.

While this manual lists standard specifications and service procedures, some minor deviations may be found between this literature and your equipment. Differences in local codes and plant requirements, material delivery requirements, etc., make such variations inevitable. Compare this manual with your system installation drawings and associated equipment manuals to reconcile such differences.

Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier troubleshooting. If you do not have the manuals and safety literature for your equipment, contact your local Carlisle Fluid Technologies representative or Carlisle Fluid Technologies technical support.


WARNING



- The user **MUST** read and be familiar with the Safety Section in this manual and the safety literature therein identified.
- This equipment is intended to be used by trained personnel **ONLY**.
- This manual **MUST** be read and thoroughly understood by **ALL** personnel who operate, clean or maintain this equipment! Special care should be taken to ensure that the **WARNINGS** and safety requirements for operating and servicing the equipment are followed. The user should be aware of and adhere to **ALL** local building and fire codes and ordinances as well as **NFPA-33 AND EN 50177 SAFETY STANDARDS, LATEST EDITION**, or applicable country safety standards, prior to installing, operating, and/or servicing this equipment.


WARNING




- The hazards shown on the following pages may occur during the normal use of this equipment.

Repairs may only be performed by authorized personnel.

<p>AREA Tells where hazards may occur.</p>	<p>HAZARD Tells what the hazard is.</p>	<p>SAFEGUARDS Tells how to avoid the hazard.</p>
<p>Spray Area</p> 	<p>Fire Hazard</p> <p>Improper or inadequate operation and maintenance procedures will cause a fire hazard.</p> <p>Protection against inadvertent arcing that is capable of causing fire or explosion is lost if any safety interlocks are disabled during operation. Frequent Power Supply or Controller shutdown indicates a problem in the system requiring correction.</p>	<p>Fire extinguishing equipment must be present in the spray area and tested periodically.</p> <p>Spray areas must be kept clean to prevent the accumulation of combustible residues.</p> <p>Smoking must never be allowed in the spray area.</p> <p>The high voltage supplied to the atomizer must be turned off prior to cleaning, flushing or maintenance.</p> <p>Spray booth ventilation must be kept at the rates required by NFPA-33, OSHA, country, and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents.</p> <p>Electrostatic arcing must be prevented. Safe sparking distance must be maintained between the parts being coated and the applicator. A distance of 1 inch for every 10KV of output voltage is required at all times.</p> <p>Test only in areas free of combustible material. Testing may require high voltage to be on, but only as instructed.</p> <p>Non-factory replacement parts or unauthorized equipment modifications may cause fire or injury. If used, the key switch bypass is intended for use only during setup operations. Production should never be done with safety interlocks disabled.</p> <p>The paint process and equipment should be set up and operated in accordance with NFPA-33, NEC, OSHA, local, country, and European Health and Safety Norms.</p>

<p>AREA Tells where hazards may occur.</p>	<p>HAZARD Tells what the hazard is.</p>	<p>SAFEGUARDS Tells how to avoid the hazard.</p>
<p>Spray Area</p> 	<p>Explosion Hazard</p> <p>Improper or inadequate operation and maintenance procedures will cause a fire hazard.</p> <p>Protection against inadvertent arcing that is capable of causing fire or explosion is lost if any safety interlocks are disabled during operation.</p> <p>Frequent Power Supply or Controller shutdown indicates a problem in the system requiring correction.</p>	<p>Electrostatic arcing must be prevented. Safe sparking distance must be maintained between the parts being coated and the applicator. A distance of 1 inch for every 10KV of output voltage is required at all times.</p> <p>Unless specifically approved for use in hazardous locations, all electrical equipment must be located outside Class I or II, Division 1 or 2 hazardous areas, in accordance with NFPA-33.</p> <p>Test only in areas free of flammable or combustible materials.</p> <p>The current overload sensitivity (if equipped) MUST be set as described in the corresponding section of the equipment manual. Protection against inadvertent arcing that is capable of causing fire or explosion is lost if the current overload sensitivity is not properly set. Frequent power supply shutdown indicates a problem in the system which requires correction.</p> <p>Always turn the control panel power off prior to flushing, cleaning, or working on spray system equipment.</p> <p>Before turning high voltage on, make sure no objects are within the safe sparking distance.</p> <p>Ensure that the control panel is interlocked with the ventilation system and conveyor in accordance with NFPA-33, EN 50176.</p> <p>Have fire extinguishing equipment readily available and tested periodically.</p>
<p>General Use and Maintenance</p> 	<p>Improper operation or maintenance may create a hazard.</p> <p>Personnel must be properly trained in the use of this equipment.</p>	<p>Personnel must be given training in accordance with the requirements of NFPA-33, EN 60079-0.</p> <p>Instructions and safety precautions must be read and understood prior to using this equipment.</p> <p>Comply with appropriate local, state, and national codes governing ventilation, fire protection, operation maintenance, and housekeeping. Reference OSHA, NFPA-33, EN Norms and your insurance company requirements.</p>

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
<p>Spray Area / High Voltage Equipment</p> 	<p>Electrical Discharge</p> <p>There is a high voltage device that can induce an electrical charge on ungrounded objects which is capable of igniting coating materials.</p> <p>Inadequate grounding will cause a spark hazard. A spark can ignite many coating materials and cause a fire or explosion.</p>	<p>Parts being sprayed and operators in the spray area must be properly grounded.</p> <p>Parts being sprayed must be supported on conveyors or hangers that are properly grounded. The resistance between the part and earth ground must not exceed 1 megohm. (Refer to NFPA-33.)</p> <p>Operators must be grounded. Rubber soled insulating shoes should not be worn. Grounding straps on wrists or legs may be used to assure adequate ground contact.</p> <p>Operators must not be wearing or carrying any ungrounded metal objects.</p> <p>When using an electrostatic handgun, operators must assure contact with the handle of the applicator via conductive gloves or gloves with the palm section cut out.</p> <p>NOTE: REFER TO NFPA-33 OR SPECIFIC COUNTRY SAFETY CODES REGARDING PROPER OPERATOR GROUNDING.</p> <p>All electrically conductive objects in the spray area, with the exception of those objects required by the process to be at high voltage, must be grounded. Grounded conductive flooring must be provided in the spray area.</p> <p>Always turn off the power supply prior to flushing, cleaning, or working on spray system equipment.</p> <p>Unless specifically approved for use in hazardous locations, all electrical equipment must be located outside Class I or II, Division 1 or 2 hazardous areas, in accordance with NFPA-33.</p> <p>Avoid installing an applicator into a fluid system where the solvent supply is ungrounded.</p> <p>Do not touch the applicator electrode while it is energized.</p>

<p>AREA Tells where hazards may occur.</p>	<p>HAZARD Tells what the hazard is.</p>	<p>SAFEGUARDS Tells how to avoid the hazard.</p>
<p>Electrical Equipment</p> 	<p>Electrical Discharge</p> <p>High voltage equipment is utilized in the process. Arcing in the vicinity of flammable or combustible materials may occur. Personnel are exposed to high voltage during operation and maintenance.</p> <p>Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation.</p> <p>Frequent power supply shut-down indicates a problem in the system which requires correction.</p> <p>An electrical arc can ignite coating materials and cause a fire or explosion.</p>	<p>Unless specifically approved for use in hazardous locations, the power supply, control cabinet, and all other electrical equipment must be located outside Class I or II, Division 1 and 2 hazardous areas in accordance with NFPA-33 and EN 50176.</p> <p>Turn the power supply OFF before working on the equipment.</p> <p>Test only in areas free of flammable or combustible material.</p> <p>Testing may require high voltage to be on, but only as instructed.</p> <p>Production should never be done with the safety circuits disabled.</p> <p>Before turning the high voltage on, make sure no objects are within the sparking distance.</p>
<p>Toxic Substances</p> 	<p>Chemical Hazard</p> <p>Certain materials may be harmful if inhaled, or if there is contact with the skin.</p>	<p>Follow the requirements of the Safety Data Sheet supplied by coating material manufacturer.</p> <p>Adequate exhaust must be provided to keep the air free of accumulations of toxic materials.</p> <p>Use a mask or respirator whenever there is a chance of inhaling sprayed materials. The mask must be compatible with the material being sprayed and its concentration. Equipment must be as prescribed by an industrial hygienist or safety expert, and be NIOSH approved.</p>
<p>Spray Area</p> 	<p>Explosion Hazard — Incompatible Materials</p> <p>Halogenated hydrocarbon solvents for example: methylene chloride and 1,1,1, - Trichloroethane are not chemically compatible with the aluminum that might be used in many system components. The chemical reaction caused by these solvents reacting with aluminum can become violent and lead to an equipment explosion.</p>	<p>Spray applicators require that aluminum inlet fittings be replaced with stainless steel.</p> <p>Aluminum is widely used in other spray application equipment - such as material pumps, regulators, triggering valves, etc. Halogenated hydrocarbon solvents must never be used with aluminum equipment during spraying, flushing, or cleaning. Read the label or data sheet for the material you intend to spray. If in doubt as to whether or not a coating or cleaning material is compatible, contact your coating supplier. Any other type of solvent may be used with aluminum equipment.</p>

INTRODUCTION

GENERAL DESCRIPTION

The ICE Bell 2 is a high rotation atomizer, which was especially designed for fast drying water-thinnable paint materials.

This atomisation technique is based on a patented air-bearing turbine and, thus, enables finest atomisation and long durability.

Due to the European VOC directives, today, more and more air-drying water-thinnable paint materials are used. As a result, the spray systems are adjusted to such paints. In accordance with these environmental directives, Carlisle Fluid Technologies designed the ICE Bell 2 as the best technical solution.

By air cooling at the bell cup, a condensate film is created on the spray bell which enables a proper material flow without residues.



WARNING

- The ICE BELL must be used with waterbased materials only, either non ignitable or hard to ignite materials. Ref. EN 50348 Annex A for additional information.

CHARACTERISTICS

Fast drying water-thinnable paints can cause a dry film on the spray bell. By using the cooling system, the turbine and spray bell temperature is reduced so that a physical surface drying is avoided.

RELIABILITY/DURABILITY

The bell cup is made of titanium and offers better operational safety and a longer service life. By mounting the drive shaft in an air cushion, a metal-to-metal contact is avoided. The turbine has a high service life and offers high reliability.

FLEXIBILITY AND HANDINESS

Suitable for almost all modern water-based paints. Material feed in a hollow shaft enables fast bell cleaning and colour change.

All outer parts are made of robust solvent-resistant materials. They are easily to clean.

With the ICE Bell 2, you can update your current bell installation to the latest status of application technology when converting to fast drying water-based paints.

TYPICAL AREAS OF APPLICATION

- Automobile supply industry
- Appliances
- Engineering
- General industry
- Timber construction and furniture manufacture



Figure: ICE-Bell 2

SPECIAL FUNCTIONS:

Part of the functions which cause the suitability of the high rotation atomizer ICE Bell 2 in electrostatic applications are:

- CE certified
- Bell cup and individual components are made of titanium and, thus, offer better operational safety and a longer service life.
- The air-bearing turbine offers a high service life and reliability. It reaches maximum speeds of up to 60000 rpm with minimum air consumption (see specifications).
- The patented serrated edge at the bell cup guarantees excellent atomisation quality at minimum speeds.
- High flexibility in use by choosing appropriate bell cup sizes (30 mm and 57 mm).
- Fast colour change by:
 - Paint/solvent supply in the bell central axis
 - Integral braking air
 - Flow controller
 - Paint valves (simultaneous paint emission and solvent purging of paint tube and bell cup).
- Bell cleaning takes place fast and efficiently. Controlled detergent consumption at the paint tube due to a installed valve.
- Paint saving due to integrated dump valve.
- The air cooler is capable of reducing the temperature at the bell cup to up to -15°C.
- The ICE Bell 2 is easy to install and low-maintenance. Hoses and connections are placed at the back of the bell and therefore easily accessible.
- Fast dismantling of the turbine regarding repairs.
- The ring-shaped shaping air canal provides excellent passage with minimum air consumption, and further, a uniform and stable spray pattern.
- This aerodynamic design facilitates cleaning the outer surfaces.
- The ICE Bell 2 can be pivoted to guarantee consistent paint application also at surfaces that are difficult to access.
- The turbine air is released behind the bell to not impair the inner of the atomizer with contamination by paint/solvents.
- The speed measurements is done magneto-optical by means of the fibre optic transmission technology.

SPECIFICATIONS

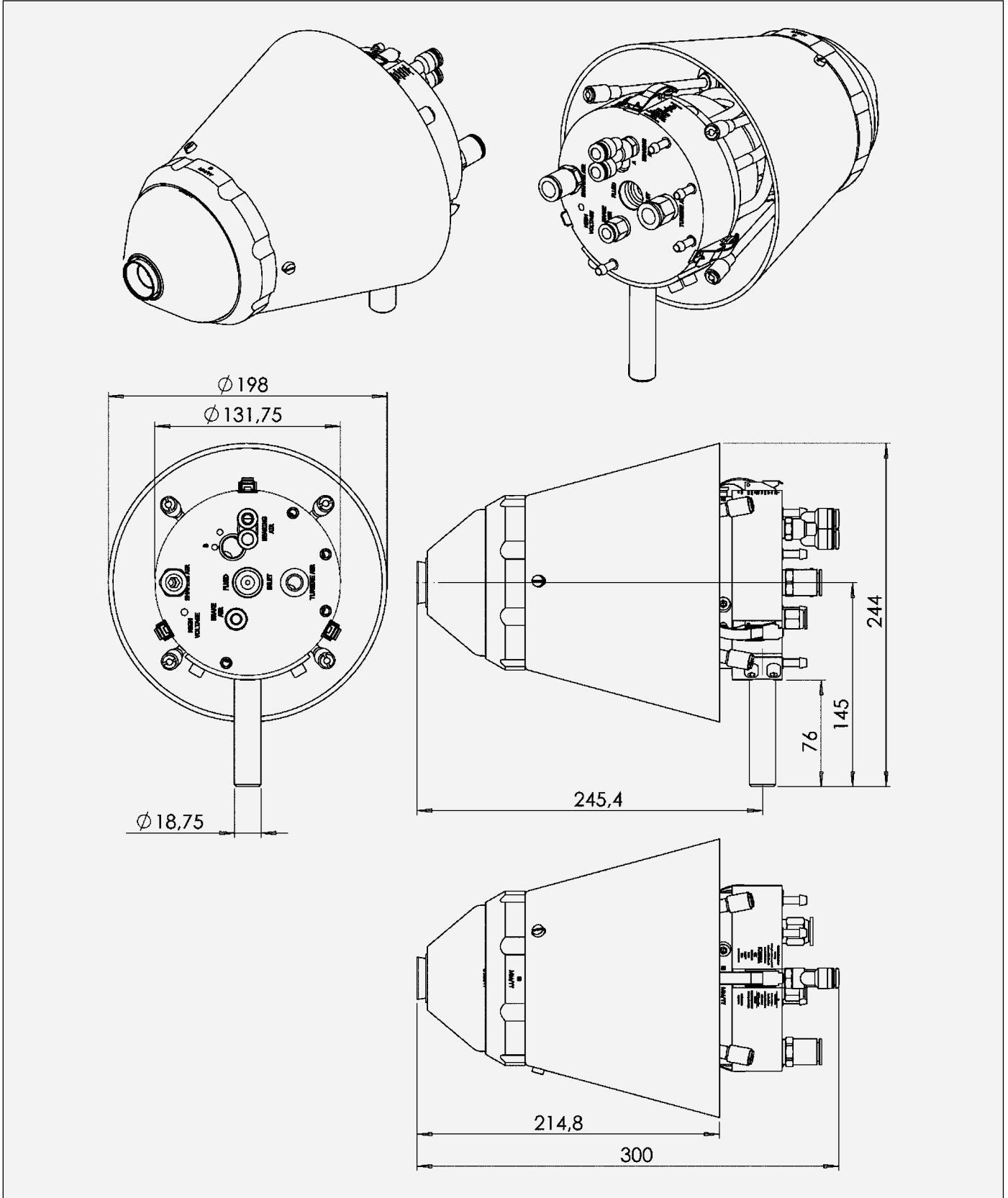
Electrical

Power Supply:	MicroPak 2e
Charging Method:	Direct
Output Voltage:	30 – 100 kV
Variable Output Current:	Max. 1000 μ A
Control:	MicroPak 2e

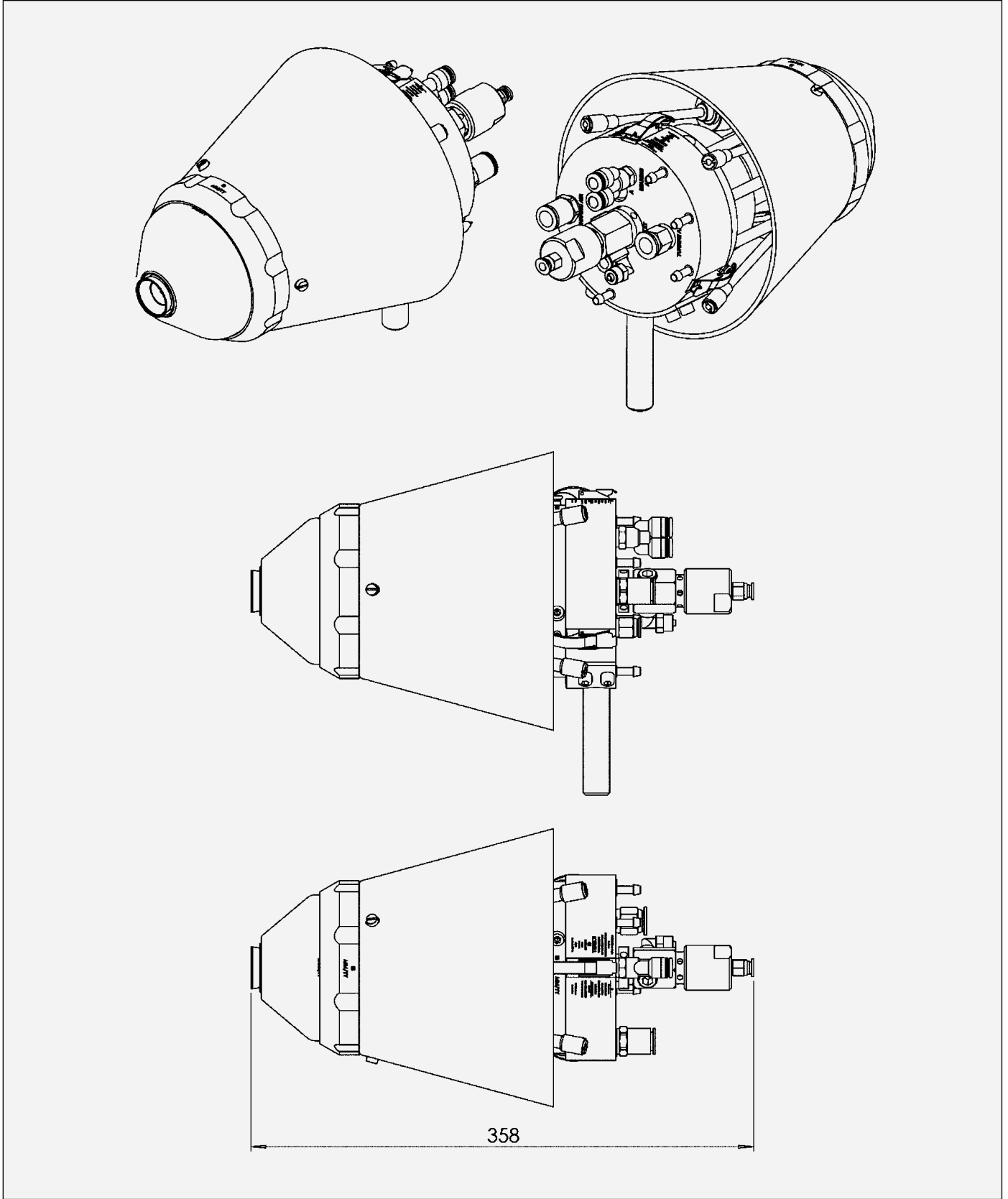
Mechanical

Length:	See “Outer dimensions”
Diameter:	See “Outer dimensions”
Weight (Approx.):	5.0 kg
Turbine Type:	Air-bearing turbine
Turbine Air Supply:	At 30000 rpm (nominal) 3.5 bar max. 0.5 m ³ /min
Max. Turbine Speed:	30 mm Bell Cup 40000 rpm (60000 rpm) Continuous (Periodical) 57 mm Bell Cup 40000 rpm (60000 rpm) Continuous (Periodical)
Bearing Air Supply (Nominal):	5 bar nominal 7 bar max. 0.1 m ³ /min
Supply Air Supply (Nominal):	10 bar max. 0.4 m ³ /min
Braking Air Supply (Nominal):	6.3 bar
Max. Material Pressure Supply:	7 bar max.
Flow Rate:	25 - 1000 cc/min (ml/min)
Usable Spray Area (Diameter):	381 – 762 mm
Bell Disc Cleaning Time:	Approx. 2 – 3 seconds
Time Colour Change:	Depending on following system influences: Material pressure Material viscosity Length material flow etc.
Readout Speed:	Magnetic pickup, optical fibre link
Exchange Atomizer Time:	Less than 2 minutes
Exchange Bell Disc Time:	Less than 2 minutes

