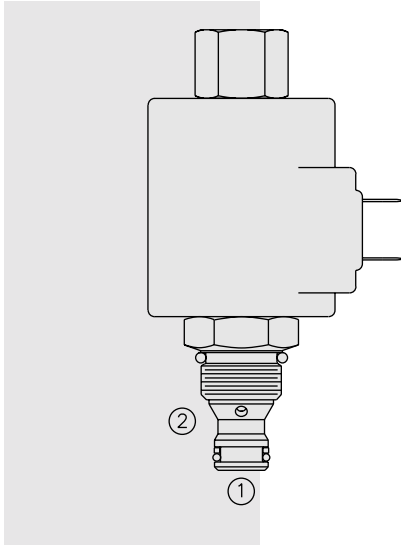


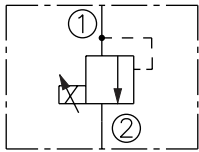
ELECTRO-PROPORTIONAL VALVES—PRESSURE CONTROLS

TS38-20 Proportional Electric Relief Valve



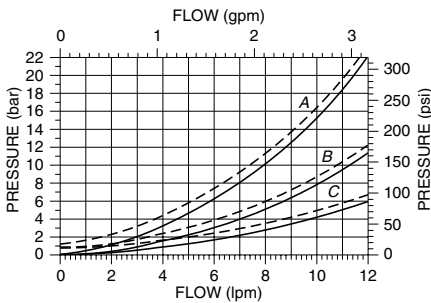
SYMBOLS

USAS/ISO:

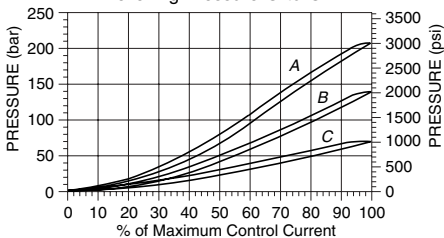


PERFORMANCE

Pressure Drop vs. Flow Characteristic
For Flow ① to ② with Coil De-energized
Vertical Mount - - - - ; Horizontal Mount —



Relief Pressure vs.
Current (DC) 250 Hz Dither
Relieving Pressure ① to ②



DESCRIPTION

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

OPERATION

The **TS38-20** blocks flow from ① to ② until sufficient pressure is present at ① to offset the electrically induced solenoid force. With no current applied to the solenoid, the valve will free flow from ① to ②.

Note: Back pressure on port ② becomes additive to the pressure setting at a 1:1 ratio.

FEATURES

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

RATINGS

Maximum Port Pressure: 241 bar (3500 psi)

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

Control Signal: DC or PWM (Significant improvements in valve performance occur with superimposed dither, with either control method.)

Dither Frequency: 150 Hz or higher

Hysteresis with Dither 250 Hz: 3.3% (7% maximum without dither)

Operational Relief Pressure Range from Zero to Maximum Control Current:

A: 0–207 bar (0–3000 psi); **B:** 0–138 bar (0–2000 psi); **C:** 0–69 bar (0–1000 psi)

Rated Flow: A: 11.4 lpm/3 gpm @ 20 bar/290 psi pressure drop

B: 11.4 lpm/3 gpm @ 10 bar/150 psi pressure drop

C: 11.4 lpm/3 gpm @ 5.5 bar/80 psi pressure drop

Step Response: $T_{ON} < 50$ ms; $T_{OFF} < 7$ ms

Flow Path: Free Flow: ① to ② coil de-energized; Relieving: ① to ② coil 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: VC08-2; See page 9.108.1; **Cavity Tool:** CT08-2XX; See page 8.600.1

Seal Kit: SK08-2X-B; See page 8.650.1

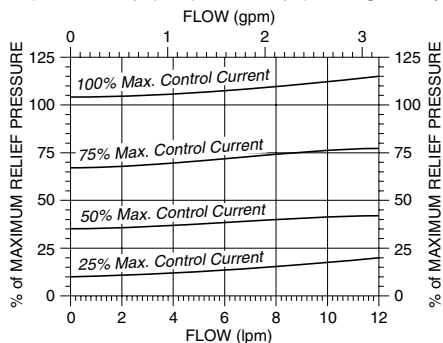
Coil Nut: Part No. 4540560;

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

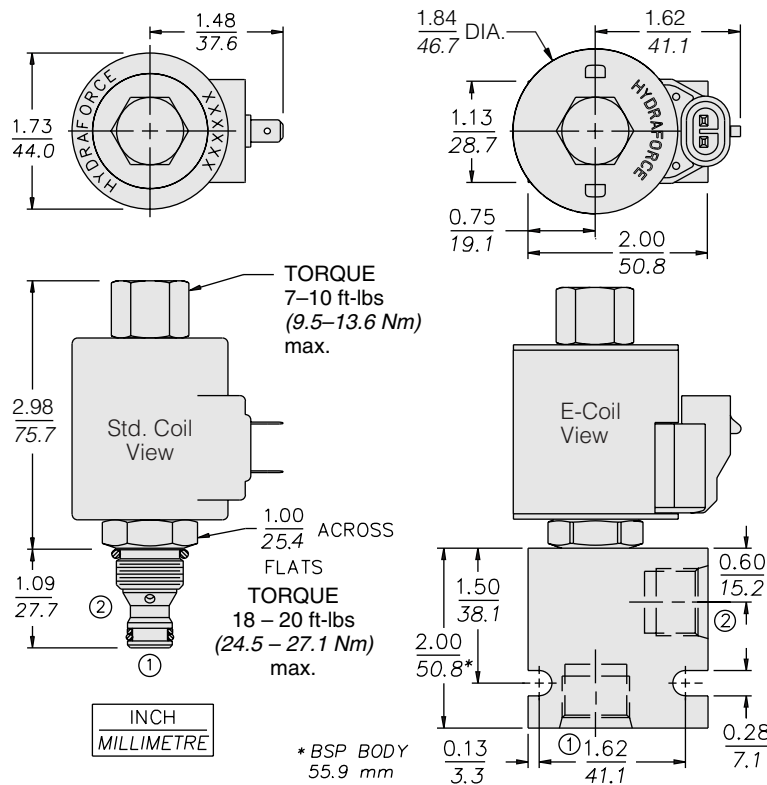
Pressure Range A: (207 bar/3000 psi);
B: (138 bar/2000 psi); C: (69 bar/1000 psi); Cartridge in Body



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 |

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.25 kg. (0.55 lbs.); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

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 8.008.1. Ductile iron and steel bodies available; dimensions may differ; consult factory.

Standard Coil: Weight: 0.32 kg. (0.7 lbs.); Unitized, thermoplastic encapsulated, Class H high temperature magnetwire; 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

TS38-20

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

Option
None (Blank)
Manual Override **M**

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.)