



Expertise – Passion – Automation

**Filled with solutions for you**  
Packaging industry

“Our core commitment to the packaging industry has remained unchanged”

“We support you in every step of your process”





## Packaging industry

### Filled with solutions for you

Packaging was born to deliver goods from producer to consumer. However, nowadays packaging functions go far beyond containing, protecting and preserving.

The current customer-based arena, assisted by multiple technological innovations, has introduced communication, promotion and differentiation within its core functionalities.

These new requirements, together with cost efficiency, light solutions, demand and ever-present sustainability, have made us, the suppliers, adapt and evolve together with our customers' new needs.

Nevertheless, our core commitment to the packaging industry has remained unchanged.

Thermo-forming, Filling, Sealing, Shrink Wrapping, Case Erecting, Conveying, Case Packing, Palletising. These are some of the parts of your process. These are our solutions for them, and the benefits for you:

- ▶ Temperature control equipment – Improve performance & reliability
- ▶ Products & Materials compliant with your process - Ensure product & process hygienic conditions
- ▶ Static electricity removal solutions - Guarantee final product quality
- ▶ High-speed guarantors - Keep up your productivity
- ▶ Smart Flexibility - Achieve the Smart Flexibility your customers demand
- ▶ Environmentally resistant products - Operate smoothly in micro-powder environments.

Over the years, we have demonstrated our commitment to energy efficiency as one of the ways of helping to reduce our customers' bills. We are aware of the variety of processes that exist in your industry and, for each of them, our portfolio includes solutions to increase energy efficiency but without compromising productivity.

We support you in every step of your process. We support you worldwide. We support you with our local packaging experts. They'll be glad to discuss your application with you.

# Packaging industry

- 1 Thermo-forming
- 2 Filling
- 3 Sealing
- 4 Shrink wrapping
- 5 Case erecting
- 6 Conveying
- 7 Case packing
- 8 Palletising



**Static electricity removal solutions**  
Guarantee final product quality



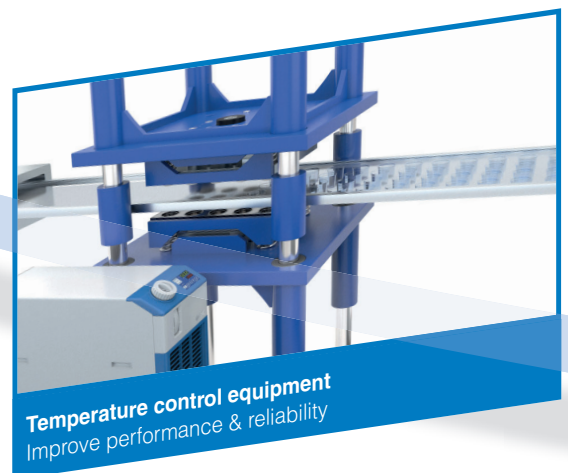
**High-speed guarantors**  
Keep up your productivity

- 1 Thermo-forming
- 2 Filling
- 3 Sealing
- 4 Shrink wrapping
- 5 Case erecting
- 6 Conveying
- 7 Case packing
- 8 Palletising



**Products & Materials compliant with your process**  
Ensure product & process hygienic conditions

- 1 Thermo-forming
- 2 Filling
- 3 Sealing



**Temperature control equipment**  
Improve performance & reliability

- 1 Thermo-forming
- 2 Filling
- 3 Sealing
- 4 Shrink wrapping





**Smart Flexibility**

Achieve the smart Flexibility your customers

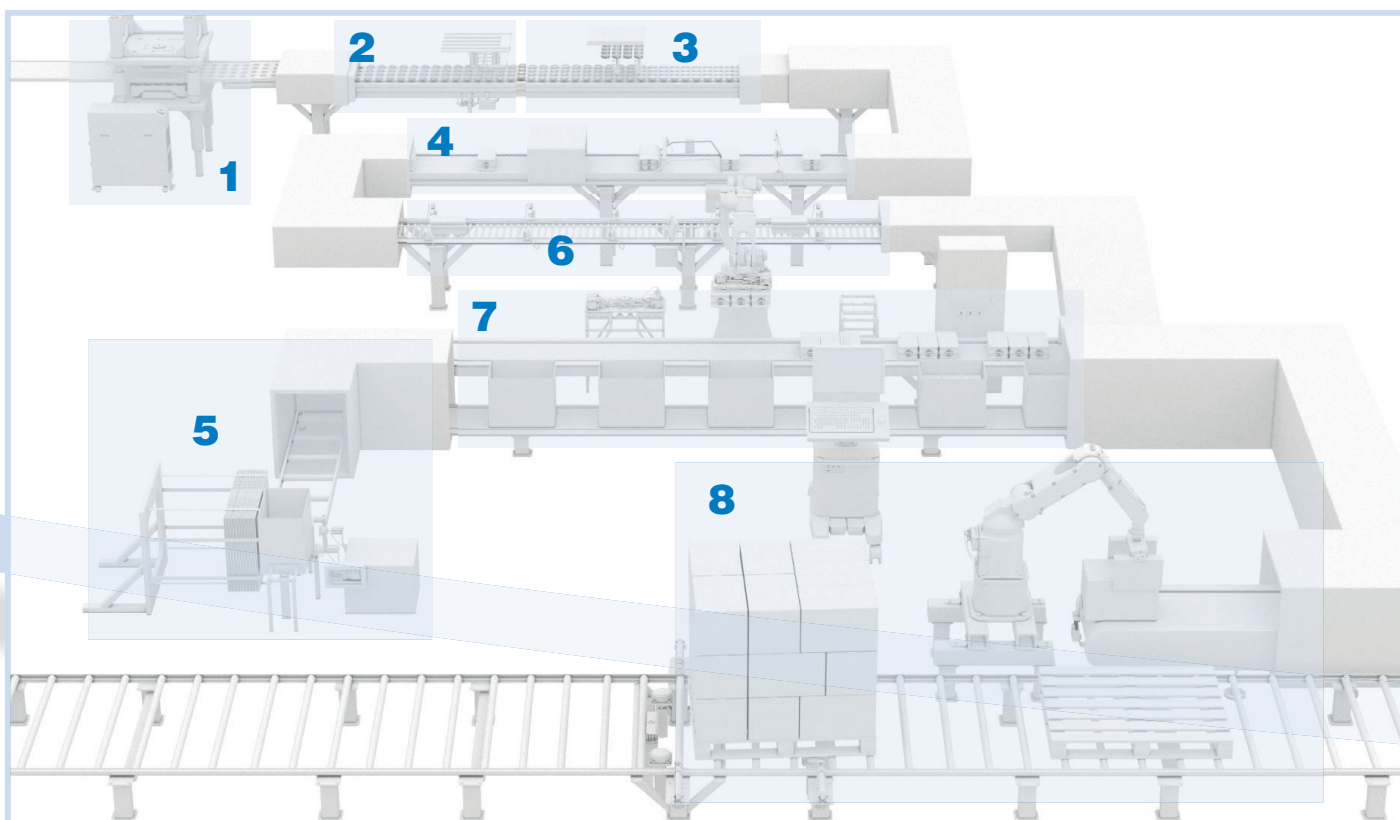


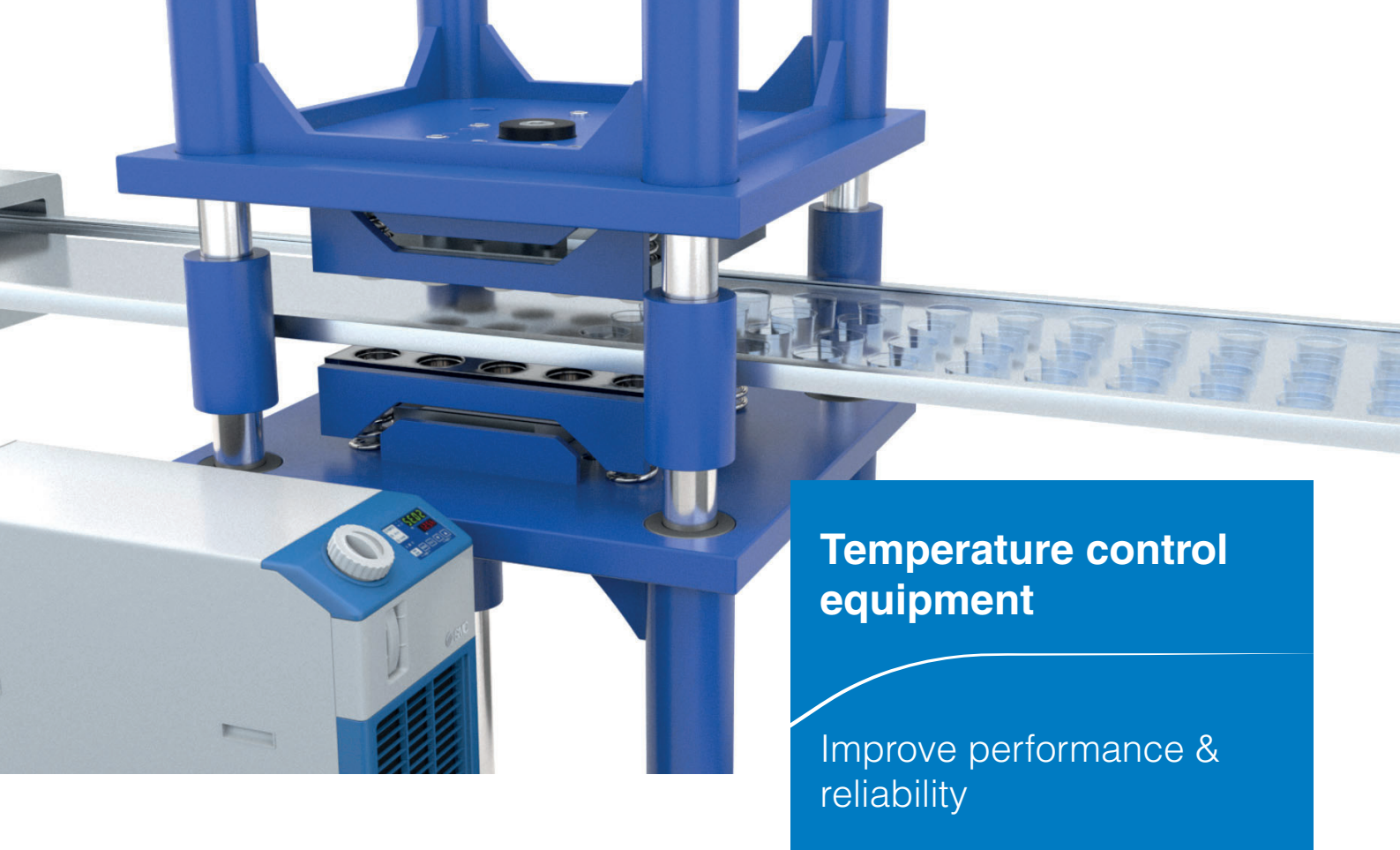
**Environmentally resistant products**

Operate smoothly in micro-powder environments

- 1 Thermo-forming
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## Temperature control equipment

Improve performance & reliability

Any application involving a heat-generating device requires the support of a thermo-chiller to guarantee its reliability. Packaging involves several processes with heat generators, whilst one of the most sensitive is possibly thermo-forming.

### The affected processes

Apart from thermo-forming, other processes in the packaging industry, such as shrink wrapping, are likely to have heat generators. We've seen final product wraps totally ruined in our customer's facilities, with the costs that product rejection incurs at the very final stages of production.

