

MAKEEN
ENERGY

***THE POWERFUL TOOL
FOR LEAN OPERATION***



FLEX  ***SPEED***

MAKEEN Energy has developed a record-breaking new filling system that will change the gas filling business as we all know it. Flexibility, accuracy and capacities beyond known technical limits. Innovation that will add even more value to the players in the cylinder filling industry. With a Facility Management deal FLEXSPEED offers even more benefits in terms of optimization and cost-effectiveness in your business. Flexible and speedy. That is why the new approach to filling is called FLEXSPEED.

For more than 40 years, the standard gas cylinder filling capacity has been around 1,200 units per hour. A standard that was set by MAKEEN Energy when cylinder filling on a carousel system was introduced to the

market as the solution of the future over four decades ago.

Market demands have increasingly challenged this industry standard, and many gas fillers look at higher capacity by adding more filling units and more carousels to existing systems. This means more space, additional investments and higher operational costs.

FLEXSPEED now trebles the industry standard!

In a changing market place with stronger competition on the retail market, structural changes in the energy sector, increasing operational costs and higher prices on supplies, gas fillers focus more and more on cost-effective initiatives that directly has an influence on the bottom line.

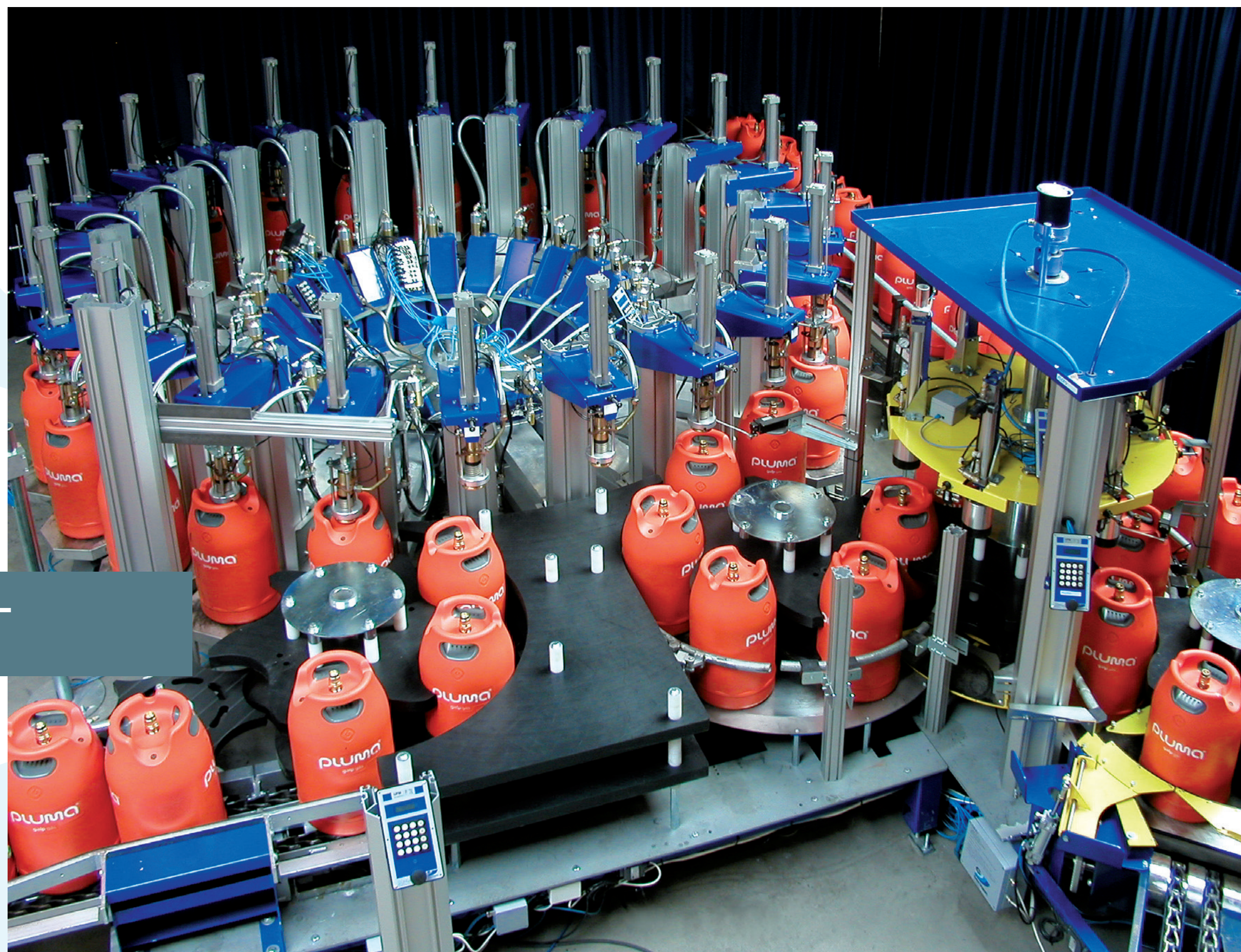
FLEXSPEED is definitely one of these cost-effective initiatives!

