MVP

UK & IRELAND

SOLVENT DISTILLATION UNIT
SMART SERIES K16/K30/K60 ATEX 2G

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SOLVENT DISTILLATION UNIT

Smart Series

K16 - K30 - K60 ATEX 2G

Solvents distillation unit

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Why choose Ciemme?

Over 40 years of history

The first company in Italy registered with the Chamber of Commerce (March 16th, 1982) for the production of solvent distillers.

"Trust in our experience. We can provide you with a state-of-the-art technical solution for your needs."

Maximum company reliability

RATING 1 certification as the highest company financial reliability.

This allows us to be referenced in the most important industrial groups in the world that we have provided with mutual satisfaction.

"We will continue to provide you the best service over time. Day after day."

More safety and controls

We install more controls and safeties than required by regulations to ensure maximum process reliability and risk prevention.

"Safety is our priority. Our systems can work completely autonomously even if not supervised."

3 YEAR WARRANTY

We are the only manufacturer of solvent distillers to give clients a 3-year warranty with simple and clear delivery conditions.

"The reliability of our systems are not only in words but through a unique and valid guarantee"

RCT and RCO insurance included

With a cumulative insured capital of € 50.000.000,00 in case of unforeseen events we guarantee coverage with the best insurance companies on the market.

"Whatever happens at the distillation system we will be by your side to support you"

Note: Request terms and conditions of supply to benefit from all these advantages.

The Smart series in brief

The Ciemme *Smart Series* of solvent distillers offer levels of safety, performance and functionality that are state-of-the-art, in particular:

High safety

- Relief valve for boiling tank
- Distillation tank thermal protection
- 4 reference standards
- Safety thermostat
- Diathermic oil expansion tank
- Relief valve for expansion oil tank
- Expansion tank thermal protection

Easy use and maintenance

- Swinging machine body up to 100° with safety lock
- Large boiler lid
- Diathermic oil temperature display
- Solvent vapours temperature display
- Distillation bags (opt)

