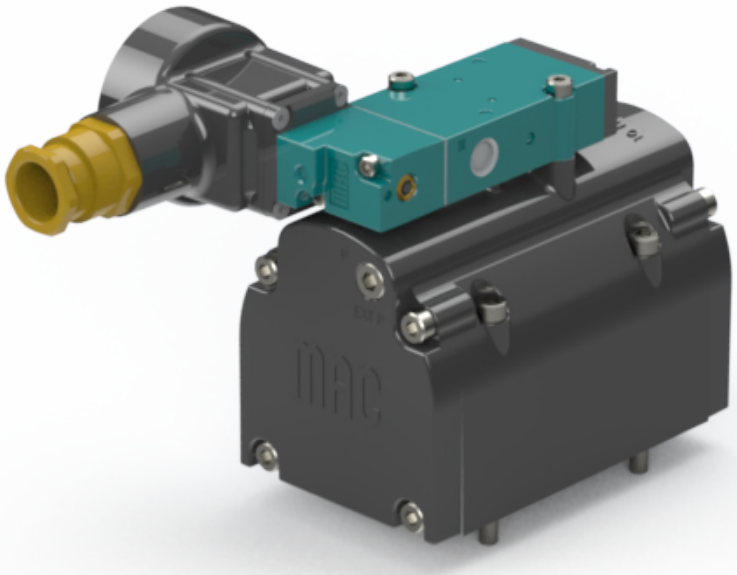
MAC Pulse Valve Series • PV03
ATEX Electrical Operation

PV03 • ATEX • Electrical Operation

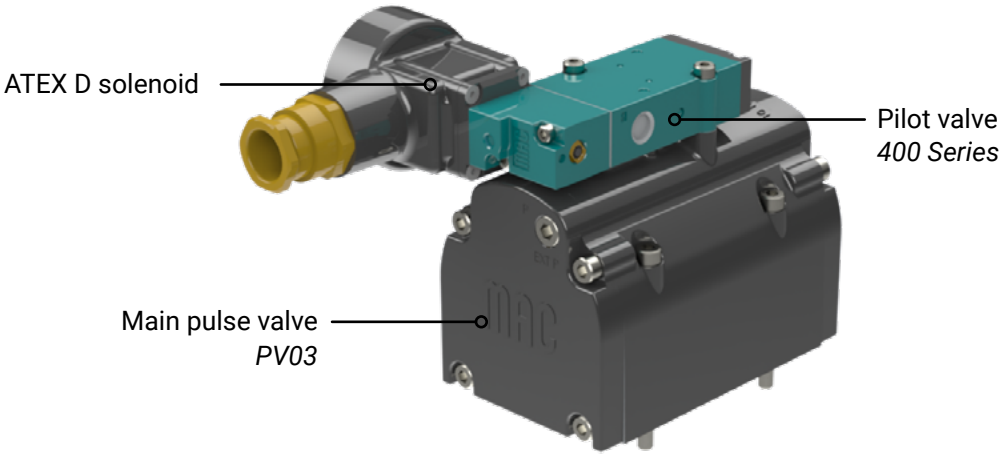
2/2-Way Pilot Operated Valve Electrical Operated • ATEX Certification

Available configuration	Individual base mounted
Port sizes	3/4” or 1” ports
Flow	24 000 Nl/min (24 Cv)
Pressure range	2.8 to 8 bar
Function	2/2 way normally closed
Operation	Electrical
Electrical connection	Cable gland wire length (2m or 5m)



MAC Pulse Valve Series • PV03
ATEX Electrical Operation

01. OPERATION



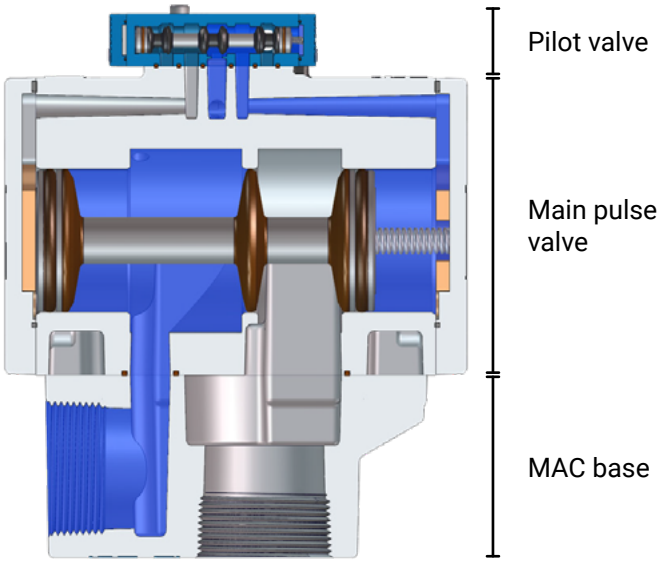
- The MAC ATEX certified electrical operated Pulse Valves are composed of the following parts:
  - Main pulse valve
  - Pilot valve operated by ATEX D solenoid
- As the main valve is operated by a pilot, there is a need for pilot air
- The pilot air can be external or internal depending on the level of the main pressure

