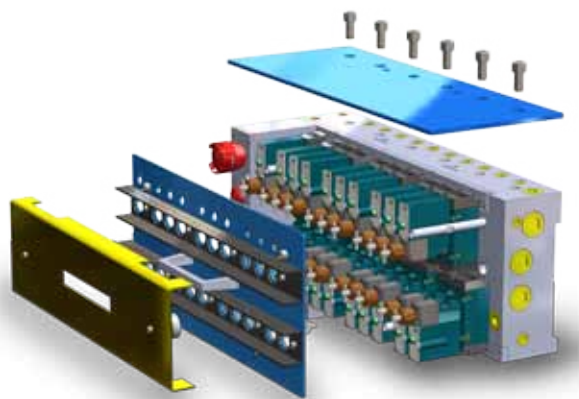


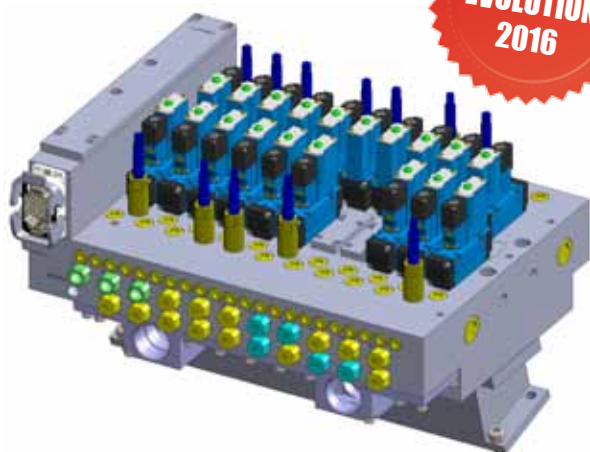
Technical Bulletin

Liège, March 30th, 2016

“To date, MAC Valves has installed over 3800 valve blocks in 130 plants. MAC Valves and the MAC Distributor Network develop innovative solutions aiming at reducing maintenance frequency and increase your pack to melt.”



**NEW
EVOLUTION
2016**



With innovative products featuring high added value, MAC Valves reworks standard solutions according to each customer's specifications, which means a very high level of flexibility.

The valve block on the left has been designed including options such as inclined version, integrated flow controls at the front, dual pressure, possibility of 21 individual inlet pressures. It is an example of the solutions specially developed for the glass industry

MAC Valves is constantly working on improving users' comfort and ergonomics. For example, the distance between the mould and the operator has been substantially reduced. MAC designs allow to reduce valve block depth between 50 and 120 mm.

180 days to Glasstec 2016



We will be pleased to welcome you from September 20th to 23rd to Glasstec in Düsseldorf to update you on our latest developments and discuss our projects.