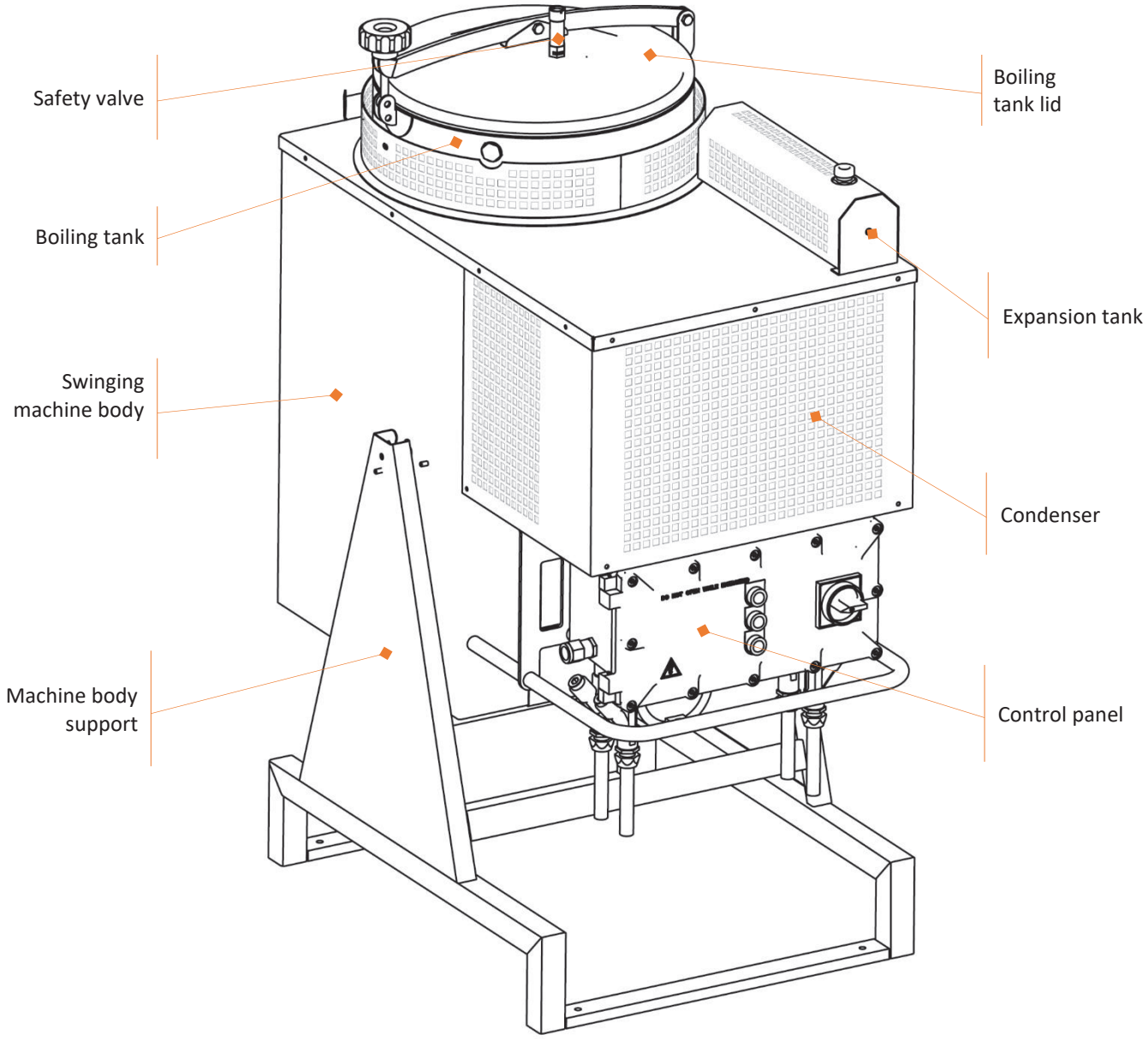
High productivity

- Design of the tank to maximise thermal exchange
- Vapour pipe with optimised diameter to guarantee vapour flow
- Condenser with more exchange surface
- Two temperature probes for distillation cycle management

Customisable with a choice of options, including:

- Stainless steel condenser
- Water post-condenser
- Vacuum generator
- Vacuum generator delayed start timer
- Containment tank
- Loading kit for dirty solvent

1. System composition



2. Boiling tank

The *Smart Series* boiling tank is composed of a **double cavity in stainless steel** with a **lid** with **EPDM gasket** and a **safety relief valve, calibrated to 0.3 bar** by a certified external body.

For those special applications, and where chemically aggressive solvents are present, a Teflon gasket can be installed (opt).

The **design of the tank** ensures constant, uniform heating, with maximum efficiency of heat exchange.

The synthetic type diathermic oil **avoids the formation of carbon residue formation** on the heating elements which were designed to have **an excellent W/cm² ratio** which extends the **life of the oil up to 2.000 working hours**.

On the diathermic oil circuit there is an external **expansion tank** that allows optimal expansion during the heating and cooling phases, reducing the surface in contact with air, to avoid **moisture build-up** and possible **acidification**.

The external body of the boiling chamber is insulated to avoid dispersion of precious energy.

On the **expansion tank** and on the top part of the **boiling chamber**, **protection** is installed to avoid direct operator contact with the **hot parts** of the machine.

It is possible to **tilt** the machine body **up to 100°** to discharge solid or semi-solid residue and at the same time allow **easy access** to carry out maintenance and/or cleaning of the inside of the boiling chamber.

The **swinging system** of the machine body is equipped with a **damper with safety lock.**

3. Filling dirty solvent

Filling the dirty solvent takes place manually, from above, directly inside the boiling chamber.

Alternatively, you can equip the system with a **filling kit** of the solvent to process (opt).

