



-System

High Pressure Metering Machines
for Polyurethanes

Automotive Interiors & Exteriors

Refrigerator Insulation

Panel Insulation

Rigid, Flexible & Integral Foams for Furniture

Building & Piping Insulation

Technical Components

cannon
POLYURETHANE TECHNOLOGY



-System

Modularity, Flexibility and High Performance are the Cannon Policy

The Cannon Group has achieved market success through a total commitment to product quality, reliability, service and value.

This approach have helped manufacturers with their with their constant need to balance productivity, profitability and systems integration and innovation, whilst making cost savings to maintain their competitiveness.

Almost forty years of experience in the mixing, metering and foaming of polyurethanes, more than **10,000 metering machines** installed around the world and an ongoing commitment to R&D, have all contributed to continual technological improvements for Cannon machinery, especially in terms of quality, performance and safety.

Cannon **high-pressure** metering machines are the right solution for the widest variety of applications and customer needs with a tailored design able to satisfy the most complex production requirements. The use of high-pressure technology offers many and significant advantages:

- chlorinated solvents are not longer required
- improving the working conditions, safeguarding and protecting the more global environment
- more efficient production processes
- foams with higher quality and better physical and mechanical properties
- significant raw material saving.

Cannon's "A-System" is especially suitable for effortless interfacing with handling equipment such as carousels, jigs, storage and premix units, Cartesian and anthropomorphic robots, loading and unloading groups, thus offering complete turnkey production systems solutions.

The "A-System" series also includes solutions for special applications such as production processes based on hydrocarbon blowing agents, **multi-component foaming lines** and plants fitted with multiple mixing heads.

Sandwich Insulated Panels for Building Applications (Courtesy of Lattonedil).



At present, machine configurations available for Cannon "A-System" dosing units are:

A-System Basic

The ratio and output adjustment is manual and it can be optionally upgraded to being automatically driven by frequency inverters.



TV Cabinet (Courtesy of SIM2).

Medical Trolley (Courtesy of GMP Italia).



Complete Plants for Automotive Interiors and Exteriors (Courtesy of Alfa Romeo - Fiat Group).



A-System Servo

Equipped with frequency inverters, this model is supplied complete with a "closed loop" control of the component's metering.

Set values are constantly compared with those measured in real time. Whenever deviations beyond the tolerances allowed are recorded, the control system automatically adjusts the parameters, keeping output & ratio values constantly stable.

Furthermore, it is possible to automatically modify component ratio and output from shot to shot, offering a wider production flexibility during the foaming process, for example, when changing over to different foamed parts or for the production of multi-hardness components (car seating etc.).

A-System Penta Twin

The optimisation of power consumption as well as the reduction of environmental impact resulting from the emission of polluting gases, are today main topical subjects on which Cannon is highly focused. In this direction, hydrocarbons-blown foams represent today the right and balanced solution for a **sustainable growth**.

Especially designed for the use of flammable blowing agents, such as Cyclopentane and other hydrocarbons less harmful to the Ozone's layer.

Special units are also available for the affordable, quick, safe and **efficient conversion** of existing foaming systems.

Component groups in contact with the potential flammable blowing agent are sited in special ventilated enclosures properly equipped with explosion-proof electrical apparatus, inert circuits and safety sensors.

The "A-System" is the result of Cannon's effort toward the continuous machine development and design programs applying **modular concepts** and guaranteeing the maximum flexibility in machine configuration.

In particular, following the modular design concept, the machine is mainly composed of **four main modules** customisable in a wide range of available configurations to meet specific technical requirements.

The **open frame design** makes maintenance operations easier with full accessibility to all the parts.

Cannon has selected the world's best-known suppliers, to guarantee that the **most important parts** - control systems and electronic instruments, mechanical and hydraulic devices - are reliable and readily replaceable.



Flexible Paddings for Furniture (Courtesy of B&B Italia).

Courtesy of Electrolux Zanussi.



Turnkey PU Foaming Systems for Cold Chain Industry.