There are other processes involving food handling which, in order to maintain and conserve the food in the right cold conditions, need to control the temperature. With filling and sealing applications great care has to be taken since the temperature could threaten your product and your profits.

### Consequences of not properly controlling temperature in heat-generating devices

In short, the temperature may rise to the extent of significantly shortening the life of the component or even causing the machine to fail. Without going to extremes, our experience has shown that a temperature not managed properly leads to high rejection rates, poor product quality and a lack of overall process reliability.

### The benefits of proper temperature control

Improve the quality of your final product and lengthen the service life of your machine components.

In more general terms, you will be able to tackle existing problems in the production chain and increase the overall machine performance as well.

### Whatever your cooling needs, we've got a solution for you

The use of an SMC thermo-chiller will not only give you reliability and precision, but also overall peace of mind:

- Get a smart solution that will give you proactive control. Anticipate any changes via the remote control and manage anomalies and incidents in the cooling system.
- Improve the performance and reliability of your machine thanks to superior temperature stability.
- Ensure yourself worldwide support, streamline your suppliers and profit from product order unification.



## Thermo-chillers



### HRS/HRSE/HRSH Series

We have a range of standard, basic and high-level thermo-chillers that will adapt to your application needs. Our range of chillers offers a variety in sizes, temperature stability and additional features so you can choose one that adapts perfectly to your needs.

#### Industry 4.0 oriented thermo-chiller

- Convenient functions
- Self-diagnosis function
- Communication function.

#### Reduced power consumption with a triple inverter

This technology adapts the refrigeration level to demand in real time, avoiding any energy surplus (HRSH Series).



#### Heating function available even with no heater

Temperature stability even in winter (HRS/HRSH Series).

### The Expert's experience:



**Ms. LINNET VILLANUEVA**  
HEAT EXCHANGERS  
PRODUCT MANAGER,  
SMC SPAIN

Our customer produces a wide variety of baked and pastry products on a large scale, including biscuits, donuts, muffins or brownies.

Depending on the process, the thermo-forming machine they were using required refrigeration at several points, such as in moulds and sealing.

They were suffering many problems due to the quality and the temperature of the water, the life of some components were significantly shortened and, in the worst cases, it was affecting the overall process reliability and quality of the end product, with many unnecessary machine stoppages.

After analysing the application, we offered the customer our compact HRS series thermo-chiller to keep the required temperature of the machine. The remarkable increase in the performance of the application and the technical support provided by SMC were two of the factors that convinced our customer.

Besides, our thermo-chiller was easily integrated within the operation panel, and the communication functions allowed remote operation and alarm control, as well as simple control thanks to its digital display.

### You might find the following of interest as well



#### Thermo-dryer IDH Series

Achieve a supply of compressed air with a stable temperature and an accurate and reliable dewpoint & pressure. Ensure it is clean. Constant compressed air conditions will also improve the performance and reliability of your process.



## Products & Materials compliant with your process

Ensure product & process  
hygienic conditions

All the big trends that are shaking up the packaging sector, like customer commitment or sustainability concerns or e-commerce demands, inevitably fall on the basic ground of ensuring the hygienic conditions of the content itself.

### Focus on your equipment conditions

When it comes to hygiene, corrosion resistance and clean requirements, the packaging industry does not compromise. At the end of the day, health is important for any of us.

Food, beverage or pharmaceutical manufacturers must all ensure that their packaging process is not a potential source of contamination. Achieving maximum hygiene and safety conditions for products is a common demand, even more so when taking into account that international bodies such as FDA are increasingly legislating around this issue.

### Benefit from our capabilities

For processes like ingredient handling & heating, cleaning & wash down, filling, sealing & capping, which are very sensitive to sanitary conditions, we count on a range of solutions that:

- Meet packaging laws and regulations
- Are made of approved and enduring materials
- Are resistant to cleaning agents.

In short, our range complies with the highest safety standards your processes demand.

On the following pages discover our highlighted solutions that will ensure both your product and process hygienic conditions:

- Hygienic design
- Corrosion-resistant
- Heat-resistant
- FDA Compliant
- Clean room.



## Hygienic design

The processing and packaging of food products has to comply with highly specific requirements. Automation processes not only have to be safe and efficient – cleanliness and hygiene are also top priorities.

Our products have been designed to meet hygienic principles so that no product or living being can enter them from the outside, and no organic material can accumulate inside. As such, you enhance cleanability, decreasing the risk of biological (pathogens), physical and chemical (allergens) contamination.

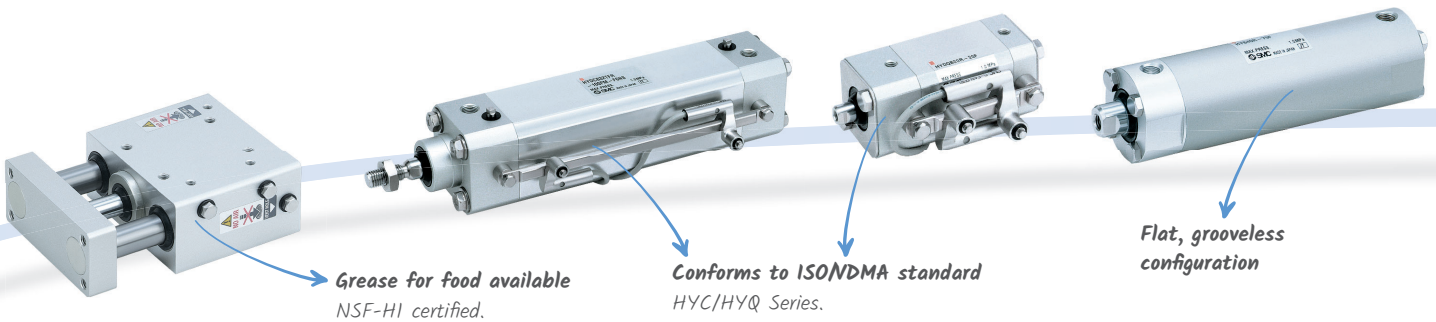
## Cylinders

HY Series

Outstanding water resistance thanks to its new lubrication mechanism, improved rod bushings and new packing.

Fivefold increase in service life compared to the conventional water-resistant cylinder.

Ideal solution for splash zones and/or non-food zones.



## NAMUR solenoid valve

VFN2120N-X23/36 Series

Engineered plastic PPS body provides high temperature and chemical corrosion resistance for use in wash down applications.

*Waterproof sealing  
M12 stainless steel connector & IP67 enclosure.*



*You might find the following of interest as well*



### Clean style valve manifold

SY-X500 Series

Developed for the Food & Beverage Industries, as it is IP69K rated for wash down and cleaning.

You can mount valves outside a protective panel and closer to the actuators for better control.

Your application will also benefit from a small and lightweight solution, easy to maintain.

## Corrosion-resistant

The importance of cleanliness in food processing plants is extremely high; you need to ensure you eliminate all microbial presence from surfaces and equipment with the use of disinfectants and sanitisers. As most of these sanitisers can be quite corrosive for metals, we guarantee that our products will resist these highly corrosive chemicals with all kinds of applications.

### Stainless steel cylinders

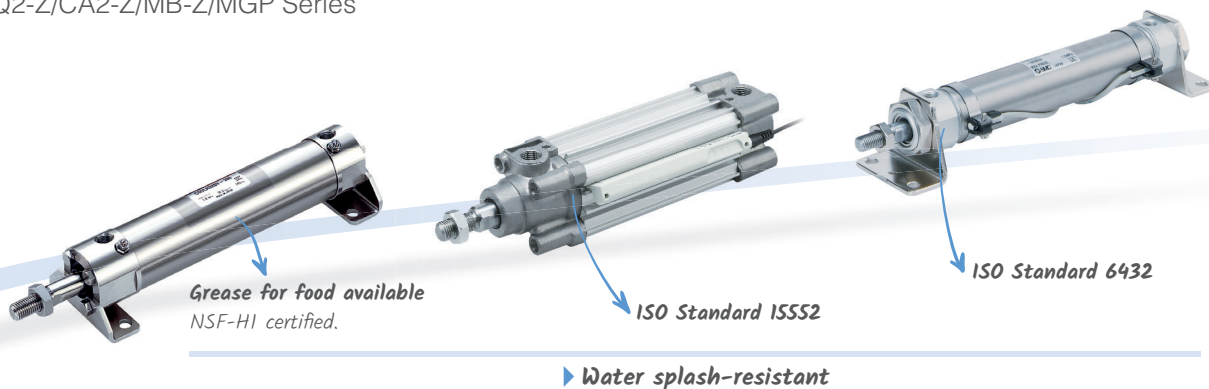
CJ5/CG5-S Series

### Water-resistant cylinders

CG1-Z/CM2-Z/CQ2-Z/CA2-Z/MB-Z/MGP Series

### ISO cylinders

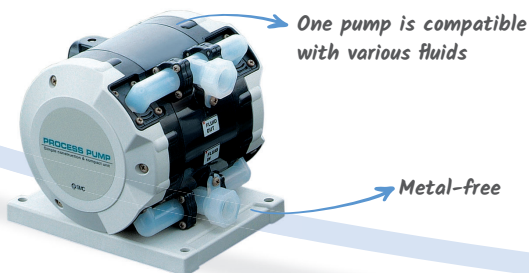
CP96/C85 Series



### Process pump

PAF Series

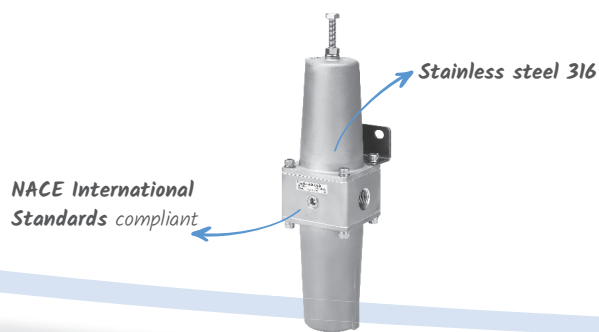
Excellent corrosion resistance due to the new PFA wetted material construction.



### Filter regulator

AW-X2622 Series

Can handle a range of temperatures from as low as -40 °C to as high as 80 °C.



### The Expert's experience:



**MR. MASSIMO GAETTI**  
FOOD PROJECT MANAGER,  
SMC ITALY

Our customer is a producer of dairy products, including milk, yogurt and cheese. Within the pressing line part of the cheese making process, they were experiencing quality issues with the aluminium body cylinders they had installed.

The pressing is done with cylinders slowly pressing the cheeses. As the cylinder is in direct contact with cleaning agents, the aluminium body cylinders were corroding, with the related maintenance and cost implications.

We proposed our CG5 Series. Their stainless steel body material is really the best guarantor against corrosion, the splash-proof scraper prevents water from entering the cylinder ensuring longer life in wet areas.

Furthermore, SMC installed stainless steel components along the whole line such as fittings and speed controllers, therefore eliminating any potential corrosion issue in this line and ensuring a smoother process for this dairy farmer.



Always keep the details in mind



### Speed controllers

ASG Series

Can be used in areas where wash down could degrade standard flow controllers, such as food and packaging.

Material:

- Body: Stainless steel 316
- Sealant: Special FKM
- Seat ring: Stainless steel 303.



### Fittings

KQG2/KFG2/KQB2/  
KKA Series

High levels of corrosion resistant fittings.

Material:

- Stainless steel 316
- Stainless steel 304 (KKA Series).



### Tubing

TL/TIL Series

Compatible with chemicals such as acids, bases and ultrapure water.

Material: Super PFA.

