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工业清洗机



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## 生产的灵活性和创新性

ILSA（伊尔萨）的工业清洗部门是在28年前（1992）成立的，由于市场上对这种特殊清洗类型的需求，根据在原产地获得的技术和经验；事实上，自1978年成立之日起，ILSA就投入设计和制造溶剂清洗机。

该系统针对不同的行业：微机械零件、机床精密零件、模具零件、液压元件、汽车阀门和配件、热交换器、工具、烧结零件、链轮、手表、医疗。

在这段漫长的历史中，ILSA一直致力于生产的灵活性，以高度的创新性为特点。

ILSA（伊尔萨）完全在意大利的博洛尼亚工厂开发和制造其系统，博洛尼亚是世界上最先进的工程产业集群之一，直接负责设计、建造、装配、布线、编程和测试。

ILSA（伊尔萨）向市场提供：

最有成效的技术解决方案，由一个完整的标准设备和广泛的选择和定制，允许以灵活的方式来组合不同的清洗阶段。

最有成效的生产和技术解决方案可以大幅缩短生产时间，提高平均生产率，在某些项目中，同样的应用，生产率甚至可以达到100%。

最佳环境质量保护，是因为采用“全真空”技术，确保没有溶剂残留在零件或释放到环境中。

最优化的能源管理，可将工厂实际用电量降低40%。

更准确地管理清洗产品和残留物。

通过装置和软件集成，您可以大大减少溶剂的消耗，将油从溶剂中完全分离出来，然后在生产循环中再利用，带来巨大的经济效益，并从根本上减少对环境的影响。

全自动程序管理，简化和减少日常维护。

小尺寸相对于生产能力而言，是工作空间不断优化和产业化建设的结果。

应用范围广泛，ILSA（伊尔萨）是最全面的可用系统装载能力从5到1000 dm<sup>3</sup>（清洗仓），可以按照特别要求和规格完成。

凭借先进的硬件和软件监控和通信系统，完全实现工业4.0。

除了所有ILSA（伊尔萨）系统的功能以外，最后的解决方案还具有以下特点：

- 全真空运行
- 溶剂的连续蒸馏
- 溶剂的连续过滤
- 预先干燥需要打开/清空的过滤器
- 水分离
- 从溶剂中分离油，并可连续自动排放
- 详细连续显示所有操作参数的可编程逻辑控制器
- 网络远程连接

ILSA（伊尔萨）机器代表了一种精密清洗所有类型的金属和许多用不同冷却液处理过的塑料组件的解决方案，甚至可以在同一工厂内同时清洗，其应用的过程允许对每种类型的油脂进行彻底的脱脂，清洁和干燥，特别是存在复杂几何形状，盲孔和毛细管的情况下。

ILSA（伊尔萨）通过其在欧洲、美国、中国和墨西哥、印度、东南亚自己的销售和技术代表，为客户提供与全球合作伙伴合作的机会。



## Production flexibility and propensity to innovation

The metal cleaning division of ILSA was founded over twentyfive years ago (1992) in the wake of the demands of the market for this specific type of cleaning and based on the technology and experience gained in the area of origin; ILSA in fact, since 1978, the year of foundation, designs and manufactures cleaning machines for working with solvents.

The systems are aimed at different sectors: micromechanical parts , turning precision parts, moulded parts, hydraulic components, Automotive, valves and fittings, heat exchangers, tools, sintered components, sprockets, watches, medical. In this long history, ILSA has always focused its efforts on the production flexibility, distinguished by the high propensity for innovation.

ILSA develops and manufactures its systems entirely in Italy in the factories of Bologna, one of the most advanced industrial clusters for engineering in the world, being directly responsible for the design, construction carpentry, assembly, wiring, programming and testing . ILSA offers to the market:

**the best available technology** thanks to a complete standard equipment and a wide choice of options and customizations that allow to combine in a flexible way different cleaning phases **the most productive result** with technological solutions that allow a drastic reduction of the cycle time, with an average increase in productivity which, in some cases, with the same application, can even reach 100%.

The last solutions are in addition to the features of all ILSA systems that are distinguished by :

- Operation in TOTAL VACUUM
- Continuous distillation of the solvent
- Continuous filtration of the solvent
- Drying of different filters before opening / emptying
- Water separation
- Separation of oil from the solvent, with the possibility of automatic discharge in continuous
- PLC with detailed and continuous indication of all operating parameters
- Ethernet remote connection

**the best environmental quality** since the technology “total vacuum” at the end of the process ensures that no residuals are present on the pieces or released into the environment.

**the optimal energy management** with solutions that reduce till 40% the values of the actual electrical consumption of the plant. **the more accurate management** of cleaning products and residues.

With devices and software integrations that allow you to drastically reduce the consumption of solvent, to completely separate the oils from the solvent, and then for reuse in the production cycles with enormous economic benefits and fundamental reduction of environmental impact.

All with automatic procedures that simplify and minimize the daily maintenance.