Up to 3,600 cylinders per hour – on one single carousel system

FLEXSPEED is much more than just a new filling system

Combining FLEXSPEED and MAKEEN Energy's Facility Management concept, implies no investment in productive apparatus and no economic surprises. With the Facility Management concept, MAKEEN Energy places FLEXSPEED at your disposal, handles the production planning, operation and maintenance of the plant

with specially qualified staff – at a fixed and agreed price. So you may concentrate on sales and distribution. A Facility Management deal ensures that you always have precisely the number of cylinders you want, when you need it – at the lowest possible price.



New handling and processing techniques

FLEXSPEED is a carousel based system with several newly developed handling and processing techniques. The introduction to the carousel is performed dynamically with a set of special double-action star wheels that leads the cylinders from the conveyor onto the filling unit. Each cylinder is weighed dynamically as it is being filled on the revolving carousel. When ejected from the carousel the set of star wheels grabs the cylinders and leads them onto a newly developed dynamic leak detection carousel for safety check in one continuous operation.

All this happens at high-speed without stopping and starting the flow of cylinders at all. More processes may be added as required on the serial connection that controls and synchronizes the stars, so long as available space allows the extension.

Configuration possibilities

A basic *FLEXSPEED* filling system consists of a filling carousel (standard sizes: 30, 36, 42, 48, 54, 60, 66 and 72) and up to five process modules. Examples of possible process modules are a leak detector, a valve tester, a cap applicator, a cap sealing unit, and a hard cap applicator.

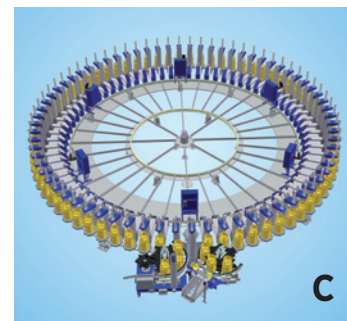
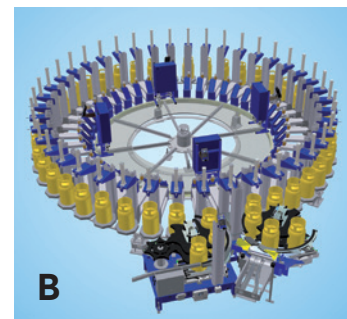
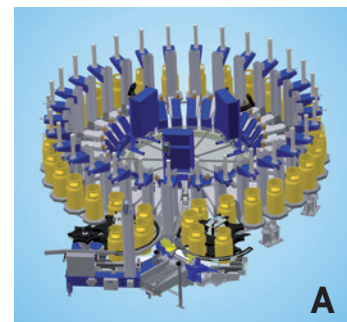
The size of a *FLEXSPEED* carousel is determined by the filling time of the cylinders to be processed. As a thumb rule, the size of a carousel to fill 3,600 cylinders per hour is calculated with a simple formula: the filling time + 7 = number of filling points. Example: if the filling time of the cylinders to be processed is 34 seconds per cylinder, the filling carousel must have at least 41 filling points (34+7=41).