The kit allows you to **transfer the solvent to process** from an external container inside the boiling chamber, using an **Atex certified pneumatic pump** managed manually by the operator.

4. Vapour pipe

A stainless-steel pipe sends the **solvent vapours** from the boiling chamber to the condenser.

The vapour pipe has an **optimised** diameter to ensure the greatest possible flow of vapour, to **optimise machine productivity**.

The vapour pipe has a **specific design** to **avoid** dragging any **foam** or **volatile particles** that can generate during distillation.

5. Condenser

The *Smart Series* condenser is one of the most important components of the distillation process, with **an increased exchange surface**, thanks to our exclusive proprietary design.

A **high-performance motor fan** guarantees condensation of the vapours with high ambient temperatures.
The blades of the ventilation system are built with **specific material to avoid the accumulation of static electricity** and are **non-sparking** to comply with ATEX regulations.

The condenser is supplied in copper in the standard configuration.

For applications where chemically aggressive solvents are present, the **stainless-steel version** can be installed (opt).

Alternatively, for **particular ambient temperatures or low boiling products**, a **water post-condenser** can be installed, in addition to the air one, which needs to be connected by a cold wate centralised system or by an external refrigeration unit (opt).

6. Residue drainage

In the standard configuration of the *Smart Series*, once the distillation cycle has completed, the residue is drained by tilting the boiler and usually collected in an appropriately sized **metal drum**.

Alternatively, you can add a **distillation bag** in the boiling chamber (opt).

The distillation bag, which is manually positioned before filling the dirty solvent, allows:

- easy removal of residue when distillation is complete
- the boiling chamber to be kept clean and guarantee better heat exchange
- increased cycle performance, distilling more solvent to have solid and semi-solid residue

The distiller is equipped with a **specific spring**, in stainless steel, which allows you to **fasten** and **hold the bag in position** on the walls of the distillation chamber, during the entire cycle.

7. Cycle management

The **distillation parameters**, the safety and the alarms are managed by a built-in **logic** which allows easy configuration and setting.

The temperatures are managed by two thermocouples to have maximum **reading precision** of the important process temperatures.

The **distillation cycle is managed**: timed or on vapour reading. This makes it possible to **optimise the parameters** of the cycle, to **distil every type of solvent mix**.

Basically, the **distillation cycle is configured** to carry out **single batch distillation**.

With this configuration, the load of dirty solvent and unloading of the residue are managed manually; automatically is managed the end of the distillation cycle and by gravity the collection of the distilled solvent.

8. Safety

The distiller is **designed and manufactured** in compliance with the directives of the following **standards**:

- 2006/42/EC (Machinery directive)
- 2014/35 EU (Low voltage)
- 2014/30/EU (EMC - Electromagnetic compatibility)
- 2014/34/EU (ATEX)

The *Smart Series* distillers are **ATEX certified for ZONE 1** with the following string :

II 2G Ex h IIB T3

and are equipped, according to their configuration, with a series of **safety devices**:

- Safety **thermostat**
- **Over-pressure** valve calibrated to **0.3 bar**
- **Expansion chamber** for the diathermic oil, equipped with relief and dipstick
- **Two temperature probes** for distillation cycle management
- Distillation tank **thermal protection grate**
- Expansion tank **thermal protection grate**
- **Dampened system** with **safety lock** of the swinging body

9. Structure and containment tank

A **containment tank** must be installed **by law** in case of spills of dangerous substances.

Ciemme is the **only manufacturer** offering **containment tanks** on its range of distillers for solvents with the possibility of fastening the distillers directly on the grate. (opt).

10. Vacuum generator

One of the most requested and efficient accessories of the *Smart Series* is the pneumatic **vacuum generator** (opt).

The vacuum distillation process allows:

- **Reduce the boiling temperature** of the solvent to distil, thereby helping evaporation and extraction of the solvents
- **Avoid reaching critical temperatures** for auto-ignition and decomposition which cause risks of acidification of the solvents and/or degradation of the contaminants
- **Reduce risks** during distillation of the solvents contaminated by nitrocellulose.
- **Distil the solvents with high boiling point** or with low vapour tension.

