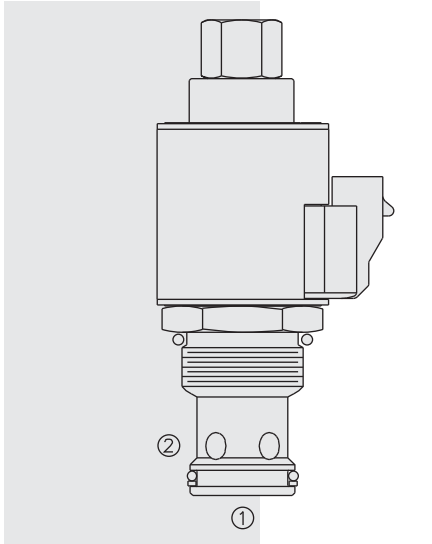


# ELECTRO-PROPORTIONAL VALVES—DIRECTIONAL CONTROL

## SP16-21 Poppet, 2-Way, Normally Open



### DESCRIPTION

A proportional solenoid-operated, 2-way, poppet-type, normally open, screw-in hydraulic cartridge valve for low-leakage blocking and load-holding applications

### OPERATION

When de-energized, the **SP16-21** allows flow from ② to ①. When the valve is partially energized, the valve begins to throttle the flow from ② to ①. When fully energized, the poppet closes on the seat, blocking flow from ② to ①. Flow from ① to ② will occur when hydraulic pressure exceeds the solenoid force.

**Note: If low voltage is expected on the machine, 12 or 24 volt systems will require the use of 10 volt or 20 volt coils respectively. See “SP Valves and Coil Operating Parameters,” page 2.002.1.**

### FEATURES

- Industry-common cavity.
- Continuous-duty rated coils.
- Manual override option.
- Efficient wet-armature construction.
- Optional waterproof E-Coils rated up to IP69K.

### RATINGS

**Operating Pressure:** 250 bar (3625 psi)

**Flow:** 265 lpm (70 gpm); see performance charts

**Max. Internal Leakage:** 7 drops per minute at 207 bar (3000 psi)

**Dither/Pulse Frequency:** 100 to 400 Hz

**Hysteresis:** Less than 10% up to 70% of I-max.; Less than 5% above 70% of I-max.

**Maximum Control Current:** 1.2 amp required to achieve rated flow

**Threshold Current:** 0.3 A; see performance charts

**Temperature:** -40 to 120°C with standard Buna seals

**Fluids:** Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

**Filtration:** See page 9.010.1; **Installation:** No Restrictions. See page 9.020.1

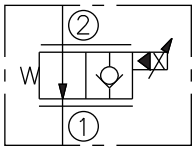
**Cavity:** VC16-2; See page 9.116.1; **Cavity Tool:** CT16-2XX; See page 8.600.1

