



# Operating manual

## **CORiTEC 350i series**

CNC-Machine

Article number:  
51100X X350

Original  
Operating manual

Date created:  
December 11, 2019





## Table of contents

<b>1</b>	<b>Basic guidelines</b>	<b>9</b>
1.1	About using this operating manual	9
1.2	Explanation of the machine types and designations	9
1.2.1	Overview of the respective chapters	10
1.2.2	Explanation of the warning and information fields	11
1.2.3	Explanation of symbols	12
1.2.4	Symbols on the packaging	14
1.2.5	Symbols on the device	15
1.3	Information about this operating manual	15
1.4	Limitations of liability	16
1.5	Copyright	16
1.6	Trademark protection	16
1.7	Guarantee	17
1.8	Technical modifications	17
1.9	Warranty Milling spindle	17
1.10	Accessories and modifications	17
1.11	Contact	18
1.11.1	Manufacturer	18
1.11.2	Customer service	18
<b>2</b>	<b>For your safety</b>	<b>19</b>
2.1	Responsibility of the operator	19
2.2	Information about the intended use	20
2.3	Brief description	20
2.4	Intended use	21
2.5	Residual risks and fundamental dangers	22
2.5.1	Reasonably foreseeable misuses	23
2.5.2	Danger due to electrical energy	24
2.5.3	Mechanical hazards	25
2.5.4	Dangers due to high temperatures	25
2.5.5	Danger of fire	26
2.5.6	Substance hazards (dust)	27
2.5.7	Substance hazards (vapours)	27
2.5.8	Noise/sound emissions	28
2.5.9	Freeing a trapped person	28
2.5.10	In case of emergency	28
2.5.11	In case of fire	29
2.6	Personnel requirements	29
2.6.1	Qualifications	30
<b>3</b>	<b>Description of the machine</b>	<b>31</b>
3.1	Materials	31
3.2	Cooling lubricant CORiTEC mill & grind liquid	32
3.3	Milling tools	32
3.4	Permissible milling tools	32
<b>4</b>	<b>Technical data</b>	<b>33</b>
4.1	CORiTEC 350i series	33
4.2	CORiTEC 350i (Loader)	34
4.3	CORiTEC 350i (Loader) PRO	35
4.4	CORiTEC 350i (Loader) PRO +	36
4.5	Ambient and installation conditions	36
4.6	Requirement for a compressed air connection	37
4.6.1	Air purity	37
4.7	Emissions	37

4.7.1	Noise emissions .....	37
4.8	Type plate .....	38
<b>5</b>	<b>Structure and views .....</b>	<b>39</b>
5.1	Front view .....	39
5.1.1	CORiTEC 350i (PRO) (+) .....	39
5.1.2	CORiTEC 350i Loader (PRO) (+) .....	40
5.2	Side view left .....	41
5.2.1	CORiTEC 350i (PRO) (+) .....	41
5.2.2	CORiTEC 350i Loader (PRO) (+) .....	42
5.3	Side view, right .....	43
5.3.1	CORiTEC 350i (Loader) (PRO) .....	43
5.3.2	CORiTEC 350i (Loader) PRO + .....	44
5.4	Rear view .....	45
5.4.1	CORiTEC 350i (PRO) (+) .....	45
5.4.2	CORiTEC 350i Loader (PRO) (+) .....	46
5.5	Tool magazine (direct changer) .....	47
5.5.1	CORiTEC 350i (PRO) (+) .....	47
5.5.2	CORiTEC 350i Loader (PRO) (+) .....	48
5.6	View of Loader area .....	49
5.7	Buttons and switches (front side) .....	50
5.8	Connection panel .....	51
5.8.1	CORiTEC 350i Loader (PRO) .....	51
5.8.2	CORiTEC 350i (Loader) PRO + .....	52
5.9	Supply connections .....	53
5.10	Maintenance unit .....	54
5.11	Cooling lubricant system .....	55
5.12	Cooling lubricant tank .....	56
5.13	Ionizer device .....	57
5.14	View axle structure .....	58
5.15	Coordinate system .....	58
5.16	Assignment of the movement axes .....	58
5.17	Safety equipment on the machine .....	59
5.17.1	EMERGENCY STOP switch .....	59
5.17.2	Protection and access doors .....	60
5.17.3	Separating door inside .....	62
5.17.4	Protective door monitoring .....	63
5.17.5	Protective door lock .....	63
5.17.6	Cover button .....	63
5.18	Working and hazard area .....	63
5.18.1	Working area .....	63
5.18.2	Hazard area .....	63
5.19	Safety equipment that the operator might have to retrofit .....	64
<b>6</b>	<b>Transport and packaging .....</b>	<b>65</b>
6.1	Safety instructions for transport .....	65
6.1.1	Improper transport .....	65
6.1.2	Eccentric centre of gravity .....	66
6.2	Transporting pallets .....	66
6.3	Transport locks .....	66
6.4	Carry handles (transport aid) .....	66
6.5	Packaging .....	67
6.6	Handling packaging materials .....	67
6.7	Standard scope of delivery .....	68
<b>7</b>	<b>Installation and first commissioning .....</b>	<b>69</b>
7.1	Safety instructions for installation and first commissioning .....	69

7.2	Requirements for the installation location.....	70
7.3	Installation plans.....	71
7.3.1	For operation of the machine.....	71
7.3.2	For service and maintenance work.....	73
7.4	Ergonomics and workplace configuration.....	75
7.5	Space requirement.....	75
7.6	Technical drawing.....	76
7.7	Installation of the carry handles.....	78
7.8	Setting up the machine.....	79
7.9	Connecting the machine.....	80
7.10	Connection to the mains network.....	81
7.11	Aligning the machine.....	81
7.12	Before initial commissioning.....	82
7.13	Installation, assembly and use of accessories.....	82
7.13.1	Extraction systems (optional).....	83
7.13.2	Wet processing (optional).....	83
7.13.3	Cooling lubricants (optional).....	83
7.13.4	Cooling aggregate machining spindle (optional).....	84
7.13.5	Ionizer device (optional).....	84
<b>8</b>	<b>Operating the system.....</b>	<b>85</b>
8.1	Safety instructions for operation.....	85
8.2	Operating elements.....	88
8.3	Operating modes.....	89
8.3.1	Dry processing.....	89
8.3.2	Wet processing.....	91
8.4	Operating modes.....	92
8.4.1	Automatic mode.....	92
8.4.2	Set-up.....	92
8.4.3	Expanded set-up.....	92
8.5	Switching on and referencing.....	93
8.6	Loading the system with workpieces.....	94
8.6.1	Insert and remove workpiece (inside of machine).....	94
8.6.2	Insert and remove workpiece (loader).....	95
8.7	Loading the tool magazine.....	97
8.8	Tool assignment in the operating software Remote Dental.....	99
8.9	Exchanging tools.....	100
8.9.1	Replace tools at expired runtime.....	100
8.9.2	Replace tools in case of tool damage.....	101
8.10	Tasks before each use of the machine.....	102
8.11	Process description.....	102
8.12	Milling file identifiers.....	102
8.13	Starting a milling process.....	103
8.13.1	Starting a milling process in Remote Dental.....	103
8.13.2	Starting a milling process in CNC Manager.....	104
8.14	Switching the machine off.....	105
<b>9</b>	<b>Software.....</b>	<b>106</b>
9.1	Operating software Remote Dental.....	106
9.1.1	Start screen.....	106
9.1.2	Tool bar.....	107
9.1.3	Tool fields.....	109
9.1.4	Information bar.....	114
9.1.5	Status indicator.....	116
9.2	Administration software CNC Manager.....	117
9.2.1	Start page CNC Manager.....	117
9.2.2	Tool bar.....	118

9.2.3	Selection area of milling files .....	119
9.2.4	Job list.....	120
9.2.5	Status field .....	121
9.2.6	Loader control .....	122
<b>10</b>	<b>Service, maintenance and cleaning .....</b>	<b>123</b>
10.1	Safety instructions for service, maintenance and cleaning.....	123
10.1.1	Electronics .....	125
10.1.2	Pneumatic system.....	125
10.1.3	Replacement parts .....	126
10.2	Cleaning and maintenance.....	126
10.2.1	General cleanliness.....	127
10.2.2	Cleaning products .....	127
10.2.3	Protective panes .....	127
10.2.4	Extraction systems .....	128
10.2.5	Workpiece holder (clamping device).....	128
10.2.6	Tool holders and length measuring probe.....	128
10.2.7	Protective door guide rails .....	128
10.2.8	Machining spindle .....	129
10.2.9	Collet chuck .....	130
10.2.10	Fan filter .....	133
10.2.11	Safety interlocking system.....	133
10.2.12	Cooling lubricants and coolants.....	134
10.2.13	Zero point clamping system (mount).....	134
10.2.14	Pre-filter machine interior .....	135
10.2.15	Cooling lubricant tank.....	135
10.2.16	Filter fleece .....	136
10.2.17	Maintenance unit (water separator) .....	136
10.2.18	Lights .....	136
10.2.19	Guide rails and drive shafts .....	137
10.2.20	Cooling aggregate machining spindle.....	137
10.2.21	Ionizer device.....	137
10.3	Maintenance schedule .....	140
10.4	Periodic inspections .....	141
10.5	Semi-annual maintenance tasks.....	141
10.6	Annual maintenance tasks .....	141
10.7	Commissioning maintenance work .....	142
10.8	Measures after completion of maintenance .....	142
10.9	Replacement parts and parts of wear .....	143
10.10	Creation of a calibration body.....	144
10.11	Calculating and calibrating the zero point .....	145
<b>11</b>	<b>Faults .....</b>	<b>146</b>
11.1	Safety instructions for trouble-shooting.....	146
11.2	Actions in the event of faults.....	147
11.3	Cancelling the EMERGENCY STOP .....	147
11.4	Error messages of the operating software Remote Dental.....	148
11.5	Fault table .....	150
11.6	Online support and remote maintenance (TeamViewer®) .....	152
<b>12</b>	<b>Disassembly and disposal.....</b>	<b>153</b>
12.1	Safety instructions for disassembly and disposal.....	153
12.2	Disassembly.....	155
12.3	Disposal .....	156
12.3.1	Collection .....	156
12.3.2	Return and collection systems.....	156

<b>Revision index</b>		
<b>Revision</b>	<b>Date</b>	<b>Name</b>
New edition	April 09, 2019	CW
Translation	April 16, 2019	OGLM
Adaption	May, 07, 2019	CW
Adaption	June, 10, 2019	CW
Translation	June, 17, 2019	OGLM
Adaption	Sept., 30, 2019	CW
Adaption	Dec., 11, 2019	CW

## **1 Basic guidelines**

Read this operating manual carefully before connecting and starting up the machine! As with all technical systems, it is only possible to guarantee the faultless functionality and operational safety of this machine if the generally applicable safety precautions and the special safety instructions in this operating manual are observed during its operation. Every person involved with the installation, operation, maintenance, repair and inspection of the system must have read and understood the following safety instructions!

### **1.1 About using this operating manual**

Before using the machine, it is essential to read this operating manual carefully! Every person involved with the installation, operation, maintenance, repair and inspection of the system must have read and understood the following safety instructions! This operating manual must be kept throughout the entire service life of the machine! It must be freely accessible at all times and must be located in the immediate vicinity of the machine!

### **1.2 Explanation of the machine types and designations**

This operating manual is valid for the following machine types: The individual specifications can be found in the technical data. If content concerns all six machine types, this is referred to in the text as CORiTEC 350i series.

- CORiTEC 350i
- CORiTEC 350i Loader
- CORiTEC 350i PRO
- CORiTEC 350i Loader PRO
- CORiTEC 350i PRO +
- CORiTEC 350i Loader PRO +

---

## 1.2.1 Overview of the respective chapters

- Chapter 1** contains **fundamental information** and instructions about the operating manual.
- Chapter 2** contains **safety-related information** when working with the machine.
- Chapter 3** contains the **description** of the machine.
- Chapter 4** contains all **technical data** pertaining to the machine.
- Chapter 5** provides information on the **layout and function** of the machine.
- Chapter 6** describes the machine's **transport process** and **handling the packaging**.
- Chapter 7** concerns **installation** and **first commissioning** of the machine.
- Chapter 8** provides information on the procedures for **operating** the machine.
- Chapter 9** includes information about the operating software.
- Chapter 10** describes the **maintenance, servicing and cleaning** of the machine.
- Chapter 11** contains suggested solutions for **trouble-shooting**.
- Chapter 12** provides information about **disassembly and disposal** of the machine.

## 1.2.2 Explanation of the warning and information fields

The following warning fields label hazards according to their risk level (hazard level) and contain important safety-relevant information on handling the machine. The information field contains (important) instructions and additional information. Also always observe the generally valid accident prevention regulations and the internal health and safety regulations.

The hazard warnings and warning messages in this manual are based on the SAFE principle:

Signal	Degree of risk and signal word (danger, warning or caution).
Art und Gefahr (Type and hazard)	Nature, cause, type and source of danger.
Folgen (Consequences)	Consequences of ignoring the danger.
Entkommen (Action)	Action to escape the danger.

The signal words indicate the degree of risk of the hazard:

Signal word	Degree of risk	Consequences
 <b>DANGER!</b>	<b>High</b>	Certain consequence grave injury or death!
 <b>WARNING!</b>	<b>Medium</b>	Could have grave injury or death as a consequence.
 <b>CAUTION!</b>	<b>Low</b>	Could have a minor to medium injury as a consequence.

The information fields indicate (important) information and hints for the operator or user of the machine:

	<b>Information fields</b>
--	---------------------------

### 1.2.3 Explanation of symbols

Symbols are used in this operating manual and on the machine itself, in order to highlight particularly important sections/areas. It is necessary to pay particular attention to all sections/areas that are marked with the symbols shown here!

Symbol	Description
	<b>Caution, warning, danger! Personal injury due to a lack of care!</b> This symbol is used in all areas where a lack of diligence can lead to (serious) personal injury or property damage.
	<b>Attention! Life-threatening danger due to electricity!</b> This symbol is used to highlight sections containing warnings of electricity and the associated dangers.
	<b>Attention! Danger of explosion and fire!</b> This symbol is used in all areas where a lack of diligence can lead to a risk of fire and explosion, and with this to personal injury or a risk of death.
	<b>Attention! Danger of crushing!</b> This symbol is used in all areas where a lack of diligence can lead to personal injury due to crushing or trapping.
	<b>Warning of a risk of slipping!</b> This symbol is used in all areas where oil or coolant on the floor can lead to personal injury.
	<b>Warning of sharp-edged or pointed objects!</b> This symbol marks areas with potential hazards, which may cause cuts or punctures resulting in personal injury and even death.
	<b>Warning of rotating components and risk of being drawn in!</b> This symbol is used in all areas where rotating components may cause serious personal injury or death.
	<b>Attention! Prior to automatic start-up!</b> This symbol is used in all areas where automatic start-up of components may cause serious personal injury or death.
	<b>Attention! Hot surfaces!</b> This symbol marks hazard areas, in which hot surfaces may cause injuries in the form of burns.

Symbol	Description
	<b>Attention! Concerning ozone discharge!</b>
	This symbol indicates on outlet of ozone. Ozone can be harmful to the human body.
	<b>People with pacemakers or implanted defibrillators must keep their distance!</b>
	Machines designated by this symbol may not be operated by persons with implanted pacemakers, implanted defibrillators or other active implants, nor may such persons be in proximity to such machines.

Symbol	Description
	<b>Use protective gloves!</b>
	The symbol is used in all areas where it is necessary to use protective gloves!
	<b>Wear safety shoes!</b>
	The symbol is used in all areas where it is necessary to wear safety shoes!
	<b>Use hearing protection!</b>
	The symbol is used in all areas where it is necessary to use hearing protection!
	<b>Use respiratory protection!</b>
	The symbol is used in all areas where it is necessary to use respiratory protection!
	<b>Wear long-sleeved work clothing!</b>
	The symbol is used in all areas where it is necessary to wear long-sleeved work clothing!
	<b>Use eye protection!</b>
	The symbol is used in all areas where it is necessary to wear safety goggles (eye protection)!

---

## 1.2.4 Symbols on the packaging

Always observe the following symbols on the package during transport.

Symbol	Description
	<b>Fragile!</b> Packages marked with this symbol contain fragile and sensitive contents. Handle the package with care, do not allow it to fall and protect it against impacts.
	<b>Do not stack!</b> Do not stack any objects on packages marked with this symbol.
	<b>Protect from moisture!</b> Protect packages marked with this symbol from moisture and keep them dry.
	<b>Maximum stacked load!</b> Observe the "... kg max." information above the arrow. This value specifies the maximum permissible stacked load. Do not exceed the load limit. If possible, place these packages on top.
	<b>This way up!</b> The arrow should always point up during transport and storage. Do not tip, roll or tilt the package.

### 1.2.5 Symbols on the device

Symbol	Description
	<p><b>Disposal!</b></p> <p>Electrical and electronic devices labelled with these symbols may not be disposed of together with household waste, in accordance with EU directives.</p>

### 1.3 Information about this operating manual

Despite every effort, it is not possible to fully exclude printing errors and mistakes. We welcome any suggestions for improvements and information regarding errors.

The information provided in this manual is based on a standard scope of supply, with which the machine is operational. For the installation and commissioning of software or the accessories, also observe the additional manuals, instructions and annexes provided.

imes-icore machines are compliant with CE requirements and marked appropriately. For all other machine parts and components, for which the CE safety guidelines are applicable, start-up is prohibited until all corresponding requirements have been fulfilled. If a change is made to the system without agreement with the manufacturer (imes-icore GmbH), CE conformity is invalidated.

The following documentation complies with the valid legal provisions, regulations and ordinances, as well as standard engineering practice at the time the machine was delivered.

---

## 1.4 Limitations of liability

All data, information and instructions in this operating manual have been provided with due consideration of applicable standards and regulations, current engineering practice, as well as our many years of experience.

**The manufacturer assumes no liability for damage in the following cases:**

- Disregard of this operating manual
- Improper use
- Deployment of insufficiently qualified personnel
- Unauthorised conversions
- Technical modifications
- Usage of unapproved material, spare parts or accessories

The scope of delivery may vary from the explanations and representations provided in this manual in the case of special versions, with technical changes or if additional options are ordered. The obligations agreed in the delivery contract, the general terms and conditions, as well as delivery conditions of the manufacturer and the statutory regulations valid at the time the contract was concluded, apply.

Insofar as the exclusion of liability is legally permissible, imes-icore GmbH shall not be liable for any loss or damage arising due to this product, regardless of whether this is due to direct, indirect, special, collateral or consequential damages, irrespective of the legal grounds, including guarantee, contract, negligence or malice.

The general terms and conditions (T&Cs) of imes-icore GmbH apply. They are available at <http://www.imes-icore.de/deu/agb>.

## 1.5 Copyright

The contents of this operating manual are copyright protected and are the intellectual property of imes-icore GmbH. Usage of this content is only permissible within the framework of using the machine. Any use beyond this is prohibited without the express written permission of the manufacturer. All rights, also those of translation, are reserved.

## 1.6 Trademark protection

All rights to product, company and brand names or third party rights in this operating manual belong to the respective company or holder, regardless of their form, and are subject to international copyright and trademark laws. Individual labelling has been omitted from this operating manual.

imes-icore® is a legally protected trademark according to section 4 no.1 MarkenG (trademark law).

## 1.7 Guarantee

imes-icore GmbH guarantees that this product is free of material and manufacturing faults. imes-icore GmbH accepts no further liability, also no implied guarantee, with regards to its marketability or suitability for a specific purpose. The user is responsible for the application and intended use of the product. If product damages arise during the guarantee period your only claim and the only obligation of imes-icore GmbH lies in the repair or the replacement of the imes-icore product.

## 1.8 Technical modifications

Technical modifications and errors are reserved. imes-icore GmbH reserves the right to modify any product listed here or the content of the operating manual without prior notification.

## 1.9 Warranty Milling spindle

The processing spindle is excluded from the overall machine warranty.

**A warranty period of 6 months applies here.**

## 1.10 Accessories and modifications

The attachment of accessories to the machine and any other modifications require the express permission of imes-icore GmbH. All attachments and modifications that may affect the operational safety of the machine are strictly prohibited and lead to the immediate voiding of CE-conformity and the manufacturers guarantee!

As soon as such changes are made to the machine, imes-icore GmbH accepts no liability whatsoever.

The ECM test only applies to the machine in its original configuration ex works.

### **The following is applicable in general:**

- The machine may only be used exclusively in accordance with the following operating instructions. We accept no liability for damage caused by use of the machine for any other applications.
- The machine must only be operated with consumption materials and the original accessories approved by imes-icore GmbH. The use of non-approved consumables and accessories can cause damage to people, machines and materials. In these cases, we accept no liability.
- If a change to the machine or components is made without the written permission of imes-icore GmbH then the issued EC declaration of conformity is voided and we exclude any liability for injuries or damages to the machine that arise as a result of this.



Detailed information about the limitation of liability is available in chapter 1.4.

---

## 1.11 Contact

### 1.11.1 Manufacturer

Manufacturer			
Address	<b>imes-icore® GmbH</b> Im Leibolzgraben 16 D-36132 Eiterfeld	Telephone	+49 (0) 6672 898-228
		Fax	+49 (0) 6672 898-222
		Email	<a href="mailto:info@imes-icore.de">info@imes-icore.de</a>
		Internet	<a href="http://www.imes-icore.de">www.imes-icore.de</a>

### 1.11.2 Customer service

Our customer service department will be happy to provide you with technical information:

imes-icore customer service			
Address	<b>imes-icore® GmbH</b> Im Leibolzgraben 16 D-36132 Eiterfeld	Telephone	+49 (0) 6672 898-469
		Fax	+49 (0) 6672 898-222
		Email	<a href="mailto:service@imes-icore.de">service@imes-icore.de</a>
		Internet	<a href="http://www.imes-icore.de">www.imes-icore.de</a>

---

## 2 For your safety

The following chapter contains a list of safety aspects that are required for the protection of personnel, as well as safe and fault-free operation of the machine.

### 2.1 Responsibility of the operator

Read this operating manual through carefully before connecting, starting up and operating the machine! As with all technical systems, it is only possible to guarantee the faultless functionality and operational safety of this machine if the generally applicable safety precautions and the special safety instructions in this operating manual are observed during its operation!

The operator is the person who uses the machine for commercial or industrial purposes, or who commissions a third party with this, and who bears the legal product responsibility for protecting the user, personnel or third parties during its operation. The machine operator is subject to the statutory obligations of industrial health and safety when using the machine in commercial areas.

The operator and the personnel authorised by the operator (who receive special instructions regarding hazards that may arise) are responsible for the fault-free operation of the machine, and for clear stipulations regarding the responsibilities when transporting, installing, operating, maintaining and cleaning the machine.

In addition to the safety instructions and information in this instruction manual, it is also necessary to observe and adhere to the local accident prevention regulations and the general health and safety provisions, as well as the valid environmental protection regulations relevant to the area of use of the machine.



The information in this instruction manual must be followed completely and without limitation!

---

## 2.2 Information about the intended use

Any use of the machine that exceeds the intended use or deviates from this is prohibited and is considered improper use. Any claims against the manufacturer or their authorised representatives due to damages arising from improper use of the machine are excluded. The operator alone is liable for any damages resulting from improper use.

**All guarantee and warranty entitlements of the operator against the manufacturer are voided in case of improper use of the machine. Any use other than intended use is prohibited!**

Unprofessional handling and improper use can lead to dangers and damage. You must therefore carefully read and precisely follow this operating manual and the associated documents carefully. This operating manual must be stored in the immediate vicinity of the machine, and must be accessible to the personnel working on and with the machine at all times. The machine must only be operated when in an operationally safe and technically faultless condition!



### Due to lack of care and improper use!

Serious to fatal personal injury due to non-observance of the instructions for use and internal occupational safety!

- Reading, understanding and following the instructions!
- Training and commissioning by qualified personnel!
- Transport, installation, commissioning, operation, cleaning and maintenance of the system must be performed by instructed specialist personnel!
- Use of suitable personal protective equipment!



In order to avoid personal injury or property damage, always observe all safety information and instructions!

## 2.3 Brief description

The machines of the CORiTEC 350i series are intended for the production of dentures and were developed especially for the requirements of the dental industry. Thus, these machines are not suitable for the application of conventional milling techniques. CORiTEC 350i series machines are approved for dry and wet processing of the materials listed in chapters 8.3.1 and 8.3.2.

## 2.4 Intended use

- These machines are intended for the production of dentures.
- The following materials are intended for processing: Zirconium dioxide, plastics, composites, wax and cobalt chrome (in dry processing with suitable extraction system from imes-icore GmbH); lithium disilicate, glass-ceramic and titanium (in wet processing with cooling lubrication system).
- The usage of highly flammable and inflammable materials is prohibited!
- When processing titanium and other reactive materials, a general risk of fire exists depending on the material! Perform an assessment to determine the requirement for an automatic extinguishing system!
- Only use tools that are defined by imes-icore GmbH on the website, or that have been retrospectively approved!
- Only use cooling lubricants and cooling agents that of imes-icore GmbH!
- An extraction system must be used in the application cases defined in the operating manual! Only use extraction systems that are supplied or approved by imes-icore GmbH!
- Wet processing may only take place without an extraction system. These machine may only be operated within the values specified in the technical data (see chapter 4). Operation of the machine is only permissible if the protective devices are functioning correctly (see chapter 5.17).
- Machines and components must only be operated when in an operationally safe and technically faultless condition.
- The machine is designed for use in dry rooms (workshops, labs and similar rooms) and industrial operations (for maximum ambient temperature see technical data).
- Put the machine into a safe state for maintenance work. This includes de-energising as described in the operating manual, as well as other safety instructions!
- The cleaning and maintenance intervals for the machine and its accessories must be adhered to and implemented.
- All instructions contained in the instruction manual, the safety instructions and the accident prevention guidelines must be adhered to.
- Transport, installation, commissioning, operation and maintenance of the machine must be performed by instructed specialist personnel.
- The instruction manual must be read carefully, understood and strictly followed.



The precise connection values, ambient and installation conditions can be found in chapter 4.

---

## 2.5 Residual risks and fundamental dangers

During intended use of machines of the CORiTEC 350i series, general residual risks and fundamental dangers arise, which are listed in the following chapter.

### **DANGER!**

#### **Due to sharp tools, pieces and components!**

When dealing with sharp tools and workpieces there is an increased risk of cuts that can lead to death!

Always wear cut-resistant safety gloves when reaching into the machine interior and when handling tools and workpieces!

### **WARNING!**

#### **Hearing damage due to noise pollution!**

- Milling certain materials can cause noise, which can damage your hearing!
- If the daily noise exposure level of 85 dB (A) is exceeded, this can cause permanent damage to your hearing!

We recommend always using suitable hearing protection!

### **WARNING!**

#### **Health hazard due to release of ozone!**

Various health problems can occur when using an ionizer device (optional)!

- Regular cleaning and maintenance of the ionizer!
- Avoid direct blowing of ionized air into the face!
- Ventilate the space constantly!

### **WARNING!**

#### **Health damage due to dust / fine dust pollution!**

The formation of dusts and fine dusts can lead to various health problems!

- Use of suitable personal protective equipment!
- Regular cleaning and maintenance of the extraction system!
- Immediate repair of damage to the extraction system and accessories!

**⚠ CAUTION!**

**General shock and crushing hazard!**

Injuries can be caused by bumping or crushing while operating the machine!

- Reading, understanding and following the instructions!
- Training and commissioning by qualified personnel!
- Use of suitable personal protective equipment!