## Heat-resistant

The use of high temperatures to preserve and ensure the safety of food is based on the effect of microbial destruction. With our range of heat-resistant solutions you will find the perfect match to fulfil your requirements.

### Heat-resistant cylinders (-10 to 150 °C)

CQ2-Z/MGP/CG1-Z/CG5-S/CM2-Z/  
CA2-Z/CQS/MB-Z/CU/CS2/CXS/  
CJ2-Z/CJP2 Series

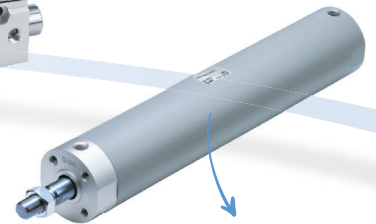
### ISO cylinders (-10 to 150 °C)

CP96/C85 Series

Seal material and grease have been changed, so that they could be used at a higher temperature.



Heat-resistant solid state switch available



No environmentally hazardous substances used

### Fluoropolymer piping equipment (max. 200 °C)

LQ Series

The use of new PFA virtually eliminates particle generation and TOC (total organic carbon), allowing convincing use for the most demanding applications.

#### Face seal design

Allows for quick change of tubing.



Always keep the details in mind



### Speed controllers (max. 60 °C)

ASG Series

Can be used in areas where wash down could degrade standard flow controllers, such as food and packaging.

Material:

- Body: Stainless steel 316
- Sealant: Special FKM
- Seat ring: Stainless steel 303.



### Fittings (max. 150 °C)

KFG2/KQG2 Series

Suitable for use with steam and are grease-free.

Material: Stainless steel 316.



### Tubing (max. 260 °C)

TH/THH/TL/TIL/TLM/TILM/  
TD/TID Series

Material:

- FEP
- Super PFA
- Modified PTFE.

## Achieve your clean room requirements

If your application is within a controlled environment, very sensitive to contaminants and pollutants, we have accommodated our portfolio to include: sterilisation, low particle contamination, resistance to most chemicals, high quality sealing or antistatic solutions.

From our basic pneumatic range including valves, cylinders, grippers, air preparation equipment to fittings and tubing. As well as pressure sensors and electric actuators. All of them specified by the standard ISO 14644-1, controlling air filtration which, in turn, decreases the risk of any contamination or interference with the processing of food and medical manufacturing.

Some of them are featured below.

### Linear cylinders

10/11-CG1-Z/CJ2-Z/CQ2-Z/CQS Series

ISO Class 4 (10- Relief style)

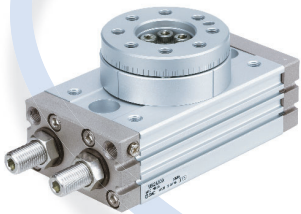
ISO Class 3 (11- Vacuum style).



### Rotary cylinders

11-MSQ Series

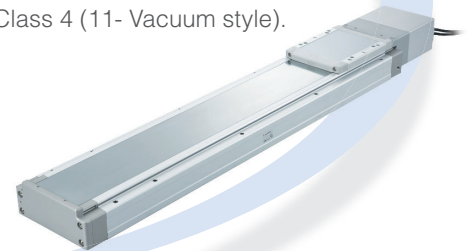
ISO Class 3 (11- Vacuum style).



### Electric actuators

11-LEFS/LEFG-S/LEJS Series

ISO Class 4 (11- Vacuum style).

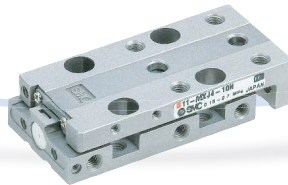


### Guided cylinders

13-MXS/11-MXJ Series

ISO Class 5 (13- Vacuum style with special treatment on guide)

ISO Class 5/6 (11- Vacuum style).



*You might find the following of interest as well*



### Fittings

KP Series

ISO Class 3.



### Regulators

SRF/SRH/SRP Series

ISO Class 3 (SRH Series)

ISO Class 5 (SRF/SRP Series).



### Filter

SF Series

ISO Class 7.

## Compliance with the FDA (Food and Drug Administration)

The control and cleaning processes are key aspects to ensure a standardised product that is not altered at any stage of the process. With this objective, materials that comply with the different regulations in the sector are used.

Our FDA-compliant products are the best choice for safe use in food, medical and cosmetics industries, as the material has no effect on the human body even if it is mixed in wrapped food or medical equipment. Thus, the produced products are safe, without risking the health of final consumers.

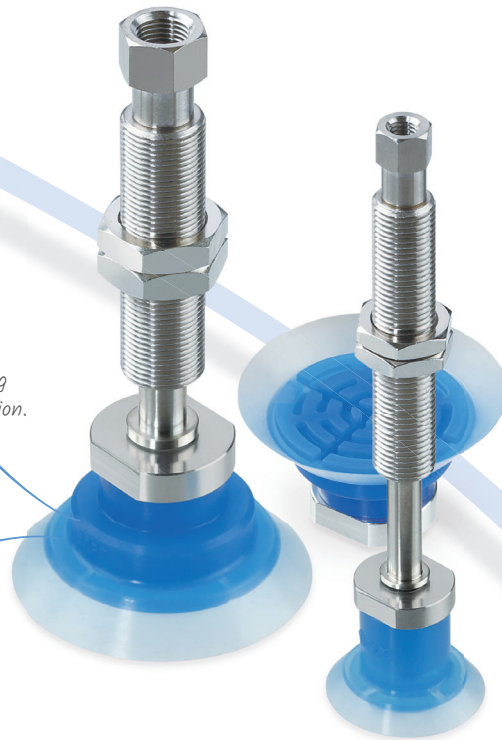
### Vacuum pads

ZP3P Series

Silicone rubber complies with FDA 21CFR§177.2600 dissolution test.

**Blue-coloured pad**  
Easy to identify during contamination inspection.

**Thin and soft pad skirt**  
Better adsorbing performance for film-wrapped workpieces or when the shape of the workpiece easily changes form when being lifted.

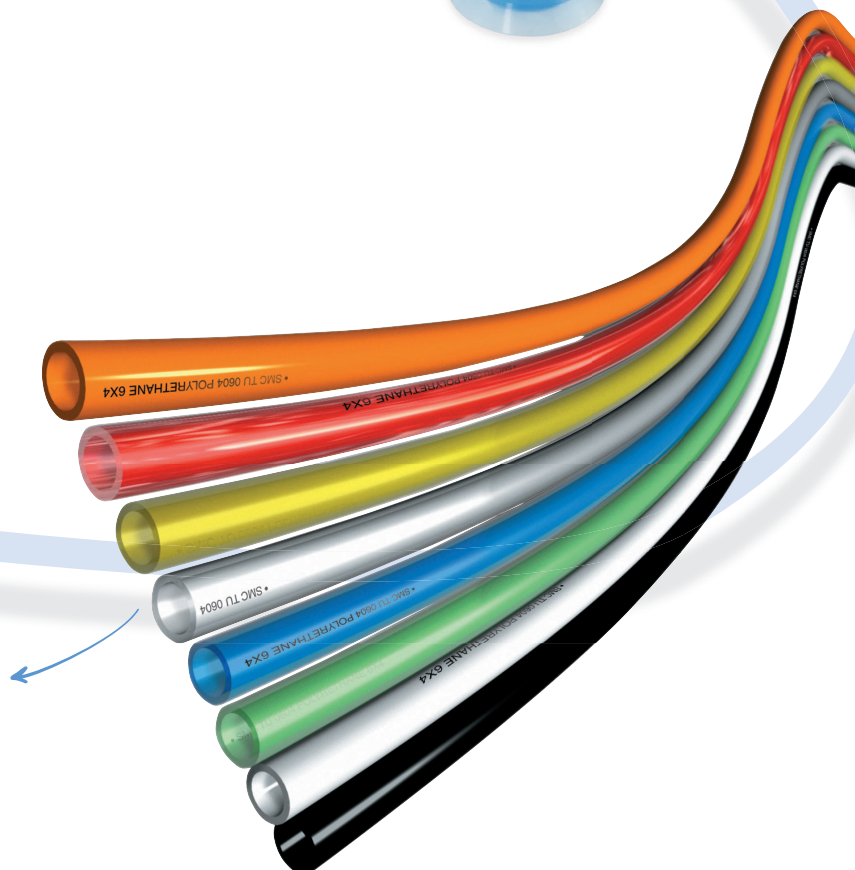


### Tubing

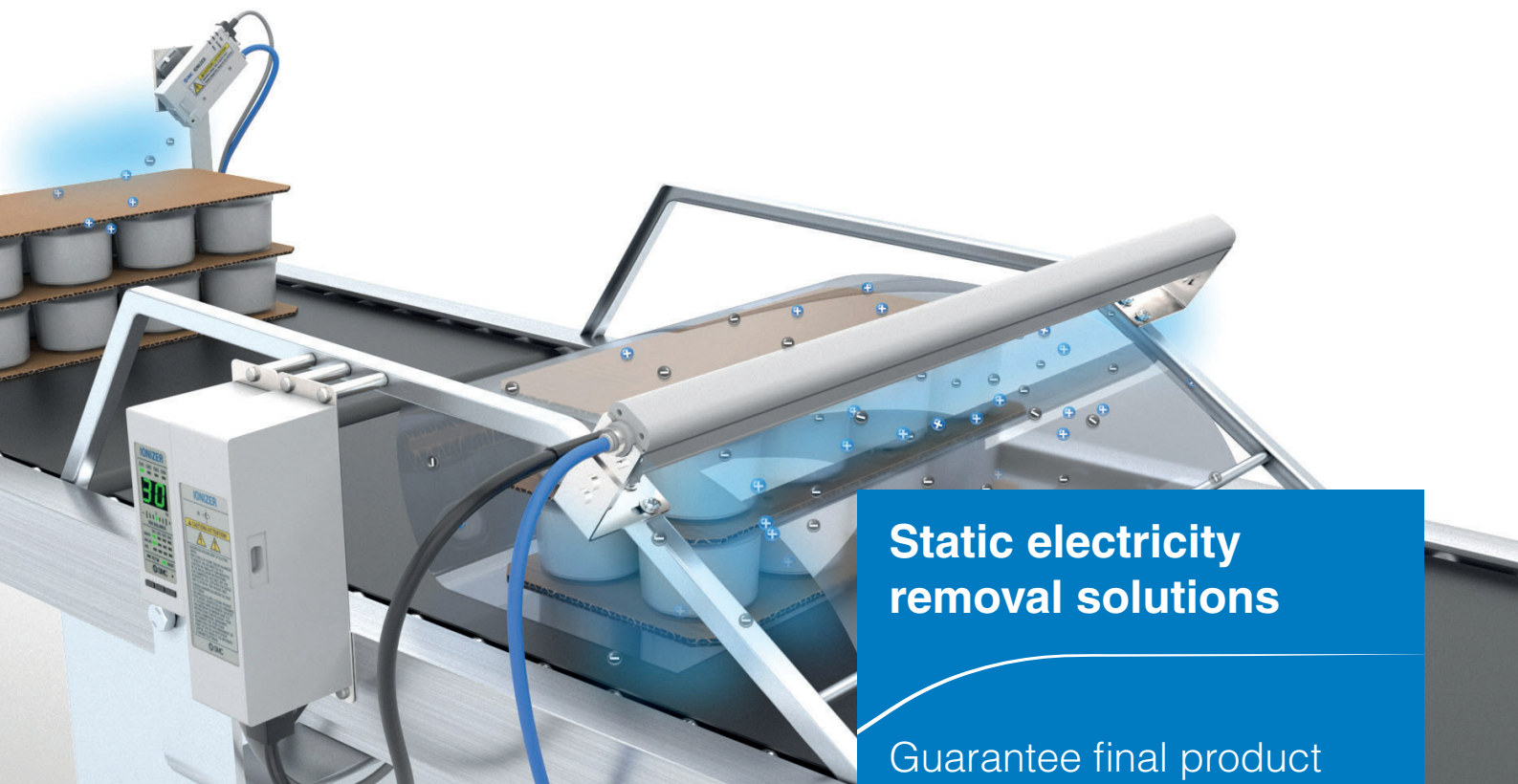
TH/TIH/TL/TIL/TLM/TILM/TD/TID/  
TU-X214 Series

Complies with FDA CFR§177.1550 & CFR§177.2600 dissolution tests.