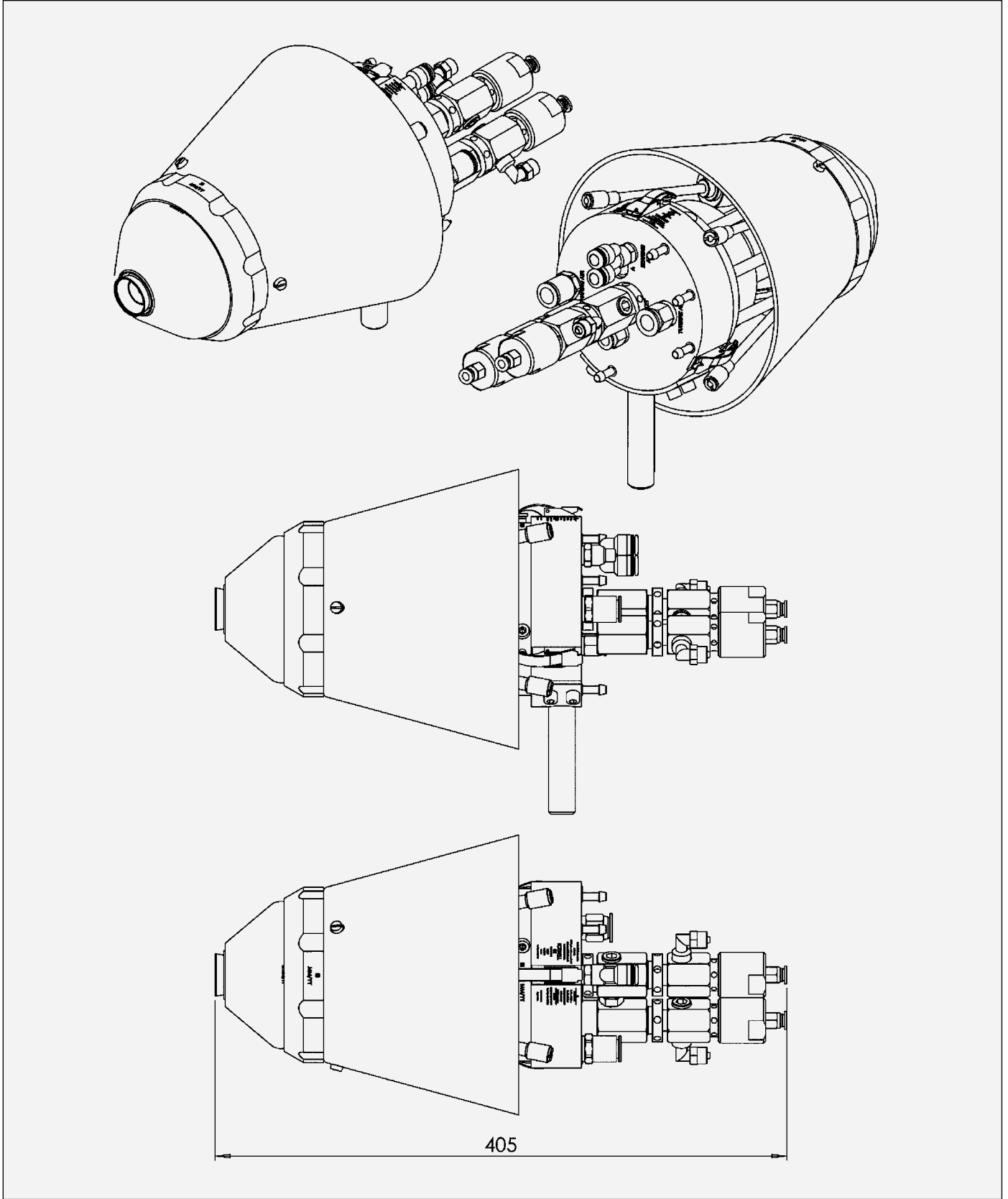
OUTER DIMENSIONS IB-30



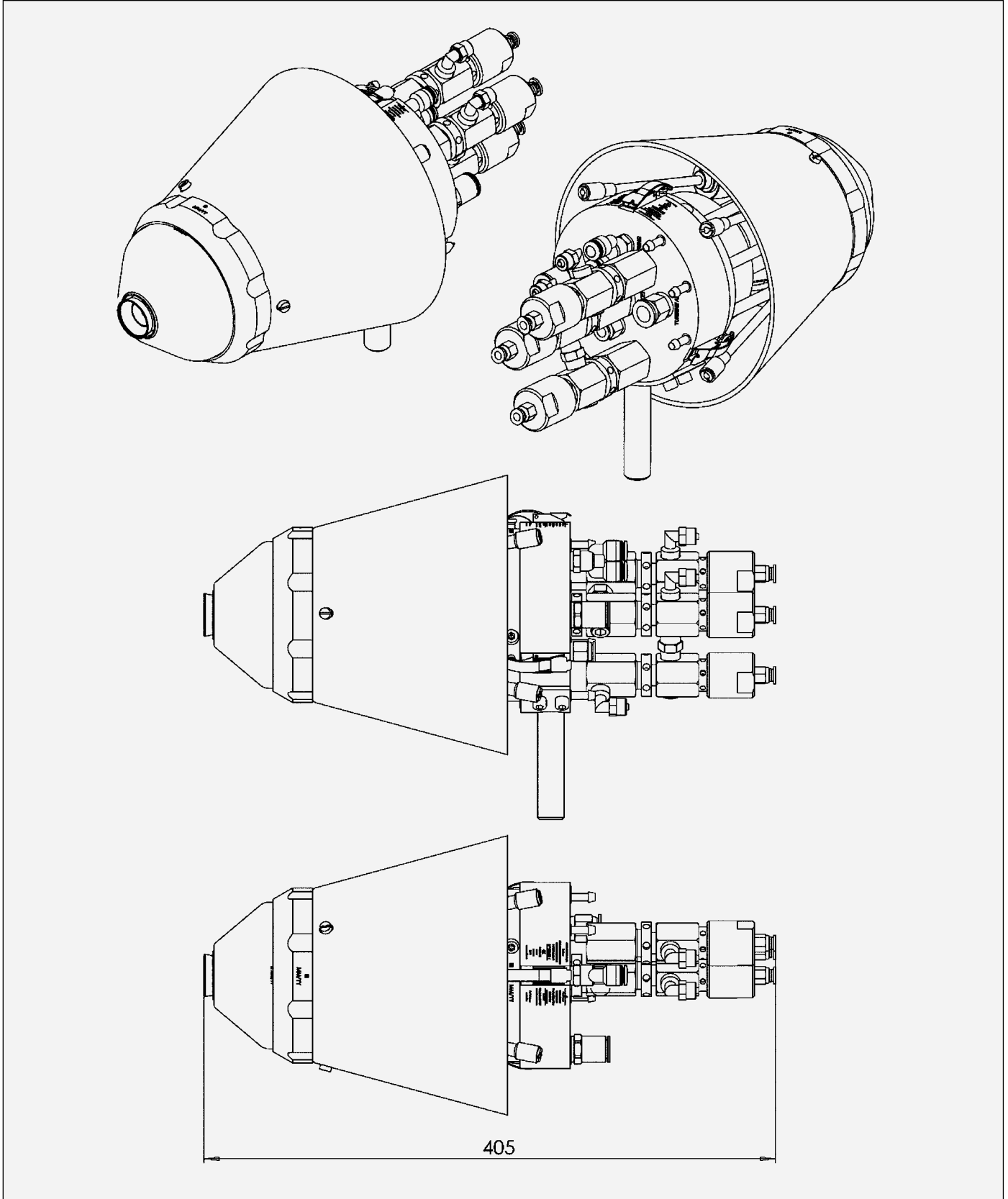
IB-30 Without Valves



IB-30 With One Valve

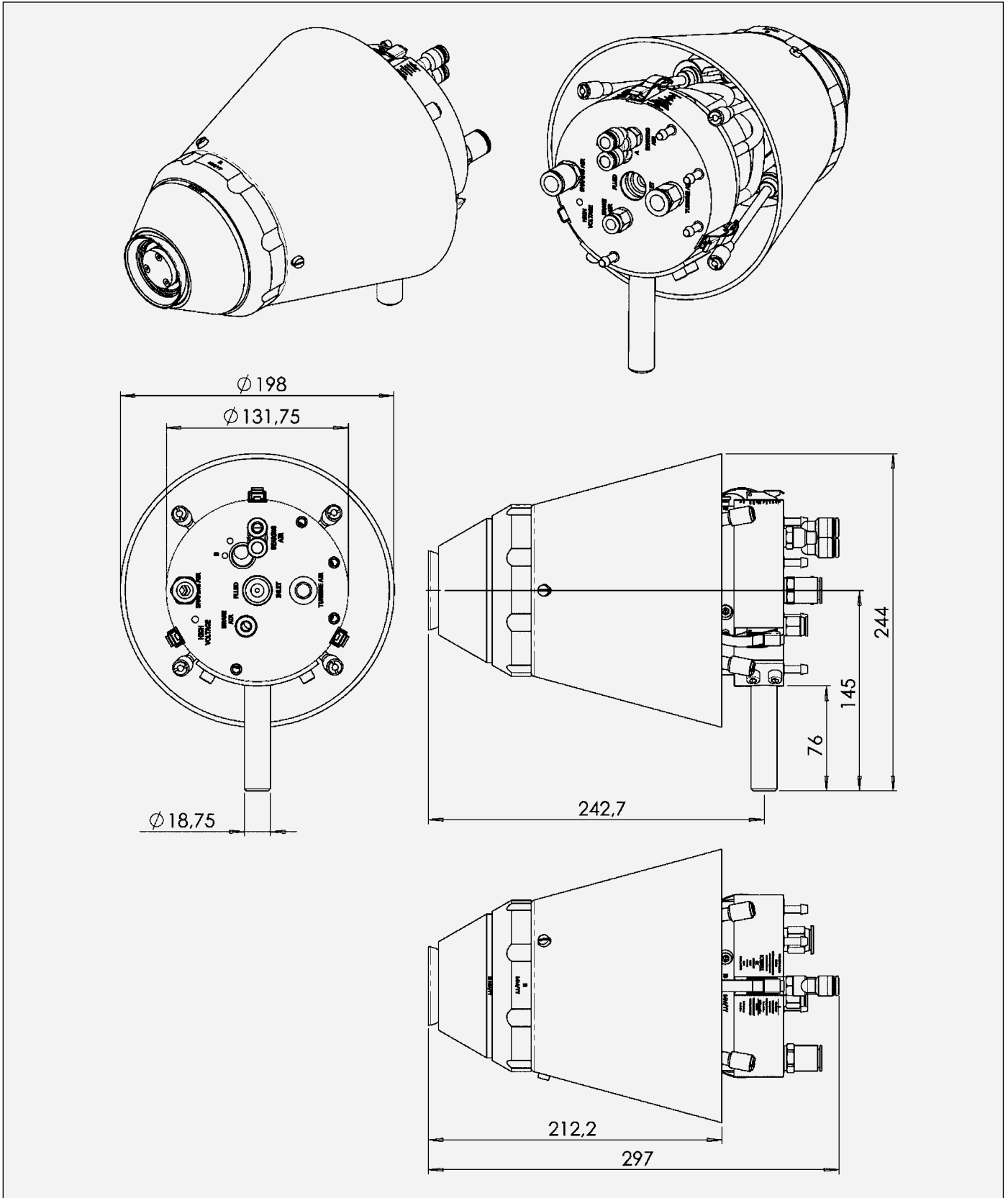


IB-30 With Two Valves

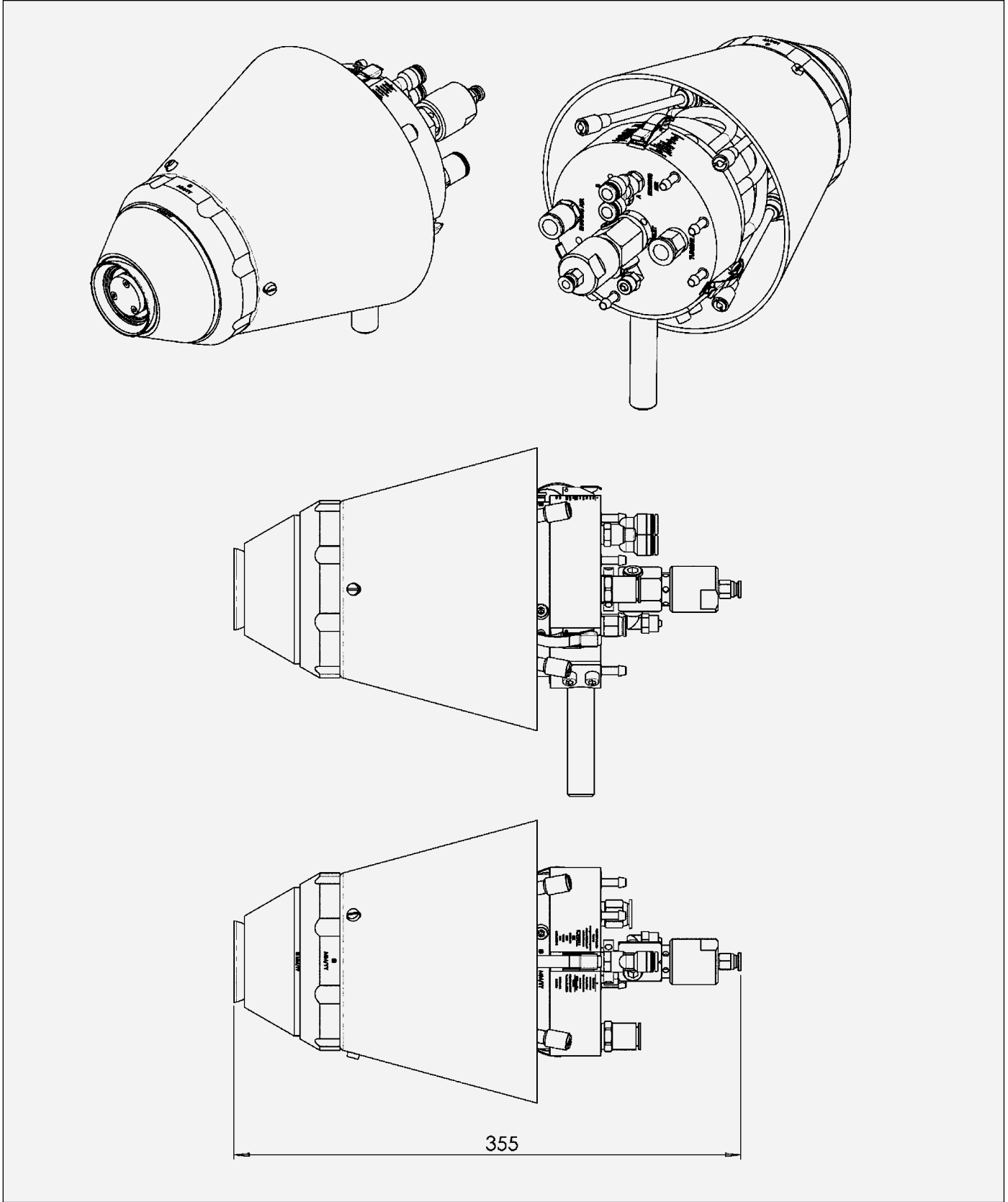


IB-30 With Three Valves

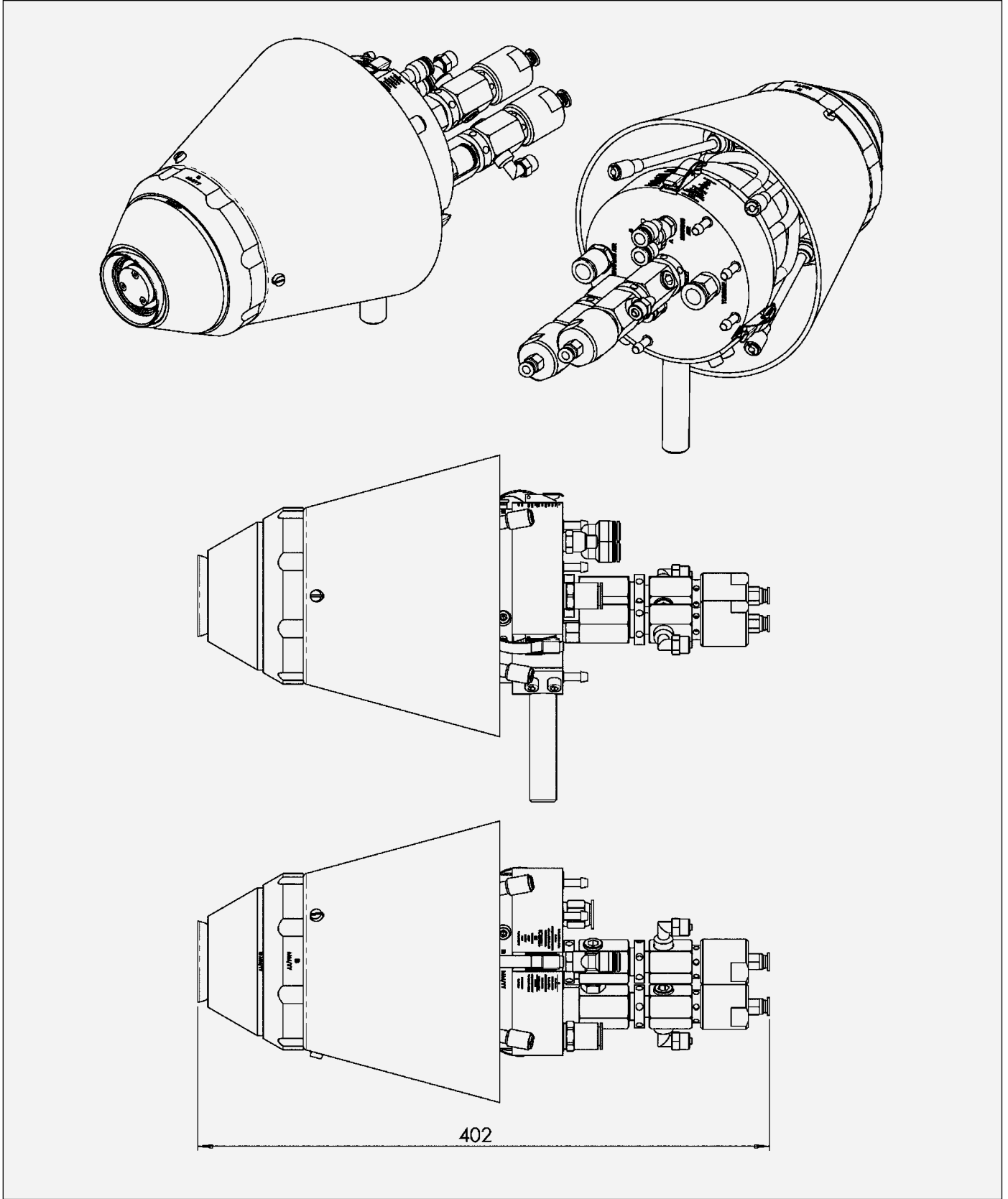
OUTER DIMENSIONS IB-57



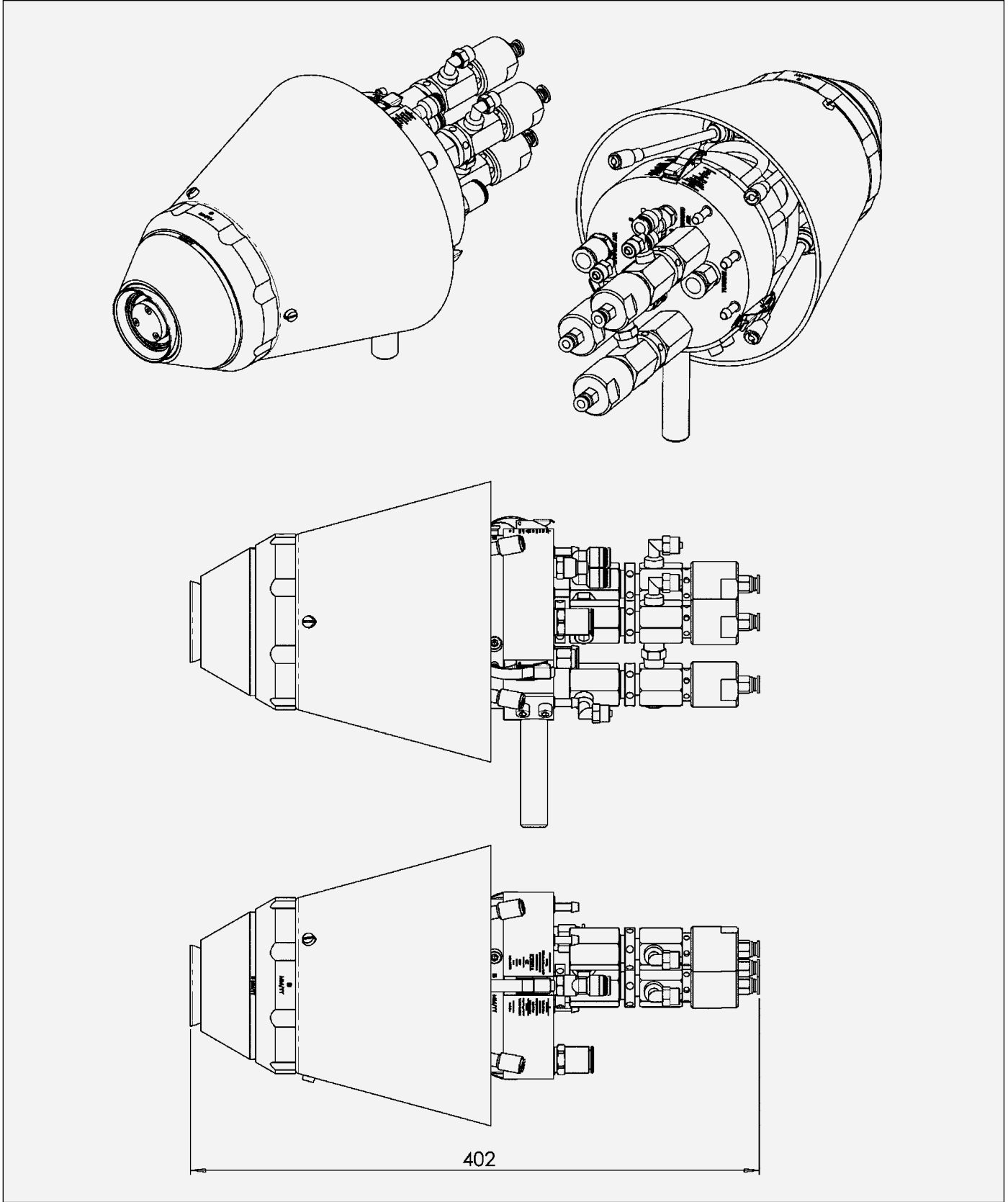
IB-57 Without Valves



IB-57 With One Valve



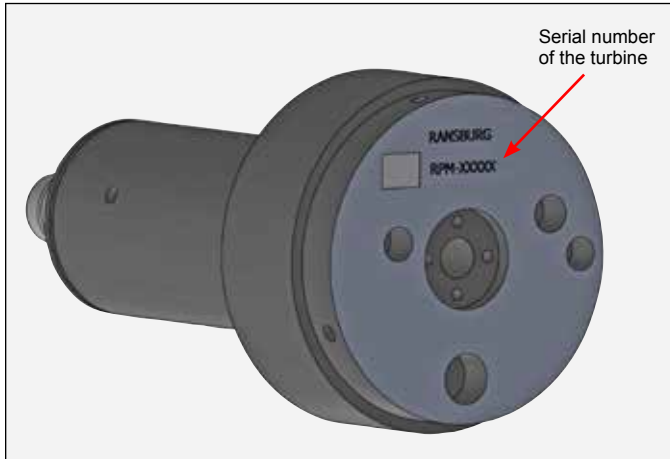
IB-57 With Two Valves



IB-57 With Three Valves

IMPORTANT NUMBERS

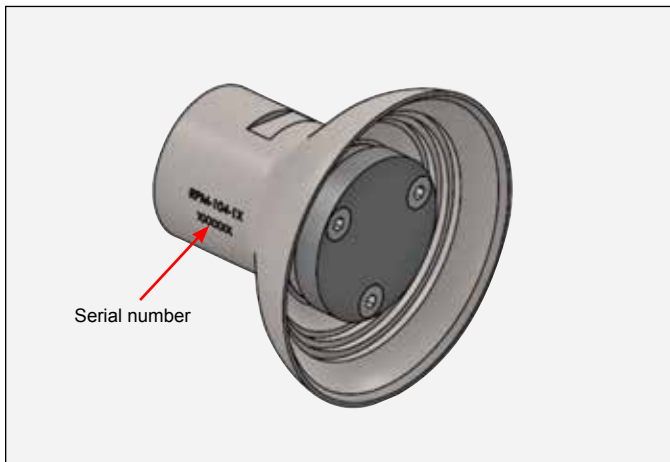
Enter these numbers in a minute book for future inspection. The last digits of the serial number of the bell cup are also the serial numbers of the turbine.



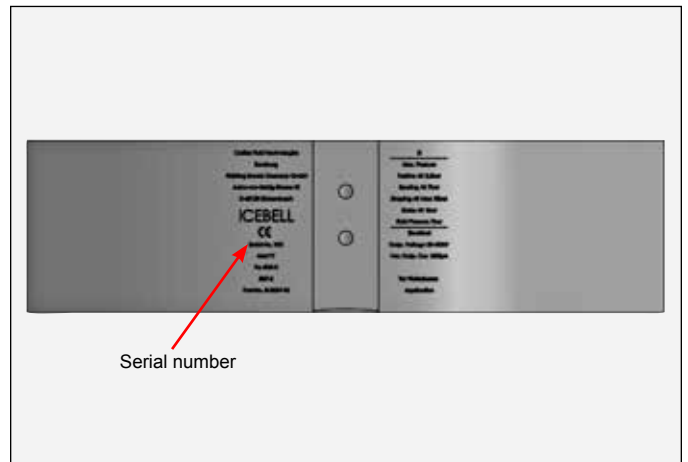
Turbine



Bell Cup



Bell Cup



Manifold

INSTALLATION

GENERAL INFORMATION

The information provided is made ONLY to indicate general parameters for this product and, if applicable, its effect relationships to other system components from Carlisle Fluid Technologies during typical use.

As each installation is unique, it is important to carry it out under the guidance of an authorised Carlisle Fluid Technologies representative or by strictly observing the installation drawings provided by Carlisle Fluid Technologies for your specific installation.

WARNING

- Danger of flashovers and fire. Maintain a safety distance between the work pieces to be painted and the ICE Bell 2, this also applies to all grounded pieces. This distance must be at least 25 mm per 10 kV, meaning 250 mm per 100kV.
- In the plant, fire protection and fire recognition systems according to EN 50176 must be installed.
- The power supply voltage must be interlocked with the conveyor system and the cabin ventilation.
- Never wrap the applicator in plastic wrap. Doing this will cause electrostatic problems and may even initiate a fire.

CAUTION

- The ICE Bell 2 packaging includes the standard atomizer system with bell and distributor. To handle this device, 2 (or more) keys RPM-419 are also necessary (in the scope of delivery). The keys are necessary to remove the shaping air screw and shaping air ring as well as the bell. The additionally available colour changing equipments CCV are defined in the specification and are part of the delivery.
- Mount the ICE Bell 2 with its provided stand, diameter 19 mm (3/4 in.), onto a stationary or moveable retainer.

AIR FILTER INSTALLATION

When installing the air filter for the system ICE Bell 2, the following directives are to be obtained (see table “Air Filtration Requirements” for further information).

1. Only use the prefilters and bearing air filters which are listed in the table “Air Filtration Requirements” in this chapter. As required, a further filtration or system air treatment (e. g. compressed air refrigeration dryers) can be enabled.
2. Use a separate bearing air filter for each ICE Bell 2.
3. Install the bearing air filter as close to the ICE Bell 2 as possible (not over 9 m/30 ft. away).
4. If possible, prefilter and bearing air filter should be mounted clearly visible to make it possible to see when maintenance is required.
5. Standard pipelines made of black or galvanised malleable iron are to be used in front of the prefilters HAF-503 or HAF-508 only. All pipelines installed behind the prefilters must be made of brass, stainless steel, aluminium, or hose lines (plastic, nylon, nylinder etc.).
6. Under no circumstances, use PTFE tape, sealing grease or other pipe thread sealants in the lines downstream behind the bearing air filters. It is possible that small PTFE tape items or other sealants come loose and close the very fine vents in the turbine bearings.
7. Use bright, transparent air pipes between the bearing air filter and the bearing air connector so that the operating personnel is able to clearly see whether contamination in the form of oil or moisture get through the filter.
8. If air heating devices are used in the system (to minimise the impacts of excessive moist conditions) and the temperature of the heated air exceeds 48.8 °C (120 °F), the heating devices must be arranged behind all filters to avoid filter media damages.

AIR FILTRATION REQUIREMENTS

Ransburg Filter Model No.	Description / Technical Data	Spare Filter Element Part No.
HAF-503	Pre-filter, removes coarse amounts of oil, moisture and dirt. Used upstream of HAF-508 pre-filter (used in systems with poor air quality).	HAF-15 Element, One Item
HAF-508	Coalescence prefilter, 136 SCFM (0.064 m ³ /s), efficiency 98.5 %, particle removal 0.3 to 0.6 micron, max. aerosol permeability 1.0 micron, max. particle permeability 0.4 micron (according to flow requirement of each applicator, a filter type HAF-508 can be used for up to three ICE Bell 2 assemblies).	HAF-38 Elements, Carton of 4
RPM-418	Coalescence bearing air filter, 19 SCFM, efficiency 99.995 %, particle removal 0.3 to 0.6 micron, max. aerosol permeability 0.6 micron, max. particle permeability 0.2 micron (one for each atomizer ICE Bell)	HAF-33 Elements, Carton of 8

CAUTION

- A good air filtration is necessary to extend the service life of the turbine and avoid contamination of the coating. Insufficient filtered compressed air pollutes the air bearings of the turbines and causes turbine failure. Therefore, a ICE Bell 2 system must contain the correct filter types. The filter elements must be exchanged regularly to guarantee pure compressed air at any time.

- The operator is responsible for ensuring that pure compressed air is available at any time. Turbine failures which are caused by contaminated compressed air are not covered by the warranty. If other filters are installed into the system, their filter performance must be equal or higher than those of the filters which are listed in the table "Air Filtration Requirements".

- The user must ensure that the bearing air supply is not switched off by mistake while the air motor of the ICE Bell 2 rotates. This would cause a failure of the air bearing.

NOTE

- Each applicator must have its own bearing air filter. Recommended: RPM-418 or equivalent.

TYPICAL CONFIGURATION

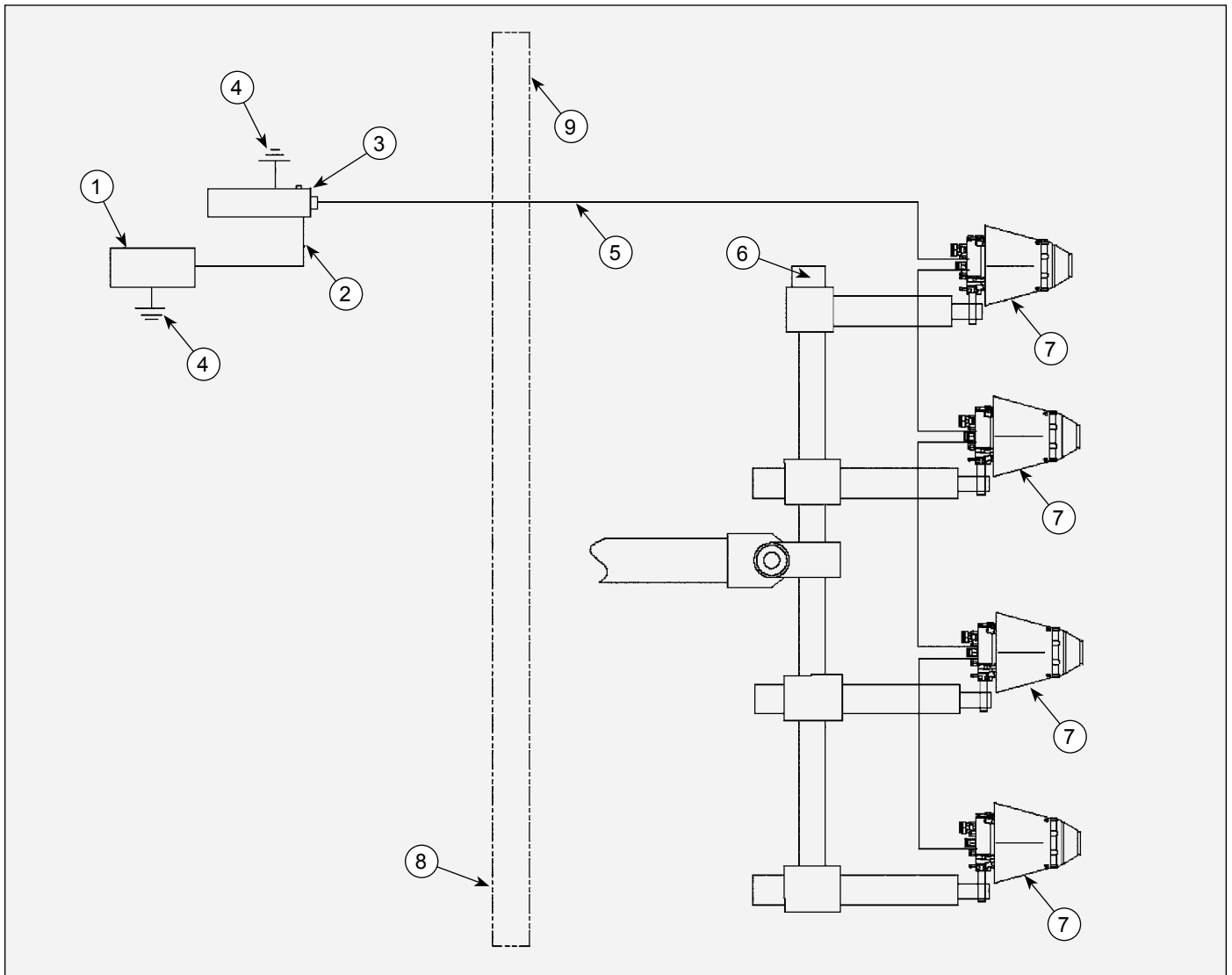


Figure: Typical Configuration

TYPICAL CONFIGURATION	
Item No.	Description
1	High Voltage Control
2	Low Voltage Cable
3	Cascade
4	Suitable Grounding Point
5	High Voltage Cable
6	Spray Gun Carrier/Movement Machine/Stationary Spray Station
7	ICE-Bell 2
8	Cabin Wall – Safe Area
9	Cabin Wall – Danger Area

EXAMPLE INSTALLATION

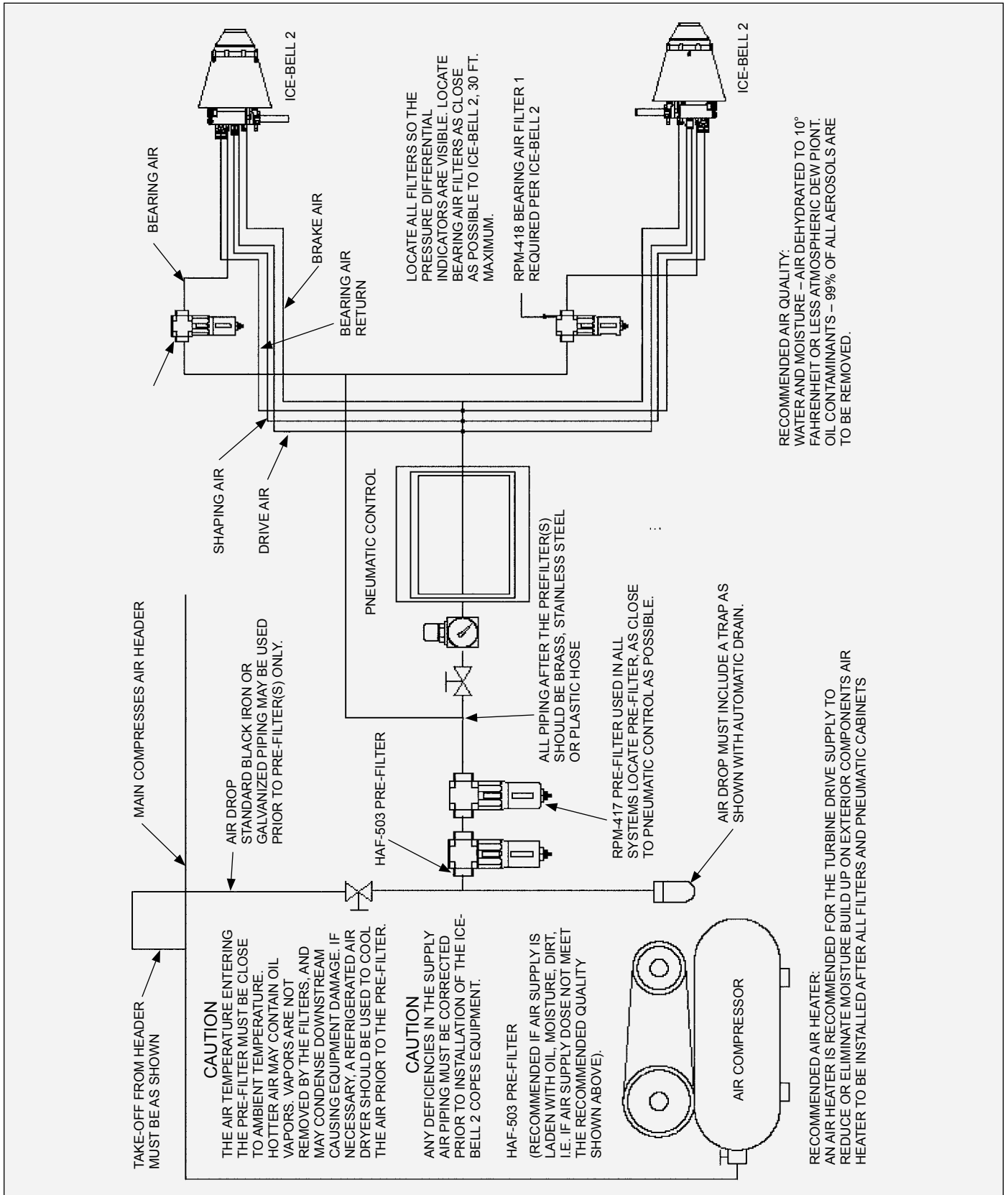
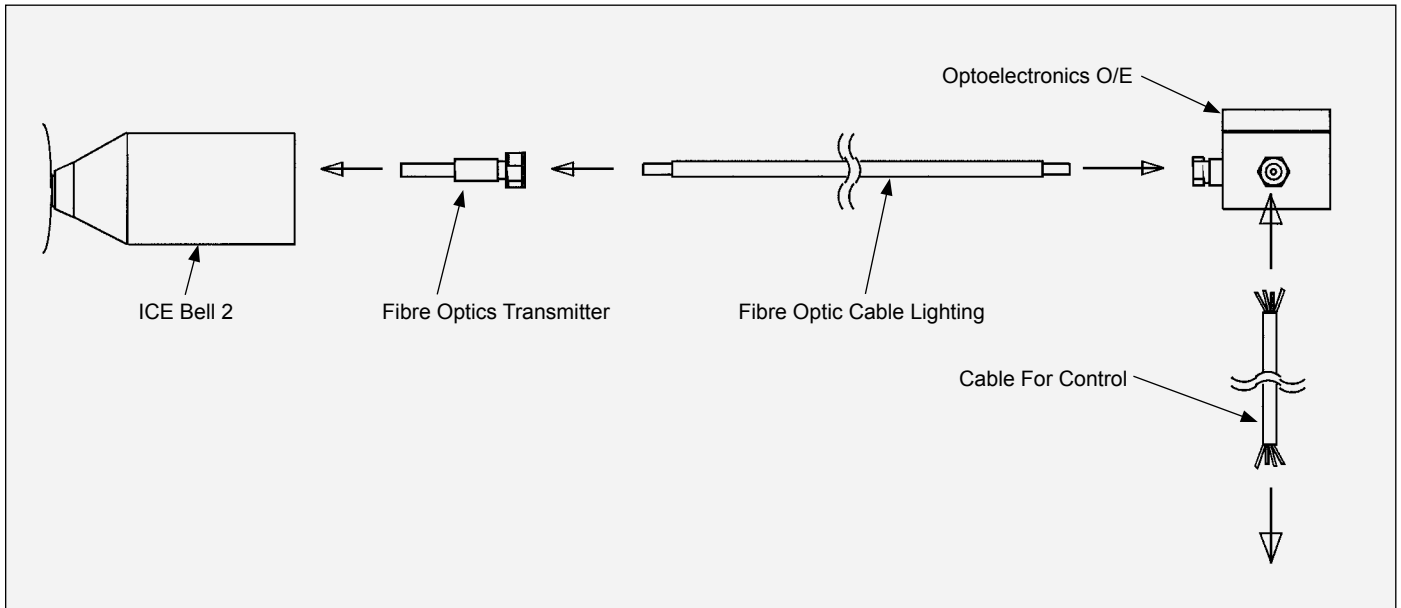


Figure: Example Installation

ASSEMBLY/FUNCTIONS SPEED MEASUREMENT



Functional Description

Two magnets are installed at the turbine wheel of the ICE Bell 2.

The fibre optics transmitter is screwed in the bell's housing, it receives the magnetic pulse when the turbine is rotating and converts these into optical pulses.

The optical pulses are transferred to the optoelectronics via fibre optic cables and converted into electrical pulses which then are transferred to the respective control via a shielded cable.

As required, the fibre optic cable can be repaired, lengthened or shortened by means of a special "cable repair/lengthening kit" KK-4913.

The control compares actual and nominal value and controls the turbine air via a proportional valve and keeps the speed constantly on the predefined level.

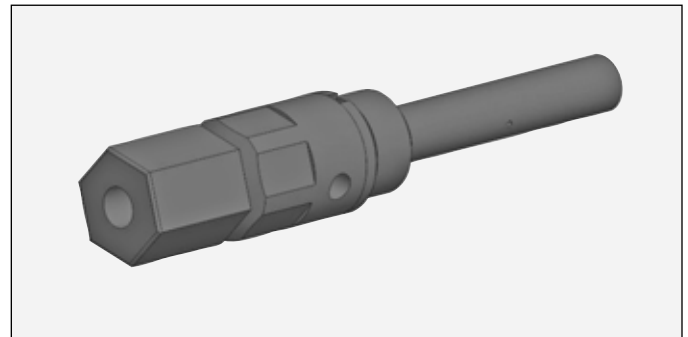


Figure: Fiber optics transmitter (SMC-29)

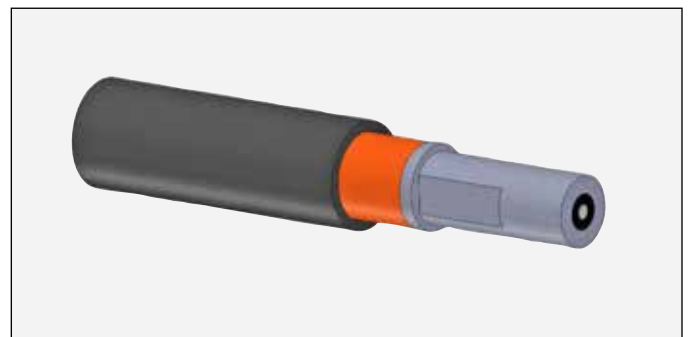
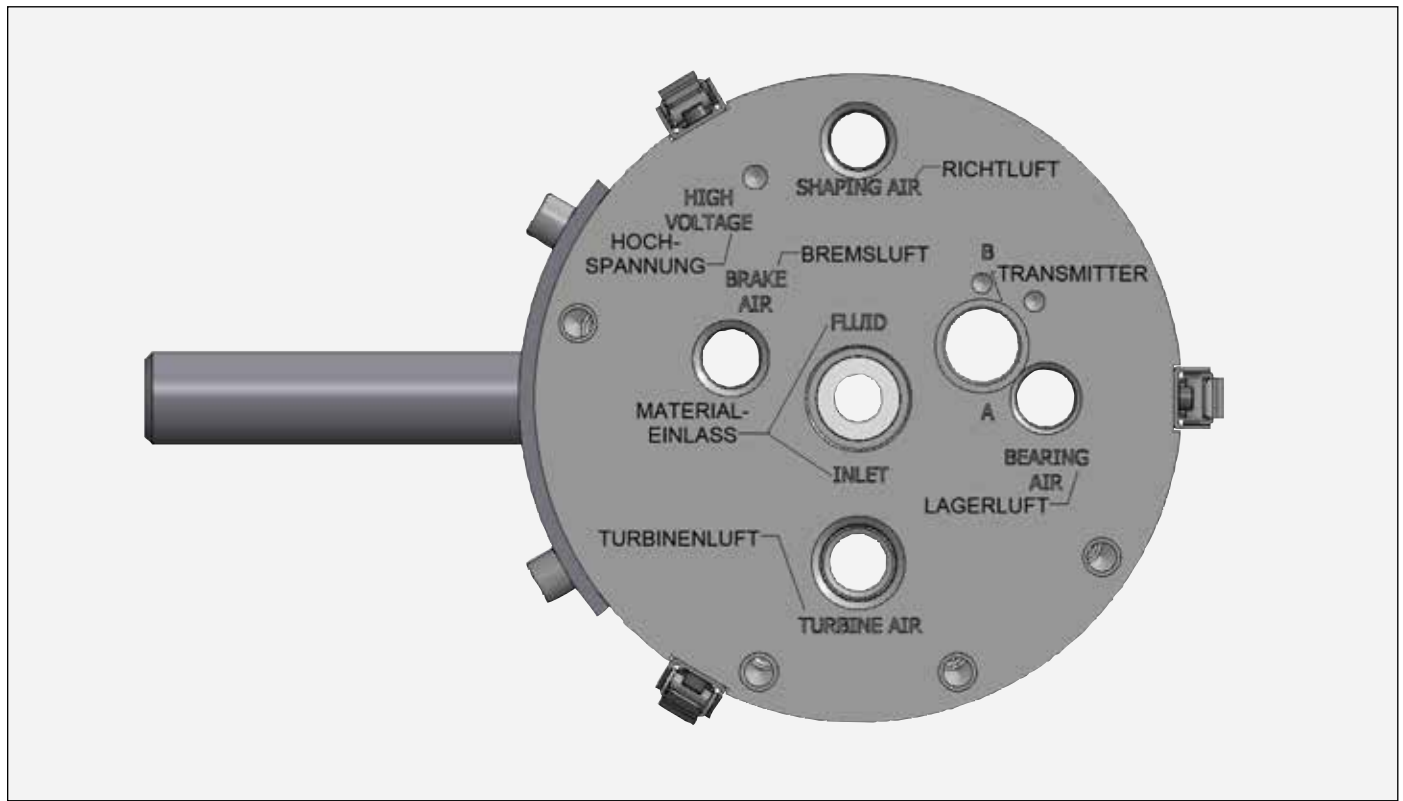


Figure: Fibre optic cable (A12409-02)

CONNECTION AND HOSE DATA



CONNECTORS AND HOSE DATA

Function	Connection	Hose Characteristics	Operation Pressure
Bearing Air	1/4"	6 mm ID x 8 mm AD PA	6 bar max; return 5.5 bar
Turbine Air	3/8"	9 mm ID x 12 mm AD PA	variable
Shaping Air	1/4"	9mm ID x 12mm AD PA	variable
Braking Air	1/4"	6 mm ID x 8 mm AD PA	4 bar
Material inlet	7/8-16UN-2B	---	---

⚠ WARNING

- ▶ Danger of electric arcs/fire when using ungrounded metal connections (air or material) in spray area. Therefore, use nonconductive plastic connections only or ensure that the metal connections are on ground potential.
- ▶ Only use polyamide-nylon hoses for air pipe connections.
- ▶ Hoses made of polyurethane are not allowed.

