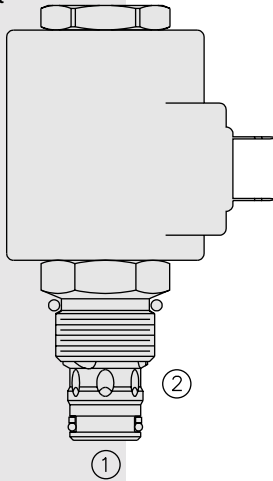


# ELECTRO-PROPORTIONAL VALVES—PRESSURE CONTROLS

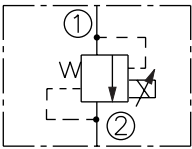
## TS10-27 Proportional Electric Relief w/Internally

U.S. Patent  
6,267,350



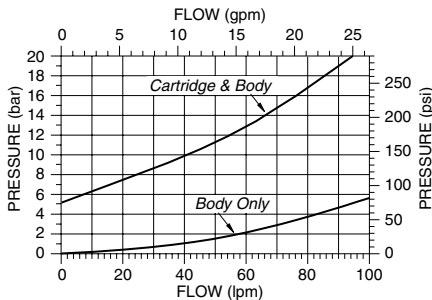
### SYMBOLS

#### USAS/ISO:

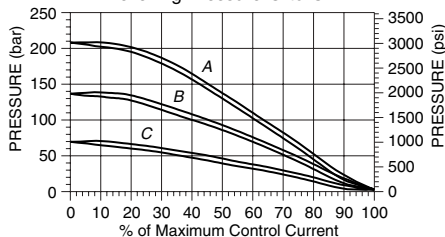


### PERFORMANCE

Pressure Drop vs. Flow Characteristic  
For Flow ① to ② with Coil Energized



Relief Pressure vs.  
Current (DC) Characteristic, 200 Hz PWM  
Relieving Pressure ① to ②



### DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type hydraulic relief valve, which can be infinitely adjusted across a prescribed range using a variable electric input. Pressure output is inversely proportional to DC current input. This valve is intended for use as a pressure limiting device in demanding applications.

### OPERATION

The **TS10-27** blocks flow from ① to ② until sufficient pressure is present at ① to open the valve by overcoming the preset induced spring force. With no current applied, the valve will relieve at  $\pm 50$  psi of the range maximum. Applying current to the coil decreases the induced spring force, thereby reducing the valve setting.

Note: This valve is ideal for hydraulic fan drive applications. Consult factory for electronic controllers specifically designed for fan drive applications.

### FEATURES

- 12 and 24 volt coils standard.
- Industry common cavity.
- Optional waterproof E-Coils rated up to IP69K.

### RATINGS

**Maximum Operating Pressure:** 241 bar (3500 psi)

**Maximum Control Current:** 1.10 amps for 12 VDC coil; 0.55 amps for 24 VDC coil

**Relief Pressure Range from Zero to Maximum Control Current:**

**A:** 207–10.3 bar (3000–150 psi)

**B:** 138–10.3 bar (2000–150 psi)

**C:** 69–10.3 bar (1000–150 psi)

**Rated Flow:** 75.7 lpm (20 gpm),  $\Delta P=14.8$  bar (215 psi), Cartridge only,  
① to ② coil energized

**Maximum Pilot Flow:** 0.76 lpm (0.2 gpm)

**Hysteresis:** Less than 3%

**Flow Path:** Free Flow: ① to ② coil energized; Relieving: ① to ② coil de-energized

**Temperature:** -40 to 120°C (-40 to 250°F) with standard Buna N seals

**Filtration:** See page 9.010.1

**Fluids:** Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 ssu)

**Installation Recommendation:** When possible, the valve should be mounted below the reservoir oil level. This will maintain oil in the armature preventing trapped air instability. If this is not feasible, mount the valve horizontally for best results.

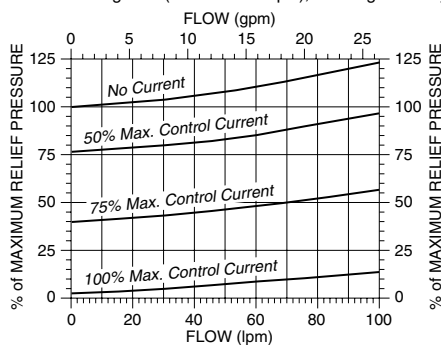
**Cavity:** VC10-2; See page 9.110.1; **Cavity Tool:** CT10-2XX; See page 8.600.1

**Seal Kit:** SK10-2X-B; See page 8.650.1

**Coil Nut:** Part No. 4540550;

For E-coils manufactured prior to 1-1-04, see page 3.400.1 for coil nut info.

