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## Unit Specification

MCV116C1201

Pressure Control Pilot Valve (PCP)  
 Intrinsically Safe

ISSUE: 1

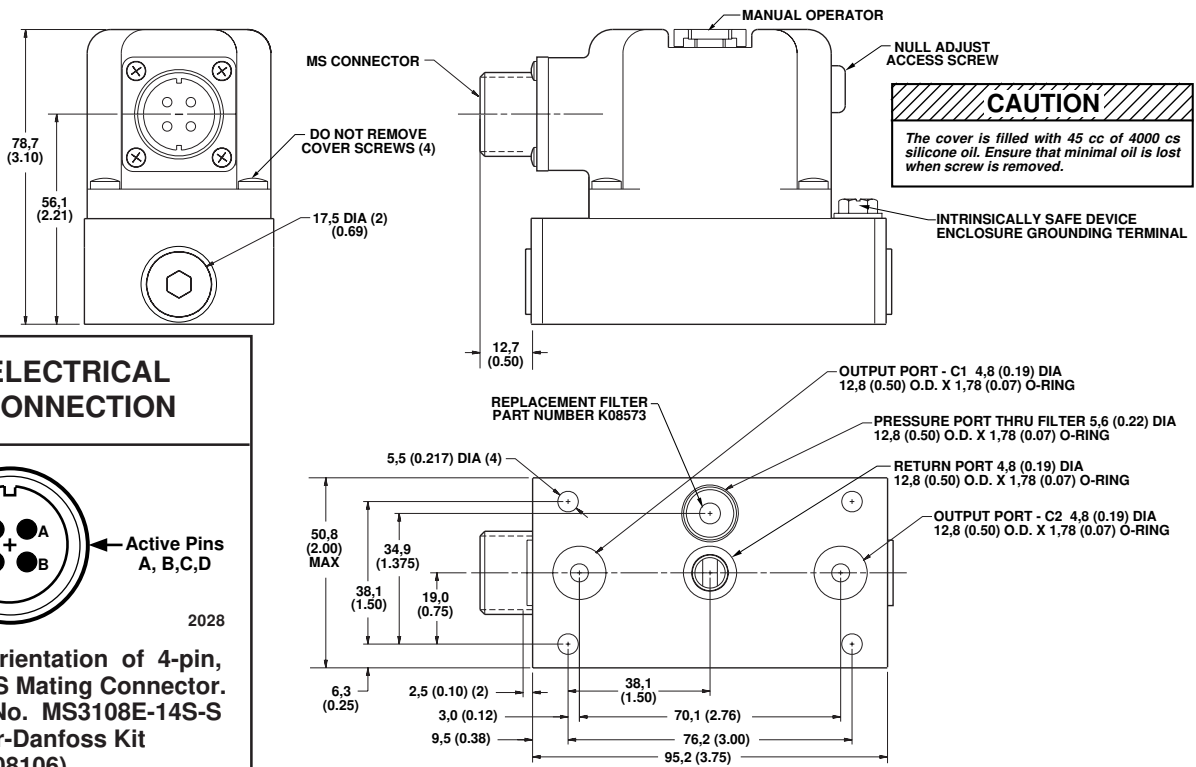
DATE: July 1998

### GENERAL DESCRIPTION

This Pressure Control Pilot (PCP) is an intrinsically safe, torque motor-actuated, double-nozzle flapper valve that produces a differential output pressure proportional to the applied electrical input signal. It is a single-stage, stand-alone, closed-loop pressure control valve which uses internal hydraulic pressure reactions to achieve its closed-loop control characteristics. The PCP contains an arc suppression circuit for use in hazardous areas.

The term "intrinsically safe" refers to a design technique based on limiting energy, electrical and thermal, to a level below that required to ignite a specific hazardous atmospheric mixture. This device is Factory Mutual certified for use in Class I, II, or III, Division 1, Group C, D, F, and G hazardous locations as defined by the National Electrical Code, NFPA-70 when used with approved barriers.

### DIMENSIONS



### ELECTRICAL CHARACTERISTICS

- Dual coil
  - A 20Ω
  - B 16Ω
  - C 20Ω
  - D 16Ω
- Phasing:
  - Positive voltage to pin A or C produces a pressure rise at output port C1
  - Positive voltage to pin B or D produces a pressure rise at output port C2
- Current/voltage range: up to 205 mA at 4.50 Vdc (linear range), maximum 275 mA at 6.0 Vdc
- Pulse Width Modulation (PWM)
  - The PCP is designed to be controlled from a dc current source or voltage source. If a PWM signal is used, do not use a pulse current of more than 120% of that required.
- Scale factor: 1.47 ± 0.15 psid / mA

