

CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM18US0039X
3. **Equipment:** Series 35A, Series 45A, 52A, Series 82A, Series 56C, Series 4, Series 5, Series 1, Series 9, Series 8, Series 82, Series 63, Series 65, Series 66, ISO Series, Series MAC, Series 9 Solenoid Valves, Series DM, Series FM, FP, FC& FD, Series FA & FB-D Pilot Valves
(Type Reference and Name)
4. **Name of Listing Company:** MAC Valves
5. **Address of Listing Company:** 30569 Beck Rd.
Wixom, MI 48393
USA
6. The examination and test results are recorded in confidential report number:

2X7A8AX dated 25th January 1994
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

FM Class 3600:2011, FM Class 3610:2010, FM Class 3810:2005,
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

Certificate issued by:



J.E. Marquedant
VP, Manager, Electrical Systems

23 February 2018

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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10. Equipment Ratings:

Intrinsically safe for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; T5; hazardous (classified) locations, with an ambient temperature rating of 0°C to 50°C; IS-001; Entity.

Entity parameters:

$V_{max} = 30V$, $I_{max} = 175 \text{ mA}$, $C_i = 0$, $L_i = 0$

11. The marking of the equipment shall include:

Class I, II, III, Division 1, Groups ABCDEFG; T5 0°C < Ta < 50°C; IS-001

12. **Description of Equipment:**

General – The solenoid and pilot valves are electromagnetic valves controlled by current through a solenoid coil. When the coil is energized, the valve will open, connecting the inlet port to the outlet port. They are intended for general use in industrial pneumatic or vacuum systems.

Construction – The solenoid and pilot valves consist of an intrinsically safe solenoid affixed to an aluminum valve body with various mechanical components contained therein. The solenoid consists of a plastic encapsulated magnet wire coil over a plastic bobbin. Components necessary to maintain intrinsic safety (namely diodes) are crimped to the coil terminals and molded into the solenoid with the coil. Contacts for the coil (generally lead wires) protrude from the face of the solenoid.

Ratings - $V_{max} = 30V$, $I_{max} = 175 \text{ mA}$.

Series 35A-abc-Dde-fg-FM-h

a = Body type 0, A, B, E, F, G or H.

b = Port size 0, A, B, C, D, E, F, G, H, J or K.

c = Valve function/manifold type 0, A or B.

d = Coil voltage FR, or FS, or FV.

e = Lead length A through Z.

f = Manual operator 0, 1, 2, 3 or 4.

g = Electrical connection AA through ZZ.

h = Modification (4 digit alphanumeric code) or blank.

Series 45A-abc-Dde-fg-FM-h

a = Body type A, D, F, O, L or M.

b = Port size 0, A, B, C, D, F, G, H, J or K.

c = Flow control regulators base styles 1, 2, 0, A, B, C, D, E, F, G, H, J or K.

d = Coil voltage FR, or FS, or FV.

e = Lead length A through Z.

f = Manual operator 0, 1, 2, 3 or 4.

g = Electrical connection AA through ZZ.

h = Modification (4 digit alphanumeric code) or blank

Series 52A-ab-c0d-e-Dfg-hi-j

a = Spool type 1, 2, 3 or 4.

b = Body option 1 or 4.

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c = Port sizes/thd. Type A, B, C, D, E or F.
d = Internal or external A or B.
e = Pilot style DM or DP.
f = Coil voltage FR, or FS, or FV.
g = Lead wire length A through Z.
h = Manual operator 0, 1, 2, 3 or 4.
i = Electrical connection AA through ZZ.
j = Modification (4 digit alphanumeric code) or blank.

Series 82A-ab-cde-f-Dgh-ij-k

a = Spool type-valve function 0, A, B, C, D, E, F, G, H, J, K, L or M.
b = Body type A, B, C, D, E or F.
c = Port size 0, A, B, C, D, E or F.
d = Individual and manifold base port configuration 0, A, B, C, D, K, L, M, N, P, R or S.
e = Internal or external pilot 0, A, B, C, D, E or F.
f = Pilot style FA or FB.
g = Coil voltage FR, or FS, or FV.
h = Lead wire length A through Z, 1, 2, 3, 4, 5 or 6.
i = Manual operator 0, 1, 2, 3 or 4.
j = Electrical connection AA through ZZ.
k = Modification (4 digit alphanumeric code) or blank.

