



# Product Specification

## Automax Valve Automation System

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Aviator™II/BUSwitch II Integrated Valve Controller

FCD AXENPS0100-02

### INTRODUCTION:

The Aviator™ II integrated valve controller combines an internal solenoid pilot, an external high capacity spool valve and a pair of valve indicating limit switches in one enclosure for maximum corrosion protection. It meets CSA , CSAus, , Nema, 4, 4X, environmental and explosion proof standards. The integral switches and solenoid are pre-wired to a terminal block which provides screw terminal connectors for easy external wiring. The Aviator™ II housing includes three 3/4" NPT or three M20 conduit connections for field wiring flexibility. Housings have been designed for easy upgrade to fieldbus communication protocols: upgrading is achieved simply by adding a communications circuit board and the appropriate shaft assembly.



### APPLICATIONS:

The Aviator™ II package is designed to meet corrosive, hazardous and non-hazardous location valve control and position signaling needs. Many switch options are available to meet a wide range of electrical specifications. Solenoid options include field convertible 3- and 4-way configurations, with standard 120 VAC, 220 VAC, 12 VDC, 24 VDC 2 Watt coils and other low-power coil options available. The Aviator™ II is a certified (CSAus) explosion-proof and flame-proof enclosure suitable for use throughout the world. Durable construction and corrosion resistant materials and coatings provide protection against the toughest applications in all process industries including:

1. Chemical and Petrochemical
2. Power
3. Food and Beverage
4. Pharmaceutical
5. Municipal and Waste Water

## Features:

1. **Internal Pilot Solenoid Coil** contains and protects the coil within the Aviator™ II housing. This feature allows for secure operation in hazardous environments, eliminates expensive explosion proof conduit and fittings, simplifies wiring, and reduces the time and expense of installation. This feature also offers a high degree of solenoid coil protection making it ideal for harsh corrosive or difficult “wash down” applications.
2. **Compact, Selectable Cv Spool Values.** Options for 1.8 or industry leading 4.5 Cv spools. The spool is internally vented to prevent the ingress of corrosive atmospheres. Available in anodized aluminum and 316 SST construction with optional momentary or locking manual overrides.
3. **Quick-Set Cams.** Tool free adjustment of switch trip point is accomplished simply by pushing or pulling the cam and rotating it to the new trip point position. Cams are spring-loaded and splined to maintain switch settings in any installed position. They are fully adjustable through 360° in 4° increments.
4. **Corrosion Resistant Materials.** All exposed parts are either stainless steel, anodized aluminum, or aluminum treated with Dichromate undercoat and polyester electrostatic powder top coat to enhance protection in corrosive environments. A food grade epoxy coating is also available.
5. **Captive Cover Screws** permit removal of the cover/lid to facilitate calibration without potential for losing screws.
6. **UltraDome™ Visual Position Indicator** provides adjustable, high-contrast, full angle viewing of valve position.
7. **Fieldbus Upgradable.** Fieldbus digital communications is a common requirement. The Aviator™ II housing has been designed to accommodate circuitry necessary to communicate with these systems and may be upgraded at our facility to expand the installed unit's capabilities. Including AS-i, DeviceNet or Foundation Fieldbus.



## Principles of Operation:

The Aviator™ II is designed for use with pneumatic rotary industrial valve actuators in hazardous locations and non hazardous, weatherproof locations. It provides actuator/valve control by receiving a direct solenoid voltage signal. It also provides remote indication of open and closed valve positions by completing separate electrical circuits. Local visual indication is accomplished with the UltraDome rotary indicator.