### 2.5.1 Reasonably foreseeable misuses

The (reasonably) foreseeable misuses include:

- Improper use includes any use beyond the intended use!
- Incorrect fastening of workpieces. The machine operator is responsible for ensuring that the workpiece clamping device used is suitable for the actual processing - i.e. that it is secure. Unsuitable, insecure clamping devices may result in parts being ejected out of / from the workpiece clamping device due to the workpiece loosening. During processing, this can lead to serious accidents with physical injury or death or serious damage to the workpiece, the tool, the clamping device and other machine parts!
- Processing or use of an unapproved component or material!
- Risk of injury from sharp tools (wear protective gloves)!
- Risk of injury due to protruding tools (wear protective gloves)!
- Operation of the machine outside the specified performance data!
- Misuse of machine parts as storage locations or climbing aids!
- Deployment of insufficiently qualified personnel!
- A failure to comply with the cleaning and maintenance intervals for the machine and its accessories!
- Operating the machine without correctly functioning protective equipment!
- Manipulation of the protective equipment is fundamentally prohibited without exception!



Unintended use can result in serious physical injury or death, as well as significant property damage!

---

## 2.5.2 Danger due to electrical energy



### Due to electric shock!

Contact with live parts or damage to insulation poses immediate danger to life and limb due to electric shock!

Before working on electrical components, disconnect the machine from the mains and prevent it from being switched on again during work!



### Due to stored charges!

After switching off the machine, electrical charges may still be stored in components. Contact with such components may be painful and even fatal!

Wait until all such components have fully discharged before performing work on them!



### Due to high electrical voltage in the ionizer!

Ventricular fibrillation or cardiac arrest possible due to high voltage, alternating electric fields or magnetic fields!

Persons with pacemakers or other electronic implants may not operate these machines and must maintain a safety distance of 100 cm to the machine!

#### Always be aware that:

- Only electricians are permitted to work on the electrical system!
- Work on the electrical system must be carried out when in a safe (de-energised) state!
- With damaged insulation, switch off the power supply immediately and organise a repair!
- Never bypass fuses or render these ineffective. When replacing a fuse always ensure the correct current strength!
- Keep moisture away from live parts. Danger of a short circuit!

When working on active parts of the electrical system and operating equipment, de-energise the system for the duration of the work and observe the **five safety rules**:

1. Disconnect
2. Secure against being switched on again
3. Test to ensure a de-energised state
4. Earth and short circuit
5. Cover or close off any nearby live parts

### 2.5.3 Mechanical hazards

 <b>WARNING!</b>
<b>Concerning rotating components and moving axes!</b>
Risk of injury and death due to contact with rotating or moving components of the machine!
<ul style="list-style-type: none"> <li>• Before starting work check that all covers, safety and protective equipment are correctly installed and functional!</li> <li>• Never reach into the machine during operation!</li> <li>• Before performing cleaning, maintenance and servicing work, switch off the machine's main switch and unplug the mains plugs in order to prevent the machine being switched on accidentally (establish safe machine state)!</li> <li>• Before starting work, check that there no loose parts inside the machine!</li> </ul>

**Always be aware that:**

- Manipulating moving and fixed protective equipment is generally prohibited without exception!
- After opening the protective door, reaching into the processing space is strictly prohibited until all parts of the machine have come to a standstill without exception! Because for example the machining spindle can have a follow-up time due to technical reasons!

### 2.5.4 Dangers due to high temperatures

 <b>WARNING!</b>
<b>Concerning hot surfaces on materials and tools!</b>
Risk of burns on heated materials or tools after processing!
During machine operation, high temperatures may arise. Therefore ensure that surfaces have cooled to ambient temperature before commencing all work or activities. Tools, workpieces and chips may become very hot. Always wear heat-resistant work clothing and protective gloves during work!

---

## 2.5.5 Danger of fire

The risk of fire that applies to the machine is dependent on the materials and tools used. The machine operator is therefore additionally responsible for conducting a risk assessment of the workstation in accordance with the industrial health and safety act, ArbSchG §§ 5 and 6 while selecting the materials and tools!



### **Due to fire under unfavourable conditions!**

Injury and death, as well as significant property damage may arise due to:

- Unsuitable tools!
- Incorrect cutting speeds!
- Processing highly combustible materials!
- Overheating machine parts due to irregular cleaning and maintenance!
- Sparks flying from tools!
- Unsuitable cleaning or operating products!

Therefore always ensure that:

- Only approved materials and milling cutter types are used.
- Only approved extraction systems for dry dust are used.
- The maximum cutting and feeding speed is not exceeded.
- The operator of the machine is responsible for a risk assessment of the workstation.
- If necessary, an extinguisher must be retrospectively installed by the operator.
- When milling with new parameters, the processing procedure must take place under supervision.
- Tools are checked for wear regularly.
- Dirt must be removed from the components immediately.
- When handling cooling lubricants, the corresponding safety data sheet is used with particular awareness of the fire risks.
- Only cooling lubricants and cooling agents approved by imes-icore GmbH may be used.
- Every employee who works with this machine in any manner receives regular safety instructions, is sufficiently trained and has read the instruction manual.
- Before starting wet processing, check the coolant level.
- The machining of titanium must not take place unattended!

---

### 2.5.6 Substance hazards (dust)

When working with certain materials, fine drilling/milling dust may result. This may be harmful to health or flammable and should - if necessary - be vacuumed with an extraction system approved by imes-icore GmbH, because this complies with the valid and applicable legal regulations!

The machine operator must ensure that:

- Employees receive regular safety training.
- Employees are sufficiently sensitised in this regard (information security).
- Storage and disposal of health-endangering or flammable dust takes place correctly.
- Dust is not inhaled and suitable personal protective equipment is made available if necessary (BGV A1).
- Eating, drinking and smoking are strictly prohibited in areas where health-endangering dust may arise!
- Warning signs are visibly displayed in areas where this is necessary!
- Operation and maintenance instructions for the extraction system are strictly observed!

### 2.5.7 Substance hazards (vapours)

When working with certain materials, vapours (gases, aerosols) may arise. These may be harmful to health or flammable, and the operator must therefore ensure that:

- Employees receive regular safety training.
- Employees are sufficiently sensitised in this regard (information security).
- User instructions and safety data sheets of the various substances are available to the employees and provide information on the dangers (operating instructions)!
- Vapours are not inhaled and suitable personal protective equipment is made available if necessary (BGV A1).
- Eating, drinking and smoking are strictly prohibited (ban on flames and fire) in areas where health-endangering gas and vapours may arise!
- Warning signs are visibly displayed in areas where this is necessary!

---

## 2.5.8 Noise/sound emissions

The machine's emissions sound pressure level is lower than or equal to 75 dB(A) when using the approved materials and tools. However noise peaks may arise with certain processing combinations, and the operator must therefore ensure that:

- Employees are informed of noise risks and protective measures!
- Suitable hearing protection is available if the daily noise exposure level exceeds 85 dB(A).
- Sufficiently trained personnel are available if necessary, in order to reduce the duration of exposure.
- Warning signs are visibly displayed where this is necessary!

## 2.5.9 Freeing a trapped person

Freeing a person trapped in the machine's interior, e.g. due to trapping or catching on a drive axis, can be done after pressing the EMERGENCY STOP switch, in order to bring the machine to a standstill as quickly as possible and analyse the hazardous situation! Proceed as follows to release trapped personnel:

- Assess the condition of the trapped person and inform an emergency doctor if necessary!
- Due to the low mass of the drives, it is possible to move the axes manually when de-energised! If the trapped person cannot free himself, a second person must be summoned to shift the affected axis in the right direction.

## 2.5.10 In case of emergency

In situations in which there is a danger to persons or property, the user must initiate an EMERGENCY STOP immediately (see also chapter 5.17.1)

**If persons are injured:**

- Administer first aid,
- Inform emergency doctor or medic!



### 2.5.11 In case of fire

In case of fire, only extinguish this at the machine with a CO2 fire extinguisher (carbon dioxide extinguisher). The use of extinguishers containing water must be avoided with electrical systems for safety reasons!



#### In case of fire:

- Press EMERGENCY STOP,
- Disconnect the power supply (fuse box),
- Notify the fire brigade,
- Extinguish machine fire with CO2 fire extinguishers

## 2.6 Personnel requirements

The tasks described in this operating manual place different requirements on the qualifications of the persons entrusted with these tasks.

 <b>WARNING!</b>	
<b>In case of insufficient qualification of personnel!</b>	
Insufficiently qualified personnel are unable to correctly assess risks posed when working with the machine. These persons may therefore put themselves and others at risk of serious and even fatal injuries!	
<ul style="list-style-type: none"><li>• Persons with inadequate qualifications are prohibited from carrying out work on the machine!</li><li>• New operators must receive machine training before using the machine for the first time.</li></ul>	

---

## 2.6.1 Qualifications

Work on and with the machine must be carried out exclusively by authorised, trained and instructed personnel. Such personnel must receive instruction regarding possible hazards and special residual risks that may arise.

**The qualifications required for the various tasks are set out in the following:**

**Operator:**

The operator is required to instruct the user regarding the tasks entrusted to him and to clarify the possible dangers of improper conduct. All tasks that exceed operation in normal mode may only be performed by the user if the operator has expressly assigned these tasks to them.

**Electrician:**

An electrician is able to independently perform work on electrical systems and detect and avoid possible dangers due to his professional training, skills and experience, as well as knowledge of the applicable standards and provisions.

An electrician is familiar with all the relevant standards and provisions applicable to their working environment.

**Specialist personnel:**

Qualified personnel are able to independently detect and avoid possible dangers and hazards due to their professional training, skills and experience.

**Manufacturer (service technician):**

The manufacturer's specialist personnel are authorised to perform certain work exclusively. In order to carry out this work, contact our customer service department.

### 3 Description of the machine

Machines of the type CORiTEC 350i series serve the production of dentures and have been specially developed to satisfy the requirements of the dental industry. They are not suitable for the application of conventional milling techniques. The integrated cooling lubricant system allows for wet processing.

The tool magazine enables equipping with up to 20 tools. The modern and optimised machine kinematics enables simultaneous processing in 5 axes.

#### 3.1 Materials

The following materials can be processed with machines of the CORiTEC 350i series:

Dry processing	Wet processing
<ul style="list-style-type: none"> <li>• Zirconium dioxide</li> <li>• Plastics</li> <li>• Wax</li> <li>• Cobalt chrome</li> <li>• Composite</li> </ul>	<ul style="list-style-type: none"> <li>• Lithium disilicate</li> <li>• Glass-ceramic</li> <li>• Titanium</li> </ul>

The workpieces for the above stated materials are available from the sales department of imes-icore GmbH. The workpiece diameters 98 mm and 98.5 mm have a 10 mm step for clamping into the workpiece holder. Depending on the material, workpieces up to a height of 30 mm can be machined.

For block materials and prefabricated abutments, appropriate workpiece holders must be used. These are necessary to clamp other geometries in the round workpiece holders. Other materials are available on request and require the express approval of imes-icore GmbH.

<b>i</b>	Processing other materials is prohibited and requires separate approval and permission from imes-icore GmbH.
----------	--

---

## 3.2 Cooling lubricant CORiTEC mill & grind liquid

Only use cooling lubricant from imes-icore GmbH. The mixture ratio can be found in the cooling lubricant description. For further information regarding handling and disposal, refer to the separate safety data sheet, which you can request from the customer service department of imes-icore GmbH at any time.



Article	Article number
CORiTEC mill & grind liquid	526020 0050
imes-icore cooling lubricant (5 kg canister)	526020 0040

**i** Cooling lubricant is available via imes-icore GmbH sales.

## 3.3 Milling tools

In order to process workpieces, the machine must be equipped with at least one milling tool. The appropriate and ready-ringed milling tools for direct change are available from the sales department of imes-icore GmbH.

## 3.4 Permissible milling tools

The current list of the permissible milling tools for your machine is available on our homepage. To see this list, go to the internet page [www.imes-icore.de](http://www.imes-icore.de) and navigate to:

[Dental products → downloads–coritec – dental systems → Milling tools](#)

Open the current list of milling tools (CORiTEC Dental Milling Tools DE XX.20XX) and check their proper use.

Before loading the machine with new milling tools, check whether an updated list of milling tools (see website) is available!

The data of the milling tools must match the intended use, the material to be processed and the machine type!

**i** Only use milling tools approved by imes-icore GmbH to avoid material damage and injury!

## 4 Technical data

The technical data of the machine is summarised in the following tables. Chapter 4.1 contains general specifications for all machines of the CORiTEC 350i series. This is followed by Chapters 4.2, 4.3, 4.4, which contain the individual specifications of the different machine types. Observation of the specifications indicated is a necessary requirement for correct operation of the machine and to ensure its warranty. The technical data quoted here relates to the standard configuration of the machine.

### 4.1 CORiTEC 350i series

Information	Value	Unit
Voltage	110 / 230	V
Control	Logosol 5 Achs	—
Frequency	50 / 60	Hz
Required air pressure	6 – 9	bar
Protective door(s)	Sliding door(s) (vertical)	—
Max. Processing area	Ø 94 (X, Y) x 30 (Z)	mm
Cooling lubricant tank	~ 4.8	l
Max. Installation height	2000	m above sea level
Ø Clamping sleeve Milling spindle	6	mm
Tool changer	20-slot direct tool changer	—
Workpiece changer (Loader)	Workpiece holder 6 (standard) up to 12 (max.)	—
Max. Work angle	A axis: 30 / B-axis: 25	° (degrees)

## 4.2 CORiTEC 350i (Loader)

Information	350i	350i Loader	Unit
Article number	511001 0350	511001 1350	—
Dimensions	758 x 857 x 802	1060 x 847 x 802	mm (W x H x D)
Weight (gross)	180	225	kg
Max. Nominal power	700	1000	W
Max. Nominal current	3	4	A
Zero point clamping system	Optional	yes	—
Required air flow rate	80		l/min
Monitor	12 Touchscreen		" (Inches)
Drive type	EC servo motors		—
Max. Speed Milling spindle	60.000		rpm
Weight Milling spindle	~ 2.2		kg
Required air pressure	6 – 9		bar
Basic structure	Steel / Aluminium		—

### 4.3 CORiTEC 350i (Loader) PRO

Information	350i PRO	350i Loader PRO	Unit
Article number	511003 0350	511001 1350	—
Dimensions	758 x 865 x 802	1060 x 855 x 802	mm (W x H x D)
Weight (gross)	205	250	kg
Max. Nominal power	700	1000	W
Max. Nominal current	3	4	A
Zero point clamping system	yes		—
Required air flow rate	80		l/min
Monitor	15 Touchscreen		" (Inches)
Drive type	AC servo motor with absolute encoder		—
Max. Speed Milling spindle	60.000		rpm
Weight Milling spindle	~ 2.2		kg
Required air pressure	6 – 9		bar
Basic structure	Polymer concrete		—

#### 4.4 CORiTEC 350i (Loader) PRO +

Information	350i PRO +	350i Loader PRO +	Unit
Article number	511004 0350	511004 1350	—
Dimensions	758 x 865 x 802	1060 x 855 x 802	mm (W x H x D)
Weight (gross)	210	255	kg
Max. Nominal power	1200	1500	W
Max. Nominal current	5	6.5	A
Zero point clamping system	yes		—
Required air flow rate	80		l/min
Monitor	15 Touchscreen		" (Inches)
Drive type	AC servo motor with absolute encoder		—
Max. Speed Milling spindle	60.000		rpm
Weight Milling spindle	~ 4.6		kg
Required air pressure	6 - 9		bar
Basic structure exterior	Polymer concrete		—

#### 4.5 Ambient and installation conditions

The individual components of the machine possess varying expansion coefficients. Imprecision during processing can only be ruled out with an ambient temperature from +18 to +25°C. If your ambient temperatures are not within this range, we recommend using an air conditioning unit. Please contact our customer service department for more information.

Requirement	Information	Value	Unit
Operation	Temperature range	+18 to +25	°C
	max. humidity	60	%
Storage	Temperature range	+10 to +50	°C
	max. humidity	80	%
Transport	Temperature range	-10 to +55	°C
	max. humidity	80	%

## 4.6 Requirement for a compressed air connection

The compressed air connected must expressly comply with the following conditions:

Information	Value	Unit
Air pressure [P]	6.5 to 9	bar
Connection	Plug-in nipple NW 7.2 (quick connection)	mm

### 4.6.1 Air purity

Specifications per ISO 8573-1, compressed air for general application, part 1: Contamination and quality classes

Information	Class	Value	Unit
Solid contaminants	Class 3 - filter grade for solids	Better than 5	µm
Water content	Class 4 - maximum pressure dew point	+3	°C
Total oil content	Class 3 - maximum oil content	1	mg / m <sup>3</sup>

## 4.7 Emissions

### 4.7.1 Noise emissions

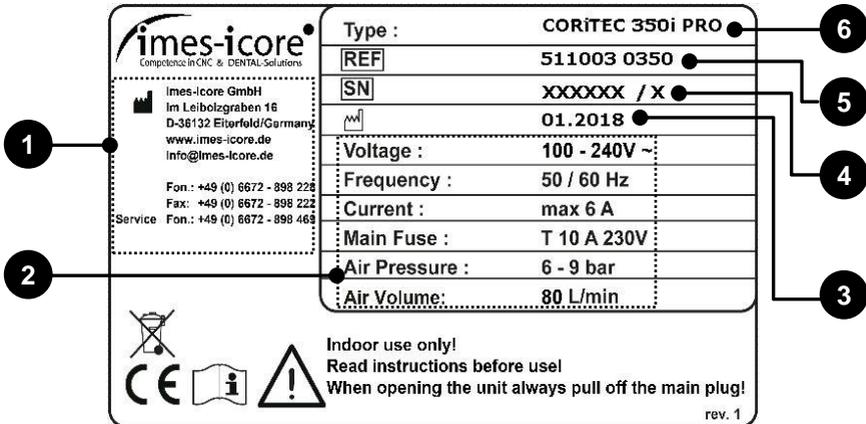
Information	Verification	Value	Unit
Noise level	Milling in plastic	< 70	dB (A)



The noise pressure level may vary depending on the material and milling parameters.

## 4.8 Type plate

The type plate contains all information about the identification and classification of the machine. The type plate is located on the right side, above the machine connection panel and may not be removed!



**i** This figure is an example and serves as an illustration only.

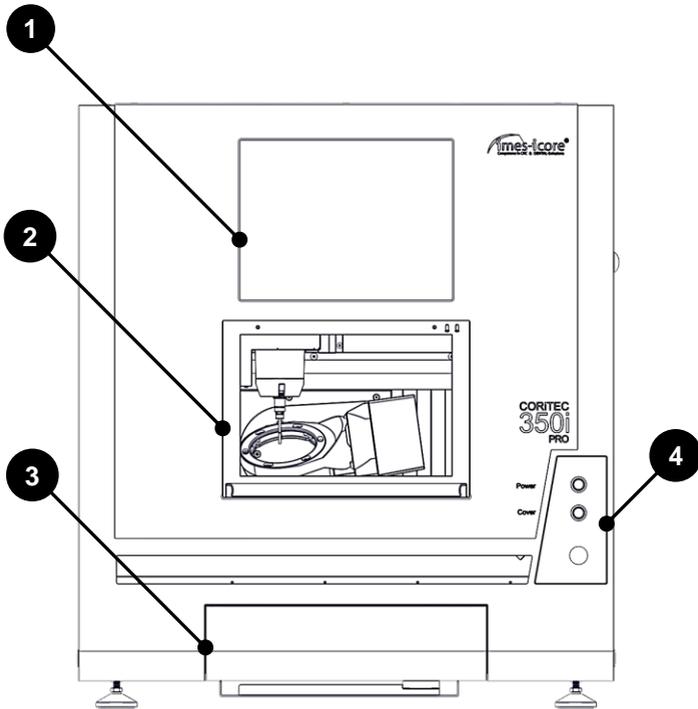
Item	Designation
1	Machine manufacturer
2	Technical data of the machine
3	Date of machine manufacture
4	Machine serial number
5	Machine article number
6	Machine designation

## 5 Structure and views

### 5.1 Front view

#### 5.1.1 CORiTEC 350i (PRO) (+)

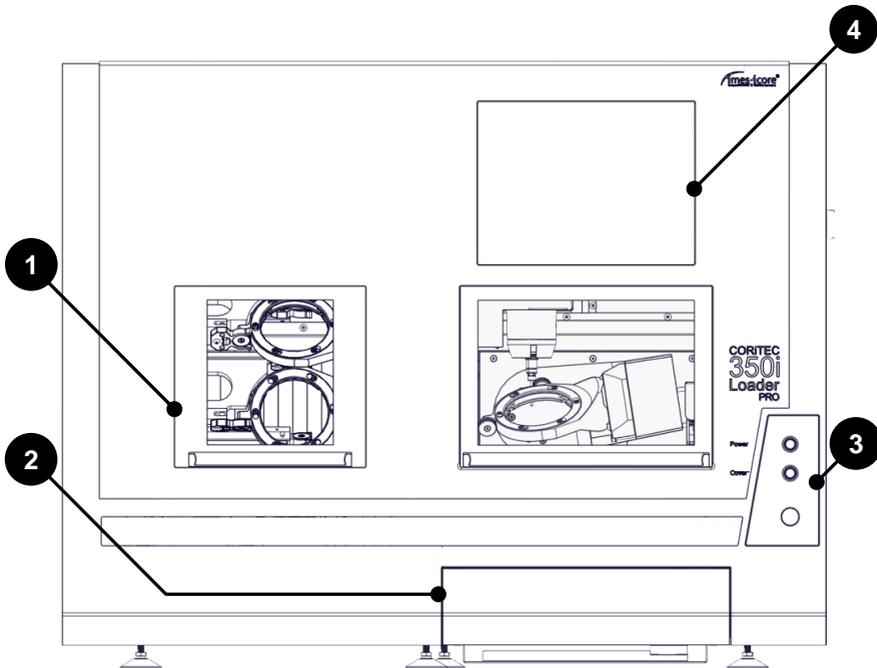
The front side is the working area of the machine. The access to the interior and cooling lubricant tank is located here. The machine is controlled via the control buttons and the touchscreen.



Item	Designation
1	Control panel (Touchscreen TFT)
2	Protective door
3	Access door for cooling lubricant tank
4	Operating keys

## 5.1.2 CORiTEC 350i Loader (PRO) (+)

The front side is the working area of the machine. The access to the cooling lubricant tank, the interior of the milling area and the loader is located here. In addition, the control buttons and the touch screen for the control PC are attached here.

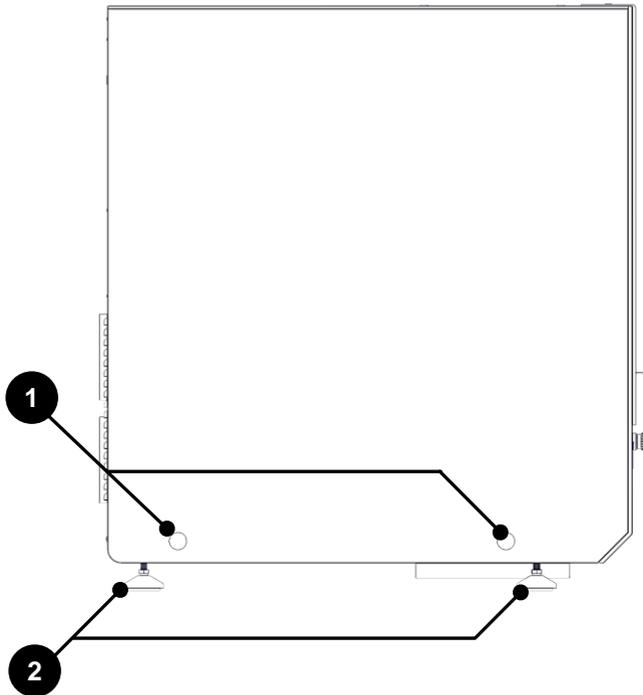


Item	Designation
1	Protective doors
2	Access door for cooling lubricant tank
3	Operating keys
4	Touchscreen TFT (control panel and control PC)

## 5.2 Side view left

On the left side there are two threads for mounting a transport handle. These threads are closed with a blanking plug.

### 5.2.1 CORiTEC 350i (PRO) (+)

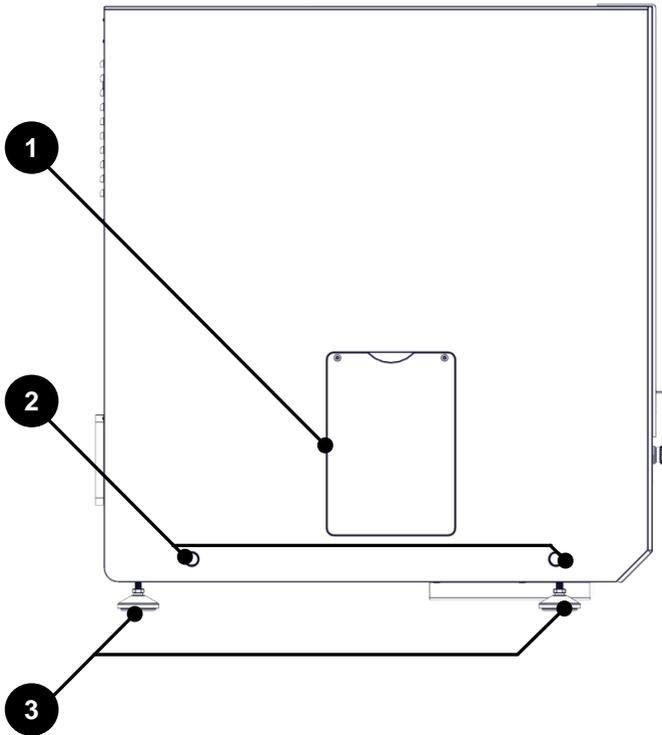


Item	Designation
1	Blind plug with thread behind for transport handle
2	Machine feet

---

## 5.2.2 CORiTEC 350i Loader (PRO) (+)

On the left side there are two threads for mounting a transport handle. These are closed with a blind plug. A service flap is attached in the middle.