- ▶ **Compatible with a wide range of fluids**  
Compatible with chemicals such as acids, bases and ultrapure water.
- ▶ **Wide range of sizes and lengths**  
Personalised industrial solution.
- ▶ **Different colours available**  
Easy installation and maintenance contamination inspection.







## Static electricity removal solutions

Guarantee final product quality

### Ensure your Clean Label 2.0, embracing an “essentialist” design, gets stuck the first time

Label misalignment, or incorrect positioning, is just one of the many nasty effects of static electricity. But it can be one of the most annoying ones, given the emphasis industry places on labels as a critical informative and marketing tool.

### Consequences of not properly controlling static electricity

Degradation in workability, dust adhesion to workpieces, electric shocks for machine operators, difficulties in separating impurities, etc. These are just a few of the effects we have seen in our customers' facilities.

### This is the good news...

Static can be solved in a very quick, easy and efficient way: with an ionizer. Implementing an ionizer does not entail complicated installation or maintenance. Basically, you simply have to find the right one, plug it in, and forget about annoying unplanned stops, messy products or jolts.

Eliminating static and guaranteeing process & product quality is quite simple.

At SMC, we count on a wide range of ionizers for almost any packaging application, such as shrink packaging, transportation & conveying, labelling, boxing, casing and cartoning.

With SMC's Ionizers and the support of our experienced technical teams you will:

- Forget about product rejections, futile maintenance hours and machine downtime caused by static electricity – plug it in and see the benefits right away
- Optimise the quality of your process – the installation of the appropriate solution will increase production speed and improve output quality in a simple way
- Create a safe environment for your workers – eliminate jolts produced by static
- Guarantee getting the proper antistatic solution – a wide range for the measurement, removal and control of static electricity is at your disposal.

## These are our solutions to guarantee final product quality



### ► Static neutralisation + Dust removal

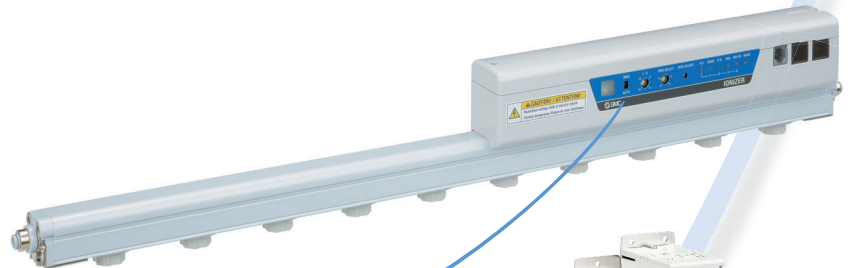
#### Bar type ionizer

IZS40/41/42 Series

#### Separate controller bar type ionizer

IZT40/41/42 Series

Quick & Efficient elimination of static electricity from flat surfaces.  
Suitable for a diverse range of applications.  
Specially beneficial for the highly-functional film manufacturing industry.



**Extensive effective electricity elimination distance**

Air blowing for a distance up to 2 m and to blow off dust.

**Separate controller**

Monitor & Operate bars installed in an inaccessible location.

#### Nozzle type ionizer

IZN10E Series

Close-up efficient static removal.  
Suitable for static removal from parts feeders or plastic cups. Also recommended for general dust adhesion prevention.



**Slim & Compact design**

Installation in tight spaces.

**Optional sensor and monitor**

You might find the following of interest as well

### ► Static neutralisation



#### Fan type ionizer

IZF10/IZF21/31 Series

Portable ionizer with highly versatile use without requiring air supply.  
Suitable for electrostatic removal in the atmosphere around workpieces.

### ► Static neutralisation + Dust removal + Dust collection



#### Desktop duster box

ZVB Series

Integration of the three processes in a single box.  
Applicable when handling the workpiece with your hands.

## The Expert's experience:



**MR. DANIEL RELLSTAB**  
PRODUCT MANAGER  
ELECTRIC ACTUATORS  
AND IONIZERS, SMC  
SWITZERLAND

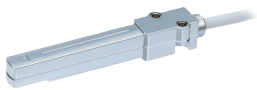
This cosmetics manufacturer packages their skin care products in plastic boxes. Once each box is packed, it gets wrapped with a plastic film.

Due to the high quality requirements of the industry, neither dust nor other particles should get stuck on the interior of the plastic film covering. When particles are found, the box in question is rejected during a later quality control.

Our proposal for them was a combination of a bar and nozzle type ionizers. The bar is employed to discharge and the nozzle to clean the film just before the wrapping process.

The customer successfully tested this tandem. Ensuring no particles or dust inside the wrapping improved the customer's regularity in the process, and their overall efficiency.

## Other static electricity removal solutions available for you



### Electrostatic sensor

IZD10 Series

Detect & Control the electrostatic potential of an object/place. The sensor is a pre-wired assembly including sensor head, sensor amplifier, and cable with flying leads.



### Electrostatic monitor

IZE11 Series

Monitor to be used with the IZD10 Sensor. The monitor has a 2-colour display and multiple functions such as peak and bottom hold, as well as error diagnostics.



### Handheld electrostatic meter

IZH10 Series

Detect the electrostatic charge easily and quickly, wherever you want. This meter features two function buttons and a backlit LCD display.



### Antistatic tubing

TAS/TAU Series

Designed for air pressure piping to product or assembly while preventing static electricity.

Material:

- Conductive nylon + flame-resistant nylon material (TAS Series)
- Conductive polyurethane material (TAU Series).



### Antistatic fittings

KA Series

Can be used in copper-free applications and in vacuum. Conductive resin is used for body and seals in fittings and tubing.



### Conductive vacuum pads

ZP/ZP2/ZP3 Series

Conductive NBR or antistatic urethane helps to ensure static discharge. Wide variety of pad designs to choose from.





**High-speed guarantors**

**Keep up your productivity**

### **Productivity, productivity, productivity**

This is one of the most popular melodies in the packaging industry.

Furthermore, dealing with systems that must handle thousands of units per hour, such as box erectors, conveyors and handling robots, is indeed quite demanding. Lines where any unpredicted minimal stop translates directly into considerable economical losses.

The industry's new standard is measuring Overall Equipment Effectiveness (OEE), not only in terms of achieving high packaging speeds, but also in terms of shorter downtimes.

To this end, our solutions provide your application with high speed to keep up, and with reliability to avoid system shutdown and any overall downtime.

### **You have to stay competitive!**

SMC's high-speed and standard metal seal solutions will keep up with your productivity requirements while keeping maintenance time down to a minimum.

For robot applications, we've got our J Cylinders. Their special feature is that they are much more compact and much lighter; with a reduced footprint that will improve the cycle time of your robots.

In short, SMC provides highly efficient equipment to improve the output of finished products. By integrating these products you will adapt your process to the needs and requirements of current and future packaging.

Thanks to our many years of experience, we can optimally adapt our solutions and thus deliver an excellent product to meet your specific requirements, such as high speed and frequency, compactness, lightness and reliability.

## High-speed solutions

High-speed packaging is in high demand. Now, more than ever, products must be produced and packaged in a fast and efficient way to ensure an adequate supply.

The processes must be optimised to the maximum by improving repeatability, uptime and performance, thus increasing capacity while reducing costs.

The solution: Our high-speed automation products suitable for high-speed & frequency applications, such as in thermo-forming, traysealing, flow pack wrappers, automatic packing machines and inspection systems.

### High-power cylinder

#### RHC Series

Features a longer cushion design which is capable of stopping heavy or high-speed loads while maintaining the simplicity of a standard air cushion cylinder. Even with the improved performance of the RHC, cushion adjustment remains as simple as adjusting the cushion needle valve.

**Great energy absorption capacity**  
10 to 20 times more than general purpose cylinders (CGI Series).



### High-speed 2-port valve

#### SX10 Series

Developed with high performance, our high-speed valve is compact and lightweight. It has a low power consumption and high frequency. You can also reduce installation labour with the use of the quick disconnect type mount.

**Long service life**  
5 billion cycles.

**High-speed response**  
ON at 0.45 ms, OFF at 0.4 ms.



## Speed also refers to keeping unplanned stops down – Metal seal, your selection for life

The high-speed requirements fuelled by the productivity packaging mantra, essentially translates into avoiding unplanned stops. Reducing maintenance activities is aimed at lowering the operating costs of your production facility and achieving sustainable productivity through the optimisation of your process.

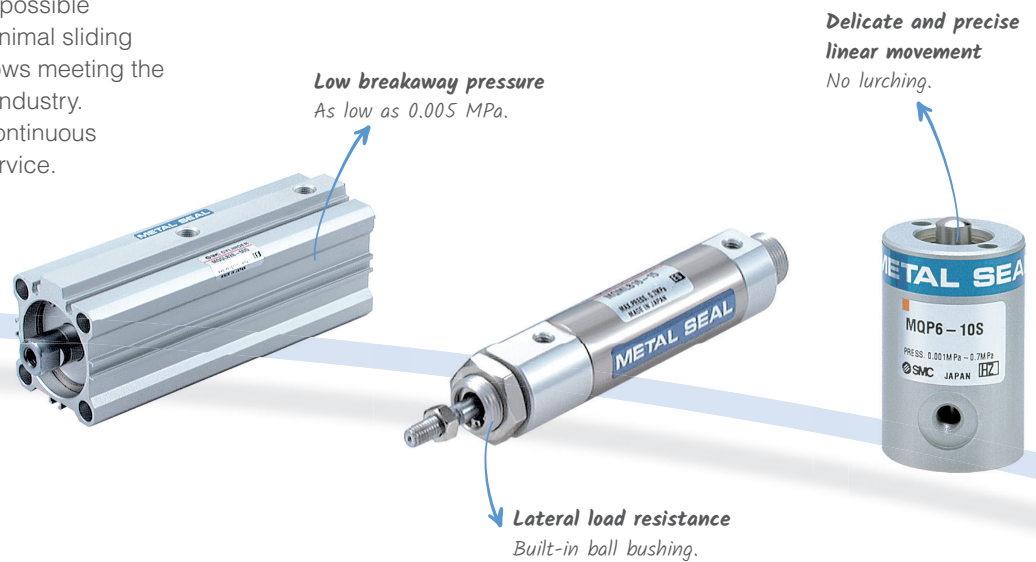
With that goal in mind, at SMC we have designed metal seals for our cylinders and valves for several decades, making our metal seal an industry standard.

Together with us, you can easily avoid costly system shutdowns and production downtime as we guarantee that our metal seal cylinders and valves last up to 100 and 200 million cycles. The seal is practically immune to wear and will therefore outlast your machine's service life. Pure reliability.