Main Valve

- 2/2-Way NC pilot operated valve
- Bonded spool with minimum friction, shifting in a glass-like finished bore
- Wiping effect, valve immune to contamination
- Long service life

400 Series Pilot Valve

- Electrical ATEX D solenoid
- 5/2-Way pilot operated valve
- Balanced spool & poppet, immune to pressure variations
- High energization shifting force
- High de-energization shifting force



MAC Pulse Valve Series • PV03
ATEX Electrical Operation

02. ATEX MARKING

The main valve and the pilot are clearly identified by the following plates:

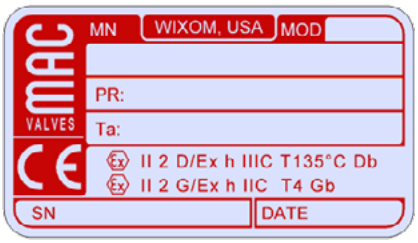
- ATEX identification plate on the side of the main body
- ATEX identification plate at the top of the solenoid

Main valve: Identification plate on the side of the main body

The plate at the side of the main body informs the user about the pulse valve and its use in ATEX environment.

The following information is reported on the plate:

- CE marking
- Manufacturer: MAC Valves
- MAC Valve type
- Year of production
- Serial number
- Pressure range: max. 120 PSI
- Temperature: -20°C to +110°C
- ATEX marking:
  - Dust: II 2 D/Ex h IIIC T135°C Db
  - Gas: II 2 G/Ex h IIC T4 Gb
- Protection concept: Constructional Safety 'c'



Large Valve

Small Valve

Pilot valve: Identification plate on top of the solenoid

The plate at the top of the solenoid informs the user about the valve and its use in ATEX environment.

The following information is reported on the plate:

- CE marking & UKCA marking
- Manufacturer: MAC Valves
- MAC Valve model number and modif
- Temperature:
  - -25°C to +105°C for models above 5.4W
  - -25°C to +110°C for models 5.4W and below
- Pressure: max. 120 PSI
- Serial number
- Voltage, wattage
- ATEX marking:
  - Dust: II 2 D/Ex tb IIIC T135°C Db
  - Gas: II 2 G/Ex db IIC T4 Gb
- ATEX & IECEx certificate number

MAC Pulse Valve Series • PV03
ATEX Electrical Operation

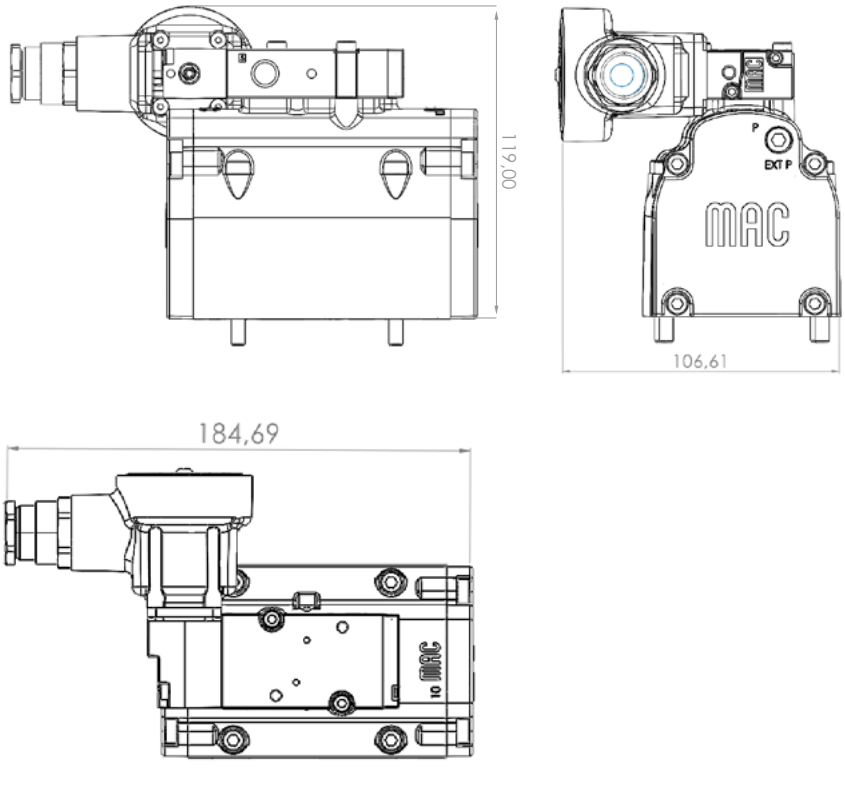
03. MAC PV03 SERIES • INDIVIDUAL BASE MOUNTED

3.1. Technical Data

Fluid	Compressed air
Main pressure range	0 to 8 bar
Pilot pressure range	2.8 to 8 bar
Lubrication	Not required, if used select a medium aniline point lubricant (between 80°C and 100°C)
Filtration	40 µm
Temperature range	-18°C to +80°C
Flow (at 6 bar, ΔP = 1 bar)	24 000 Nl/min (24 Cv)
Coil	Epoxy encapsulated
Voltage range	-15% to +10% of nominal voltage

3.2. Dimensions

All dimensions are metric (in mm).