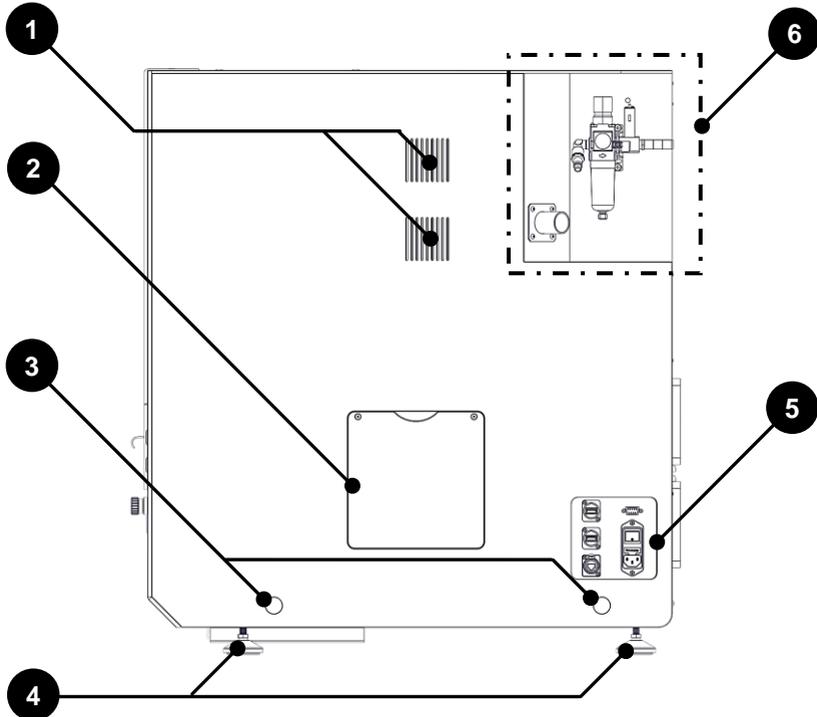


Item	Designation
1	Service flap
2	Blind plug with thread behind for transport aid
3	Machine feet

## 5.3 Side view, right

### 5.3.1 CORiTEC 350i (Loader) (PRO)

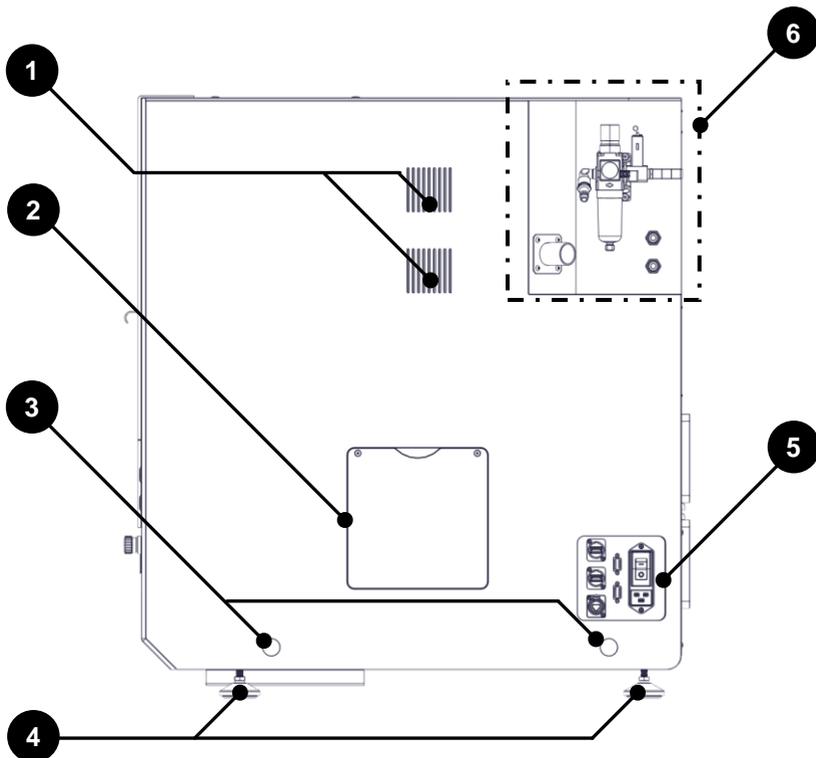
There are two threads for mounting a transport handle on the right side. These threads are closed with a blanking plug. In addition, all connections of the machine and the main switch are attached here. In the middle area of the right side there are ventilation slots and a service flap.



Item	Designation
1	Ventilation slits
2	Service flap
3	Blind plug with thread behind for transport handle
4	Machine feet
5	Connection panel
6	Supply connections

### 5.3.2 CORiTEC 350i (Loader) PRO +

In addition, the CORiTEC 350i (Loader) PRO + has two connections for supply and return on the right side, as well as a Sub-D connection for flow monitoring of the cooling unit machining spindle.

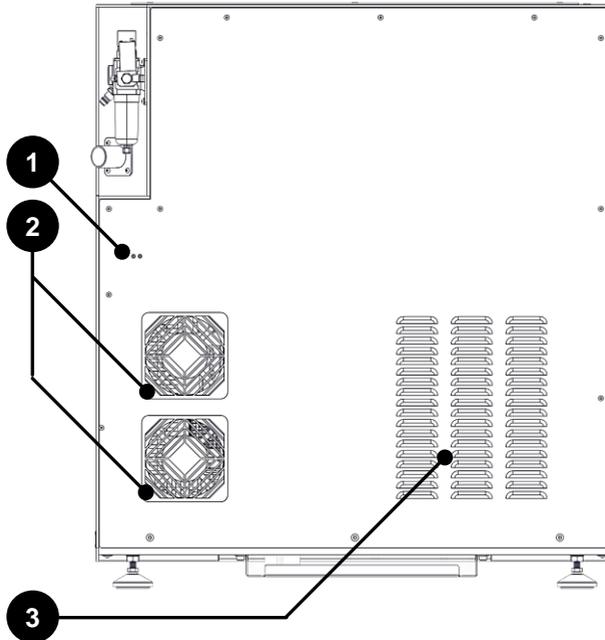


Item	Designation
1	Ventilation slits
2	Service flap
3	Blind plug with thread behind for transport handle
4	Machine feet
5	Connection panel
6	Supply connections

## 5.4 Rear view

### 5.4.1 CORiTEC 350i (PRO) (+)

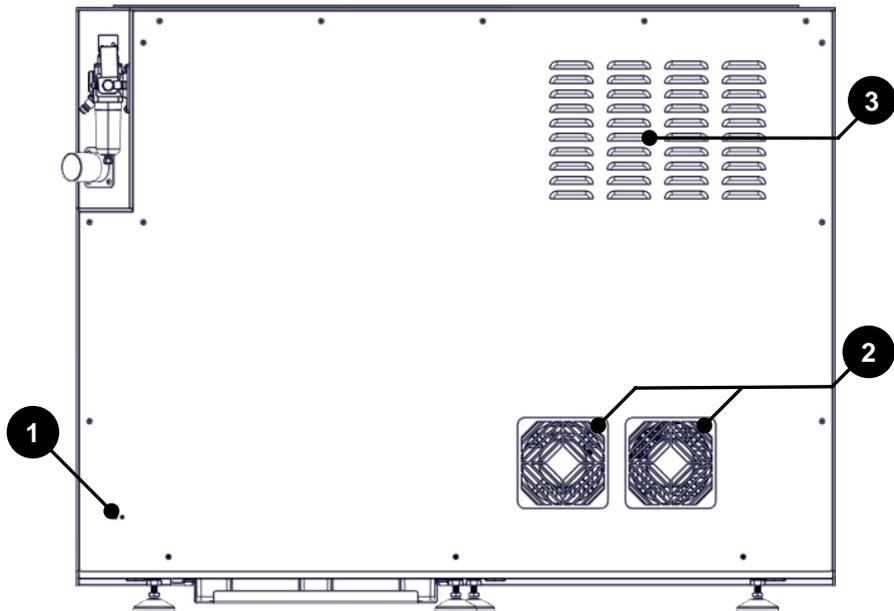
There are ventilation slots and ventilators on the back.



Item	Designation
1	Earthing connection of the wall housing
2	Ventilation fans
3	Ventilation slits

## 5.4.2 CORiTEC 350i Loader (PRO) (+)

The front side is the working area of the machine. The access to the cooling lubricant tank, the interior of the milling area and the loader is located here. In addition, the control buttons and the touch screen for the control PC are attached here.

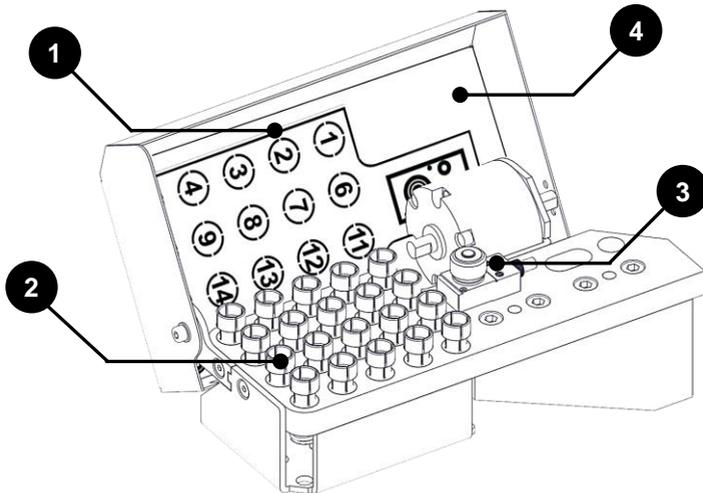


Item	Designation
1	Earthing connection of the wall housing
2	Fan cover with integrated filter
3	Ventilation lamella

## 5.5 Tool magazine (direct changer)

### 5.5.1 CORiTEC 350i (PRO) (+)

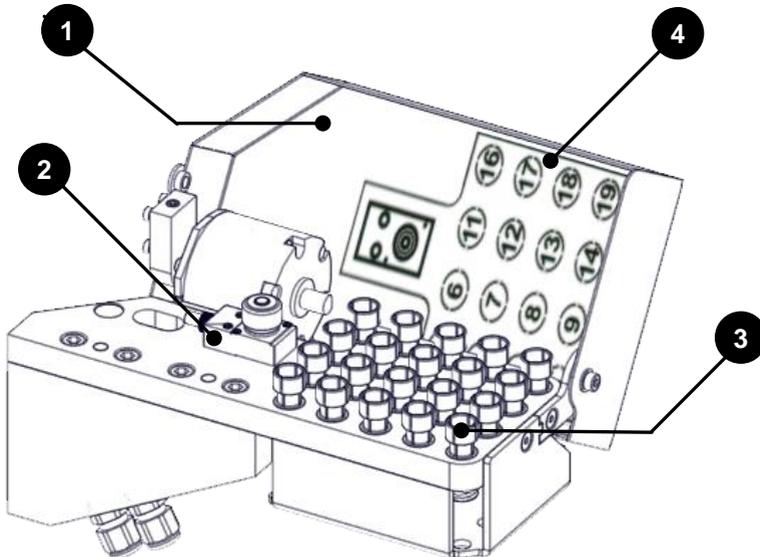
The machine's tool magazine contains a total of 20 tool positions for ready-ringed tools. The arrangement of the tool positions is shown on the inside of the tool cover. Above the tool positions is a length measuring probe to measure the length of tool currently in use.



Item	Designation
1	Arrangement of tool positions
2	Tool holder
3	Length measuring switch
4	Tool cover

## 5.5.2 CORiTEC 350i Loader (PRO) (+)

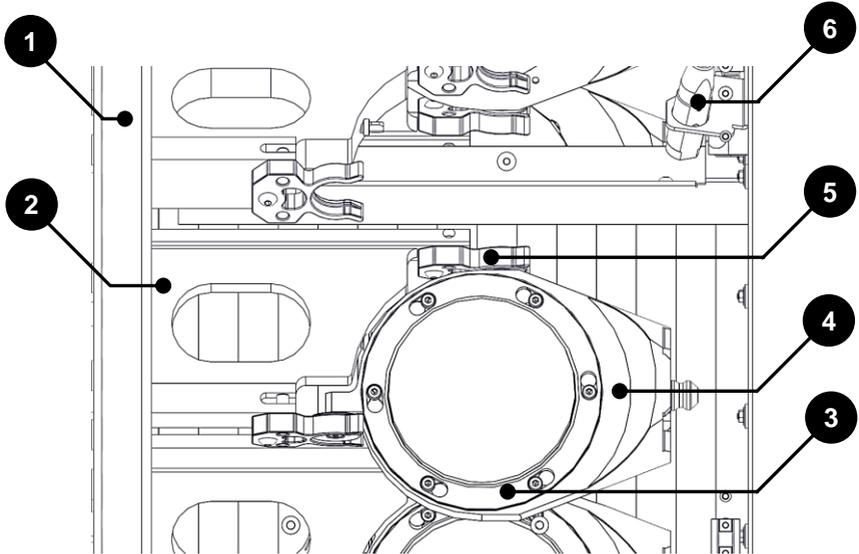
The machine's tool magazine contains a total of 20 tool positions for ready-ringed tools. The arrangement of the tool positions is shown on the inside of the tool cover. Above the tool positions is a length measuring probe to measure the length of tool currently in use.



Item	Designation
1	Tool cover
2	Length measuring switch
3	Tool holder
4	Arrangement of tool positions

## 5.6 View of Loader area

The machine is equipped with workpieces in the loader area of the CORiTEC 350i Loader (PRO) (+). Due to different material densities and workpiece heights of the machining materials, the proper loading of the loader wheel must be ensured. Heavy workpieces must not be loaded on only one side of the loader wheel. In addition, workpiece holders made of stainless steel and aluminium are available. Only workpiece holders made of one material may be used in a CORiTEC 350i Loader (PRO) (+). Mixed operation is not permitted.

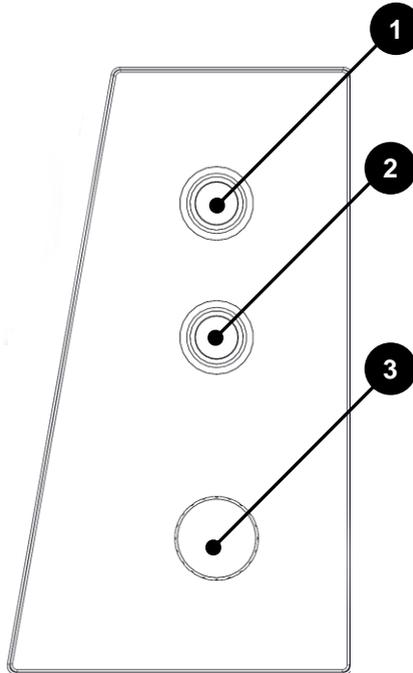


Item	Designation
1	Loader wheel
2	Storage space for workpiece holder
3	Clamping ring of the workpiece holder
4	Workpiece holder
5	Clamping claw
6	Monitoring sensor for workpiece holder

---

## 5.7 Buttons and switches (front side)

The power button, cover button and EMERGENCY STOP button are located in a control element on the front of the machine.

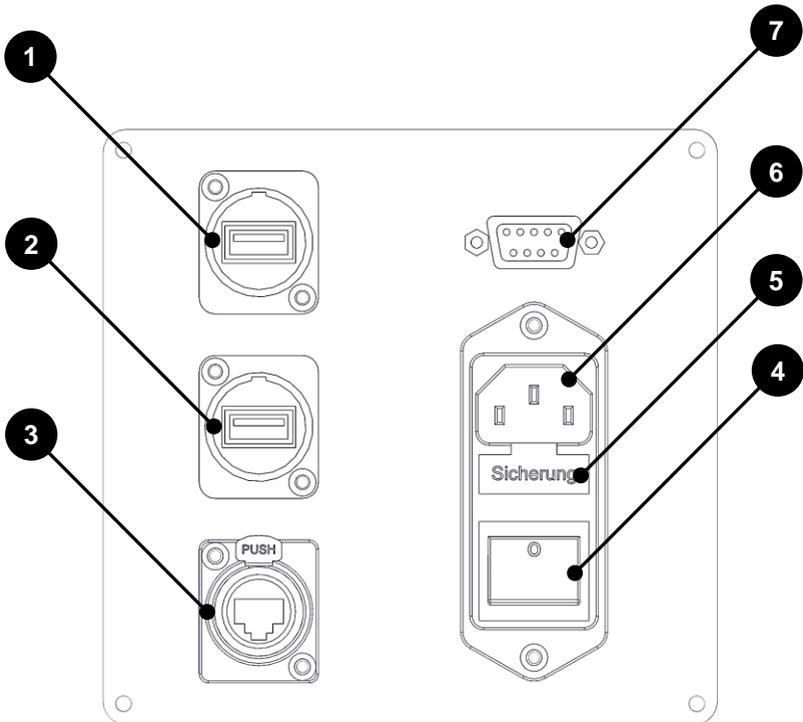


Item	Designation
1	Power button
2	Cover button
3	EMERGENCY STOP switch

## 5.8 Connection panel

### 5.8.1 CORiTEC 350i Loader (PRO)

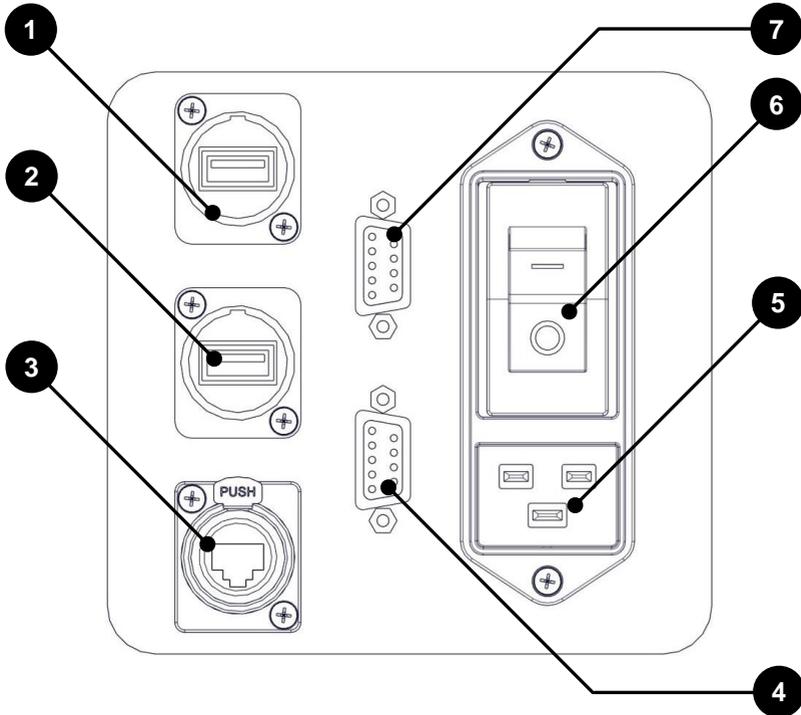
There are two USB ports, one RJ45 network connection and one connection for the control line of the extraction system in the connection area. In addition, an element for power supply consisting of main switch, miniature fuse and mains connection socket is integrated.



Item	Designation
1	USB-socket type A (USB connection) (1)
2	USB-socket type A (USB connection) (2)
3	RJ-45 Network connection
4	Machine main switch (on/off switch)
5	Access fine wire fuse
6	Mains connection for mains connection cable (IEC connection cable)
7	Sub-D connection for the control line of the extraction system

## 5.8.2 CORiTEC 350i (Loader) PRO +

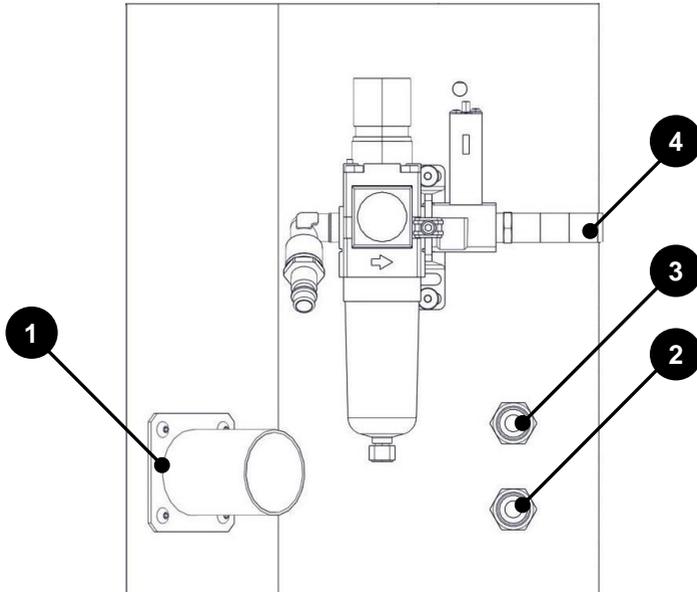
The connection panel contains two USB ports, an RJ45 network connection and a connection for the control line of the extraction system. In addition, an element for power supply consisting of main switch, Sub-D connection for flow monitoring of the spindle cooling unit and mains connection socket is integrated.



Item	Designation
1	USB-socket type A (USB connection) (1)
2	USB-socket type A (USB connection) (2)
3	RJ-45 Network connection
4	Sub-D connection for flow monitoring of the spindle cooling unit
5	Mains connection for mains connection cable (IEC connection cable)
6	Machine main switch (on/off switch)
7	Sub-D connection for the control line of the extraction system

## 5.9 Supply connections

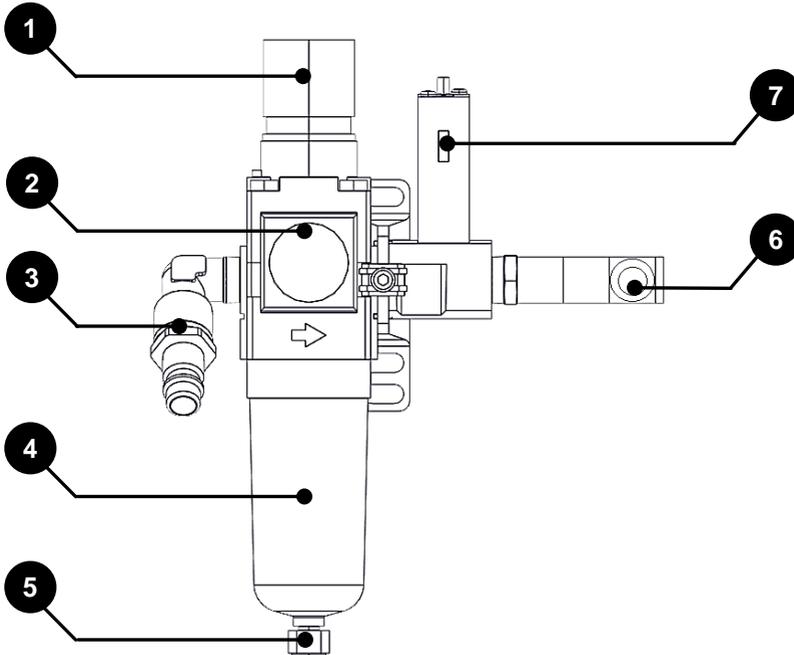
On the right side of the machine there is a maintenance unit with compressed air connection and the nozzle of the extraction hose for the extraction system. In addition, the CORiTEC 350i (Loader) PRO + has one connection each for inlet and outlet of the spindle cooling unit attached.



Item	Designation
1	Connection for suction hose of the extraction system
2	Connection for drainage of the spindle cooling unit
3	Connection for supply of the spindle cooling unit
4	Maintenance unit with compressed air connection

## 5.10 Maintenance unit

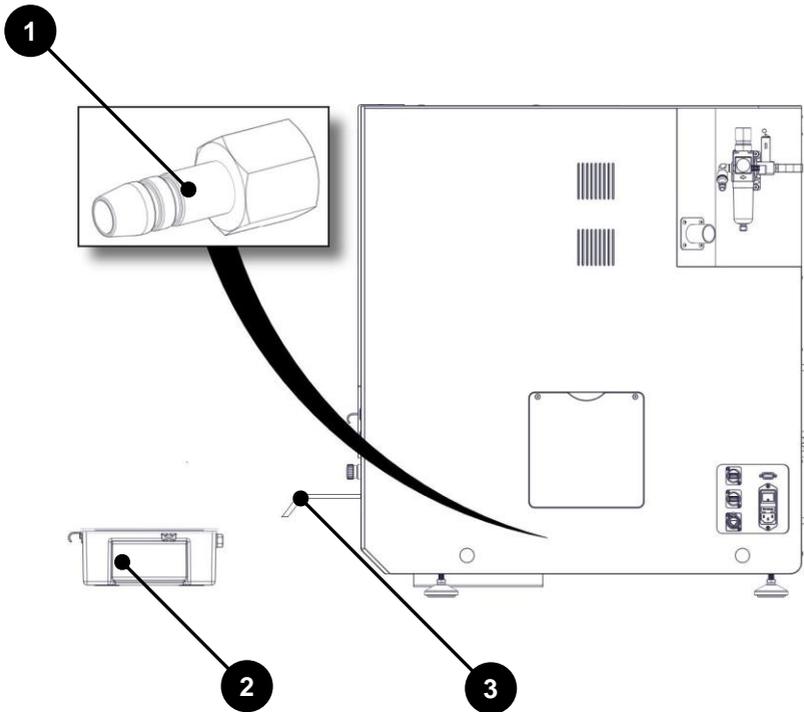
The maintenance unit serves as a connection for the compressed air supply of the machine. In addition, a water separator for coarse cleaning of the compressed air and a sensor for minimum pressure monitoring is integrated.



Item	Designation
1	Control valve for compressed air (6 to 9 bar)
2	Compressed air display (bar)
3	Compressed air connection (plug-in nipple NW 7.2 (quick connection))
4	Separation tank
5	Drainage valve on the separation tank
6	Optional compressed air supply for cleaning the filter cartridge of the extraction system
7	Minimum pressure monitoring (5.5 bar / 0.55 MPa)

## 5.11 Cooling lubricant system

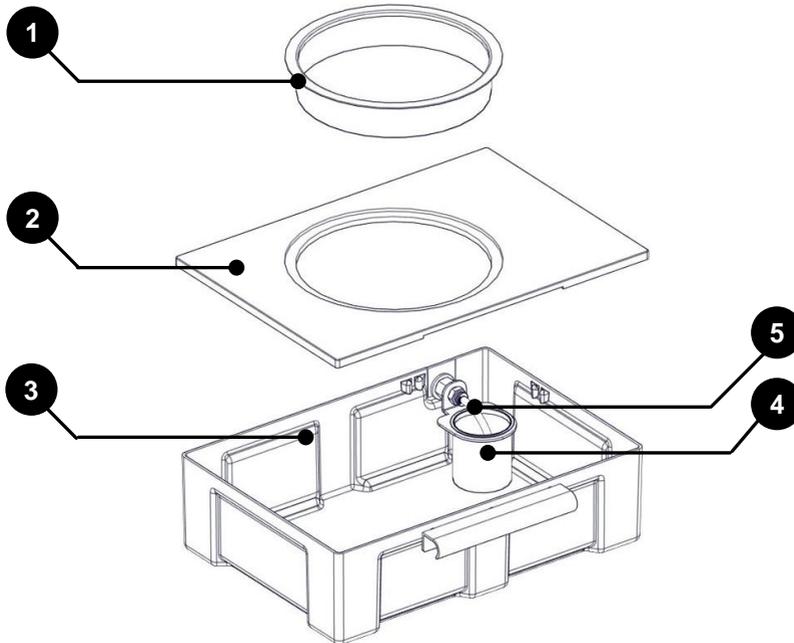
The cooling lubrication system is preinstalled on the CORiTEC 350i Loader (PRO) (+). Only use approved cooling lubricant from imes-icore GmbH, because this is optimally tailored to the requirements of the machine and guarantees a seamless processing sequence.



Item	Designation
1	Extraction device (plug-in nipple)
2	Cooling lubricant tank (capacity 4.8 l)
3	Access door for cooling lubricant tank

## 5.12 Cooling lubricant tank

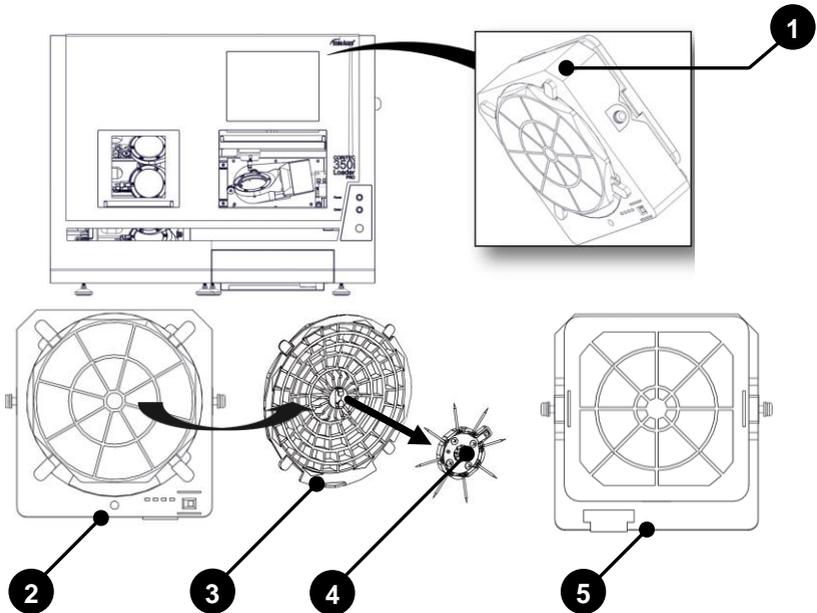
The cooling lubricant tank of the CORiTEC 350i series has a capacity of 4.8 l cooling lubricant. It consists of a cover, a sump and a round screen insert. The sieves filter and clean milling dust from the cooling lubricant. Before every wet operation, check the coolant lubricant level in the coolant reservoir. There must always be sufficient coolant lubricant available.



