RoboCylinder 3-position Controller

PMEC User Application Examples

MEC (Mechanical Engineer Control) is a class of controllers that can be used easily even by mechanical engineers.

For Flash Animations, Visit:
http://iaiquality.com/category/application-examples/
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With MEC, you can easily replace your air-cylinder system with a low-cost RoboCylinder system which is easy to operate.

**3-position RoboCylinder® Controller MEC** (Mechanical Engineer Control)

### Features

**1 Low Cost**
The PMEC package, which comes with a controller, power supply, acceleration/speed change function and PC connection cable, among others, is at an affordable price. The MEC PC software can be downloaded free of charge from IAI’s website.

**2 Easy Operation**
Even a beginner can set up the controller without reading the operation manual. The acceleration and speed can be changed using the knobs on the controller.

**3 Easy Replacement from Your Air-cylinder System**
Operation signals are exactly the same as those used to operate air cylinders. This means that you can use the program of your current PLC directly.

**4 Push-motion Operation/Intermediate Stopping**
Push-motion operation can be performed in the same manner as you would with any air-cylinder system. Also, you can cause the actuator to stop at any desired intermediate point between the home position and stroke end by changing the setting of the intermediate point using the MEC PC software.
Industries and Applications in Which MEC Is Used

Reasons for Adopting MEC…

1. Easy operation/installation
2. Inexpensive
3. Built-in power supply
4. No need for PLC to operate
5. No need for air supply
6. Supporting constant-speed operation

And many more…

Industries

- Semiconductor/liquid crystal
- Metal/raw material/construction material
- Chemical/film
- Electronic/electrical components and parts
- Food/medicine/cosmetics
- Industrial machinery/mechanical parts
- Automobile/automotive parts
- Other

Applications

- Positioning/conveyance
- Inspection/measurement
- Pusher
- Welding
- Up/down
- Filling/injection
- Clamping/gripping
- Press-fitting/insertion
- Other

PMEC User Application Examples
Applying Adhesive to Mechanical Parts

This system applies adhesive to mechanical parts using a dispenser. The semi-automatic system has operation switches that are used to move the dispenser to the left and right.

http://iaiquality.com/2011/03/02/glue-applicator-application-example/

Explanation

The customer was using an air-cylinder system before, but every time the work part was changed, the stopper position had to be changed to adjust the application position, which was time-consuming given the many varieties of work parts handled.

After introducing a RoboCylinder + MEC system, setup and position change became easy and operation also became more stable.

Another plus is that since air is not used, compressors are no longer necessary, resulting in a simpler system.
This system drives a facility that cuts medical device parts.

This system cuts a bundle of medical device parts. The customer adopted a RoboCylinder to allow for fine-tuning of cutting speeds and ensure stable operation. Since powder dust generates from cutting, the dust-proof RCP2W was selected. Also, the system was designed with a guide to prevent the rod from receiving lateral forces when cutting.
System for Press-fitting Resin Parts into Appliances

This process is designed to press-fit resin parts into the frames of household appliances.

Before, the operator had to tap each resin part for installation, and this manual process was subject to problems, such as 1 the part being damaged and 2 the insertion amount becoming varied, when the part was not tapped properly. After introducing a RoboCylinder system, the customer can now perform the process stably, resulting in quality improvement.
Sealing Machine

**Application**
This system presses seals in a process where seals, supplied in the form of tape, are attached to work parts.

**Explanation**
Before, the operator was pressing seals manually, but the customer considered automating the process to standardize varying results and also to prevent careless mistakes.

After considering an air-cylinder system, the customer decided to adopt a RoboCylinder system because with an air-cylinder system, varying pressures caused by fluctuation in the main pressure could produce defects.
This system is used to automatically shape Gohei mochi\(^{\text{(note)}}\) and put them on skewers. The baking process is manual.

\(^{\text{(Note)}}\) Gohei mochi is a local delicacy found in Kiso, Ina, Hida and Mikawa regions in Japan. Glutinous rice is baked softer than usual and rolled into balls, which are then put on skewers, dipped in sauce, and baked.

