# Technical Bulletin

## Introduction

AC Valves, Inc. is pleased to announce the release of an innovative new 21-line valve block. This 100% drop in replacement solution is aimed to replace traditional cartridge electro-pneumatic valve blocks on IS glass container forming equipment.

> The MAC Glass Gazette 4 – Technical Bulletin – September 25th, 2014 - Page 1 of 8 MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium Tel : +32 4 239 68 68 – Fax : +32 4 263 19 42 – E-Mail : nicolas.mathieu@macvalves.be

The MAC Valves Glass Gazette is MAC Valves Newsletter for the Glass Industry **■** TO FIND YOUR LOCAL DISTRIBUTOR, VISIT WWW.MACVALVES.COM Wixom, MI, USA – Liège, Belgium- Taoyuan, Taiwan – Penrose, Auckland, New Zealand **■** Date : September, 25th 2014



Liège, September 25th, 2014

All rights reserved. Content of this publication may not be electronically distributed or reproduced even partially without written consent of MAC Valves, Inc. and/or its associated companies. MAC Valves Europe Inc. – September 2014.

# Technical Bulletin

## **Requirements from the field**

AC Valves, Inc. has carfully taken into consideration the requests of users and understood their issues to create this new drop-in solution that will give you the possibility to modernize your existing machinery.

This new solution integrates all the MAC features and technology resulting from over 25 years of experience on the field (more than 1500 blocks running worldwide).

The main complaints received from different users worldwide were the following :

- Skinner type pilots extremely sensitive to pressure variation and contamination (see details with MAC Valves on page 3)
- Poppet design cartridges not enough flow for some mechanisms and short life time
- NON Plug-in solution wires likely to be contaminated by oil, water, steam or other liquids

- Complicated and high cost of maintenance: +/- 30 minutes to replace one cartridge

Liège, September 25th, 2014

- Block « ergonomy » not adapted for the machine operator difficult access to manual overrides
- Outdated 50-year old solution !!!

The main focus of MAC Valves is to offer an innovative product developed basing on users' experience that provides:

- An increased production due to less downtime
- An increased bottle quality due to fast, repeatable response times and higher flow
- A more user friendly solution for the operators and maintenance teams





Example of traditional cartridge electro-pneumatic valve block

The MAC Glass Gazette 4 – Technical Bulletin – September 25th, 2014 - Page 2 of 8 MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium Tel : +32 4 239 68 68 – Fax : +32 4 263 19 42 – E-Mail : nicolas.mathieu@macvalves.be

MAC

The MAC Valves Glass Gazette is MAC Valves Newsletter for the Glass Industry 
TO FIND YOUR LOCAL DISTRIBUTOR, VISIT WWW.MACVALVES.COM
Wixom, MI, USA – Liège, Belgium- Taoyuan, Taiwan – Penrose, Auckland, New Zealand 
Date : September, 25th 2014



# Technical Bulletin

## Typical skinner design vs. MAC Valves design



#### Skinner design

- Spring force (holding poppet on seat) is constant
- Inlet air acts upon a single sealing area
- Inlet pressure X sealing area creates a force that opposes return spring shifting forces

Liège, September 25th, 2014

- Force created by inlet air pressure on inlet poppet seal varies as inlet air pressure varies
- Changing inlet pressure therefore affect enerigzing and de-energizing shifting forces

#### **DISADVANTAGES:**

- Normal pressure fluctuations cause inconsistent shifting forces
- Air pressure fights return spring, reducing shifting forces
- Weak return spring force
- Exhaust contaminants pass through operating solenoid parts causing sticking and coil burnout
- Exhaust located in pole piece is restricted due to core iron requirements



#### Patented MAC Valves design

- High shifting forces (energized) short stroke
- High shifting forces (de-energized) strong return spring
- Shifting forces unaffected by changing air pressure (IN/EXH) balanced design
- Shifting forces virtually unaffected by typically contaminated air
- Wiping action Low friction minimizes resistance to shifting forces
- Minimal friction

#### **ADVANTAGES**

- Short stroke solenoid produces high energization shifting force
- High force return spring due to high force solenoid, maximizes both energization and de-energization shifting forces
- Special D-rings to protect the electrical part from external contamination
- Valve shifting forces are consitent and not affected by pressure variations
- Solenoid isolated from exhaust of contaminants

The MAC Glass Gazette 4 – Technical Bulletin – September 25th, 2014 - Page 3 of 8 MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium Tel : +32 4 239 68 68 – Fax : +32 4 263 19 42 – E-Mail : nicolas.mathieu@macvalves.be



The MAC Valves Glass Gazette is MAC Valves Newsletter for the Glass Industry ■ TO FIND YOUR LOCAL DISTRIBUTOR, VISIT WWW.MACVALVES.COM Wixom, MI, USA – Liège, Belgium- Taoyuan, Taiwan – Penrose, Auckland, New Zealand • Date : September, 25th 2014



All rights reserved. Content of this publication may not be electronically distributed or reproduced even partially without written consent of MAC Valves, Inc. and/or its associated companies. MAC Valves Europe Inc. – September 2014.