**the small dimensions** in relation to production capacity, the result of continuous work space optimization and industrialization of the construction.

**a wide range**, probably one of the most comprehensive available with systems load capacities from 5 to 1000 dm<sup>3</sup> completed by the possibility of special achievements and specifications.

**complete integration in Industry 4.0** ambient thanks to a sophisticated hardware and software monitoring and communication system.

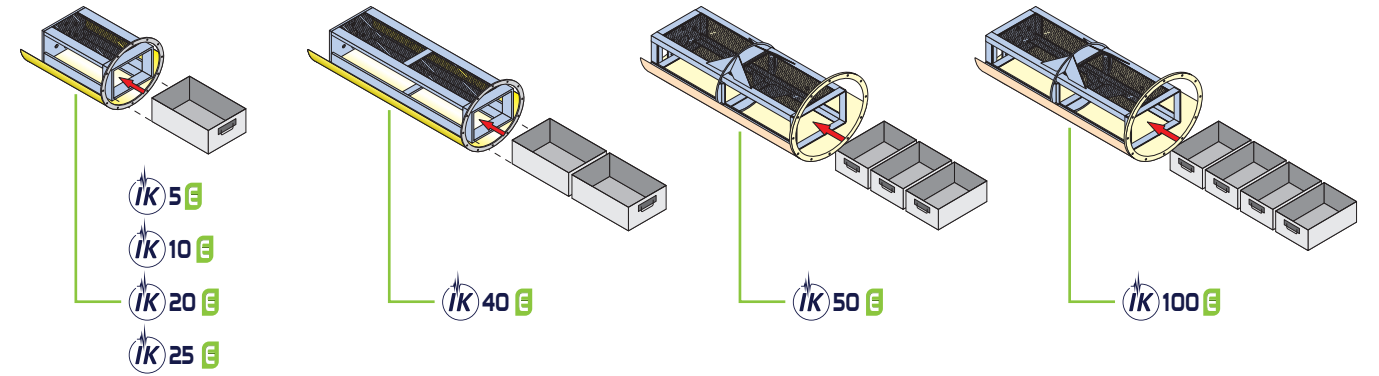
The ILSA machines represent a solution for the precise cleaning of components of all types of metals and many plastics treated with different coolants, even simultaneously within the same plant, with the application of a process that allows to degrease, clean and dry thoroughly each type of particular also in the presence of complex geometries and blind holes and capillaries. ILSA is present through its own sales and technical representatives throughout Europe, USA & Mexico, India, South East Asia, by providing to customer the opportunity to work with a global partner.

# 系列 IK

改性醇醚或碳氢-全真空运行  
Modified alcohols or Hydrocarbon - Fully VACUUM operation

FULL ELECTRIC POWERED

	装载尺寸 Loading dimensions	装载量 Loading volume	装载能力 Loading capacity	腔体容积 Chamber volume	机器尺寸 Machine dimensions
	毫米 / mm	升 / lt	公斤 / kg	升 / lt	毫米 (长X宽X高) / mm (LxPxH)
IK 5	150 x 210 x 130	5	10	20	1400 x 1600 x 2410
IK 10	220 x 370 (320) x 200	12	30	60	1400 x 1600 x 2410
IK 20 COMPACT	320 x 480 x 200	30	50	100	1400 x 1600 x 2410
IK 20	320 x 480 x 200	30	50	100	2000 x 1600 x 2410
IK 25	320 x 480 (520) x 200	30	75	130	2200 x 1800 x 2510
IK 40	320 x 960 (1040) x 200	60	100	220	2200 x 2100 x 2510
IK 50	480 x 660 x 400 (480 x 960 x 200)	120	150	390	3200 x 2400 x 2960
IK 100	480 x 980 x 400 (480 x 1280 x 200)	180	200	510	3200 x 2400 x 2960
IK 200	660 x 960 x 400	250	400	800	4000 x 2400 x 3410
IK 400	850 x 1240 x 970	1000	600	3000	6000 x 2800 x 3410



# 系列 IPK

可转换多溶剂-真空干燥  
Convertible multisolvent - VACUUM Drying

从 25 型开始提供  
Available from model 25.