The powerful tool for lean operation

The dynamic cylinder flow gives a most flexible production cycle at any capacity. Moreover, with *FLEXSPEED* gas fillers can look at low maintenance costs, low production costs and low unit cost as they benefit from less system and equipment maintenance, better uptime, more processing time and – when operating with e.g. a fully automatic tare reading system – no tare encoding errors.

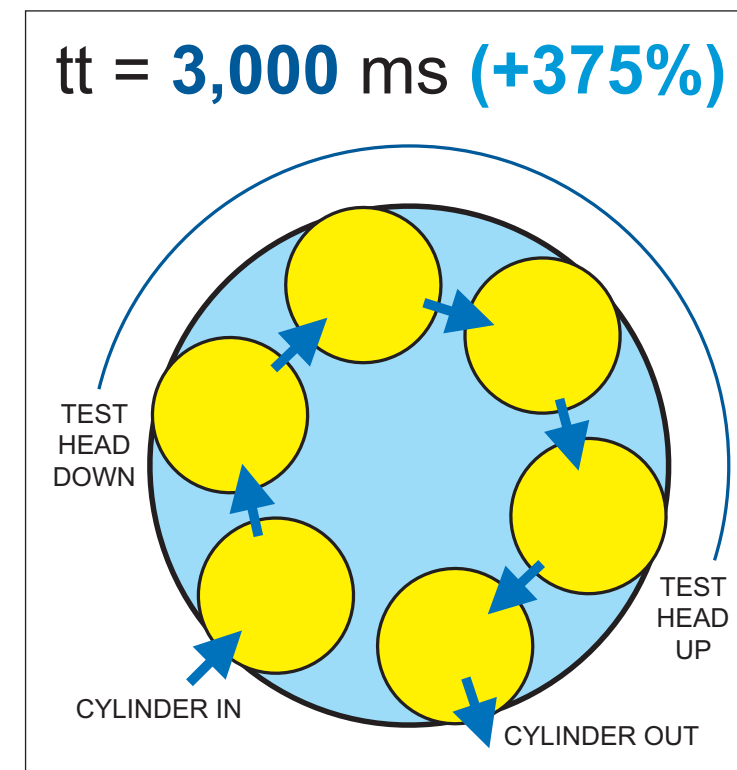
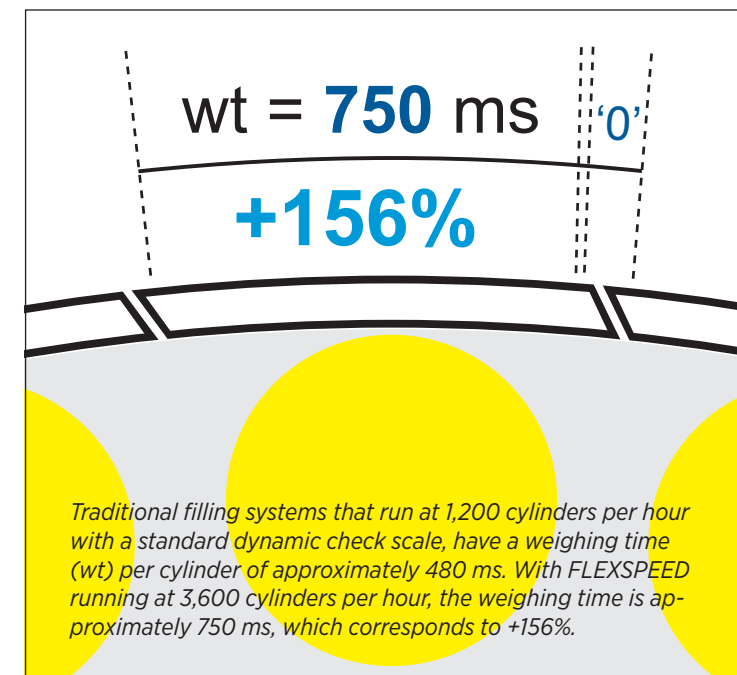
Gas fillers need just focus on local logistics to feed the system with sufficient cylinders to maintain a smooth and continuous cylinder flow. Or indeed out-source the operation to Kosan Crisplant through a Facility Management agreement and then