# Technical Bulletin

## **General benefits**

Relying on an experience of over 25 years in the glass industry and with over 1500 valve blocks installed worldwide, we engineer and manufacture an innovative valve block solution meeting all requirements from users of such blocks on their equipment :

- 100% drop in solution 60 minutes to have it fully ready on the machine!
- Designed to fit on existing flow control blocks and inlet accumulator bottom plate (see picture)
- Easy quick exchange for the valves only 4 screws per valve NO CARTRIDGE !!!



Kissplate on which the block is mounted

Liège, September 25th, 2014



The MAC Glass Gazette 4 – Technical Bulletin – September 25th, 2014 - Page 4 of 8 MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium Tel : +32 4 239 68 68 – Fax : +32 4 263 19 42 – E-Mail : nicolas.mathieu@macvalves.be



The MAC Valves Glass Gazette is MAC Valves Newsletter for the Glass Industry 
TO FIND YOUR LOCAL DISTRIBUTOR, VISIT WWW.MACVALVES.COM
Wixom, MI, USA – Liège, Belgium- Taoyuan, Taiwan – Penrose, Auckland, New Zealand 
Date : September, 25th 2014



# Technical Bulletin

## Liège, September 25th, 2014

# **General benefits (Continuation)**

- Ergonomic design for easier maintenance operations Depth reduced by 50 mm vs. traditional cartridge valve block
- High flow valve characteristics (5000 NI/min) compared to +/- 2500 NI/min for the traditional cartridge block
- Strong resistance to contamination designed to work in harsh environments
- Independent electrical wiring harness for easier maintenance
- 3-position manual override and LED facing the operator
- Color distinction normally closed, normally open
- Long life time, fast and repeatable switching times
- Different connector configurations possible
- LOTO cover available (safe energy isolation)

This new valve block is available in several configurations in function of the glass forming machine you are operating.



MAC Valves 54 series with spool technology



#### New MAC Valves 21-line valve block assembled

The MAC Glass Gazette 4 – Technical Bulletin – September 25th, 2014 - Page 5 of 8 MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium Tel : +32 4 239 68 68 – Fax : +32 4 263 19 42 – E-Mail : nicolas.mathieu@macvalves.be



The MAC Valves Glass Gazette is MAC Valves Newsletter for the Glass Industry 
TO FIND YOUR LOCAL DISTRIBUTOR, VISIT WWW.MACVALVES.COM
Wixom, MI, USA – Liège, Belgium- Taoyuan, Taiwan – Penrose, Auckland, New Zealand 
Date : September, 25th 2014



Technical Bulletin

## **Dimensional comparison**

As evidenced on the below dimensional drawings, the new MAC Valves electro-pneumatic valve block is very compact. The blank mould - operator distance is reduced.

Please be advised that the orange top cover shown in the below illustrations can also be used on the MAC Valves block upon request.

**Overview** 





Liège, September 25th, 2014

# Technical Bulletin

# Specific features





NEUTRAL



### A) New 3-position manual override

The MAC Valves 54 Series mounted on the drop-in electro-pneumatic valve block that has been detailed in this technical bulletin comes with a new 3-position manual override that has been engineered specifically for the glass industry.

## Connector





Plug in connector and guide pin holes on valve

Connector Guide pins on the manifold



Liège, September 25th, 2014



#### C) Large LED

For optimum visibility of valve operation on the electro-pneumatic valve block, MAC Valves implemented a large size LED on its 54 series valve mounted on the valve blocks. LED color can be changed upon request.

The MAC Glass Gazette 4 – Technical Bulletin – September 25th, 2014 - Page 7 of 8 MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium Tel : +32 4 239 68 68 – Fax : +32 4 263 19 42 – E-Mail : nicolas.mathieu@macvalves.be



The MAC Valves Glass Gazette is MAC Valves Newsletter for the Glass Industry ■ TO FIND YOUR LOCAL DISTRIBUTOR, VISIT WWW.MACVALVES.COM Wixom, MI, USA – Liège, Belgium- Taoyuan, Taiwan – Penrose, Auckland, New Zealand ■ Date : September, 25th 2014



### B) Robust plug in and new guide pins

For user friendly maintenance and reliability purposes, MAC Valves implemented robust plug in connectors and new guide pins for the valve.

# The Marce GLASS Gazette

# Technical Bulletin

# **Specific features (Continuation)**

### D) NC/NO color identification

To prevent any confusion between normally closed and normally open valves, MAC Valves paints the main body of the valve in different colors : Red=NC ; Blue=NO.





Liège, September 25th, 2014



54 Series normally closed valve



### E) Fully repairable valve and test base

MAC Valves offers a repair kit for the 54 Series valve to give the option to repair the valve. Repair kit for NO/NC valve is identical. Also available: a complete on-site maintenance training along with the literature.