The vacuum system is **composed of a tank** in stainless steel, which have the function of **generating the vacuum** and **collecting the** distilled **solvent**.

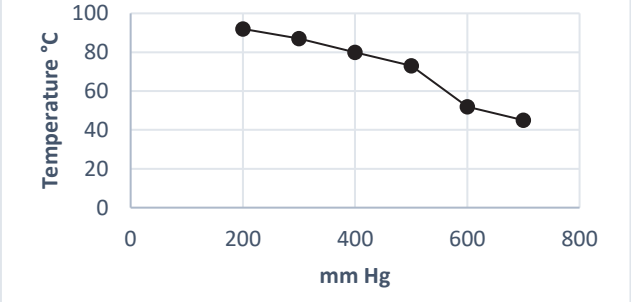
For particular applications, you can install a **timer** to start the **vacuum generator** after a **pre-set time** from the start of the distillation cycle (opt).

At the end of the distillation cycle and before starting a new cycle, the vacuum **generator tank must be emptied** of **distilled solvent.**

The vacuum generator is a “Venturi” ejector type with adjustable vacuum switch.

Example of boiling temperature of the water at different vacuum levels:

Vacuum level (mm Hg)	Temp. Boiling (°C)
200	92 (197°F)
300	87 (188°F)
400	80 (176°F)
500	73 (163°F)
600	52 (125°F)
700	45 (113°F)