# 系列 ILS

特殊和大型尺寸应用  
Special and Big Sized Applications



组合真空干燥  
COMBINED VACUUM DRYING



容量和尺寸根据应用而定  
CAPACITY AND DIMENSIONS  
ACCORDING TO THE APPLICATION

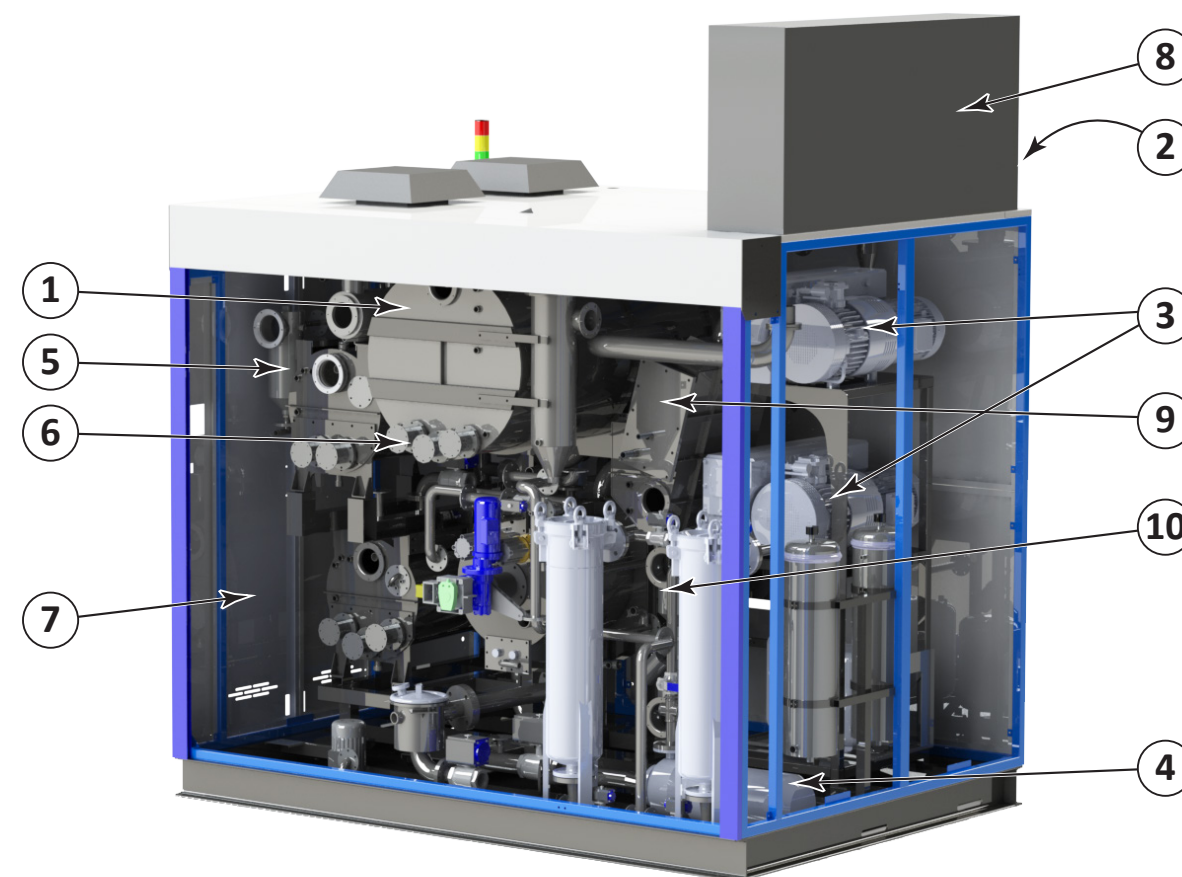




FULL ELECTRIC POWERED

甚至更多...  
even more...

... 履行!  
... performing!



- |   |  |
|---|--|
| ① 两个大储液槽在更小的空间内<br>Two big tanks in less space          | ⑥ 耐热性<br>Heat resistances                        |
| ② 完全无障碍进入腔体<br>Total accessibility to treatment chamber | ⑦ 维护的最佳可达性<br>Best accessibility for maintenance |
| ③ 高真空 (双真空泵)<br>Higher vacuum with double pump          | ⑧ 无需水连接<br>No water connection needed            |
| ④ 高性能溶剂泵<br>High performance solvent pump               | ⑨ 十倍冷凝表面<br>Tenfold condensation surface         |
| ⑤ 自动油回收<br>Automatic oil recovery                       | ⑩ 优化水分离<br>Optimized water separation            |

	装载尺寸 Loading dimensions 毫米 - mm	装载量 Loading volume 升 - lt	生产力 Productivity 循环/小时 - cycles/h	装载能力 Loading capacity 公斤 - kg	腔体容积 Chamber volume 升 - lt	机器尺寸 Machine dimensions 毫米 (长x宽x高) - mm (LxPxH)
	320 x 480 (520) x 200	30	8-10	75	130	2200 x 2100 x 2510
	320 x 960 (1040) x 200	60	8-10	100	220	3200 x 2250 x 2510
	480 x 660 x 400 (480 x 960 x 200)	120	8-10	150	390	4000 x 2400 x 2960
	480 x 980 x 400 (480 x 1280 x 200)	180	8-10	200	510	4000 x 2400 x 2960



金属清洗

金属清洗是去除由于工业制成品的生产和/或加工而在其表面形成的有机污染物（油、油脂等）和无机污染物（碎屑、灰尘等）的必要过程。

清洗是生产过程中的一个基本阶段，它不仅影响后续的加工和/或装配，而且还影响最终的产品质量和运行。

它能清洗什么？什么都可以！应用不计其数：图中显示了一些最常见的机器，它们生产的零件可以使用我们的工业清洗机进行清洗。

自动化产线  
TRANSFER

机台  
LATHE

冲压  
PRESS



加工中心

MACHINING CENTER

炉子

FOURS

抛光机

POLISHING MACHINES

the metal cleaning

Metal cleaning is the process necessary to remove organic contaminants (oil, grease, etc.) and inorganic contaminants (chips, dust, etc.) built up on the surface of industrial manufactured articles due to their production and/or machining.