### Low-friction cylinders

MQQ/MQM/MQP Series

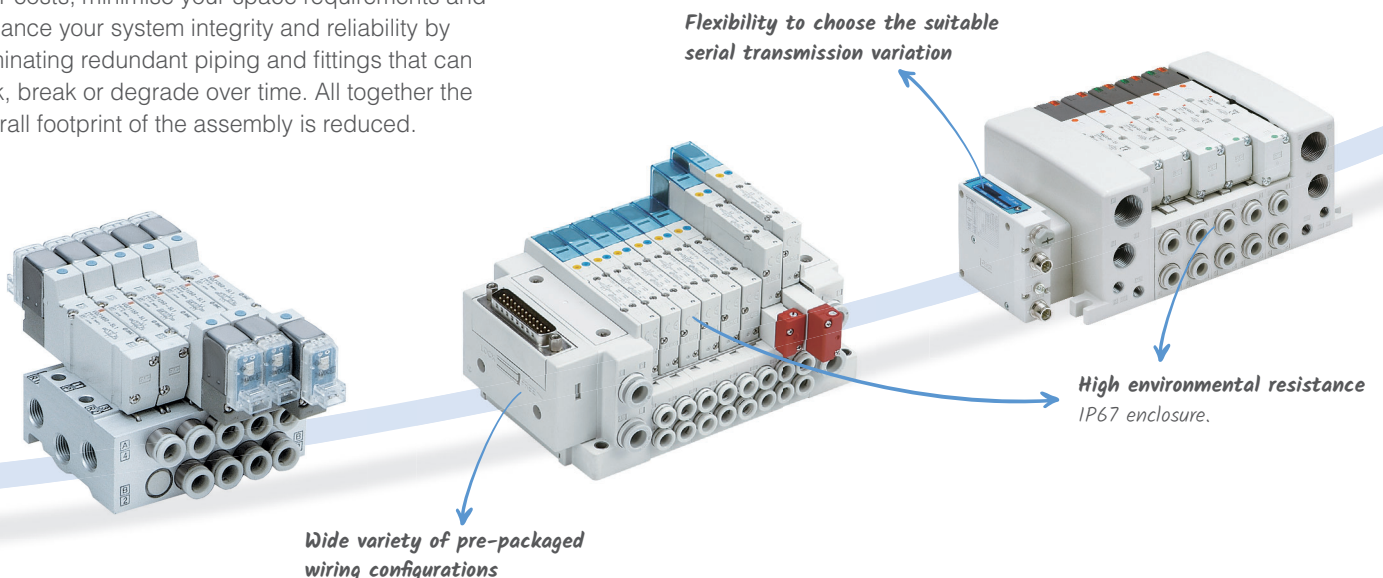
These cylinders can cover a range of driving speeds and output controls not possible with ordinary cylinders. Their minimal sliding resistance and high stability allows meeting the requirements of the packaging industry. At your disposal: high speed, continuous actuation, as well as long life service.



### Pilot-operated solenoid valves

SY-NEW/VQC/VQZ Series

Our integrated solenoid valve manifolds can reduce your costs, minimise your space requirements and enhance your system integrity and reliability by eliminating redundant piping and fittings that can leak, break or degrade over time. All together the overall footprint of the assembly is reduced.





## More compact and lighter – The steady trend

The use of robots is considerably increasing and continuously expanding. With space being at a premium, the need to produce smaller, more efficient machinery is growing.

This trend is becoming a real must however within the packaging industry due to transport lines or robotic manipulation and handling.

Our product range achieves just that for you, more compact products with a reduced footprint compared to similar ones on the market. By developing the product in response to your operating conditions, it is possible for us to achieve a more compact body for the cylinder.

Besides, we have intermediate bore sizes available which are the first of their kind to be offered in the industry, helping you to meet the demands that drive down costs and drive up productivity. They maintain the same cylinder performance but reduce the product size, since it is possible to propose more optimal sizing tailored to your specification. In addition, we offer lightweight solutions, improving your cycle time due to reduced inertia loads at the moving parts of the robots.

### J Cylinders

JCM/JCQ/JMB/JMGP Series

#### Various cover types

Direct mounting is possible.



Short stroke cylinder

Piping is possible  
in 4 directions



Intermediary bore sizes  
Air saving & space saving.



### The Expert's experience:



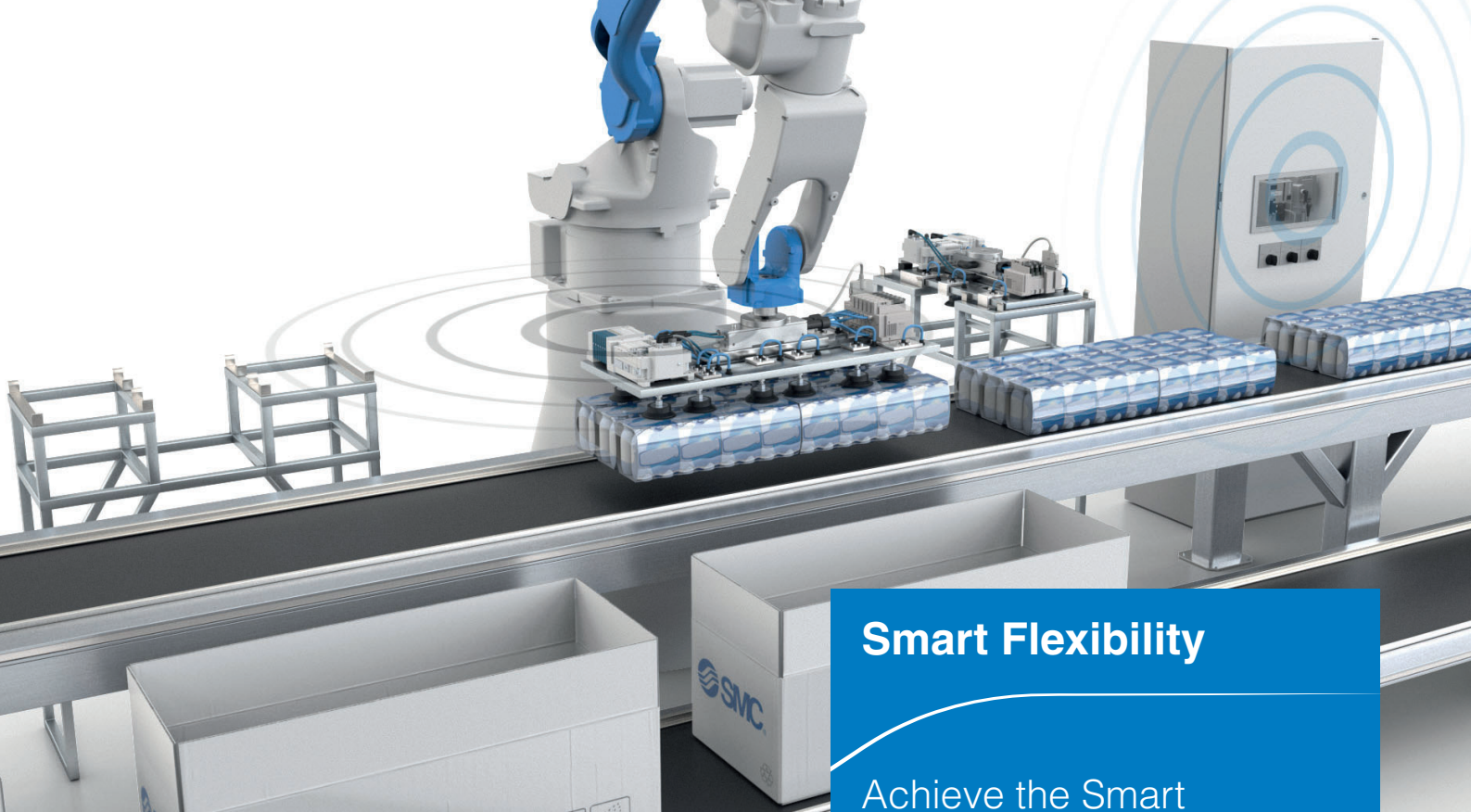
**MR. STEVE ARNOLD**  
BUSINESS MANAGER FOOD  
AND PACKAGING,  
SMC UK

The application we encountered at the customer's baby food production line was the movement of 60 pouches with a robot gripper from a feeder to the packaging machine. The process functionality was not fulfilling the speed requirements as the cylinders installed by the competitor were too heavy.

We provided our customer with our compact size and lightweight cylinders, JCQ series, reducing each unit weight from 585 g to 275 g, in order to increase robot speed.

The robot gripper was equipped with 18 JCQ, therefore considering all the pieces in the application, the weight was reduced from 10.53 Kg to 4.95 Kg.

This fact solved a significant problem in the machine functionality with a remarkable improvement in the process speed. In addition to getting a lightweight solution, it was also possible to reduce the overall footprint of the machine.



## Smart Flexibility

Achieve the Smart Flexibility your customers demand

Smart factories need to offer tailor-made products at affordable prices without compromising quality. This now places the production process on a secondary level. Machines tend to integrate modules that are intelligent and easily adaptable to changes for highly flexible production, together with e-Maintenance to smartly support the complete life cycle of the product.

How do Industry 4.0, Smart factories, Digitization, you name it, interact with the Packaging industry? For starters, new technologies are the key for developing individual packaging and the special formats that are demanded by consumers.

### SMC's contribution to smart up your factory is:

- Format adjustments, with changes in guide rails, sidebands or link chains, are a reality with our complete range of electric actuators and controllers which offer high-speed production together with fast and flexible format change capabilities.
- Our high-capacity and speed-networking solutions offer you a high degree of access to and feedback from automation components via condition monitoring. With our improved communications, the control of the process is ensured, essential for making decisions in real time, directly resulting in an increase in production.
- Our unique wireless solution on the market that offers cutting-edge communication and freedom of movement for the packing industry. Introduces flexibility in your machines with a simple layout modification & quick connection. Easily put to work anywhere as it is suitable for any application, being ideal for tool changes in robot arms or rotary tables.
- Last but not least, our IO-Link solutions offer new opportunities for automation, in addition to solving current problems that arise in the packaging industry. This integrated intelligence lets you minimise the overall setting control time, thus increasing machine availability.

All these allow reducing costs and time to market, broadening control over production to take your packaging system reliability and performance to new levels – with our overall solution!

## Smart & flexible packaging solutions for you

Digitalisation does not stop at the packaging industry. There is a clear trend toward more individual packaging and special formats. What does this mean? You need fully automated, highly flexible machines, which you can easily adjust to the different formats and special variants at the press of a button.

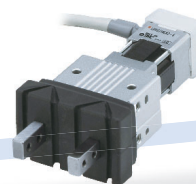
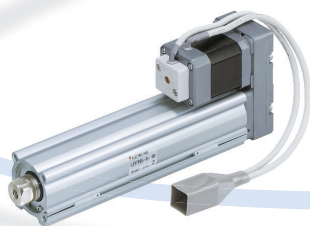
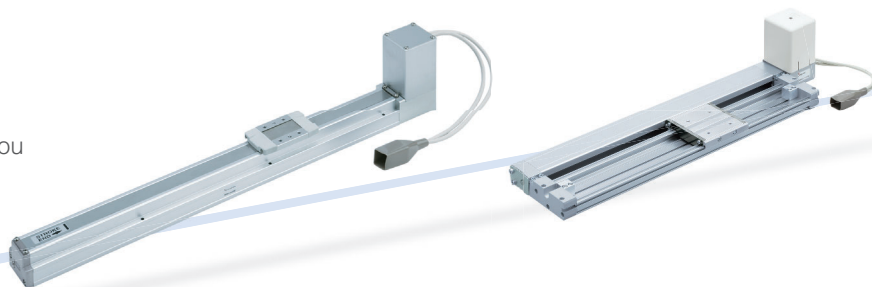
Our electric actuators are, by definition, a flexible solution, at least in terms of speed, force or positioning. Almost any pneumatic movement has its electric version thanks to several electric actuator types. It is precisely that adaptability which is behind our range of electric solutions; where you decide, you choose, but you don't adapt to them. They adapt to you!