⚠ CAUTION

- ▶ Air hoses provided by the end user must be designed for a operating pressure of at least 7 bar (100 psig).

⚠ CAUTION

- ▶ Material hoses provided by the end user must be designed for a operating pressure of at least 10 bar (150 psig). Material hoses must meet requirements of EN 50348.

AIR AND MATERIAL CONNECTORS

WARNING

- Danger of electric arcs/fire when using ungrounded metal connections (air or material) in spray area. Therefore, use non-conductive plastic connections only or ensure that the metal connections are on ground potential.

CAUTION

- Under no circumstances use PTFE tape or sealing grease in the air pipes downstream to the last bearing air filter. The sealing tape or sealant could come loose, close the turbine air bearings and thus cause a turbine failure. (See previous pages for pipe connections and measurements.)

Bearing Air

Use a transparent hose (bright, nylon, natural colour) with a diameter of 8 x 6 mm and connect the properly filtered air source to the bearing air inlet „Bearing Air“ at the distributor. It is recommended to use bright transparent pipes for the bearing air supply so that contamination that possibly got through the last bearing air filter is clearly visible. For this see also the previous section “Caution”.

The following chapter “Operation” contains a section “Caution” which points out the possibility of bearing damages when operating the turbine while bearing air is switched off. As the turbine must not be operated without switching on the bearing air first, some precautionary measures are to be taken to check the presence of the bearing air prior to switching on the turbine. One method is to lock the turbine driving air with the bearing air (this means with a air controlled valve).

CAUTION

- There is also a need to ensure that the bearing air stays switched on during the deceleration time after switching off the turbine.

Shaping Air

Use a hose with a diameter of 12 x 9 mm. Connect the shaping air at the shaping air inlet „Shaping Air“ to the distributor.

Braking Air

The braking air decelerates the turbine in case of speed change. Use a hose with a diameter of 8 x 6 mm and connect the braking air at the braking air inlet “**Brake Air**” to the distributor.

Observe that the braking air inlet was covered by the factory. If the braking air device is not used, do not remove the cover plug. The plug keeps external contamination away from the system and avoids leakage.

NOTE

- It is recommended to install a locking between the braking air and the driving air of the turbine.

Turbine Air

Use a hose with a diameter of 12 x 9 mm. Connect the turbine air at the inlet „Turbine Air“ to the distributor.

A locking between the driving air of the turbine and the material flow is to be installed. The shaft can be damaged if material supply is actuated without a rotating bell disc.

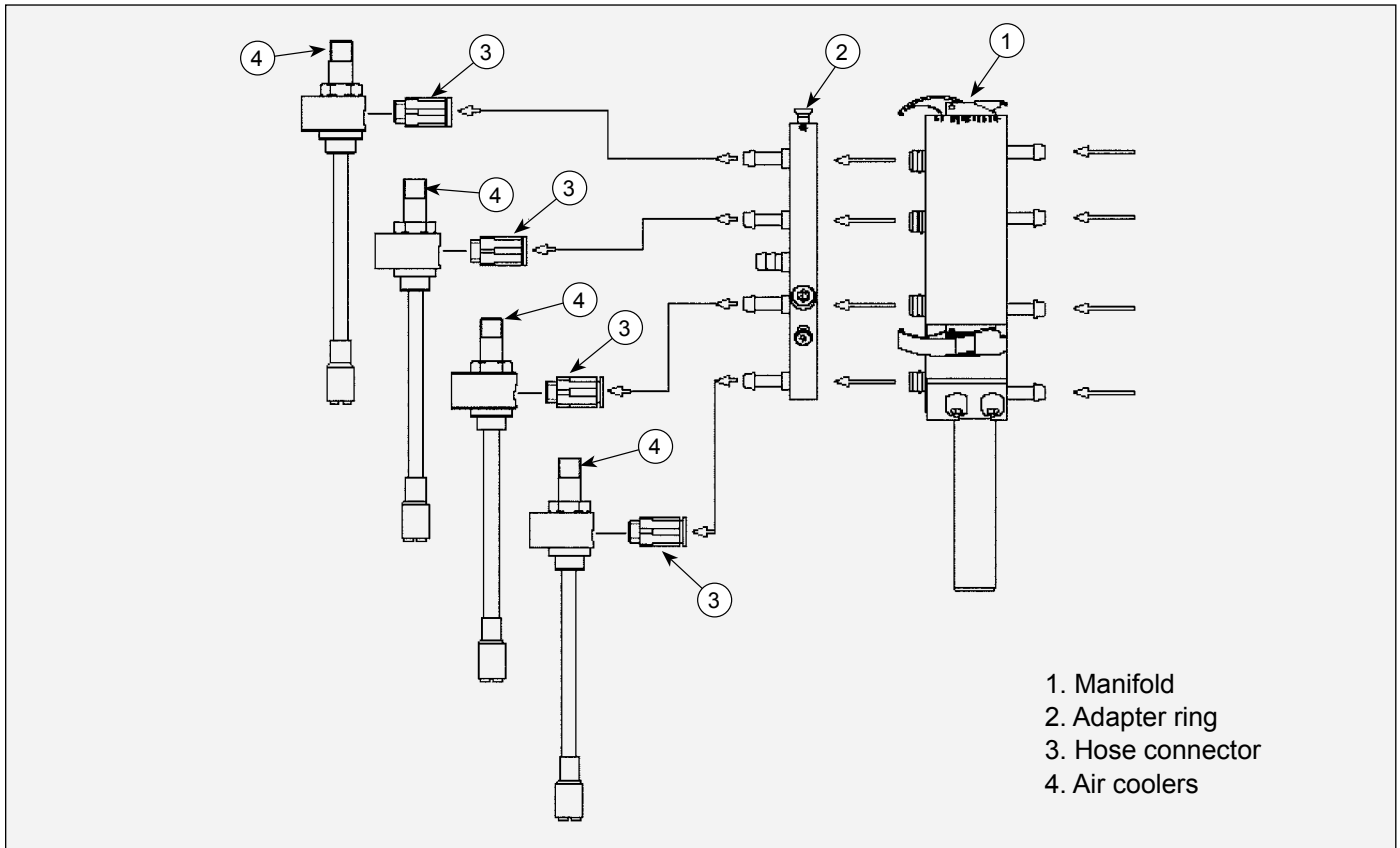
Control air for material valves

Use hoses with a diameter of 6 x 4 mm and connect them to the control air inlets of the appropriate valves.

Air Vortex Tube Cooler

Four air vortex tube coolers are installed at the connecting elements of the ICE-Bell 2. This patented process uses what is referred to as “Vortex effect”. A constant air temperature of up to -15°C in the front area of the atomizer can be created by adjustable screws at the coolers.

Use a PA hose with a diameter of 8 x 6 mm and connect it to the hose nozzles at the back of the manifold (1). To guarantee the air supply for the vortex tube coolers (4), use an antistatic PU hose with a diameter of 8 x 6 mm in the area of adapter ring (2) and air hose connector (3).



Material Connections

NOTE

- If the used coating material is heated, check the maximum permitted temperature nominal value of the used material pipes.

High Voltage

Tighten the high voltage screw 1/4"-20 at the back of the distributor. If necessary, the connector can be installed at each suitable place of the distributor or at the mounting bolt.

Lockings

Following system lockings are recommended to prevent damages:

1. Always keep the bearing air switched on and only switch it off when the main air supply at the compressed air control cabinet is switched off.
2. Atomising the coating material must not be possible if the turbine is not rotating.
3. Two (2) bearing air connections that are coupled together are planned: one for the air supply and the other one as return signal to measure the bearing air pressure at the atomizer. If the bearing air pressure at the atomizer falls under 4.2 bar, the turbine air is to be automatically switched off via a appropriate locking. The operating personnel should be informed about this situation by displaying it.
4. The high voltage must be locked with the control signal of the detergent valve so that no detergent supply is possible during high voltage.
5. A locking between turbine air and braking air is planned to avoid their simultaneous use.
6. Further, all lockings are to be planned that are required by local, national or international laws and regulations.
7. The high voltage must be locked at the access door to the spray cabin.
8. The high voltage must be locked together with the conveyor system and the cabin ventilation via the power supply unit.

⚠ WARNING

- After the turbine is switched off, it rotates for about two more minutes meaning it “comes to a standstill”. It has to be taken care that the operating personnel waits at least three minutes after having switched off the turbine driving air until the main air supply is switched off.
- During normal operation, the high voltage and/or coating material must not be switched on before the bell cup is mounted on the drive shaft and the turbine rotates. Failure to comply will flood the turbine with material.
- The compressed air supply at the air inlet of the turbine is to be controlled so that the turbine never exceeds the maximum nominal speed of 60000 rpm.
- Never switch off the high voltage while the solvent for cleaning is sprayed through the supply pipe to the applicator or through the bell cleaning pipe. Therefore, a locking between high voltage and detergent is to be planned.
- Never spray cleaning solvents when high voltage is switched on.

⚠ CAUTION**Flow Check:**

- The bell cup must be removed for the flow check. These material flow tests must be carried out when the turbine is not rotating. If the material supply is switched on and the bell cup is not removed, material can enter the shaft and damage the air bearing when the turbine is not rotating.
- Normally, pneumatic lockings prevent material flow when the turbine is switched off. If necessary, these lockings must be bypassed by using suitable safety procedures.

Normal Operation:

- The bell cup must rotate with a speed of at least 10000 rpm when causing the material supply. Switching on the material supply without rotating bell cup would flood the turbine and damage its components.

OPERATION

WARNING

- The operating personnel must be properly trained in safely operating electrostatic equipment. Prior to using this equipment, the operating personnel must have read and understood all instructions and safety information (see NFPA-33, EN 50176).
- The electrical discharge to a material/colour system with high electrical capacity can cause fire or explosion at some materials. If an arc flash or flashover occurs when using a certain material, switch OFF the system and check that the material is not flammable. Under these circumstances, the system can release enough electrical and thermal energy to ignite a certain hazardous substance in the air.

CAUTION

- When switching on the turbine, bearing air must exist already. Also, the bearing air must stay switched on as long as the turbine rotates after having switched off the turbine air. Never switch off the bearing air to stop the turbine. Braking air can be used to decelerate the turbine (see “braking air” in this chapter). Prior to switching off the bearing air, wait until the turbine stops rotating.

As it is the case in all paint-spraying systems, operating the ICE Bell 2 also needs correct adjustment of the operating parameters as a basic requirement to receive the best final quality for the coating material to be applied and simultaneously ensure trouble-free and reliable operation of the used equipment. These adjustable operating parameters, which also affect spraying, cleaning and ON/OFF control, include:

- Coating materials
- Material flow rate control
- Material valve/triggering control
- Turbine speed
- Shaping air (spray pattern control)
- Electrostatic voltage
- Target distance

TURBINE SPEED

The turbine speed depends on the inlet air pressure. For further information about this see chapter “Installation”. The required speed depends on the kind of coating material and the different application requirements.

CAUTION

- Too high speeds cause turbine damages. The maximum nominal speed of 60000 rpm must not be exceeded.

BEARING AIR

CAUTION

- Bearing air must be switched on during the whole turbine operation. Otherwise, the bearing can be severely damaged. It is recommended to leave the bearing air permanently switched on. During maintenance and dismantling works, turbine air must be switched off for at least 3 minutes before the air or main air supply is closed.
- Bearing damages (and resulting turbine failure) which are caused by operating the turbine without bearing air are excluded from the warranty by Carlisle Fluid Technologies.
- When switching on the turbine, bearing air must exist already. Also, the bearing air must stay switched on as long as the turbine rotates after having switched off the turbine air. Never switch off the bearing air to stop the turbine. Braking air can be used to decelerate the turbine (see “braking air” in this chapter). Prior to switching off the bearing air, wait until the turbine stops rotating.
- Operating the turbine with a bearing air pressure below 4.2 bar (measured at the turbine inlet) can cause bearing damages.
- The bearing air pressure nominal value is 5.6 bar with a minimum pressure of 4.2 bar and a maximum pressure of 7 bar. Under no circumstances must the turbine be operated with less than 4.2 bar bearing air pressure.

BRAKING AIR

The braking air reduces the turbine speed. It is useful for short colour change times and can be used to stop the turbine in this case. Applying the brake is done by (1) switching off the turbine driving air and then (2) switching on the braking air for a short period of time.

The braking air is to be locked in a way that it is not possible to supply the braking system with air as long as the turbine air is switched on.

BRAKING TIME (at 90 PSI = 6.3 bar braking air pressure)		
rpm of	Speed Reduction up to rpm	approx. sec.
60,000	to 40,000	3.7
60,000	to 20,000	7.5
60,000	to 0	12.9
40,000	to 20,000	4.0
40,000	to 0	9.0

WARNING

- The electrical discharge of a material/colour system with high electrical capacity can cause fire or explosion at some materials. If an arc flash or flashover occurs when using a certain coating material, switch off the system and check that the material is not flammable. Under these circumstances, the system can release enough electrical and thermal energy to ignite a certain hazardous substance in the air.

ELECTROSTATIC VOLTAGE

The maximum output voltage can vary according to the power supply model used. The actual voltage setting depends on different requirements of the respective coating application. The voltage at the ICE Bell 2 is of particular importance for the spray pattern, the application efficiency (adhesion), the coating penetration in sunk areas and the target object distance.

SHAPING AIR FLOWS

To form the spray pattern, shaping air (also referred to as guidance air or forming air) is used. The lower the pressure, the broader the spray pattern, and vice versa, a higher pressure causes a smaller spray pattern. The shaping air does not only atomise the material but also supports the entering of the atomised particles in sunk areas. The shaping air should always be on a minimum level which is appropriate for the coating requirements. Excessive shaping air can cause atomised particles to spray beyond the target object so that no complete “adhesion” is achieved, or colour particles bounce off and spray back onto the atomizer.

MATERIAL-FLOW QUANTITY CONTROL

To control the material control, normally external mounted flow regulators or gear pumps are used. The atomizer assembly is equipped with valves which are actuated pneumatically to guide the material flow to the supply pipe or drain line (“dump”).

MATERIAL-FLOW QUANTITY CHECK

To measure the flow quantity in test mode, take off the bell cup from the atomizer, switch on the material flow and collect the material over a defined period of time with a measuring cup. Shaping air, high voltage and turbine air must be switched off.

WARNING

- Danger of electric shock and/or injuries. The instructions for suitable grounding regulations are to be strictly observed. The personnel is not allowed to work near the turbine while it is rotating or high voltage is switched on.

TARGET OBJECT DISTANCE

The distance between the ICE-Bell 2 and the target object affects the spray application. Meaning that smaller distance causes a smaller spray pattern and greater application efficiency. By increasing the distance, the spray jet becomes broader and the efficiency probably becomes less. Too much distance can cause “back spraying” of the coating material on the ICE-Bell 2. The safety distance for the ICE-Bell 2 is at least 25 mm per 10 kV. All grounded objects must be outside this area.

WARNING

- The safety distance for the electrostatic atomizer ICE-Bell 2 is 25 mm per 10 kV to grounded objects. The end operator must ensure that the minimum distance is observed and any contact between grounded objects and the bell cup of the applicator is avoided if the applicator is switched on and in operation.

WARNING

- Danger of electric arcs/fire. The ICE-Bell 2 must be kept in safe distance to the object to be sprayed and also to all other grounded objects. The safety distance must be 25 mm per 10 kV.

MATERIAL CONDUCTIVITY

The ICE-Bell 2 is applicable with a comprehensive range of conductive coating materials. It may be necessary to insulate material feeding container and hoses from earth in case of coating materials with high conductivity. If you have doubts or questions about the suitability of a coating material for the application with the ICE-Bell 2, ask your Carlisle Fluid Technologies dealer or representative. (Please observe the following “warning”.)

WARNING

- The electric charge can cause fire or explosion. If an arc flash or flashover occurs when using a certain coating material, switch off the system immediately and inform the coating material supplier. Do not switch on the system again before the coating material is set properly.

TURBINE AIR NOTE

If the turbine air is heated up, check the maximum temperature nominal value of the air supply lines used. Polyethylene lines are suited for max. 27 °C (80 °F). Nylon lines are suited for max. 95 °C (200 °F).

WARNING

- If possible, use non-flammable cleaning agents.
- If flammable liquids are used for cleaning, after having switched off the high voltage, all high voltage conducting parts need to be discharged to a discharging power of less than 0.24 mJ before they can be touched.
- It is to be guaranteed by suitable measurements that the resistance to true earth ground from the position point to the work piece is max. 1 megaohm, measured at 500V or 1000V.
- Only use electrically conductive containers for the cleaning liquid; they need to be grounded. No ungrounded material inside the spray area. Reference EN 50176.

MAINTENANCE

Professional maintenance is essential prerequisite for the safe and productive operation of the equipment. Therefore, the operator should make suitable maintenance schedules which are based on the following general information and observation of the initial production requirements.

The maintenance and safety instructions provided by Carlisle Fluid Technologies must be accessible to the whole operating personnel.

Normal fire protection measures are to be heeded, including the correct storage of coating materials (paints) and solvents as well as the proper waste disposal. Fast access to suitable fire extinguishing equipment must always be guaranteed. For further details on this refer to the according local directives/standards.

See chapter check of stationary equipments and the check intervals according to EN 50176 in the respective applicable version.

WARNING

- Unexpected robot movements can cause hazards. Do not carry out adjustments or repairs at the ICE-Bell 2 if the robot is in operation or ready to start. The robot must be locked and secured from being switched on again.
- Do not carry out adjustments or repairs if the power supply is switched on. Secure the power supply from being switched on again.
- The flash point for solvents used for cleaning must be at least 5°C (9°F) above ambient temperature. The end operator is responsible for the compliances with this requirement.
- Never take off the ICE-Bell 2 when it is pressurised.
- If flammable liquids are used for cleaning, all parts must be entirely discharged and must not carry any high voltage anymore.

WARNING

- During the maintenance, hazards by electric shock/arc flash as well as risk of fire can occur. Prior to entering the spray area and carrying out maintenance works, the high voltage must be switched off. After waiting 3 minutes for the bell to stop and voltage to dissipate ensure the water base supply system is fully discharged to earth ground. The ventilation(s) of the cabin suction should be switched on during cleaning the equipment with solvents.
- Never touch the atomizer bell when it is rotating. The front edge can easily cause cuts. Do not try to touch the atomizer bell before it certainly has stopped rotating. After having switched off the turbine air, wait for at least 3 minutes before touching the bell.

CAUTION

- Do not plunge the turbine of the ICE-Bell 2 in solvents or other liquids. The turbine components would be damaged by this.
- Bearing air must be switched on during the whole cleaning process.
- If the ICE-Bell 2 is sprayed with a solvent applicator for cleaning, turbine and shaping air should be switched on (high voltage off). The turbine exhaust air and the shaping air create a kind of curtain around the rear bell edge and, thus, help to avoid that solvents enter the hollow behind the bell. Do not direct the cleaning jet at the opening behind the bell edge as, thereby, solvents could enter the turbine.

O-RINGS

The O-rings in the air-bearing shaft are not solvent-resistant. These O-rings must not be soaked in solvents. If they are exposed to solvents or soaked with them, they must be replaced. These O-rings are designed for creating a perfect fit between the air-bearing shaft and the corresponding components to reduce or eliminate harmonious resonances (vibration).

Some O-rings are encapsulated in PTFE. These O-rings only have a limited elasticity and cannot return to their original diameter if they were overstretched. These O-rings tend to deform more easily than O-rings made of rubber. Therefore, it is important that they are sufficiently lubricated if components are mounted on them. Over time, they also take an angular shape and should be replaced regularly if components are repeatedly dismantled or new components are mounted on them.

O-rings that have cracks, notches or are deformed must be replaced.

A suitable lubricant is vaseline of food grade quality or Carlisle Fluid Technologies Petrolatum Jell A11545-00.

CLEANING PROCEDURE

The exact order for purging the colour system can vary depending on the material valve arrangement used and on other automatic functions integrated in the system. However, the following basic procedures for cleaning should always be obeyed:

1. Ensure that the high voltage is switched off.
2. Purge all material off the material tubes with solvents while bearing air and turbine air are switched on. Carry out purging before each production interruption. If the ICE-Bell 2 is mounted vertical and pointing upwards, it must be brought to a horizontal position before being purged and cleaned.
3. Carry out purging with an installed atomizer bell cup. Normally, the bell disc is completely cleaned via the purge. However, if, after the purging procedure, there are still paint residues somewhere on the bell, the bell should be dismantled and cleaned by hand.
4. For cleaning, soak the bell cup in a suitable solvent as long as necessary for dissolving the paint residues. Remove material deposits with a soft brush that was dipped into solvents. Ensure that all paint is removed (observe the following "Warning"). Purge and dry bell.
5. Prior to reinstallation of the bell onto the shaft, ensure that the conical mating surfaces of turbine shaft and bell are free of paint residues. Clean to remove residues (see following "Warning").

6. Clean the outer surface of the ICE-Bell 2. (See following "Warning".)
7. Atomizer bells that have visible signs of damages like notches, deep scratches, pressure marks or excessive wear must not be used for any further purpose.

CAUTION

- Using a bell cup with material deposits cause an unbalanced run (imbalance) of the bell. This imbalance of the bell can cause bearing damages and turbine failure. Further, paint residues that are trapped between the conical surfaces can avoid the perfect uptake of the bell regarding its fitting and cause imbalance.

WARNING

- The flash point for solvents used for cleaning must be at least 5°C (9°F) above ambient temperature. The end operator is responsible for the compliance with this requirement. Further, as also electrostatic equipments are affected by this cleaning, these solvents should be nonpolar. Solvents that can be used for wiping and are nonpolar and not flammable are e. g.: Amyl acetate, Methylamyl acetate, Solvent naphtha (xylol substitute) and white spirit.
- If the ICE-Bell 2 is wiped with a cloth by hand, the turbine air should be switched off but the shaping air should stay switched on.
- Do not use conductive solvents as e. g. butanone (MEK) to clean the ICE-Bell 2.

VIBRATION NOISE

If the ICE-Bell 2 vibrates or creates an unusually loud noise, this normally points to an imbalance. There may be dry paint on the bell cup, the bell itself could be damaged or there may be paint between the bell and the shaft which avoids perfect fitting of the bell. If one of these conditions applies, it must be remedied. An excessive imbalance caused by one of these conditions can cause bearing damages and turbine failure. For failures that can be traced back to unbalanced loading conditions, NO warranty is given.

To determine whether a bell is impure or damaged dismantle the bell and switch on the turbine. If the noise is eliminated this way, the bell causes the problem. If the noise still can be heard, the turbine may be damaged and must be checked. Also if a much higher amount of air than normal is required to reach the same speed, this can be a note for a faulty or impure turbine. UNDER NO CIRCUMSTANCES continue operation if the turbine creates loud noise.

PREVENTIVE MAINTENANCE

(See "Schedule for preventive maintenance")

Daily/Weekly Maintenance

- Due to the proximity of the high voltage to the ground potential, a schedule for the maintenance (cleanliness) of the equipment must be created.
- Ensure that the high voltage is switched OFF and the shaping air, bearing air and turbine driving air are switched ON.
- Open the drain valve (if available) and purge all paint off the supply tubes and the valve module.
- Open the solvent valve (if available) and purge all paint off the material hose and through the atomizer bell assembly.
- Ensure that the high voltage is switched OFF and the bell cup does not rotate anymore. The shaping air and bearing air should stay SWITCHED ON.
- Clean all outer surfaces of the applicator with a lint-free cloth that is moistened with solvents. Part of the outer surfaces are also the housing and valve modules.
- After cleaning, all conductive residues must be removed with a non-conductive solvent. As also electrostatic equipments are affected by the cleaning, the solvents must be nonpolar.
- Check bell cup for notches, pressure marks, deep scratches and excessive wear. Replace if necessary.



WARNING

- Prior to entering the spray area and carrying out maintenance works, the high voltage must be **SWITCHED OFF**. The ventilation(s) of the cabin suction should be switched on during cleaning the equipment with solvents. The supply system for the applicator must be grounded to remove all residual voltage.

Internal Material Feed Line - Drain, Cleaning and Feeding

Cleaning of the material feed line of the material supply source, as e. g. a paint distributor, via the material distributor block and the bell assembly:

Open the drain valve and purge the paint feed line with solvents or via pulsation of a air/solvent mixture. Ensure that in the last step of the sequence, air is used for purging so that even the residual solvents are purged off the drain line. To accelerate feeding of the new paint material, leave the drain lines open so that air can escape from the upbuilding paint pressure. The duration of opening the drain valve depends on multiple factors, as e. g. viscosity, paint pressure etc. The time should be selected in a way that the drain is closed as soon as the material reaches the trigger valve in the atomizer. Residual paint in the drain line can cause problems with the high voltage.

Clean Outer Surfaces of the Atomizer

Ensure that the high voltage is switched off.

All outer surfaces can be wiped with a mild solvent and lint-free cloths by hand. The turbine driving air must be switched off, the bearing air and shaping air must stay switched on.

If the unit is sprayed with a solvent applicator used for cleaning, the notes from page 30 must be observed. Pressurised cleaning liquids may favour that conductive materials enter areas that are difficult to clean or that liquids are pressed into the turbine assembly.

Atomizer bell cup that have visible signs of damages like notches, deep scratches, pressure marks or excessive wear must not be used for any further purpose.

Finally, always wipe all parts with a nonpolar solvent (e. g. solvent naphtha) and dry them.

 **WARNING**

➤ Never wrap the applicator in plastic to keep it clean. A surface charge may appear at the plastic material and discharge to the next grounded object. The performance of the applicator may be negatively affected by this and damages or failure at the applicator components may occur. **WRAPPING THE APPLICATOR IN PLASTIC CAUSES THE WARRANTY CLAIM TO BECOME VOID.**

 **WARNING**

- To reduce the risk of fire and explosion, the flash point of the solvents used for cleaning must be at least 5°C (9°F) above ambient temperature. The end operator is responsible for the compliance with this requirement. As also electrostatic equipments are affected by the cleaning, the solvents should be nonpolar. Non-flammable, nonpolar solvents that are used for cleaning are e. g.: Amyl acetate, Methylamyl acetate, Solvent naphtha (xylool substitute) and white spirit.
- Use a solvent to clean the outer surfaces of the applicator that is compatible with the coating material used. Finally, wipe with benzine to remove the conductivity of the surfaces.
- If the ICE-Bell 2 is wiped with a cloth by hand, the turbine air should be switched off but the shaping air and bearing air should stay switched on. Ensure that rotating is completely stopped.

Replace Air Filter/Element

 **WARNING**

➤ Feed of air containing oil, moisture or dirt can cause wear and damages at the bearings. The operator is responsible for monitoring the air quality and replacing the filter elements as often as necessary. Turbine failures which are caused by low compressed air quality are **NOT COVERED BY THE WARRANTY.**

SPARE ELEMENTS

Part #	No. of Elements Per Carton	Used On
HAF-503	1	HAF-15, prefilter
HAF-508	4	HAF-38, prefilter
RPM-418	8	RPM-418, bearing air filter

In all Carlisle Fluid Technologies ICE-Bell systems, (a) pre and endfilter for all air supply lines to the ICE Bell unit are to be planned. The endfilter is intended for the bearing air only. All filters contain elements that are to be replaced regularly to guarantee permanently clean air. The filters HAF-508 and RPM-418 contain also an automatic drain and a differential pressure indicator.

The differential pressure indicator offers a visual display which becomes highlighted (more visible) if the filter element is clogged. Change the filter elements as soon as the visual display becomes visible; do not wait until it can be seen entirely. As soon as the filter elements start to become clogged, their efficiency becomes noticeably less. The frequency of filter element exchanges depends on the compressed air quality of the plant. It is recommended to replace the elements at least every 4 to 6 months.

In units with high amounts of oil and moisture steam in the air lines, using a compressed air refrigeration dryer may be necessary.

The ICE-Bell 2 is designed for reliable operation and a long service life. One of the most important factors for a long service life is the air quality. Therefore, it is essential that the operator ensures that the air quality is always monitored and the filter elements are exchanged as often as necessary as part of the proper maintenance of the air filters. (Replace the elements at least every 4-6 months, and, if required, more often.)

Bell Cup Assembly

Check the bell for damages, wear and paint deposits on a daily basis.

BELL CUP CLEANING

Always ensure that the high voltage is switched off and the atomizer bell rotates before carrying out a cleaning cycle for purging the bell.

To reduce the risk of fire and explosion, the flash point of the solvents used for cleaning the outer surfaces must be at least 5°C (9°F) above ambient temperature. As also electrostatic equipments are affected by the cleaning, the solvents must be nonpolar.

The flash point for solvents used to clean the devices must be equal or higher than the flash point of the coating material to be atomised.

1. Normally, the atomizer becomes completely cleaned during a bell cleaning cycle. Carry out purging before each downtime or production interruption. A bell cleaning cycle may also be necessary if work pieces are sprayed with the same colour during a production batch. Ensure that the high voltage is switched off and the atomizer bell rotates before cleaning through the bell is carried out.
2. If, after the purging procedure, there are still paint residues somewhere on the bell, the bell should be dismantled and cleaned by hand.

Manual Inspection

3. Carry out a visual inspection of the bell cup edge regarding abrasion. If the edge is damaged by wear or bumping against a component, immediately replace the bell cup.
4. Remove the distributor disc. Check the bell cup for wear where the material leaves the large diameter of the distributor disc. If in this area deepenings can be determined, the bell cup should be replaced. In case of visible wear, replace the whole distributor disc assembly.
5. Distributor discs can be soaked to remove dried materials. Clean with a soft brush. Free the central opening from material via blowing out. Never use a pointed object for cleaning these openings as they can be damaged this way.
6. Soaking the bell in solvents can help to dissolve and remove material deposits. It is recommended to remove the distributor disc and clean it separately.

7. Remove the material deposits from the knurling, the material supply holes or slits and from the outer and inner surfaces of the bell with a soft brush that previously was dipped into solvents.
8. Paint residues on the outer and inner surfaces of the atomizer can be removed with a soft lint-free cloth that is moistened with solvents.
9. Prior to reinstallation of the bell onto the shaft, ensure that the mating surfaces of thread and cone are free of paint accumulations and residues. Further, check the material point, the outer diameter of the material hose and the shaft for material accumulations. These surfaces should be cleaned before installing the bell.
10. It is recommended to purchase additional bell cups. So, the cups can be dismantled and then cleaned in an automatic cleaning device while production continues with a second batch.
11. Reinstall the bell cup again and tighten it by hand.