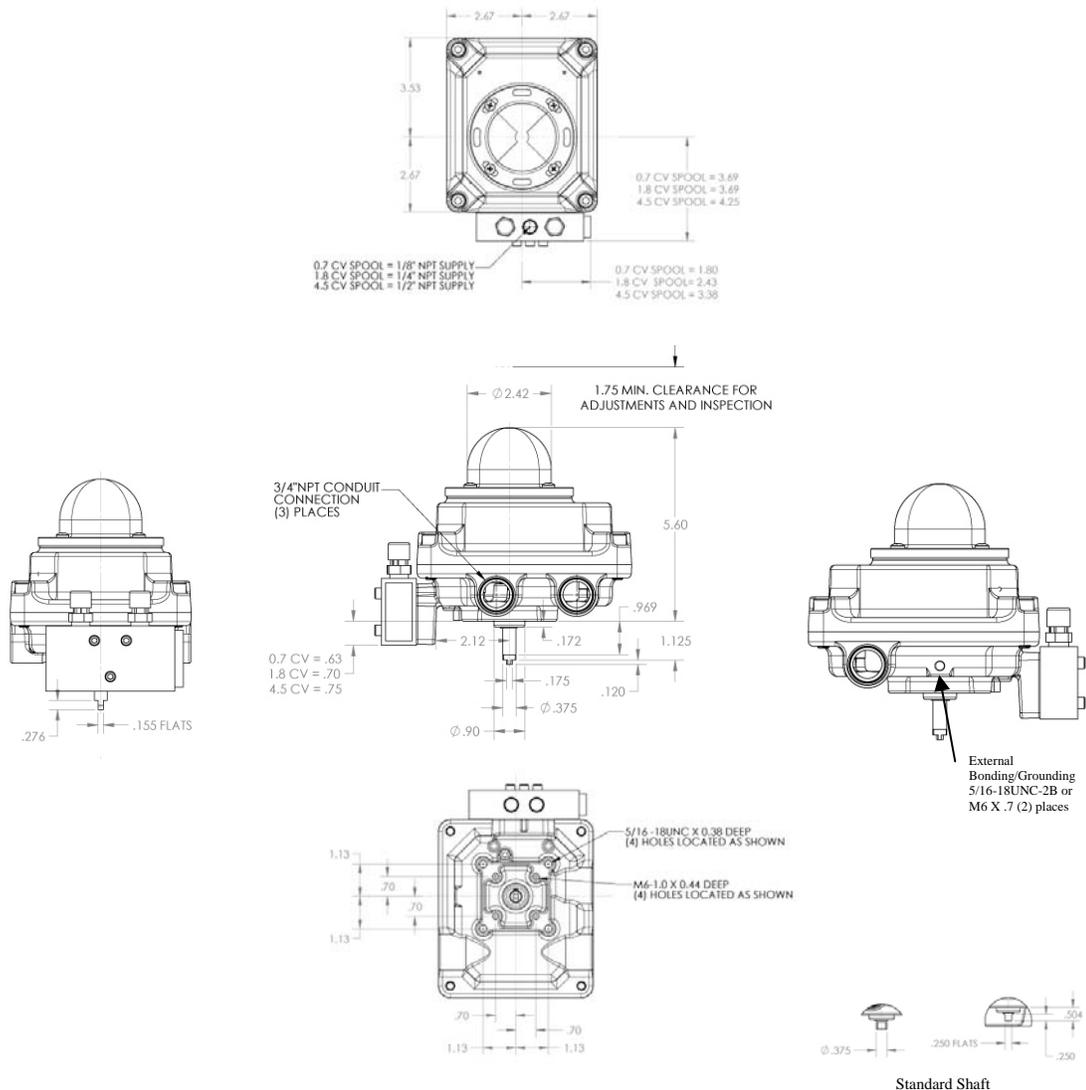


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## Materials of Construction:

Part	Materials
Housing/Cover	Aluminum with Dichromate and Powdercoat
Shaft	Stainless Steel
Cams/Splines	Nylon
UltraDome Dome and Rotor	Polycarbonate
Terminal Block	PCB Screw Terminals
Internal Brackets	Stainless Steel or Plated Carbon Steel
All Internal Fasteners	Stainless Steel or Plated Carbon Steel
All External Fasteners	Stainless Steel