concentrate on sales and distribution to the retail market.



Examples of *FLEXSPEED* filling carousels with 30 (A), 42 (B) and 72 (C) filling points

Continuous flow – no stopping and starting the flow of cylinders at all



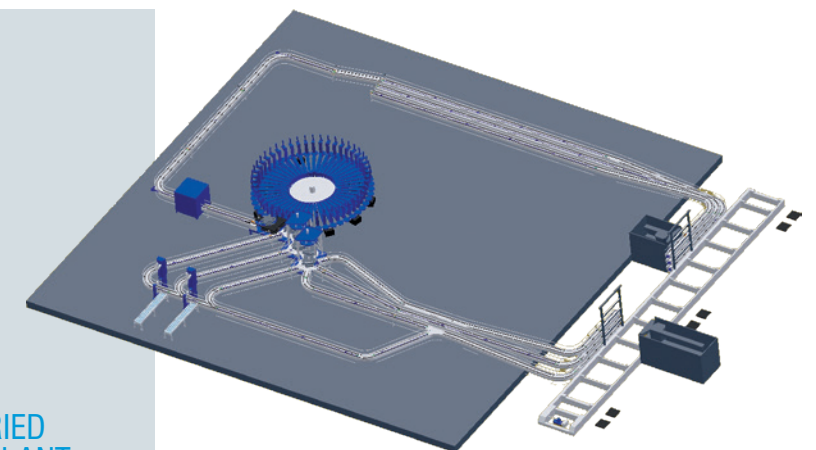
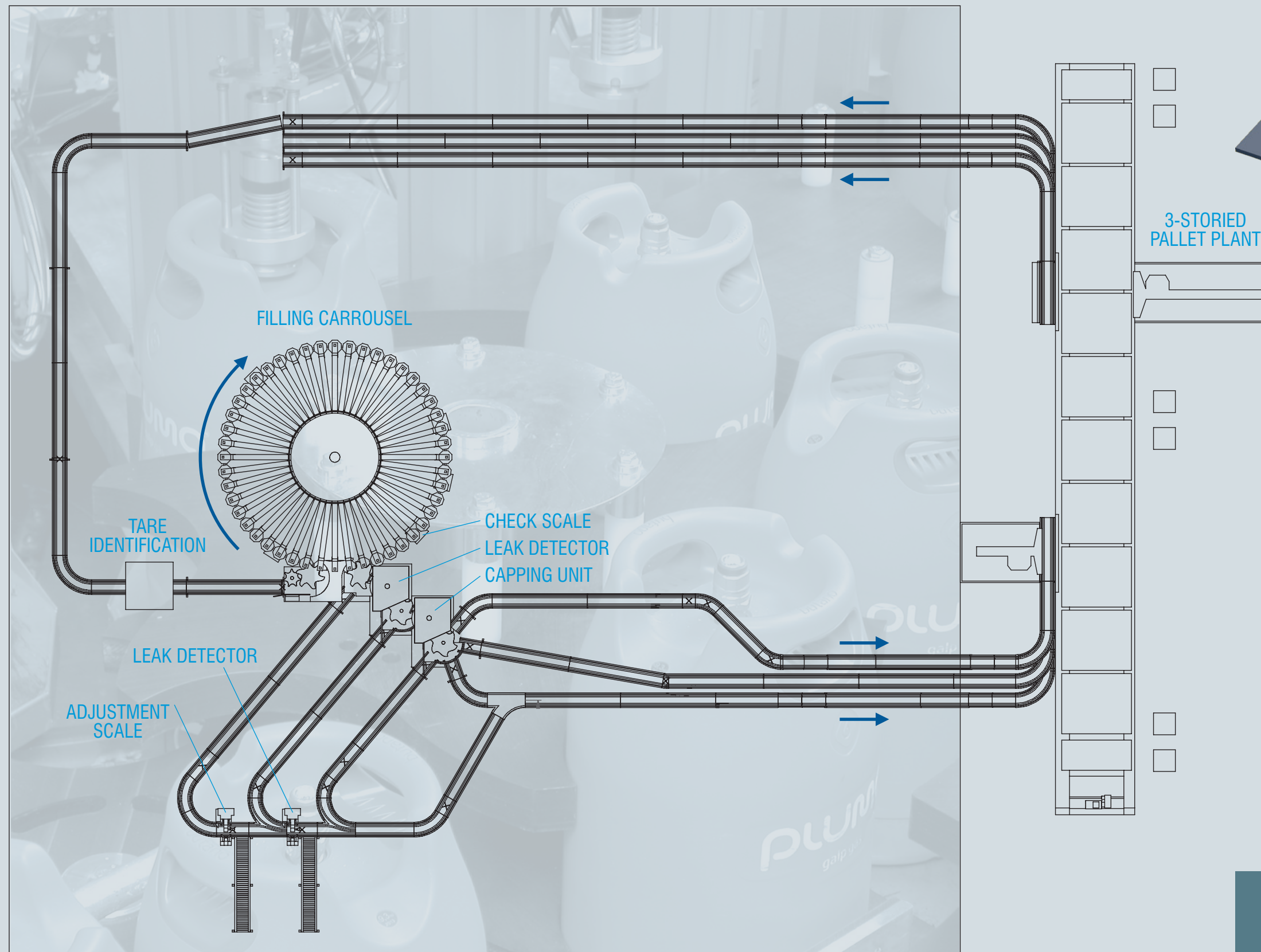
Longer processing time for each cylinder