Soak Bell Cup

Bell cups and distributor discs can be soaked in a heated solution (max. 49°C/120°F) in a ultrasonic cleaning bath for up to 2 hours.

CLEAN SHAPING AIR OPENINGS

To constantly guarantee an uniform spray pattern, keep the shaping air slit clean.

Best, leave the shaping air supply SWITCHED ON during normal cleaning phases in production pauses. The shaping air flow can be reduced during these periods. This helps avoiding that material enters the flow openings.

Regularly (weekly or more often) remove the shaping air cap and the shaping air ring and clean them thoroughly. Using a ultrasonic cleaning device facilitates cleaning. Do NOT use pointed objects for cleaning the openings. This way, components could be damaged and the performance of the unit could be negatively affected.

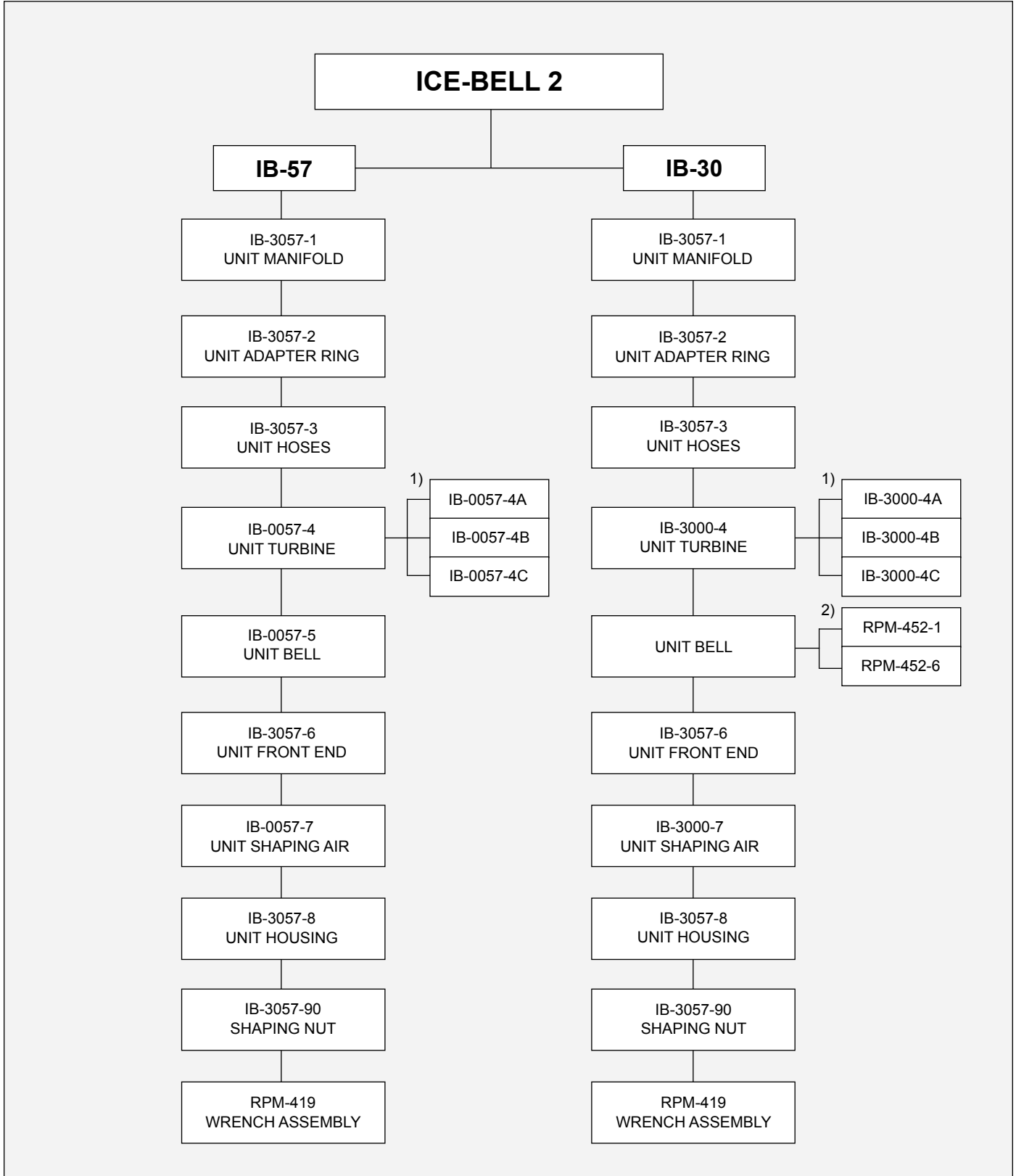
Check Bell Cup on a Daily Basis

Check for signs of damage like notches, deep scratches, pressure marks or excessive wear. Replace the bell cup assembly if one of these conditions applies.

ICE-BELL 2 PREVENTIVE MAINTENANCE SCHEDULE

Procedure	Frequency (Maximum)							
	Mid-Shift	End of Shift	Weekly	2 Weeks	Monthly	3 Months	6 Months	Yearly
Cleaning during shift: Wipe housing, visual inspection of bell	●							
Cleaning at end of shift: Wipe housing, wipe bell cup, replace cover cloth (if provided)		●						
Clean housing, clean shaping air cap	●	●	●					
Bell cup: Dismantling /Inspection / Cleaning /Tightening		●	●					
Material hose: Check/ Cleaning		●	●					
Check valve and seat assembly for leakage				●				
Replace valves and/or seats in valve module							●	●
High voltage cable, checks			●					
High voltage, checks						●		
Check all screws. Replace if defective. Check for wear. Tighten according to instructions.					●			
Check cone and thread of the turbine shaft.	●							
Replace bell cups						●	●	●
Replace distributor discs						●	●	●
Check and clean shaft, hole and material tube AD		●	●					
Check for material leakages.	daily							

STRUCTURING ICE-BELL 2



1) Unit turbine with paint tube variant A/B/C

2) Unit bell with bell cup type A/B

PARTS IDENTIFICATION

ICE-BELL 2 MODEL IDENTIFICATION

When ordering, use 1B-XXXXX as indicated by Tables A, B, C and D.
Five (5) digits must follow the basic part number. For Example:

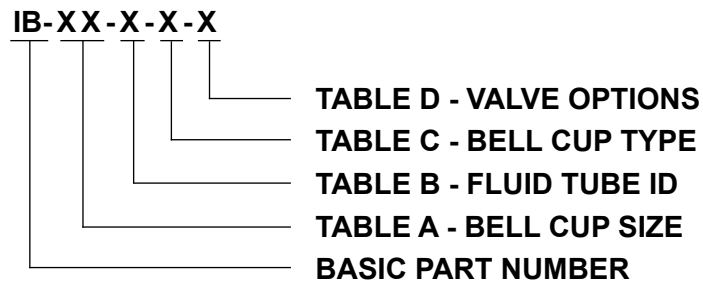


TABLE A - BELL CUP SIZE

Number	Description
30	30 mm Bell Cup
57	57 mm Bell Cup

TABLE B - FLUID TYPE ID

Letter	Part #	Description	Typical Flow Rates
0	RPM-439	Fluid Tube 1/8" ID	300 - 1000 cc/min. (Viscosity 23-38 sec. DIN 4)
1	RPM-440	Fluid Tube 3/32" ID	100 - 500 cc/min. (Viscosity 18-28 sec. DIN 4)
2	RPM-441	Fluid Tube 1/16" ID	30 - 800 cc/min. (Viscosity 12-15 sec. DIN 4)

TABLE C - BELL CUP TYPE (See next page)

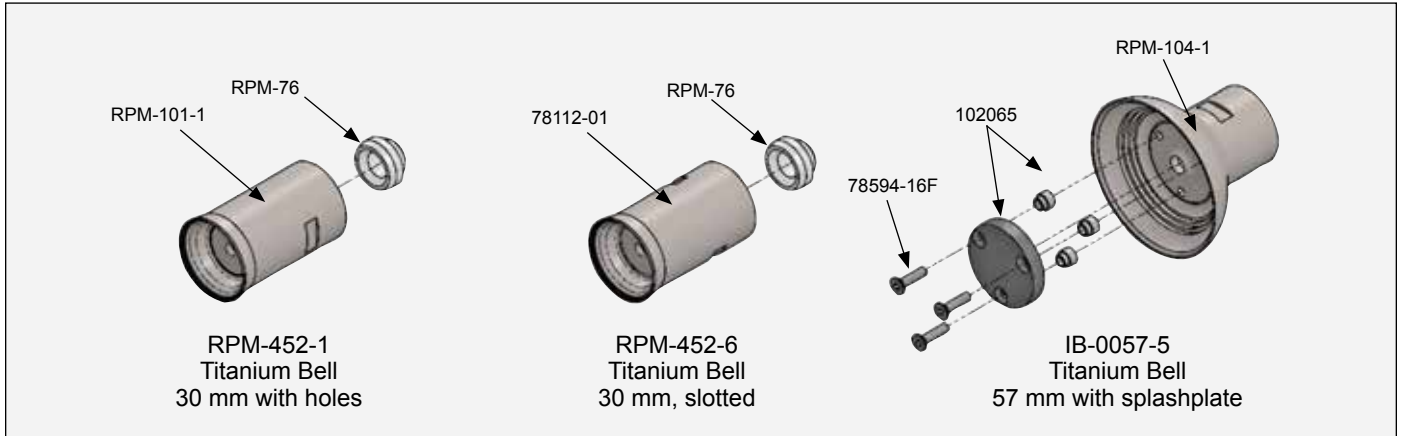
Letter	Part #	Description
1	RPM-452-1	Titanium Bell Cup 30 mm, hole Ø1.2 mm
2	RPM-452-6	Titanium Bell Cup 30 mm, slotted
3	IB-0057-5	Titanium Bell Cup 57 mm

TABLE D - VALVE OPTIONS (See next page)

Letter	Part #	Description
0	-	No Valve
1	IB-CCV-4005-01	Trigger Valve
2	IB-CCV-4005-02	Trigger/Solvent Valve
3	IB-CCV-4005-03	Trigger/Dump/Solvent Valves

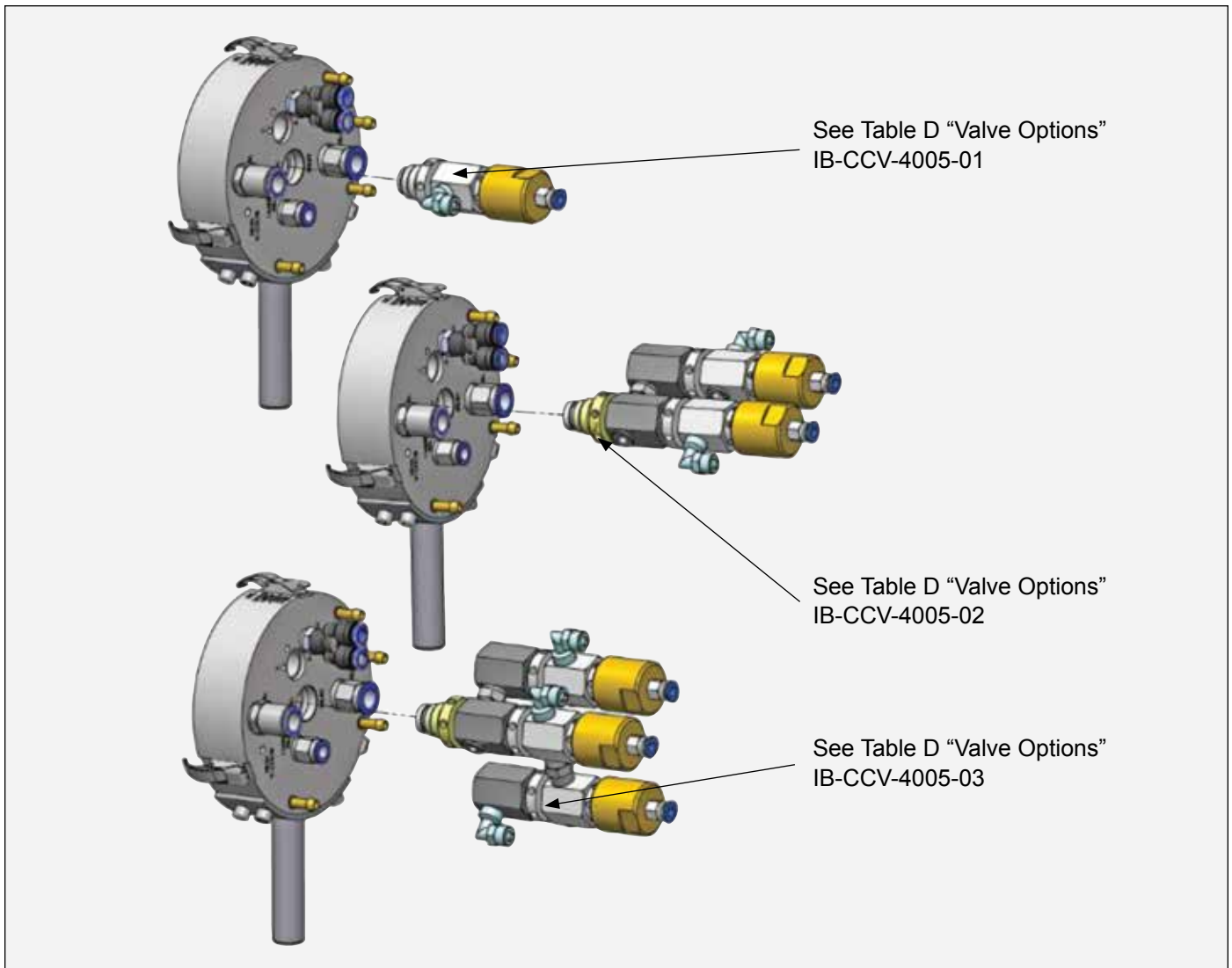
BELL CUP TYPE

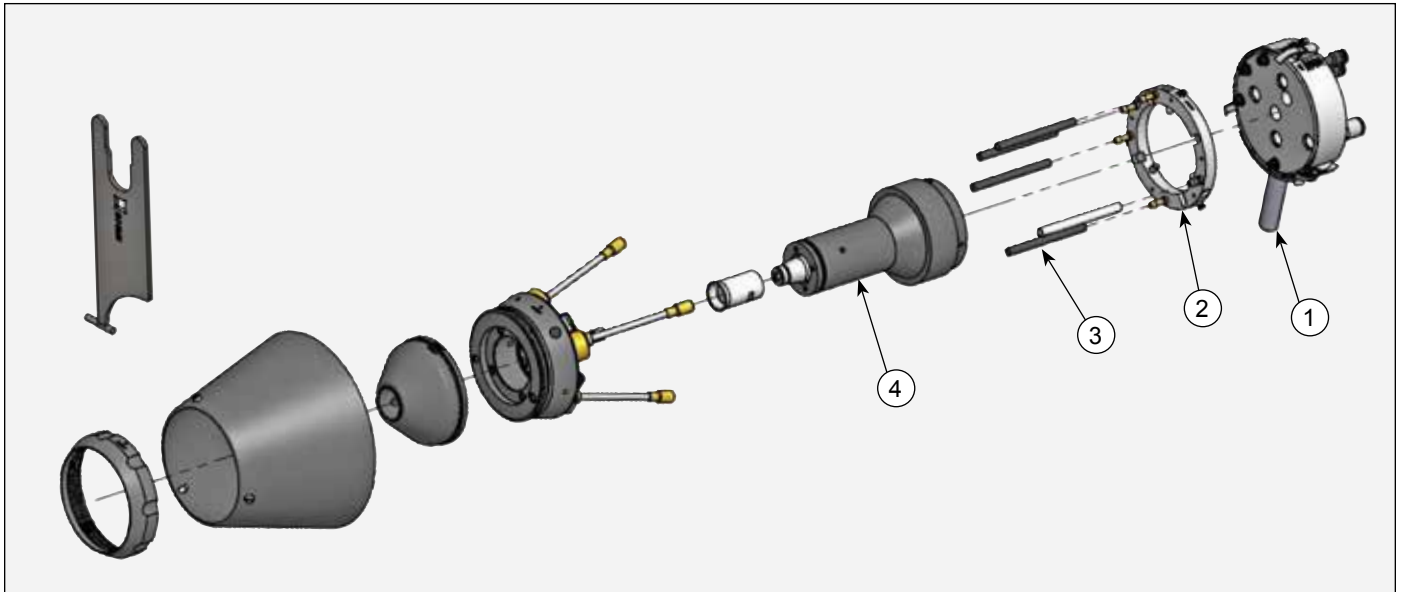
Bell Cup Type configuration (see table "C - Bell Cup Type")



VALVE OPTIONS

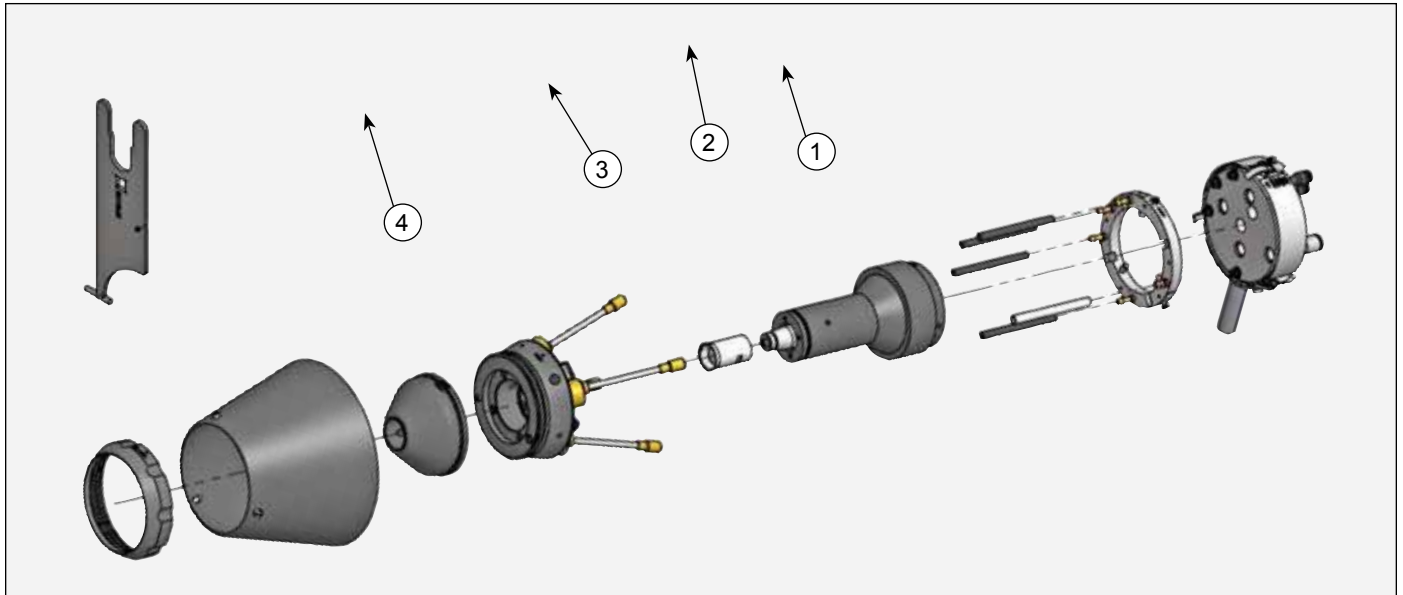
Mounting Manifold with optional valve configuration (see table "D - Valve Options")





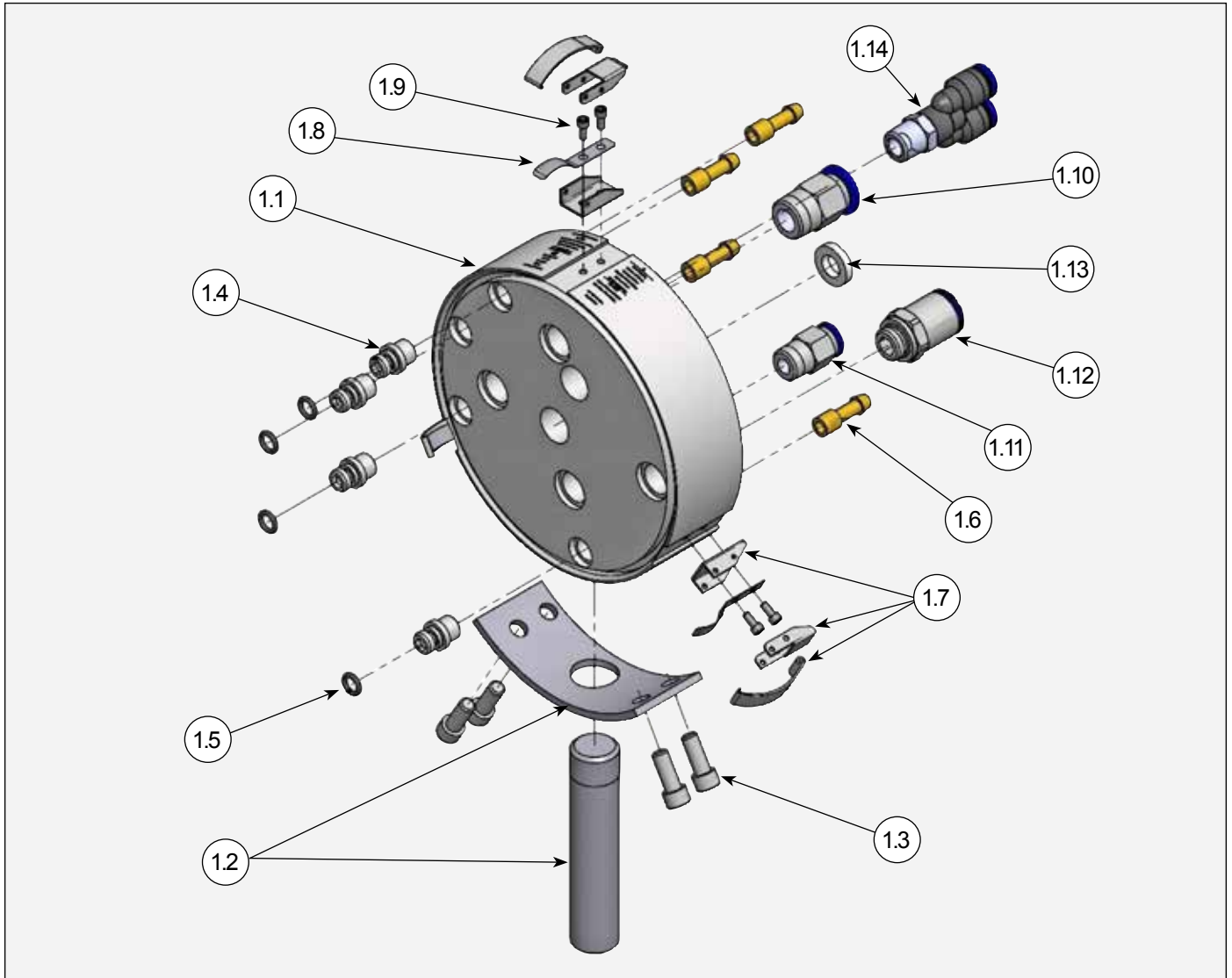
IDENTIFICATION IB-30

Pos.	Qty	Unit	Art.-No.	Description
1	IB-3057-1 UNIT MANIFOLD			
1.1	1	PC	-	Manifold
1.2	1	PC	RPM-403	Holder
1.3	4	PCS	SS-7936-NI	Cap Screw
1.4	4	PCS	IB-3057-11	Nipple
1.5	4	PCS	IB-3057-12	O-Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
1.7*	3	PCS	RPM-20	Draw Latch
1.8*	3	PCS	RPM-34	Spring
1.9*	6	PCS	20089-08c	Screw
1.10	1	PC	Esta-402-4	Straight Connector R3/8" A12mm
1.11	1	PC	Esta-402-1	Straight Connector R1/4" A8mm
1.12	1	PC	Esta-402-2	Straight Connector R1/4" A12mm
1.13	1	PC	100406	Gasket
1.14	1	PC	IQSY148	Y Push In Fitting R1/4" A8mm
2	IB-3057-2 UNIT ADAPTER RING			
2.1	1	PC	-	Adapter Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
2.2	1	PC	RPM-7	Hose Nozzle
2.3*	3	PCS	SSF-4240	Screw
2.4*	3	PCS	RPM-21	Keeper Button
2.5*	3	PCS	RPM-14	Spacer
1.3	3	PCS	SS-7936-NI	Cap Screw
3	IB-3057-3 UNIT HOSES			
3.1	0,117	M	9704-11	Shaping Air Hose
3.2	2	M	PUN8x6ANTISTAT	Air Cooler Hose PU 8x6
4	IB-3000-4A/B/C UNIT TURBINE			
4.1	1	PC	RPM-401-1	Air Bearing Turbine



IDENTIFICATION IB-30

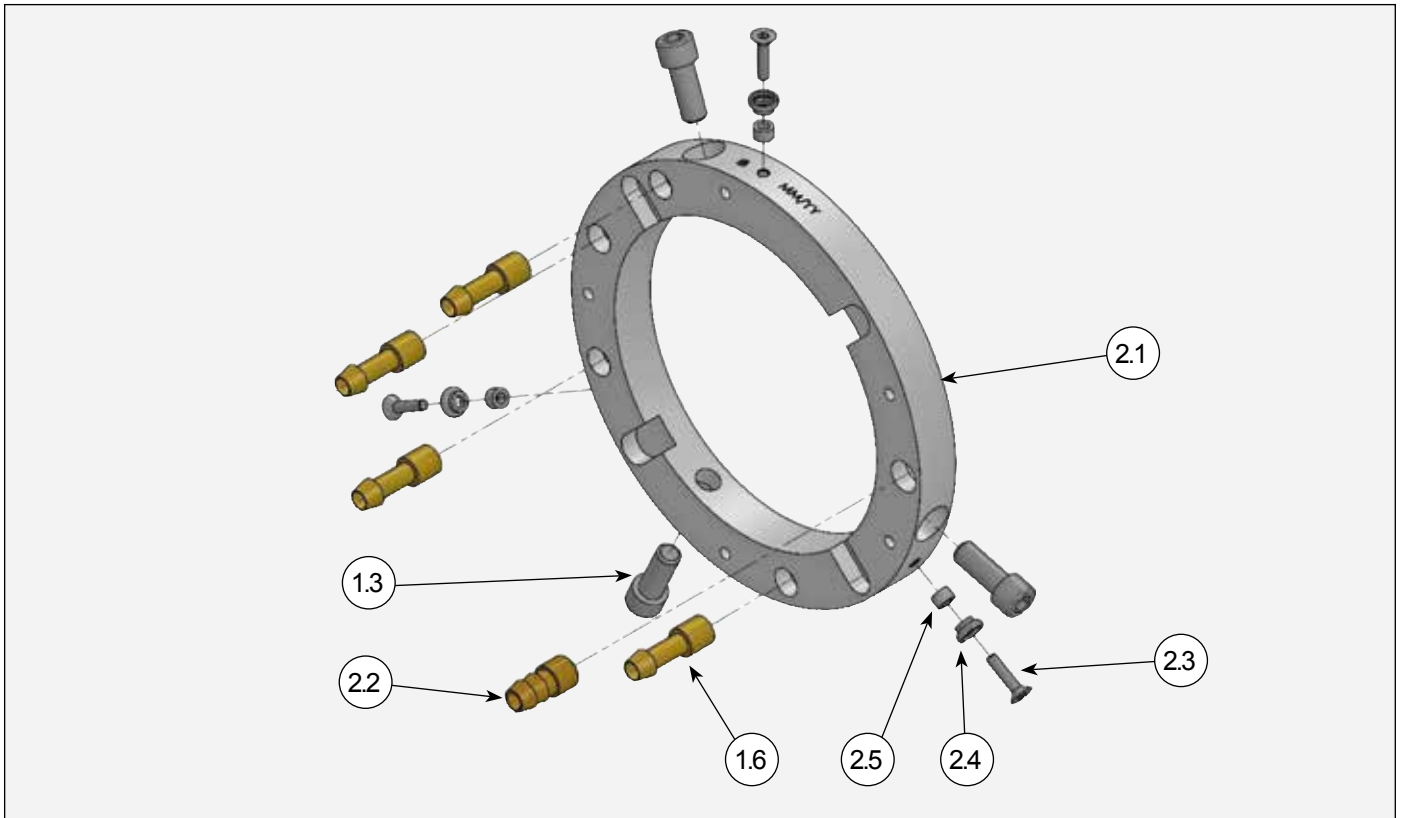
Pos.	Qty	Unit	Art.-No.	Description
4.2	4	PCS	SSF-3137	Screw, Socket HD CAP, M3x5 PITC
A	1	PC	RPM-439	Fluid Tube Assembly 1/8" ID
4.3 B	1	PC	RPM-440	Fluid Tube Assembly 3/32" ID
C	1	PC	RPM-441	Fluid Tube Assembly 1/16" ID
4.4	1	PC	79001-05	O-Ring
4.5	3	PCS	SSF-3117	Screw
5 A	RPM-452-1 BELL CUP			
B	RPM-452-6 BELL CUP, SLOTTED			
6	IB-3057-6 UNIT FRONT END			
6.1	1	PC	IB-3057-60	Front End
6.2	4	PCS	102055	Air Coolers
6.3	4	PCS	AGMD-127	Air Hose Connector 8mm-1/8"
6.4	1	PC	102057	O-Ring
6.5	1	PC	AGMD-121	O-Ring
6.6	1	PC	DIN84M4x10PA	Cylinder Screw PA
1.5	4	PCS	IB-3057-12	O-Ring
6.7	1	PC	AGMD-93 K5	O-Ring
7	IB-3000-7 UNIT SHAPING AIR			
7.1	1	PC	IB-3000-70	Shaping Air Screw
7.2	1	PC	IB-3000-71	Shaping Air Ring
7.3	1	PC	IB-3057-72	O-Ring
6.6	4	PCS	DIN84M4x10PA	Cylinder Screw PA
1.5	1	PC	IB-3057-12	O-Ring
8	IB-3057-8 UNIT HOUSING			
8.1	1	PC	102054	Housing
8.2	3	PCS	DIN84M5x10PA	Screw Plastic
9	1	PC	IB-3057-90	Shaping Nut
10	2	PCS	RPM-419	Wrench Assembly



1 IB-3057-1 UNIT MANIFOLD

Pos.	Qty	Unit	Art.-No.	Description
1.1	1	PC	-	Manifold
1.2	1	PC	RPM-403	Holder
1.3	4	PCS	SS-7936-NI	Cap Screw
1.4	4	PCS	IB-3057-11	Nipple
1.5	4	PCS	IB-3057-12	O-Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
1.7*	3	PCS	RPM-20	Draw Latch
1.8*	3	PCS	RPM-34	Spring
1.9*	6	PCS	20089-08c	Screw
1.10	1	PC	Esta-402-4	Straight Connector R3/8" A12mm
1.11	1	PC	Esta-402-1	Straight Connector R1/4" A8mm
1.12	1	PC	Esta-402-2	Straight Connector R1/4" A12mm
1.13	1	PC	100406	Gasket
1.14	1	PC	IQSY148	Y Push In Fitting R1/4" A8mm

