The MAC VALVES GLASS Gazette 3

Technical Bulletin

Liège, August 21st, 2014

Introduction

MAC Valves, Inc. is pleased to announce the release of a new proportional valve designed for the plunger control on container forming machines – **The Proportional Quick Exhaust (PQE)**

This new unit is available in several configurations:

- The proportional valve for a direct competition replacement on existing machines (all interfaces and electrical connectors available)
- The proportional valve with an isolation valve and a transition plate to fit on existing base (several transition plates and electrical connectors available)
- The proportional valve with an isolation valve and a customized base for specific package size (for single, double, triple and quadruple GOB)

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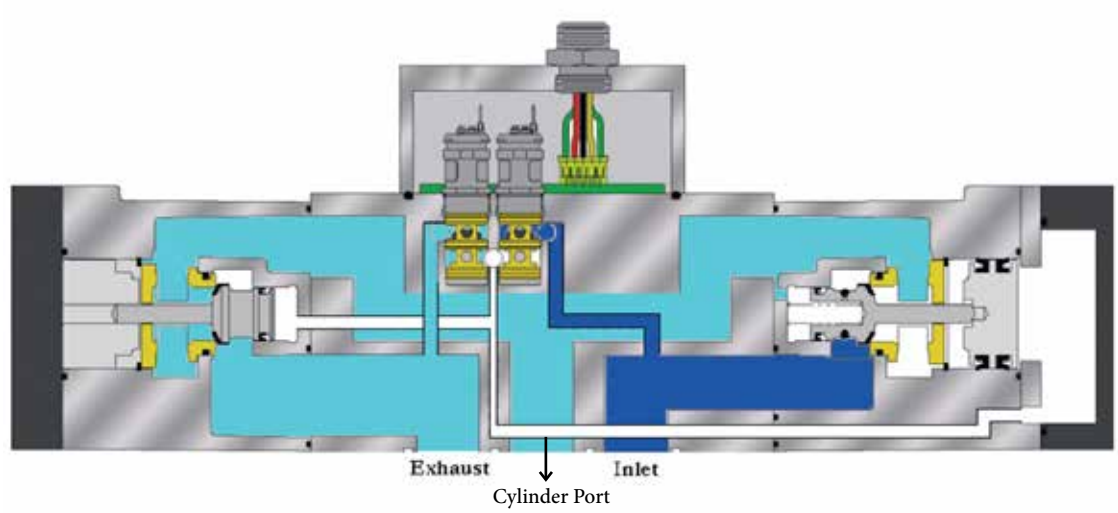
PQE Operation Principle



MAC Valves listened carefully to the specific needs of the users and took their observations into consideration to create a new proportional valve integrating all the MAC Valves features and technology.
The technology brings short and consistent responses times and a better control at each step of the process.
The unit has been designed to resist harsh environments, and therefore all components are resistant to high temperature and aggressive lubrication.

Our unique and innovative design is composed of two mechanical boosters piloted by two 2/2 small valves integrated in the PQE.

MAC Advantages vs. Competition

The MAC technology pilot operating boosters for inlet & exhaust :
- Less parts – increased reliability
- Reduced electrical consumption
- Faster & consistent response times throughout the process

Vs. competition proposing traditional proportional coils operating poppets on long strokes :
- Heavier weight
- Higher current consumption
- Slower and inconsistent response times

MAC Valves also proposes a repair kit for the entire unit, and a maintenance bench.

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New PQE with isolation valve

MAC Valves is releasing a new assembly composed of one PQE and and one 3/2 way isolation valve that isolates the PQE against contamination from the plunger.

The feedback from the field for this assembly is extremely positive. The solution offers huge advantages compared to competition:

- Less variation in plunger up process time
- Low pressure can be used during the complete plunger process, and this increases the bottle neck quality and reduces wear on mechanical parts
- The press time is extremely constant from cycle to cycle

This new assembly has been designed to be fitted on all IS machine types using existing proportional valve to control the plunger operation.