With our electric actuators you will combine the high speed common in continuously operating machines with fast and flexible format change capabilities, shortening set-up times and increasing system productivity.

### Electric actuators

#### LE Series

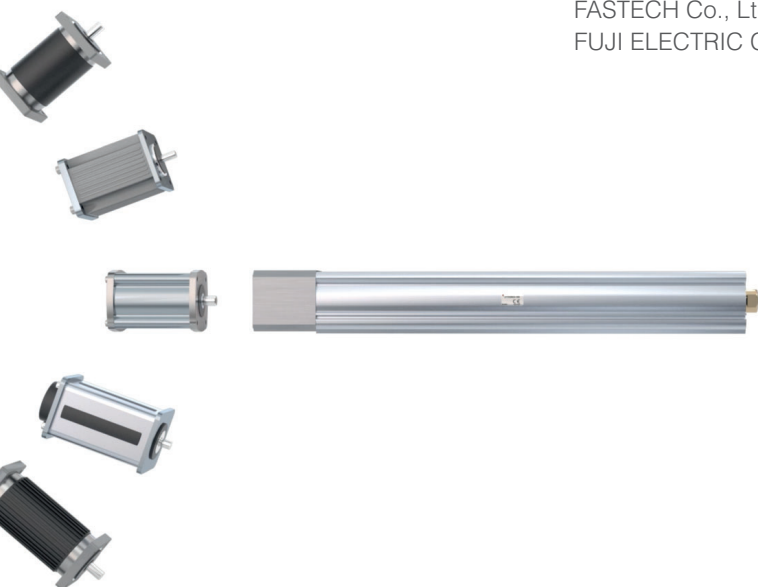
Perform any movement, anywhere, in any way you want – Align, rotate, grip,... a world of motion at your disposal; motion that you can adapt to the specificities of your application.



However, if you prefer to use your own motor and own driver together we can offer you our motorless type electric actuators, being compatible with 100/200/400 W equivalent motors by the following manufacturers:

OMRON Corporation  
Siemens AG  
Beckhoff Automation GmbH  
YASKAWA Electric Corporation  
Panasonic Corporation  
Delta Electronics, Inc.  
FANUC Corporation  
FASTECH Co., Ltd.  
FUJI ELECTRIC CO., LTD.

KEYENCE Corporation  
Mitsubishi Electric Corporation  
NIDEC SANKYO Corporation  
Rockwell Automation, Inc.  
(Allen-Bradley)  
SANYO DENKI CO., LTD.  
ORIENTAL MOTOR Co., LTD.



### Motorless type electric actuator

#### LEF/LEJ/LEY(G) Series

#### Empowers you to choose freely

In general, it can be used for the precise positioning of workpieces, picking and placing, loading and unloading transfer of workpieces, vertical transfer, high-speed transfer or automatic assembly/ inspection/transfer, among other applications.



Currently there is great demand in the packaging industry for controllers that incorporate detection and fault diagnosis capabilities. The reason for this is that these features allow the early detection of defects in the products, correct deviations from a productive process, and mainly warn of possible situations that endanger human life or the process itself.

Benefit from our smart and innovative controllers giving you direct control of electric actuators, providing real-time and high-speed communication, as well as added safety, together with a range of savings.

## Controllers & Drivers

### JXC/LEC Series

Enjoy a variety of options for motion control:

- Digital I/O commands, direct parametrisation at the controller.
- Multi-axis controllers/drivers.
- Fieldbus commands, direct connection to a fieldbus network through several communication protocols.

24 VCD controller/driver	
	AC servo motor



### The Expert's experience:



**Mr. Pierre Leclercq**  
KAM FOR SIDEL GROUP,  
SMC FRANCE

A few months back we visited a customer in the beverage industry. The customer blow moulds bottles on a large scale using a fully automated palletiser that forms layers of finished bottles stacked on a pallet with layer dividers.

The layers are placed on pallets and held in place with a squaring station that requires manual setup based on the type and size of bottles being manufactured.

The setup needs too much labour at each changeover and is very time consuming. They are incapable of making real-time adjustments, causing frequent positioning errors.

The installation of our LEYG, paired with the JXC to communicate with a total of four actuators, allowed the customer to set up the software on a touch panel control station. This enabled real-time adjustments of the actuator position during palletiser operation using visual inspection as the bottles exited the machine, without needing more manual adjustments.

*You might find the following of interest as well*



**Card motor**  
LAT3 Series



**Card motor controller**  
LATCA Series

Unique miniature 3-in-1 card motor for transport, pushing and measuring with a high-speed response. Easy programming thanks to the LATCA controller, as it can be put to work by just inputting 3 parameters. In addition, it is compatible with Modbus serial communication.

## EXpand your communications

The use of Fieldbus in manufacturing processes has substantially improved the way we handle communications, providing us with substantial savings in terms of wiring, connectors, installation and setup time, electronic diagrams or documentation.

For the development of our Serial Interface range, we have gone a step further and expanded the number of possibilities in industrial communication, bearing in mind the flexibility and versatility that the packaging market currently demands.

With SMC's EX range of solutions you can enter the industry 4.0 era underpinned by its remote control capabilities. Our solutions offer a high degree of access to and feedback from automation components via control systems for predictive maintenance. This is also underpinned by the EX range's adaptability, as our solutions provide the possibility of managing different pneumatic components such as valves, cylinders or instrumentation equipment in any common network. Besides, you will be able to easily update, enlarge or integrate your machine with our solution in a simple way.

### Fieldbus systems

#### EX Series

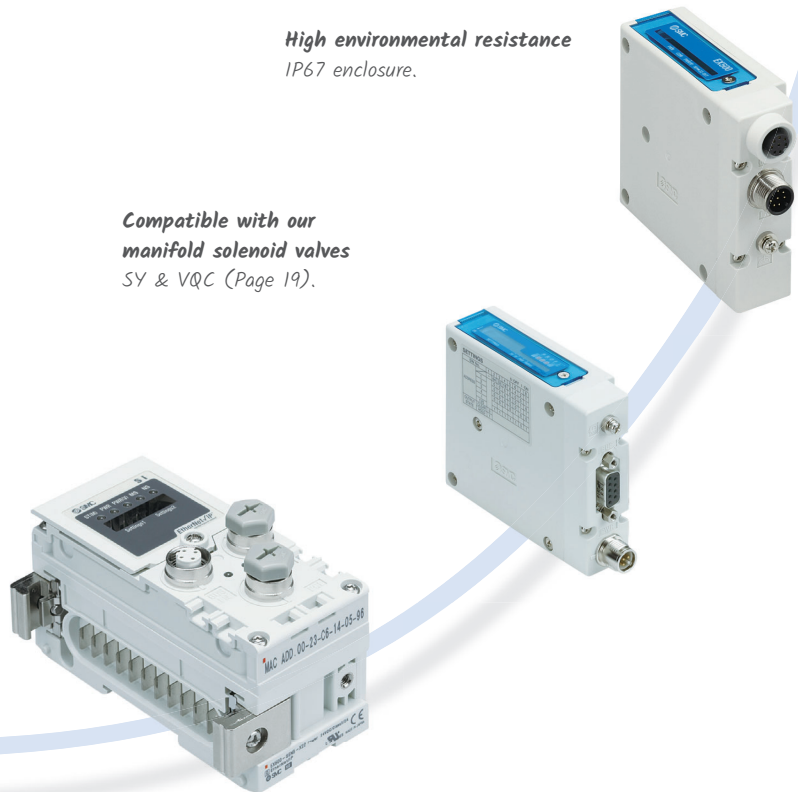
Our solutions communicate in your language: Ethernet POWERLINK, PROFINET, EtherNet/IP™, EtherCAT®, PROFIBUS DP, DeviceNet™, CC-Link, IO-Link, CANopen, Modbus and AS-Interface.

Get the most out of its capabilities:

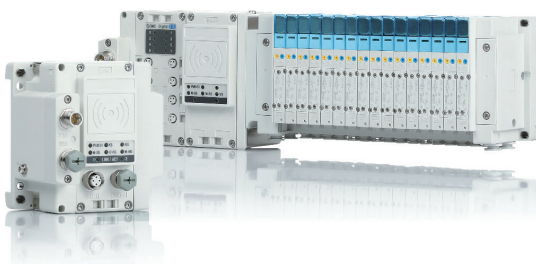
- Web server function: Allows remote access via a general-purpose web browser, such as Internet Explorer, and enables status checks, parameter settings and forced output, among others.
- QuickConnect™ function: Enables the EtherNet™ devices to quickly power up and join an EtherNet/IP™ network (Fast Start-Up function for PROFINET)
- Self diagnosis function: Makes it possible to ascertain the maintenance period and identify the parts that require maintenance.

**High environmental resistance**  
IP67 enclosure.

**Compatible with our manifold solenoid valves**  
SY & VQC (Page 19).



### You might find the following of interest as well



### Wireless system

#### EX600-W Series

A decentralised wireless fieldbus system, compatible with industrial Ethernet, which allows the connection of several slave units to a master unit without having to use cables.

With SMC's Wireless Fieldbus System you will benefit from less cables & connectors, less installation & maintenance and less breakage & disconnection risk, achieving totally reliable, noise-resistant communication.

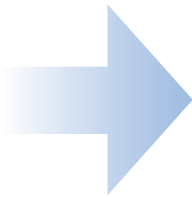
Put it to work anywhere as it is suitable for any application, being ideal for tool changes in robot arms or rotary/indexing tables. You will introduce flexibility in your machines, with simple layout modification & quick connection.

## SMC, your one supplier with IO-Link

IO-Link represents a strong trend related to Industry 4.0, a step forward to communication in manufacturing. Our IO-Link sensors, IO-Link master and IO-Link actuators are just some of our smart products that can help improve your productivity and reduce your costs, with reduced start-up time and maximum flexibility.

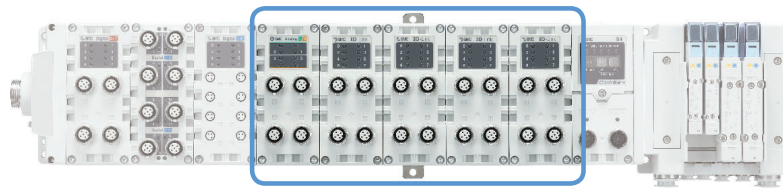
SMC smarts up your factory with a high quality packaging process, enhanced availability of packaging machines and the capability to carry out remote diagnosis. This condition monitoring makes the replacement of defective sensors and actuators faster and smoother. Besides, the maintenance staff can carry out preventive maintenance on the machines, for example during a planned stop during operation and avoid unplanned downtimes.