MAC Pulse Valve Series • PV03
ATEX Electrical Operation

04. HOW TO ORDER

PV03B - A X X - 41 P - D XX Y - 0 E F / EPV1

Series 1 2 3 4 5 6 7 8

1. Spool Type

A	NC main with memory spring Viton® seals

2. Port Size & Thread Type

0	Basic valve, no base

3. Internal / External Pilot

C	External pilot (BSPPL threads)
E	Internal pilot (BSPPL threads)

4. Voltage

JA	110/50 VAC - 2.9W
JB	220/50 VAC - 2.9W
DA	24 VDC - 5.4 W
DB	12 VDC - 5.4 W
EA	12 VDC - 6.0 W
EB	220 VDC - 4.2 W
EC	120 VDC - 5.2 W
ED	24 VDC - 4.2 W
EE	12 VDC - 4.2 W
EP	110 VDC - 2.4 W
EU	120 VDC - 2.1 W
FC	10 VDC - 2.1 W
FD	24 VDC - 2.0 W
FE	12 VDC - 2.4 W
FF	24 VDC - 2.4 W
FJ	6 VDC - 2.4 W
FK	48 VDC - 1.9 W

5. Lead Wire Length

E	2.0 m
M	5.0 m

6. Manual Override

0	No manual override

7. Solenoid

E	ATEX D solenoid

8. Electrical Connection

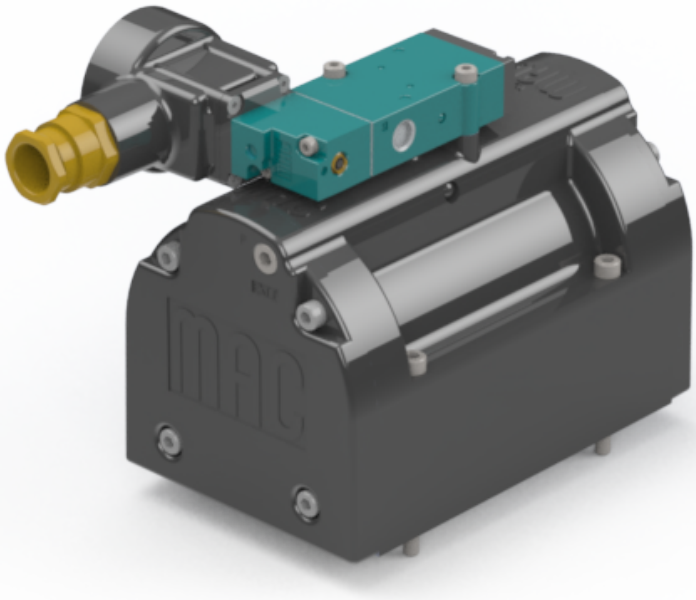
F	Cable gland

MAC Pulse Valve Series • PV06
ATEX Electrical Operation

PV06 • ATEX • Electrical Operation

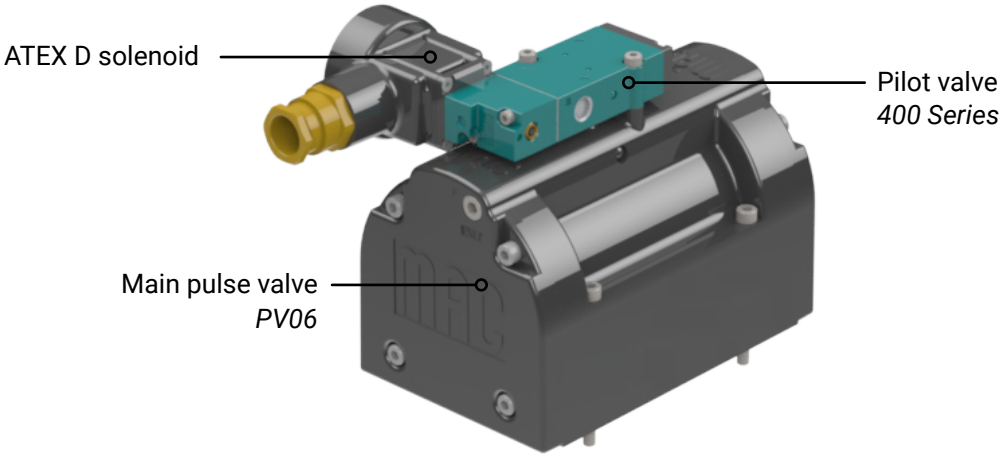
2/2-Way Pilot Operated Valve Electrical Operated • ATEX Certification