Item	Designation
1	Screen insert round
2	Cover on the cooling lubricant tank
3	Sump of the cooling lubricant tank
4	Screen insert (pump connection)
5	Suction tube pump

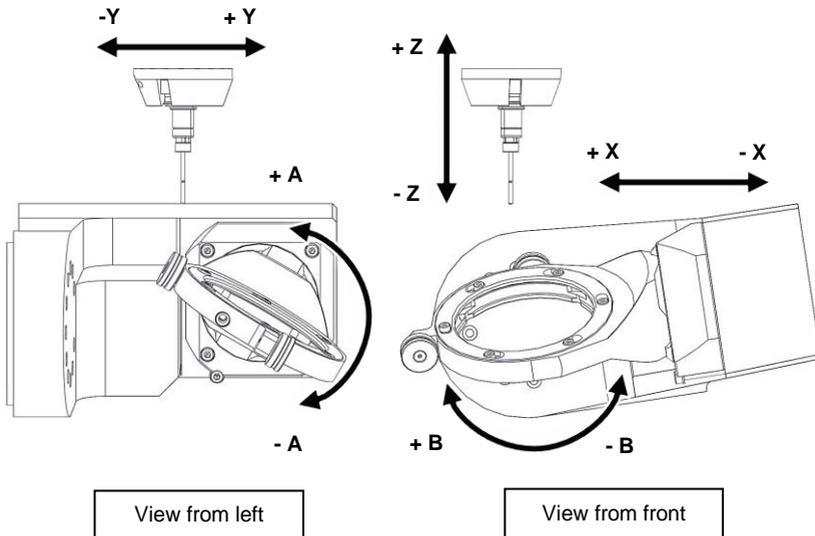
### 5.13 Ionizer device

An ionizing unit can optionally be installed in the milling room of the machine. The ionizer device uses the functional principle of coronal discharge and produces partially ionized air during operation. These ions in the air are attracted by positively charged plastic chips. As a result, a neutralization of the charge of the plastic chips takes place. Afterwards, plastic chips can be extracted more effectively. The device is automatically switched on by the milling program.



Item	Designation
1	Position of the ionizing unit (interior)
2	Front with fan cover, control buttons and status LED's
3	Fan cover
4	Ionizer tips (discharger unit)
5	Filter with cover

## 5.14 View axle structure



## 5.15 Coordinate system

Yellow stickers on the axes of the machine label the axes and the positive and negative axis alignment with linear axes, or the positive and negative direction of rotation with rotating axes. X, Y, Z: generally the axis address letters for linear axes. A, B, C: generally the axis address letters for swivelling or pivoting axes.

## 5.16 Assignment of the movement axes

For machines of the CORiTEC 350i series:

Axis	Designation	Description	
X	Transverse axis	+X to the left	-X to the right
Y	Longitudinal axis	+Y towards the back	-Y towards the front
Z	Stroke axis	+X upwards	+Z downwards
A	Rotating axis	+A counter clockwise	-A clockwise
B	Rotating axis	+B clockwise	-B counter clockwise

## 5.17 Safety equipment on the machine



### Due to lack of care!

You are at risk of serious injuries and even death if you remove or deactivate the safety equipment!

- Do not dismantle or manipulate the safety device!
- Check correct function of safety devices on a regular basis!
- Have damaged safety equipment repaired immediately!

### Therefore always note:

- The machine may only be operated when the safety equipment is intact!
- The user has a duty to immediately report any faults that may affect the safety!
- The machine must not be operated after such security faults arise and must be disconnected from the mains power and compressed air supply until the faults have been remedied by qualified specialist personnel!
- If the noise pressure level at the machine exceeds a value of 85 dB(A), the operating personnel must wear suitable hearing protection!

### 5.17.1 EMERGENCY STOP switch

An EMERGENCY STOP switch is located on the right side of the machine (to the right of the protection door). This can be used to bring the machine to a very quick stop. It interrupts the power supply to the power electronics (motor output stages) and the frequency converter for the machining spindle. The standstill occurs after stop category 1 (controlled standstill and subsequent interruption of the energy supply to the drives).



#### Location of the EMERGENCY STOP switch:

The EMERGENCY STOP switch is located on the right next to the protection door.

#### Always be aware that:

- The EMERGENCY STOP switch must always be freely accessible.
- The machine main switch does not include an EMERGENCY STOP function!
- The EMERGENCY STOP switch does not protect against an unexpected machine start!

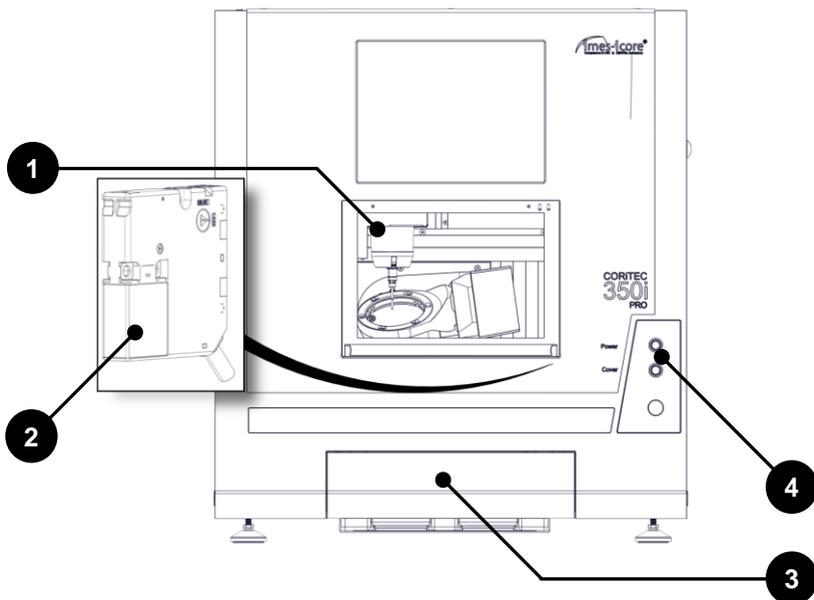


After actuating the EMERGENCY STOP switch, the mains power supply is still connected. Only the operating voltage for the motor output stages and the machining spindle is interrupted.

## 5.17.2 Protection and access doors

### CORITEC 350i (PRO) (+)

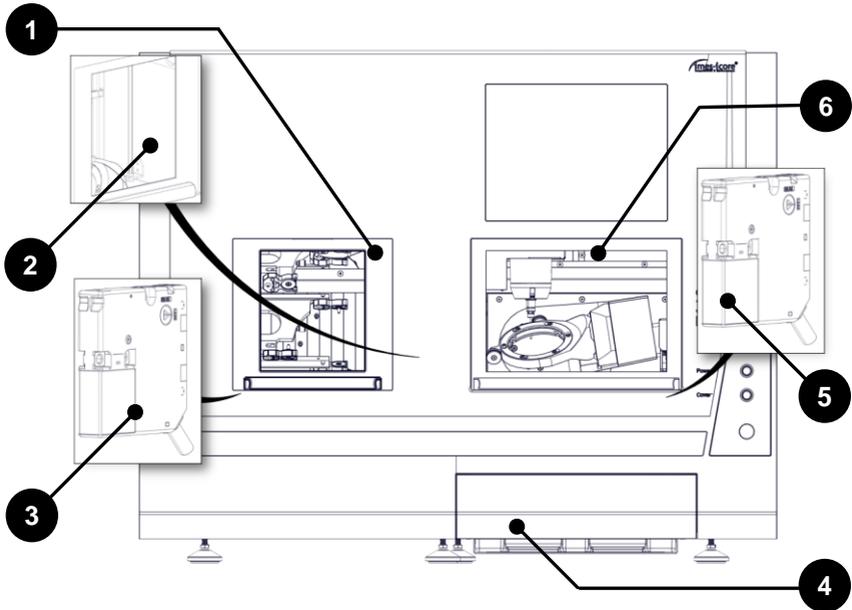
The protective door enables access to the milling area of the machine. It protects the user and persons in the environment against dangers. The protective door of the machine protects against moving tools and components, reduces the noise level and retains the chips. The access door to the cooling lubricant tank enables access to the cooling lubricant tank, in order to fill or clean this. During operation, the protective door to the milling area is locked.



Item	Designation
1	Safety interlocking system milling chamber
2	Safety interlocking system loader
3	Protective door for cooling lubricant tank
4	Safety interlocking system milling chamber

## CORiTEC 350i Loader (PRO) (+)

The protective door loader and the protective door milling room provide access to the machine. They protect the user and persons in the environment against dangers during operation. They also protect against moving tools and components, reduce the noise level and retain the chips. The access door to the cooling lubricant tank enables access to the cooling lubricant tank, in order to fill or clean this. During operation, the protective door to the milling area is locked. The protective door loader can be unlocked in the CNC Manager to access the workpieces in the loader wheel.

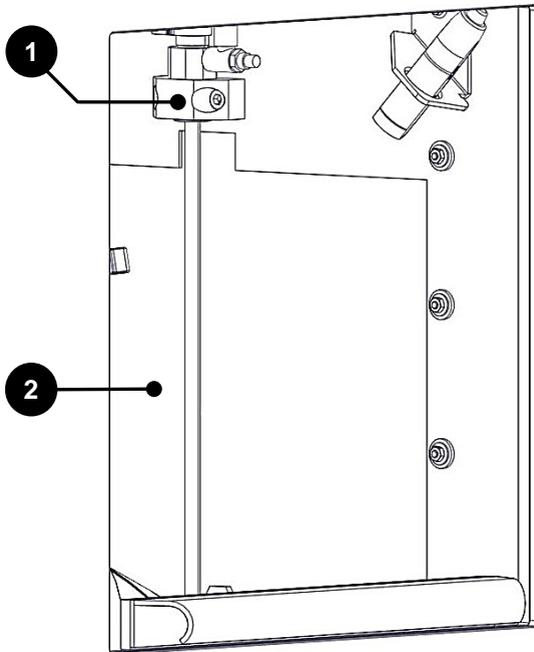


Item	Designation
1	Protective door loader
2	Separating door inside
3	Safety interlocking system loader
4	Protective door for cooling lubricant tank
5	Safety interlocking system milling chamber
6	Protective door milling chamber

---

### 5.17.3 Separating door inside

Inside the CORiTEC 350i Loader (PRO) (+) machines there is a partition door between the loader and the milling room. During a milling process, the partition door is closed and protects the loader interior against chips, dirt and moisture. With the partition door closed, workpiece holders can be removed or inserted in the loader interior during a milling process.



Item	Designation
1	Pneumatic operating mechanism of the interior separation door
2	Separating door inside

### 5.17.4 Protective door monitoring

The protective door to the milling area is monitored with a safety interlocking system. If the protective door is opened then the machine cannot be started and is in set-up mode!

### 5.17.5 Protective door lock

The protective door to the milling area is locked during a milling process and can only be opened when all axes and the machining spindle have come to a standstill.

### 5.17.6 Cover button

The cover button allows the user to open the protective door for the milling area and thereby gain access to the working area of the machine. Operation of the cover button is only possible with the machine at a standstill. Before starting the machine, it is necessary to close the protective door again and latch the safety interlocking system.

Opening the safety door is necessary in order to equip the machine with the process material and milling tools.

## 5.18 Working and hazard area

### 5.18.1 Working area

Area	Operating mode
Control panel	Set-up / automatic
Workpiece holder	Set-up
Tool holder	Set-up

### 5.18.2 Hazard area

Area	Operating mode
Entire machine interior	Set-up / automatic

---

## 5.19 Safety equipment that the operator might have to retrofit

### Extraction system

When dry processing certain materials, the operator must install an extraction system, in order to vacuum off fine dust that is harmful to health. Only use original imes-icore extraction systems because these are designed for the requirements of the machine. Other extraction systems require the approval of imes-icore GmbH.



For further information please contact the imes-icore customer service department.

### Fire protection

When processing flammable materials the operator of the machine must perform a risk assessment of the workstation in accordance with ArbSchG §§ 5 and 6, because he selects the materials and tools (see also industrial health and safety regulation). When doing so, it is necessary to assess the risks of fire with consideration to the materials and tools, and if necessary to define measures for their reduction (e.g. extinguisher equipment, temperature monitoring, monitored operation by employees).

Always also observe the safety information and data sheets from the cooling lubricant and materials manufacturers! In accordance with the organisational fire protection, suitable extinguisher equipment (fire blankets and fire extinguishers of class A, B, C, D) must be made available as is expedient and in sufficient quantities. When selecting the extinguisher equipment it is essential to observe the limitations of use and the distance information.



For further information please contact your responsible fire protection officer.

## 6 Transport and packaging

### 6.1 Safety instructions for transport

<b>Personnel required:</b>	Specialist personnel	
<b>Protective equipment required:</b>	Protective work clothing, protective gloves, safety footwear	

Before installation and further use, it is necessary to familiarise the storage, operating and maintenance personnel of the operator with package handling. It is essential to observe the following instructions!

#### 6.1.1 Improper transport

 <b>CAUTION!</b>
<b>When installing the system!</b>
When setting up the machine, there is a risk of crushing as a result of trapping of limbs by the machine!
<ul style="list-style-type: none"> <li>• Usage of suitable auxiliary equipment, e.g. lift truck, forklift truck, crane.</li> <li>• The machine must only be lifted with suitable lifting equipment or with a sufficient number of people!</li> </ul>

 <b>CAUTION!</b>
<b>With improper transport!</b>
Improper transport may result in transported items falling or toppling! This may result in significant personal injury or property damage!
<ul style="list-style-type: none"> <li>• Do not stack transports!</li> <li>• Transport with care!</li> <li>• Remove packaging only directly prior to installing the machine!</li> </ul>

---

## 6.1.2 Eccentric centre of gravity



### Concerning falling or toppling packages!

Incorrect striking (fastening) may result in injury or even death due to tipping or falling transport pieces, as these may have an eccentric centre of gravity!

- Observe the markings and details of the centre of gravity of packages!
- When using cranes, the crane hook should be placed over the centre of gravity of the package!
- Carefully lift packages with consideration for possible tilting!
- If necessary, adaptation of the attachment point!

## 6.2 Transporting pallets

Transported items fastened on a pallet can be transported with a forklift truck or lift truck, if the following conditions have been fulfilled and complied with:

- The forklift truck or lift truck must be designed for the weight of the transported item.
- The transported item must be securely fastened to the pallet.
- A driver authorised in accordance with the valid national regulations must be available to drive the industrial truck with driver's seat or driver's platform.
- Drive the forklift truck or lift truck with the forks between or beneath the spars of the pallet.
- Drive in the forks sufficiently, until they protrude on the opposite side.
- Make sure that the pallet cannot tip with an eccentric centre of gravity.
- Lift the pallet with the transport item and start to transport it.

## 6.3 Transport locks

No transport safety devices must be installed.

## 6.4 Carry handles (transport aid)

For the installation of the machine, the carry handles (including in the accessories of the machine) must be mounted. These carry handles are necessary for a safe transport of the machine. The transport process must be carried out with suitable transport devices! The mounting of the carry handles is described in chapter 7.7!



## **6.5 Packaging**

The individual packages have been packaged according to the anticipated transport conditions. The packaging serves to protect against transport damage, corrosion and other damage. Therefore only remove the packaging directly prior to assembly.

## **6.6 Handling packaging materials**

Store the machine packaging for any subsequent transport. Otherwise take the packaging to an appropriate recycling centre in accordance with the valid legal and local regulations.

## 6.7 Standard scope of delivery

Image	Description	Pcs.	Image	Description	Pcs.
	CORiTEC 350i (Loader) (PRO) (+)	1x		USB mouse	1x
	Touch Pen	1x		Cleaning brush	1x
	Triple socket strip	1x		Operating manual	1x
	Mains connection cable 5 m (Schuko®)	1x		Crevice nozzle	1x
	RJ-45 network cable	1x		Hexagon socket Screwdriver 3 mm	1x
	Compressed air spiral tube 7.5 m	1x		Transport aid (carry handles)	2x
	Spindle maintenance kit	1x		Measuring cup	1x

Additional standard delivery scope for the machines CORiTEC 350i Loader (PRO) (+):

Image	Description	Pcs.	Image	Description	Pcs.
	Workpiece holder with clamping ring	6x		Discharge tool workpiece holder	1x

## 7 Installation and first commissioning

### 7.1 Safety instructions for installation and first commissioning

<b>Personnel required:</b>	Specialist personnel / manufacturer	
<b>Protective equipment required:</b>	Protective work clothing, protective gloves, safety footwear, safety goggles, hearing protection	

#### **WARNING!**

##### **Concerning defective installation and initial commissioning!**

Defective installation and false first commissioning can result in serious injuries and significant property damage!

- Reading all of the instructions manuals and data sheets (machine, extraction system, accessories, etc.)!
- Attention to sufficient freedom of assembly at the workplace!
- The assembly location must be clean and orderly! Components and tools that are lying loose or on top of each other are potential accident sources!
- Use of personal protective equipment!

#### **WARNING!**

##### **Before connecting to the mains supply!**

Only establish the connection with the mains supply network once the machine is ready for commissioning! Otherwise serious injuries to persons and damage to the machine may arise!

- Check all installation work according to the instructions and information given in this manual!
- Check the proper installation of accessories!
- Avoidance of tripping hazards and damage during the laying of cables and hoses!
- Check the correct fit of all plug connections!
- Check that the actual mains input voltage matches the mains input voltage on the type plate!



Installation and commissioning must be performed exclusively by authorised specialist personnel!

---

## 7.2 Requirements for the installation location

The installation location of the machine must fulfil the following requirements. Please observe chapter 4 Technical data in this regard:

- The machine may not be installed in areas at risk of explosion!
- Never operate the machine at locations in which there is a risk that water or other liquids might penetrate the machine!
- The installation surface must be dry, level and suitable for the weight of the machine. There must also be sufficient stability, in order to absorb the vibrations produced by the machine!
- Check the surface of the installation site with a spirit level to make sure this is level!
- A corresponding plug, a network connection and a compressed air connection must be located close to the device and be freely accessible!

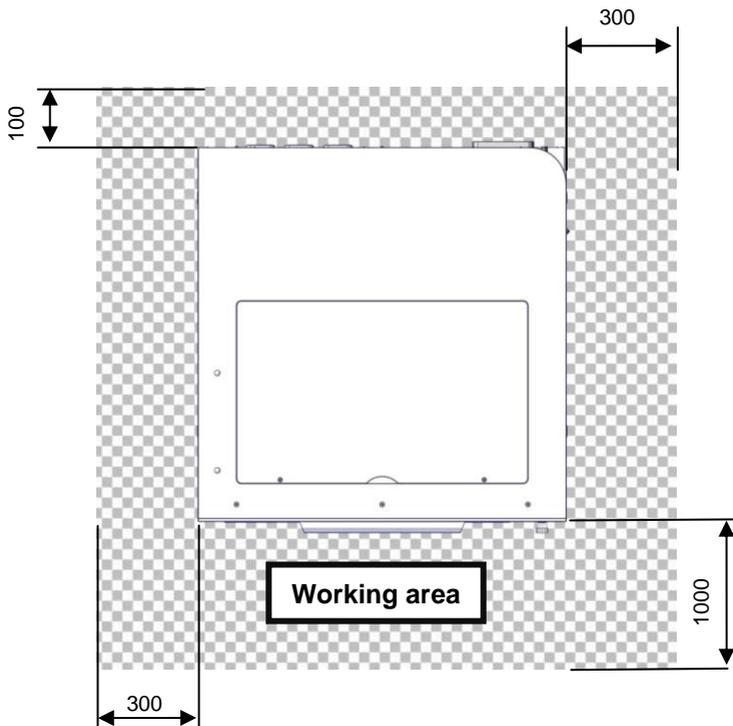
## 7.3 Installation plans

### 7.3.1 For operation of the machine

#### CORiTEC 350i (PRO) (+)



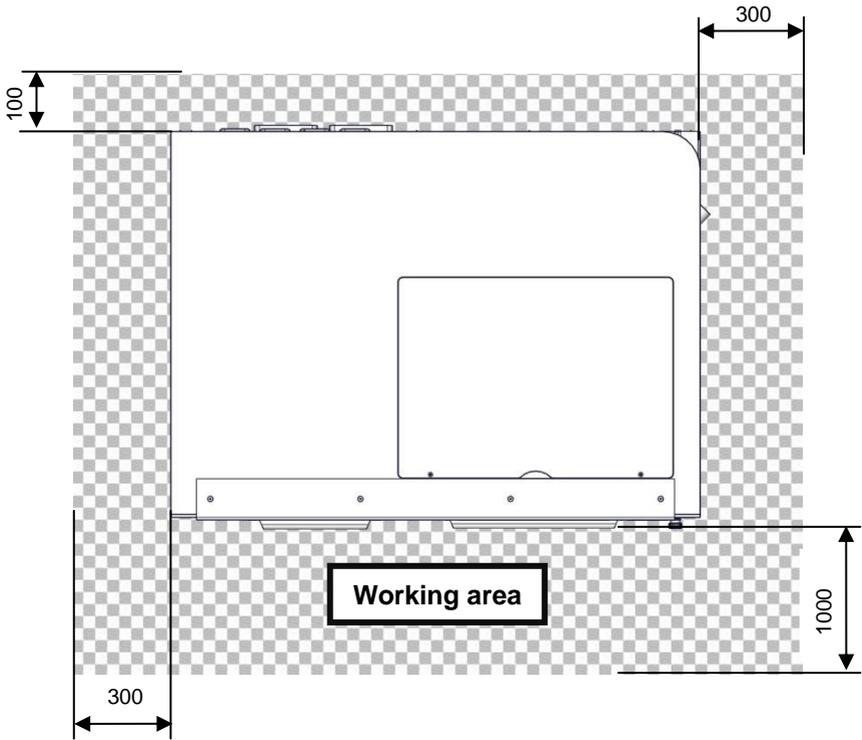
All dimensions are indicated in millimetres (mm) and not true to scale.



---

**CORiTEC 350i Loader (PRO) (+)**

**i** All dimensions are indicated in millimetres (mm) and not true to scale.

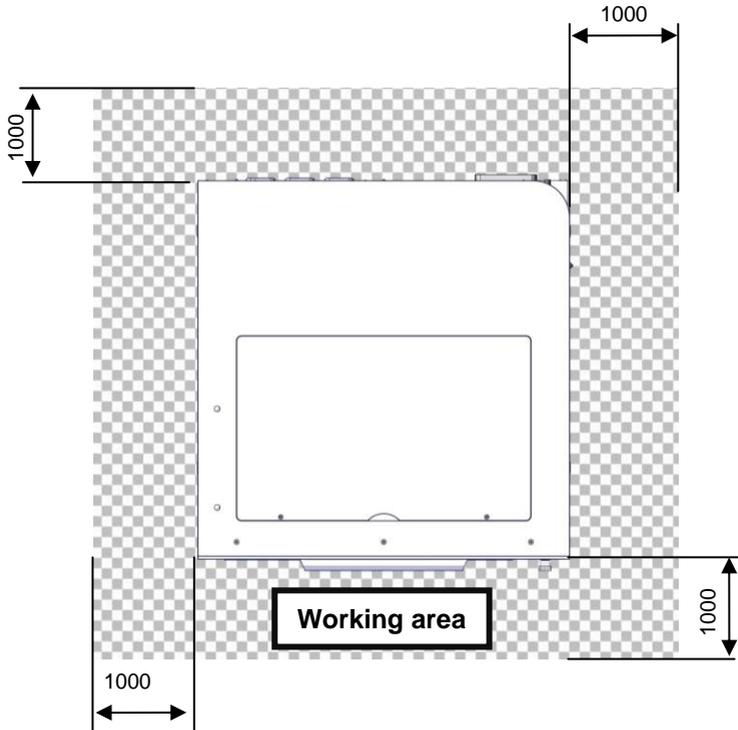


### 7.3.2 For service and maintenance work

#### CORiTEC 350i (PRO) (+)

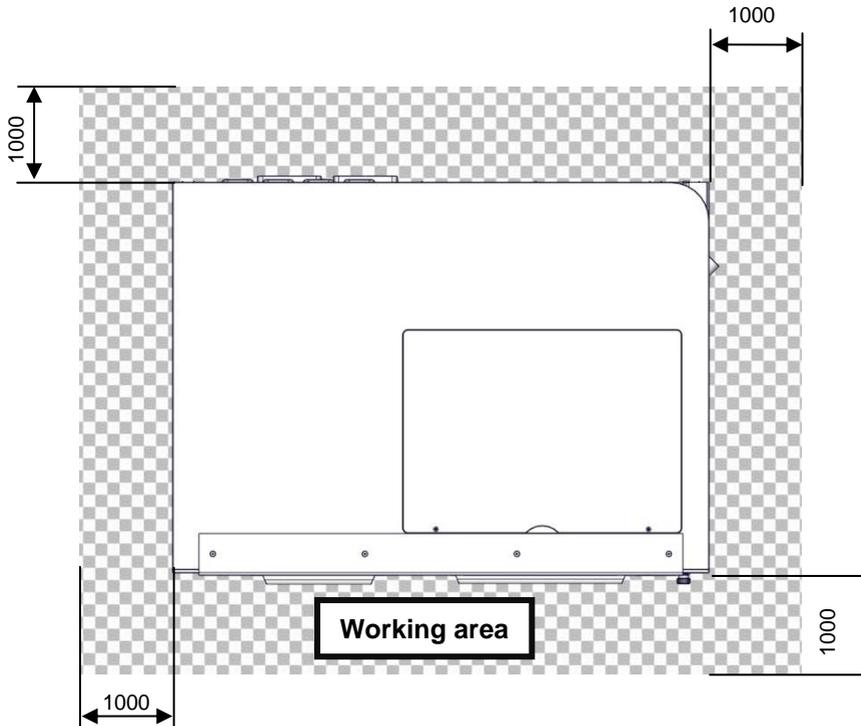


All dimensions are indicated in millimetres (mm) and not true to scale.



**CORiTEC 350i Loader (PRO) (+)**

**i** All dimensions are indicated in millimetres (mm) and not true to scale.



## 7.4 Ergonomics and workplace configuration

In order to enable the best possible operability and ergonomic work, the machine should be placed on a suitable machine table. Imes-icore GmbH will be happy to offer a machine table tailored to your machine.

## 7.5 Space requirement

When installing the machine, make sure there is sufficient space around the machine!

- For the machine dimensions refer to the technical drawing (see chapter 7.6) or the technical data (chapter 4).
- Keep sufficient space available around the machine for ventilation and hose connections, and avoid stumbling hazards when laying the connection cables and hoses.
- During operation, the machine must be positioned as described in chapter 7.3.1– Installation plan for operation of the machine. So that a distance of 1000 mm in front, 100 mm behind and 300 mm on the right and left side of the machine is available as a minimum.
- Before service and maintenance works the machine must be positioned as described in chapter 7.3.2 – Installation plan for service- and maintenance works. There must be a safety distance of 1000 mm around the machine to guarantee an unobstructed area in the workplace, so that it is freely accessible from all sides during service and maintenance work!