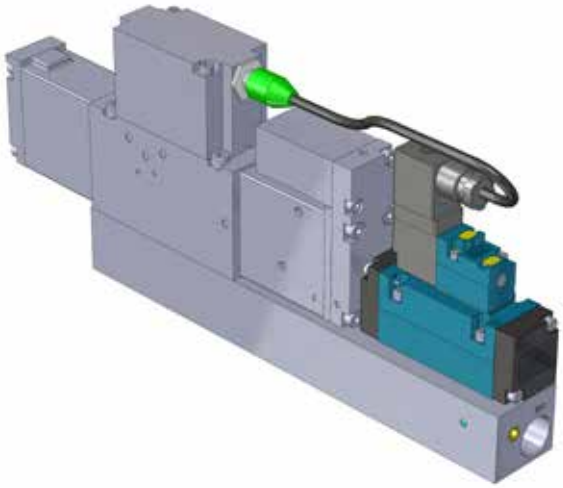
With this new MAC Valves assembly, the exhaust air is forced through a spool valve when commanding to 0 bar and no longer through the proportional valve itself. This significantly reduces the presence of contaminants in parts involved in the proportional operation of the valve.

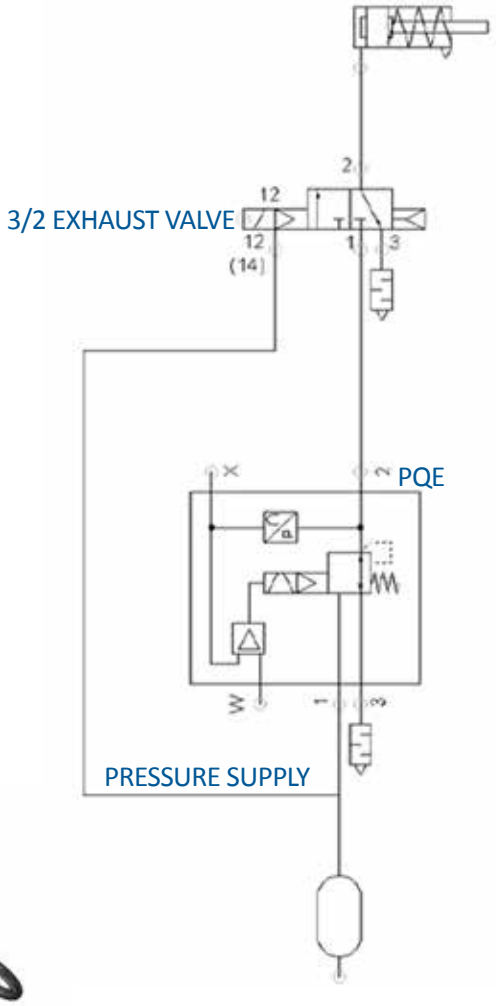
Different block configurations are possible – the picture shown on this page is one example.

A needle can be integrated into the manifold to control the exhaust air coming back from the plunger up air line.

A shut off can also be integrated into the manifold to cut the air inlet of the PQE and allow to change the unit in case of trouble.

The isolation valve is electrically controlled by the PQE circuit board itself – an additional channel coming from the main PLC is thus not necessary.





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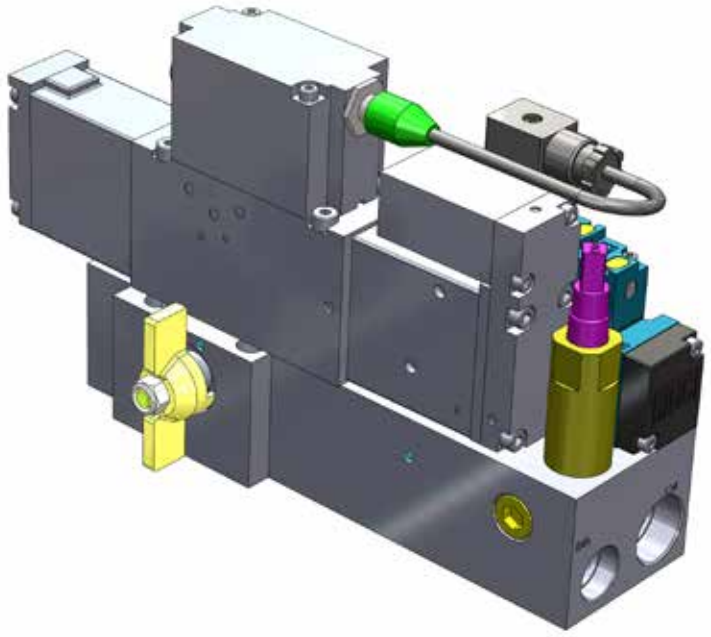
New PQE with isolation valve – Operation principle

The operation of the new assembly combines the features of the two types of valves used. The PQE is used to create the pressure as it is required by the process.
The isolation valve is less sensitive to dirt and all exhaust air than the PQE. To avoid the contamination of the PQE with dirt, particles, residues of swabbing and lubrication, the main exhaust air flows through the isolation valve.
With this assembly, the speed and accuracy of the plunger movement to the loading position in NNPB and from the up position to the counterblow position in BB is significantly improved.