Available configuration	Individual base mounted
Port sizes	1 1/2” ports
Flow	53 200 Nl/min (53.2 Cv)
Pressure range	2.8 to 8 bar
Function	2/2 way normally closed
Operation	Electrical
Electrical connection	Cable gland wire length (2m or 5m)



MAC Pulse Valve Series • PV06
ATEX Electrical Operation

01. OPERATION



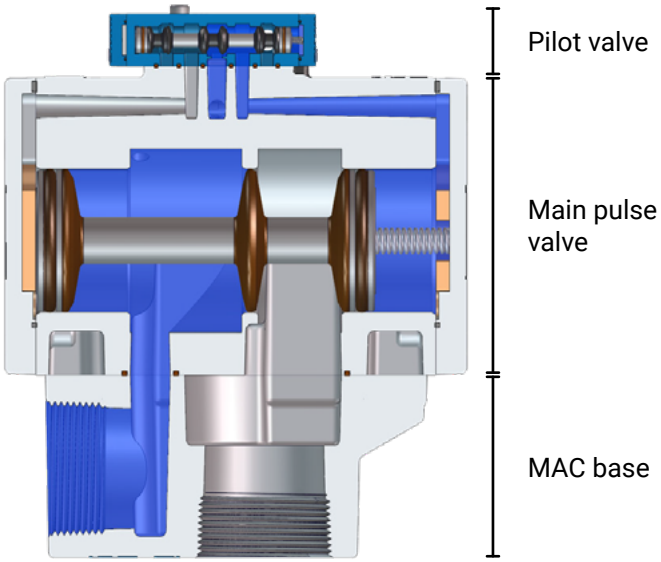
- The MAC ATEX certified electrical operated Pulse Valves are composed of the following parts:
  - Main pulse valve
  - Pilot valve operated by ATEX D solenoid
- As the main valve is operated by a pilot, there is a need for pilot air
- The pilot air can be external or internal depending on the level of the main pressure

Main Valve

- 2/2-Way NC pilot operated valve
- Bonded spool with minimum friction, shifting in a glass-like finished bore
- Wiping effect, valve immune to contamination
- Long service life

400 Series Pilot Valve

- Electrical ATEX D solenoid
- 5/2-Way pilot operated valve
- Balanced spool & poppet, immune to pressure variations
- High energization shifting force
- High de-energization shifting force



MAC Pulse Valve Series • PV06
ATEX Electrical Operation

02. ATEX MARKING

The main valve and the pilot are clearly identified by the following plates:

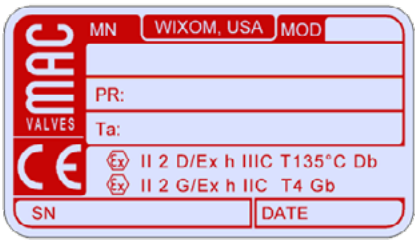
- ATEX identification plate on the side of the main body
- ATEX identification plate at the top of the solenoid

Main valve: Identification plate on the side of the main body

The plate at the side of the main body informs the user about the pulse valve and its use in ATEX environment.

The following information is reported on the plate:

- CE marking
- Manufacturer: MAC Valves
- MAC Valve type
- Year of production
- Serial number
- Pressure range: max. 120 PSI
- Temperature: -20°C to +110°C
- ATEX marking:
  - Dust: II 2 D/Ex h IIIC T135°C Db
  - Gas: II 2 G/Ex h IIC T4 Gb
- Protection concept: Constructional Safety 'c'



Large Valve

Small Valve

Pilot valve: Identification plate on top of the solenoid

The plate at the top of the solenoid informs the user about the valve and its use in ATEX environment.

The following information is reported on the plate:

- CE marking & UKCA marking
- Manufacturer: MAC Valves
- MAC Valve model number and modif
- Temperature:
  - -25°C to +105°C for models above 5.4W
  - -25°C to +110°C for models 5.4W and below
- Pressure: max. 120 PSI
- Serial number
- Voltage, wattage
- ATEX marking:
  - Dust: II 2 D/Ex tb IIIC T135°C Db
  - Gas: II 2 G/Ex db IIC T4 Gb
- ATEX & IECEx certificate number