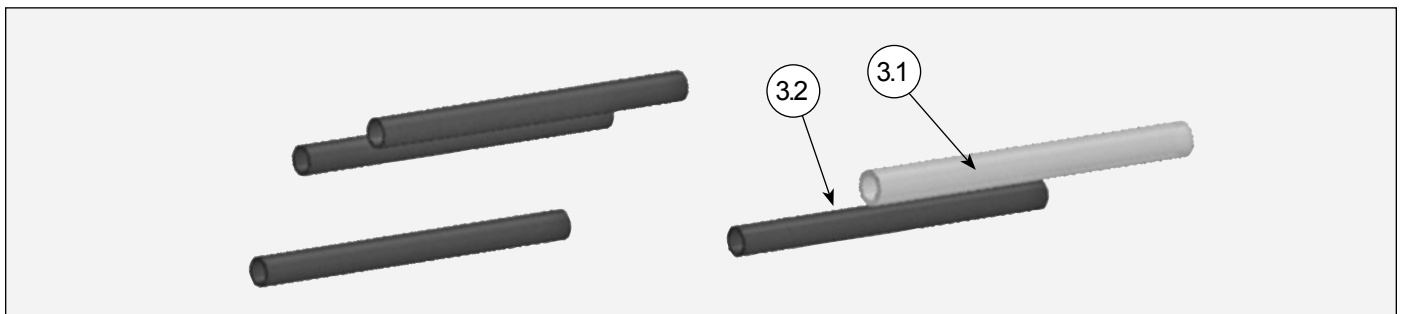
* included in KK-4458



2 IB-3057-2 UNIT ADAPTER RING

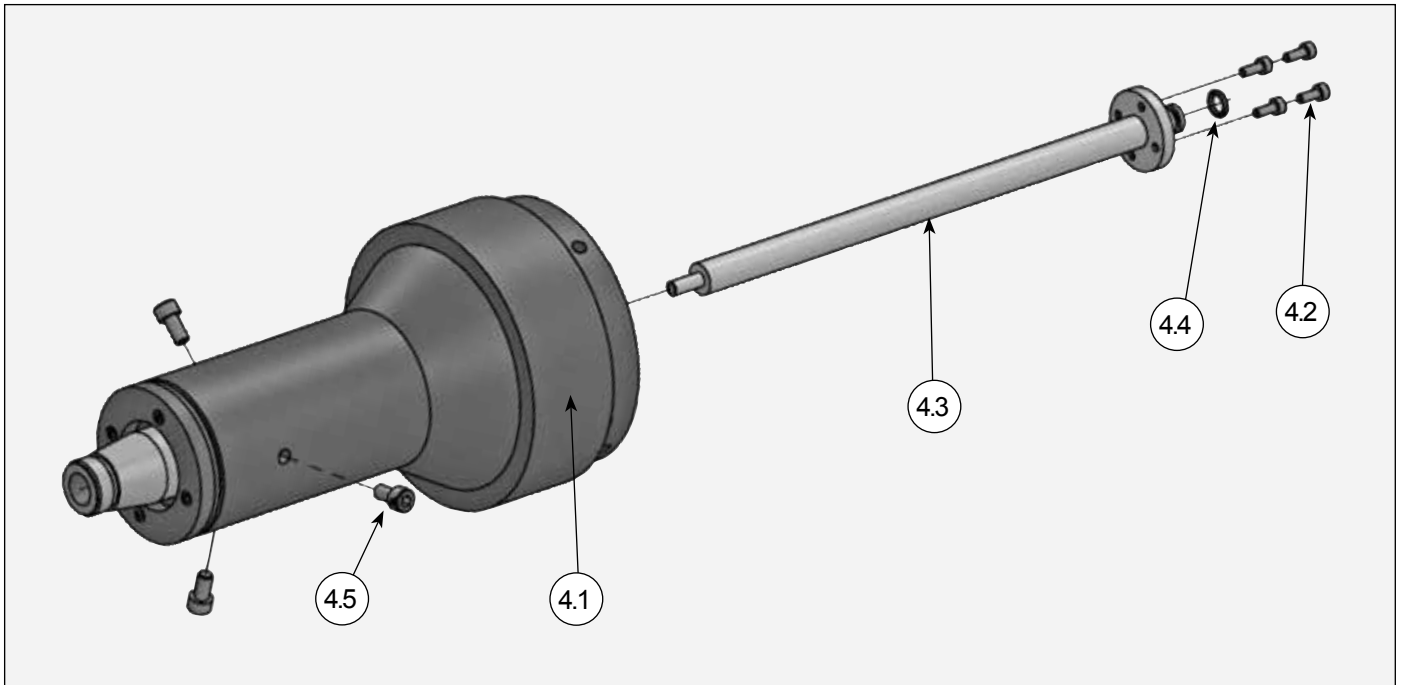
Pos.	Qty	Unit	Art.-No.	Description
2.1	1	PC	-	Adapter Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
2.2	1	PC	RPM-7	Hose Nozzle
2.3*	3	PCS	SSF-4240	Screw
2.4*	3	PCS	RPM-21	Keeper Button
2.5*	3	PCS	RPM-14	Spacer
1.3	3	PCS	SS-7936-NI	Cap Screw

* included in KK-4458



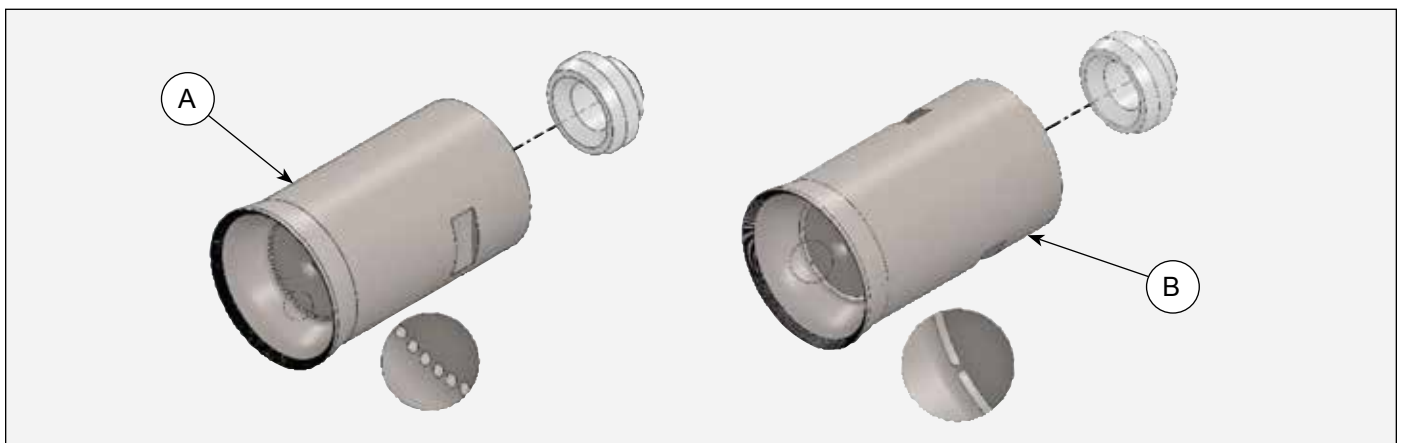
3 IB-3057-3 UNIT HOSES

Pos.	Qty	Unit	Art.-No.	Description
3.1	0,117	M	9704-11	Shaping Air Hose
3.2	2	M	PUN 8x6 ANTISTAT	Air Cooler Hose PU 8x6



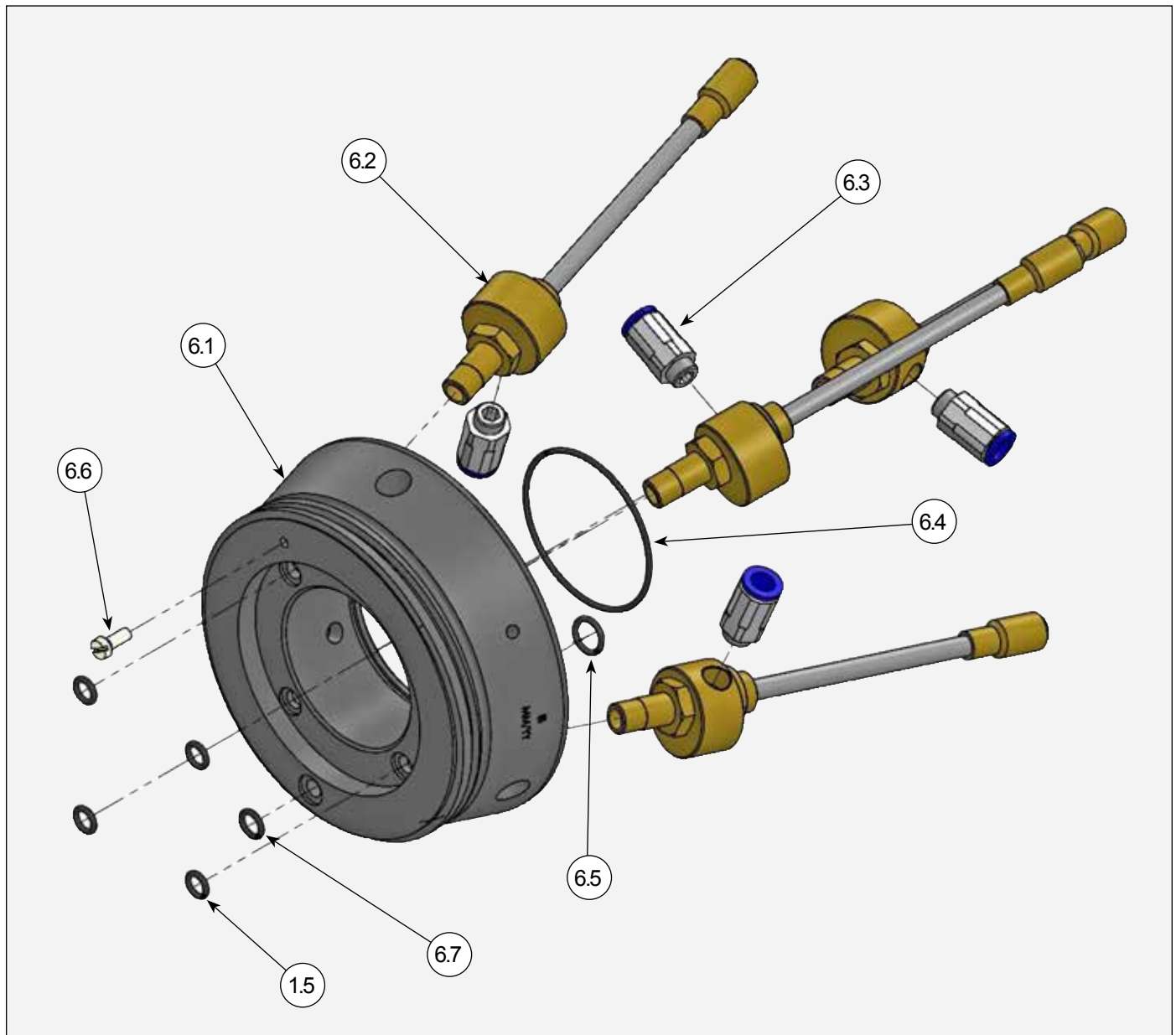
4 IB-3000-4A/B/C UNIT TURBINE

Pos.	Qty	Unit	Art.-No.	Description
4.1	1	PC	RPM-401-1	Air Bearing Turbine
4.2	4	PCS	SSF-3137	Screw, Socket HD CAP, M3x5 PITCH
4.3 A	1	PC	RPM-439	Fluid Tube Assembly 1/8" ID
4.3 B	1	PC	RPM-440	Fluid Tube Assembly 3/32" ID
4.3 C	1	PC	RPM-441	Fluid Tube Assembly 1/16" ID
4.4	1	PC	79001-05	O-Ring
4.5	3	PCS	SSF-3117	Screw



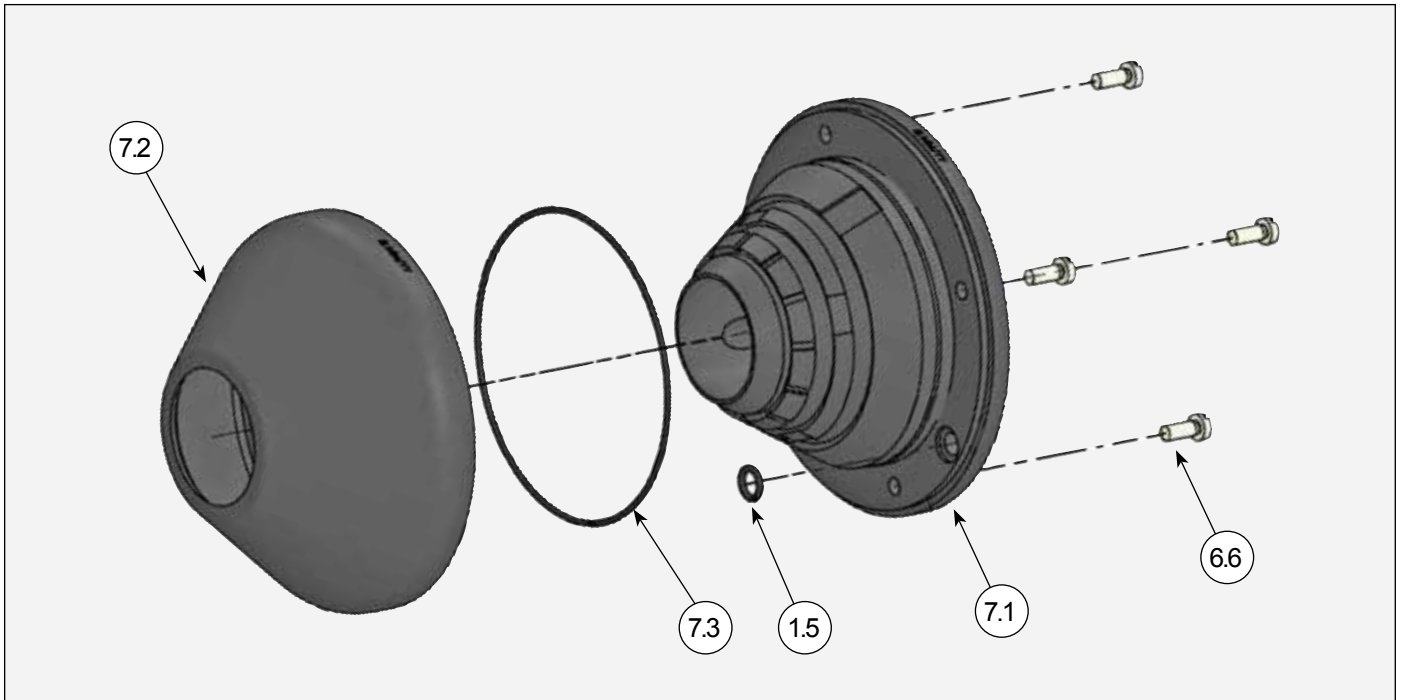
5 RPM-452-1/6 BELL CUPS

Item	Description
5 A	RPM-452-1 BELL CUP
5 B	RPM-452-6 BELL CUP, SLOTTED



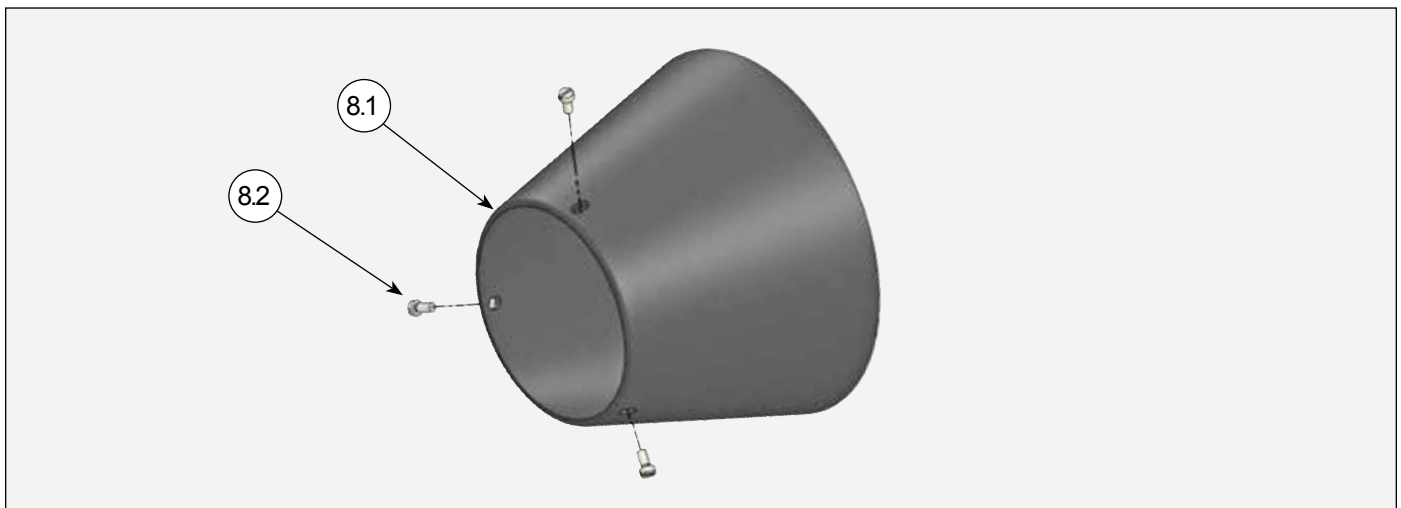
6 IB-3057-6 UNIT FRONT END

Pos.	Qty	Unit	Art.-No.	Description
6.1	1	PC	IB-3057-60	Front End
6.2	4	PCS	102055	Air Coolers
6.3	4	PCS	AGMD-127	Air Hose Connector 8mm-1/8"
6.4	1	PC	102057	O-Ring
6.5	1	PC	AGMD-121	O-Ring
6.6	1	PC	DIN84M4x10PA	Cylinder Screw PA
1.5	4	PCS	IB-3057-12	O-Ring
6.7	1	PC	AGMD-93 K5	O-Ring



7 IB-3057-7 UNIT SHAPING AIR

Pos.	Qty	Unit	Art.-No.	Description
7.1	1	PC	IB-3000-70	Shaping Air Screw
7.2	1	PC	IB-3000-71	Shaping Air Ring
7.3	1	PC	IB-3057-72	O-Ring
6.6	4	PCS	DIN84M4x10PA	Cylinder Screw PA
1.5	1	PC	IB-3057-12	O-Ring



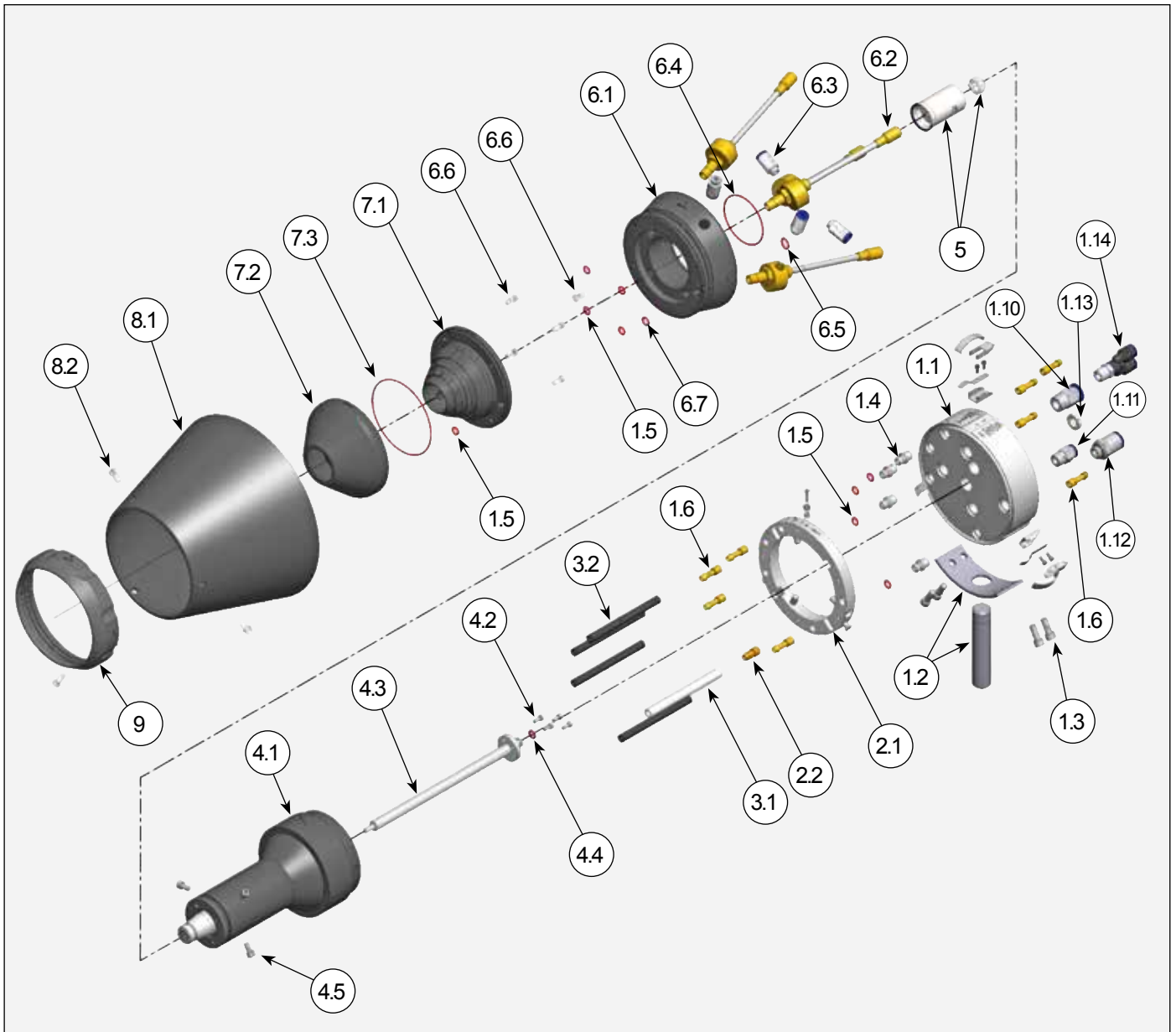
8 IB-3057-8 UNIT HOUSING

Pos.	Qty	Unit	Art.-No.	Description
8.1	1	PC	102054	Housing
8.2	3	PCS	DIN84M5x10PA	Screw Plastic



9 IB-3057-90 SHAPING NUT

Item	Description
9	IB-3057-90 SHAPING NUT



IB-30 SPARE PARTS LIST

Pos.	Art.-No.	SP	WP
1	IB-3057-1		
1.2	RPM-403	X	
1.3	SS-7936-NI	X	
1.4	IB-3057-11	X	
1.5	IB-3057-12		X
1.6	IB-3057-13	X	
1.7*	RPM-20		X
1.8*	RPM-34		X
1.9*	20089-08c		X
1.10	Esta-402-4	X	

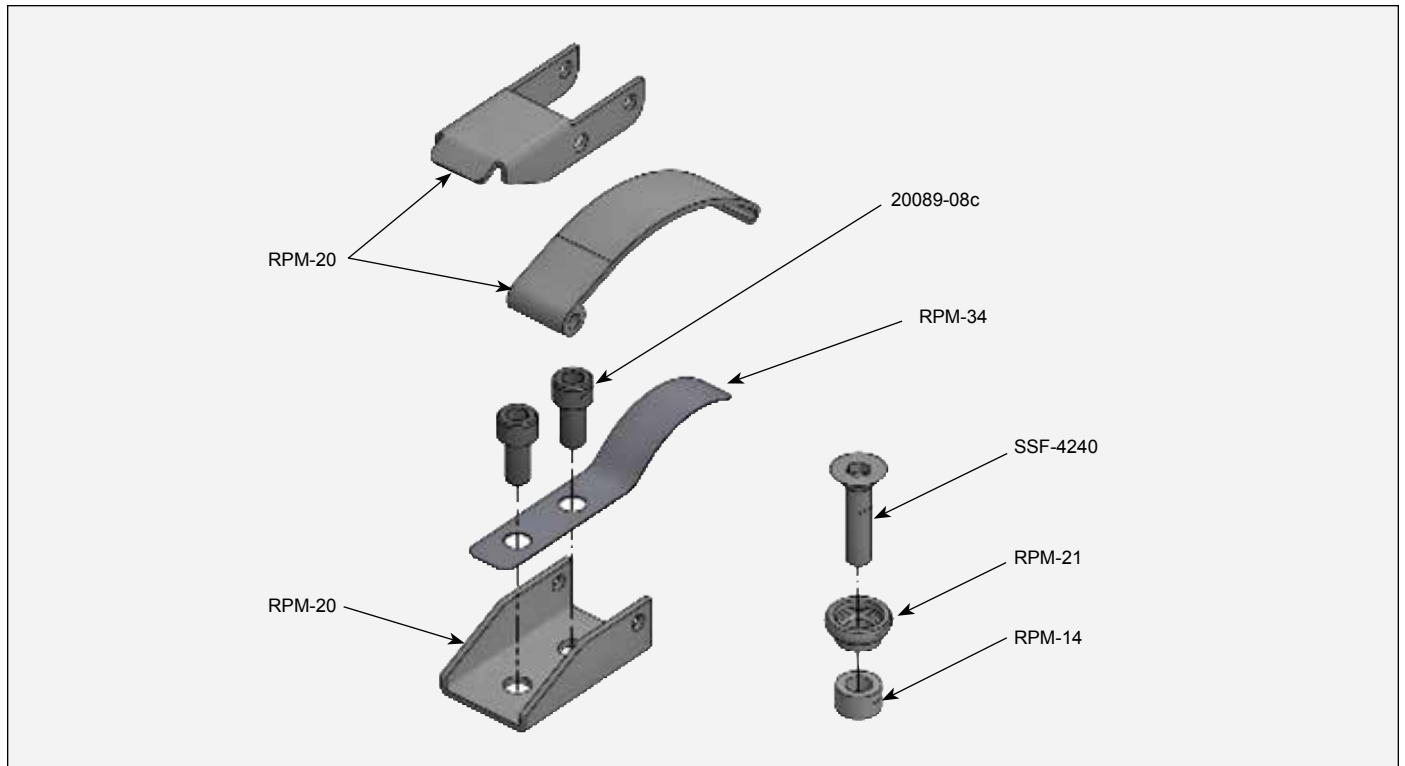
* included in KK-4458 **SP** - Spare Parts **WP** - Wear Parts

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IB-30 SPARE PARTS LIST (Cont.)

Pos.	Art.-No.	SP	WP
1.11	Esta-402-1	X	
1.12	Esta-402-2	X	
1.13	100406		X
1.14	IQSY148	X	
2	IB-3057-2		
1.6	IB-3057-13	X	
2.2	RPM-7	X	
2.3*	SSF-4240		X
2.4*	RPM-21		X
2.5*	RPM-14		X
1.3	SS-7936-NI	X	
3	IB-3057-3		
3.1	9704-11		X
3.2	PUN8x6ANTISTAT		X
4	IB-3000-4A/B/C		
4.1	RPM-401-1	X	
4.2	SSF-3137	X	
4.3	RPM-439	X	
	RPM-440	X	
	RPM-441	X	
4.4	79001-05		X
4.5	SSF-3117	X	
5	RPM-452-1	X	
	RPM-452-6	X	
6	IB-3057-6		
6.1	IB-3057-60 X		
6.2	102055	X	
6.3	AGMD-127	X	
6.4	102057		X
6.5	AGMD-121		X
6.6	DIN84M4x10PA		X
1.5	IB-3057-12		X
6.7	AGMD-93 K5		X
7	IB-3000-7		
7.1	IB-3000-70	X	
7.2	IB-3000-71	X	
7.3	IB-3057-72		X
6.6	DIN84M4x10PA		X
1.5	IB-3057-12		X
8	IB-3057-8		
8.1	102054	X	
8.2	DIN84M5x10PA		X
9	IB-3057-90	X	
10	RPM-419	X	

* included in KK-4458 **SP** - Spare Parts **WP** - Wear Parts



REPAIR KITS

Part #	Description
KK-4458	Draw latch repair kit
IB-3057-100	Seal repair kit (redstained parts)

CONVERSION KIT IB-30-CK

With the conversion kit IB-30-CK, Carlisle Fluid Technologies offers the possibility to changeover the ICE Bell used by the customer to the latest version. This conversion kit is compatible with the following previous ICE Bell variants: RPM-6125-PSP and RPM-6193-PSP.

NOTE

► The individual exchange of components of older versions with components of the conversion kit that seem to be the same is not allowed. It is only allowed to exchange components with the same article number. Components of the latest version have an IB sign. In case of improper use, warranty claim and liability are reduced or entirely eliminated.

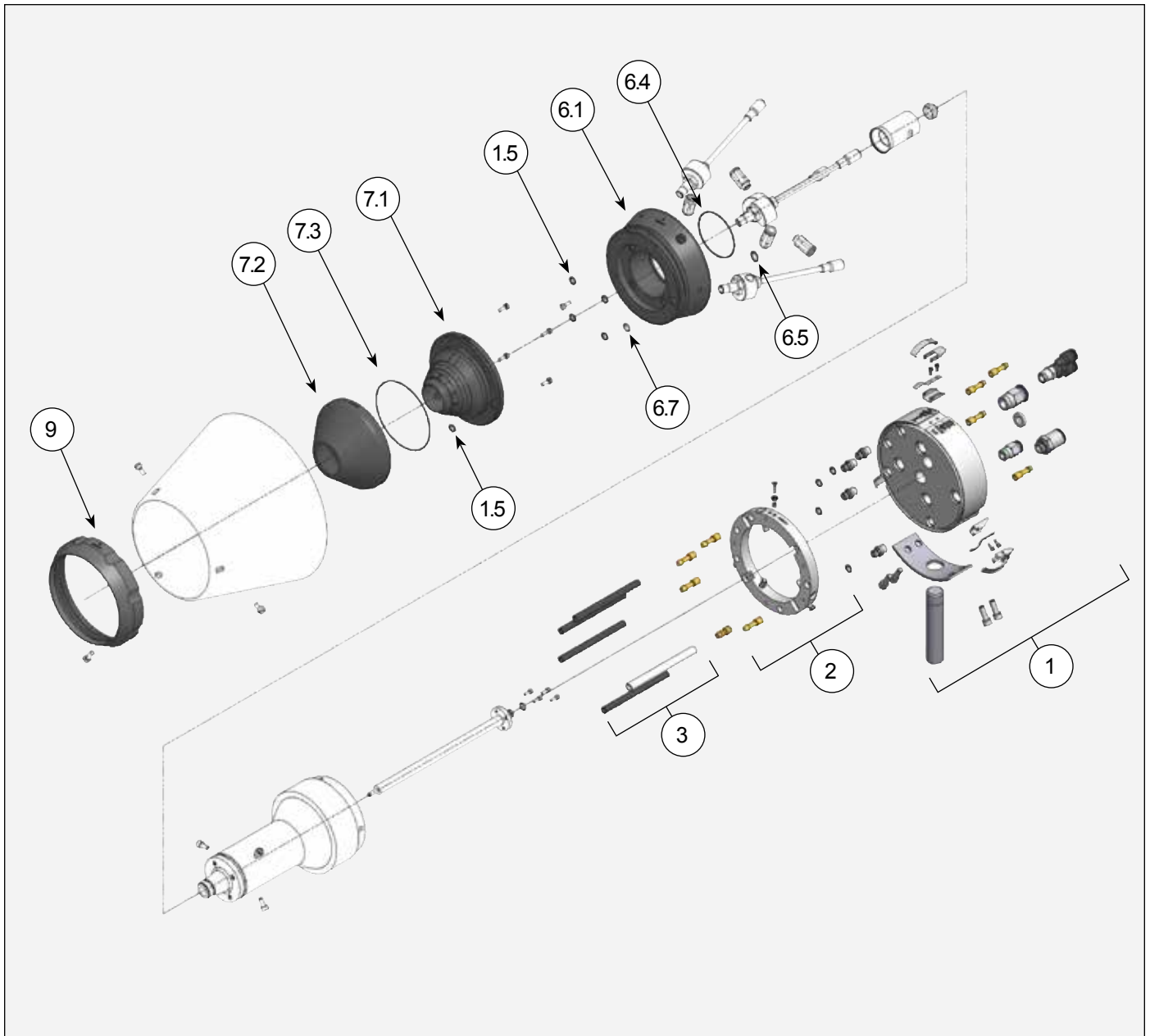


Figure: Conversion kit with repair kit KK-4458

(Continued On Next Page)

IB-30-CK - PARTS LIST

Pos.	Qty	Unit	Art.-No.	Description
1	IB-3057-1 UNIT MANIFOLD			
1.10	1	PC	Esta-402-4	Straight Connector R3/8" A12mm
1.11	1	PC	Esta-402-1	Straight Connector R1/4" A8mm
1.12	1	PC	Esta-402-2	Straight Connector R1/4" A12mm
1.13	1	PC	100406	Gasket
1.14	1	PC	IQSY148	Y Push In Fitting R1/4" A8mm
2	IB-3057-2 UNIT ADAPTER RING			
2.1	1	PC	-	Adapter Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
2.2	1	PC	RPM-7	Hose Nozzle
2.3*	3	PCS	SSF-4240	Screw
2.4*	3	PCS	RPM-21	Keeper Button
2.5*	3	PCS	RPM-14	Spacer
1.3	3	PCS	SS-7936-NI	Cap Screw
3	IB-3057-3 UNIT HOSES			
3.1	0.117	M	9704-11	Shaping Air Hose
3.2	2	M	PUN8x6ANTISTAT	Air Cooler Hose PU 8x6
4	IB-3000-4A/B/C UNIT TURBINE			
4.1	1	PC	RPM-401-1	Air Bearing Turbine
4.2	4	PCS	SSF-3137	Screw, Socket HD CAP, M3x5 PITC
A	1	PC	RPM-439	Fluid Tube assembly 1/8" ID
4.3 B	1	PC	RPM-440	Fluid Tube assembly 3/32" ID
C	1	PC	RPM-441	Fluid Tube assembly 1/16" ID
4.4	1	PC	79001-05	O-Ring
4.5	3	PCS	SSF-3117	QScrew
5 A	RPM-452-1 BELL CUP			
B	RPM-452-6 BELL CUP, SLOTTED			
6	IB-3057-6 UNIT FRONT END			
6.1	1	PC	IB-3057-60	Front End
6.2	4	PCS	102055	Air Coolers
6.3	4	PCS	AGMD-127	Air Hose Connector 8mm-1/8"
6.4	1	PC	102057	O-Ring
6.5	1	PC	AGMD-121	O-Ring
6.6	1	PC	DIN84M4x10PA	Cylinder Screw PA
1.5	4	PCS	IB-3057-12	O-Ring
6.7	1	PC	AGMD-93 K5	O-Ring
7	IB-3000-7 UNIT SHAPING AIR			
7.1	1	PC	IB-3000-70	Shaping Air Screw
7.2	1	PC	IB-3000-71	Shaping Air Ring
7.3	1	PC	IB-3057-72	O-Ring

