



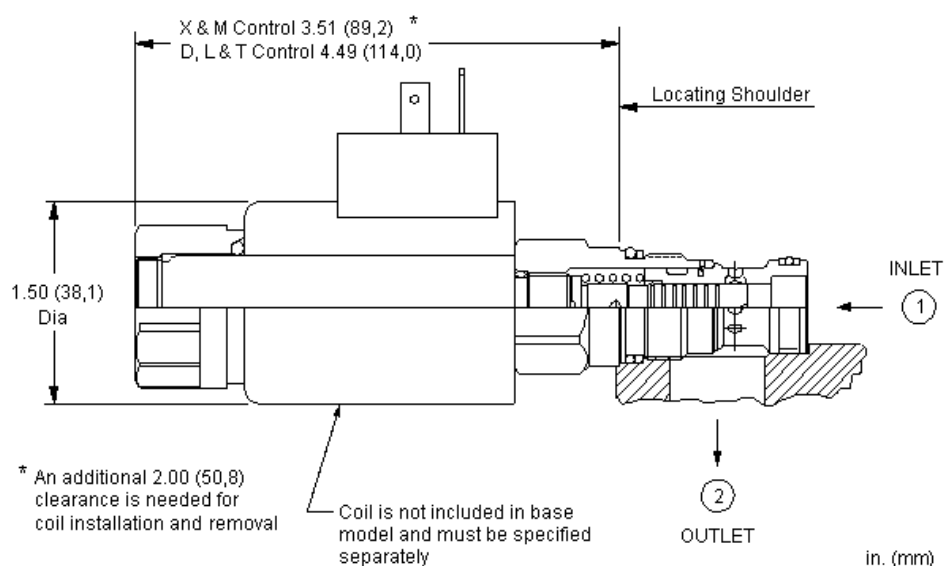
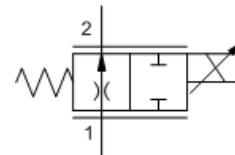
## Electro-proportional flow control valve - normally open

Capacity:  
7 gpm (28 L/min.)

Model:  
FPCH

### Product Description

This valve is a normally-open, electro-proportional throttle. The valve is spring biased open. Energizing the coil generates an closing force on the spool proportional to the command current and this force is countered by the spring and flow forces. This force balance creates a metering orifice whose effective size is proportional to the current. The valve exhibits a large degree of self-compensation in the 1 to 2 direction and will provide proportional flow control in the 2 to 1 direction with the addition of an external compensator. Full reverse flow (2 to 1) with no command in the 2 to 1 direction is possible without a compensator under all conditions.



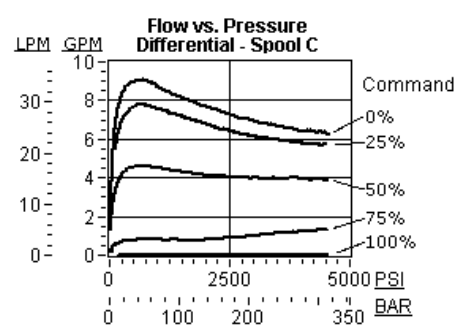
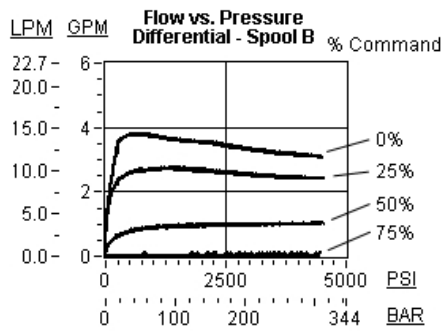
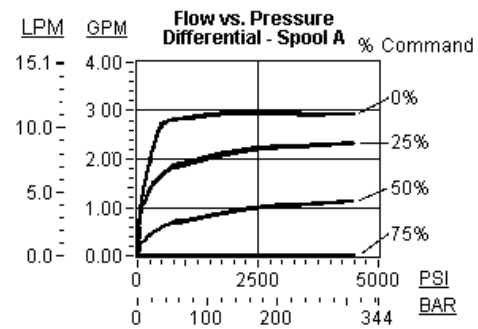
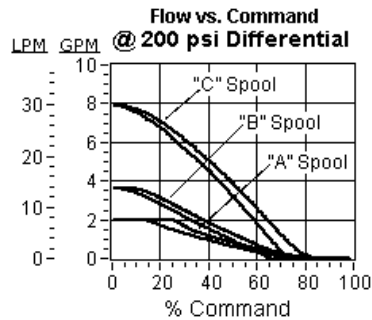
### Technical Features