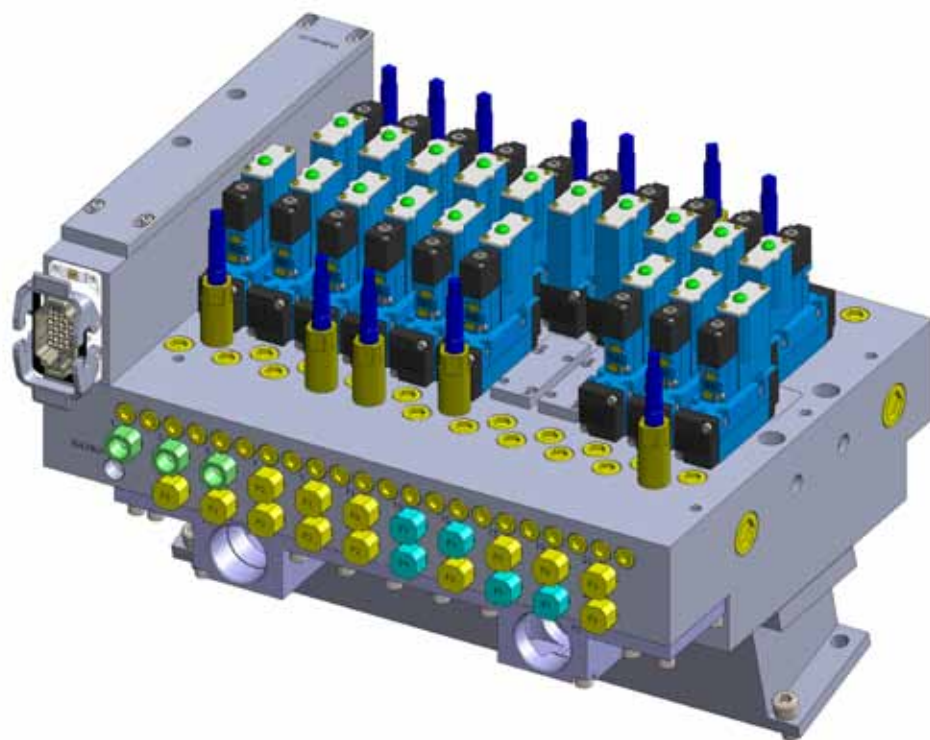
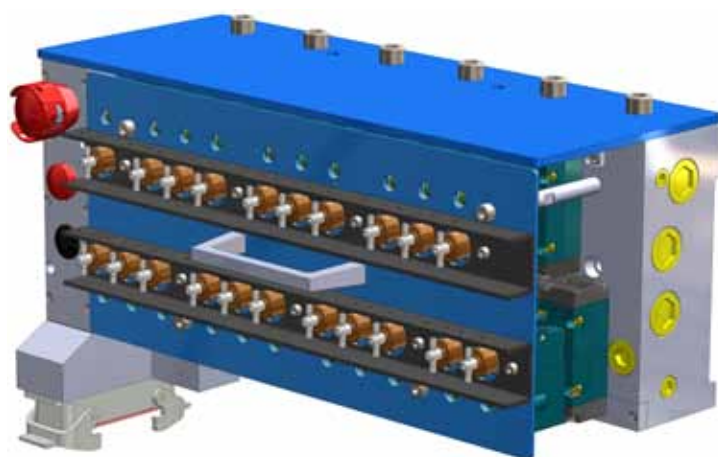
glasstec

Technical Bulletin

Liège, March 30th, 2016

Introduction

MAC Valves, Inc. is pleased to release a new innovative 21-line valve block that is added to our range of 100% drop-in replacement solutions available for replacing traditional cartridge electro-pneumatic valve blocks on IS glass container forming equipment.



**NEW
EVOLUTION
2016**

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MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium
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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 : March, 30th 2016



Technical Bulletin

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Requirements from the field

MAC Valves, Inc. has carefully taken into consideration the request of users and understood their issues to create this new drop in solution which will give you the possibility to modernize your existing machinery.

This new solution integrates all the MAC features and technology resulting over 25 years of experience on the field (over 3800 blocks running worldwide).

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

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

- Complicated and high cost maintenance - +/- 30 minutes to replace one cartridge
- Block «ergonomy» not adapted for the machine operator – difficult access to manual overrides
- Outdated 50 years old solution !!!

The main focus of MAC Valves is really to give an innovative product developed based on users experience which will provide you:

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



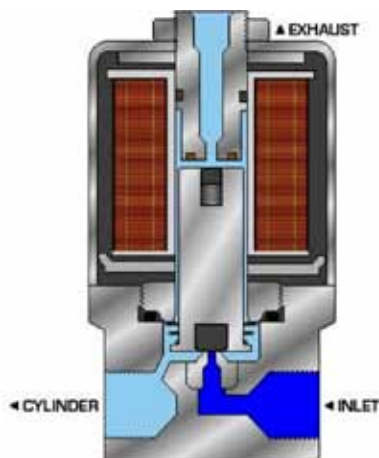
Example of traditional cartridge electro-pneumatic valve block

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Typical Skinner design vs. MAC Valves design

Skinner design

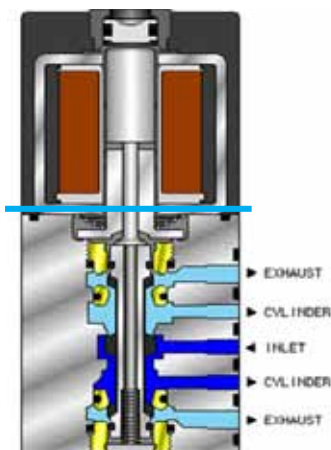


- Spring force (holding poppet on seat) is constant
- Inlet air acts upon a single sealing area
- Inlet pressure X sealing area creates a force that opposes return spring shifting forces
- Force created by inlet air pressure on inlet poppet seal varies as - inlet air pressure varies
- Changing inlet pressures therefore affect energizing 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 force (energized) – short stroke
- High shifting force(de-energized) – strong return spring
- Shifting forces unaffected by changing air pressure (IN/EXH) -balance design -
- Shifting forces virtually unaffected by typically contaminated air
- Wiping action - Low friction minimizes resistance to shifting forces
- Minimal friction -