With *FLEXSPEED* you have more time to fill each cylinder, which again means that you get an up to 50 grams more accurate filling result compared to present market standards, and more time for thorough safety checks than on conventional systems – even when moving the cylinders through a high-speed system!



As for leak detection, the time (tt) required for detection on standard in-line systems running at 1,200 cylinders per hour is approximately 800 ms. With *FLEXSPEED* running at 3,600 cylinders per hour the detection time is approximately 3,000 ms corresponding to +375%.

Extremely accurate and reliable filling and test results



With this new and patented solution for better performance, it is now possible to fill up to 3,600 gas cylinders per hour on one single carousel system. And at lower production costs per filled cylinder. The system features infinitely variable speed control which trebles the output on the same physical production space with no need for major modifications to the existing filling area.

FLEXSPEED is innovative thinking and sound business in one. Outsourcing the system operation to MAKEEN Energy with a Facility Management deal calls for even more benefits, as you will lower your administration costs and get a lower unit price per filled gas cylinder compared to the present market level. Optimization and centralization of the filling operation is how you move forward.

The lean operation makes *FLEXSPEED* the future backbone of high-capacity filling plants everywhere.

**Triple output
on the same space**

MAKEEN
ENERGY

FLEX[®]SPEED

THE POWERFUL TOOL FOR LEAN OPERATION

MAKEEN Energy A/S

Alsvej 21
8940 Randers SV
Denmark

Tel +45 8740 3000

info@makeenenergy.com

www.makeenenergy.com

www.flexspeed.info