MAC Pulse Valve Series • PV06
ATEX Electrical Operation

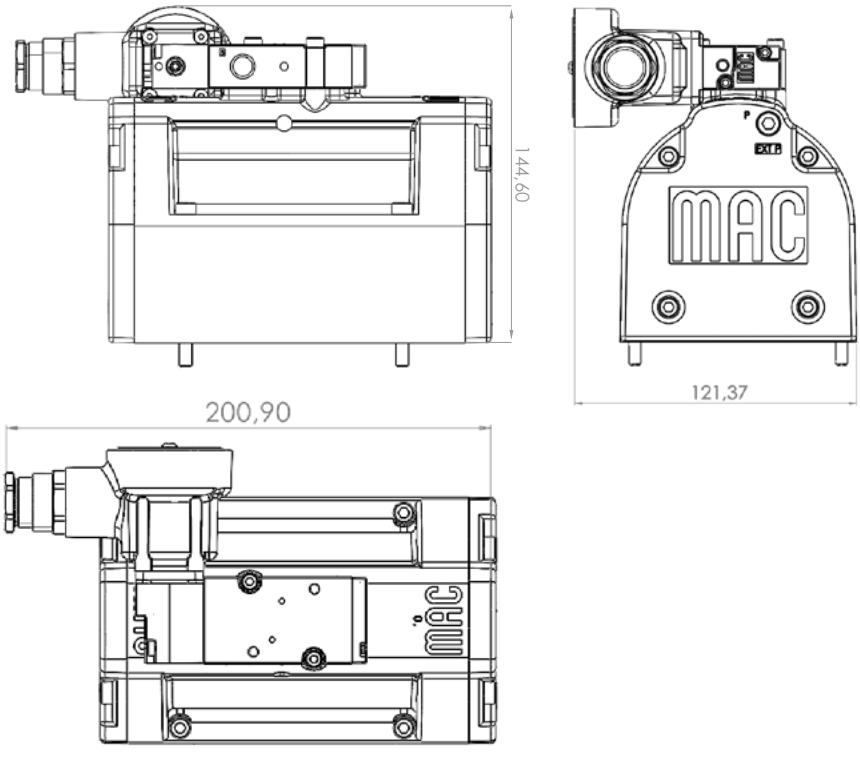
03. MAC PV06 SERIES • INDIVIDUAL BASE MOUNTED

3.1. Technical Data

Fluid	Compressed air
Main pressure range	0 to 8 bar
Pilot pressure range	2.8 to 8 bar
Lubrication	Not required, if used select a medium aniline point lubricant (between 80°C and 100°C)
Filtration	40 µm
Temperature range	-18°C to +80°C
Flow (at 6 bar, ΔP = 1 bar)	53 200 Nl/min (53.2 Cv)
Coil	Epoxy encapsulated
Voltage range	-15% to +10% of nominal voltage

3.2. Dimensions

All dimensions are metric (in mm).



MAC Pulse Valve Series • PV06
ATEX Electrical Operation

04. HOW TO ORDER

PV06B - A X X - 41 P - D XX Y - 0 E F / EPV1

Series 1 2 3 4 5 6 7 8

1. Spool Type

A	NC main with memory spring Viton® seals

2. Port Size & Thread Type

0	Basic valve, no base

3. Internal / External Pilot

C	External pilot (BSPPL threads)
E	Internal pilot (BSPPL threads)

4. Voltage

JA	110/50 VAC - 2.9W
JB	220/50 VAC - 2.9W
DA	24 VDC - 5.4 W
DB	12 VDC - 5.4 W
EA	12 VDC - 6.0 W
EB	220 VDC - 4.2 W
EC	120 VDC - 5.2 W
ED	24 VDC - 4.2 W
EE	12 VDC - 4.2 W
EP	110 VDC - 2.4 W
EU	120 VDC - 2.1 W
FC	10 VDC - 2.1 W
FD	24 VDC - 2.0 W
FE	12 VDC - 2.4 W
FF	24 VDC - 2.4 W
FJ	6 VDC - 2.4 W
FK	48 VDC - 1.9 W