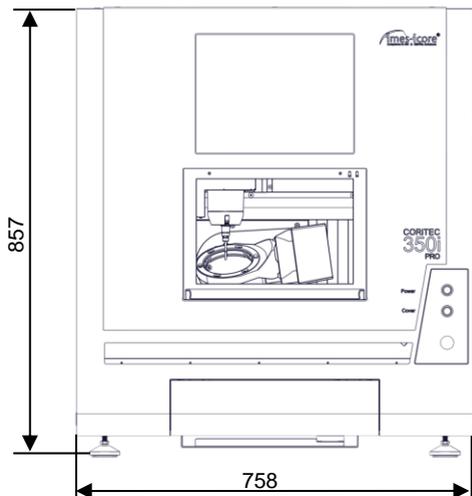
This machine is designed for operation in weather-protected areas and must not be operated in explosive atmospheres!

## 7.6 Technical drawing

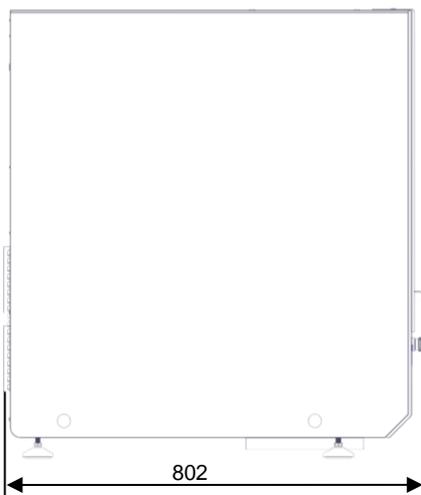
### CORITEC 350i (PRO) (+)



All dimensions are indicated in millimetres (mm).



Front view

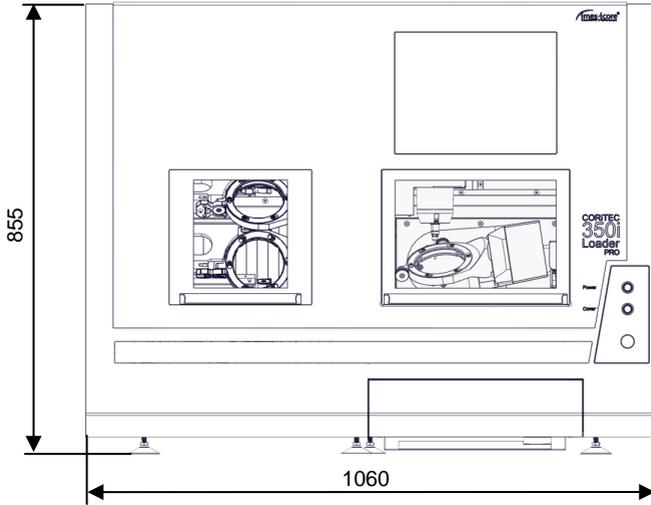


Side view

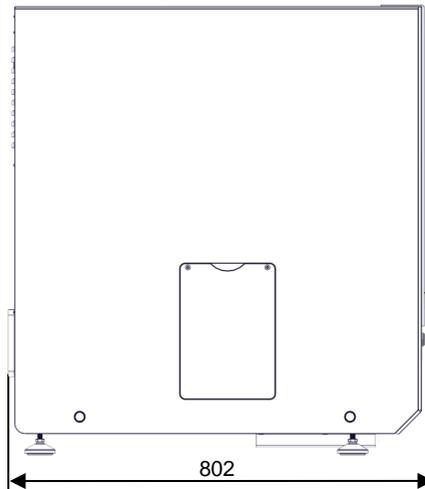
### CORiTEC 350i Loader (PRO) (+)



All dimensions are indicated in millimetres (mm).



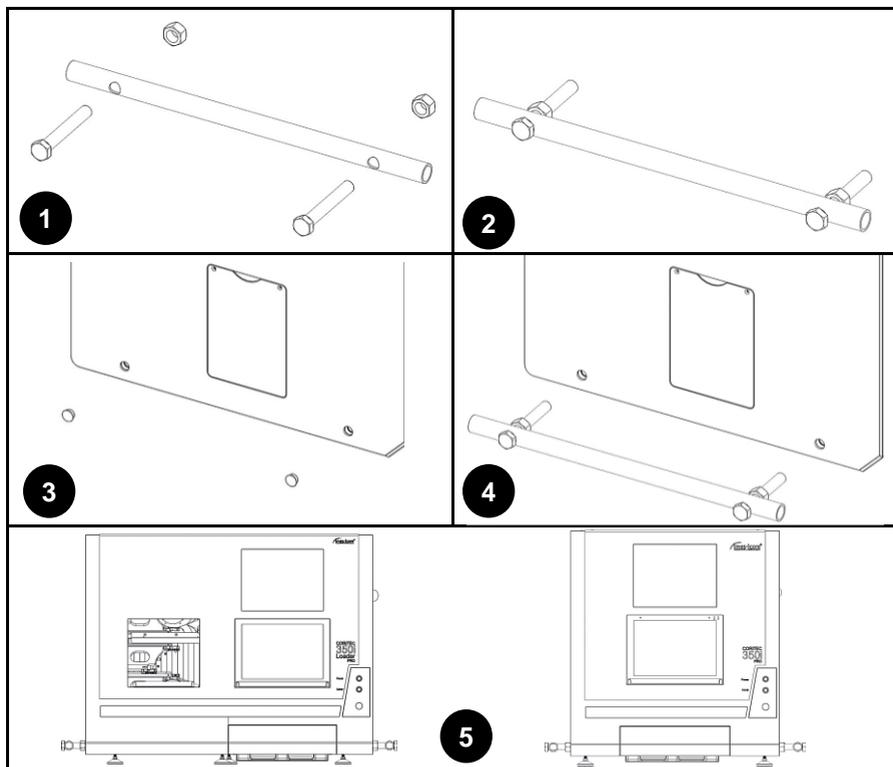
Front view



Side view

## 7.7 Installation of the carry handles

Step	Description
1	Remove the two carry handles, the four M20 x 140 hexagon screws and the four M20 hexagon nuts from the machine accessories.
2	Put the hexagon screws through the holes in the carry handle and tighten the hexagon nuts on the screws. Leave some space between the nut and the carry handle (approx. 5 mm), so the screws can still be rotated.
3	Remove the plastic plugs (Blind plugs), two each on the left and right side of the machine to reach the threads.
4	Screw the hexagon screws in all way in alternation, till the end stop in the threads of the machine.
5	Tighten the hexagon nuts against the carry handles (tighten firmly), to lock them and stabilize the carry handles.



## 7.8 Setting up the machine

In order to set up the machine, proceed as follows:

Step	Description
1	Transport the machine to the intended installation site (sufficient space must be kept available all round the machine for operation and set-up, traffic/emergency exit routes must be kept clear).
2	Only remove the packaging directly prior to installation.
3	Store the packaging for any subsequent transport.
4	Make sure that all parts included in the scope of supply are contained in the delivery package.
5	Check the delivery for transport damage and raise any complaints immediately.
6	Install the carry handles as described in chapter 7.7.
7	Lift the machine onto the installation location using only suitable lifting devices (the installation surface must be capable of absorbing any vibrations, be located at an ergonomically suitable installation height and suitable for the weight of the machine).
8	Check that all machine feet are firmly positioned on the installation area. If necessary, readjust the screwable machine feet.

---

## 7.9 Connecting the machine

First, all other electronic and pneumatic connections are established!

Then, the mains plug-in of the machine can be connected with the power mains last.

**In order to connect the machine, proceed as follows:**

Step	Description
1	Connect the compressed air to the maintenance unit.
2	Connect the hose of the extraction system (optional).
3	Connect control line and if applicable the cleaning air of the extraction system (optional).
4	Put the extraction system into operation (see manual for the extraction system) (optional).
5	Establish the network connection (optional).
6	If necessary, connect additional accessories (see manuals for the accessories). Install water hoses and spindle cooling monitoring sensor (CORiTEC 350i (Loader) PRO + only).
7	Connect the mains plug-in of the machine with the power mains.



The connection requirements are listed in Chapter 4. - Technical data and on the type plate of the machine!

## 7.10 Connection to the mains network



### Due to electricity!

Contact with live parts or damage to insulation poses immediate danger to life and limb due to electric shock!

- Immediately repair damage to safety equipment and live parts.
- When connecting the machine to the mains supply network only use the connection cables supplied. This is standardised according to DIN EN 60309 and VDE 0623 and requires a mains voltage from 110 - 230 Volt.
- Only use Schuko outlets because the protective conductor connection is established via the mains connection line!

**In order to connect the machine to the mains supply network, proceed as follows:**

Step	Description
1	Check whether a suitable power connection is within reach.
2	Compare the technical data for the machine with the data for the available mains supply network. Only proceed with the machine installation if the data corresponds!
3	Connect the mains connection cable with the machine.
4	Check that the mains connection cable is positioned correctly.
5	Connect the mains connection cable with the power connection (shock-proof socket).
6	Make sure that the cable is not strained or rubbing on edges.

## 7.11 Aligning the machine

The clamping surface and all axes are aligned at precise right angles in the factory. It is therefore unnecessary to align the machine. Never loosen the axes fastenings, otherwise a service technician will need to readjust these against a cost!



The alignment of the machine is checked and guaranteed by authorized service personnel during commissioning!

---

## 7.12 Before initial commissioning

**Before initial commissioning, you must ensure that:**

- The system is installed and aligned on a horizontal surface. Check this with a suitable spirit level.
- The safety distances from the installation plans (see chapter 7.3) are adhered to.
- The workstation is clean and well-illuminated.
- The maintenance unit is connected with a pressure between 6 – 9 bar.
- The required accessories are correctly connected and installed.
- All plug-in connections are secure and correctly seated.
- All cable and hose connections have been laid professionally.
- All covers and safety equipment are installed and functioning perfectly.
- The ambient temperature is between +18 and +25 °C (see chapter 4.5).
- All stipulated technical requirements of the system have been fulfilled (See Chapter 4).
- The EMERGENCY STOP switch is not latched.
- In case of machines with a cooling lubricant system, the cooling lubricant tank is sufficiently filled.
- At least one suitable tool is in the tool changer.
- The control software “Remote Dental” is installed on the control PC and has been put into operation.
- The instruction manual has been read in full and understood, and it is located in the immediate vicinity of the machine and is freely accessible at all times.

## 7.13 Installation, assembly and use of accessories

The installation or assembly of accessories must take place in accordance with the information in the respective operating manual for the accessories!



### **Due to incorrectly installed accessories!**

Incorrectly installed accessories, e.g. inside the machine, may be ejected or fall in an uncontrolled manner during operation, thereby causing serious injuries!

Always install accessories professionally, with consideration to the safety regulations and the associated documentation!



Our customer service is available to you for any questions and assistance you may require.

---

### **7.13.1 Extraction systems (optional)**

When milling certain materials, fine dust and possible gas development may arise. Fine dust and gases are harmful to health. Ensure sufficient ventilation if dust or gases develop due to material processing. Make sure the extraction system is functioning correctly. Only process materials that may produce fine dust or gases in conjunction with an appropriately configured extraction system. imes icore GmbH offers appropriate extraction systems.

Always observe the instruction manual for the extraction system and the safety instructions, maintenance and cleaning intervals specified, in order to ensure safe and seamless operation of the machine.

To connect an extraction system, follow the description in chapter 8.3.1.

### **7.13.2 Wet processing (optional)**

During wet processing, the material is processed with an active cooling lubrication system. Only use cooling lubricant approved by imes-icore GmbH for wet processing. When using cooling lubricants, always ensure sufficient ventilation!

In order to put the cooling lubrication system into operation, follow the description in chapter 8.3.2

### **7.13.3 Cooling lubricants (optional)**

Only use cooling lubricants approved by imes-icore GmbH for material processing with a cooling lubricant system. The cooling lubricants used by imes-icore are optimally tailored to the requirements of the machine and guarantee a seamless processing sequence. To ensure intended use, storage and disposal of the cooling lubricant be sure to read the respective safety data sheet issued by the manufacturer. The cooling lubricants must be stored in the containers supplied and intended for this purpose!

Always observe the legal regulations and safety data sheets when handling cooling lubricants. The machine operator must instruct his employees regularly regarding the handling of cooling lubricants and ensure correct storage and disposal!

In addition, you must check the mixing ratio with a refractometer in accordance with the manufacturer's instructions from the manufacturer of the cooling lubricant.

---

### **7.13.4 Cooling aggregate machining spindle (optional)**

To cool the machining spindle, a cooling unit is used on machines of the CORiTEC 350i (Loader) PRO +. To ensure intended use, storage and disposal of the spindle coolant be sure to read the respective safety data sheet issued by the manufacturer.

Always observe the instruction manual for the cooling aggregate and the safety instructions, maintenance and cleaning intervals specified, in order to ensure safe and seamless operation of the machine.

Always observe the legal regulations and safety data sheets when handling coolants. The machine operator must instruct his employees regularly regarding the handling of coolants and ensure correct storage and disposal!

### **7.13.5 Ionizer device (optional)**

An ionizing unit can optionally be installed in the milling room of the machine. The ionizer generates ions. These ions are attracted by positively charged plastic chips. As a result, a neutralization of the charge of the plastic chips takes place. Afterwards, plastic chips can be extracted more effectively. The device is automatically switched on by the milling program.

Machines with built-in ionizing device may only work on dry materials! Contact of the ionizer with moisture may result in material and personal injury.

Always observe the instruction manual for the ionisation device and the safety instructions, maintenance and cleaning intervals specified, in order to ensure safe and seamless operation of the machine.

## 8 Operating the system

### 8.1 Safety instructions for operation

<b>Personnel required:</b>	Operator	
<b>Protective equipment required:</b>	Protective work clothing, protective gloves, safety footwear, safety goggles, hearing protection	

For safe handling of the system note the following points:

- Persons who operate the machine must be at least 18 years of age!
- During training, all persons - in particular those under the age of 18 - must be supervised constantly!
- The machine must be operated exclusively by authorised and trained specialist personnel without physical limitations!
- Responsibilities for the operation, maintenance and servicing of the machine must be clearly stipulated and complied with!
- Cleaning, maintenance and servicing work must only ever be carried out when the machine is switched off!
- The machine operator should attend a training session of at least one day before operation, in order to learn how to handle the machine safely and avoid erroneous use!
- Before every milling process check that the workpiece is secure, so that it cannot become loose during processing!
- Before starting processing, always check that sufficient cooling lubricant is present in the cooling lubricant tank! If the pump of the cooling lubricant system should run dry then this can lead to the destruction of the pump!
- Do not use running water for cooling/lubrication, but rather only a cooling lubrication system with suitable cooling lubricant!
- Every person involved with the installation, operation, maintenance, repair or inspection of the machine must have read and understood all the safety instructions!

 **DANGER!**

#### **Due to sharp-edged or pointed tools!**

Risk of injury and death when reaching into the machine's interior!

- Be aware of protruding tools!
- Caution with sharp tools!
- Never reach into a running tool or moving parts!
- Wear protective gloves and safety goggles!

---

 **DANGER!**

**Due to improper operation!**

Improper operation of the machine can result in serious injuries and significant property damage!

- Operating steps must be carried out in accordance with the instructions in this manual!
- Safety devices must not be bypassed, manipulated or turned off!
- Changes to tools, materials or parameters must be monitored during the process (monitored operation)!
- Check the machine for obvious defects and integrity before switching on!
- Eating, drinking and smoking are prohibited when handling cooling lubricants or vacuumed substances!
- Mobile phones may not be used in close proximity to the machine, because interference of the CNC control cannot be excluded!

 **WARNING!**

**Concerning a risk of slipping!**

A risk of slipping exists due to dust, material, oil or cooling lubricants on the floor! Heavy parts or sharp tools may cause serious injuries!

- Therefore remove all soiling from the user's workstation immediately!
- Wear non-slip safety footwear!

 **WARNING!**

**Concerning hot surfaces on materials and tools!**

Risk of burns on heated materials or tools after processing! High temperatures may occur during machine operation!

- Before any work or activity, check the temperatures of the surfaces for heating!
- Always wear heat-resistant work clothing and protective gloves during work!

**⚠ CAUTION!**

**When switching the system on and off!**

Incorrect switching on and off can cause a short!

The machine and accessories must always be switched on and off with the machine main switch. Never use the mains plug as an on / off switch!

**⚠ CAUTION!**

**Concerning loose tools or objects inside the machine!**

Loose tools or objects in the interior of the machine can block or be thrown around moving components of the machine. This can cause property damage!

Before starting the machine, check the machine interior for loose and lying objects!

**⚠ CAUTION!**

**Concerning the formation of fine dust or gas development!**

Damaged suction hoses or an unsuitable extraction system can cause gas and fine dust pollution!

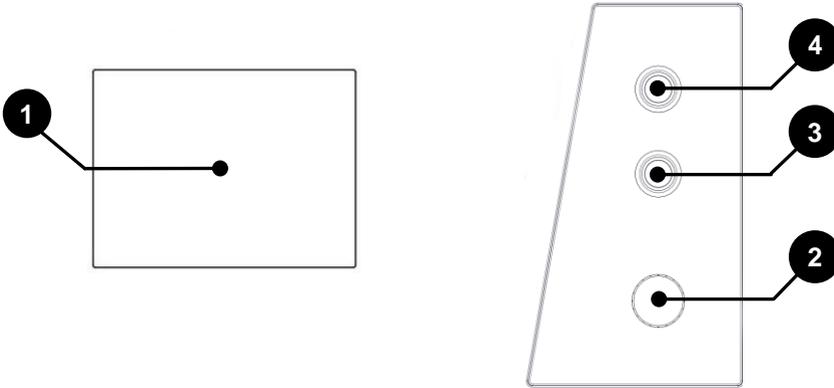
- Before starting the machine, check the extraction system for proper function and integrity!
- Replace porous and defective suction hoses!



Always ensure a clean and well-lit workstation!

## 8.2 Operating elements

Machines of the CORiTEC 350i series have the following four operating elements on the front:



Item	Designation	Description
1	Control panel	The control panel serves to operate the machine. Navigation and the entry of data for the operating system and operating software are done directly via the touchscreen.
		<b>The control panel serves to operate the machine.</b>
2	EMERGENCY STOP switch	The EMERGENCY STOP switch implements the fastest possible machine stop. Pressing the switch stops all drives immediately and the power electronics are disconnected from the power supply. After it is pressed, the EMERGENCY STOP switch remains latched.
		<b>Turn the EMERGENCY STOP switch to the right to disengage it.</b>
3	Cover button	The cover button serves to open the protective door. Pressing the button makes it possible to open the protective door. This process is only possible if the button is constantly illuminated. The button illumination signals that all drives of the machine are at a standstill.
		<b>The cover button must be held to open the protective door.</b>
4	Power button	Pressing the power button switches on the machine's power electronics. It is only possible to switch on the power electronics if all safety-relevant electronic equipment is fault-free.
		<b>The power button must be pressed before starting the operating software or after a prompt from the operating software.</b>



Before disengaging the EMERGENCY STOP switch, make sure that all faults have been remedied.

## 8.3 Operating modes

 <b>CAUTION!</b>
<b>When changing operating modes!</b>
When changing the types of dry to wet or wet to dry, heavy contamination and coolants can damage the machine or the extraction system!
Thoroughly clean the machine before each change of the type of machining and at least once a day!

### 8.3.1 Dry processing

 <b>CAUTION!</b>
<b>In case of improper use of an imes-icore extraction system!</b>
The extraction systems supplied by imes-icore GmbH serve exclusively to vacuum dry milling dust. Do not vacuum cooling lubricant residues with the extraction systems supplied. This can lead to serious damage and even destruction of the extraction system!
Thoroughly clean the machine before each change of the type of machining and at least once a day!

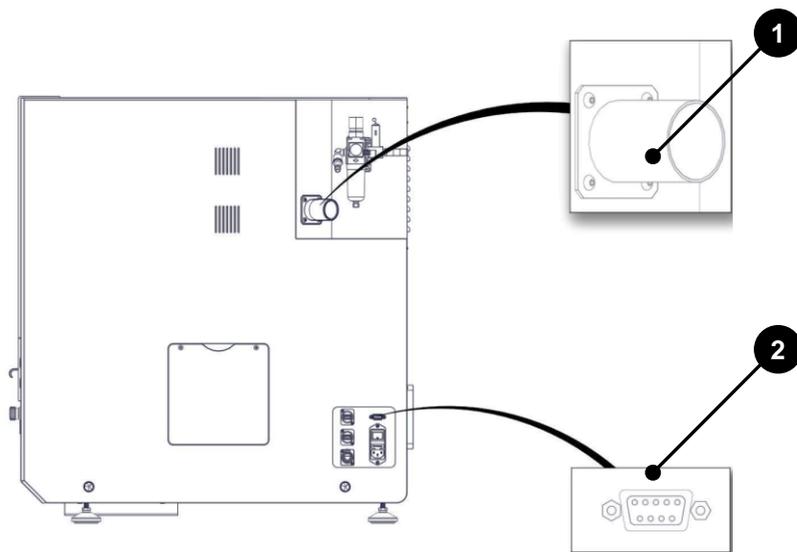
During dry processing, the material is processed without a cooling lubrication system. As such, fine dust and gases can be produced, which may have harmful effects on health. Furthermore, dust that is not extracted may damage the machine and result in an increased risk of fire. The connection and operation of an extraction system approved by imes-icore GmbH is therefore required for the dry processing of materials.

**The following materials are usually dry-processed:**

- Zirconium dioxide
- Plastic
- Composite
- Wax
- Cobalt chrome

**In order to start dry-processing a workpiece, proceed as follows:**

Step	Description
1	Connect the hose of the extraction system to the extraction nozzle of the machine.
2	Connect the extraction system to the control connection (Sub-D bushing) of the machine using the supplied control cable (included in the extraction system).
3	Connect the low-heat device connector of the extraction system to an external shockproof socket.
4	Check that the extraction system is correctly connected.
5	Start the milling process with the extraction system switched on.



Item	Designation
1	Sub-D socket (connection for control cable of the extraction system)
2	Suction port (connection for the extraction system hose)

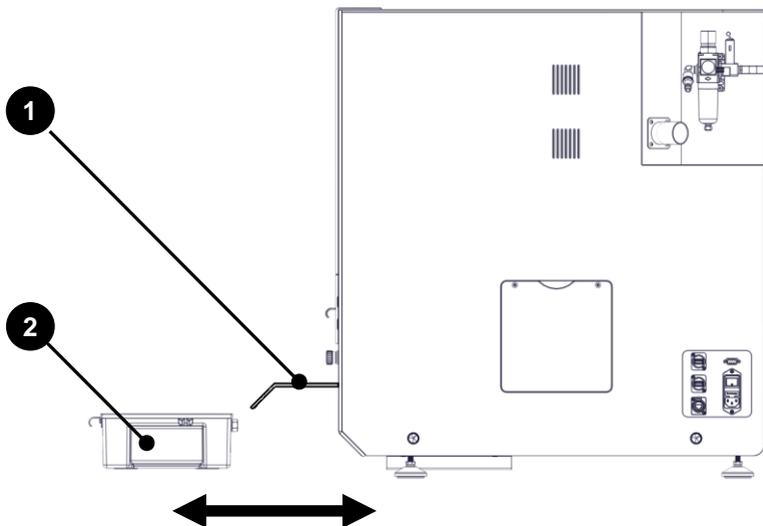
### 8.3.2 Wet processing

The following materials are generally wet-processed:

- Lithium disilicate
- Glass-ceramic
- Titanium

In order to start wet-processing a workpiece, proceed as follows:

Step	Description
1	Thoroughly clean the complete machine interior and the flat filter of the machine interior of chips and dry milling dust. Only use a filter fleece for wet processing. (Wear protective gloves and safety goggles all the time!).
2	Open the access door to the cooling lubricant tank (Figure below (1)).
3	Remove the cooling lubricant tank (Figure below (2)).
4	Thoroughly clean all filters and the sump of contaminants and fill the sump with 4.8 l of diluted cooling lubricant mixture (observe the mixture ratio according to the cooling lubricant description).
5	Reinsert the cooling lubricant tank (Figure below (2)).
6	Close the access door to the cooling lubricant tank (Figure below (1)).
7	Start the milling process.



---

## 8.4 Operating modes



### Concerning sharp and pointed tools or chips in set-up!

In the machine's set-up mode there is an increased risk of injury due to sharp milling tools, protruding tools, sharp or pointed chips!

Always wear adequate protective gloves and safety goggles in set-up mode!

The machine has three modes of operation. These are explained hereafter.

### 8.4.1 Automatic mode

With a closed protective door, the system is in "automatic" mode. The drives and machining spindle can only be actuated in this operating mode. A program start can take place when the machine is in this state.

### 8.4.2 Set-up

With an open protective hood, the machine is in "set-up" mode. This operating mode serves to load workpieces into the machine (see chapter 8.6) as well as tools (see chapter 8.7), and enables cleaning (see chapter 10.2). If all drives are at a standstill, the protective hood can be opened by pressing the cover button. The drives and machining spindle cannot be actuated in this operating mode. No program start can take place in this machine state.

### 8.4.3 Expanded set-up

Expanded set-up is only accessible to authorised and trained specialist personnel (service personnel) of imes-icore GmbH. This function serves to parametrise the machine and access is protected by a password.

## 8.5 Switching on and referencing

The machine must be referenced upon every start of the operating software Remote Dental. For machines of type CORiTEC 350i Loader (PRO) (+) with Loader, the CNC Manager management software must also be referenced. Without a reference run, the machine cannot perform any processing movements.

**In order to switch on and reference the machine, proceed as follows:**

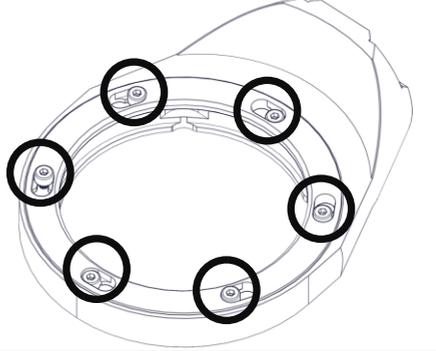
Step	Description	
1	Switch on the main switch in the machine's connection panel (position "1").	
2	If necessary, activate additional accessories (such as the extraction system, cooling aggregate).	
3	Start the operating software Remote Dental on the desktop interface and close the protective door.	
4	Press the "power button" on the control panel.	
5	Press the "power button" in the operating software.	
6	Start referencing the machine.	
6.1	Start the administration software CNC Manager on the desktop (Only applicable for the machine types CORiTEC 350i Loader PRO (+)).	
6.2	Reference the loader (Is only applicable for the machine types CORiTEC 350i Loader PRO (+)).	
8	Once the reference run has been completed, the machine is ready for operation.	

## 8.6 Loading the system with workpieces

With every workpiece change the workpiece holder must be thoroughly cleaned of contaminants, in order to guarantee faultless clamping of the workpiece!