Typical Relief Pressure  
vs. Flow Characteristic  
Typical Relieving Pressure ① to ②  
at Various %'s of Maximum Control Current  
Pressure Range "A" (207 bar/3000 psi); Cartridge in Body



Recommended Controllers (See Section 3)

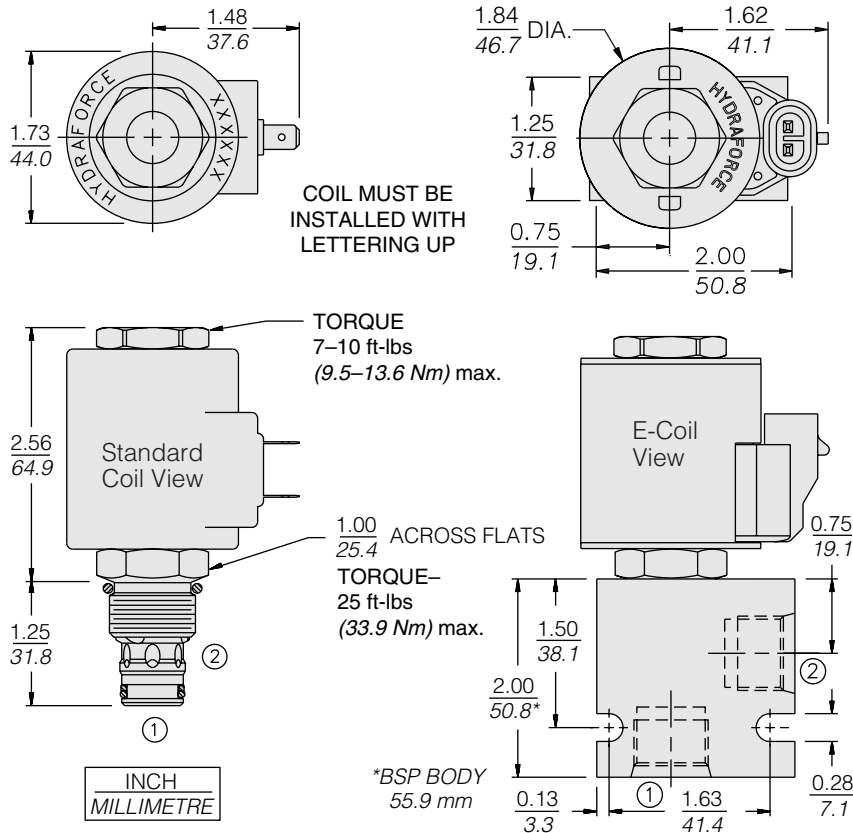
Input Sig. w/12V or 24V Coil	DIN Coil Mount	PCB Board	Metal Box	DIN Rail Mount
0-5 VDC	4000161	4000194	4000174	4000136
0-10 VDC	4000165	4000141	4000182	4000137
4-20 mA	4000169	4000143	4000186	4000139
PWM	—	4000144	4000133	4000140

# Piloted Spool

# TS10-27

## DIMENSIONS

U.S. Patent 6,267,350



## MATERIALS

**Cartridge:** Weight: 0.18 kg. (0.4 lbs.); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard. Optional polyurethane seals with fluorocarbon back-up recommended for pressures over 240 bar (3500 psi).

**Standard Ported Body:** Weight: 0.16 kg. (0.35 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 240 bar (3500 psi); See page 8.010.1. Ductile iron and steel bodies available; dimensions may differ; consult factory.

**Standard Coil:** Weight: 0.27 kg. (0.6 lbs.); Unitized thermoplastic encapsulated, Class H high temperature magnet-wire; See page 3.200.1.

**E-Coil:** Weight: 0.41 kg. (0.9 lbs.); Fully encapsulated with rugged external metal shell; Rated up to IP69K with integral connectors; **Note: See page 3.400.1 for all E-Coil retrofit applications.**

## TO ORDER

TS10-27 - - -

**Maximum Relief Pressure**

207 bar (3000 psi) **A**  
138 bar (2000 psi) **B**  
69 bar (1000 psi) **C**

**Porting**

Cartridge Only **0**  
SAE 6 **6T**  
SAE 8 **8T**  
3/8 in. BSP\* **3B**  
1/2 in. BSP\* **4B**

\*BSP Body; U.K. Mfr. Only

**Seals**

Buna N (Std.) **N**  
Fluorocarbon **V**

**Termination Std. Coil**

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

**Termination E-Coil**

**ER** Deutsch DT04-2P (IP69K Rated)  
**EY** Metri-Pack® 150 (IP69K Rated)

Coils with internal diode are available. Consult factory.

**Voltage**

**0** Less Coil  
**10** 10 VDC (1.30 amps max.)  
**12** 12 VDC (1.10 amps max.)  
**20** 20 VDC (0.65 amps max.)  
**24** 24 VDC (0.55 amps max.)