5. Lead Wire Length

E	2.0 m
M	5.0 m

6. Manual Override

0	No manual override

7. Solenoid

E	ATEX D solenoid

8. Electrical Connection

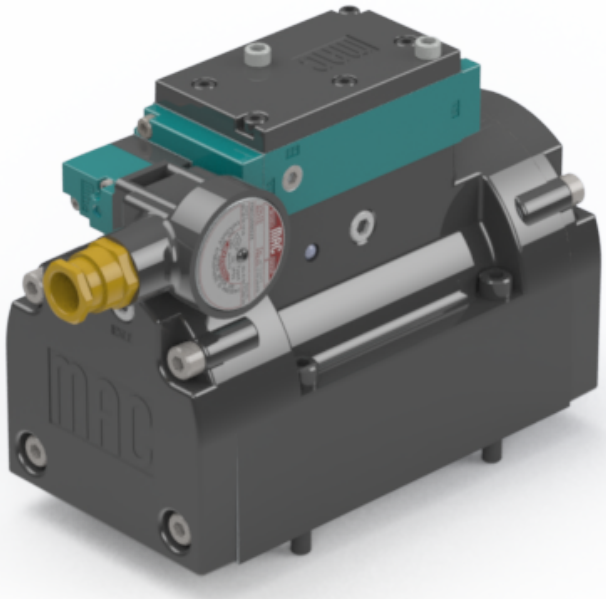
F	Cable gland

MAC Pulse Valve Series • PV09
ATEX Electrical Operation

PV09 • ATEX • Electrical Operation

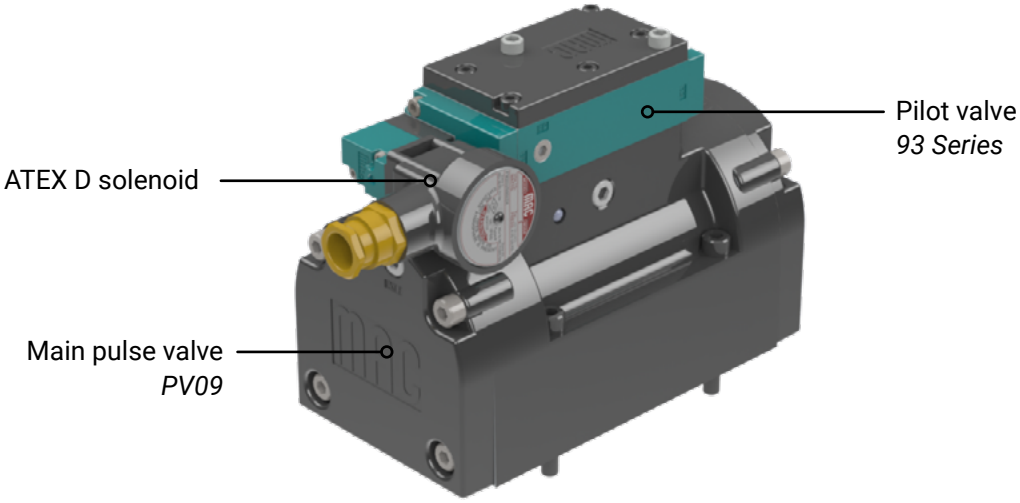
2/2-Way Pilot Operated Valve Electrical Operated • ATEX Certification

Available configuration	Individual base mounted
Port sizes	2 or 2 1/2” ports
Flow	100 000 Nl/min (100 Cv)
Pressure range	2.8 to 8 bar
Function	2/2 way normally closed
Operation	Electrical
Electrical connection	Cable gland wire length (2m or 5m)



MAC Pulse Valve Series • PV09
ATEX Electrical Operation

01. OPERATION



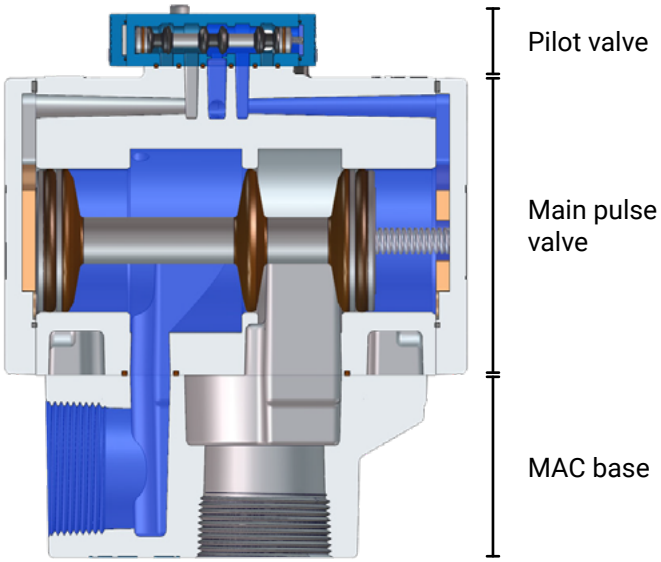
- The MAC ATEX certified electrical operated Pulse Valves are composed of the following parts:
  - Main pulse valve
  - Pilot valve operated by ATEX D solenoid
- As the main valve is operated by a pilot, there is a need for pilot air
- The pilot air can be external or internal depending on the level of the main pressure

Main Valve

- 2/2-Way NC pilot operated valve
- Bonded spool with minimum friction, shifting in a glass-like finished bore
- Wiping effect, valve immune to contamination
- Long service life

93 Series Pilot Valve

- Electrical ATEX D solenoid
- 5/2-Way pilot operated valve
- Balanced spool & poppet, immune to pressure variations
- High energization shifting force
- High de-energization shifting force



MAC Pulse Valve Series • PV09
ATEX Electrical Operation

02. ATEX MARKING

The main valve and the pilot are clearly identified by the following plates:

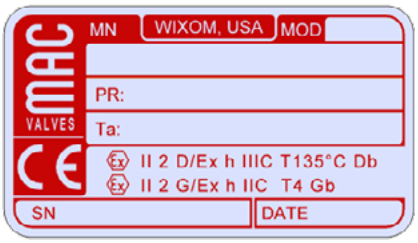
- ATEX identification plate on the side of the main body
- ATEX identification plate at the top of the solenoid

Main valve: Identification plate on the side of the main body

The plate at the side of the main body informs the user about the pulse valve and its use in ATEX environment.