### 8.6.1 Insert and remove workpiece (inside of machine)

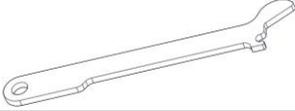
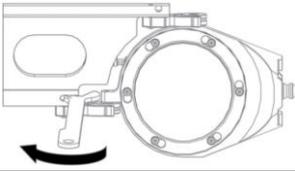
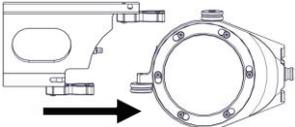
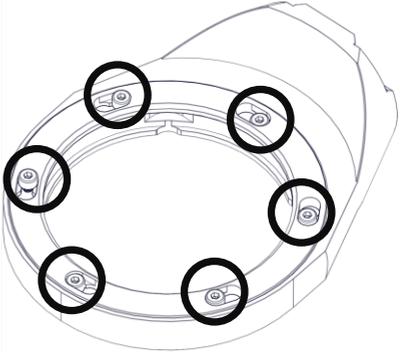
In order to insert or remove a workpiece into the workpiece holder on the interior of the machine, proceed as follows:

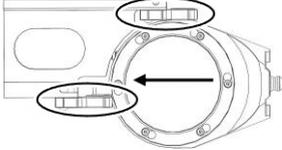
Step	Description	
1	Start the machine as described in chapter 8.5.	
2	Drive the machine to the workpiece change position. 	
3	Wait until all drives and the spindle are at a standstill.	
4	Press the cover button and open the protective door. 	
5	Loosen (do not remove) the clamping screws (black circle) with a 3 mm Allen key.	
6	Remove the clamping ring by turning it clockwise to the right.	
7	Remove the workpiece (if applicable).	
8	Clean the tool holder with the help of the cleaning brush.	
9	Insert the workpiece into the workpiece holder.	
10	Make sure the workpiece is correctly aligned.	
11	Insert the clamping ring and turn it to the left in counter-clockwise direction, until reaching the stop.	
12	Tighten the clamping screws of the clamping ring by hand (see Figure Step 5). The clamping ring may not lift off. It must have full contact with the workpiece holder all around.	
13	Check the secure seating of the workpiece!	
14	Close the protective door.	

## 8.6.2 Insert and remove workpiece (loader)

The loader's management software, called CNC Manager, allows the insertion and removal of workpieces during a running milling process.

In order to insert a workpiece into the loader, proceed as follows:

Step	Description	
1	Start the machine as described in chapter 8.5.	
2	Close the interior door if it is open.	
3	Drive to the desired position in the CNC Manager (Drive to loader position).	
4	Wait until the loader is at a standstill.	
5	Open the protective door of the loader.	
6	Place the ejector tool in the intended position.	
7	Grasp the workpiece holder with one hand and lever it out of the holder in a clockwise direction.	
8	Remove the workpiece holder from the holder in the direction of the arrow	
9	Loosen the clamping screws of the clamping ring (do not remove).	
10	Remove the clamping ring by turning it in a clockwise direction to the right.	
11	If applicable, remove the workpiece.	
12	Clean the tool holder with the help of the cleaning brush.	
13	Insert the workpiece into the workpiece holder.	

Step	Description
14	Make sure the workpiece is correctly aligned.
15	Insert the clamping ring and turn it to the left in counter-clockwise direction, until reaching the stop.
16	Tighten the clamping screws of the clamping ring until hand-tight. The clamping ring may not lift off. It must have full contact with the tool holder all around.
17	Check the secure seating of the workpiece!
18	<p>Insert the workpiece holder into the holder in the direction of the arrow. Pay attention to correct positioning of the attachment points.</p> 
19	Close the protective door of the loader.
20	Check the CNC Manger under "Workpiece in the machine" to see which workpiece holder is currently in the interior of the machine. Press the number of the workpiece holder in the machine interior under "Drive to loader position".

**i** If you want to insert and / or remove workpieces during operation, repeat steps 4 to 20.

## 8.7 Loading the tool magazine

Only use milling tools from imes-icore GmbH. The milling tools are ready-ringed in the correct projecting length and are available via the sales department.

The tool magazine for this machine can be equipped with a max. of 20 tools. Each available tool position can be assigned an arbitrary tool type.

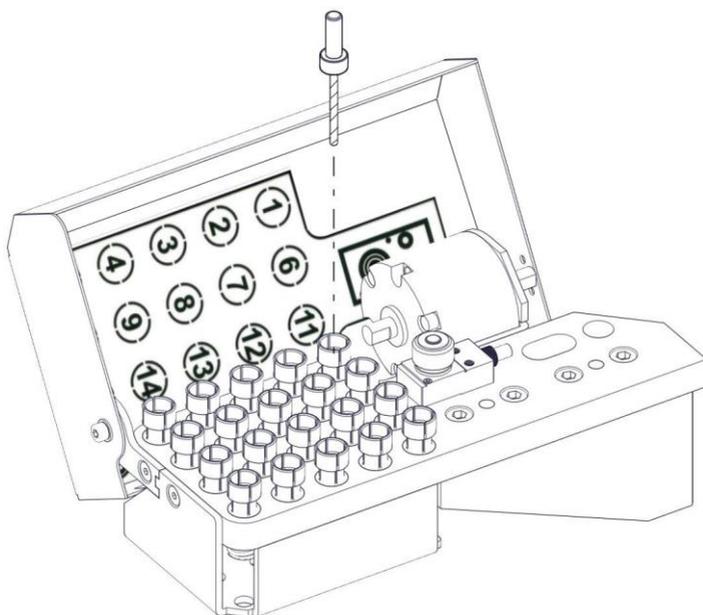
The software does not check whether the milling cutters in the tool fields are also physically inserted in the tool cartridge. If an incorrect milling cutter type or no milling cutter type is stored then this can result in serious damage to the tools, the material or the machine!

**In order to equip the tool magazine with tools, proceed as follows:**

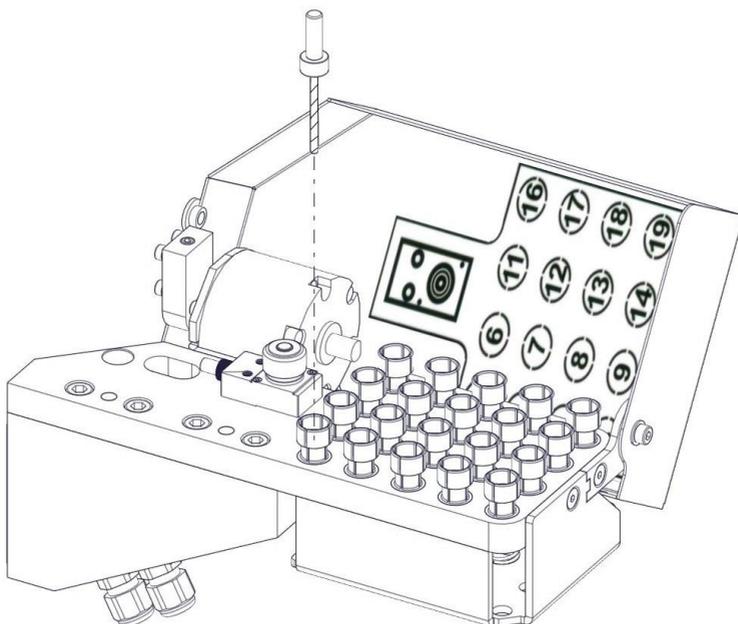
Step	Description
1	Wait until all drives and the spindle are at a standstill.
2	Activate the function "Open / close the tool cover" in the operating software. 
3	Press the cover button on the control panel and open the protective door. 
4	Insert the tool in the corresponding tool position in the tool magazine with the cutting edge to the front, as shown in the following figures (wear protective gloves!).
5	Make sure you do not strike or damage the tools during insertion!
6	Make sure the tool is correctly and securely positioned in the tool changer.
7	Close the machine's protective door.
8	Activate the function "Open / close the tool cover" in the operating software. 
9	Check the operating software, to ensure the tool assignment in the tool changer matches with the assignment in the software!

---

**CORITEC 350i (PRO) (+)**



**CORiTEC 350i Loader PRO (+)**



## 8.8 Tool assignment in the operating software Remote Dental

The following chapter includes a description of how to allocate a tool type to a tool station in Remote Dental.

The software does not check whether the toolboxes of mounted cutters are also physically mounted on the tool changer. If an incorrect milling cutter type or no milling cutter type is stored then this can result in serious damage to the tools, the material or the machine!

Step	Description
1	Start the machine as described in chapter 8.5.
2	Wait until all drives and the spindle are at a standstill.
3	Activate the function "Edit tool field" of the tool field in which the new tool is to be assigned. 
4	Select the corresponding tool. <input data-bbox="568 619 1036 655" type="text" value="[ 11 ] 2.5mm PMMA-Wax RADIUS imes-icore"/>
5	Confirm the tool selection. 

## 8.9 Exchanging tools

The service life of the milling tools in use is logged in the Remote Dental. The preset maximum service life of the milling tools is a recommendation of imes-icore GmbH and may vary depending on the material used. A manual adjustment of the maximum service life of the milling tools is possible by the user in the Remote Dental software. If milling tools are worn, they must be replaced. Replacing the milling tool is also necessary after a tool breaks.

In order to perform a tool change, the user must be familiar with the fundamental operation of the machine and the operating software.



**Only instructed personnel is permitted to perform the tool change!**

### 8.9.1 Replace tools at expired runtime

Step	Description	
1	If the tool to be replaced is currently in the spindle, insert a different tool into the spindle.	
2	Activate the function "Open / close the tool cover" in the operating software.	
3	Wait until all drives and the spindle are at a standstill.	
4	Press the cover button and open the protective door.	
5	Remove the tool with the expired runtime from the tool magazine (wear protective gloves!).	
6	Insert the new tool into the identical tool position in the tool magazine with the cutting edge to the front, as shown in Chapter 8.7.	
7	Be careful not to strike or damage the tool when inserting it.	
8	Make sure the tool is correctly and securely positioned in the tool changer.	
9	Close the machine's protective door.	
10	Activate the function "Open / close the tool cover" in the operating software.	
11	Activate the function "Edit tool field".	
12	Reset the runtime of the new tool in the operating software.	

## 8.9.2 Replace tools in case of tool damage

Step	Description
1	Confirm the message "Tool change module error" with OK.
2	Activate the function "Move to maintenance position". 
3	Wait until all drives and the spindle are at a standstill.
4	Press the cover button and open the protective door. 
5	Remove the broken tool from the tool magazine (wear protective gloves!).
6	Insert the new tool into the identical tool position in the tool magazine with the cutting edge to the front, as shown in Chapter 8.7.
7	Be careful not to strike or damage the tool when inserting it.
8	Make sure the tool is correctly and securely positioned in the tool changer.
9	Close the machine's protective door.
10	Enter a tool number of another tool from the machine into the service position view.
11	Close the service position view. 
12	Activate the function "Edit tool field" of the new tool. 
13	Reset the runtime of the new tool in the operating software. 

---

## 8.10 Tasks before each use of the machine

**Observe the following every time before starting work with this machine:**

- Check the machine for visible defects and ensure integrity.
- Make sure that all covers and safety equipment are installed and functioning perfectly.
- Make sure that all plug-in connections are securely positioned.
- Check the ambient temperature. It should correspond with the information provided in the technical data.
- Make sure the EMERGENCY STOP switch is not engaged.
- Make sure that all necessary accessories (e.g. extraction system, cooling aggregate, machining spindle) are connected correctly and ready for operation.
- Make sure that there is sufficient cooling lubricant in the cooling lubricant tank.
- Check that the required tools are in the machine's tool changer and that the assignment corresponds with the assignment in the operating software.
- Check the machine interior for any loose parts and tools lying around.
- Check the alignment and correct fastening of the workpiece.
- Ensure that successful referencing of the machine has taken place.

## 8.11 Process description

The finished template of the components to be milled are transferred to a CAM software like e.g. CORITEC iCAM VX as an "STL file". In the CAM software, the components are positioned in a workpiece. Subsequently, settings such as process speed, insertion depth of the milling cutter, milling sequence and scaling are automatically specified for further processing. The CAM software generates the milling paths and calculates a milling file. The completed milling file is saved to the control PC of the machine in the folder "C:\NC\_Daten\350i". The operating software "Remote Dental" assumes and processes this information and controls the machine.

## 8.12 Milling file identifiers

After processing the workpiece to be produced in the CAM software, a file is created with the ending ".iso". This file contains all relevant data that is required for executing the milling process. The name of the generated file is composed of blank names, blank heights, material descriptions and other information. Once the file has loaded, it is possible start the milling process by selecting the menu item "open milling program" and pressing the "start" button in the operating software.

## 8.13 Starting a milling process

The following two subchapters describe how to perform the milling process in the CNC Manager management software and the Remote Dental operating software. The milling process of the CORiTEC 350i (PRO) (+) is performed in Remote Dental.

Milling processes of the CORiTEC 350i Loader (PRO) (+) should preferably be started via the CNC Manager, since further milling jobs can be added to a waiting loop during operation. These are started automatically immediately after the current milling job has ended.

### 8.13.1 Starting a milling process in Remote Dental

In order to start a milling process, proceed as follows:

Step	Description
1	Switching on and referencing the machine (see Chapter 8.5).
2	Wait until all drives and the spindle are at a standstill.
3	Insert a workpiece into the clamping device and check the correct positioning of the workpiece (see chapter 8.6).
4	Make sure that there is sufficient cooling lubricant in the cooling lubricant tank.
5	Close the machine's protective door.
6	Transfer the milling file to the control PC. 
7	Open the overview of the milling programs. 
8	Double-click the desired milling file to load it into the operating software Remote Dental.
9	Make sure that all required tools have been created correctly and are present in the tool changer.
10	Start the milling process with the "program start" function. 

---

### 8.13.2 Starting a milling process in CNC Manager

In order to start a milling process, proceed as follows:

Step	Description
1	Switching on and referencing the machine (see Chapter 8.5).
2	Wait until all drives and the spindle are at a standstill.
3	Insert a workpiece into the machine (see chapter 8.6).
4	Make sure that there is sufficient cooling lubricant in the cooling lubricant tank.
5	Close the machine's protective doors.
6	Transfer the milling file to the control PC. 
7	Update the index. 
8	Highlight the milling job.
9	Under the file selection, select the workpiece holder number in which you would like to process the milling job.
10	Make sure that all required tools have been created correctly and are present in the tool changer.
11	Start the milling process with the "program start" function. 

## 8.14 Switching the machine off

In order to switch off the machine, proceed as follows:

Step	Description
1	End the operating software Remote Dental and optionally the CNC manager (End → file). 
2	Shut down the control PC as usual (Windows® start button → shutdown).
3	Wait for the operating system to shut down completely.
4	Switch off the main switch in the connection panel of the machine (position "0"). 
5	If necessary, activate additional accessories (such as the extraction system and cooling aggregate).
6	If necessary, perform cleaning or maintenance work.

## 9 Software

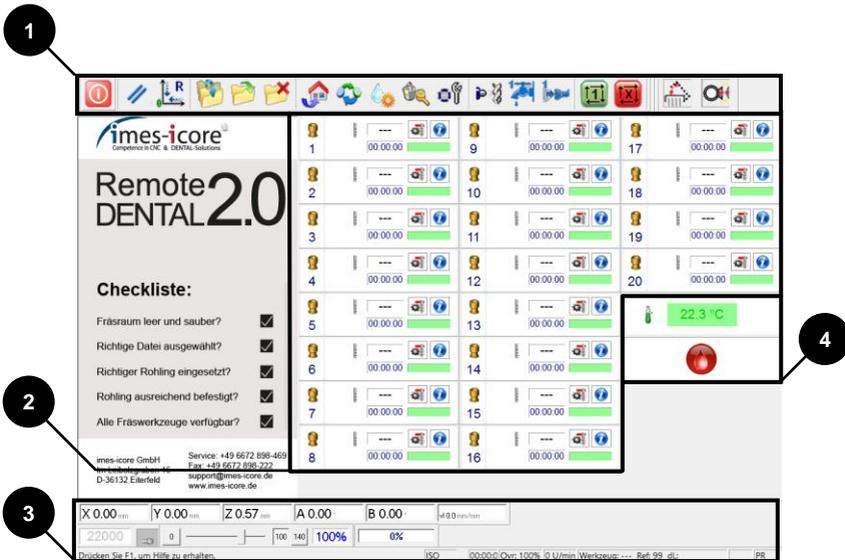
### 9.1 Operating software Remote Dental

Double-click on the link to start the operating software Remote Dental.



#### 9.1.1 Start screen

The start page of the Remote Dental operating software has various functions, information and displays, which are explained in detail in the following chapters.



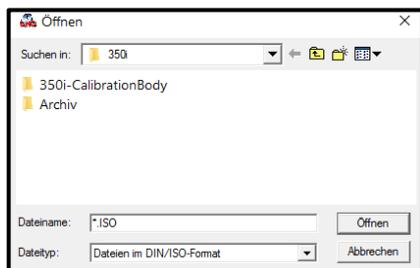
Item	Designation	Chapter
1	Tool bar	9.1.2
2	Tool fields	9.1.3
3	Information bar	9.1.4
4	Status indicator	9.1.5

## 9.1.2 Tool bar

The tool bars serve to edit milling jobs. In addition, functions for maintenance work and for resetting the control are stored here.

Symbol	Designation	Description
	End program	The control software is exited and closed. The control is also reset. In order to access the control software again, it must be restarted.
	Transfer milling files	The milling files from iCAM are transferred over the local network into the folder "C:\NC_Daten\350i" (see chapter 8.11).
	Open milling program	Opens a new window (see below the table on the left). In this window it is possible to open stored milling files. The folder "350i" is opened as standard. This folder contains the two further folders "archive" and "calibration body", as well as the milling files stored in this folder by the function "transfer milling files" (see also chapter 8.12). The folder "archive" contains milling files that have been moved into this folder with the "archive milling files" function. The "calibration body" folder contains milling programs for the creation of a "calibration body" (see chapter 10.10).
	Program start	Starts a loaded milling program. If no milling program is loaded then pressing this button takes the user into the "open milling program" menu, from which it is possible to select a milling program.
	Program stop	Using this button, currently executed milling programs are stopped and the machine drives directly back into the "home position".
	Archive milling files	This button moves all files out of the "350i" folder into the "archive" folder.
	Reset control	With an error the control can be reset with this. Subsequently, it is necessary to perform a reference run again.
	Reference run	With this it is possible to start the system referencing manually.
	Drive to home position	The predefined starting position (home position) of the machine will be approached. This is the same position in which the axes of the machine are located after a reference run.
	Move to spraying position	The machine drives to the spraying position. In this position it is possible to check the alignment of the spray nozzles and to adjust them if necessary.
	Workpiece changing position	The workpiece holder is turned in the horizontal position and is now in the "workpiece change position".
	Drive to cleaning position	The machine drives to a cleaning position. This eases the cleaning of areas inside the machine that are difficult to access.

Symbol	Designation	Description
	Cooling lubricant on / off	The cooling lubricant flow is switched on or off. This function serves only to control the alignment of the spray nozzles. During automatic operation, the cooling lubricant flow is switched on and off automatically after the program start.
	Purging on / off	Manual switch on and off of the air nozzle. During automatic operation, switching on and off takes place automatically. The button serves to control and set the nozzles.
	Extraction system on / off	If an extraction system is properly connected with the machine via a control cable, it can be switched on and off manually using this button. In automatic mode the extraction system is switched on and off automatically with dry processing.
	Drive to service position	The milling cutter in the spindle is placed in its assigned tool position. The machine subsequently drives into the service position. The collet chuck is open and a dialogue window appears (see underneath the table on the right). This function is primarily suitable for free access to the collet chuck for cleaning. Once the service work is complete, close the protective door on the machine again. After selecting a tool position and confirming it, the machine automatically picks up the corresponding tool in the collet chuck and measures it.
	Open / close protective flap	This button can be used to manually open or close the protective flap of the tool changer. In automatic operation, opening and closing is done automatically.
	Workpiece clamp/unclamp	This button is for clamping or unclamping a workpiece holder, in the zero point clamping system, of the milling system.

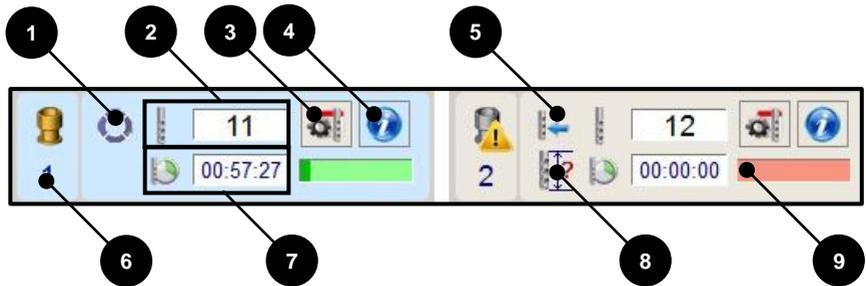


### 9.1.3 Tool fields

In order to enable correct access to the tools, all tools located at the tool positions must be represented on the software interface. Only in this way is it guaranteed that the machine will use the right tool for processing.

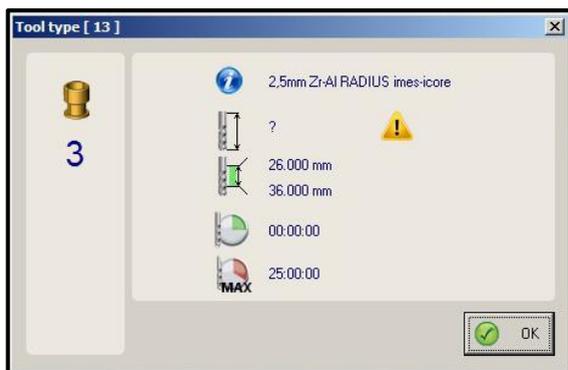
**i** The software does not check whether the tools in the tool fields are also equipped in the device.

The representation of the tools in the operating software takes place by means of the tool fields. It includes the following functions and illustrations:



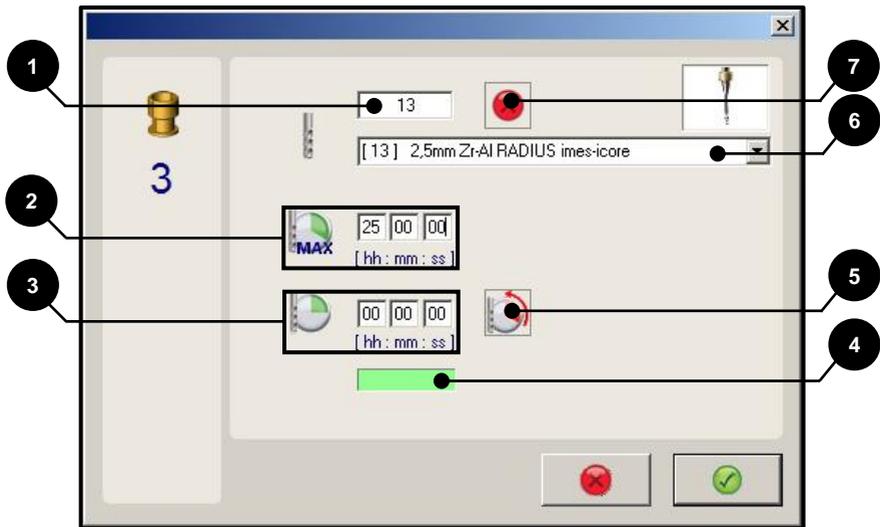
Item	Designation	Description
1	Collet chuck	It signals that the tool is currently located in the clamping sleeve. In addition, the tool field of this tool is highlighted in blue.
2	Tool type	The type of tool is displayed in this field for the respective tool.
3	Edit tool field	For editing the respective tool field. If the milling tool is in use, this symbol is deactivated.
4	Information button	The information button opens a new window. All significant information related to the tool is displayed, such as cutter length, duration, etc. If there is no tool saved, "???" milling type is displayed (see also image underneath the table).
5	Tool change	Performs a tool change. The tool found in the clamping sleeve is replaced by the selected tool.
6	Tool position	The number of the tool slot is displayed in this field. The tool holder's symbol is replaced with a red warning triangle when the value of tool length is not within the specified range after measurement or when breaking of the tool has been determined.
7	Operating life	Indicates how long the tool has been in use for. The time is reset to "0" with a new tool. The time runs during use of the tool. If the tool is stored in its position, the time stops and only starts to run on with the next use.

Item	Designation	Description
8	Tool length	This field displays whether there is an error regarding the tool length.
9	Service time bar display	The bar visually displays the tool wear. If approx. 90% of the maximum service time has been reached then the bar colour changes from green to red and the tool should be replaced.



### 9.1.3.1 Edit tool fields (register tool)

The function (5) tool change from chapter 9.1.3 opens a new dialog window.



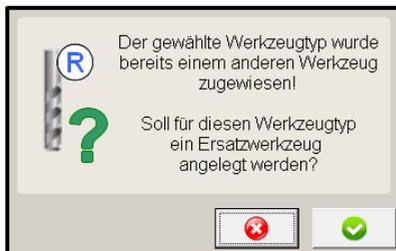
Item	Designation	Description
1	Tool type	In this field, the tool type (cutter type) is assigned to the appropriate tool slot. If the tool type is created another time, the tool will be activated as a "replacement tool".
2	Maximum service life	It is possible to change the maximum service life of a tool here. imes-icore GmbH specifies a suitable tool service life. This service life is based on many years of experience and should not be changed. However, the service life can be specifically adjusted here under your own responsibility.
3	Tool service life	The displayed service life is the actual service life of the tool. The service life can be manually adjusted with an entry. However, overpassing this time can lead to an increase in quality problems when milling (e.g. breakouts). After making an entry in the "tool type" field, the service life is reset automatically.
4	Service time bar display	The bar visually indicates tool service life. If approx. 90% of the service life has passed, the bar colour changes from green to red and the tool should be replaced.

Item	Designation	Description
5	Reset tool service life	Pressing this button resets the service life to "0". This function can be used for example if an existing worn tool is replaced with a new tool. Resetting the service life signals to the software that a new tool is now in the respective tool field.
6	Tool type list	Entering the type of cutter in field "(1) Tool type" can also be done by directly selecting the appropriate cutter from the drop-down list. Further information concerning cutter types is also found here.
7	Delete	This function removes the value from the "Tool type" field.

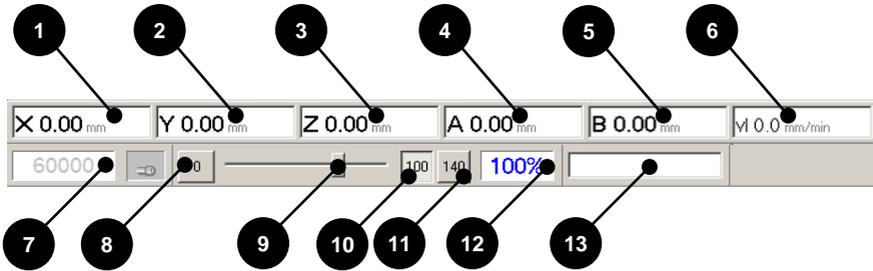
### 9.1.3.2 Save replacement tool

Remote Dental offers the option to work with replacement tools. When the service life of the currently active tool has expired, the machine can change the replacement tool in the next time the identical tool type is changed. Below you will find a description of how a replacement tool is saved. Creating a replacement tool requires that the cutting type has already been created in the machine at least once. Saved tools must actually be located on the assigned tool position or in the machining spindle as active tool.

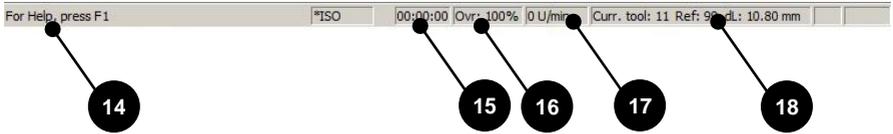
Step	Description
1	With consideration of the safety notices, as described in chapter 8.6.1, place the replacement tool in the desired tool position.
2	Open the control panel "Edit tool field" of the tool field on which you want to create the replacement tool. 
3	Select the identical tool.
4	Confirm the dialog window (see below the table on the left).
5	The tool field shows the replacement tool with one decimal place. When creating several replacement tools of one tool type, the decimal place is continuous (see below the table on the right).