- Available in either a normally open or normally closed configuration with three different capacity ranges.
- Capable of operating with pressures up to 5000 psi.
- Low leakage levels in the closed position.
- Coils are interchangeable with Sun's other full flow, solenoid-operated valves and can be mounted on the tube in either direction.
- This cartridge has several manual override choices, including no manual override. See Option Selection below.
- For optimum performance, an amplifier with current sensing and adjustable dither should be used. Dither should be adjustable between 100 - 250 Hz.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

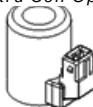
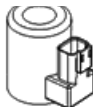
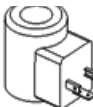
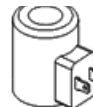
### Technical Data

|                              | U.S. Units | Metric Units |
|------------------------------|------------|--------------|
| Cavity                       | T-13A      |              |
| Capacity                     | 7 gpm      | 28 L/min.    |
| Hysteresis (with dither)     | <4%        |              |
| Hysteresis with DC input     | <8%        |              |
| Linearity (with dither)      | <2%        |              |
| Repeatability (with dither)  | <2%        |              |
| Recommended dither frequency | 140 Hz     |              |

|                                              |                                   |                        |
|----------------------------------------------|-----------------------------------|------------------------|
| Deadband, nominal (as a percentage of input) | 25%                               |                        |
| Manual Override Force Requirement            | 5 lbs/1000 psi @ Port 1           | 3 kgs/100 bar @ Port 1 |
| Manual Override Stroke                       | .10 in.                           | 2,5 mm                 |
| Maximum Valve Leakage at 110 SUS (24 cSt)    | 6 in <sup>3</sup> /min. @3000 psi | 100 cc/min. @210 bar   |
| Series (from Cavity)                         | Series 1                          |                        |
| Solenoid Tube Diameter                       | .75 in.                           | 19 mm                  |
| Valve Hex Size                               | 7/8 in.                           | 22,2 mm                |
| Valve Installation Torque                    | 30 - 35 lbf ft                    | 40 - 50 Nm             |
| Model Weight (with coil)                     | 1.10 lb                           | 0,50 kg                |
| Seal Kits - Cartridge                        | Buna: 990-413-007                 |                        |
| Seal Kits - Cartridge                        | Viton: 990-413-006                |                        |
| Seal Kits - Coil                             | Viton: 990-770-006                |                        |
| Model Weight                                 | 0.66 lb.                          | 0.30 kg.               |