ADVANTAGES

- Short stroke solenoid produced 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 electrical part from external contamination
- Valves shifting forces are consistent and independent from pressure variations
- Solenoid isolated from exhaust of contaminants

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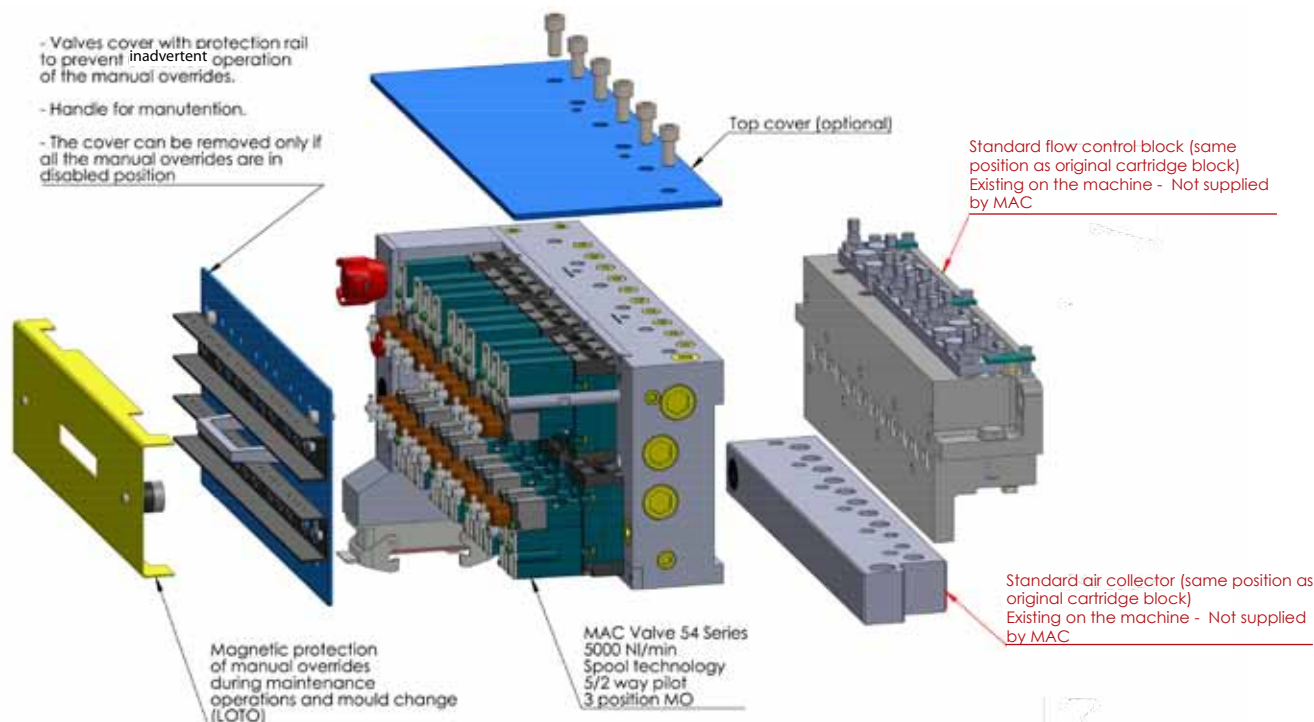
General benefits

Relying on an experience of over 25 years in the glass industry and with over 3800 valve blocks installed worldwide, we were able to engineer and manufacture an innovative valve block solution meeting all requirements from users using 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 controls blocks and inlet accumulator bottom plate** (please see picture aside)
- Easy quick exchange for the valves – only 4 screws per valve – NO CARTRIDGE !!!