The following information is reported on the plate:

- CE marking
- Manufacturer: MAC Valves
- MAC Valve type
- Year of production
- Serial number
- Pressure range: max. 120 PSI
- Temperature: -20°C to +110°C
- ATEX marking:
  - Dust: II 2 D/Ex h IIIC T135°C Db
  - Gas: II 2 G/Ex h IIC T4 Gb
- Protection concept: Constructional Safety 'c'



Large Valve

Small Valve

Pilot valve: Identification plate on top of the solenoid

The plate at the top of the solenoid informs the user about the valve and its use in ATEX environment.

The following information is reported on the plate:

- CE marking & UKCA marking
- Manufacturer: MAC Valves
- MAC Valve model number and modif
- Temperature:
  - -25°C to +105°C for models above 5.4W
  - -25°C to +110°C for models 5.4W and below
- Pressure: max. 120 PSI
- Serial number
- Voltage, wattage
- ATEX marking:
  - Dust: II 2 D/Ex tb IIIC T135°C Db
  - Gas: II 2 G/Ex db IIC T4 Gb
- ATEX & IECEx certificate number

MAC Pulse Valve Series • PV09
ATEX Electrical Operation

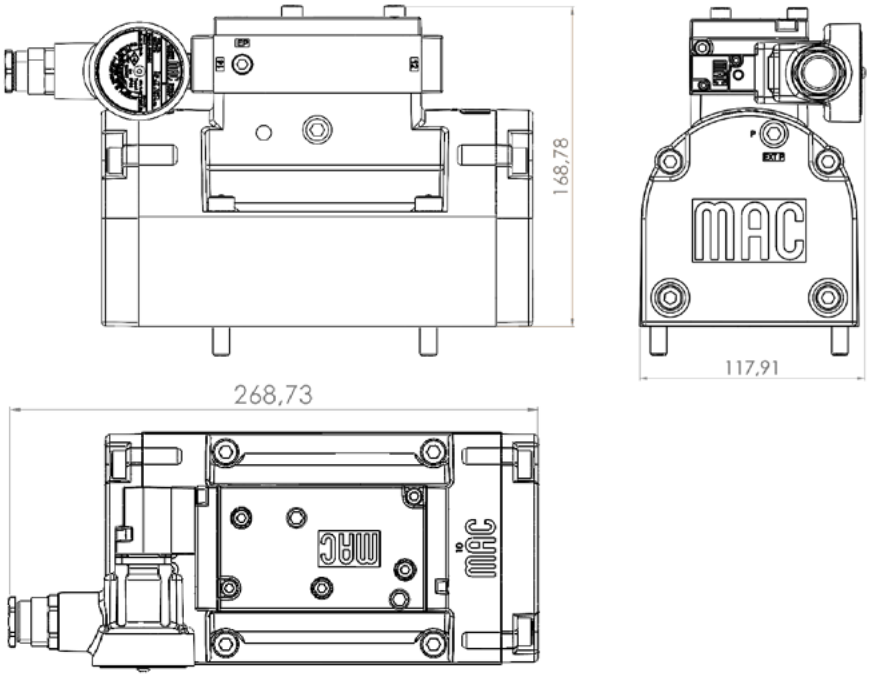
03. MAC PV09 SERIES • INDIVIDUAL BASE MOUNTED

3.1. Technical Data

Fluid	Compressed air
Main pressure range	0 to 8 bar
Pilot pressure range	2.8 to 8 bar
Lubrication	Not required, if used select a medium aniline point lubricant (between 80°C and 100°C)
Filtration	40 µm
Temperature range	-18°C to +80°C
Flow (at 6 bar, ΔP = 1 bar)	100 000 Nl/min (100 Cv)
Coil	Epoxy encapsulated
Voltage range	-15% to +10% of nominal voltage

3.2. Dimensions

All dimensions are metric (in mm).



MAC Pulse Valve Series • PV09
ATEX Electrical Operation

04. HOW TO ORDER

PV09B - A X X - 93 P - D XX Y - 0 E F / EPV1

Series | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8

1. Spool Type

A	NC main with memory spring Viton® seals

2. Port Size & Thread Type

0	Basic valve, no base

3. Internal / External Pilot

C	External pilot (BSPPL threads)
E	Internal pilot (BSPPL threads)

4. Voltage

JA	110/50 VAC - 2.9W
JB	220/50 VAC - 2.9W
DA	24 VDC - 5.4 W
DB	12 VDC - 5.4 W
EA	12 VDC - 6.0 W
EB	220 VDC - 4.2 W
EC	120 VDC - 5.2 W
ED	24 VDC - 4.2 W
EE	12 VDC - 4.2 W
EP	110 VDC - 2.4 W
EU	120 VDC - 2.1 W
FC	10 VDC - 2.1 W
FD	24 VDC - 2.0 W
FE	12 VDC - 2.4 W
FF	24 VDC - 2.4 W
FJ	6 VDC - 2.4 W
FK	48 VDC - 1.9 W