The customer adopted a RoboCylinder system for shaping and pressing gohei mochi and piercing them with skewers. The actuator that pierces skewers moves at high speed until immediately before piercing, where it reduces the speed and moves slowly to prevent mochi from deforming. The customer also likes this system because it can be used in locations without an air supply and there is no compressor noise.

This system was adopted by stores selling gohei mochi in tourist places, which together manufactured 50000 pieces of gohei mochi in five days during the festival period.
**Food Sorting System**

**Application**
This system is used to sort pieces of food flowing in a single line on a conveyor, into two lines.

**Explanation**
The customer adopted a MEC system partly because the number of positioning points was small and partly because they liked the built-in power supply feature.
This system is used to align lunch boxes on a conveyor before they enter a packaging machine.

Lunch boxes flowing on a conveyor are pressed against the guide by the RoboCylinder rod to align the boxes before they enter the packaging machine. The customer was using an air-cylinder system before, but adjusting the pressing force was difficult and work parts sometimes got scratched or caught. With the current RoboCylinder system, adjustment is easy and quality has also improved.
System for Mixing Source in Food

**Application**

This system is used to mix source, which is injected from a nozzle, evenly in a hopper.

**Explanation**

The customer adopted a RoboCylinder system for their machine that adds source to food material by moving its nozzle to the left and right to introduce source evenly in a hopper, etc. With this system, the operating speed can now be changed flexibly according to the type of material or source, and source can also be mixed evenly and quickly.
Process for Forming Household Appliance Parts

Application
This system is used to press against a die and bend a copper shaft, which is a part of a household appliance.

Explanation
Before, the customer was using an air-cylinder system to perform this bending operation. After changing to a RoboCylinder + MEC system, low-speed operation is now possible and pressure has also stabilized. The result is elimination of warped or burred work parts and, consequently, stable quality.
This mechanism is used to move the guides of a transfer system according to the size of glass substrates being transferred.

This system is used for a glass substrate transfer line to move the guides on the left and right according to the size of glass substrates being transferred. The customer had never used RoboCylinders before, but decided on a MEC system that could meet their requirements for easy operation, low cost and short lead time.
This system is used to perform sampling inspection of glass substrates. Cameras are used to inspect the moving glass simultaneously from top and bottom. We could build a low-cost system by simply connecting operation switches to a MEC controller.
This mechanism is used for an iron pipe welding system to move a welding torch at a constant speed.

Before, this process was performed by skilled operators, where the quality of welded pipes varied.

After adopting a RoboCylinder system, the moving speed has become constant and quality has stabilized.

Speed change is also very easy and the operator can fine-tune the speed by looking at the condition of the products.

The RoboCylinder and MEC controller are the only components of this system; hence the low cost and easy operation of the system.
This system is used to slowly move a stirring bar up and down to agitate chemical contained in a flask.

The customer adopted this system as a sample unit for evaluation before building a full-scale system. Initially the customer was planning to use an air cylinder to achieve agitation, but found the RoboCylinder system more attractive because it can be operated only with a 230-V power supply and the amplitude and agitation speed can be changed freely.

http://iaiquality.com/2010/10/19/beaker-stirrer-application-example/

The customer adopted this system as a sample unit for evaluation before building a full-scale system. Initially the customer was planning to use an air cylinder to achieve agitation, but found the RoboCylinder system more attractive because it can be operated only with a 230-V power supply and the amplitude and agitation speed can be changed freely.
System for Cutting Lead Wires of Electronic Components

**Application**

This device is used to cut lead wires of electronic components.

**Explanation**

This system, designed to cut lead wires of electronic components, was operated by an air cylinder before. However, many work parts were scrapped due to cutting problems and frequent replacements of cutting blades kept the maintenance cost high, and eventually the customer adopted a RoboCylinder system. With the RoboCylinder system, fine-tuning of the speed and acceleration of the cutting blade is now possible and cut surfaces of wires have become cleaner, resulting in a significant reduction in the number of work parts that must be scrapped due to cutting problems. In addition, this system allows for setting of a desired blade stopping position, which has helped prevent tool damage caused by collision with the blade tip.
A MEC system is adopted for the gripper of a transfer system that takes out parts from a processing system.

Note. An external guide may be needed depending on the structure of the gripper.

The customer decided to replace their original air-cylinder gripper to a motor-driven counterpart for the purpose of reducing air piping.