## 9.1.4 Information bar



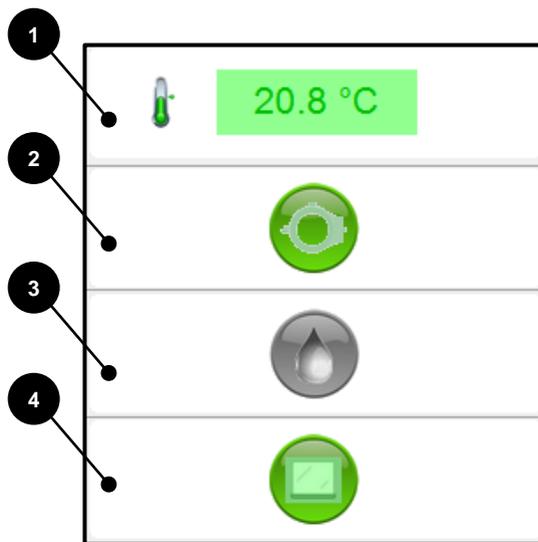
Item	Designation	Description
1	Current position of X axis	Displays the current position of the X-axis.
2	Current position of Y axis	Displays the current position of the Y-axis.
3	Current position of Z axis	Displays the current position of the Z-axis.
4	Current position of A axis	Displays the current position of the A axis.
5	Current position of B axis	Displays the current position of the B axis.
6	Current feed speed	Shows the current feed speed.
7	Current spindle speed	Displays the current rotational speed of the machining spindle.
8	Override „0“	The override value is set to 0%. This results in an axis standstill.
9	Override slide control	It is possible to manually change the override value using the slide control. The function can also be performed during program editing.
10	Override „100“	The override value is set to 100%.
11	Override „140“	The override value is set to 140%.
12	Override indicator	Shows the current override value setting. When the control software is started, the override value is set to 100% as standard.
13	Progress indicator	Shows the progress of the milling program started as a percentage.



Item	Designation	Description
14	Information field	Shows current information.
15	Time display	Displays the time of the ongoing milling process that has currently elapsed.
16	Override indicator	Shows the current override value setting.
17	Spindle speed display	Displays the current machining spindle rotational speed of the current processing.
18	Tool information	This field displays information on the currently clamped tool.

## 9.1.5 Status indicator

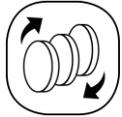
The status displays show important signal states for operating the machine to the operator.



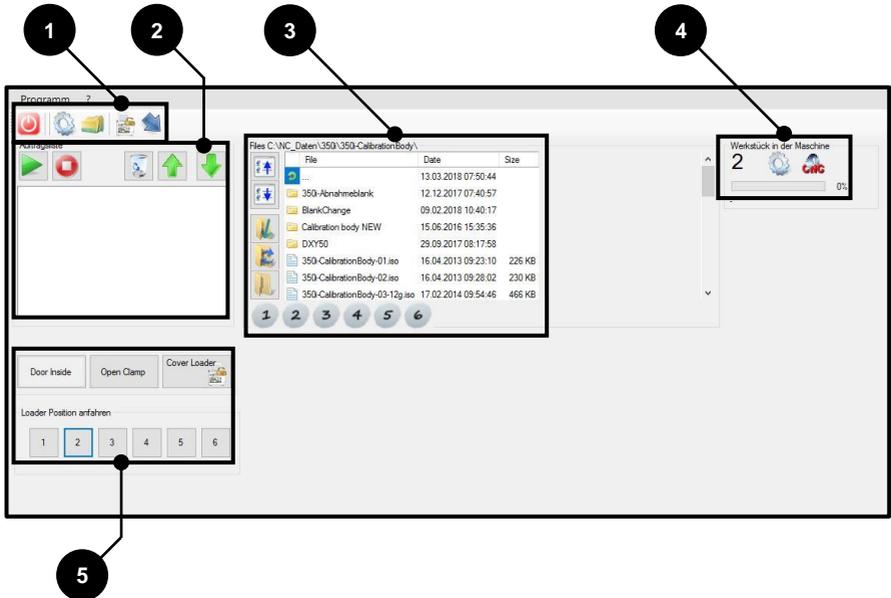
Item	Designation	Description
1	Machine temperature	The current internal temperature of the machine is displayed here. If the current temperature displayed is outside the temperature range of 18°C - 38°C, no processing can take place.
2	Monitoring sensor workpiece holder	When green, measuring and changing of the tool can take place. Loader position not free if red.
3	Flow sensor Cooling lubricant	In the green signal state, a flow of the cooling lubricant takes place. The machine cannot carry out any processing if red, because there is no flow of the cooling lubricant.
4	Protective door loader	When green, the protective door of the loader is closed. When red, it is open. To start processing, the status display must be green.

## 9.2 Administration software CNC Manager

The CNC Manager makes it possible to produce several milling jobs on different workpieces on machines with loader (workpiece changer). Double-click on the link to start the administration software CNC Manager.



### 9.2.1 Start page CNC Manager

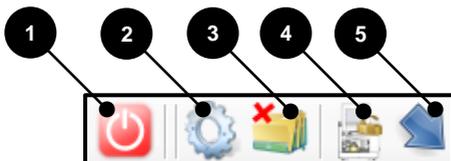


Item	Designation	Chapter
1	Tool bar	9.2.2
2	Job list	9.2.4
3	Selection of milling files	9.2.3
4	Status field	9.2.5
5	Loader control	9.2.6

---

## 9.2.2 Tool bar

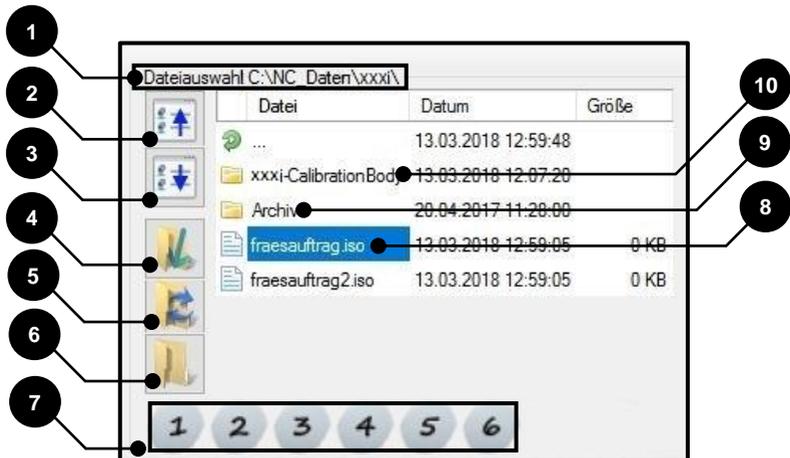
You can end the CNC Manager via the toolbar. In addition, you can minimize the view, archive milling files, switch on the loader control and unlock the safety interlock of the protective door.



Item	Designation	Description
1	End program	The management software is exited and closed.
2	Show or hide options	The area of the loader control can be shown or hidden here
3	Activate or deactivate archiving	Activate / deactivate archiving of processed milling files from the job list.
4	Cover-Loader	This can be used to unlock the protective cover of the loader (press for 3 seconds).
5	Minimized view	Scales down the CNC-Manager window to the essential functions.

### 9.2.3 Selection area of milling files

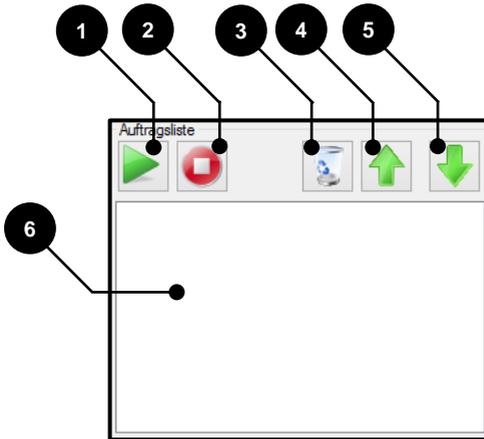
In the selection area of the milling files, the milling file is added to a workpiece and to the job list.



Item	Designation	Description
1	Current folder	Shows the current directory and folder.
2	Upward selection	Allows you to navigate up the selection list.
3	Downward selection	Allows you to navigate down the selection list.
4	Import milling file	Copies the milling job from the CAM module to the local control PC.
5	Update list	Updates the milling orders in the current index.
6	Select list	Opens a dialog box for changing the path for milling jobs.
7	Workpiece selection	Selection to assign milling file to the workpiece.
8	Current selection	Highlighted the currently selected milling file.
9	Archive	The archive contains processed milling files.
10	Calibration Body	Milling files for calibration of the machine zero point.

## 9.2.4 Job list

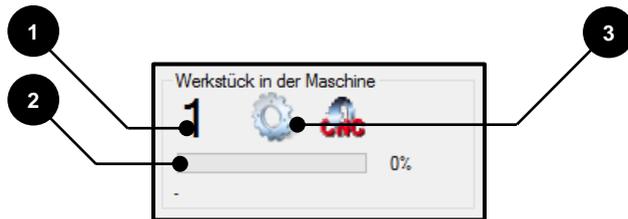
The job list contains the milling files assigned to the respective workpiece. "Selection area of milling files" (see section 9.2.3) makes it possible to populate the job list. In addition, the editing process can be started and the order can be defined.



Item	Designation	Description
1	Execution of job list	The automatic mode is started and the job list is processed from top to bottom. The machine stops after all milling files on the list are performed.
2	Stop Machining	The automatic mode is stopped and the current processing is aborted. The machine returns to its starting position.
3	Remove from list	The highlighted milling file is removed from the job list.
4	Move up (Priority "+")	Move the selected milling file up in the sequence on the job list (assign higher priority).
5	Move down (Priority "-")	Move the selected milling file down in the sequence on the job list (assign lower priority).
6	Job list	This list displays milling files (jobs) that have been assigned to the respective workpiece (workpiece holder) by "Selection area of milling files" (see section 9.2.3). The sequence of machining is from top to bottom.

## 9.2.5 Status field

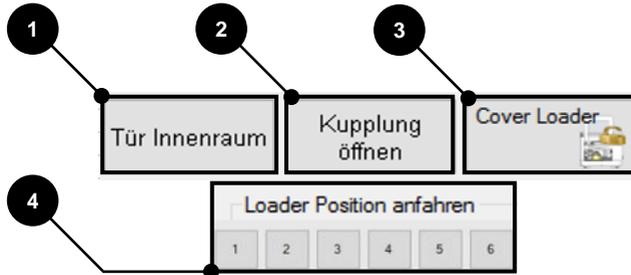
The status field indicates to the user which workpiece holder is currently clamped in the machine interior. It also includes a progress bar of the current milling file.



Item	Designation	Description
1	Current workpiece holder in the milling chamber	Displays which workpiece holder is currently being machined or found in the zero point clamping system.
2	Progress indicator	Presents the current progress of machining in the form of a bar. The displayed percentage shows the precise progress of machining (0 to 100).
3	Assign workpiece holder manually	Allows the manual change of the workpiece holder designation, the currently clamped workpiece holder, in the zero point clamping device.

## 9.2.6 Loader control

The loader control operates the interior door, the zero point clamping system coupling and the loader protective door, as well as individual positions of the workpiece magazine.



Item	Designation	Description
1	Door inside	Enables manual opening or closing of the protective partition wall between the milling area and the loading area (e.g. for cleaning).
2	Open clamp	Opens the zero point clamping system for manual removal or insertion of a workpiece holder (Attention! The workpiece holder must be held to prevent falling). The button must be kept pressed for the duration of the process.
3	Cover-Loader	Here, the protective door of the loader area can be unlocked during machining (hold the button). This process is only possible if no tool or workpiece change takes place and the partition to the loader area is closed.
4	Drive to loader position	Move the selected loader position by means of buttons 1 to 6 in order to e.g. supply or empty the loader magazine with workpiece holders.

## 10 Service, maintenance and cleaning

### 10.1 Safety instructions for service, maintenance and cleaning

<b>Personnel required:</b>	Specialist personnel / manufacturer	
<b>Protective equipment required:</b>	Protective work clothing, protective gloves, safety footwear, respiratory protection, safety goggles	

Cleanliness increases the service life of the individual components and prevents malfunctions. Therefore clean the machine regularly with a hand brush, paintbrush or vacuum cleaner. Ensure that no dirt penetrates the machine mechanism.

Cleaning with compressed air is prohibited because fine dust can penetrate the machine mechanism and damage or destroy it!

Maintenance personnel have a duty to immediately report and eliminate anomalies or faults that could affect safety! This also includes checking for possible corrosion damage or the appearance of component fatigue! The machine must not be operated after such faults arise and must be disconnected from the mains power and compressed air supply until the faults have been remedied by qualified specialist personnel!

The operational safety and service life of the machine are increased by regular maintenance and care.

 <b>DANGER!</b>
<b>Due to lack of care during maintenance, repair and cleaning!</b>
Incorrect use or failure to use operating and auxiliary equipment as well as personal protective equipment results in serious injuries!
<ul style="list-style-type: none"> <li>• Before performing cleaning, maintenance and servicing work, switch off the machine's main switch and unplug the mains plugs in order to prevent the machine being switched on accidentally (establish safe machine state)!</li> <li>• Only use suitable climbing aids for cleaning, maintenance or servicing!</li> <li>• Always wear respiratory protection, protective gloves and safety goggles because a general risk of injury exists due to sharp-edged or pointed chips!</li> </ul>

 **DANGER!**

**Risk of injury due to sharp-edged or pointed milling tools!**

Risk of injury and death when reaching into the machine interior due to sharp-edged or pointed tools!

- Be aware of protruding tools!
- Always wear protective gloves when reaching into the machine's interior!

 **DANGER!**

**Due to sharp-edged or pointed chips!**

Risk of injury when reaching into the cooling lubricant tank and taking out the screen and filter. The glass-ceramic / milling chips inside may be sharp-edged or pointed and could cause deep cuts or injuries!

Always wear protective gloves and safety goggles when cleaning the cooling lubricant tank and filter!

 **DANGER!**

**Danger of explosion and fire!**

The combination of oil mist and air can produce a highly explosive mixture! An explosion can cause injury and death.

- Do not blow out the machine with compressed air or oxygen!
- Open fire and smoking is strictly prohibited when handling the machine!
- Never use any aggressive, caustic or flammable cleaning products!

## 10.1.1 Electronics



### **Mortal danger from electric shock!**

All work on the electronic components of the machine, such as connecting the mains supply network, maintenance and repair, must be performed by qualified specialist personnel only. Even when the main switch is switched off, parts of the electrical system continue to be live and may cause injury and death if touched!

- In order to perform maintenance, service and cleaning work, always disconnect the machine from the mains power supply first and wait for a few minutes before starting work.
- In order to avoid an electric shock, do not insert objects into the machine. The only exception is the intended replacement of parts in accordance with this operating manual.

## 10.1.2 Pneumatic system



### **By whipping hose lines and slinging-away parts!**

Defective hose lines and the resulting flinging parts can cause life-threatening injuries!

- All work on pneumatics, such as commissioning, maintenance and repair, must be performed by qualified specialist personnel only!
- The pneumatics must be switched off and the pressure relieved prior to commencing work!

---

### 10.1.3 Replacement parts



#### **Due to the use of incorrect replacement parts!**

The use of incorrect or faulty replacement parts causes extreme danger for operating personnel. Beyond that, this can result in damage, malfunctions or a total failure of the machine!

- Only use original replacement parts or replacement parts approved by imes-icore GmbH!
- Use of replacement parts that have not been approved voids the manufacturer's guarantee!
- In case of question, contact the imes-icore GmbH customer service department!



Detailed replacement and parts of wear lists are available upon request.

### 10.2 Cleaning and maintenance



#### **During cleaning and maintenance!**

When cleaning and maintaining the machine, your airways may be contaminated by gases and dusts!

- Inhalation of gases and dusts must always be avoided!
- Always wear suitable respiratory protection!

## 10.2.1 General cleanliness

Cleanliness and regular machine cleaning increase the service life of the individual components and prevent malfunctions. Ensure that no dirt penetrates the machine mechanism.

Therefore clean the machine regularly with a suitable paintbrush or vacuum cleaner. When doing so, ensure that no dirt penetrates the machine mechanism. Cleaning with compressed air must be avoided because fine dust can penetrate the machine mechanism and damage or destroy it. When cleaning cooling lubricant residues from inside the machine, imes-icore GmbH recommends the use of disposable wipes. Clean the filter of the cooling lubricant tank last of all, so that any loosened dirt does not enter the cooling lubricant tank. The plastic panels and surfaces must be cleaned with a damp cloth and a suitable cleaning product (liquid cleaner) if necessary.

## 10.2.2 Cleaning products

Only use suitable cleaning products to clean the machine. Never use any aggressive, caustic or flammable cleaning products. Cleaning products can contain substances that are harmful to health. Observe the instructions of the respective manufacturer in this regard.



### Due to cleaning products!

Aggressive cleaning agents can cause property damage to the machine!

Do not use cleaning agents that damage hoses, cables, paints, plastics and gaskets!

## 10.2.3 Protective panes

The protective panes are made of toughened safety glass and serve as a separating safety guard. Use only non-abrasive liquid cleaners for cleaning.



If observation of the production process is no longer possible due to wear the panes must be replaced!

---

## **10.2.4 Extraction systems**

Extraction systems supplied by imes-icore GmbH serve exclusively to vacuum dry milling dust. It is prohibited to vacuum cool lubricant residues with the extraction systems supplied by imes-icore GmbH, and this leads to damage and even destruction of the extraction system!

Extraction systems from imes-icore GmbH must be cleaned and maintained regularly. Observe the separate operating and maintenance instructions depending on the selected extraction system! Dispose of contaminants that have collected in the filter and collection container professionally and correctly, in accordance with the legal provisions and local regulations!

## **10.2.5 Workpiece holder (clamping device)**

The workpiece holder must be cleaned of chips and dust before every insertion of a blank, so that optimum clamping is possible. We recommend using a suitable paintbrush for this. The screws and threads are to be kept clean at all times.

## **10.2.6 Tool holders and length measuring probe**

The tool holders (in the tool changer) and the length measuring probe must also be kept clean of dust and chips, in order to guarantee a faultless tool change. The measuring surface of the probe must be kept clear of contaminants at all times, because this is of elementary importance for the precision of the machine. Clean the tool positions (tool fixtures) and length measuring probe with a suitable paintbrush. Defective or worn tool fixtures must be replaced. In this case contact the service department of imes-icore GmbH.

## **10.2.7 Protective door guide rails**

Thoroughly clean the guide rails of the protective door at least once a week using a suitable brush.

## 10.2.8 Machining spindle

The following points must be observed when handling the processing spindle to ensure a long service life:

- Proceed with the necessary caution. Avoid the application of force, e.g. impacts, striking, excessive pressure on the shaft or forceful clamping, because the precision and service life of the machining spindle will be impaired. For details, refer to the operating manual supplied separately.
- The machining spindle nose and tools used must be clean. Dirt and the increased centrifugal forces that arise from this result in a heavy load on the bearing, which significantly increases wear.
- The hybrid ball bearing of the spindle is equipped with permanent grease lubrication and is therefore maintenance-free. In order to achieve the longest possible service life of the hybrid ball bearing, only well-balanced tools should be used (reduced centrifugal forces).
- In order to guarantee concentricity, the clamping device must not be damaged. To check this, open the collet chuck, remove the tool and check the collet chuck for damage, corrosion or soiling (deposits).
- For professional cleaning and maintenance of the machining spindle, also observe the manual of the manufacturer supplied separately.



Never clean the machining spindle with spray oils, liquids or compressed air. Dirt may get into the bearing through the centrifugal disc and nose.

## 10.2.9 Collet chuck

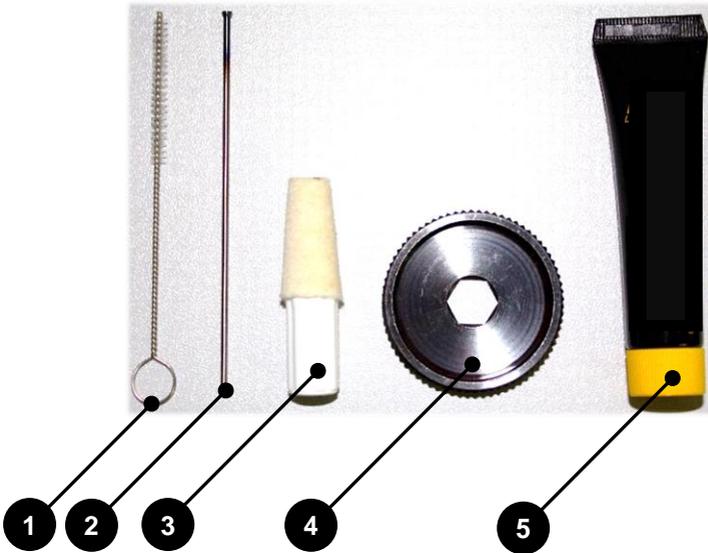
Use the collet chuck maintenance kit to clean and maintain the collet chuck.

**! CAUTION!**

**Bearing damage to the machining spindle due to incorrect operation!**

Switching on the machining spindle without a collet and inserted tool can damage the spindle!

Make sure you have a collet chuck in the machining spindle. In addition, a tool must be clamped in the collet chuck!



Item	Designation
1	Cleaning brush
2	Ejector pin
3	Felt cone
4	Clamping tool
5	Chuck grease

**! CAUTION!**

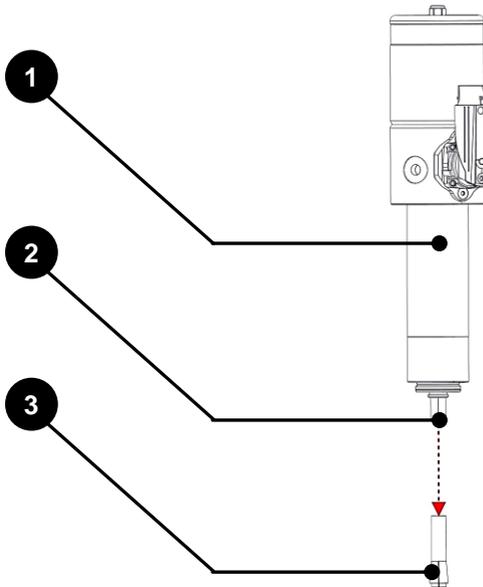
**When using the chuck grease!**

Extended skin contact with the chuck grease can lead to skin irritations and/or dermatitis!

- Avoid lengthy and intensive skin contact!
- Clean skin thoroughly after work and before breaks!
- Apply skin protection products to protect your hands!
- To request the safety data sheet for the chuck grease, contact the respective customer service department!



The collet chuck must be dismantled and cleaned at least once weekly and after every tool break, and checked for damage.



Item	Designation
1	Spindles
2	Shaft with inner cone of the spindle
3	Cone of the collect chuck

**In order to clean the collet chuck, proceed as follows:**

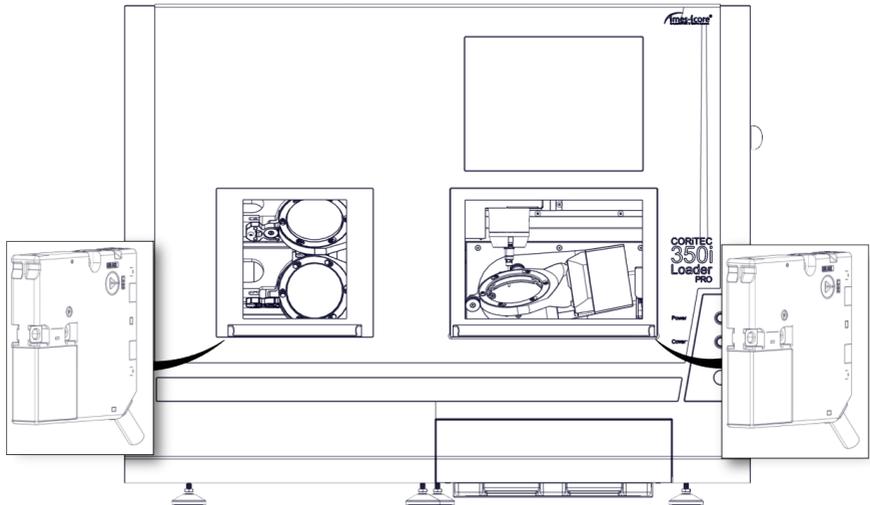
Step	Description
1	Drive the machining spindle into the "service position". 
2	Ensure that the shaft does not turn (stands still).
3	Press the cover button and open the protective door. 
4	Unscrew the collect chuck with the clamping tool. 
5	Clean the cone of the machining spindle with the provided felt cone. 
6	Clean the collet chuck using the brush intended for this. Ensure that there is no dirt in the collet chuck and that no dirt penetrates the chuck during cleaning. 
7	If a tool breaks and a piece is left in the collet chuck, you can remove it with the help of the ejector pin. 
8	Apply a light film of grease to the outer cone of the collet chuck using the chuck grease. 
9	Then screw the collet chuck back into the machining spindle by hand. Make sure that the collet chuck is screwed in hand-tight up to the stop.
10	If you are unable to screw the collet chuck in by hand to the stop, use the screw-in piece. 
11	After closing the protective door, end the service position.
11	The machining spindle is now ready for operation.

### 10.2.10 Fan filter

The fan filters must be removed, cleaned or replaced during the weekly cleaning of the machine. A fan cover with integrated filter is located on the rear side of the machine. You can access the fan filter by carefully taking off the black plastic cover by hand. You can order new filters from the sales department of imes-icore.

### 10.2.11 Safety interlocking system

Fine milling dust can enter the safety interlocking systems of the protective door loader and protective milling chamber after dry processing. Therefore the safety interlocking system should be cleaned thoroughly at least once weekly.



The safety interlocking system is a safety-relevant component and may never be manipulated or rendered ineffective!

Item	Designation
1	Safety interlocking system of the protective door loader
2	Safety interlocking system of the protective door milling chamber

---

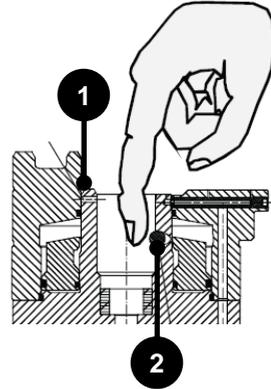
## 10.2.12 Cooling lubricants and coolants

Cooling lubricants and coolants must be used in accordance with the manufacturer's instructions. It is essential to strictly observe the data sheets and safety instructions of the manufacturer in this regard. The required intervals for replacing the liquids must always reflect the manufacturer's instructions. Always dispose of operating substances correctly, in accordance with the legal provisions and local regulations!

## 10.2.13 Zero point clamping system (mount)

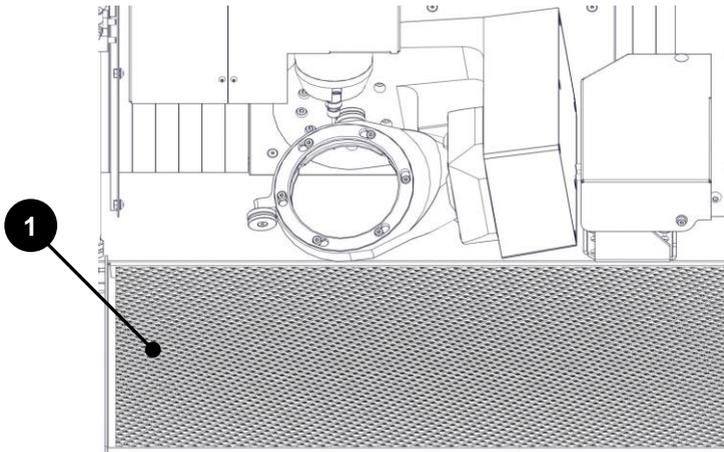
For cleaning and maintenance of the mounting of the zero point clamping system follow these steps:

- Grease balls (2) weekly
- Clean centring prisms
- Visual inspection and in case of contamination, clean the spring slot (1) (under centring prisms)
- Protect the chucks from contamination and clean after use



### 10.2.14 Pre-filter machine interior

The pre-filter for the cooling lubricant tank is located inside the machine and must be checked for contaminants every time before starting processing and cleaned if necessary. Dispose of contaminants that have collected in the pre-filter professionally and correctly, in accordance with the legal provisions and local regulations!