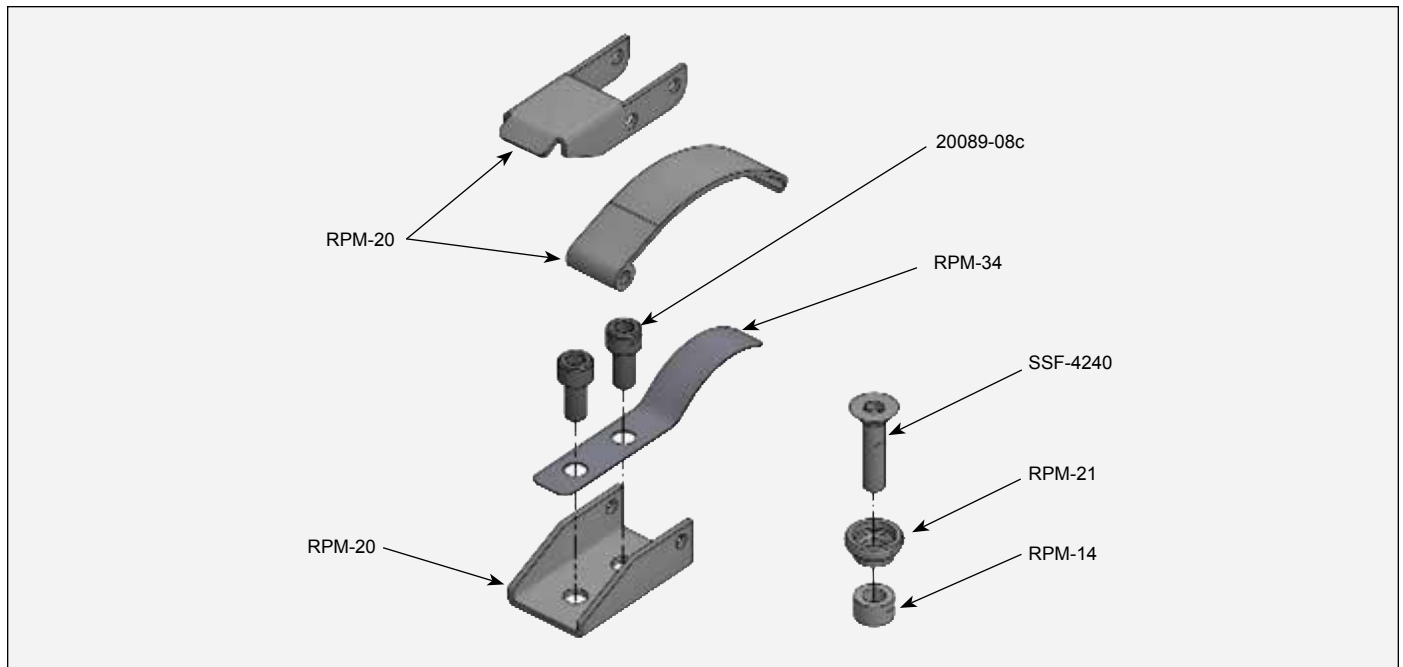
* only available in KK-4458, not available as individual part

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IB-30-CK - PARTS LIST

Pos.	Qty	Unit	Art.-No.	Description
6.6	4	PCS	DIN84M4x10PA	Cylinder Screw PA
1.5	1	PC	IB-3057-12	O-Ring
8	IB-3057-8 UNIT HOUSING			
8.1	1	PC	102054	Housing
8.2	3	PCS	DIN84M5x10PA	Screw Plastic
9	1	PC	IB-3057-90	Shaping Nut
10	2	PCS	RPM-419	Wrench Assembly
1	IB-3057-1 UNIT MANIFOLD			
1.1	1	PC	-	Manifold
1.2	1	PC	RPM-403	Holder
1.3	4	PCS	SS-7936-NI	Cap Screw
1.4	4	PCS	IB-3057-11	Nipple
1.5	4	PCS	IB-3057-12	O-Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
1.7*	3	PCS	RPM-20	Draw Latch
1.8*	3	PCS	RPM-34	Spring
1.9*	6	PCS	20089-08c	Screw

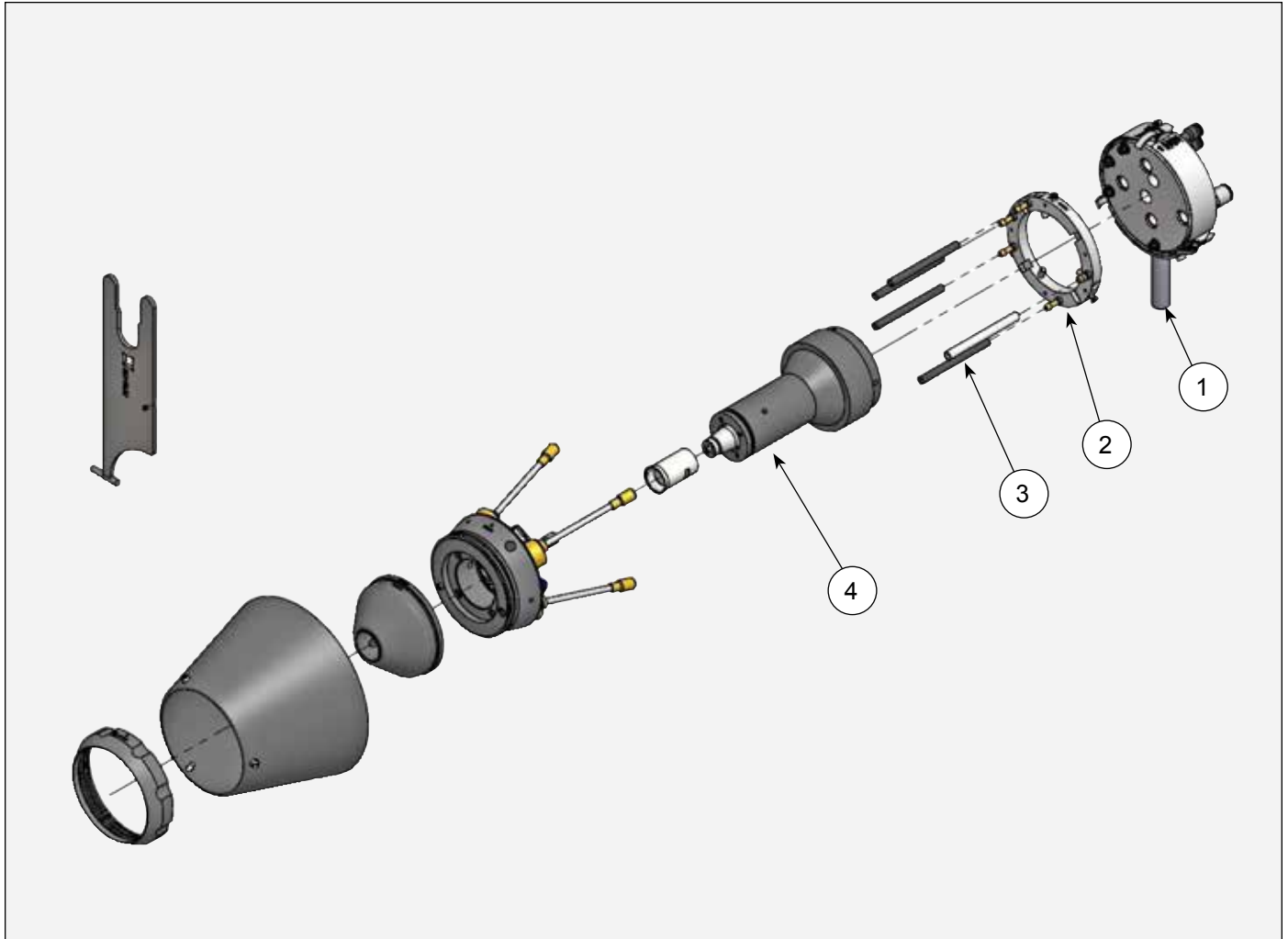
* only available in KK-4458, not available as individual part



REPAIR KITS

Part #	Description
KK-4458	Draw latch repair kit
IB-3057-100	Seal repair kit (redstained parts)

IDENTIFICATION IB-57



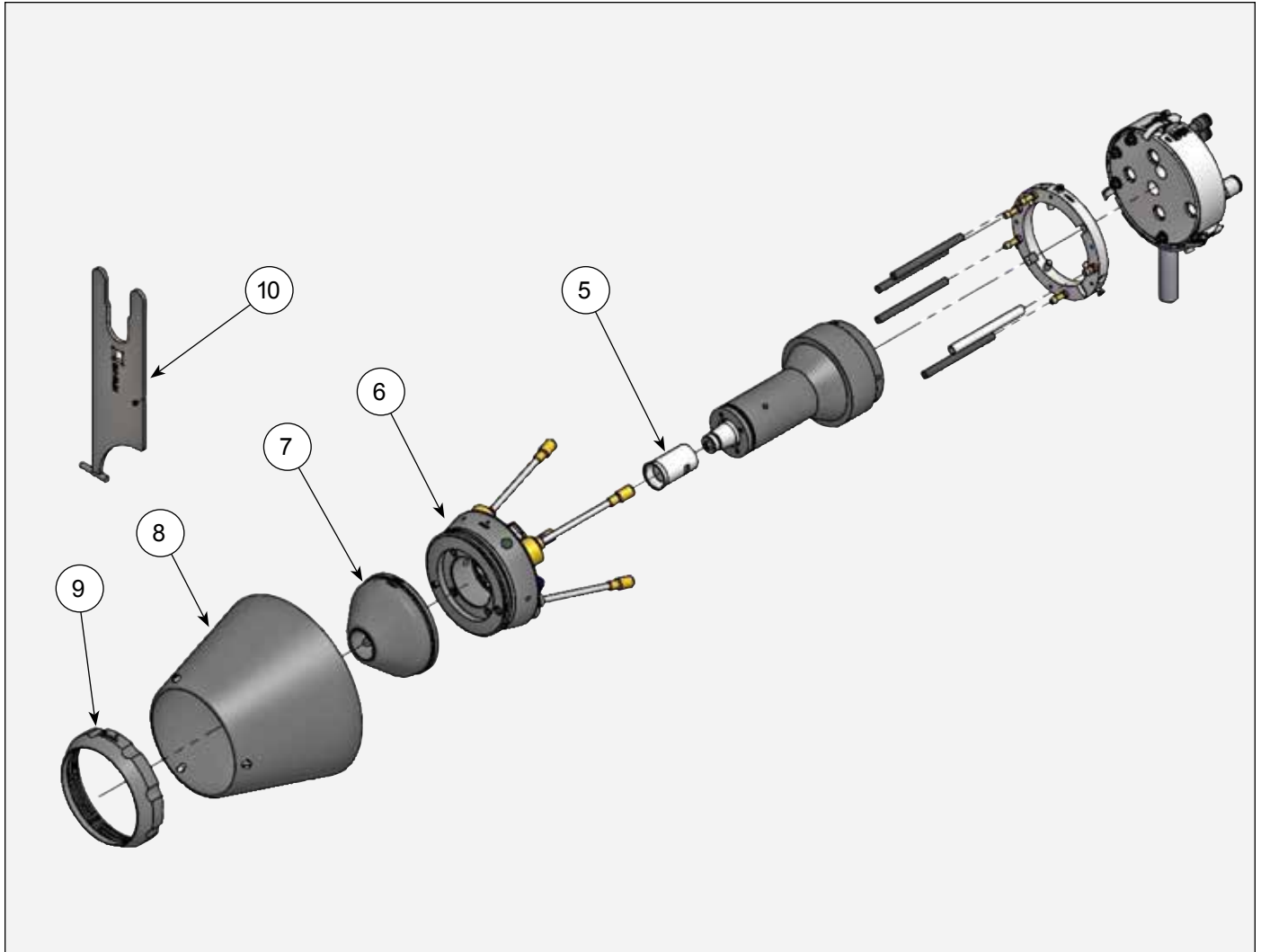
IB-57 - PARTS LIST

Pos.	Qty	Unit	Art.-No.	Description
1	IB-3057-1 UNIT MANIFOLD			
1.1	1	PC	-	Manifold
1.2	1	PC	RPM-403	Holder
1.3	4	PCS	SS-7936-NI	Cap Screw
1.4	4	PCS	IB-3057-11	Nipple
1.5	4	PCS	IB-3057-12	O-Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
1.7*	3	PCS	RPM-20	Draw Latch
1.8*	3	PCS	RPM-34	Spring
1.9*	6	PCS	20089-08c	Screw
1.10	1	PC	Esta-402-4	Straight Connector R3/8" A12mm

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IB-57 - PARTS LIST (Cont.)

Pos.	Qty	Unit	Art.-No.	Description
1.11	1	PC	Esta-402-1	Straight Connector R1/4" A8mm
1.12	1	PC	Esta-402-2	Straight Connector R1/4" A12mm
1.13	1	PC	100406	Gasket
1.14	1	PC	IQSY148	Y Push In Fitting R1/4" A8mm
2	IB-3057-2 UNIT ADAPTER RING			
2.1	1	PC	-	Adapter Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
2.2	1	PC	RPM-7	Hose Nozzle
2.3*	3	PCS	SSF-4240	Screw
2.4*	3	PCS	RPM-21	Keeper Button
2.5*	3	PCS	RPM-14	Spacer
1.3	3	PCS	SS-7936-NI	Cap Screw
3	IB-3057-3 UNIT HOSES			
3.1	0,117	M	9704-11	Shaping Air Hose
3.2	2	M	PUN8x6ANTISTAT	Air Cooler Hose PU 8x6
4	IB-0057-4A/B/C UNIT TURBINE			
4.1	1	PC	RPM-401-1	Air Bearing Turbine
4.2	4	PCS	SSF-3137	Screw, Socket HD CAP, M3x5 PITC



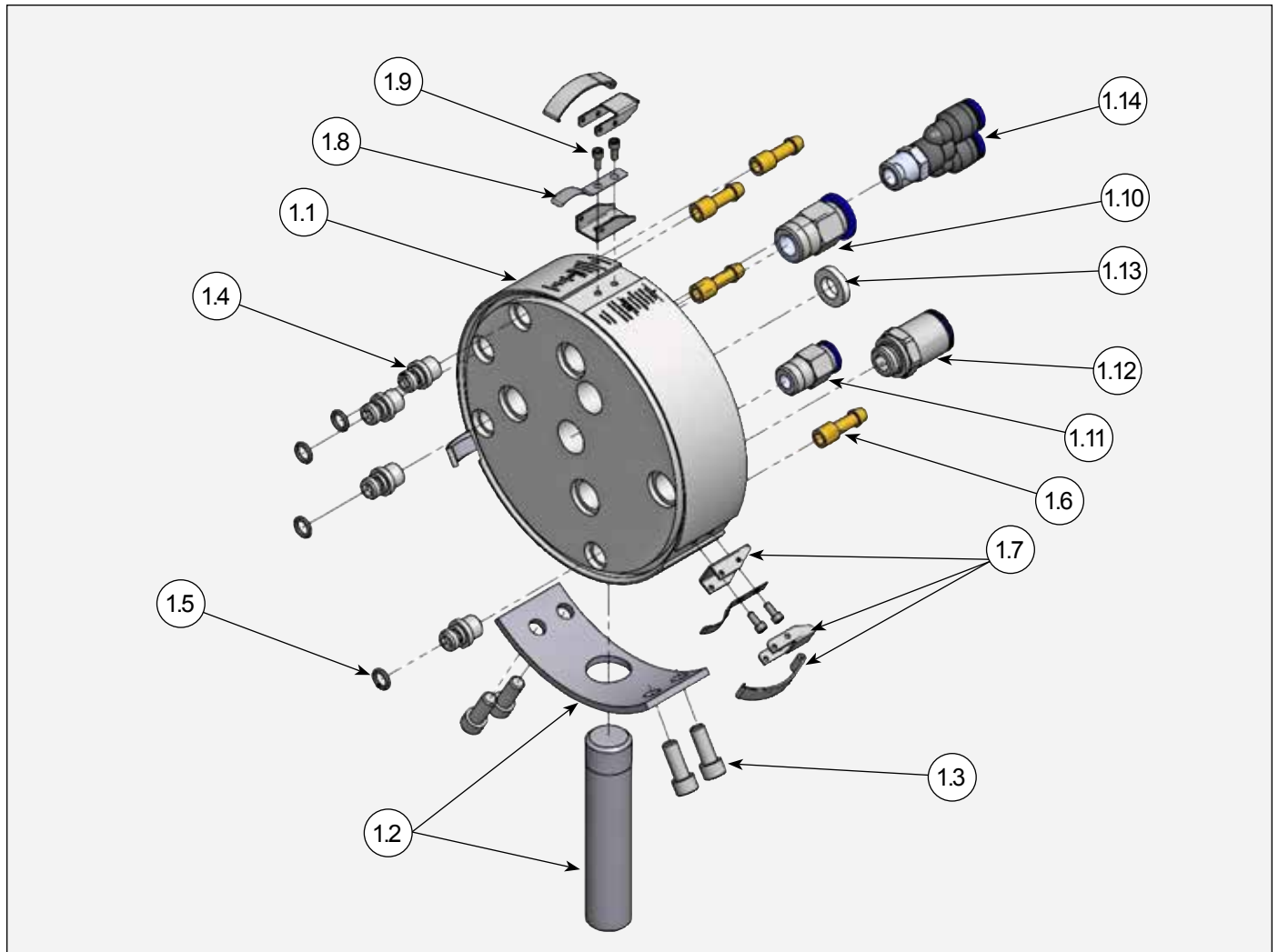
IB-57 - PARTS LIST

Pos.	Qty	Unit	Art.-No.	Description
4.3	1	PC	RPM-76	PTFE Seal
A	1	PC	RPM-439	Fluid Tube Assembly 1/8" ID
4.4 B	1	PC	RPM-440	Fluid Tube Assembly 3/32" ID
C	1	PC	RPM-441	Fluid Tube Assembly 1/16" ID
4.5	1	PC	79001-05	O-Ring
4.6	3	PCS	SSF-3117	Screw
5	IB-0057-5 UNIT BELL			
5.1	1	PC	RPM-104-1	Titanium Bell 57mm Diameter
5.2	1	PC	102065	Splashplate 57mm Bell plastic
5.3	3	PCS	78594-16F	Bell Cup Screw Icebell

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IB-57 - PARTS LIST (Cont.)

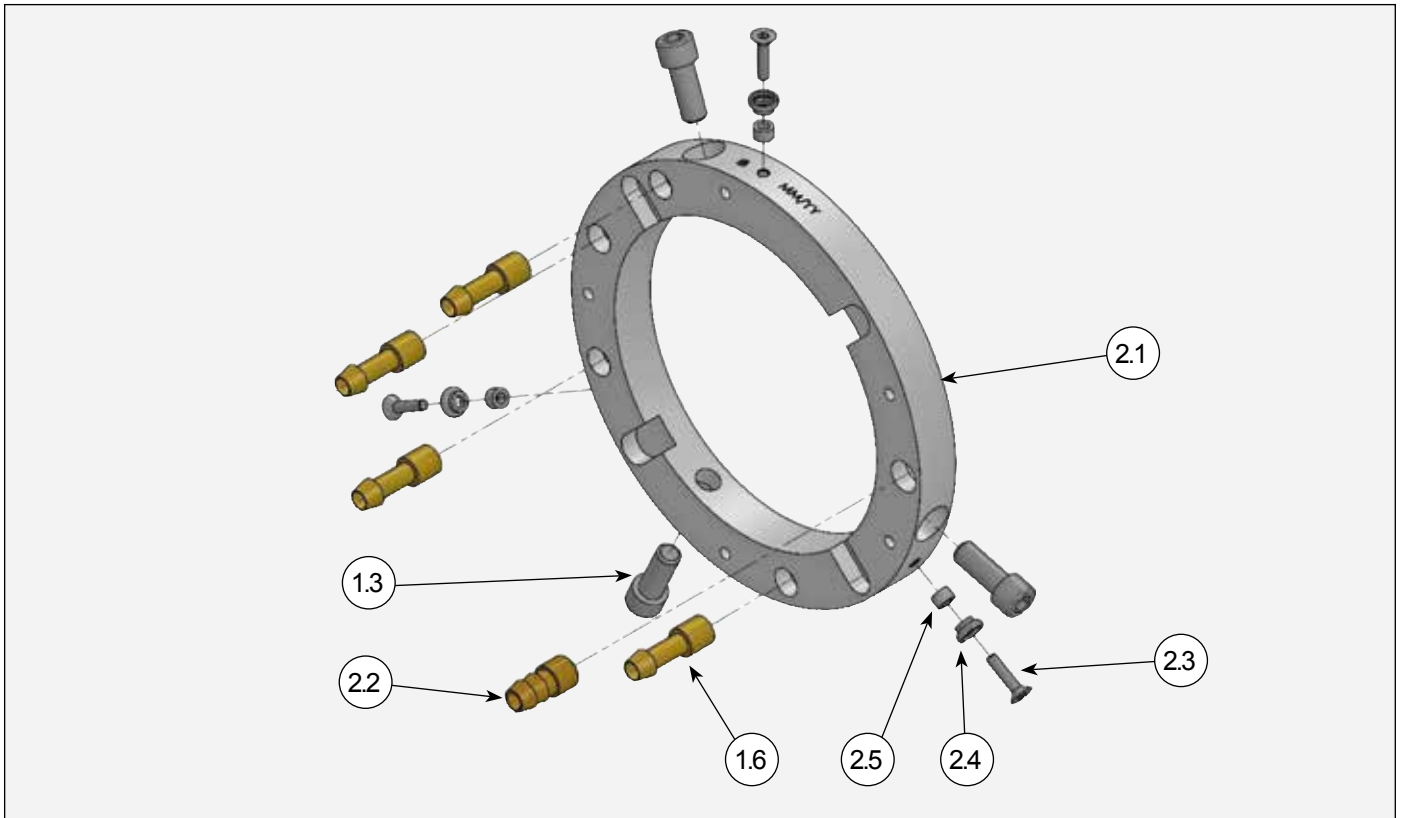
Pos.	Qty	Unit	Art.-No.	Description
6	IB-3057-6 UNIT FRONT END			
6.1	1	PC	IB-3057-60	Front End
6.2	4	PCS	102055	Air Coolers
6.3	4	PCS	AGMD-127	Air Hose Connector 8mm-1/8"
6.4	1	PC	102057	O-Ring
6.5	1	PC	AGMD-121	O-Ring
6.6	1	PC	DIN84M4x10PA	Cylinder Screw PA
1.5	4	PCS	IB-3057-12	O-Ring
6.7	1	PC	AGMD-93 K5	O-Ring
7	IB-0057-7 UNIT SHAPING AIR			
7.1	1	PC	IB-0057-70	Shaping Air Screw
7.2	1	PC	IB-0057-71	Shaping Air Ring
7.3	1	PC	IB-3057-72	O-Ring
6.6	4	PCS	DIN84M4x10PA	Cylinder Screw PA
1.5	1	PC	IB-3057-12	O-Ring
8	IB-3057-8 UNIT HOUSING			
8.1	1	PC	102054	Housing
8.2	3	PCS	DIN84M5x10PA	Screw Plastic
9	1	PC	IB-3057-90	Shaping Nut
10	2	PCS	RPM-419	Wrench Assembly



1 IB-3057-1 UNIT MANIFOLD - PARTS LIST

Pos.	Qty	Unit	Art.-No.	Description
1.1	1	PC	-	Manifold
1.2	1	PC	RPM-403	Holder
1.3	4	PCS	SS-7936-NI	Cap Screw
1.4	4	PCS	IB-3057-11	Nipple
1.5	4	PCS	IB-3057-12	O-Ring
1.6	4	PCS	B-3057-13	Hose Nozzle
1.7*	3	PCS	RPM-20	Draw Latch
1.8*	3	PCS	RPM-34	Spring
1.9*	6	PCS	20089-08c	Screw
1.10	1	PC	Esta-402-4	Straight Connector R3/8" A12mm
1.11	1	PC	Esta-402-1	Straight Connector R1/4" A8mm
1.12	1	PC	Esta-402-2	Straight Connector R1/4" A12mm
1.13	1	PC	100406	Gasket
1.14	1	PC	QSY148	Y Push In Fitting R1/4" A8mm

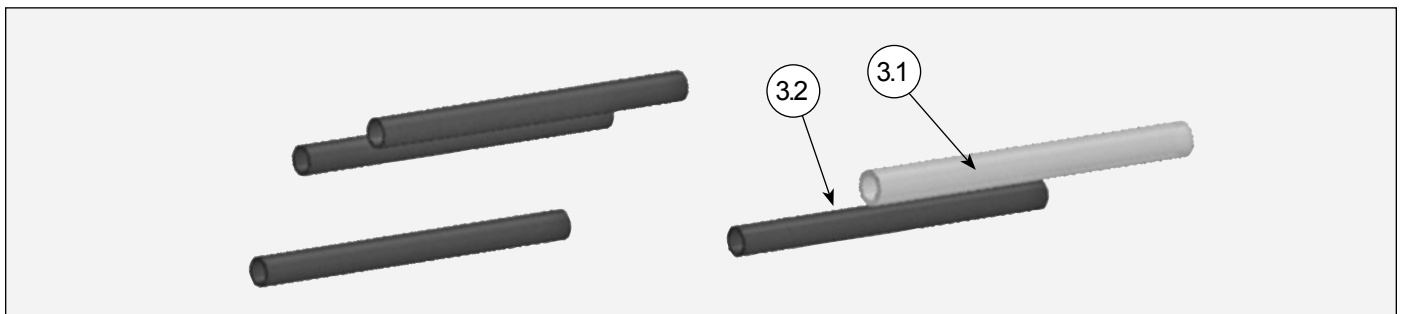
* included in KK-4458



2 IB-3057-2 UNIT ADAPTER RING

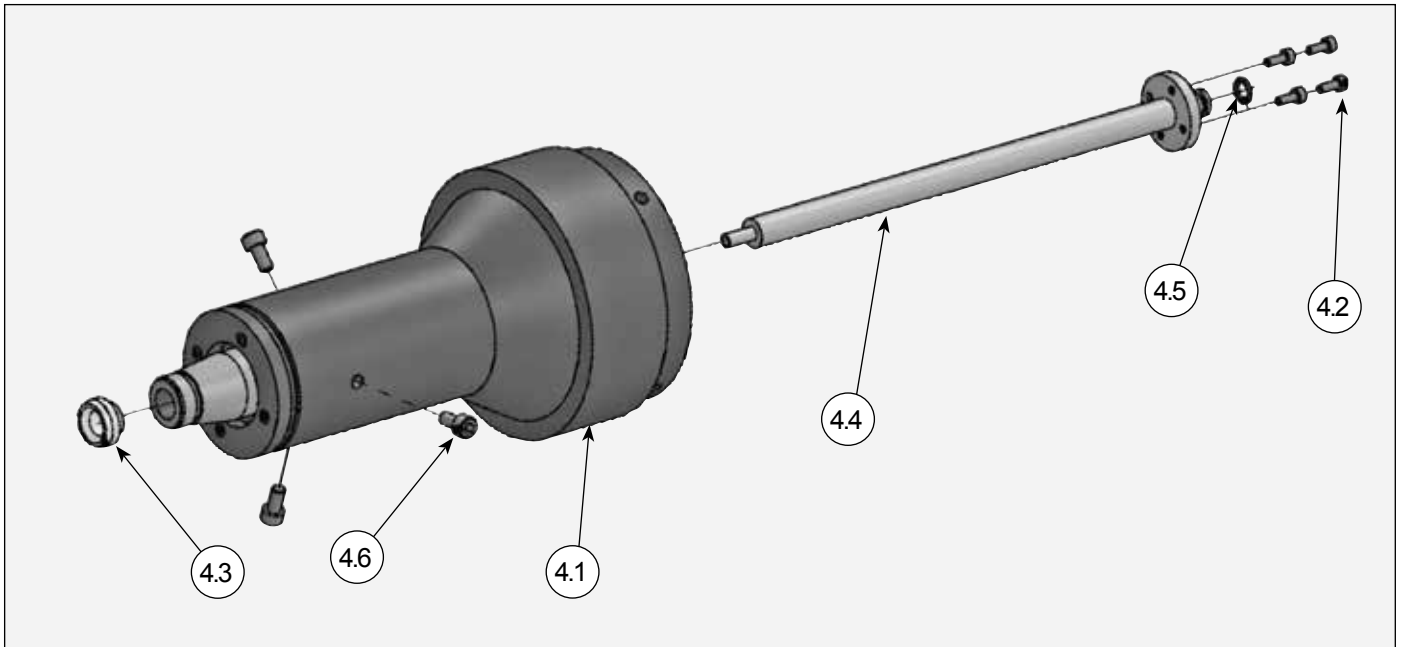
Pos.	Qty	Unit	Art.-No.	Description
2.1	1	PC	-	Adapter Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
2.2	1	PC	RPM-7	Hose Nozzle
2.3*	3	PCS	SSF-4240	Screw
2.4*	3	PCS	RPM-21	Keeper Button
2.5*	3	PCS	RPM-14	Spacer
1.3	3	PCS	SS-7936-NI	Cap Screw

* included in KK-4458



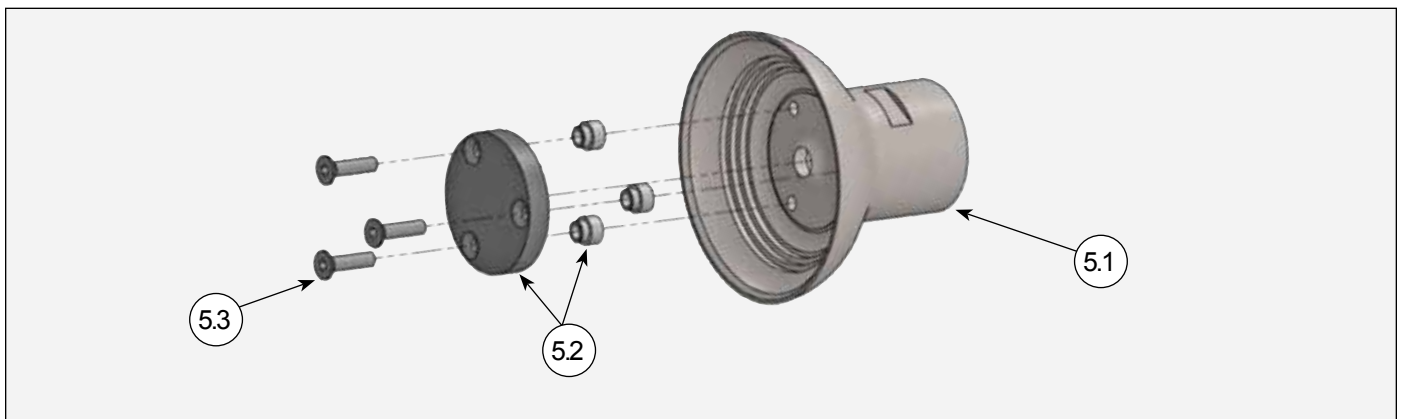
3 IB-3057-3 UNIT HOSES

Pos.	Qty	Unit	Art.-No.	Description
3.1	0,117	M	9704-11	Shaping Air Hose
3.2	2	M	PUN 8x6 ANTISTAT	Air Cooler Hose PU 8x6