This step is ensured directly by the protected circuit board inside the PQE. At a pressure set to 0 bar (<=4mA), the PQE is closing both the supply and the exhaust, forcing all the air though the isolation valve.

In maintenance stop conditions, the isolation valve is exhausting the working line for plunger up in most cases, the plunger down valve is a normally open valve to force the plunger down in maintenance stop. This means the plunger up exhaust valve is able to exhaust the air leaking, which is flowing into the plunger up cylinder from the plunger down pressure and avoids the creeping up of the plunger while all valves are de-powered.
Thanks to this assembly, if there is no power supply or command signal, the plunger cylinder exhausts.

In addition to the functional benefits described, the lifetime of the PQE is expected to be longer as the valve is not energized for longer periods of time.



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MAC solutions/options

OEM supplied assembly made of proportional valve and an exhaust valve
MAC Solution : PQE93A-AA10 Mod EP42
(OEM supplied exhaust valve stays)

OEM supplied proportional unit without exhaust valve
MAC solution – two options :

- PQE93A-AA10 MOD EP42 (no isolation valve)
- Drop in transition plate + PQE + MAC Valves isolation valve (for valve references, please consult factory)

Competition proportional valve without exhaust valve
MAC solution – two options :

- Drop in transition plate + PQE + MAC Valves isolation valve
- Drop in PQE (no transition plate required)

For references on both options please consult factory.

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NEW GENERATION Proportional Control Valves
For Plunger Control on IS Machines

- Solution for NNPB, BP and BB.
- Automatic pressure control.
- 100% drop-in solution - Several interfaces available.
- Dual transducer for extreme precision.
- High flow characteristics.
- Additional 3/2 way valve (optional) that isolates the unit against contamination coming back from the plunger.
- Twin booster design for better accuracy, lower electrical consumption and higher life time.
- High temperature components.
- Flow control needle available for plunger down on request.
- Short and consistent response times for better control of each step of the process.
- Fully repairable unit.

20 years of experience in the Glass Industry

CUSTOMER BENEFITS

- ✓ **Balanced design for high flow, high speed and high consistency.**
- ✓ **Self cleaning device for inlet & exhaust booster.**
- ✓ **Proprietary high temperature seals for long life time, improved resistance to high temperature and aggresive lubricants.**
- ✓ **Actual pressure measurement performed at outlet of Propotional Pressure Controller.**
- ✓ **MAC Technology Pilot operating booster for inlet and exhaust: reduces overheat.**
- ✓ **MAC Technology Pilot operating booster for inlet and exhaust: less parts - more reliability.**
  Vs. Traditional proportional coils operating poppets on long strokes: heavier weight.
- ✓ **MAC Technology Pilot operating booster for inlet and exhaust: reduced electrical consumption.**
  Vs. Traditional proportional coils operating poppets on long strokes: higher electrical consumption.
- ✓ **MAC Technology Pilot operating booster for inlet and exhaust: short and consistent response times for better control of each step of the process.**
  Vs. Traditional proportional coils operating poppets on long strokes: longer & inconsistent response times
- ✓ **Aluminum alloy enclosure for control system.**
- ✓ **100% interchangeable with existing solution.**
- ✓ **Repair kit available for the complete proportional control valve.**
- ✓ **Optional test bench.**

MAC Valves – Highly engineered solutions for the highest performing applications since 1948

MVE001-GL-AUG2014-EN

MAC Valves Inc, Wixom, Michigan - **MAC Valves Inc,** Dundee, Michigan
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To find your *local* distributor, visit *www.macvalves.com*