## Dimensions:





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## Enclosure Ratings:

NEMA 4, 4X

## North America

### Mechanical Switches

Types M1 & MG

Class I, Division 1 Groups C & D  
Class II Division 1 Groups E, F, G  
Class II Division 2 Groups F,G  
Class III

Class I Zone 1 Group IIB  
AEx-d IIB T3/T4 IP65  
Ex-d IIB T3/T4 IP65

### Proximity Switches

Types PP, PK, PL, P4, P5, PE, PT, PX, N8, NP, FA, F2, FN

Class I, Division 1 Groups C&D  
Class I Division 2 Groups ABCD  
Class II, Division 1 Groups E, F, & G  
Class II Division 2 Groups F,G  
Class III

Class I, Zone 1 Groups IIB  
AEx-d IIB T3/T4 IP65  
Ex-d IIB T3/T4 IP65

## FACTORY MUTUAL C/US INSTRISICALLY SAFE CERTIFIED SWITCHES

Types MG, PE, PT, P4, N8, NQ, NP

Class I,II,II Div 1 Groups A,B,C,D,E,F,G T5

**Note:** When using hermetically sealed proximity switches in Division 2 hazardous locations, a conduit seal is not required.

### Temperature Range

Hazardous Locations: Class I, Div 1,	T6: -4 to 133 Deg.F (-20 to 60 Deg. C)
Class II, Class III	T6: -4 to 133 Deg.F (-20 to 60 Deg. C)
	T5: -4 to 176 Deg.F (-20 to 80 Deg. C)
Class I Div 2 –	T4: -4 to 133 Deg.F (-20 to 60 Deg. C)
	T3C: -4 to 176 Deg.F (-20 to 80 Deg. C)
Zone 1 -	T3: -4 to 133 Deg.F (-20 to 60 Deg. C)
	T4: -4 to 104 Deg.F (-20 to 40 Deg. C)

## Europe



II 2 G Ex d T3/T4 IP65  
T4 = Tamb -20C to +40C  
T3 = Tamb -20C to +60C  
(Excludes switch options FN, F2, F4)

EN 60079-0:2006; EN 60079-1:2004

## IECEX

Ex d IIB T3/T4 IP65  
T4 = Tamb -20C to +40C  
T3 = Tamb -20C to +60C  
(Excludes switch options FN, F2, F4)

IEC 60079-0:2004; IEC 60079-1:2003

## Agency Listings

CSA number 1902001 IECEx CSA 07.0009X  
KEMA 07ATEX0122X FM 3028844 & 3028844C



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## Ordering Guide:

Sample part number: NXVU2M1-17-0A3A2PRN

### □ **BRAND**

Blank - Automax

### □ **SHAFT TYPE**

D - Double-D Shaft (1/4" Flats)  
N - NAMUR VDI/VDE 3845 Shaft

### □ **BODY STYLE**

XV - Aluminum Housing, Explosion-proof / Flame-proof, (3) 3/4" NPT Conduit  
XM - Aluminum Housing, Explosion-proof / Flame-proof, (3) M20 Conduit

### □ **INDICATOR TYPE**

U - Standard UltraDome (Red/Green)  
3 - 4-Window UltraDome  
C - 90° 3-Way UltraDome  
D - 180° 3-Way Ultradome  
E - 180° 3-Way Center-Blocked UltraDome  
F - 120° Thru / Divert UltraDome  
H - Black / Yellow UltraDome  
K - Ektar UltraDome (Red/Green)  
R - Reverse UltraDome (Red = Open, Green = Closed)  
W - White / Blue Ultradome  
X - 180° 3-Way UltraDome (White/Blue)

### □ **NUMBER OF SWITCH ELEMENTS**

0 - 0 Switch Elements  
1 - 1 Switch Element  
2 - 2 Switch Element (Required for All Network Options)  
3 - 3 Switch Element  
4 - 4 Switch Element