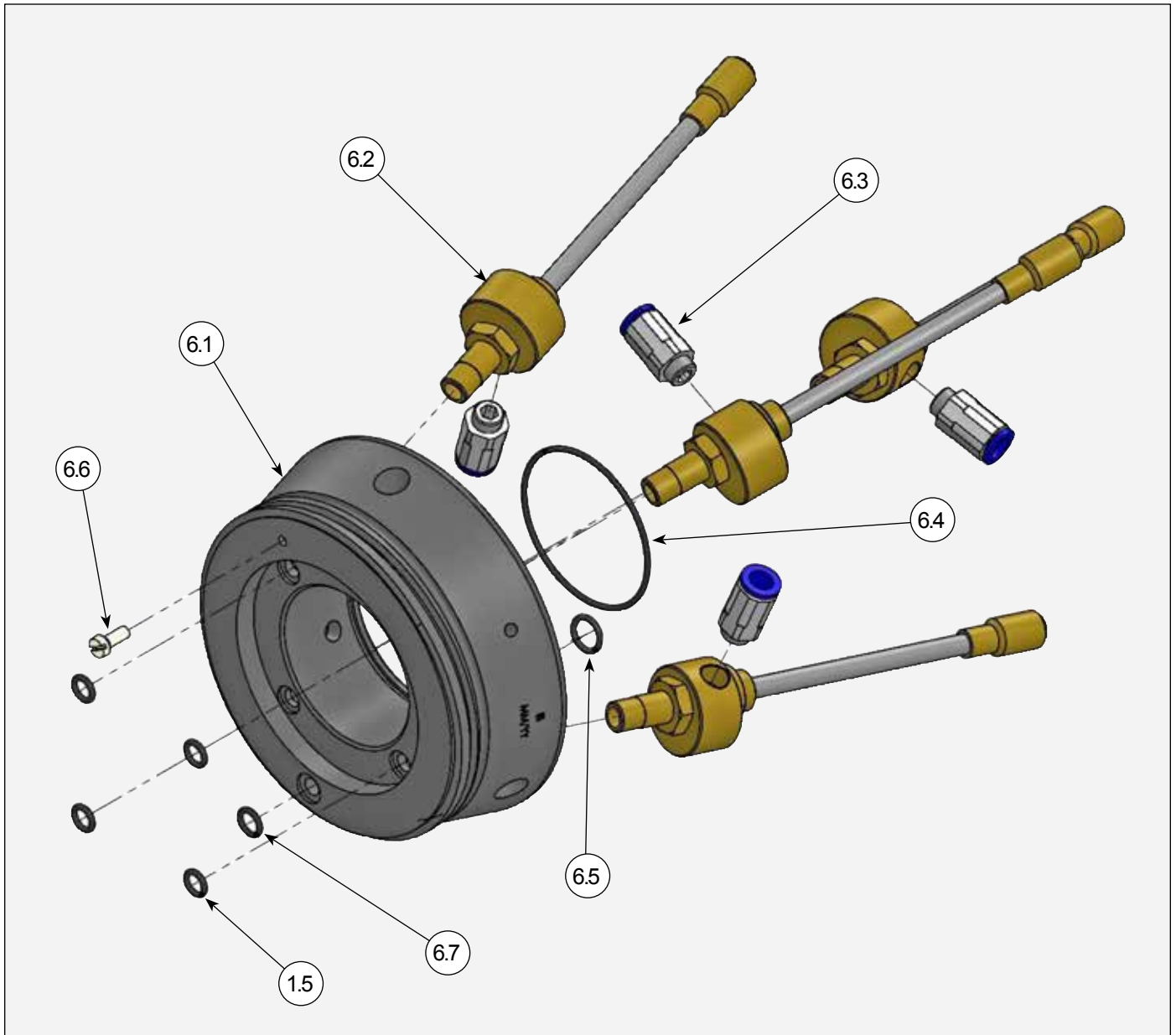
4 IB-0057-4A/B/C UNIT TURBINE

Pos.	Qty	Unit	Art.-No.	Description
4.1	1	PC	RPM-401-1	Air Bearing Turbine
4.2	4	PCS	SSF-3137	Screw, Socket HD CAP, M3x5 PITC
4.3	1	PC	RPM-76	PTFE Seal
4.4 A	1	PC	RPM-439	Fluid Tube Assembly 1/8" ID
4.4 B	1	PC	RPM-440	Fluid Tube Assembly 3/32" ID
4.4 C	1	PC	RPM-441	Fluid Tube Assembly 1/16" ID
4.5	1	PC	79001-05	O-Ring
4.6	3	PCS	SSF-3117	Screw



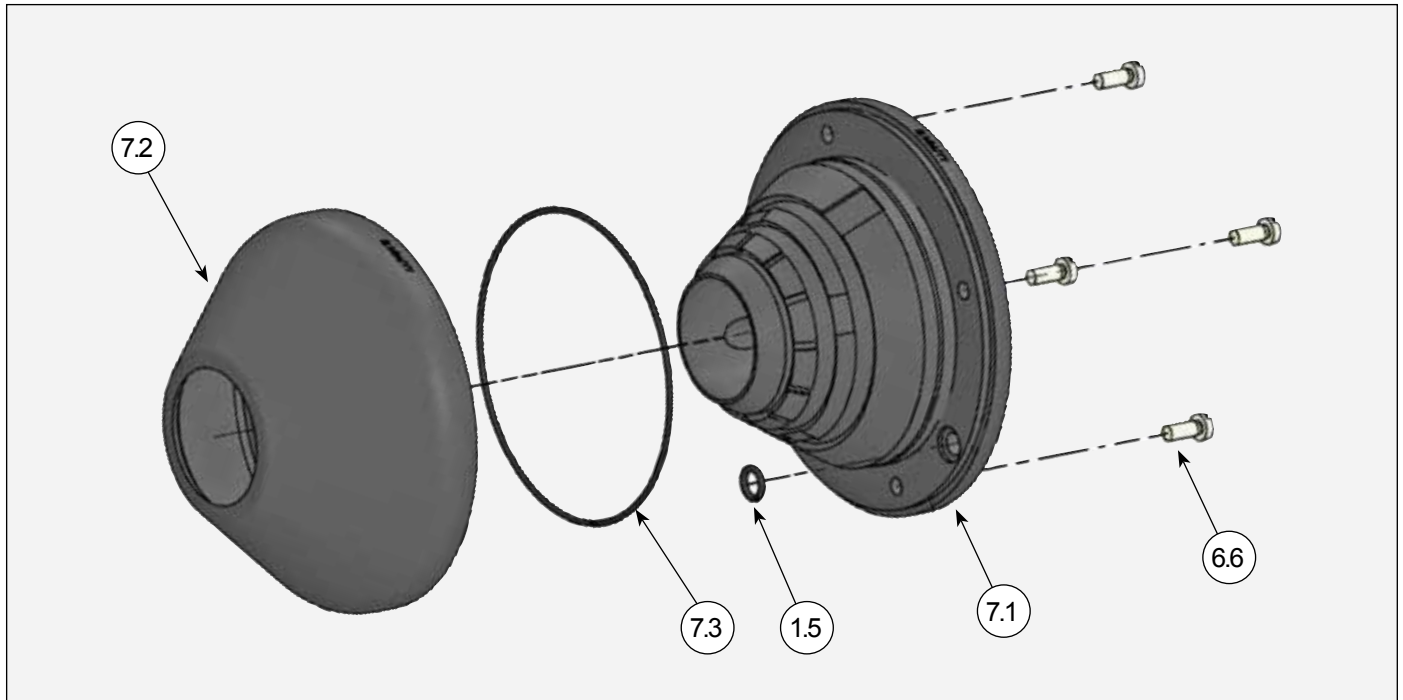
5 IB-0057-5 UNIT BELL

Pos.	Qty	Unit	Art.-No.	Description
5.1	1	PC	RPM-104-1	Titanium Bell 57mm Diameter
5.2	1	PC	102065	Splashplate 57mm Bell plastic
5.3	3	PCS	78594-16F	Bell Cup Screw Icebell



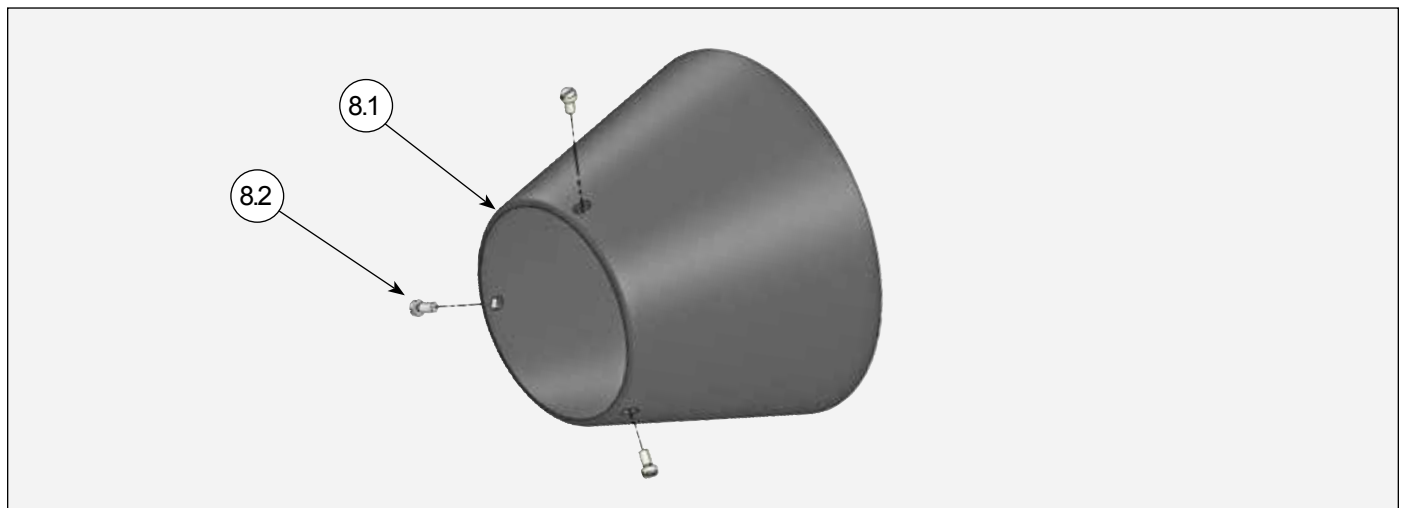
6 IB-3057-6 UNIT FRONT END

Pos.	Qty	Unit	Art.-No.	Description
6.1	1	PC	IB-3057-60	Front End
6.2	4	PCS	102055	Air Coolers
6.3	4	PCS	AGMD-127	Air Hose Connector 8mm-1/8"
6.4	1	PC	102057	O-Ring
6.5	1	PC	AGMD-121	O-Ring
6.6	1	PC	DIN84M4x10PA	Cylinder Screw PA
1.5	4	PCS	IB-3057-12	O-Ring
6.7	1	PC	AGMD-93 K5	O-Ring



7 IB-3057-7 UNIT SHAPING AIR

Pos.	Qty	Unit	Art.-No.	Description
7.1	1	PC	IB-3000-70	Shaping Air Screw
7.2	1	PC	IB-3000-71	Shaping Air Ring
7.3	1	PC	IB-3057-72	O-Ring
6.6	4	PCS	DIN84M4x10PA	Cylinder Screw PA
1.5	1	PC	IB-3057-12	O-Ring



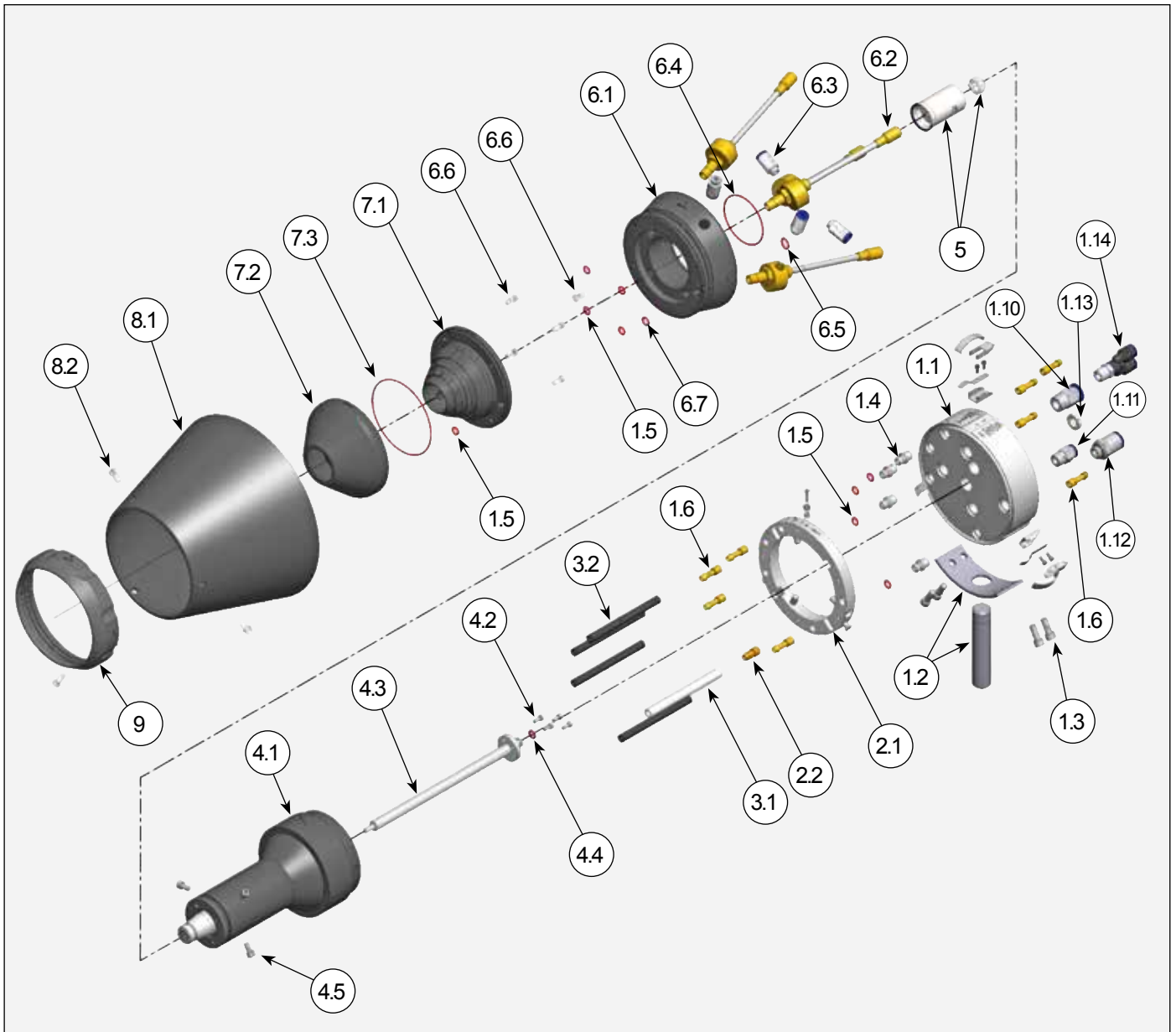
8 IB-3057-8 UNIT HOUSING

Pos.	Qty	Unit	Art.-No.	Description
8.1	1	PC	102054	Housing
8.2	3	PCS	DIN84M5x10PA	Screw Plastic



9 IB-3057-90 SHAPING NUT

Item	Description
9	IB-3057-90 SHAPING NUT



IB-30 SPARE PARTS LIST

Pos.	Art.-No.	SP	WP
1	IB-3057-1		
1.2	RPM-403	X	
1.3	SS-7936-NI	X	
1.4	IB-3057-11	X	
1.5	IB-3057-12		X
1.6	IB-3057-13	X	
1.7*	RPM-20		X
1.8*	RPM-34		X
1.9*	20089-08c		X
1.10	Esta-402-4	X	

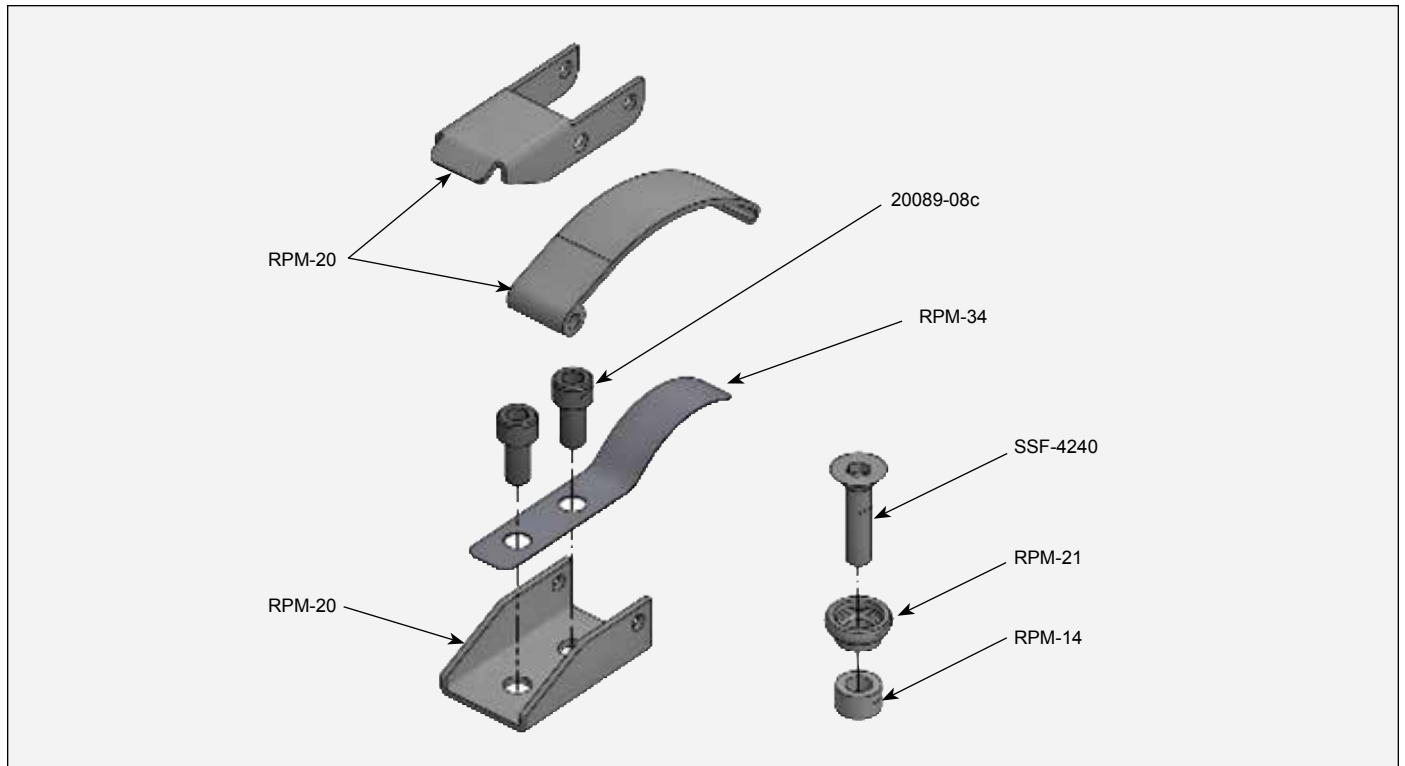
* included in KK-4458 **SP** - Spare Parts **WP** - Wear Parts

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IB-30 SPARE PARTS LIST (Cont.)

Pos.	Art.-No.	SP	WP
1.11	Esta-402-1	X	
1.12	Esta-402-2	X	
1.13	100406		X
1.14	IQSY148	X	
2	IB-3057-2		
1.6	IB-3057-13	X	
2.2	RPM-7	X	
2.3*	SSF-4240		X
2.4*	RPM-21		X
2.5*	RPM-14		X
1.3	SS-7936-NI	X	
3	IB-3057-3		
3.1	9704-11		X
3.2	PUN8x6ANTISTAT		X
4	IB-3000-4A/B/C		
4.1	RPM-401-1	X	
4.2	SSF-3137	X	
4.3	RPM-439	X	
	RPM-440	X	
	RPM-441	X	
4.4	79001-05		X
4.5	SSF-3117	X	
5	RPM-452-1	X	
	RPM-452-6	X	
6	IB-3057-6		
6.1	IB-3057-60 X		
6.2	102055	X	
6.3	AGMD-127	X	
6.4	102057		X
6.5	AGMD-121		X
6.6	DIN84M4x10PA		X
1.5	IB-3057-12		X
6.7	AGMD-93 K5		X
7	IB-3000-7		
7.1	IB-3000-70	X	
7.2	IB-3000-71	X	
7.3	IB-3057-72		X
6.6	DIN84M4x10PA		X
1.5	IB-3057-12		X
8	IB-3057-8		
8.1	102054	X	
8.2	DIN84M5x10PA		X
9	IB-3057-90	X	
10	RPM-419	X	

* included in KK-4458 **SP** - Spare Parts **WP** - Wear Parts



REPAIR KITS

Part #	Description
KK-4458	Draw latch repair kit
IB-3057-100	Seal repair kit (redstained parts)

CONVERSION KIT IB-57-CK

With the conversion kit IB-57-CK, Carlisle Fluid Technologies offers the possibility to changeover the ICE Bell used by the customer to the latest version. This conversion kit is compatible with the following previous ICE Bell variants: RPM-6093-PSP and RPM-6193-PSP.

NOTE

► The individual exchange of components of older versions with components of the conversion kit that seem to be the same is not allowed. It is only allowed to exchange components with the same article number. Components of the latest version have an IB sign. In case of improper use, warranty claim and liability are reduced or entirely eliminated.

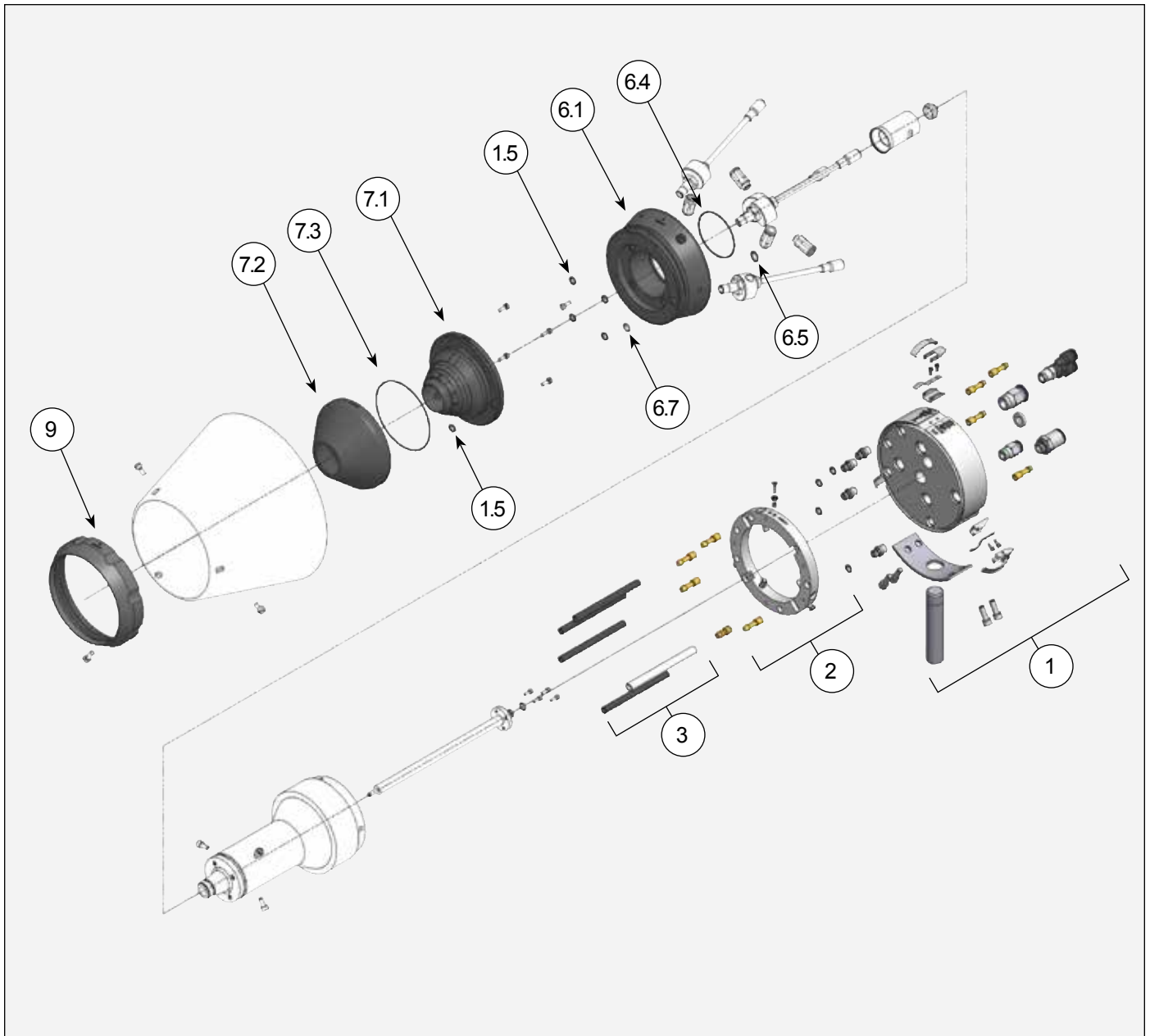


Figure: Conversion kit with repair kit KK-4458

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IB-57-CK - PARTS LIST

Pos.	Qty	Unit	Art.-No.	Description
1	IB-3057-1 UNIT MANIFOLD			
1.1	1	PC	-	Manifold
1.2	1	PC	RPM-403	Holder
1.3	4	PCS	SS-7936-NI	Cap Screw
1.4	4	PCS	IB-3057-11	Nipple
1.5	4	PCS	IB-3057-12	O-Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
1.7*	3	PCS	RPM-20	Draw Latch
1.8*	3	PCS	RPM-34	Spring
1.9*	6	PCS	20089-08c	Screw
1.10	1	PC	Esta-402-4	Straight Connector R3/8" A12mm
1.11	1	PC	Esta-402-1	Straight Connector R1/4" A8mm
1.12	1	PC	Esta-402-2	Straight Connector R1/4" A12mm
1.13	1	PC	100406	Gasket
1.14	1	PC	IQSY148	Y Push In Fitting R1/4" A8mm
2	IB-3057-2 UNIT ADAPTER RING			
2.1	1	PC	-	Adapter Ring
1.6	4	PCS	IB-3057-13	Hose Nozzle
2.2	1	PC	RPM-7	Hose Nozzle
2.3*	3	PCS	SSF-4240	Screw
2.4*	3	PCS	RPM-21	Keeper Button
2.5*	3	PCS	RPM-14	Spacer
1.3	3	PCS	SS-7936-NI	Cap Screw
3	IB-3057-3 UNIT HOSES			
3.1	0,117	M	9704-11	Shaping Air Hose
3.2	2	M	PUN8x6ANTISTAT	Air Cooler Hose PU 8x6
4	IB-0057-4A/B/C UNIT TURBINE			
4.1	1	PC	RPM-401-1	Air Bearing Turbine
4.2	4	PCS	SSF-3137	Screw, Socket HD CAP, M3x5 PITC
4.3	1	PC	RPM-76	PTFE Seal
A	1	PC	RPM-439	Fluid Tube Assembly 1/8" ID
4.4 B	1	PC	RPM-440	Fluid Tube Assembly 3/32" ID
C	1	PC	RPM-441	Fluid Tube Assembly 1/16" ID
4.5	1	PC	79001-05	O-Ring
4.6	3	PCS	SSF-3117	Screw
5	IB-0057-5 UNIT BELL			
5.1	1	PC	RPM-104-1	Titanium Bell 57mm Diameter
5.2	1	PC	102065	Splashplate 57mm Bell plastic
5.3	3	PCS	78594-16F	Bell Cup Screw Icebell

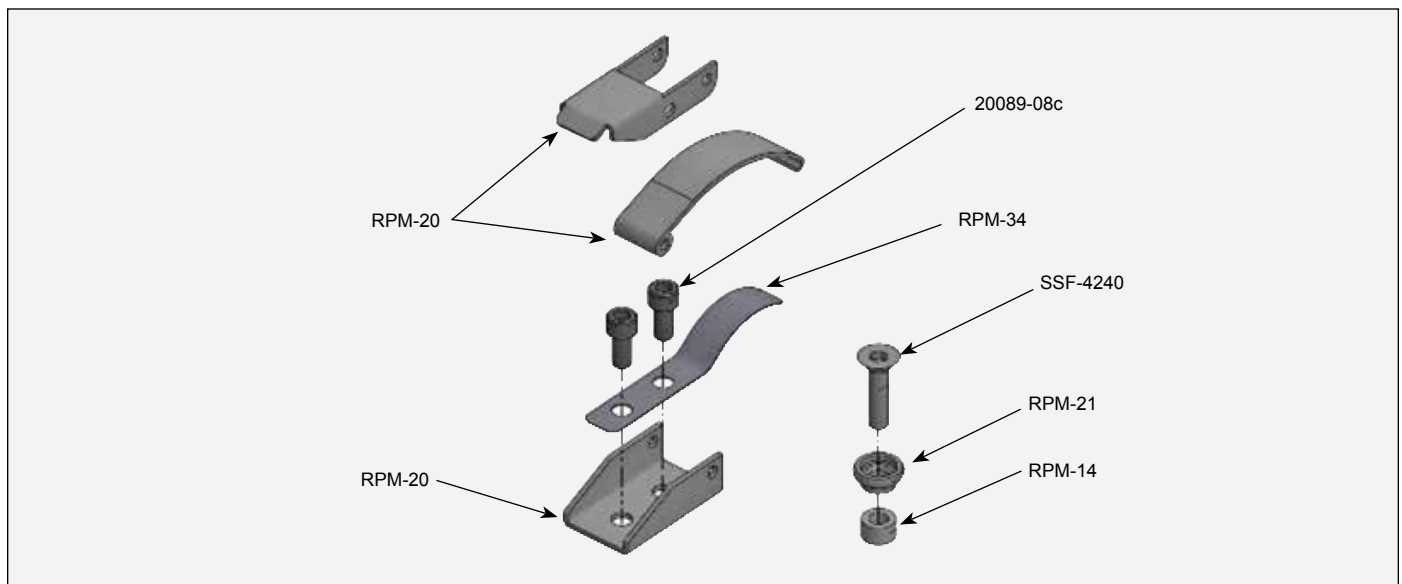
* only available in KK-4458, not available as individual part

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IB-57-CK - PARTS LIST (Cont.)

Pos.	Qty	Unit	Art.-No.	Description
6	IB-3057-6 UNIT FRONT END			
6.1	1	PC	IB-3057-60	Front End
6.2	4	PCS	102055	Air Coolers
6.3	4	PCS	AGMD-127	Air Hose Connector 8mm-1/8"
6.4	1	PC	102057	O-Ring
6.5	1	PC	AGMD-121	O-Ring
6.6	1	PC	DIN84M4x10PA	Cylinder Screw PA
1.5	4	PCS	IB-3057-12	O-Ring
6.7	1	PC	AGMD-93 K5	O-Ring
7	IB-0057-7 UNIT SHAPING AIR			
7.1	1	PC	IB-0057-70	Shaping Air Screw
7.2	1	PC	IB-0057-71	Shaping Air Ring
7.3	1	PC	IB-3057-72	O-Ring
6.6	4	PCS	DIN84M4x10PA	Z Cylinder Screw PA yinderschraube PA
1.5	1	PC	IB-3057-12	O-Ring
8	IB3057-8 UNIT HOUSING			
8.1	1	PC	102054	Housing
8.2	3	PCS	DIN84M5x10PA	Screw Plastic
9	1	PC	IB-3057-90	Shaping Nut
10	2	PCS	RPM-419	Wrench Assembly

* only available in KK-4458, not available as individual part



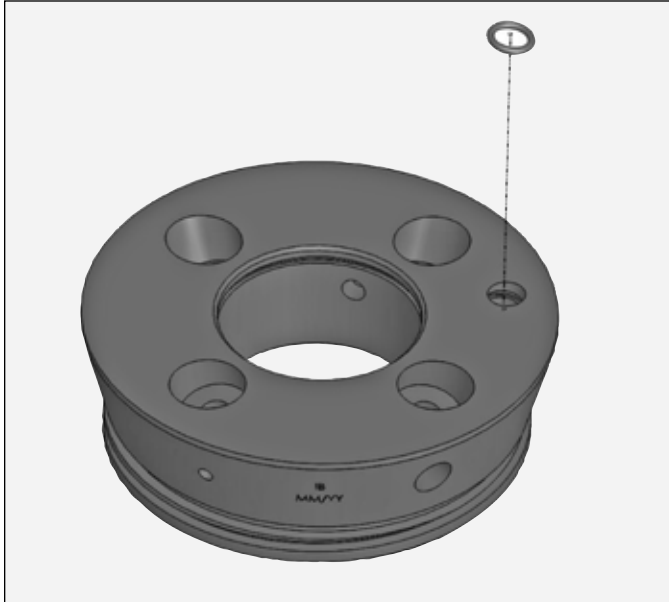
REPAIR KITS

Part #	Description
KK-4458	Draw latch repair kit
IB-3057-100	Seal repair kit (redstained parts)

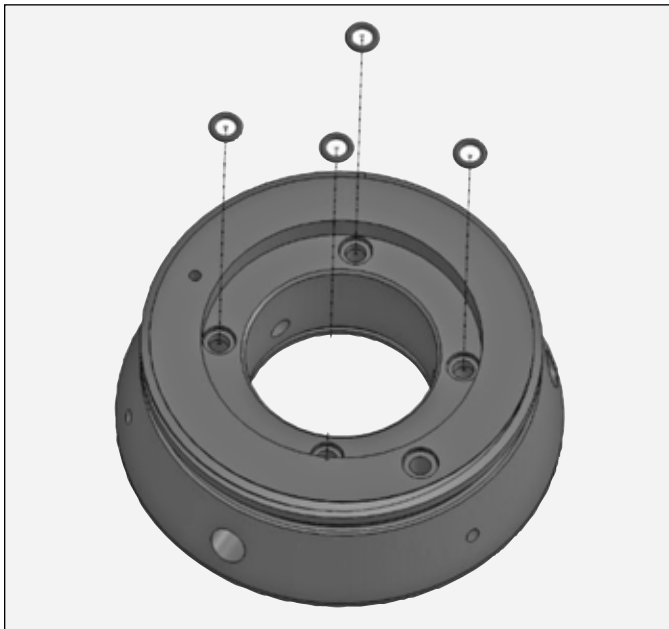
MOUNTING INSTRUCTIONS

IB-3057-60

1. Insert the lubricated O-Ring AGMD-121 (Pos. 6.5) in the Front End IB-3057-60 (Pos. 6.1). Lubricant used: Petrolatum Jell (A11545-00)



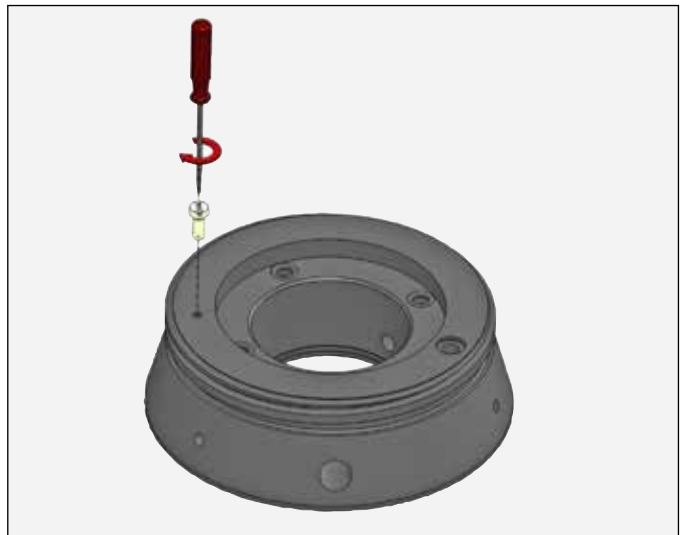
2. Position the 4 lubricated O-Rings IB-3057-12 (Pos. 1.5) in the rear grooves of the Front End.