5. Lead Wire Length

E	2.0 m
M	5.0 m

6. Manual Override

0	No manual override

7. Solenoid

E	ATEX D solenoid

8. Electrical Connection

F	Cable gland

1 # EU-TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU**

3 **EU-Type Examination Certificate No:** **FM21ATEX0009X**

4 **Equipment or protective system: (Type Reference and Name)** **D-Series Pilot Valves (Electrical Solenoid Valve Actuator)**

5 **Name of Applicant:** **Mac Valves Inc**

6 **Address of Applicant:** **30569 Beck Rd**
Wixom, MI 48393
United States of America

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

PR457075 dated 26th October 2021

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-31:2014
and EN 60529:1991+A1:2000+A2:2013

10 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.

11 This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:

II 2 G Ex db IIC T4 Gb
II 2 D Ex tb IIIC T135°C Db

Ta = -25°C…+105°C (for models rated and marked over 5.4 Watts)
Ta = -25°C…+110°C (for models rated and marked 5.4 Watts and under)

Richard Zammitt
Certification Manager, FM Approvals Europe Ltd.

Issue date: 27th January 2023

FM Approvals Europe Limited, One Georges Quay Plaza, Dublin. Ireland. D02 E440
T: +353 (0) 1761 4200 E-mail: atex@fmapprovals.com www.fmapprovals.com

SCHEDULE

to EU-Type Examination Certificate No. FM21ATEX0009X

13 **Description of Equipment or Protective System:**

General
The D-Series Pilot Valves (equipment) are electromagnetic valves controlled by current through a solenoid coil. When the coil is energized, it actuates a metallic operating rod, which in turn operates a connected valve assembly. The valve assembly is not a subject of this report. The equipment is intended for use controlling air used in industrial pneumatic or vacuum systems.

Construction
The equipment employs a solenoid constructed of plastic encapsulated magnet wire, which is contained and fastened inside a robust Aluminum enclosure. The enclosure has an operating rod and external mounting holes on the bottom for connection to the valve assembly. The housing also includes a permanently secured cover and a single ½-14 NPT entry with flying leads for wiring to a suitably rated junction box in accordance with the applicable electrical codes. The equipment optionally includes a separately certified Ex Equipment "A2F" Series Cable Gland covered on CML18ATEX1321X.

Ratings
The equipment has a maximum working air pressure rating of 20…120 psi. Electrical ratings are 5…110VDC or 5…240VAC (50/60Hz); 7.3 Watts maximum.

The equipment has been assessed to Degree of Protection IP66 in accordance with EN 60529.

D a b-0Ec Series Pilot Valves.
a = Voltage Code: two-letter code corresponding to electrical input ratings
b = Wire Length: one-letter code corresponding to wire length, minimum 24 in. (60 cm)
c = Options: E (flying leads) or F (integral cable gland)

14 **Specific Conditions of Use:**

1. Contact the manufacturer for information on dimensions of flamepath joints.
2. The solenoid assembly shall only be secured internally by M3X0.5X30.0 SHCS with property class 70. The label shall only be secured by a M3x0.5x6.0 socket button head cap screw with property class 10.9.
3. Equipment does not offer external bonding provisions and must be installed as part of a bonded system using the flying lead provided for protective bonding.
4. The external painted surfaces of the equipment may store electrostatic charge and become a source of ignition in applications with a low relative humidity where the surface is relatively free of contamination such as dirt, dust or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in PD CLC/TR 60079-32-1 and IEC TS 60079-32-1. Cleaning of the painted surfaces should only be done with a damp cloth, or outside of explosive atmospheres.
5. Do not open or separate the threaded cover. Contact the manufacturer if internal repair or maintenance is needed.

15 **Essential Health and Safety Requirements:**

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

SCHEDULE

to EU-Type Examination Certificate No. FM21ATEX0009X

16 **Test and Assessment Procedure and Conditions:**

This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

17 **Schedule Drawings**

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

18 **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
28th October 2021	Original Issue.
10th February 2022	Supplement 1: Report Reference: RR231271 dated 09th February 2022. Description of Change: Minor updates to labels and instructions for combined markings of existing ratings and for addition of UKCA certification, resulting in additional Approval Location model code option "E".
04th April 2022	Supplement 2: Report Reference: RR232083 dated 01st April 2022. Description of Change: Minor drawing revisions not affecting safety.
27th January 2023	Supplement 3: Report Reference: RR234701 dated 25th January 2023. Description of Change: Addition of model code Option "F" to include separately certified cable gland. Documentation revised accordingly.