# HYDRAULIC CHARACTERISTICS

- Maximum supply pressure: 1000 psid  
Recommended range: 500 - 600 psid
- Maximum return pressure: 200 psid
- Maximum internal leakage: 0.90 gpm at 500 psid supply
- Maximum linear psid output pressure: 310 psid at 500 psid supply
- Load flow: the output differential flow across a 100 psid load pressure drop at maximum current: > 45 cim
- Hydraulic Fluid: Petroleum based, other fluids may be used provided that they are compatible with viton and fluorosilicone seals. Fluid cleanliness is ISO 4406 code 18/15 or better
- Hydraulic Null Adjustment: The PCP null adjustment is sometimes required when configured with the servovalve (KVF) or applied as a stand-alone. If the PCP null takes an offset of <15 psid (>15 psid, consult factory) across C1 and C2 ports it can usually be reestablished to the original factory setting. To adjust, remove the null access screw (see Dimensions) and with a 3/32 inch hex head Allen wrench locate the adjusting screw just inside the cover. Turn screw in very small increments until the servovalve neutral is established or C1 and C2 psid is as close to 0 as possible. When finished, replace access screw. If the PCP is configured with an Electrical Displacement Control (EDC) mounted to a pump, never adjust an EDC neutral using the PCP null adjustment. EDCs are adjusted at their second stage.

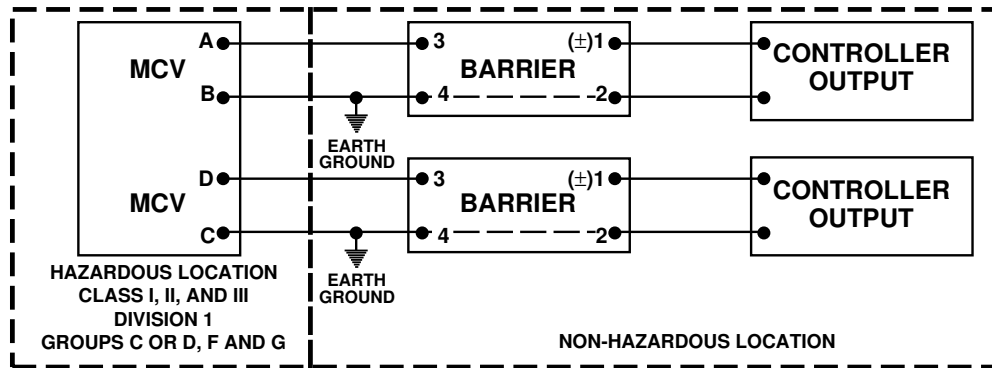
# WIRING

A suppression circuit is incorporated in the PCP torque motor cover but by itself does not insure intrinsic safety. An additional suppression circuit (Zener barrier) must be connected in series with the valve coils. The Zener barrier and electrical controller must be isolated from the hazardous area either

through use of a purge enclosure or mounted in a safe area. See Dimensions for PCP enclosure grounding. Proper connection and suggested barrier model numbers are shown in the connection diagram below. Two per application may be required.

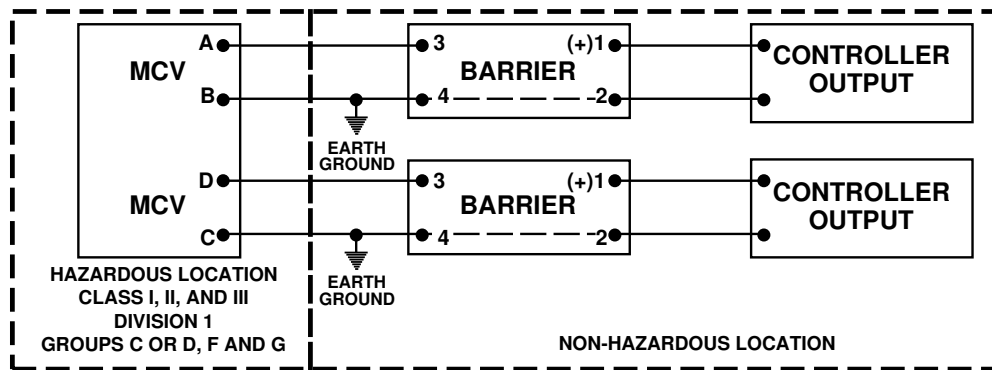
### BIDIRECTIONAL TWO STATION CONTROL, SELECT ONE OF THE FOLLOWING BARRIERS

- Stahl Barrier 9001/02-172-270-10 (12V)  
Groups A, B, C, D, F and G (maximum voltage  $\pm 17.2V$ )
- Stahl Barrier 9001/02-308-230-10 (26V)  
Groups D, E, F and G (maximum voltage  $\pm 31.8V$ )



### BIDIRECTIONAL CONTROL, SELECT ONE OF THE FOLLOWING BARRIERS

- Stahl Barrier 9001/01-158-270-10 (12V)  
Groups A, B, C, D, F and G (maximum voltage 15.8V)
- Stahl Barrier 9001/01-280-280-10 (26V)  
Groups D, E, F and G (maximum voltage 31.5V)



NO CHANGES TO THIS DRAWING WITHOUT PRIOR WRITTEN AUTHORIZATION FROM FACTORY MUTUAL.

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