Series 56C-ab-cde-f-FM-g

a = Valve function 1, 2, 3, 4, 6 or 7.
b = Port size 2, 3, 5, 6, 7 or 8.
c = Coil voltage A5 or A6.
d = Manual operator 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
e = Enclosure AA through ZZ.
f = Lead length AA through ZZ or blank.
g = Modification (4 digit alphanumeric code) or blank.

Series 4abA-cde-f-Dgh-ij-k

a = Spool type 0, 1, 2, 3, 4, 5, 6, 7 or 8.
b = Body options 0, 1, 2, 3 or 4
c = Port size/type 0, A, B, C, D, E or F.
d = Base configuration 0, A or G.
e = Internal or external pilot 0, A, B, C or D.
f = Pilot style DM or DP.
g = Coil voltage FR, or FS, or FV.
h = Lead length A through Z.
i = Manual operator 0, 1, 2, 3 or 4.
j = Electrical connection AA through ZZ.
k = Modification (4 digit alphanumeric code) or blank.

Series 5aD-bc-def-FM-g

a = Series 7 or 8
b = Valve function 1, 2, 3, 4, 6 or 7.
c = Port size 1, 2, 3, 4, 5 or 6.
d = Coil voltage A5 or A6.
e = Manual operator 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.

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f = Enclosure AA through ZZ.
g = Modification (4 digit alphanumeric code) or blank.

Series 1abB-cde-f-FM-g

a = Valve function 1, 2, 3, 4, 6, 7 or 8.
b = Port size/body style 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
c = Coil voltage A5 or A6.
d = Manual operator 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
e = Enclosure AA through ZZ.
f = Lead length AA through ZZ or blank.
g = Modification (4 digit alphanumeric code) or blank.

Series 9abB-c-def-g-h

a = Operator 1 or 2.
b = Body style/ports 1, 2, 3, 4, 5, 6, 7, 8 or 9.
c = Pilot type FM or FP.
d = Coil voltage A5 or A6.
e = Manual operator 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
f = Enclosure AA through ZZ.
g = Lead length AA through ZZ or blank.
h = Modification (4 digit alphanumeric code) or blank.

Series 8abC-c-def-ghi-j-k

a = Operator 1 or 2.
b = Pilot air 1, 2, 5 or 6.
c = Pilot exhaust FM or FP.
d = Coil voltage A5 or A6.
e = Manual operator 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
f = Enclosure AA through ZZ.
g = Spool configuration 1, 2, 5, 6, 7 or 8
h = Body configuration 1, 2, 3, 4, 5, 6, 7 or 9.
i = Port size 2, 3, 5 or 6.
j = Lead length AA through ZZ or blank.
k = Modification (4 digit alphanumeric code) or blank.

Series 62abC-cde-f-ghDA-i

a = Function 1, 2, 3 or 4.
b = Body type 1, 2 or 3.
c = Port size 0, 1, 2, 4 or 5.
d = Pilot air 0, 1, 2, 5 or 6.
e = Porting option 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
f = Pilot exhaust FM or FP.
g = Coil voltage A5 or A6.
h = Manual operator 0, 1, 2, 3 or 4.
i = Modification (4 digit alphanumeric code) or blank.

Series 63abD-cde-f-ghDA-i

a = Function 1, 2, 3, 4 or 5.
b = Body type 1, 2, 3, 4, 5 or 6.

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c = Port size 1, 2, 3, 4, 5, 6, 7 or 8.
d = Pilot air 0, 1, 2, 5 or 6.
e = Porting option 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
f = Pilot exhaust FM or FP.
g = Coil voltage A5 or A6.
h = Manual operator 0, 1, 2, 3 or 4.
i = Modification (4 digit alphanumeric code) or blank.

Series 65abB-cde-f-ghDA-i

a = Function 1, 2, 3, 4 or 5.
b = Body type 1, 2 or 3.
c = Port size 0, 1, 2, 3, 4, 5, 6, 7 or 8
d = Pilot air 0, 1, 2, 5 or 6.
e = Porting option 0, 1, 2, 3, 4, 5 or 6.
f = Pilot exhaust FM or FP.
g = Coil voltage A5 or A6.
h = Manual operator 0, 1, 2, 3 or 4.
i = Modification (4 digit alphanumeric code) or blank.