Cleaning is a fundamental stage of the production process that not only affects the following machining and/or assembly, but also final product quality and operation.

WHAT CAN IT CLEAN? ANYTHING! Applications are countless: the diagram shows some of the most common machines producing the parts that can be cleaned using our metal cleaning machines.



用来清洗零件的液体

ILSA（伊尔萨）生产的特殊系统用于不同类型产品的清洗，因此客户有广泛的选择范围和更高的可能性来找到最适合待处理零件和待清除污垢类型的解决方案。

改性醇醚

MODIFIED ALCOHOLS

脂肪族碳氢

ALIPHATIC HYDROCARBON

卤化的

HALOGENATED

其他溶剂

OTHER SOLVENTS

the fluid used to clean parts

ILSA manufactures specific systems working with different cleaning product types, so that customers have a wide range to choose from and a higher possibility to find the solution most suitable to parts to be treated and type of dirt to be removed.

		四氯乙烯-全氯乙烯(卤代-氯化) Tetrachloroethylene-perchloroethylene (Halogenated - Chlorinated )		
		异戊烷-C9至C12（脂肪族碳氢化合物） Isoparaffin - C9 to C12 (Aliphatic Hydrocarbons)		
		改性醇醚 Modified alcohols		
比重（密度） Specific weight (density)	千克/升 kg/l	0,88	0,75 - 0,77	1,62
比热 Specific heat	千焦/千克·K kJ/kg K	2,0	ca. 2,0	0,9
汽化热 Heat of vaporization	千焦/千克 kJ/kg	280	255 - 300	210
沸点 Boiling temperature	摄氏度 °C	170 - 175	180 - 200	121
20°C时的蒸汽压 Vapor pressure at 20 °C	毫巴 mbar	1,1	0,3 - 1,5	18,9
闪点 Flash point	摄氏度 °C	63	56 - 80	-
表面张力 Surface tension	毫牛顿/米 mN/m	26,1	23 - 25	32
KB值 Kauri-butanol value		>1000	ca. 30	ca. 90



## 零件的清洗方法

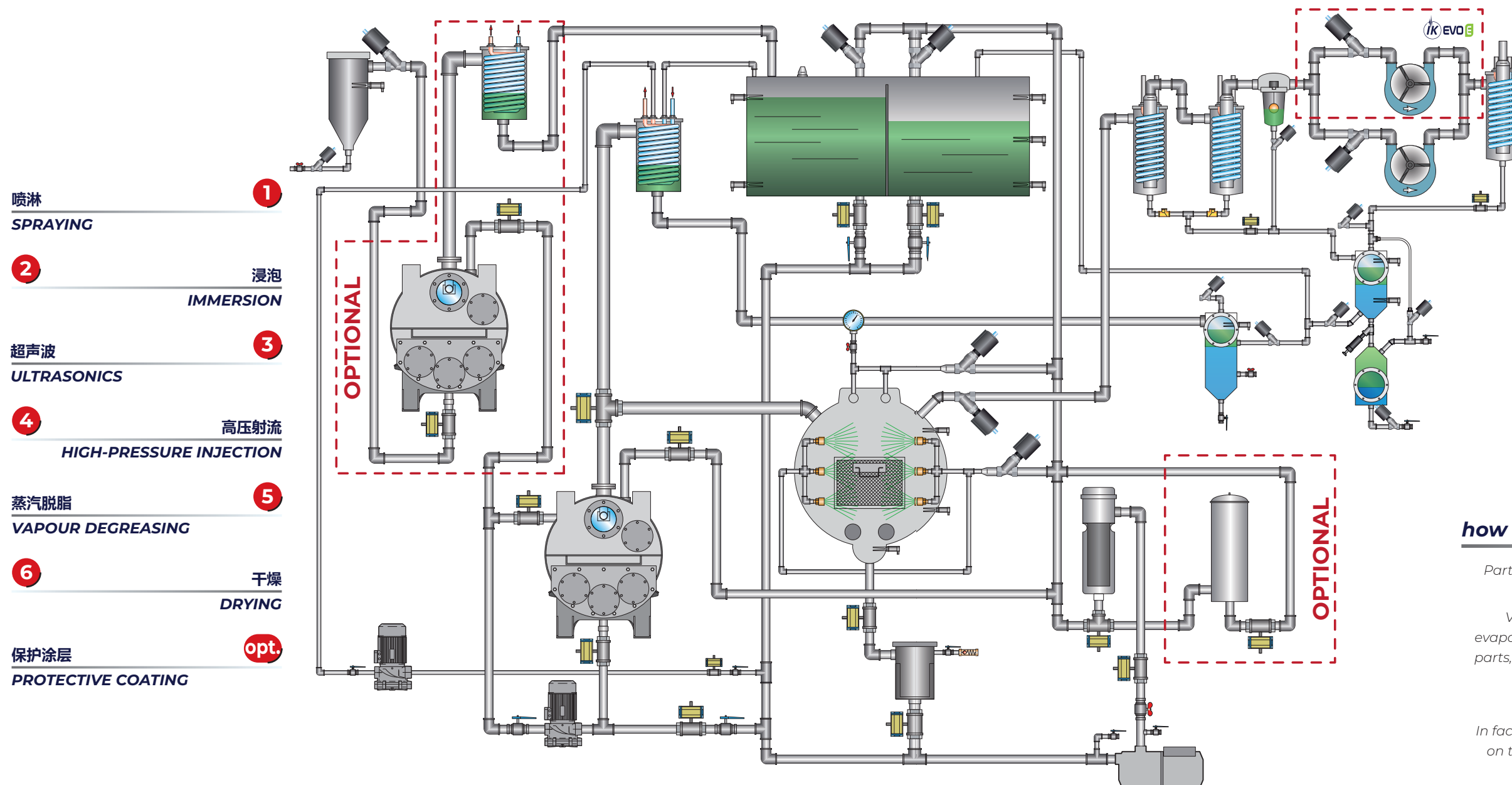
该系统可以利用不同阶段的组合来溶解有机污垢并机械地去除任何无机污垢。这些阶段可能是喷淋、浸泡、超声波、高压射流和蒸汽脱脂。