**Seal Kit:** SK16-2X-T; See page 8.650.1

**Coil Nut:** Part No. 7004400

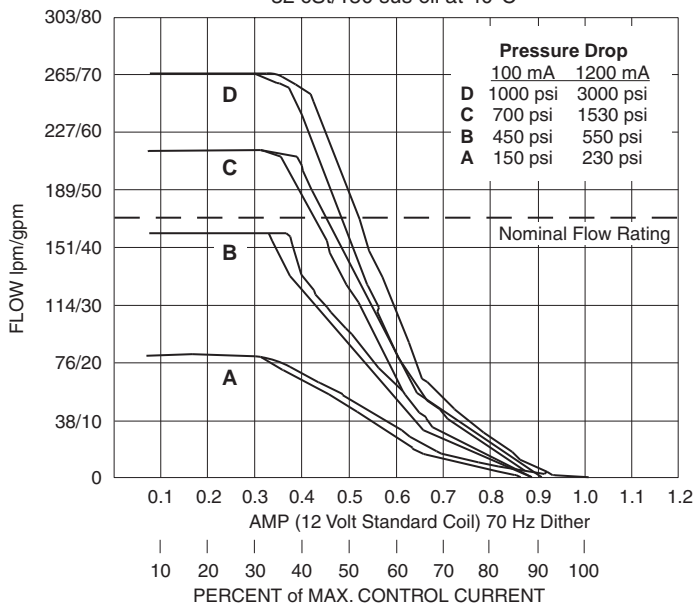
### SYMBOLS

#### USAS/ISO:

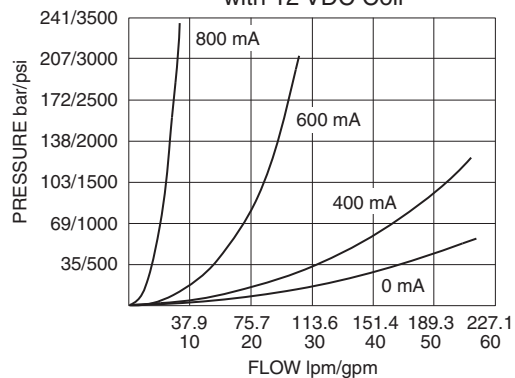


### PERFORMANCE

FLOW vs. CURRENT at Various Differential Pressures  
32 cSt/150 sus oil at 40°C

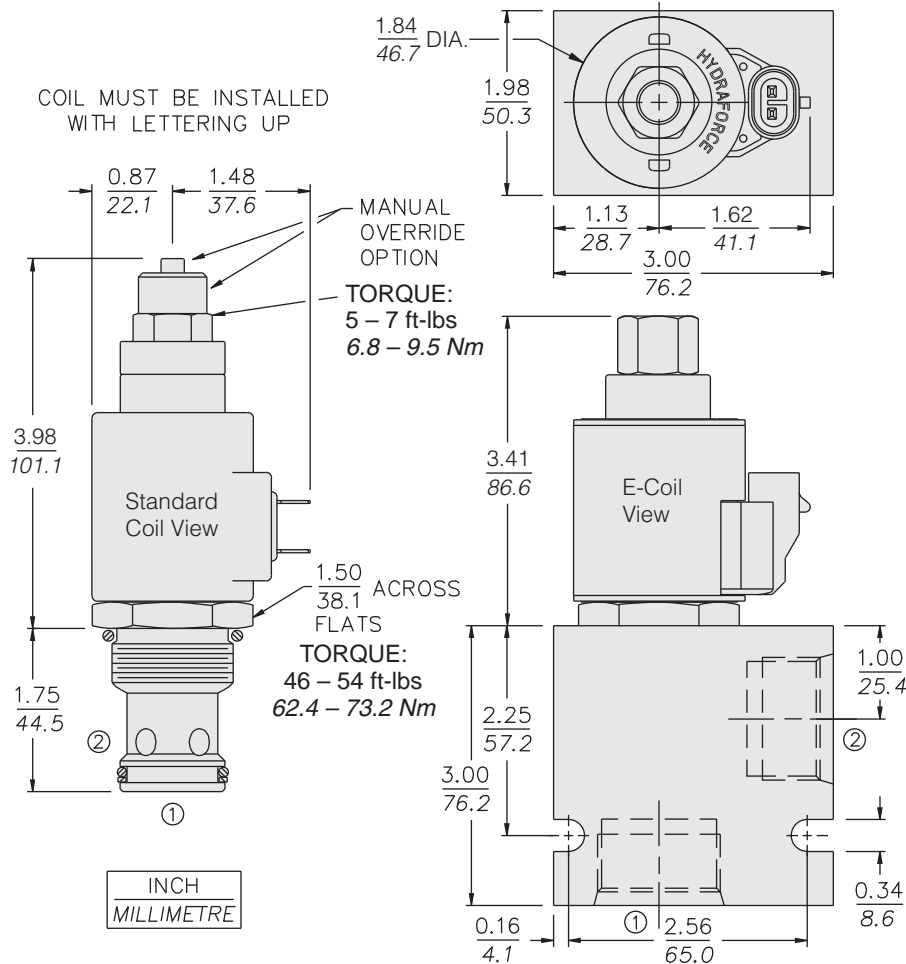


PRESSURE RESPONSE  
with 12 VDC Coil



**Recommended Electronic Controllers:**  
See page 2.001.1 or our Electronics catalog.

**DIMENSIONS**



**MATERIALS**

**Cartridge:** Weight: 0.32 kg. (0.71 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces; Buna N O-rings and back-ups standard.

**Standard Ported Body:** Weight: 0.57 kg. (1.25 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1.

**Standard Coil:** Weight: 0.27 kg. (0.60 lbs.) Unitized thermoplastic encapsulated, Class H high temperature magnetwire. See page 3.200.1.

**E-Coil:** Weight: 0.41 kg. (0.9 lbs.) Perfect wound, fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. See page 3.400.1.

**TO ORDER**

**SP16-21**

**Option**  
None (Blank)  
Manual Override **P**  
For Manual Override details see page 1.001.1

**Porting**  
Cartridge Only **0**  
SAE 12 **12T**  
SAE 16 **16T**  
3/4 in. BSP\* **6B**  
1 in. BSP\* **8B**  
\*BSP Body; U.K. Mfr. Only

**Seals**  
Buna N (Std.) **N**  
Fluorocarbon **V**  
Polyurethane **P**

**Voltage**  
**0** Less Coil\*\*  
**10** 10 VDC†  
**12** 12 VDC  
**20** 20 VDC†  
**24** 24 VDC  
\*\*Includes Std. Coil Nut  
†10 VDC and 20 VDC coils should be used for most continuous-duty applications. Consult factory.

**Termination (VDC) Std. Coil**  
**DS** Dual Spades  
**DG** DIN 43650  
**DL** Leadwires (2)  
**DL/W** Leads w/Weatherpak® Connectors  
**DR** Deutsch DT04-2P

**Termination (VDC) E-Coil**  
**ER** Deutsch DT04-2P (IP69K Rated)  
**EY** Metri-Pack® 150.2A (IP69K Rated)

Coils with internal diode are available. Consult factory.