Series 66abA-cde-f-ghDA-i

a = Function 1, 2, 3, 4 or 5.
b = Body type 1, 2 or 3.
c = Port size 0, 2, 3, 4, 5 or 6
d = Pilot air 0, 1, 2, 5 or 6.
e = Single/dual pressure 0, 1, 2, 3, 4, 5 or 6.
f = Pilot exhaust FM or FP.
g = Coil voltage A5 or A6.
h = Manual operator 0, 1, 2, 3 or 4.
i = Modification (4 digit alphanumeric code) or blank.

ISO Series a-b-c-def-g

a = Valve type MV-A1C, MV-A2B or MV-A3B.
b = Body type A111, A121, A131, A135, A141, A142, A144, A151, A152, A154, A211, A221, A231, A232, A241, A251, A311, A312, A321, A322, A331, A332, A341, A351 or A352.
c = Pilot exhaust FM, FP, FC or FD.
d = Coil voltage A5 or A6.
e = Manual operator 0, 1, 2, 3 or 4.
f = Enclosure AA through ZZ.
g = Modification (4 digit alphanumeric code) or blank.

Series MACa-bcde-f-ghDA-i

a = Series 125A or 250A.
b = Type V, B or M.
c = Function 1, 2, 3, 4, 5, 6 or 7.
d = Electrical connection A, B or C.
e = Light 1, 2, 3 or 4.
f = Pilot FM or FP.
g = Coil voltage A5 or A6.
h = Manual operator 0, 1, 2, 3 or 4.
i = Modification (4 digit alphanumeric code) or blank.

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Series 9ab-cde-fgh-i-Djk-lm-n

- a = Series 2 or 3.
- b = Valve revision letter A through Z.
- c = Valve function 0, A, B, C, D, E, F, G, L, M, N, P, R or S.
- d = Body type and exhaust option 0, A or B.
- e = Body electrical option 0, A or B.
- f = Port size and thread type 0, A, B, C, D, E, F, G, H or J.
- g = Individual base configuration 0, A, B, C or D.
- h = Internal or external pilot 0, A, B, C, D, E, F, G or H.
- i = Pilot style DM or DP.
- j = Coil voltage FR, or FS, or FV.
- k = Lead wire length A through Z or 0 through 9.
- l = Manual operator 0, 1, 2, 3 or 4.
- m = Electrical connection AA through ZZ.
- n = Modification (4 digit alphanumeric code) or blank.

Series DMA-Dbc-def-g. Pilot Valve

- a = Valve revision letter A through Z.
- b = Coil voltage FR, or FS, or FV.
- c = Lead wire length A through Z or 0 through 9.
- d = Manual operator 0,1,2,3 or 4.
- e = Electrical connection AA through ZZ.
- f = Mounting screws 1, 2, 3 or blank.
- g = Modification (4 digit alphanumeric code) or blank.

Series FM, FP, FC & FDA-bcd-e-f. Pilot Valves

- a = Valve revision letter A through Z.
- b = Coil voltage A5 or A6.
- c = Manual operator 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
- d = Enclosure AA through ZZ.
- e = Lead length AA through ZZ or blank.
- f = Modification (4 digit alphanumeric code) or blank.

Series FA & FB-Dab-cd-e. Pilot Valves

- a = Coil voltage FR, or FS, or FV.
- b = Lead wire length A through Z, 1, 2, 3, 4, 5 or 6.
- c = Manual operator 0,1,2,3 or 4.
- d = Electrical connection AA through ZZ.
- e = Modification (4 digit alphanumeric code) or blank.

13. **Specific Conditions of Use:**

1. The apparatus enclosure may contain aluminum which is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
2. Part of the enclosure is constructed from plastic. To prevent the risk of electrostatic sparking the plastic surface should only be cleaned only with a damp cloth.

14. **Test and Assessment Procedure and Conditions:**

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This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
8 th March 1994	Original Issue.
23 rd February 2018	<u>Supplement 5:</u> Report Reference: – RR212754 dated 23 rd February 2018. Description of the Change: Added a new coil voltage variant for some models. The original certificate #2X7A8AX is reissued in the new format.

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