### IO-Link with SMC: The 6 advantages

- ▶ Increased data availability
  - ▶ Product diagnostics
  - ▶ Standard wiring
  - ▶ Remote access
  - ▶ Easy device replacement
  - ▶ Tamper-free
- 
- ▶ Reduced overall costs
  - ▶ Increased process efficiency
  - ▶ Improved machine availability

#### Master

**IO-Link Master**  
EX600-X60 Series



#### Sensors

**High-precision digital pressure & vacuum sensor for air**  
ZSE20B(F)-L/ISE20B-L Series



**High-precision digital pressure sensor for air & general fluids**  
ISE7□/7□G Series



**Digital flow sensor for water**  
PF3W7□-L Series



**Actuator position sensor**  
D-MP□ Series



#### Actuators

**Valve control unit**  
EX260-SIL1-X207/X210 Series



**Step motor controller**  
JXCL1 Series



**Electro-pneumatic regulator**  
ITV10□□/20□□/30□□-X395 Series







## Environmentally resistant products

Operate smoothly in micro-powder environments

### Last but not least, important stages of the process

The use of robots for packaging applications is on the rise and they are included in applications in food and beverage, pharmaceutical and medical device industries. In these industries, the products reach a point in the production process where they are picked, packed and palletised. At this point, robots manipulate cardboard sheets, cardboard crates or place heavy stacks of boxes on conveyor belts for them to be palletised.

These processes have shown that a significant amount of dust, both airborne and on flat surfaces, is created causing numerous problems for the equipment. To avoid such problems, at SMC we have focused on environmentally resistant products. We offer different types of protection for them to be capable of smoothly operating in micro-powder (10 to 100 µm) and general environments.

### 100% reliable and safe operation

Our special cylinders prevent the entry of dust and foreign matter with a grease film formed on the piston rod surface that improves durability. Thus, the number of operating cycles can be improved even in general environments while the overall length and mounting are the same as those of the standard model for almost all series.

With our range of grippers you can benefit from their dust resistance and flexibility, along with a remarkable rigidity and accuracy thanks to their construction, which assures higher productivity due to their great repeatability and reliability.

All these solutions have differentiated technical characteristics that are ideal for applications in the areas already referred to. Besides, the installation of our solutions in this type of critical environment eliminates problems such as oxidation, fatigue and vibration that are caused by dust, humidity and contact damage.

# Cylinders



**- Stable lubrication specification**

Durability is 4 times longer than the standard model in micro-powder environments.

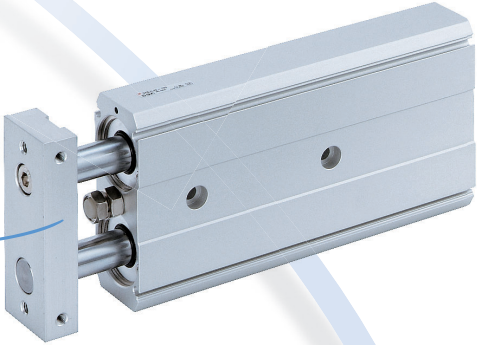
**- Heavy duty scraper (-XC4)**

Durability is 2 times longer than the standard model in micro-powder environments.

### Dual rod cylinder

CXS Series

*Possibility of 3-side workpiece mounting*



### Air cylinder

CM2-Z/CG1-Z/CA2-Z Series

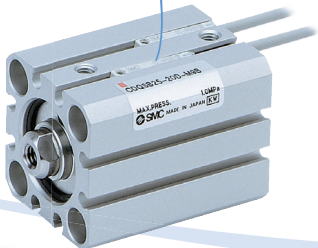
*Various mounting bracket options*



### Compact cylinder

CQS/CQ2-Z/MGP Series

*Auto switches can be mounted on up to 4 surfaces*



### Air slide table

MXQ-Z Series

*2 combinations of guide and cylinder bore size available*



*You might find the following of interest as well*



### Centring unit for conveyor lines

MACM Series

We have developed a unique product in the market that allows space and energy saving in the alignment and positioning of transferred heavy workpieces on conveyor lines. This results in more compact conveyor lines as smaller cylinders can be used. Its easy adjustment and installation makes the support and after-sales service minimal.

# Grippers



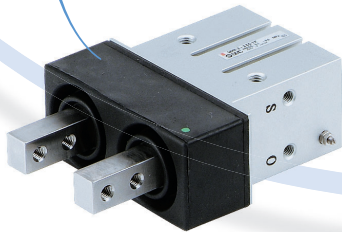
## - Dust cover

Choose from three different dust cover materials for use in different environments: Chloroprene rubber (CR - Black), fluoro rubber (FKM - Black) and silicone rubber (SI - White).

## Slide guide type air gripper

MHK Series

*High precision repeatability*  
 $\pm 0.01 \text{ mm.}$



## 3-finger parallel style air gripper

MHSJ3/MHSHJ3 Series



**Wedge cam mechanism**

*Allows strong gripping force to be obtained from a compact design.*

## Parallel style air gripper

MHZJ2/MHZAJ2/MHZJ2-X6100/  
MHZL2-X6110 Series

**Martensitic stainless steel**



**High degree of mounting flexibility**

*Can be mounted five ways from three directions.*

## The Expert's experience:



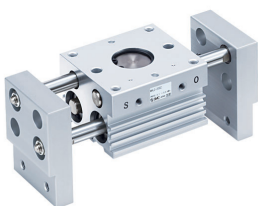
**MR. MARTIN BÜTTNER**  
SALES ENGINEER EXPERT  
IN PACKAGING,  
SMC DENMARK

A worldwide packaging company had installed a local supplier's manufactured air cylinders to work as stopper for the boxes that came through the conveyor. After that, the boxes were palletised by two robots before the pallet wrapping station. The air grippers used to handle the boxes were from the same local supplier.

They were suffering many problems with the durability and performance of both cylinders and grippers, since during the operation the environment was filled with a considerable amount of dust from the cardboard boxes.

We managed to develop a successful solution with our MGP series guide cylinders with special dust-resistance and our MHZ2 series air grippers with dust cover. Our solution outperformed the customer's expectation as the lifetime of the products in a micro-powder environment was doubled. In addition, SMC was capable of providing better technical support and a shorter delivery time.

*You might find the following of interest as well*



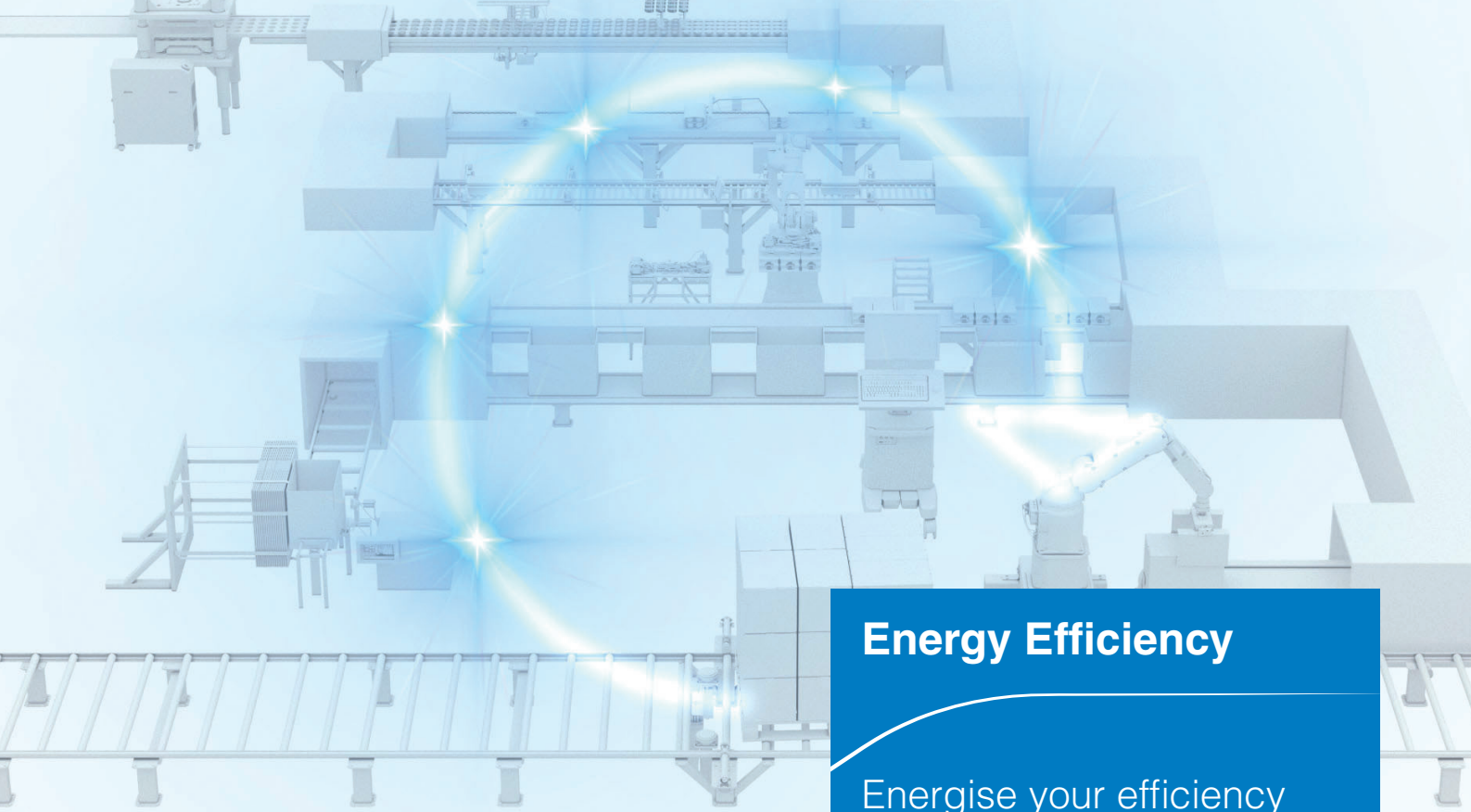
## Wide type parallel style air gripper

MHL2-Z Series

With our wide type air gripper you can grip large pieces, smaller ones or the heavier ones thanks to its wide opening / closing stroke and double piston mechanism.

It is suitable for all general pick and place applications, especially in environments where a large amount of dust or foreign matter exists, such as carton former manufacturers.





## Energy Efficiency

Energise your efficiency  
with SMC

### How to energise your efficiency

Forward-thinking companies are examining their energy usage in order to cut costs and remain competitive. To support an energy-efficient culture, numerous actions can be implemented to drive reductions and have an impact on overall energy usage.

More specifically, on a packaging line, component selection is one of the most important points for maximising energy efficiency, as energy losses are particularly noticeable when the components are not properly assigned to the application. For example, if extra energy is not necessary, then it may be worth reducing the pressure level of the line and boosting it only when required, using elements that can work intermittently or selecting elements that use only the essential.

Energy waste can be reduced by recovering part of the energy already generated, given that in many cases it is easier than we think.

In addition, there are still other opportunities for conservation on the packaging line itself. The challenge is that compressed air consumption on the line is not always visible. Monitoring your consumption is the key to an effective energy-efficient plan.

Last but not least, it is essential to think efficiently, even if the savings are minor. Considering the amount of operating hours during the year, these solutions can often pay for themselves within a short period of time.

### Let's go towards energy efficiency together

Our portfolio includes solutions for blowing, adsorbing, labelling, boxing, casing and palletising; solutions to increase energy efficiency but without compromising productivity. With worldwide teams of specialists ready to support you, doing more with less.

These are the cornerstones we propose for implementing energy efficiency together:

- Generate just what you need – The most efficient energy is the one not consumed
- Recover what you generate – Recovered energy is worth two
- Monitor your consumption – What gets measured, gets managed
- Use only the essential – Air is free. Compressed air is not. Use it wisely
- Think efficient – Get a little bit better every single day.