Flow control plate on which the block is mounted



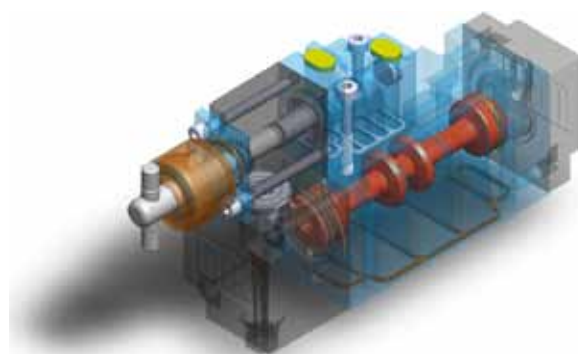
New MAC Valves 21-Line Valve Block Assembled - Exploded View

The MAC Glass Gazette 6 – Technical Bulletin – March 30th, 2016 - Page 4 of 11
MAC Valves, Inc. Europe, Inc., Rue Marie Curie 12, 4431 Loncin (Liège), Belgium
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General benefits (Continued)

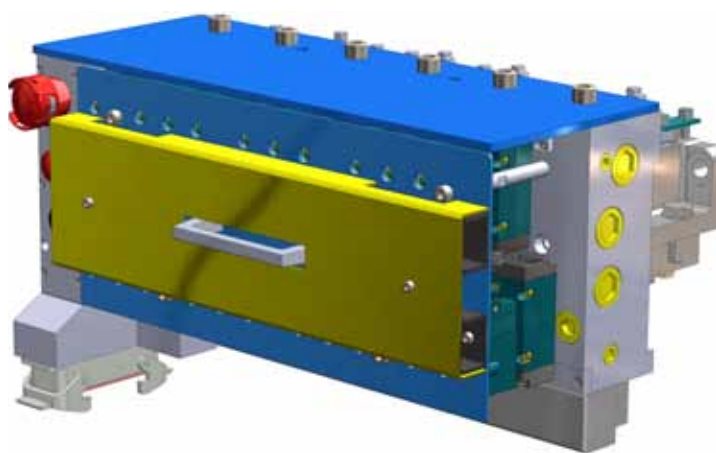
- Ergonomic design for easier maintenance operations – Depth reduction between 50 and 120 mm vs. traditional cartridge by valve block
- High flow valve characteristics (5000 NI/min) compared to +/-2500 NI/min for the traditional cartridge block
- Strong resistance to contamination – designed to work in harsh environments
- Independent electrical wiring harness for easier maintenance
- 3-position manual override and LED facing the operator
- Color distinction normally close, normally open
- Front cover with function plate
- Tread steel plate for top cover
- High life time, fast and repeatable switching times
- Different connectors configuration possible
- LOTO cover available (safe energy isolation)
- At last but not least, competitive pricing for the entire assembly

This new valve block is available in several configuration based on the glass forming machine you are operating.



MAC Valves 54 series with spool technology

**NEW
EVOLUTION
2016**



MAC Valves 21-line valve block assembled



MAC Valves 21-line valve block including options such as inclined version, integrated flow controls at the front, dual pressure, possibility of 21 individual inlet pressures

Technical Bulletin

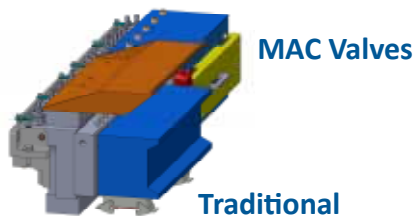
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Dimensional comparison

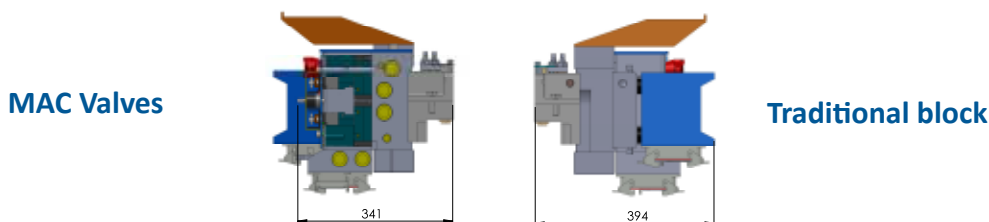
With the below dimensional drawings, the compactness of the new MAC Valves electro-pneumatic valve block is visible. The new valve block reduces blank mould operator distance.