清洁后，如有必要，可对零件进行防锈。

## the way the parts are cleaned

The systems may exploit a combination of different stages to solubilize organic dirt and mechanically remove any inorganic dirt. Such stages might be spraying, immersion, ultrasonic, high-pressure injection and vapour degreasing.

After cleaning, parts can be protected against corrosion, if necessary.



## 保护涂层

特定的可选配置允许在循环结束时将防护产品涂在工件上。该阶段可通过产品的直接雾化或在溶剂和保护性混合物中的完全浸没方式来实现。

## protective coating

Specific optional configurations allow to apply protective products on pieces at the end of the cycle. The phase can be carried out by direct nebulization of the product or by a total immersion phase in a solvent and protective mixture.

## 零件如何干燥

零件在真空中干燥，这项技术一直是ILSA（伊尔萨）系统的特点。

事实上，真空干燥，允许溶剂在处理过的零件表面几乎瞬间蒸发，不管它们的形状是否复杂。

因此干燥阶段短且有效。

事实上，进入真空装置的这一过程是基于以下原理进行的：通过降低压力，液体在低于大气压下所需的温度下蒸发。

通过作用于在清洗阶段的温度，从处理室吸取空气，直到达到必要的真空度（氯化溶剂<40 mbar，改性醇醚<5 mbar），从清洗仓中蒸发掉溶剂。溶剂被冷却器冷凝，并通过分离器返回储液槽。

## how the parts are dried

Parts are dried in VACUUM, a technology that has always characterized ILSA systems.

VACUUM drying, in facts, allows almost instant evaporation of the solvent on the surface of treated parts, regardless of their shape that might be more or less complex.

Drying stage is therefore short and efficient.

In facts, this process, into a vacuum plant, happens on the base of the principle for which by reducing the pressure a liquid evaporates at lower temperature than what necessary at atmospheric pressure.

By acting on the temperature of the load during the cleaning phase and sucking the air from the treatment chamber until reaching the necessary vacuum degree (< 40 mbar with chlorinated solvents and <5 mbar with modified alcohols), it is got the solvent evaporation from the load. The solvent is condensed by the cooler and comes back to the tank through the separator.