## FPCH-XCN-\*\*\*

| Control                                                                           | Flow Rate                                                                         | Seal Material                                                                     | Coil                                                                                |                                                                                     |                                                                                                              |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Preferred Options                                                                 | Preferred Options                                                                 | Preferred Options                                                                 | *** See Coil Options Below                                                          |                                                                                     |                                                                                                              |
| X No Manual Override                                                              | C .25 - 7 gpm (0,8 - 28 L/min.)                                                   | N Buna-N                                                                          |                                                                                     |                                                                                     |                                                                                                              |
| Standard Options                                                                  | Standard Options                                                                  | Standard Options                                                                  |                                                                                     |                                                                                     |                                                                                                              |
| D Twist/Lock (Dual) Manual Override                                               | A .1 - 1.5 gpm (0,4 - 6 L/min.)                                                   | V Viton                                                                           |                                                                                     |                                                                                     |                                                                                                              |
| L Twist/Lock (Detent) Manual Override                                             | B .15 - 3.5 gpm (0,6 - 14 L/min.)                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
| M Manual Override                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
| T Twist Manual Override                                                           |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
| Standard Coil Options                                                             |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
|  |  |  |    |  |                           |
| AMP Junior Timer                                                                  | Deutsch DT04-2P                                                                   | DIN 43650 4 pin (Hirschman)                                                       | Metri-Pack                                                                          | SAE J858A                                                                           | Twin Lead                                                                                                    |
| *** no coil                                                                       |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
| 212                                                                               | DIN 43650 4 pin (Hirschman) 12 VDC                                                | 612                                                                               | AMP Junior Timer 12 VDC                                                             | 812                                                                                 | Metri-Pack 12 VDC                                                                                            |
|                                                                                   |                                                                                   | 624                                                                               | AMP Junior Timer 24 VDC                                                             | 824                                                                                 | Metri-Pack 24 VDC                                                                                            |
| 214                                                                               | DIN 43650 4 pin (Hirschman) 14 VDC                                                | 712                                                                               | Twin Lead 12 VDC                                                                    | 912                                                                                 | Deutsch DT04-2P 12 VDC                                                                                       |
| 224                                                                               | DIN 43650 4 pin (Hirschman) 24 VDC                                                | 724                                                                               | Twin Lead 24 VDC                                                                    | 924                                                                                 | Deutsch DT04-2P 24 VDC                                                                                       |
| 524                                                                               | SAE J858A 24 VDC                                                                  |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
| Embedded Coil Options                                                             |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
| 2B12A                                                                             | DIN 43650 4 pin (Hirschman) command common on fourth pin 12 VDC 0-20 mA           | 2C24V                                                                             | DIN 43650 4 pin (Hirschman) +5V reference on fourth pin 24 VDC 0-10V                | 4A12A                                                                               | Deutsch DT04-6P all functions enabled (separate command common, 5 v reference, and an enable) 12 VDC 0-20 mA |
| 2B12V                                                                             | DIN 43650 4 pin (Hirschman) command common on fourth pin 12 VDC 0-10V             | 2D12A                                                                             | DIN 43650 4 pin (Hirschman) enable input on fourth pin 12 VDC 0-20 mA               | 4A12V                                                                               | Deutsch DT04-6P all functions enabled (separate command common, 5 v reference, and an enable) 12 VDC 0-10V   |
| 2B24A                                                                             | DIN 43650 4 pin (Hirschman) command common on fourth pin 24 VDC 0-20 mA           | 2D12V                                                                             | DIN 43650 4 pin (Hirschman) enable input on fourth pin 12 VDC 0-10V                 | 4A24A                                                                               | Deutsch DT04-6P all functions enabled (separate command common, 5 v reference, and an enable) 24 VDC 0-20 mA |
| 2B24V                                                                             | DIN 43650 4 pin (Hirschman) command common on fourth pin 24 VDC 0-10V             | 2D24A                                                                             | DIN 43650 4 pin (Hirschman) enable input on fourth pin 24 VDC 0-20 mA               | 4A24V                                                                               | Deutsch DT04-6P all functions enabled (separate command common, 5 v reference, and an enable) 24 VDC 0-10V   |
| 2C12A                                                                             | DIN 43650 4 pin (Hirschman) +5V reference on fourth pin 12 VDC 0-20 mA            | 2D24V                                                                             | DIN 43650 4 pin (Hirschman) enable input on fourth pin 24 VDC 0-10V                 | 4F12V                                                                               | Deutsch DT04-6P programmable ramps, separate rise and fall 12 VDC 0-10V                                      |
| 2C12V                                                                             | DIN 43650 4 pin (Hirschman) +5V reference on fourth pin 12 VDC 0-10V              | 2F12V                                                                             | DIN 43650 4 pin (Hirschman) programmable ramps, separate rise and fall 12 VDC 0-10V | 4F24V                                                                               | Deutsch DT04-6P programmable ramps, separate rise and fall 24 VDC 0-10V                                      |
| 2C24A                                                                             | DIN 43650 4 pin (Hirschman) +5V reference on fourth pin 24 VDC 0-20 mA            | 2F24V                                                                             | DIN 43650 4 pin (Hirschman) programmable ramps, separate rise and fall 24 VDC 0-10V |                                                                                     |                                                                                                              |
| Additional Options                                                                |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
| Additional Coils                                                                  |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |
| 512                                                                               | SAE J858A 12 VDC                                                                  |                                                                                   |                                                                                     |                                                                                     |                                                                                                              |