### How to order

Circuit bar: Normally closed valve: Normally open valve: Repair kit - NC & NO valves: CBM054 MOD EXXX (MOD is defined in function of customer requirements) 54A-CC-000-DP-DEWP-4FM MOD ER05 54A-DC-000-DP-DEWP-4FM MOD ER05 K-54001 Mod. 446K

The MAC Glass Gazette 4 – Technical Bulletin – September 25th, 2014 - Page 8 of 8 MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium Tel : +32 4 239 68 68 – Fax : +32 4 263 19 42 – E-Mail : nicolas.mathieu@macvalves.be



The MAC Valves Glass Gazette is MAC Valves Newsletter for the Glass Industry ■ TO FIND YOUR LOCAL DISTRIBUTOR, VISIT WWW.MACVALVES.COM Wixom, MI, USA – Liège, Belgium- Taoyuan, Taiwan – Penrose, Auckland, New Zealand ■ Date : September, 25th 2014



# **NEW GENERATION 21 LINES** For Electro-Pneumatic Valve Block on IS Machines

## **100 % DROP IN SOLUTION – FULLY OPERATIONAL IN 60 MINUTES**

Ergonomic design for easier operation – Depth reduced by 50 mm vs. traditional cartridge block.

High flow characteristics (5000 NI/min per valve) compared to average flow of 2500 NI/min for traditional OEM supplied cartridge blocks.

Strong resistance to contamination - Designed to work in harsh environments.

Electrical wiring harness independent for easier maintenance.

Several connector configurations possible (Harting 64 pins, Cannon 37 pins, and extra events connectors).

Different buttons available (E Stop, light, Piezzo, etc.).

3-position manual override and LED facing the operator.

LoTo cover provided - No electrical parts on the cover.

Less downtime - Increased production.

\* For valve details, please consult document MVE007-GL-MAY2015-EN



### **CUSTOMER BENEFITS**

- ✓ Standard IS machine dimensions direct installation on to the existing speed control bar.
- ✓ 3/2-way valve with the new technology patented 5-way pilot develops maximum shifting forces both ways.
- Balanced design for high flow, high speed and high consistency (Not sensitive to pressure variations).
- ✓ All valves with LED indicators facing the operator.
- ✓ Short stroke with high flow on the market for a valve block (up to 5000 NI/min per valve) in a compact package.
- ✓ Spool technology eliminates use of cartridges.
- ✓ Proprietary high temperature seals for long life time, resistance to high temperature and aggresive lubrication.
- ✓ Burn-out proof MAC solenoid, life time guarantee on coils.

- ✓ 100 million cycles (est.) MTBF life time.
- 100% interchangeable with existing solution.
- Plug in solution internal wiring (inside the manifold) no flying leads or open tabs.
- ✓ Colour coded valve body to easily identify normally closed and normally open valves (Red = NC / Blue = NO).
- ✓ Reduced blank mould operator distance 50 mm depth reduction.
- ✓ LoTo protective cover.
- ✓ Repair kit available for the complete valve.

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



MAC Valves Inc, Wixom, Michigan - MAC Valves Inc, Dundee, Michigan MAC Valves Europe Inc, Liège, Belgium - MAC Valves Asia Inc, Taiwan To find your *local* distributor, visit *www.macvalves.com* 



WVE002-GL-JUL-2014-EN

# **NEW GENERATION 21 LINES** For Electro-Pneumatic Valve Block on IS Machines

## **TECHNICAL DATA**

Fluid:	Compressed air, vacuum, inert gases
Pressure range :	External pilot 0 to 8 bar / 0 to 120 PSI
Pilot pressure :	2,5 to 8 bar / 37.5 to 120 PSI
Lubrication :	Not required if used select a medium aniline point lubricant (between 80°C and 100°C / 176°F and 212°F)
Filtration :	40 μ
Temperature :	-18°C to + 80°C / 0°F to 176°F
Orifice :	13,5 mm / 0.53 in
Flow (at 6 bar, Δ P=1bar):	5000 NI/min / Cv 5.0 (per valve)
Coil:	Epoxy encapsulated - class F wires - long energization
Voltage range:	-15% to +10% of nominal voltage
MOD. ER05:	Viton seals, spool an poppet - High temperature grease - Glass industry manual override design.

### **MAC SOLUTION - HOW TO ORDER**

Circuit bar:	CBM054 MOD EXXX (MOD is defined upon customer requirements - please consult factory)
Normally closed valve:	54A-CC-000-DP-DEWP-4FM Mod EXXX
Normally open valve:	54A-DC-000-DP-DEWP-4FM Mod EXXX
Repair kit - NC & NO valves:	K-54001 Mod. 446K / DP-DEWP-4FM Mod EXXX

## **3D OVERVIEW**