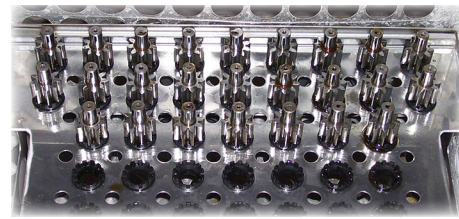
## 如何处理要清洗的零件

需要清洗的部件通常通过不同尺寸和形状的合适篮筐/框架插入清洗系统。

根据产品特点和篮筐特点，零件可以批量插入，也可以固定在一定的位置，甚至可以固定在合适的位置，同时允许其移动。

压盖可用于将零件固定在装料位置，固定或限制其移动。

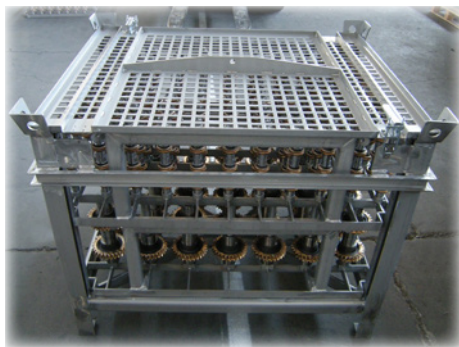
### 定位的 - POSITIONED



### 散装的 - IN BULK



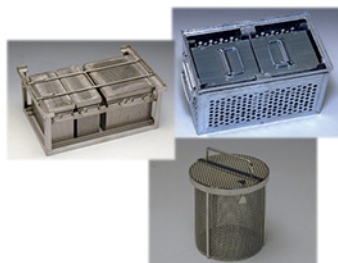
### 固定的 - FIXED



### 框架 - FRAMES



### 特殊篮筐 - SPECIAL BASKETS



### 大篮筐 - BIG BASKETS



### 标准篮筐 - STANDARD BASKETS



## how handling the parts to be cleaned

The parts to be cleaned are usually inserted into the cleaning systems by means of suitable baskets/frames of different dimensions and shapes.

According to product features and baskets/frames characteristics, the parts could be inserted in bulk or in a certain position or even fixed in place, yet allowing load movement.

Shaped covers could be used to hold parts in loading position, fasten them or restrain their movements.

## 装载设置

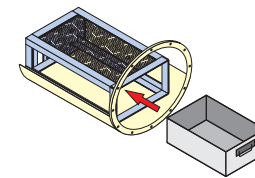
篮筐包含装载的零件，可以通过不同方式组合以优化对清洗仓总容积的利用。

以自动或手动方式装载插入并固定在机器内部。

装载可以通过手动方式，通过滚筒输送机 and 平台，或者通过与机器匹配的自动或机器人控制系统来进行插入和移除，还可以与脏区零件进料口和干净零件出料区一起存放。

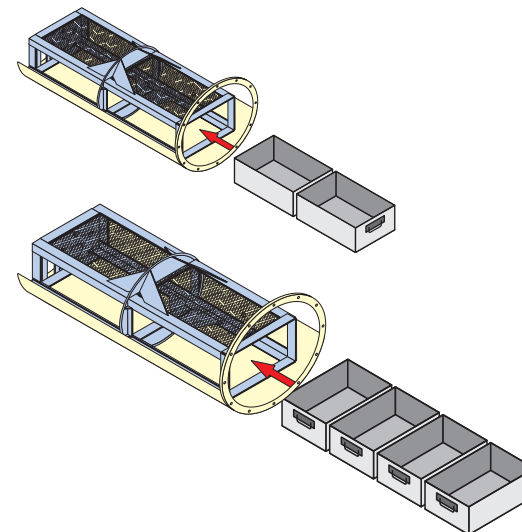
### 单个篮筐

#### SINGLE BASKET



### 水平放置多个篮筐

#### MULTIPLE BASKETS IN HORIZONTAL



### 手动装载

#### MANUAL LOADING



### 自动装载

#### AUTOMATIC LOADING



## setting up the load

The baskets contain the parts that make up THE LOAD and can be combined in different ways to optimise exploitation of the overall volume of the chamber.

The load is inserted, secured in place inside the machine in an automatic or manual way.

Load can be inserted and removed by hand, by means of roller conveyors and platforms, or by matching automatic or robot-controlled systems to the machine, possibly together with storage areas at infeed for the dirty parts and at outfeed for the clean parts.



## 处理在机器中装载的零件

根据零件的要求和特点，装载的零件可以完全回转或以设定的速度和角度摆动。

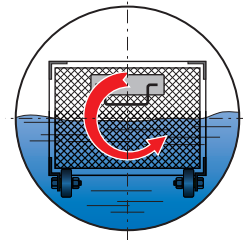
这两个设置可以由用户编程，也允许装载的零件保持静态。

这种解决方案允许在清洗循环的各个阶段进行匀速的运动，将装载的零件暴露在清洗循环的各个阶段，即使多篮筐配置的情况下也是如此。

如果篮子没有自己的盖子，可以设计自动或半自动的盖子，以防止零件在旋转过程中脱落。

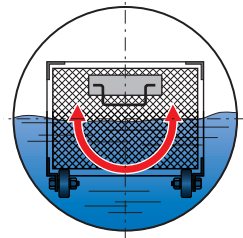
### 绕轴旋转

#### ROTATION ON ITS AXIS



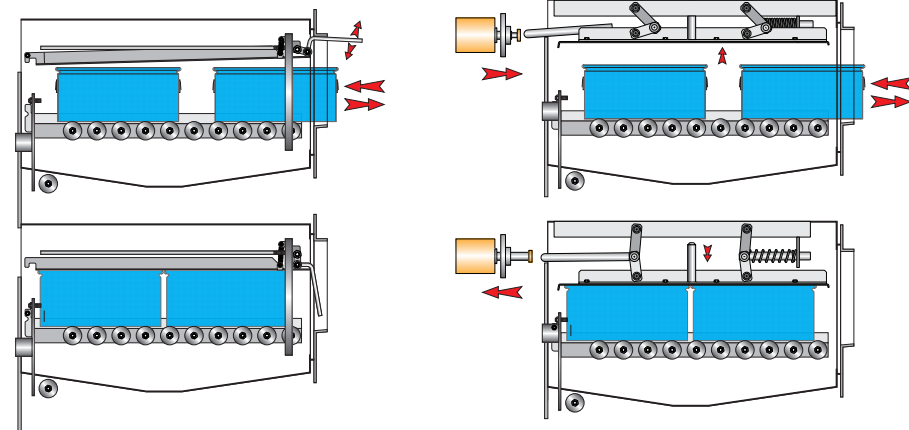
### 摆动控制

#### CONTROLLED SWINGING



### 机内压盖

#### COVERING IN MACHINE



## handling the load in the machine

According to parts requirements and features, the load can be completely turned around or swung at a set speed and by a set angle.