Courtesy of Framec.





Tailored temperature control system configurations are available with additional heat exchangers.

Excellent laminar flow at very low/high outputs.



Storage Module

Pressurised day tanks for chemicals mounted on a stand-alone and independent frame.

Tanks are certified according to PED European Standard and can also be optionally provided according to other local specific regulations.

Level sensors - magnetic switches, resistive or capacitance ones - control the volume of liquid inside the tank and operate the relevant automatic filling system if connected.

A visual indicator ensures an immediate and precise reading of the component level.

Depending on specific technical and production requirements, many optional items can be fitted onto the tanks:

- air dryers
- chemical stirrers complete with mechanical or magnetic couplings
- air emulsifier & air nucleation detector
- tank super-max levels.

Temperature Control System

Cannon "A-System" models have been designed to ensure accurate and constant control of the component temperatures, which are kept uniform by a dedicated circuit configuration based on the combined action of:

- jacketed & insulated tanks with capacities from 70 to 500 litres
- heat exchangers
- electrical heating elements
- recycle stream distributors, which guarantee a constant low-pressure flow of the material through the temperature control circuit when the machine is in operation.

Metering Module

Taking into account the required outputs, the features of the chemical components and the need to precisely meter them, Cannon always equips its machines with **high-pressure axial-piston pumps** able to process the widest range of formulations.

In particular, Cannon developed a complete series of high-pressure pumps with **fixed and variable output** which represent a real and valid alternative to the models commonly available on the market, offering intrinsic **reliability, metering accuracy and efficiency**.

The output setting can be achieved in different ways:

- manual adjustment by means of a calibrated hand wheel
- automatic adjustment by changing the motor speed through a frequency inverter

Controls & Operator Interfaces

Machine functions are monitored and controlled in real time by a PLC, which is interfaced to a dedicated control panel, basically based on "Touch Screen" technology.



Nevertheless, depending on level of requested controls, different enhanced **Data Visualization Interfaces** can be applied (text or graphic panels).

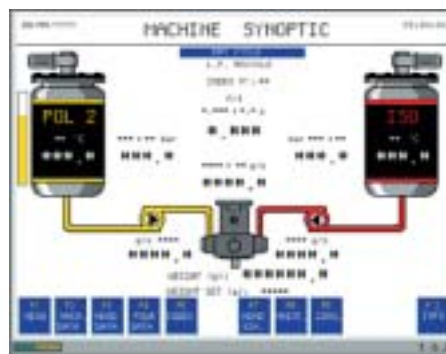
Based on high precision transducers - gathering the relevant values - and on special software developed by Cannon - integrated with the PLC -, the visualization system displays in real time, the most significant data such as: component outputs, ratios and shot weights, temperature and pressure.

During long shutdown periods or when the normal production cycle is in temporary standby, to prevent sedimentation in the tanks, **“Week-End Cycle”** can be set and programmed for low and high-pressure recycling of the components.

Cannon “A-System” are equipped with a software & hardware package for the **calibration of each independent component** directly through the mixing head.



Cannon "A-System" PentaTwin.



Software Packages

Data Collection Software Package (DCSP)

The Cannon DCSP is PC software dedicated to collect, store and manage production data. The system has been designed for direct connection between the host PC and the machine PLC in order to achieve the fastest data transfer rate.

Collected processing data are saved in real time by the system and automatically stored in indexed monthly production files that can be exported and easily processed using common office automation software.

Metering module of a multi-component foaming line.



Cannon A-System: modular design and open frames offer full accessibility and maximum flexibility in machine configuration.



Cannon AX high-pressure multi-component mixing head.

QI Analyst Statistical Data Analysis

Statistical data analysis can be carried out with the QI Analyst that can be interfaced with the Cannon DCSP.

Thanks to this software, the behaviour and the quality of the production process are constantly and efficiently tracked and controlled.

The most important indices measure the production quality, like Cp and Cpk which, once enhanced, can be displayed in graphs or diagram form.