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

Overview

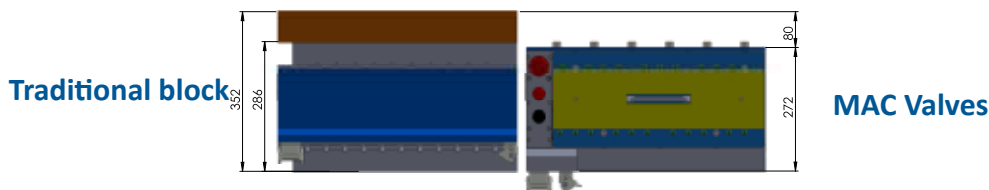


Side view



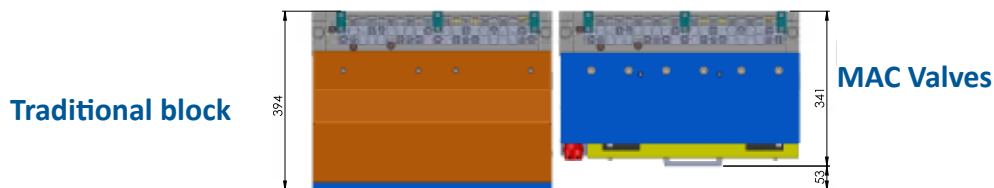
MAC Valves' valve block is 53 mm shorter than the traditional assembly

Front view



MAC Valves' valve block is 80 mm less high than traditional assembly

Top view



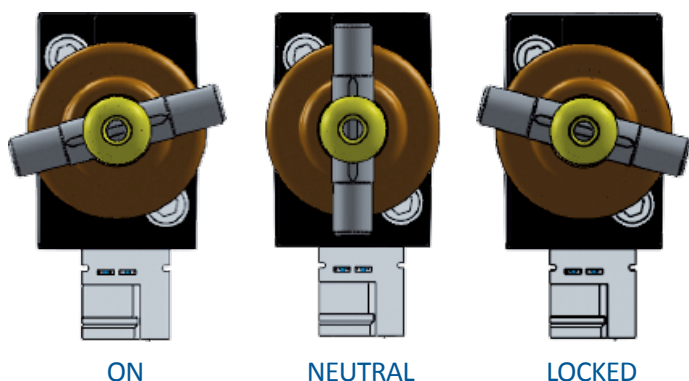
MAC Valves' valve block is 53 mm shorter than the traditional assembly

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Specific features

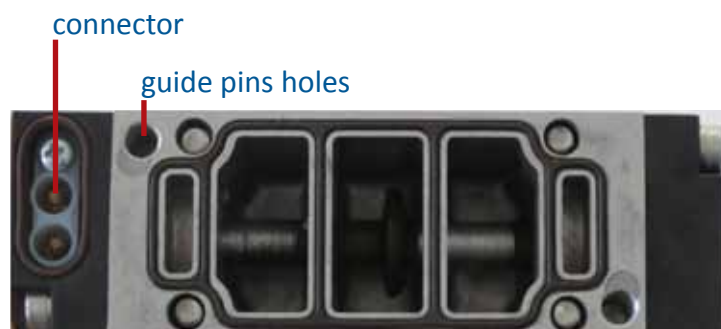


A) New 3-position manual override

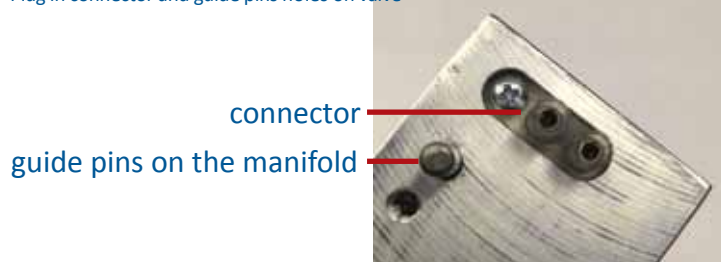
The MAC Valves 54 Series mounted on the drop in electro-pneumatic valve block that has been detailed in this technical bulletin comes with a new 3-position manual override that has been engineered specifically for the glass industry.

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.



Plug in connector and guide pins holes on valve



Plug in connector and guide pins on base plate

C) Large size 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 valves blocks. LED color may be changed upon request.