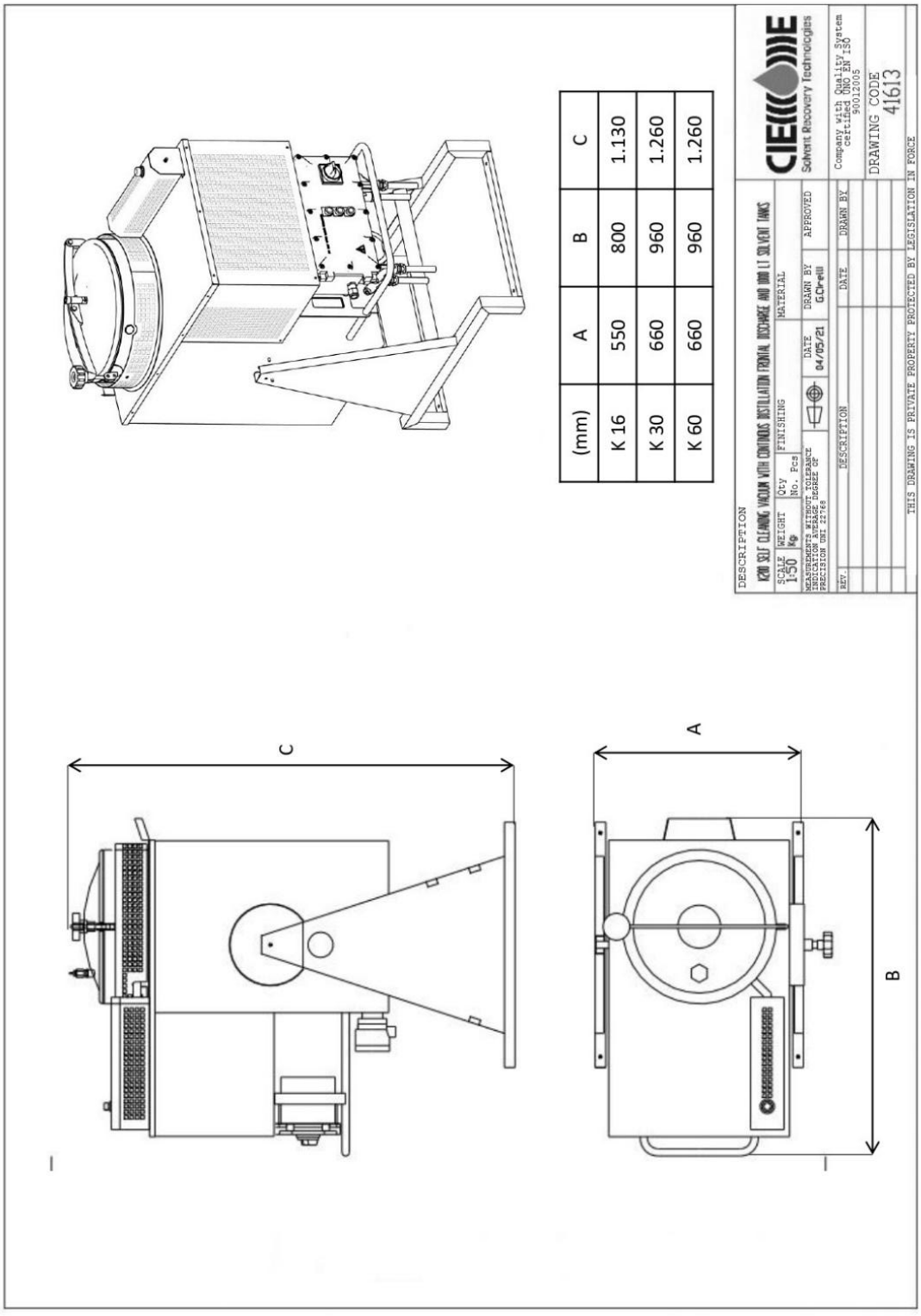


11. Technical specifications

SPECIFICATION	K 16	K 30	K 60
Daily production (lt/24h) (gal/24h)	55 (14.5)	110 (29)	200 (52)
Average production – peak (lt/h) (gal/24h)	2 – 3 (0.52-0.79)	4,5 – 6 (1.18-1.58)	8 – 11 (2.11-2.90)
Load capacity (lt) (gal)	18 (4.7)	37 (9.77)	67 (17.6)
Tank total volume (lt) (gal)	24 (6.34)	49 (12.9)	87 (22.9)
Lid gasket	EPDM / PTFE		
Heating power (Kw)	1,6	2,5	3,2
Diathermic oil quantity (lt) (gal)	14 (3.69)	16 (4.22)	24 (6.34)
Manual filling pneumatic pump (opt)	3/4” membrane in PTFE		
Vapour cooling fan (Kw)	0,15		
Cooling fan diameter (mm)	300 (12”)		
Power supply voltage	220 Volt / 1ph / 50-60Hz		
Connection cable	3G2.5		
Compressed air connection	5/6 bar – tube 10mm		
Compressed air consumption of the vacuum generator (Nl/min)	300		
	Consumption and discontinuous air use		
Noise (dB)	65		
Approximate dimensions L x P x H mm (varies according to the configuration)	550 x 800 x 1.130 22” x 35” x 45”	660 x 960 x 1.260 26” x 37” x 49”	660 x 960 x 1.260 26” x 37” x 49”
Weight (kg)	95	111	133
Working temperature	50-200°C / 323-473°F		
Certification	II 2G Ex h IIB T3		

Note: Some features listed may vary without affecting the intended use and functionality of the product. The images shown in this document are for illustrative purposes only and are not contractual, varying according to the configuration. All designs of Ciemme products and devices are protected by copyright. Please be cautious of imitations and/or unauthorized distributors or retailers. Our products and devices are conceived, designed, manufactured, and assembled exclusively by Ciemme in Italy.
The indicated productivity refers to the dirty product being treated and is to be considered purely indicative. It does not constitute contractual obligations nor is it part of the sales contract. The data provided may vary due to multiple factors, including the type and mixture of solvents being treated, the type and quantity of residue, the power supply used, as well as environmental conditions and factors. Productivity lower than expected cannot be considered defects under Article 1490 of the Civil Code.

12. Smart series layout



13. Photo of similar installations

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