Mixing Heads

As a result of its great experience acquired in the development of mixing technologies for the production of polyurethane foams, and in its constant commitment to search for new and innovative industrial solutions, Cannon boasts a wide range of **high-pressure mixing heads** to meet the needs of specific application sectors.

Cannon high pressure pumps with fixed & variable output can be equipped with mechanical or magnetic couplings.



The Cannon "A-System" machines can be equipped with any of the high-pressure mixing head models currently available, which cover an output range from 10 g/s up to 8,000 g/s and some of those can also be used for fast reacting Polyurea systems.

Furthermore, depending on the specific customer requirements, Cannon "A-System" machines can be used to complete for **multi-head foaming systems**, where, in a typical configuration, more than one mixing head can be connected to a single dosing unit.



Cannon Cartesian Robot with two movable axes.

Dedicated high-pressure mixing head models were designed:

- with an "L" shaped mixing chamber geometry for guaranteeing excellent laminar flow at very low/high outputs.
- for multi-component formulations for car seats production and dual hardness parts.
- for co-injection of reinforced and filled poliurethanes with glass fibre and other solid fillers, such as: iron powder, mineral fillers (expanded calcium carbonate, marble granulate, barite, graphite, sand), powdered recycled polyurethanes etc.
- with straight-through mixing chamber geometry suitable for spray applications, low output cavity filling of small parts and also for insulated sandwich panels, piping insulation etc.



Turnkey Plants for Automotive Industry.



Anthropomorphic robot mounted on a mezzanine and equipped with the new Cannon FPL 32 high output head.

Mixing Head Handling System

The quality of the end product heavily depends on the ability to get to an efficient mixing in order to obtain a homogeneous mixture, such as also upon the correct and precise pouring and distribution of the foam within the mould and foaming cavities.

The mixing head can be vertically and/or horizontally mounted on a **rotating boom** assembled on the machine frame or on a **separate stand-alone support**.

In order to obtain easier and more flexible mixing head positioning on the requested foaming axis, the system can also be supplied with a dedicated device to cross over from vertical to horizontal.

Integrated solutions for the automatic mixing-head handling based on Cartesian or anthropomorphic robots are also available to offer increased flexibility, ensuring higher productivity with extreme accuracy and repeatability.

Cannon Cartesian handling systems are driven by an easy interface for the simple setting of all the production parameters, such as pouring patterns and for setting speed and acceleration ramps at the beginning and at the end of the patterns for obtaining accurate overlapping.

Global Service

Customer satisfaction is the mainstay of Cannon's business philosophy as well as recognizing new trends and to creating products and services enabling customers to keep ahead with competition.

With an extensive **network of global sales & service** operations, Cannon offers a useful and well-appreciated "plus", such as: prompt local service & spare parts availability, laboratory usage for machine evaluation & trials, technical advice & consultancy, remote service connection, direct help-line assistance & periodical training courses.



Cannon FPL high-pressure head with "L" shaped mixing chamber.

Cannon can do it !