### □ **SWITCH ELEMENT TYPE**

M1 - SPDT Mechanical  
MG - SPDT Mechanical – Gold-Plated  
MB - DPDB Mechanical – Licon  
P4 - SPST Proximity  
PE - PE Sabre SPDT Proximity  
PP - Phazer SPDT Proximity  
PL - Phazer SPDT Proximity w/LED  
PT - BRS SPST Proximity  
PX - BRS SPST Proximity w/LED  
N8 - P&F NJ2-V3-N / NJ2-V3-N-V5 (NAMUR)  
NP - P&F SJ3.5N (NAMUR)  
FA - AS-i version 2.1



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- F2 - FOUNDATION Fieldbus - 2-Wire
- F4 - FOUNDATION Fieldbus – 4-Wire
- FN - DeviceNet

### □ CERTIFICATIONS

- 14 - General Purpose
- 17 - CSA CL. I, Div 1 Gr CD T6 / CL. I, Div.2, Gr ABCD T3C / CLII , Div.1,, Gr EFG, Div 2 Gr EFG  
CLIII T6, CL 1 Zone 1 AEx-d IIB T3/T4 / Class I Zone 1 Ex-d IIB T3/T4
- 19 - ATEX II 2 G, Ex d IIB T3/T4 IP65
- 24 - CSA CL. I, Div 1 Gr CD / CL. II, Div. 1 Gr EFG, Div 2 Gr EFG / CL III T6  
Class I Zone 1 AEx-d IIB T3/T4 / Class I Zone 1 Ex-d IIB T3/T4
- 25 - IECEx Ex d IIB T3/T4 IP65
- 27 - Factory Mutual/CUS Class I,II,II Div 1 Gr A,B,C,D,E,F,G T5

### □ NUMBER OF COILS

- 0 - Integral Single Coil
- 1 - External Solenoid Coil

### □ SOLENOID COIL VOLTAGE

- 0 - None
- A - 110VAC/50Hz, 120VAC/60Hz (2-Watt)
- C - 220VAC/50Hz, 240VAC/60Hz (2-Watt)
- F - 12VDC (2-Watt)
- G - 24VDC (2-Watt)
- H - 12VDC Low-Power (.67 Watt)
- J - 24VDC Low-Power (.67 Watt)
- K - 15.5 VDC Intrinsically Safe
- P - 24VDC Ultra Low-Power (Piezo .006 Watt)

### □ SPOOL VALVE

- 000 - None
- 3A2 - 3-Way Aluminum – 1.8 Cv
- 3S2 - 3-Way Stainless Steel – 1.8 Cv
- 3A4 - 3-Way Aluminum – 4.5 Cv
- 3S4 - 3-Way Stainless Steel – 4.5 Cv
- 4A2 - 4-Way Aluminum – 1.8 Cv
- 4S2 - 4-Way Stainless Steel – 1.8 Cv
- 4S4 - 4-Way Stainless Steel – 4.5 Cv
- 4A4 - 4-Way Aluminum – 4.5 Cv

### □ COATING OPTIONS

- P - Polyester Powder Coating (Standard)
- E - White Epoxy Coating



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- **SPOOL VALVE EXHAUST MUFFLERS**
  - R - Thermoplastic Rain Caps (Standard)
  - B - Sintered Bronze Exhaust Mufflers
  - S - Stainless Steel Exhaust Mufflers
  
- **OVERRIDE OPTIONS**
  - N - No Override (Standard)
  - M - Momentary Manual Override
  - L - Locking Manual Override
  
- **OTHER OPTIONS**
  - 1 - Silicone Free Aviator (Magnalube Grease or Equivalent)
  - E - Wiedmueller (European Style)
  - P - High Temperature Phenolic
  - L - Low Temperature Spool



# Product Specification

## Representative:

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To find your local Flowserve representative please use the Sales Support Locator System found at [www.flowserve.com](http://www.flowserve.com)

Or call toll free: 1-801-489-8611

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