Specific features (Continued)

D) NC/NO color indication

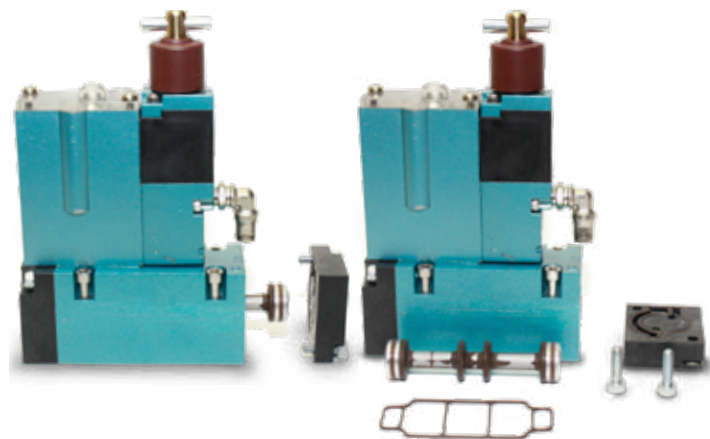
To prevent any confusion between normally closed and normally open valves, MAC Valves paints the main body of the valve in different colors : Red=NC; Blue=NO.



54 Series normally open valve



54 Series normally closed valve



E) Fully repairable valve and test base

MAC Valves is proposing a repair kit for the 54 Series valve to give the alternative to repair the valve. Repair kit for NO/NC valve is identical. Is available also :

- a complete on-site maintenance training along with the literature.

How to order

Circuit bar:

CBM054 MOD EXXX (MOD is defined in function of the customer requirements)

Normally closed valve:

54A-CC-000-DP-DEWP-4FM MOD ER05

Normally open valve:

54A-DC-000-DP-DEWP-4FM MOD ER05

Repair kit - NC & NO valves:

K-54001 Mod. 446K

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HOW TO REPLACE

**A TRADITIONAL 21 LINE BLANK
SIDE VALVE BLOCK WITH
CARTRIDGES AND PILOTS WITH
THE NEW 100% DROP-IN MAC 54
SERIES VALVE BLOCK**

IN ONLY 12 STEPS ?