www.cannon.com



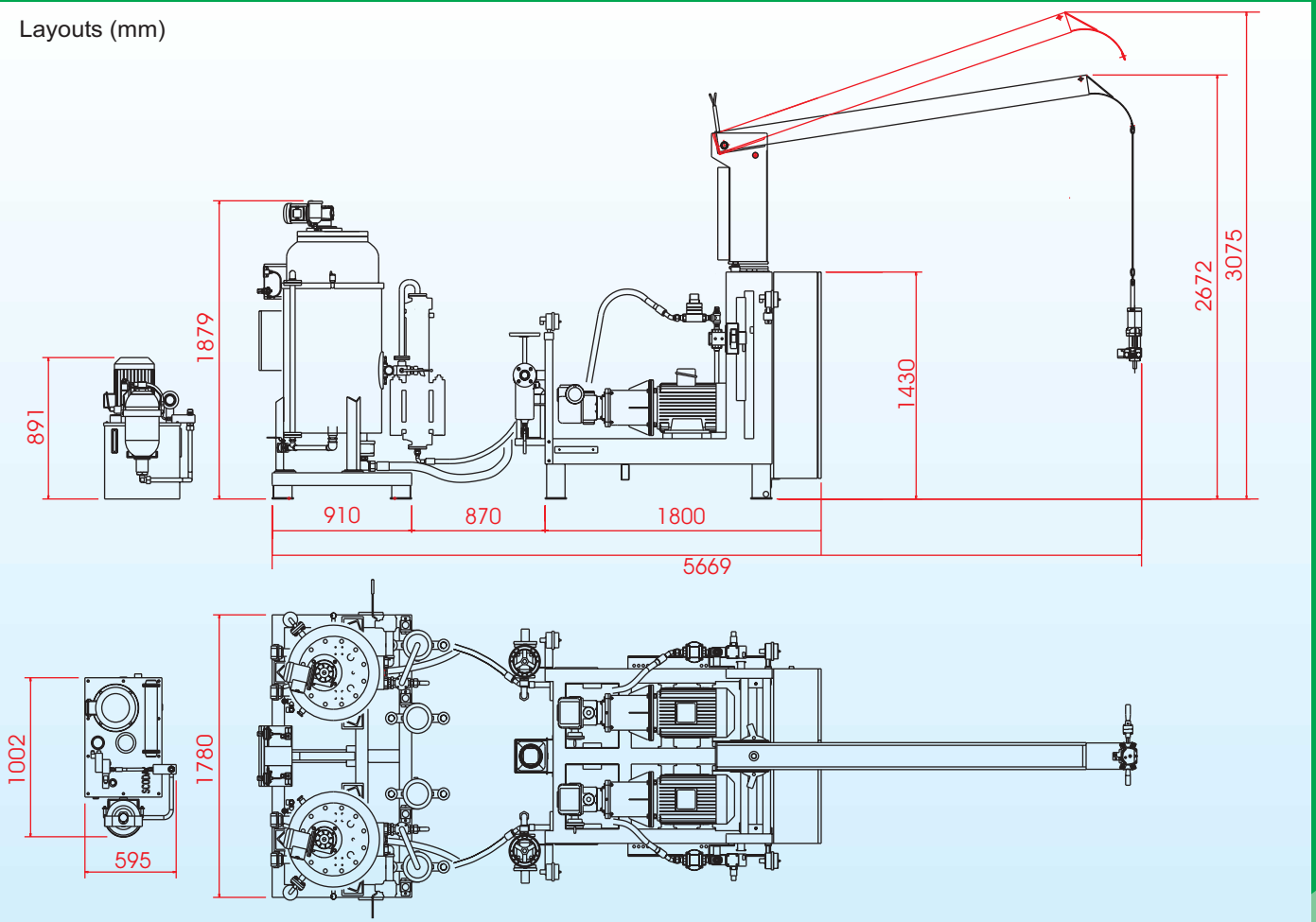
Anthropomorphic robot can be integrated in the foaming system for obtaining more flexibility in mixing head handling.

Technical Features

Machine Model	Output Range (g/s)				Absorbed Power (kW)	Air Consumption (nl/shot)
	Ratio 1:1		Ratio 2:1			
	Min	Max	Min	Max		
A-System 10	35	140	50	105	16	80
A-System 20	70	280	100	210	19	80
A-System 40	70	560	100	420	26	80
A-System 60	130	670	100	980	36	80
A-System 100	160	1305	235	980	46	100
A-System 200	310	2560	460	1920	83	100
A-System 350	600	4980	900	3740	146	100

Output values are calculated assuming a density of 1.0 kg/l for Polyol and 1.2 kg/l for Isocyanate.
 Minimum output is calculated with the handwheel positioned at 25% of the maximum setting value.
 The absorbed power is calculated at 200 bar and takes into account all the standard electrical uses and all the available optional devices, which may be installed on request.
 Variable output pumps can be optionally equipped with frequency inverter.

Layouts (mm)





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