Item	Designation
1	Pre-filter for the cooling lubricant tank

### 10.2.15 Cooling lubricant tank

 <b>DANGER!</b>
<b>Due to sharp-edged or pointed chips!</b>
Risk of injury when reaching into the cooling lubricant tank and taking out the screen and filter. The glass-ceramic / milling chips inside may be sharp-edged or pointed and could cause deep cuts or injuries!
Always wear protective gloves and safety goggles when cleaning the cooling lubricant tank and filter!

The cooling lubricant tank must be emptied and cleaned every two weeks. Always dispose of cooling lubricant residues in accordance with the legal provisions and local regulations!

Clean the filter of the cooling lubricant tank regularly or replace this to guarantee the correct flow of the cooling lubricant. Dispose of contaminants that have collected in the flat screens and round screen insert professionally and correctly, in accordance with the legal provisions and local regulations!

---

## 10.2.16 Filter fleece

Used filter fleece must either be cleaned or replaced, depending on the degree of contamination. If filter fleece should prevent the correct flow of the cooling lubricant due to heavy soiling, this must be replaced immediately because a flooding of the machine interior may otherwise occur. This can result in damage or even destruction of the machine and the operator is responsible for performing the checks. Used filter fleece must be disposed of correctly, in accordance with the legal provisions and local regulations! You can order new filter fleece from the imes-icore GmbH sales department.

## 10.2.17 Maintenance unit (water separator)

On the right side (connection panel) of the machine is a compressed air maintenance unit with a water separator. This separates any remaining moisture from the compressed air. However a prerequisite is the use of clean, dry and oil-free compressed air!

If water should collect in the sight glass despite this, a drainage screw is located beneath the sight glass. It is possible to empty the water separator by turning the screw.

The water separator must be checked at least once daily and emptied if necessary!

**In order to empty the water separator, perform the following steps:**

Step	Description
1	Switch off the compressed air supply (maintenance unit pressure-free)!
2	Turn the drainage valve of the separator container (see chapter 5.10) counter-clockwise (left) until the water separator is open.
3	Wait until the water separator has emptied completely.
4	In order to close the water separator, turn the drainage screw clockwise (right) until hand tight.



With contamination it is essential to have the compressed air supply checked!

## 10.2.18 Lights

The work space lighting is guaranteed by special LED strips, which are maintenance-free. However, if the interior lighting should partially or completely fail then the machine must be brought to a standstill because it must be possible to observe the processing at all times. Only put the machine back into operation once the interior lighting has been replaced or repaired by specialist personnel. To do this, contact the customer service department.

### 10.2.19 Guide rails and drive shafts

The guide rails and drive shafts of the axes are coated with long-term lubrication in the factory and are low-maintenance. If necessary, they are re-lubricated by specialist personnel within the framework of maintenance!

### 10.2.20 Cooling aggregate machining spindle

The machining spindle of the CORiTEC 350i (Loader) PRO + must be operated with a cooling aggregate.

Cooling aggregates of imes-icore GmbH must be regularly cleaned and maintained. Observe the separate operating and maintenance instructions! Always dispose of the coolant of the machining spindle correctly, in accordance with the legal provisions and local regulations!

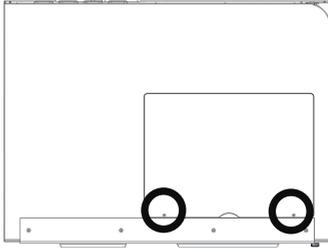
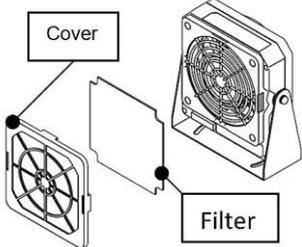
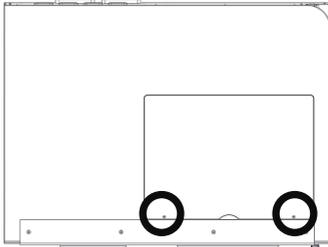
### 10.2.21 Ionizer device

 <b>DANGER!</b>
<b>Due to high electrical voltage in the ionizer!</b>
Ventricular fibrillation or cardiac arrest possible due to high voltage, alternating electric fields or magnetic fields!
Persons with pacemakers or other electronic implants may not carry out any maintenance, servicing or cleaning work on a machine with ionizing unit!

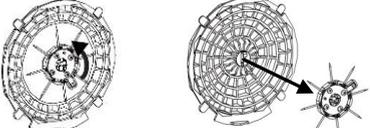
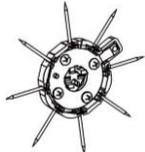
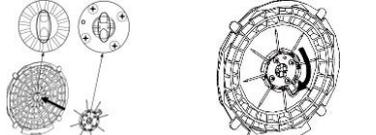
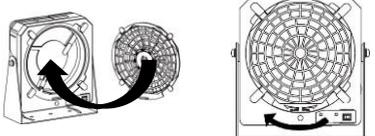
 <b>CAUTION!</b>
<b>Danger of injury due to sharp and pointed ionizer tips!</b>
Cuts, punctures or tears may occur due to the ionizer tips during cleaning or maintenance work on the ionizing unit!
<ul style="list-style-type: none"> <li>• Reading, understanding and following the instructions for use of the ionizer!</li> <li>• Perform all cleaning or maintenance work only in de-energized and discharged condition!</li> <li>• Always wear protective gloves!</li> </ul>

 The ionizer may lose its effect after some time. Therefore, the ionizer tips (discharge unit) and the blower filter must be cleaned after two weeks.
--

### Cleaning of the blower filter:

Step	Description	
1	Switch off the machine with the main switch. After a few minutes, you must unplug the power cord. 	
2	Remove the two marked M4 countersunk screws and the upper service door.	
3	Carefully remove the cover of the ionizer to access the filter.	
4	Carefully remove dust and dirt from the filter. If the filter is very dirty, wash it under running water.	
5	Mount the filter and the cover on the ionizing unit. Before installation the filter must be completely dry!	
6	Mount the two marked M4 countersunk screws and the upper service flap.	

**Cleaning of the ionization tips:**

Step	Description	
1	Switch off the machine with the main switch. After a few minutes, you must unplug the power cord. 	
2	Turn the housing cover anticlockwise until it stops. Afterwards the housing cover can be removed.	
3	Carefully turn the ionizer tips counter clockwise until they stop. Afterwards the ionizer tips can be removed.	
4	Clean the ionization needles with a cotton swab soaked in alcohol. If there is a lot of dirt, a brush (toothbrush) can be used for cleaning.	
5	Carefully insert the ionization tips into the tabs of the housing cover. For mounting, carefully turn the ionizing tips clockwise until they stop.	
6	Carefully insert the housing cover into the grooves. To install, turn the housing cover clockwise until it stops.	

### 10.3 Maintenance schedule

Interval	Action	Authorised
Before starting the machine or with every shift change	<ul style="list-style-type: none"> <li>• General cleanliness</li> <li>• Clean workpiece holder</li> <li>• Clean tool holders</li> <li>• Clean tool shaft of all tools</li> <li>• Clean the length measuring probe</li> <li>• Clean the machine interior</li> <li>• Clean filter of the machine interior</li> <li>• Clean or replace pre-filter, flat filter, screen insert and filter fleece</li> <li>• Check and top up cooling lubricant if necessary</li> <li>• *Visual inspection of the power and compressed air supply lines for damage, any leaks in the cooling lubrication system and for damage to the protective door</li> </ul>	Operator
Daily	<ul style="list-style-type: none"> <li>• Check water separator, empty if necessary</li> <li>• Check correct function of safety devices (protective door)</li> </ul>	Operator
Weekly or after a tool break	<ul style="list-style-type: none"> <li>• Clean protective door guide rails</li> <li>• Remove collet chuck, clean it and inspect for damage</li> <li>• Clean collet chuck retainer with the provided cleaning brush</li> <li>• Clean inside collet chuck with the cleaning brush provided</li> <li>• Coat collet chuck in front conical area on the outside with a thin film of grease using the chuck grease provided</li> <li>• Clean inner taper of the shaft (machining spindle) with the felt cone provided</li> <li>• Replace collet chuck with visible damage or traces of wear</li> <li>• Clean safety lock system of the protective door</li> <li>• Clean or replace fan filters</li> <li>• Complete cleaning of the machine</li> <li>• Replacement of the complete cooling lubricant and filter fleece</li> </ul>	Operator
2-week-rhythm	<ul style="list-style-type: none"> <li>• Clean ionizer tips</li> <li>• Clean filter on ionizing unit</li> </ul>	Operator

Interval	Action	Authorised
Semi-annually	<ul style="list-style-type: none"> <li>• Testing of the earthing resistances</li> <li>• Replacement of unlisted and worn wear parts</li> </ul>	Authorised specialist personnel

\*During the visual inspection by the user, it is necessary to observe the following points in general:

- Corrosion,
- Signs of fatigue from
  - Fastenings of the machine parts,
  - Energy supplies (e.g. cable runs)

Irregularities must be reported and remedied immediately. During servicing work, replace safety parts (e.g. split pins, lock nuts) with new parts. After maintenance and servicing work, activities must be documented in writing in a test log and a check of the most important connections must take place!

## 10.4 Periodic inspections

The machine should be periodically inspected (at regular time intervals):

- for component wear,
- and general machine functions (safety devices) are checked!

## 10.5 Semi-annual maintenance tasks

Visually inspect the system earthing connections every 6 months!

imes-icore GmbH recommends that machines in multi-shift operation be subjected to semi-annual maintenance of the system by a service technician of imes-icore GmbH.

In multi-shift operation, all mechanical components and machine systems are subject to increased (natural) wear.

We recommend performing maintenance after approx. 6 months with exchange of the customary wearing parts, in order to guarantee seamless and long-term functionality.

## 10.6 Annual maintenance tasks

imes-icore GmbH recommends that machines in single-shift operation be subjected to yearly maintenance of the system by a service technician of imes-icore GmbH.

In single-shift operation, all mechanical components and machine systems are subject to natural wear.

We recommend performing maintenance after approx. 12 months with replacement of the usual parts of wear, in order to guarantee seamless and long-term functionality.

---

## 10.7 Commissioning maintenance work

Maintenance by a service technician of imes-icore GmbH must be mutually arranged in good time. During maintenance, the machine is not available for processing. In case of multiple machines, maintenance must be performed in direct succession, on the same date or on consecutive days.

Maintenance takes place 6 - 8 weeks after order placement. After an order is placed, the precise date is agreed with the service department of imes-icore GmbH. Therefore always commission any necessary machine maintenance promptly and in good time, to ensure the timely scheduling of the maintenance work. Inform us of the model designation and serial number of your machine at the time of order placement, as well as your preferred date!

Services and replacement parts that are necessary but not listed in the maintenance offer and repairs that are necessary after diagnosis during inspection will be invoiced separately in case a guarantee claim is excluded.

imes-icore service department			
Address	imes-icore® GmbH Im Leibolzgraben 16 D-36132 Eiterfeld	Reception	+49 (0) 6672 898-228
		Hotline	+49 (0) 6672 898-469
		Email	<a href="mailto:service@imes-icore.de">service@imes-icore.de</a>
		Internet	<a href="http://www.imes-icore.de">www.imes-icore.de</a>

## 10.8 Measures after completion of maintenance

**After maintenance and before switching the machine on for the first time, it is necessary to check the following points:**

- Check that all threaded connections loosened during maintenance have been correctly tightened again.
- Make sure that all screws have been tightened with the correct torque.
- Make sure that all covers and safety equipment are installed and functioning again faultlessly.
- Make sure that all tools, materials and other equipment used have been removed from the working area again.
- Clean the work area and remove any spills, such as for example liquids, lubricants, processing materials or the like.
- Make sure that all maintenance work has been documented correctly.

## 10.9 Replacement parts and parts of wear

The use of replacement parts that have not been approved voids the manufacturer's guarantee! On request, replacement and wearing parts lists are available from the customer service department of imes-icore GmbH.

Replacement and wearing parts must comply with the technical specifications of the manufacturer. This is guaranteed through the use of original replacement parts and their installation by qualified personnel.

Only replacement and wearing parts from imes-icore GmbH are approved for use. All non-original parts require the explicit written approval of the manufacturer!

Designation	Article number
Filter fleece 350i	521020 6360
Fan replaceable filter	564025 1002
Stylus	470071 1081
Stylus holder	470071 1082
Hexagon socket screwdriver 3 mm	201001 0063
Cleaning brush	201009 0101
CORiTEC mill & grind liquid	526020 0050
imes-icore cooling lubricant (5 kg)	526020 0040
CORiTEC Model Disc (98.5 x 15 mm)	525013 9815
Screw set Dental	526020 2000
LOGOSOL Battery	474510 6361
Coolant machining spindle	201009 0201

---

## 10.10 Creation of a calibration body

In order to test the zero point of your machine, you should mill a “calibration body” once monthly. The milling program for the “calibration body” is stored on the control PC in the folder “C:\NC\_Daten\Calibration Body”.

Not every blank is suitable for milling a calibration body. imes-icore GmbH recommends milling a calibration body with the blank “CORiTEC Model Disc” (98.5 x 15 mm) with the art. no.: 525013 9815. This blank is available from the customer service department of imes-icore GmbH.



**Perform the following steps in order to mill a calibration body:**

Step	Description
1	Switch the machine on (see chapter 8.5).
2	Start the operating software (see instruction manual of the operating software).
3	Insert the workpiece (see chapter 8.6).
4	Open the milling program for the calibration body (“C:\NC_Data\Calibration Body”).
5	Check that the required tool T11 is available and intact.
6	Close the protective door.
7	Start processing the milling program (see chapter 8.13).
8	After completing the milling work, open the protective door.
9	Remove the workpiece (see chapter 8.6).
10	Remove the milled calibration bodies from the workpiece.
11	Start the evaluation software “TK-Zero-Point” (see chapter 10.11).
12	Follow the instructions issued by the evaluation software “TK-Zero-Point” to measure the finished calibration body (see chapter 10.11) and check or calibrate the zero point of the machine this way.

## 10.11 Calculating and calibrating the zero point

To calculate the zero point, start the evaluation software “TK-Zeropoint” in the folder “C:\imes-icore\TK-Zero-Point.exe”.

Subsequently, follow the instructions of the calibration software “TK-Zero-Point”.



The software interface is divided into several sections:

- Language Selection:** English (English) and German (Deutsch).
- Calibration Type Selection:**
  - Nullpunkt-Kalibrierung (Null-point calibration)
  - Manuelles Ausrichten mit Messwerkzeugen (Manual alignment with measuring tools)
  - Ermittlung des Dreh-Schwenkpunktes (Determination of the rotation/tilt point)
- Machine Selection (Step 1):** Choose the machine used for calibration.
- Probe Selection (Step 2):** Select the probe used for calibration.
- Probe Calibration (Step 3):** Select the probe body and the specific probe tip.
- Measurement (Step 4):** Measure the wall thicknesses of the calibration body. The software shows two views of the calibration body with measurement points 1, 2, and 3. The Y-axis is labeled 'Y-Seite lang' (long) and 'Y-Seite kurz' (short), and the Z-axis is labeled 'Z-Deckel' (cover).
- Calculation (Step 4):** The software calculates the deviation from the old null-point and the coordinates of the new null-point.

When measuring the wall thicknesses of the calibration body, imes-icore GmbH recommends using a dial calliper gauge with an accuracy of at least 0.01 mm.



## 11 Faults

### 11.1 Safety instructions for trouble-shooting

<b>Personnel required:</b>	Specialist personnel	
<b>Protective equipment required:</b>	Protective work clothing, protective gloves, safety footwear, eye protection	

#### **DANGER!**

##### **Due to electric shock!**

Contact with live parts or damage to insulation poses immediate danger to life and limb due to electric shock!

- In order to perform maintenance, service and cleaning work, always disconnect the machine from the power supply first and wait for a few minutes before starting work.
- In order to avoid an electric shock, do not insert objects into the machine. The only exception is the intended replacement of parts in accordance with this operating manual.

#### **DANGER!**

##### **Due to moving components!**

Rotating components and/or components with linear movements can cause serious injury!

- Switch off all moving components of the machine before starting trouble-shooting work on moving components, and wait until all moving components have come to a standstill
- If possible, switch off the machine main switch and unplug the mains plug!

 **DANGER!**

**Due to improper trouble-shooting!**

If trouble-shooting work is performed incorrectly then this can result in serious physical injuries and significant property damage! It is therefore essential to put the machine into a safe state before starting work. This work must be performed by qualified specialist personnel only!

- Before starting work, ensure that there is adequate free space for assembly!
- Ensure order and cleanliness in the working area. Components and tools that are lying loose or on top of each other are potential accident sources!
- After removing components, make sure these are reinstalled correctly!

## 11.2 Actions in the event of faults

**In the event of a fault, always perform the following steps:**

1. Initiate an EMERGENCY STOP immediately if there is danger to personnel or property!
2. Determine the cause of the fault!
3. Switch the machine off and unplug the machine at the mains plug, if work in the hazard area is necessary!
4. Remedy the fault or have the fault remedied by authorised personnel if necessary!



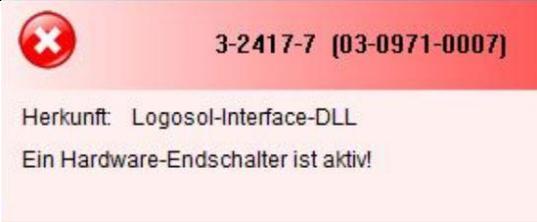
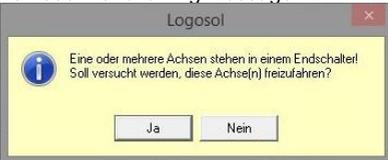
## 11.3 Cancelling the EMERGENCY STOP

Once you have successfully remedied the fault and all maintenance and servicing work is complete, you can disengage the EMERGENCY STOP again as follows:

1. Determine and remedy the cause of the fault!
2. Disengage the EMERGENCY STOP switch by turning the switch to the right.



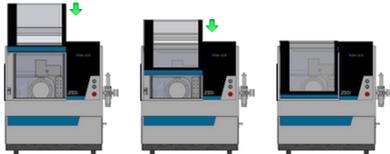
## 11.4 Error messages of the operating software Remote Dental

Error message	
	
Possible cause	Solution
<p>One of the axes is at the hardware limit switch</p>	<p>Close und Start Remote Dental. You will then see the following message.</p>  <p>After confirming with "Yes" you must activate the "Power button". Subsequently, the machine drives out from the hardware limit switch.</p>

Error message	
	
Possible cause	Solution
<p>The EMERGENCY STOP is active.</p>	<p>Disengage the EMERGENCY STOP counter clockwise. End the processing and Remote Dental. Subsequently, you can restart the processing.</p>

Error message	
 <b>3-2417-59 (03-0971-003B)</b>  Herkunft: Logosol-Interface-DLL Der Stop-Eingang einer Endstufe ist aktiv!	
Possible cause	Solution
The flywheel of the machining spindle is very filthy. After switching the main power supply of the machine off, the spindle cannot be rotated on the clamped tool. (use protective gloves)	Cleaning the flywheel on the spindle nose and the collet chuck.
	Replace spindle.

Error message	
	
Possible cause	Solution
The machine does not have enough compressed air.	Increase the connected compressed air to the range between 6 bar and 9 bar.

Error message	
	
Possible cause	Solution
The latch(es) of the protective door(s) of the machine and optional loader is/are not locked in the safety lock.	Close the protective door(s) of the machine properly.

## 11.5 Fault table

Fault	Cause	Solution	Authorisation
Machine cannot be switched on	Mains connection not available	Check power circuit, mains plug, power socket strip	Operator
	Main switch is not turned on	Turn on the main switch	Operator
	Fuse triggered/defective	Disconnect power plug, check fuse	Electrician
Power button not working	At least one motor output stage signals a fault	Diagnose fault cause and remedy	Operator
	EMERGENCY STOP not disengaged	Disengage EMERGENCY STOP	Operator
	Fuse triggered/defective	Disconnect power plug, check fuse	Electrician
	Protective door not closed correctly	Close protective door	Operator
Software not working correctly	Machine is not turned on	Switch machine on (main switch)	Operator
	Output stage is not switched on	Switch on output stage (POWER button)	Operator
	Connection between control PC and machine not correct	Contact customer service department of imes-icore GmbH and have the output stage replaced	Operator
Drive motor of an axis does not react	No power supply to the output stage, fuse defective	Check fuses in the switch cabinet or power output stage	Electrician
	Temperature protection of the output stage is active	- Check fan in the rear wall - Check / clean filter in the fan	Operator
	Output stage defective	Replace output stage (send in)	Electrician
	Connection plug has loosened	Check plug - on the control output and the motor	Electrician
	Cable break	Contact imes-icore GmbH customer service department and have the cable replaced	Operator
	Protective door not closed correctly	Close protective door	Operator

Fault	Cause	Solution	Authorisation
Machine not functioning, i.e. cannot be switched on	Not released by SC module	Check spindle release signal	Electrician
	Protective door interlocking not closed	Close protective door	Operator
	EMERGENCY STOP not disengaged	Disengage EMERGENCY STOP	Operator

## 11.6 Online support and remote maintenance (TeamViewer®)



### Due to improper remote maintenance!

Unintentional action during remote maintenance may result in personal injury and property damage.

- Strictly follow the instructions of the service technician!
- Close service flaps and protective doors before starting the remote maintenance!

In the age of digitization (Industry 4.0), imes-icore GmbH relies on networked CNC systems with Internet access.

This way, we can offer you fast, targeted and optimal service & support by our service technicians.

Take advantage of our offer for online error analysis by our service staff and benefit from our fast support and troubleshooting via remote maintenance. This will help you avoid unnecessary delays, higher downtime costs and possibly occurring service charges during the warranty period, which may be caused by operator error, improper use of the machine or out-of-warranty service.

### Requirement for online support:

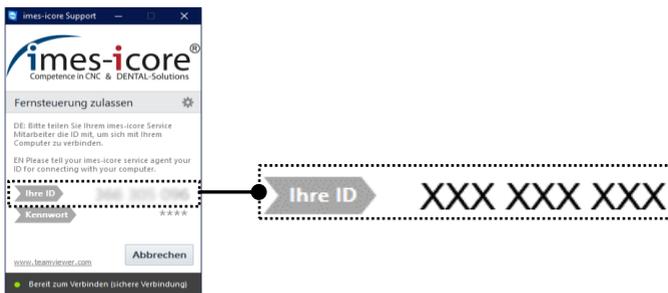
Your machine must be connected to the internet and the “TeamViewer®” software must be installed. The most recent version of the “TeamViewer®” software is available at [www.imes-icore.de](http://www.imes-icore.de).

### Using the online support:

Double-click on the “TeamViewer®” symbol and contact the imes-icore GmbH customer service department (see chapter 1.11.2).



Tell the service technician your serial number (see type plate) of your machine and then your nine-digit “TeamViewer®” ID.



Make a note of all relevant data on the type plate of the machine in advance!

## 12 Disassembly and disposal

At the end of the machine's life, the machine must be dismantled and disposed of in an environmentally responsible manner.

### 12.1 Safety instructions for disassembly and disposal

<b>Personnel required:</b>	Specialist personnel / electrician / manufacturer	
<b>Protective equipment required:</b>	Protective work clothing, protective gloves, safety footwear, respiratory protection, eye protection	

#### **DANGER!**

##### **Due to improper disassembly and disposal of the system!**

With improper disassembly of the system, angular components, points, corners, sharp edges, vapours, lubricants, liquids, etc. may cause serious injuries! Observe the safety regulations, accident prevention regulations and safety data sheets!

- Disassembly must be performed by specially trained specialist personnel!
- Only electricians are permitted to work on the electronic components!
- Appropriate warning signs must be visibly displayed in the areas!

#### **DANGER!**

##### **Mortal danger from electric shock!**

Contact with live parts or damage to insulation poses immediate danger to life and limb  
Risk to life and limb due to electric shock!

- In order to perform maintenance, service and cleaning work, always disconnect the machine from the power supply first and wait for a few minutes before starting work.
- In order to avoid an electric shock, do not insert objects into the machine. The only exception is the intended replacement of parts in accordance with this operating manual.



**Risk to the environment due to incorrect disposal!**

Improper disposal can endanger the environment!

Disposal of the materials must be performed by specialist personnel and in accordance with the applicable legal provisions. When handling hazardous materials, observe the respective safety data sheet and use personal protective equipment if necessary!

- Disposal must be performed by specialist personnel and in accordance with the applicable legal provisions.
- Use appropriate personal protective equipment!
- During disposal, the handling of the hazardous substances must be carried out according to the instructions on the respective safety data sheet!

## 12.2 Disassembly

### Important information prior to disassembly:

- Before starting work, ensure that there is adequate free space!
- Handle exposed sharp-edged components with care!
- Ensure order and cleanliness in the working area. Components and tools that are lying loose or on top of each other are potential accident sources!
- Ensure correct disassembly of the components!
- Note that some components are individually very heavy. Use hoist equipment if necessary!
- Secure the components against falling and toppling!
- Do not breathe in vapours or dust!
- Fire, naked flames and smoking are prohibited in the areas!
- Eating and drinking are prohibited in the areas!
- In case of ambiguities, consult the manufacturer!

### Prior to starting disassembly, always perform the following steps:

Step	Description
1	Switch the machine off (see chapter 8.14).
2	Disconnect the machine from all media (power supply network, compressed air supply, cooling water supply, hydraulic supply, etc.).
3	Physically disconnect the entire energy supply from the machine and discharge residual energies.
4	Remove all remaining operating and auxiliary substances, as well as all processing materials. Dispose of these in an environmentally responsible manner, in accordance with your local regulations.
5	Subsequently clean and dismantle the components correctly with consideration to the locally applicable health, safety and environmental regulations.

---

## 12.3 Disposal

If no return or disposal agreements have been concluded, recycle the dismantled components.

- Have all metals scrapped.
- Submit all glass and plastic parts for recycling.
- Sort the remaining components in accordance with their material characteristics.
- Dispose of hazardous substances such as oils, oil-water mixtures, emulsions, grease, fuel, coolants and lubricants in the correct manner!

### 12.3.1 Collection

Users of electrical and electronic devices are obligated to collect used appliances separately in accordance with regional regulations. Used electrical and electronic devices must not be disposed of with non-separated household waste. Separate collection is a prerequisite for recycling and reuse, which protect environmental resources.

### 12.3.2 Return and collection systems

When disposing of your machine and in particular its electronic components, do not dispose of these with household waste. Local disposal organisations have established disposal possibilities for this.





## **imes-icore® GmbH**

Im Leibolzgraben 16  
36132 Eiterfeld

Tel.: +49 (0) 6672 898-228

Fax: +49 (0) 6672 898-222

[info@imes-icore.de](mailto:info@imes-icore.de)

[www.imes-icore.de](http://www.imes-icore.de)