1
**EXISTING BLOCK
ON MACHINE**

**REMOVE PILOT
BLOCK FROM
CARTRIDGE BLOCK**

**REMOVE
THE TOP
AND BOTTOM
COVER FROM
PILOT BLOCK**

2



3



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4

**CARTRIDGE
VALVE BLOCK**



5

**REMOVE
CARTRIDGE BLOCK**



6

**REMOVE THE CARTRIDGE BLOCK
FROM FLOW CONTROL BLOCK +
INLET ACCUMULATOR PLATE**



7

**PROTECT
THE INLET
ACCUMULATOR
PLATE AND CLEAN
THE FLOW
CONTROL BLOCK
BEFORE
MOUNTING
MAC BLOCK**



8

**CHECK NEW
BLOCK BEFORE
INSTALLATING
ON SECTION**

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9

**BLOCK
INSTALLATION ⇒
MOUNT ON FLOW
CONTROL BLOCK**

**BLOCK
MOUNTED
ON THE FLOW
CONTROL BLOCK
⇒ FASTEN
ELECTRICAL
CONNECTORS**



10

11

**FASTEN FRONT
COVER WITH
FUNCTION
PLATES AND
TREAD STEEL
TOP COVER**



12

**BLOCK INSTALLATION COMPLETED
MACHINE READY TO START**



**APPROXIMATE TIME
TO COMPLETE VALVE BLOCK CHANGE :
60 MINUTES**



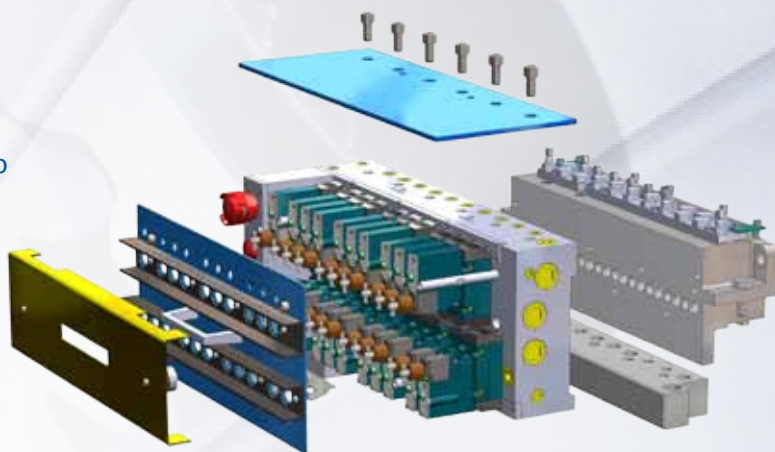
NEW GENERATION 21-LINE

Electro-Pneumatic Valve Block for IS Machines

100 % DROP IN SOLUTION – FULLY OPERATIONAL IN 60 MINUTES

- Ergonomic design for easier operation – Depth reduction between 50 mm and 120 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
- Front cover with function plate
- Tread steel plate for top cover
- 3-position manual override and LED facing the operator
- LoTo cover provided - No electrical parts on the cover
- Less downtime - Increased pack to melt

* For valve details, please consult document MVE007-GL-OCT2014-EN



3800
VALVE BLOCKS
INSTALLED
WORLDWIDE

CUSTOMER BENEFITS

- ✓ Standard IS machine dimensions - direct installation on to the existing speed control bar
- ✓ 100% interchangeable with existing solution
- ✓ 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 aggressive lubrication
- ✓ Burn-out proof MAC solenoid, life time guarantee on coils
- ✓ 100 million cycles (est.) MTBF life time
- ✓ 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 - Depth reduction between 50 mm and 120 mm
- ✓ LoTo protective cover
- ✓ Identical repair kit for NC/NO valves
- ✓ Several connector configurations possible (Harting 64 pins, Cannon 37 pins, and extra events connectors)
- ✓ Different buttons available (E Stop, light, Piezzo, etc.)

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





NEW GENERATION 21-LINE

Electro-Pneumatic Valve Block for IS Machines

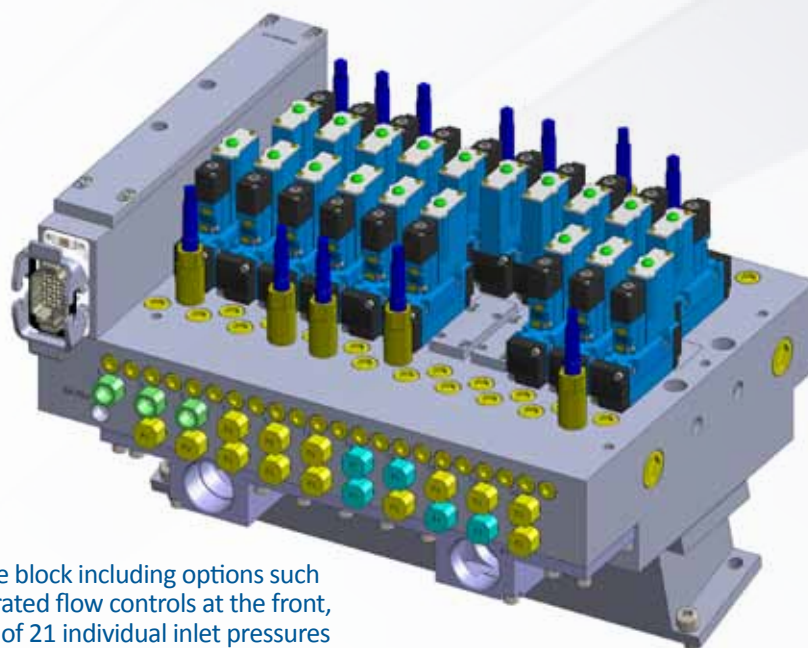
TECHNICAL DATA

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-DM-DEWJ-4FM Mod ER05
Normally open valve:	54A-DC-000-DP-DEWJ-4FM Mod ER05
Repair kit - NC & NO valves:	K-54001 Mod. 446K / DMB-DEWJ-4FM Mod ER05

NEW EVOLUTION 2016



MAC Valves 21-line valve block including options such as inclined version, integrated flow controls at the front, dual pressure, possibility of 21 individual inlet pressures



3500 factory certified specialists in over 45 countries focused on optimizing customers needs
To find your **MDN** distributor, visit www.macvalves.com