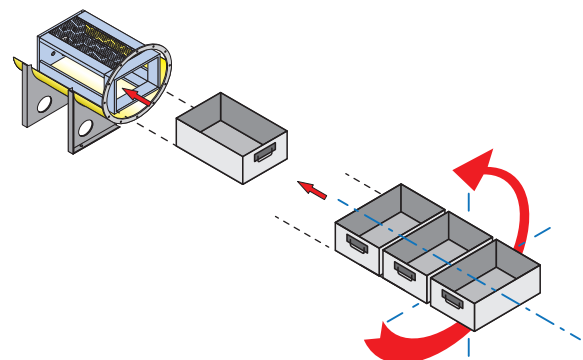
These two settings can be programmed by user and also allow for leaving load static.

This solution allows to make uniform movements and exposure of the load to the phases of the cycle, even with multi-basket configurations.

If baskets did not have their own covers, it is possible to design automatic or semi automatic covers to prevent parts from falling out during rotation.

### 多篮筐解决方案

#### MULTI-BASKET SOLUTIONS



## 控制系统

清洗循环由西门子PLC和专门为ILSA（伊尔萨）清洗系统设计的软件进行编程和控制。

可控制所有系统功能和信息功能（日志、警报、设置、维护程序）。

这些活动也可以通过网络执行，网络也用于获得在线帮助。

此外，ILSA（伊尔萨）可以提供所有设备和免费服务，为清洗系统提供带驱动器和控件的“交钥匙包”。

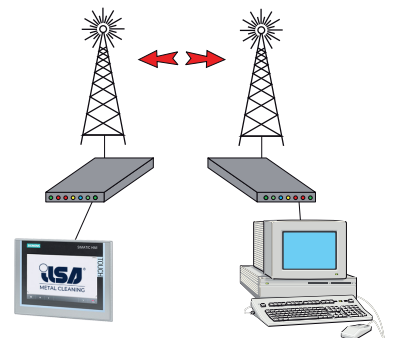
### PLC控制

#### PLC CONTROL



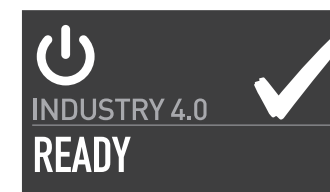
### 远程协助

#### REMOTE ASSISTANCE



### 生产和可追溯性管理

#### PRODUCTION AND TRACEABILITY MANAGEMENT



## controlling the system

Cycle is programmed and controlled by means of a PLC Siemens and a software specifically designed for use on ILSA cleaning systems.

Is possible to control all system functional and information features (Log, Alarms, Set Up, Maintenance Programmes).

These activities can also be performed through the ethernet that is also used to obtain on-line assistance.

Moreover, ILSA can supply all devices and complimentary services to offer a “turnkey package” with drives and controls for the cleaning systems.