# Generate

just what you need

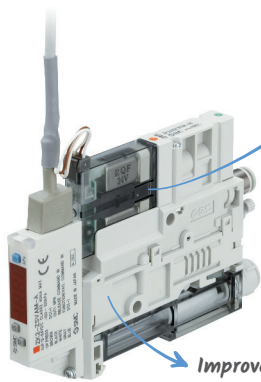


Generating just what you need, is the first step to energy-efficient use. It is certainly not simple, as oversupply is not something you can spot easily. But, according to our experience, when measures are applied, the results stand out.

## Vacuum unit

ZK2 Series

Mounting the digital pressure switch with energy-saving function cuts supply air when the pressure reaches the desired vacuum. More than 90% air consumption reduction is achieved at transfer lines, pick & place and palletising, as air is consumed and exhausted intermittently only when the vacuum pressure decreases.



**All-in-one design**  
Integrated components to be compact and lightweight.

**Improved evacuation efficiency**  
2-stage ejector.

## Air-saving speed controller

AS-R/AS-Q Series

Our speed controller automatically reduces the return stroke pressure to 0.2 MPa. With it, a reduction of 31% can be achieved in applications such as labelling and lifting. Combines multiple adjustments to simplify operations.

**Rapid supply and exhaust function**  
Avoid delays in the response time.

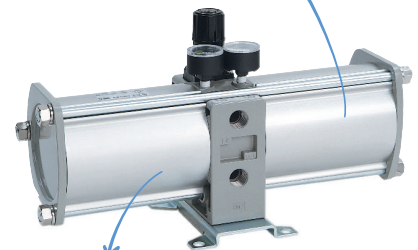


## Booster regulator + Air tank

VBA Series

With our pressure booster it is possible to provide pressure where and when it is needed, as opposed to creating a high demand on the compressor. With this, we maintain productivity and an overall efficient energy consumption.

**Reduced noise**  
Metal noise absorbed by a damper & high-noise reduction silencer.



**2 to 4 times increase in pressure**

# Recover

what you generate



Nowadays, packaging producers are increasingly designing plastic packages in ways that make them reusable; the number of reusable plastics bags and boxes used for the distribution of products is growing rapidly.

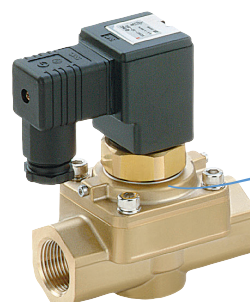
Why not apply the same to air?

Design your system with our help and make the compressed air reusable.

## Pilot-operated 2-port solenoid valve

VCH Series

Our valve for high-pressure applications can operate up to a maximum pressure of 5 MPa. Ideal for energy recovery, it is the perfect solution to feed low-pressure applications with high-pressure ones. In heavy air-consuming applications, such as PET manufacturing, it allows delivering free energy to the rest of the compressed air systems.



**Use possible in harsh environments**  
IP65 enclosure.



With the installation of switches in your machine you will be able to get up-to-date ongoing information on its energy use. Thanks to such monitoring you will be able to take informed decisions to improve your machine's productivity, performance and overall efficiency.

See some of our "out-of-the-box" solutions below, because we know you do not like complicated installations or configurations. Start being informed quickly & easily.

### Digital flow switch

PF3A7□H/PFMC/PFMB Series

Detect leaks and monitor main line, branch or specific equipment consumption with just one product on your packaging line.

*Get more information  
at a glance  
3-colour, 2-screen display.*



### High-precision digital pressure switch

ISE70/71 Series

This next generation provides continuous quantitative values, as well as switched digital outputs when pressure set points are met. Suitable for high-production manufacturing in the food industry.

*Ensure more visibility  
from anywhere  
Angled display & 336°  
rotation possible.*



### Digital flow switch for water

LFE/PF3W Series

Compact and lightweight digital flow switch. Ideal for applications requiring a constantly monitored flow of cooling or cleaning water.

*Free of clogging  
No obstacles or moving  
parts in the fluid path.*



### Pressure sensor for general fluids

PSE570 Series

General fluid pressure sensor that is easy to connect and robust enough to withstand high proof pressure and abrupt surges. The perfect solution for applications such as pressure measurement at PET bottle moulding machines or back pressure control in transport machines.

*Use possible in harsh  
environments  
IP65 enclosure.*



You might find the following of interest as well



### Automatic leak detection system

ALDS Series

A solution for locating & measuring static leaks. ALDS Series integrates a flow switch and a 3-port solenoid valve to automatically measure the given flow, both in home and working positions, gathering all data, thereby concluding where the leaks are.

It can be easily integrated in the machine thanks to its intuitive "Leak Test Cycle" software without any extra external supervision system. Moreover, it provides maintenance staff with the exact location (valve, tube or cylinder) and the leak value in NI/min.





When acquiring a new component, do you consider the ones with an energy-efficient design?

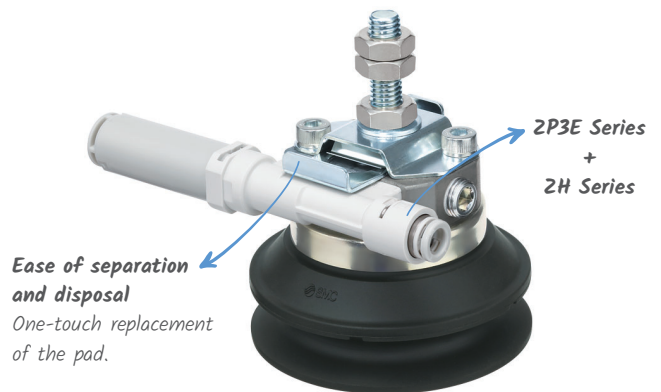
A huge amount of energy is currently wasted during its transportation through the compressed air system, e.g. tubes, fittings, connectors and valves. The target should be reducing such waste with an efficient design.

SMC puts some solutions at your disposal below, specifically designed to reduce energy consumption.

## Vacuum pad with ejector

ZHP Series

You can achieve the same performance with a lower energy consumption with the vacuum ejector and pad integrated in a single compact unit. No tubes are used between the pad and ejector. This product is suitable for applications with requirements for vacuum generation assistance in confined spaces, or for daisy-chain piping, for example, for robot handling, palletising and case packing.



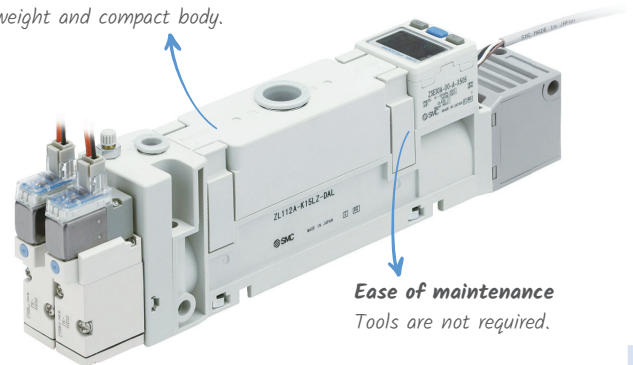
## Multi-stage ejector

ZL Series

Improves the relation between air consumption and suction capacity. Its design allows suction flow to be more than doubled while the supplied air does not vary and eliminates the need for extra ejectors, thereby increasing your energy efficiency.

The product is suitable for workpieces with an uneven surface that suffer a significant amount of leakage such as cardboard or wooden materials on packaging applications.

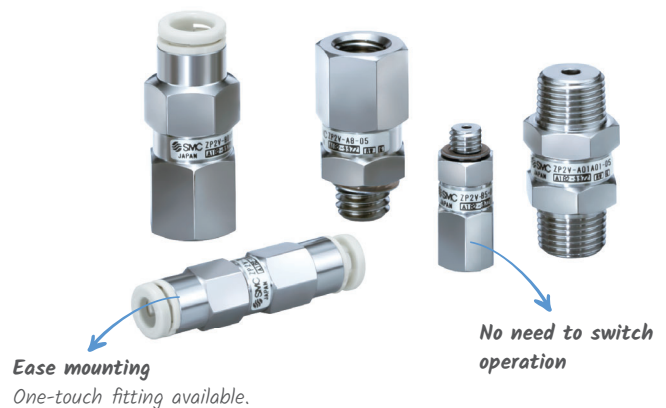
**Ideal for a robot's moving parts**  
Lightweight and compact body.



## Vacuum-saving valve

ZP2V Series

We have a tailor-made solution for cases when there is a change in the geometry of workpieces. The suction is automatically switched off when there is no workpiece, which means a considerable reduction in your vacuum pressure loss. In addition, you can simplify the control circuit with a unique ejector for multiple pads.



## Air amplifier

ZH-X185 Series

A simple, easy-to-operate and smart solution that, thanks to the Coanda effect, multiplies air flow/air suction by 4 and 3 times respectively, saving up to 70 % in your air consumption. Benefit from a set of three applications – Blowing, Suctioning & Conveying.



## Blow gun

VMG Series

### High efficiency nozzle

KNH Series

Our VMG presents a minimal pressure loss compared to conventional models; our blow gun can achieve equivalent performance at lower pressures resulting in less air consumption.

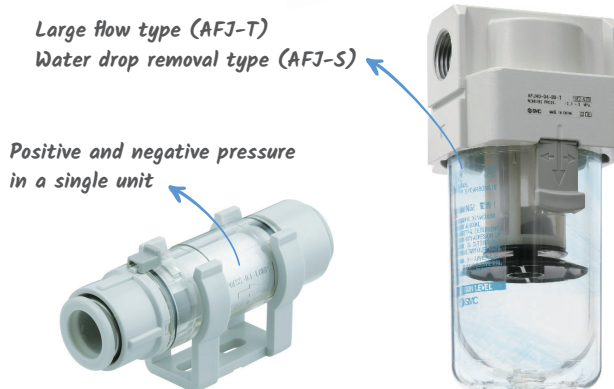
And, if you need to maximise your air blow efficiency, you can use our nozzles for a more focused blowing impact. We have a wide range to choose from, either installing in a blow gun or directly in a pipe.



## Vacuum filter

ZF/AFJ Series

To avoid contaminants such as water condensation and particles in general we propose our vacuum filters. Ultimately, poor-quality air circulating around your system can lead to important monetary losses. Keeping the compressed air dried and filtered helps to increase your machine availability and process reliability while reducing your maintenance costs. Highly recommendable in food packaging, such as in the vacuum line adsorption pad to transfer a cardboard packaging box or plywood, collection of particles before the ejector and preventing cleaning water left on the workpiece from entering the ejector when a pad picks up the workpiece.



Think efficiency is what helps us to really come full circle.

For us, Energy Efficiency is within the Continuous Improvement philosophy.

All the solutions explained above have not been thought out as a random and unconnected set of actions, but rather as a continuum. And a continuum that goes beyond these pages. And the connecting thread is Think efficiency.

To genuinely implement efficiency in our facilities, we should adopt a holistic approach to it, and try to see the energy-efficient potential in our day-to-day working activities and decisions.

**Think of energising your efficiency**





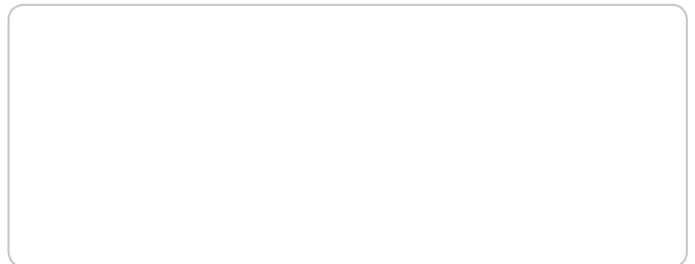




Expertise – Passion – Automation

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