NEW GENERATION Proportional Control Valves
For Plunger Control on IS Machines

TECHNICAL DATA

Fluid:	*Compressed air, vacuum, inert gases*
Inlet pressure:	*5 bars / 73 PSI*
Output pressure:	*0 to 4 bar / 0 to 58.4 PSI*
Overall accuracy:	*± 2,5% full scale*
Lubrication:	*Not required, if used, select a medium aniline point lubricant*
Supply voltage:	*20,4 to 26,4 VDC*
Command signal:	*4 to 20 mA or 0 to 10 VDC*
Analog monitor signal:	*4 to 20 mA or 0-10 VDC (if 0-10 VDC command signal)*
Ambient temperature:	*-18°C to +50°C / - 0.4°F to 122°F*
Compressed air temperature:	*-18°C to +50°C / -0.4°F to 122°F*
Flow:	*3000 Nl/min / 3.0 Cv*
Connector available:	*Consult factory*

FEEDBACK FROM THE FIELD

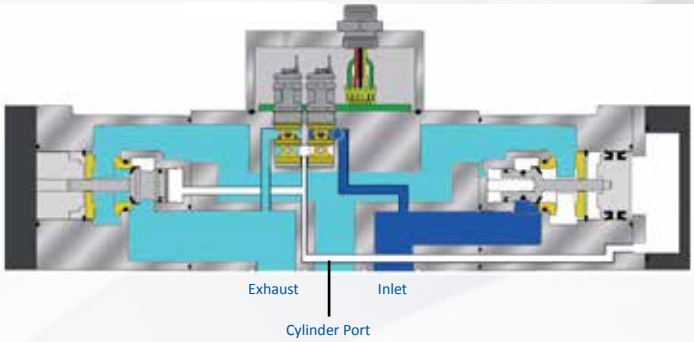
- More consistent plunger up process time.
- Lower pressure can be used during all the plunger process, resulting in an improvement of the bottle neck quality, and a wear reduction on mechanical parts.
- The duration of the holding pressure for the plunger is extremely consistent from cycle to cycle.

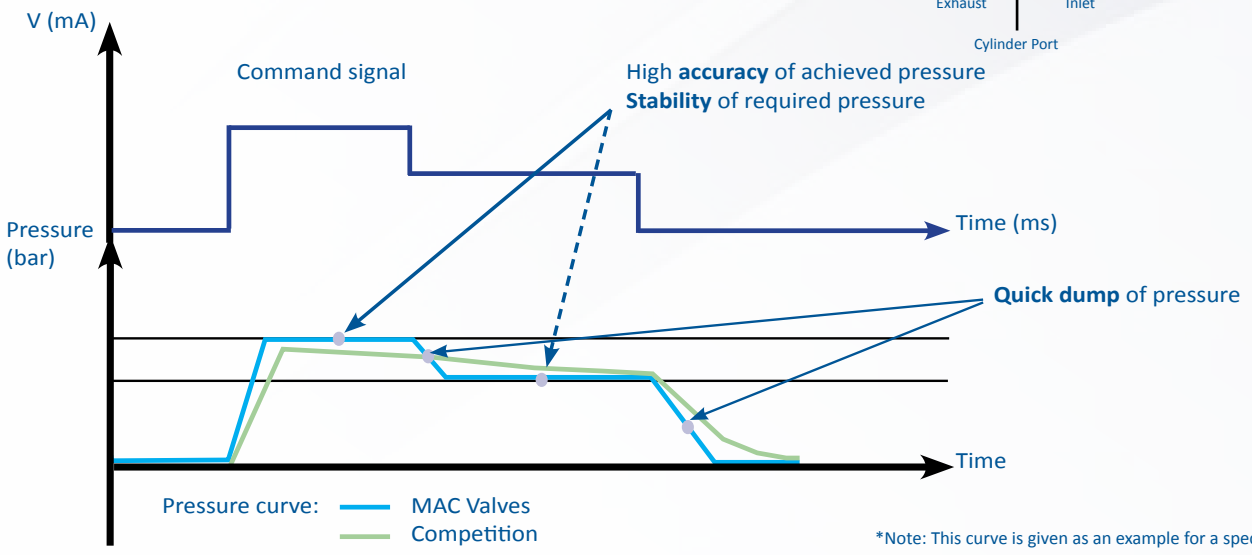
Approved

MAC SOLUTION - HOW TO ORDER

Plunger control:	*PQE93A-AA10 Mod. EXXX*
Repair kit for PQE Mod. EXXX:	*Consult factory*

DRAWING OVERVIEW





*Note: This curve is given as an example for a specific process.

3500 factory certified specialists in over 45 countries focused on optimizing customers needs

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