### 维修计划

#### MAINTENANCE PROGRAMMES





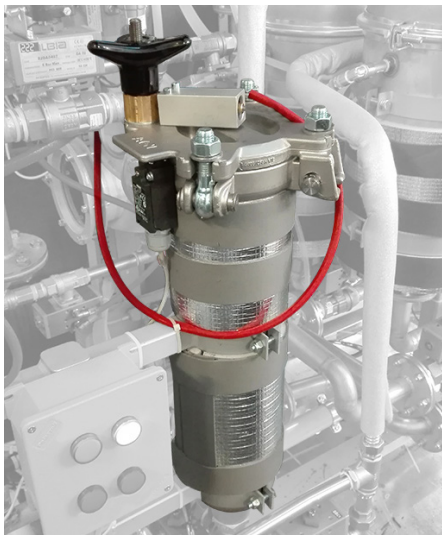
## 机器在这段时间内确保这种结果的方式

清洗液去除并带走零件上的所有杂质。

ILSA（伊尔萨）机器具有特殊的装置和程序，使液体保持理想状态。

在这些阶段，使用不同容量和类型的适当过滤器，以容纳任何污垢颗粒，如碎屑和灰尘，而油和油脂从液体分离，这得益于内置连续的蒸馏系统。

### 过滤 FILTERING

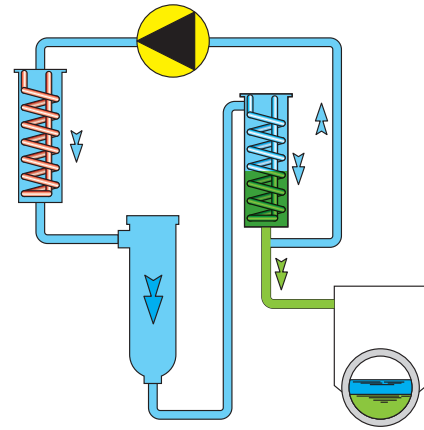


### 滤芯过滤器 CARTRIDGE FILTERS



### 过滤器干燥

#### FILTERS DRYING



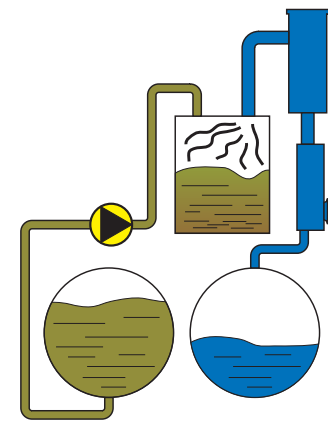
### 水分离

#### WATER SEPARATION



### 连续蒸馏

#### CONTINUOUS DISTILLATION



## the way the machine ensure such results during the time

The cleaning fluid removes and takes up all impurity from the parts.

ILSA machines feature specific devices and programmes that allow the fluid to keep ideal conditions.

During these stages, suitable filters are used, having different capacity and type, to hold any dirt particle such as chips and dust, while oil and grease are separated from fluid thanks to built-in and continuous distillation system.

## 对环境有利

ILSA（伊尔萨）的研发中心始终致力于加强和优化安全条件和环境保护，并执行有关清洗系统使用的法规。

关注能源消耗，然后关注环境的一个例子是“ILSA OE”系统，该系统通过适当的液压结构和自动管理软件，允许管理和利用蒸馏器中产生的溶剂蒸汽，以对加热系统中需要清洗的零件进行脱脂，从而减少了制冷能量用于蒸汽冷凝的功耗。

“即插即用”配置包括一个冷凝系统和空气交换器，它去除了与外部冷却水或其他设备（如冷水机）的任何连接。

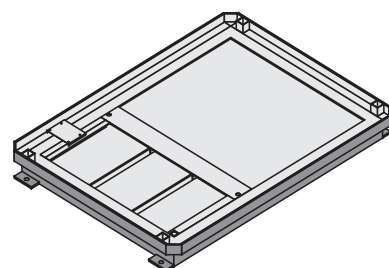
## ILSA（伊尔萨）OE系统

ILSA OE SYSTEM



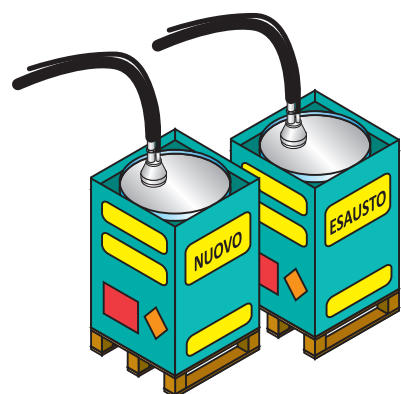
## 溶剂安全托盘

SOLVENT SAFETY TRAY



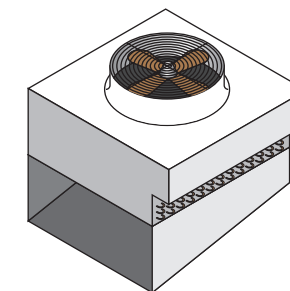
## 溶剂和残渣的自动装卸

AUTOMATIC LOADING/UNLOADING OF SOLVENT AND RESIDUES



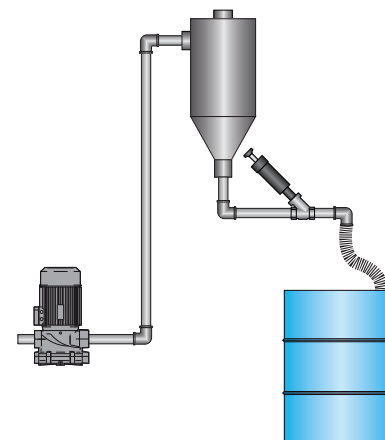
## 即插即用

PLUG & PLAY



## 自动管理-机器排放

AUTO MANAGING - MACHINES DISCHARGE



## environment friendly

ILSA R&D has always focused on enhancing and optimising the safety conditions and the environment protection, and implemented the regulations about the use of the cleaning systems.

An example of attention to energy consumption, then to the environment, is the system “ILSA OE” which, through a suitable hydraulic construction and an automatic management software, allows to manage and exploit the solvent vapors generated in the distiller for both degreasing of the components to be cleaned that for the heating system, reducing both power consumption that the refrigeration energy used for the condensation of the vapors.

The configuration “Plug & Play” incorporates a condensing system with air exchanger that eliminates any type of connection to external cooling water or additional equipment such as chillers.