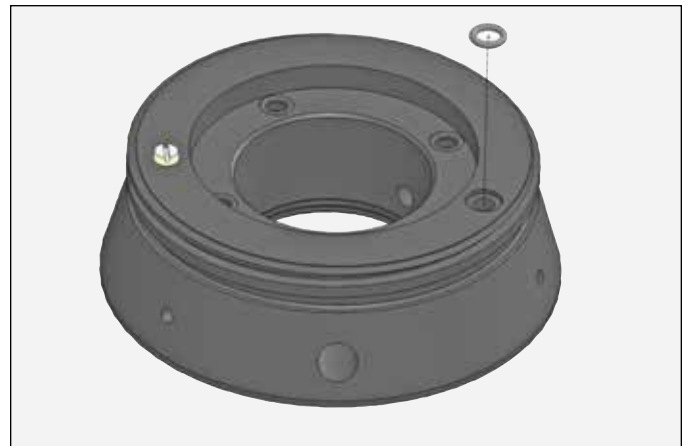
3. Lubricate the O-Ring 102057 (Pos. 6.4) and place it in the according groove of IB-3057-60.



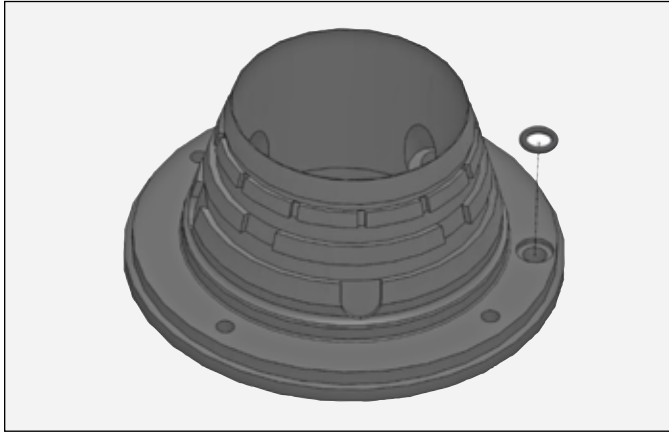
4. Screw DIN84 M4x10PA Screw (Pos. 6.6) with a torque of 0.15 Nm in IB-3057-60. This is for positioning the Shaping Air Screw IB-0057-70 or IB-3000-70 (Pos. 7.1).



5. Lubricate the O-Ring AGMD-93 K5 (Pos. 6.7) and place it in the Front End.



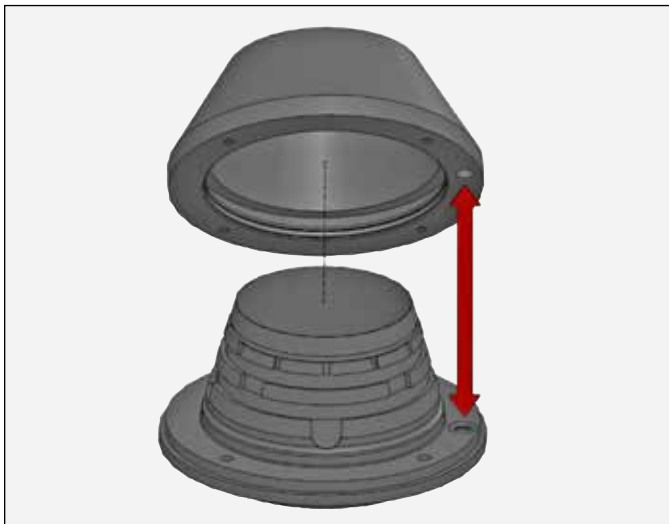
6. Position the lubricated O-Ring IB-3057-12 (Pos. 1.5) in the Shaping Air Screw IB-0057-70 or IB-3000-70 (Pos. 7.1).



7. Lubricate O-Ring IB-3057-72 (Pos. 7.3) and insert in the Groove of the Shaping Air Ring IB-0057-71 or IB-3000-71 (Pos. 7.2).



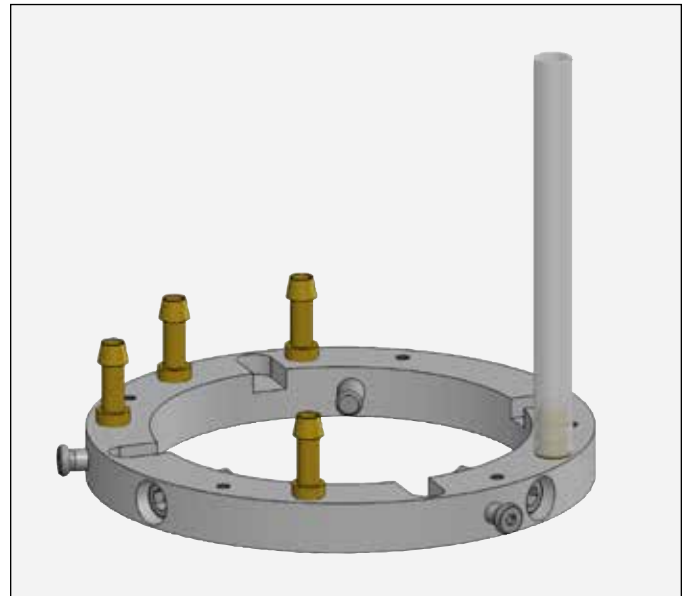
8. Position Shaping Air Screw and Shaping Air Ring in a way that the holes for the shaping air are arranged concentrically to each other.



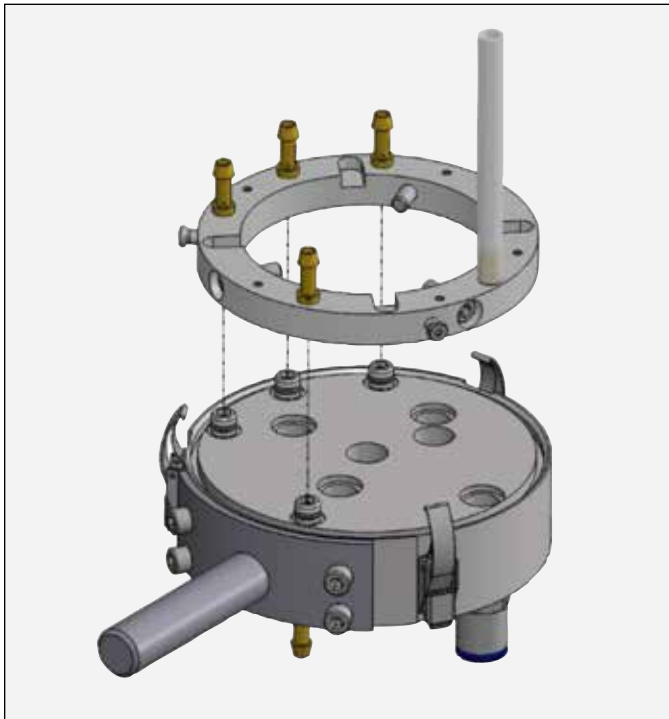
9. Then screw Shaping Air Ring and Shaping Air Screw together with a DIN84 M4x10PA (4 pieces). (Torque: 0.15 Nm)



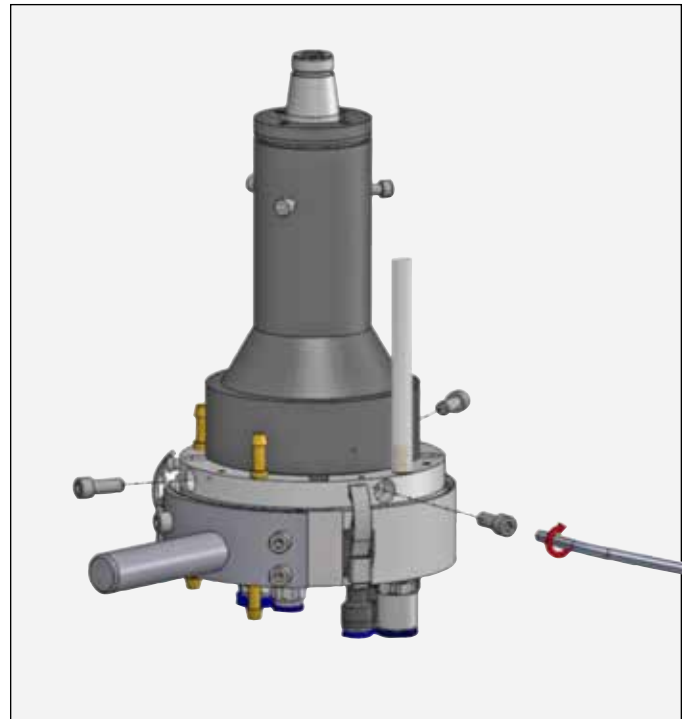
10. Push the hose 9704-11 (Pos. 3.1) onto the Unit Adapter Ring IB-3057-2 (Pos. 2) (if necessary, heat the hose with a dryer; previously shorten to 117 mm).



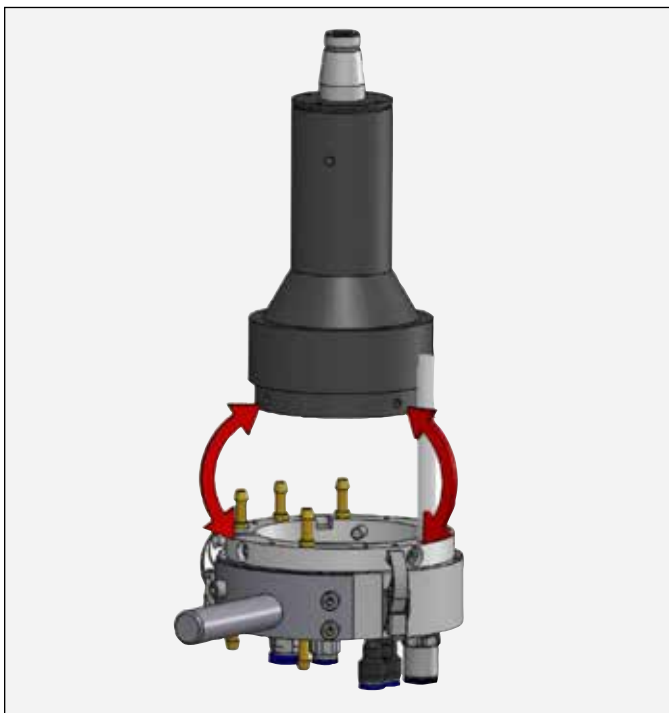
11. Plug the Unit Adapter Ring (Pos. 2) with the hose 9704-11 onto the Unit Manifold IB-3057-1 (Pos. 1). Securely tension the Adapter Ring with the draw latch.



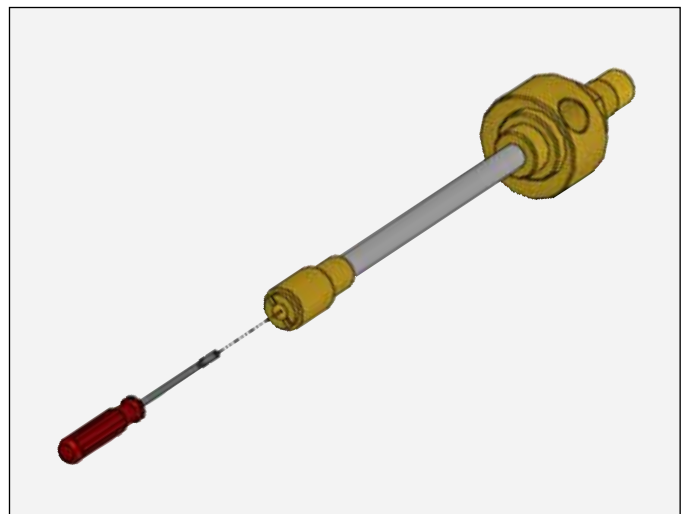
13. Tighten the Adapter Ring and the turbine with the three Cap Screws SS-7936-NI (Pos. 1.3) via allen key 3/16" with a torque of 5.0 Nm.



12. Plug the Turbine IB-0057-4 or IB-3000-4 (Pos. 4) onto the Manifold so that the respective outer holes are concentrically to each other.



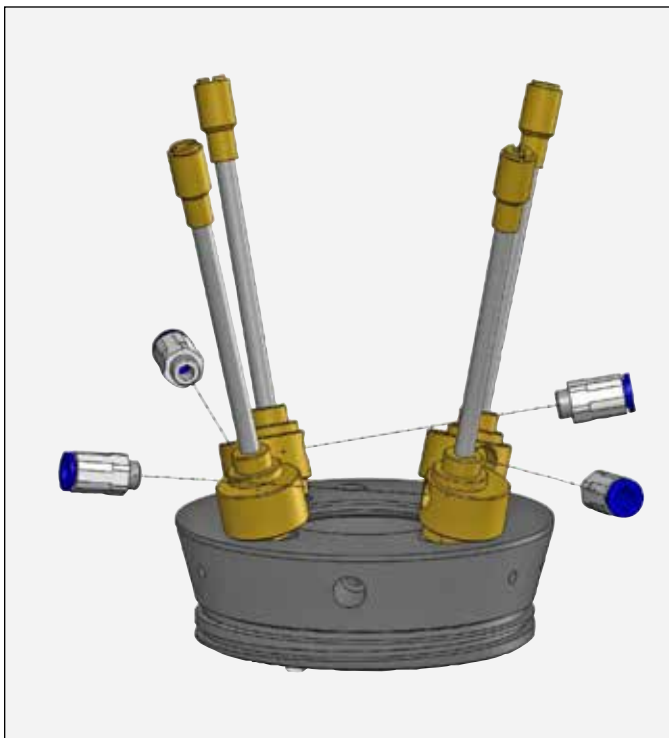
14. To adjust the Air Coolers 102055 (Pos. 6.2), first screw the adjusting screw completely in, then unscrew it again with a 3/4 turn.



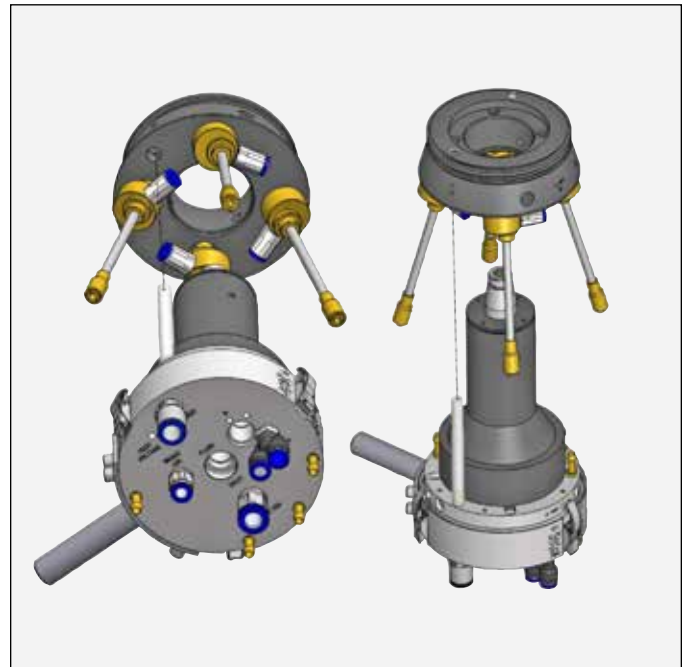
15. Screw the 4 Air Coolers into the Front End IB-3057-60. Tubes are pointing outwards.



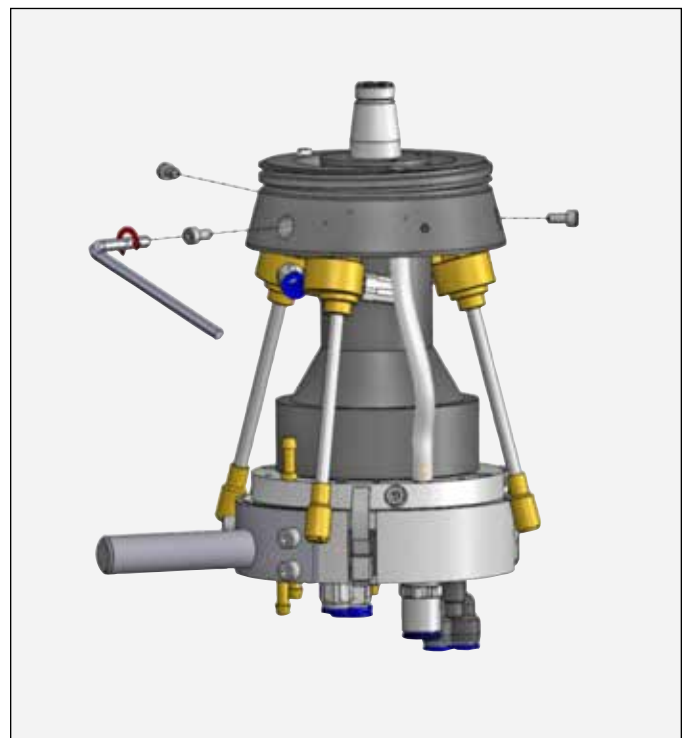
16. Mount a straight Air Hose Connector AGMD-127 (Pos. 6.3) to each cooler and arrange the hose connections clockwise.



17. Unscrew the 3 Screws SSF-3117 (Pos. 4.6) of the turbine. Plug the Front End and the Air Coolers IB-3057-6 (Pos. 6) onto the turbine and adjust them so that the hose is placed under the shaping air hole.



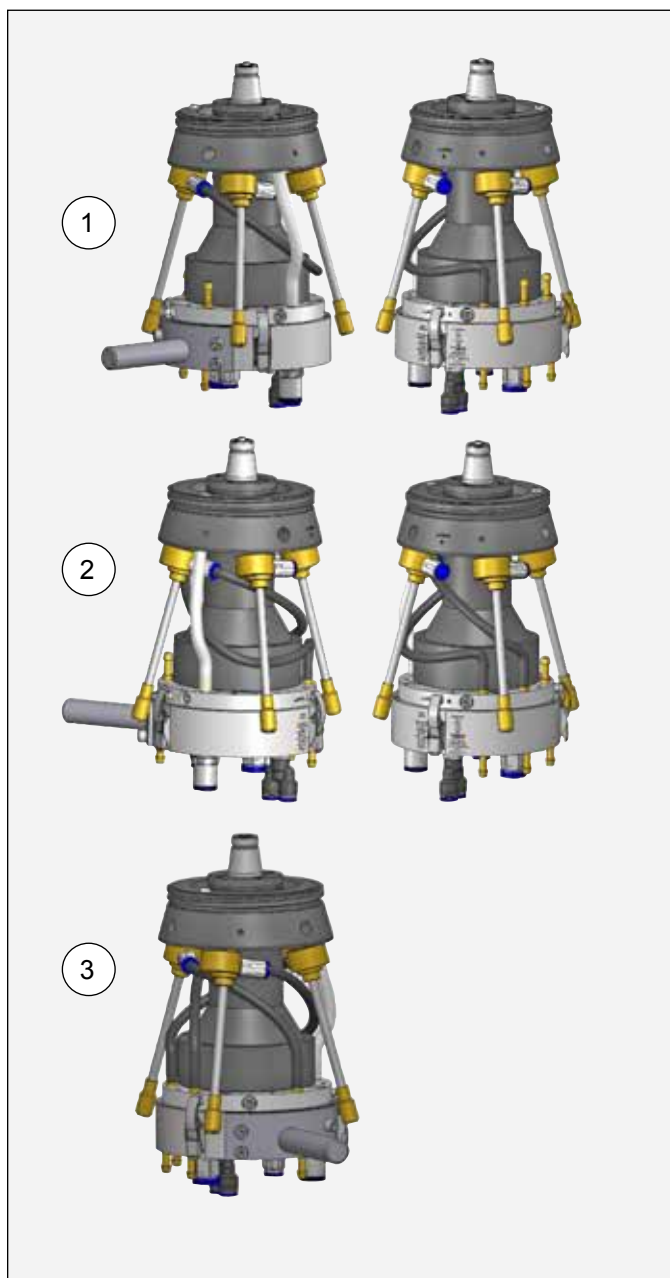
18. Tighten the Front End and the turbine with 3 Screws SSF-3117 via allen key 5/32" and a torque of 1.0 Nm.



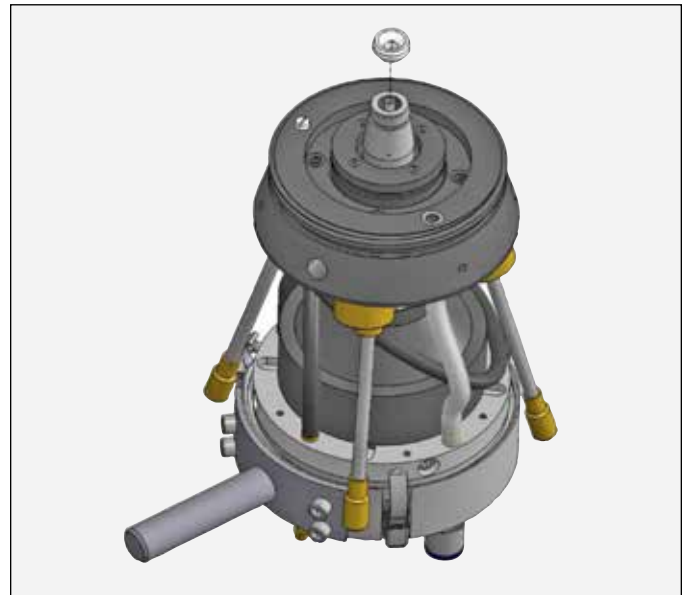
19. Clamp the bell at the holder of the Manifold. Heat up the 4 Air Hoses PUN8x6ANTISTAT (Pos. 3.2) and push them onto the Hose Nozzles IB-3057-13 (Pos. 1.6). Shorten the lengths to size and connect them to the cooler Connections AGMD-127.

To avoid that the hoses bend, carry out mounting according to the following order:

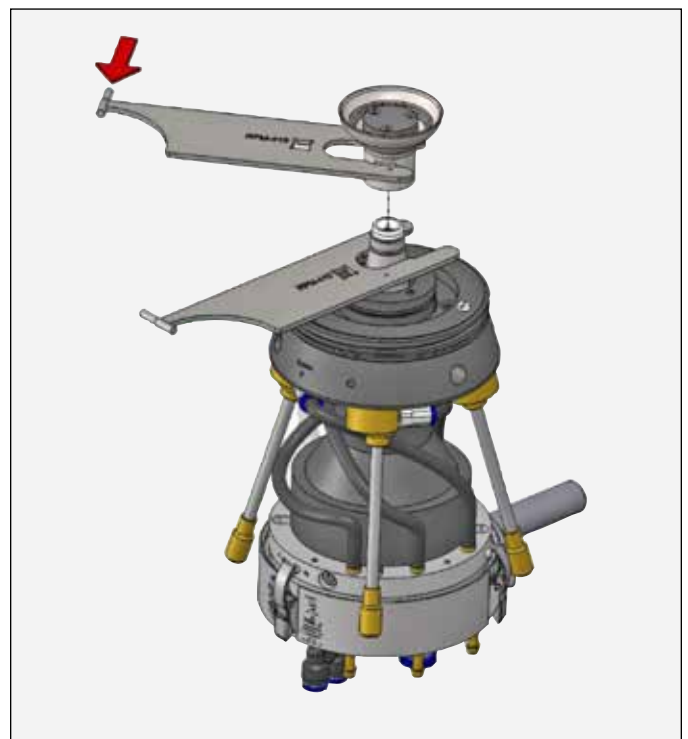
1. Start with the cooler connection to the left of the shaping air hose
2. Continue mounting counter-clockwise and position the second hose
3. Keep the direction and mount hose 3 and 4.



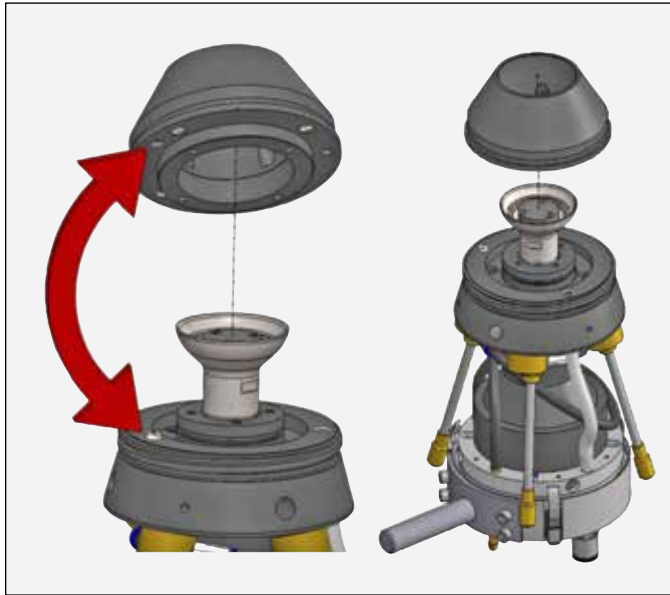
20. Plug the PTFE Seal RPM-76 (Pos. 4.3) onto the turbine. RPM-76 at IB-30 in RPM-452-1 or RPM-452-6 included.



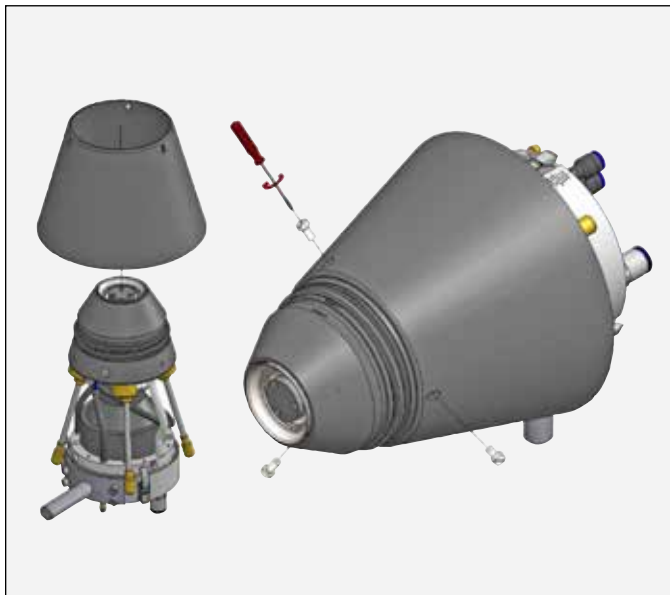
21. Tighten the Bell Cup IB-0057-5 or RPM-452-1 or RPM-452-6 (Pos. 5) with the Wrench Assembly RPM-419 (Pos. 10) by hand.



22. Put the already mounted assembly Shaping Air Screw/Shaping Air Ring onto the Front End IB-3057-60 by means of positioning (screw head).



23. Push the Housing 102054 (Pos. 8.1) onto the bell and fix it with the 3 Screws DIN 84M5x10PA (Pos. 8.2). (Torque 0.15 Nm)



24. Put the Shaping Nut IB-3057-90 (Pos. 9) onto the bell and tighten it by hand.



Mounting instructions valid for IB-57 and IB-30. Illustrations for the mounting steps with IB-57.



CHECK OF STATIONARY EQUIPMENTS

The checks are to be carried out for each single spray system. The checks are to be carried out by qualified persons and include the checking in accordance with this table and intern instructions.

OVERVIEW TABLE OF CHECKS

Type of Check	Requirements	Revision & Check Intervals
<i>Check the stationary equipment for electro-static coating with flammable liquid coating materials for its safe working condition.</i>	Especially the shut-off threshold, the overcurrent I _ü and the minimum voltage r _{pm} are to be determined and documented in consideration of the operational and local circumstances.	Annually
<i>Efficiency of technical ventilation (exhaust systems)</i>	The ventilation must be locked with the high voltage power supply in a suitable way. The efficiency of the technical ventilation must be proven by appropriate check.	Continuous
<i>Check the safe disconnection of high voltage with voltage-controlled and voltage-constant operation.</i>	Determine and document the shut-off threshold I _ü in consideration of the operational and local circumstances. Check whether the high voltage switches off in case of an impermissible increase of the operating power I _b and when reaching the shut-off threshold I _ü . Here, the shut-off threshold I _ü which was determined during first examination is to be checked. A shut-off threshold I _ü which can cause dangerous discharges or flashovers between high voltage conducting and grounded components of the system when the safety distance is not adhered to is impermissible.	During each switching on
<i>Check the safe disconnection of high voltage with voltage-controlled and voltage-constant operation.</i>	Check whether the safety circuits are functioning according to the specifications.	Monthly
<i>Protection against too high discharging energy</i>	Components must be discharged to a discharging energy of 300 mJ before these components can be reached.	Weekly

(Continued On Next Page)

OVERVIEW TABLE OF CHECKS (Cont.)

Type of Check	Requirements	Revision & Check Intervals
<p>Protection against ignition of flammable cleaning agents.</p>	<p>If possible, use non-flammable cleaning agents.</p> <p>The flash point for solvents used to clean the devices must be equal or higher than the flash point of the coating material.</p> <p>The flash point for solvents used for cleaning must be at least 5 °C (9 °F) above ambient temperature. The end operator is responsible for the compliance with this requirement.</p>	<p>before each cleaning</p>
<p>Effectiveness of the protective measures against direct touching</p> <p>Lockings/Securing of the inlet</p>	<p>At all doors and openings of the spray area where there is a risk of touching high voltage conducting components, when the high voltage is present, the inlet to the spray area must be secured so that the high voltage is switched off in case of opening. The locking must comply with the performance requirements of EN ISO 13849-1. Other openings of the spray area through which high voltage conducting components can be touched are to be installed so that they can be locked and are to be opened by a key or tool only. When using systems of the type C-L and D-L, a locking of the high voltage supply with all doors and openings must be present which avoids that persons are endangered by electric shock.</p>	<p>Weekly</p>
<p>Effectiveness of the grounding measurements</p>	<p>All conductive components of the system like floors, walls, ceilings, barriers, transport units, work pieces, coating material containers, robotics or structural components etc. in the spray area, except for the operational high voltage conducting components, must be connected to the grounding system. Parts of the cabin must be grounded in accordance with EN 12215-2004.</p> <p>If a sufficient grounding of the conductive components cannot be ensured, their discharging energy must not exceed the permitted value of 0.24 mJ.</p> <p>The resistance to ground of the position point of each work piece must not exceed 1 MΩ. The measuring voltage must be 500 V or 1000 V. The construction of the work piece positioner must ensure that the work pieces are grounded during coating.</p> <p>Note: As work pieces are often grounded via metal hooks, it is important that these hooks are regularly cleaned or they are to be manufactured and installed in a way that the arise of insulating layers from coating material is avoided.</p>	<p>Weekly</p>

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OVERVIEW TABLE OF CHECKS (Cont.)

Type of Check	Requirements	Revision & Check Intervals
<i>Effectiveness of the grounding measurements (Cont.)</i>	If a sufficient grounding of the work piece cannot be ensured, removing electric charges at the work piece via suitable devices, e. g. ionisers is permitted. Such devices must not exceed the permitted discharging energy of the spray system with which they are used. Further, these devices must be checked the same way as the spray systems used with them regarding the permitted discharging energy. The arrester device and the spray system must be locked together so that in case of malfunctioning of the arrester device, the high voltage is switched off and the coating cannot be carried out.	Weekly
<i>Effectiveness of the locally active fire-extinguishing systems</i>	<p>Additionally to a room safety system, locally active fire-extinguishing systems (firmly installed and assigned to the object) should effectively protect the hazardous area between coating material escape and work piece. Whether the aspects of locally active extinguishing systems and room safety system can be met by a single fire-extinguishing system is to be proven on a case-by-case basis.</p> <p>Electrostatic spray systems must be equipped with locally active automatic fire-extinguishing systems which are triggered immediately in case of a fire. As soon as the extinguishing system triggers, the high voltage supply, the coating material supply and the compressed air must be automatically switched off.</p> <p>EN 13478 is to be obtained.</p> <p>Whether the functioning aspects of a locally active automatic extinguishing system can also be met by an existing room safety system is to be checked on a case-by-case basis.</p>	All 6 months
<i>Conductive parts of the coating material supply system</i>	If electrically conductive components are used for the coating material supply system, they must be either grounded or connected to the high voltage supply system so that the potential power is constantly identical with the one of the electrostatic spray system.	Weekly
<i>Minimum distance in air</i>	The minimum safety distance to all grounded objects must not be below 204 mm.	Weekly
<i>Other checks</i>	According to EN standard 12215: 2004	According to EN 12215:2004

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