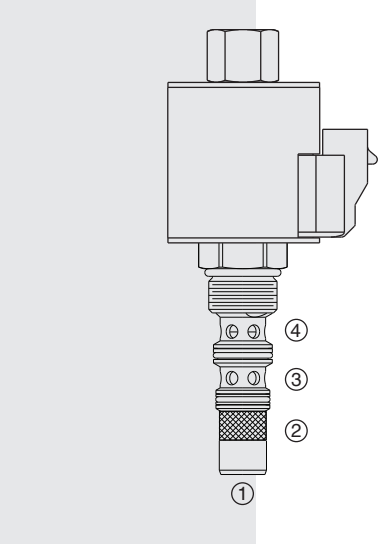
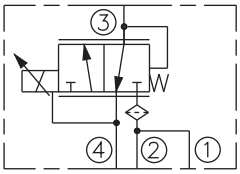
TS90-31 Proportional Reducing/Relieving Valve,

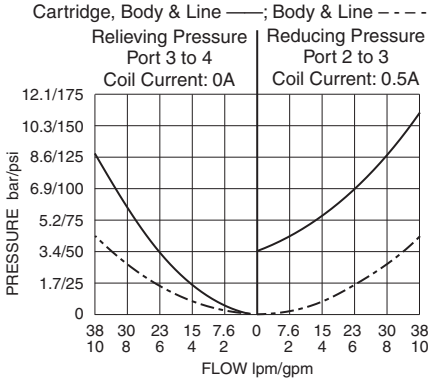


ISO SYMBOL

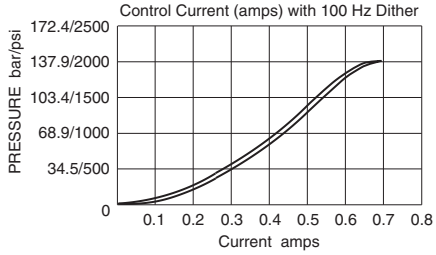


PERFORMANCE

Typical Pressure Drop vs. Flow
Cartridge, Body & Line ——; Body & Line – – – -



Reducing Pressure vs. Current
Inlet Pressure 172 bar (2500 psi) at No Flow
Control Current (amps) with 100 Hz Dither



DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type reducing/relieving 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 control device in demanding applications.

OPERATION

Without applied current, the **TS90-31** allows flow from 3 to 4 while blocking 2. When the coil is energized, 3 is connected to 2, and pressure at 3 is controlled proportional to the amount of current applied to the coil. If pressure at 3 exceeds the setting induced by the coil, pressure is relieved to 4. Back pressure on port 4 becomes additive to the pressure setting at a 1:1 ratio.

Note: This product may be customized for special OEM performance characteristics. Consult factory.

FEATURES

- 12 and 24 volt coils standard.
- Optional waterproofed E-Coils rated up to IP69K.
- Valve spool protected by a 50 x 50 mesh screen.

RATINGS

Maximum Operating Pressure: 207 bar (3000 psi) at ports 1 and 2; 69 bar (1000 psi) at port 3. **Burst Pressure:** 345 bar (5000 psi)

Flow Rating: 38 lpm (10 gpm); **Maximum Pilot Flow:** 0.85 lpm (0.23 gpm)

Adjustable Pressure Range: 0 to 138 bar (2000 psi)

Electrical Parameters:

Coil	Typical Max. Current (A) at 0 gpm		Typical Resistance ± 5% @ 20°C (ohms)		Typical Apparent Inductance (mH)	
	12 VDC	24 VDC	12 VDC	24 VDC	12 VDC	24 VDC
D-Coil	0.68	0.34	7.2 ±5%	28.8 ±5%	148	587
E-Coil	0.88	0.44	7.1 ±5%	28.5 ±5%	137	580

Recommended Drivers: Dither Frequency 350 Hz; PWM Frequency 200 Hz

Temperature: -40 to 100°C (-40 to 212°F) with standard Buna N seals; -26 to 204°C (-15 to 400°F) with Fluorocarbon 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 sus); See Temperature and Oil Viscosity, page 9.060.1

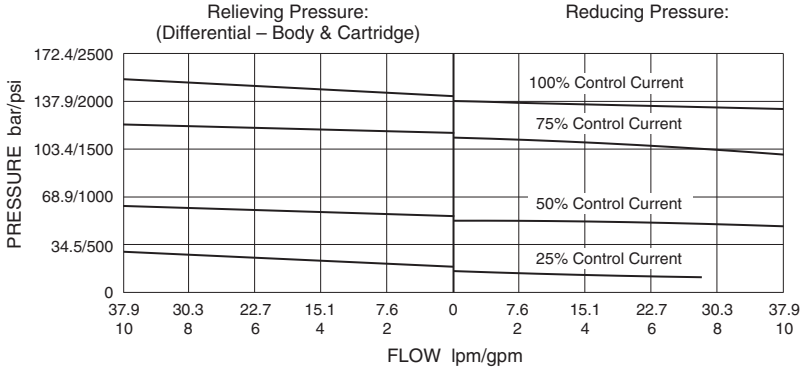
Installation Recommendation: When possible, the valve should be mounted below the reservoir oil level. This will maintain oil in the armature preventing trapped air instability. If this is not feasible, mount the valve horizontally for best results.

Cavity: VC98-3; See page 9.110.1

Cavity Tool: CT98-3XX; See page 8.600.1

Seal Kit: SK90-3X-BM; See page 8.650.1; **Coil Nut:** Part No. 4540560

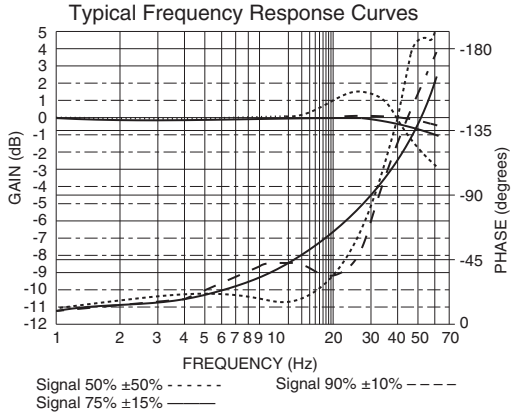
Typical Reducing/Relieving Pressure vs. Flow
For a Regulated Pressure with 172.4 bar (2500 psi) Inlet Pressure for Various Percentages of Nominal Control Currents



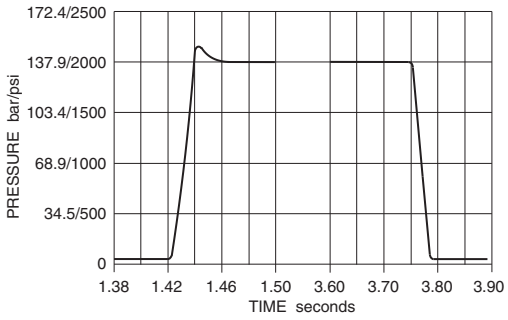
Internally Piloted — TS90-31

PERFORMANCE (continued)

Typical Frequency Response Curves

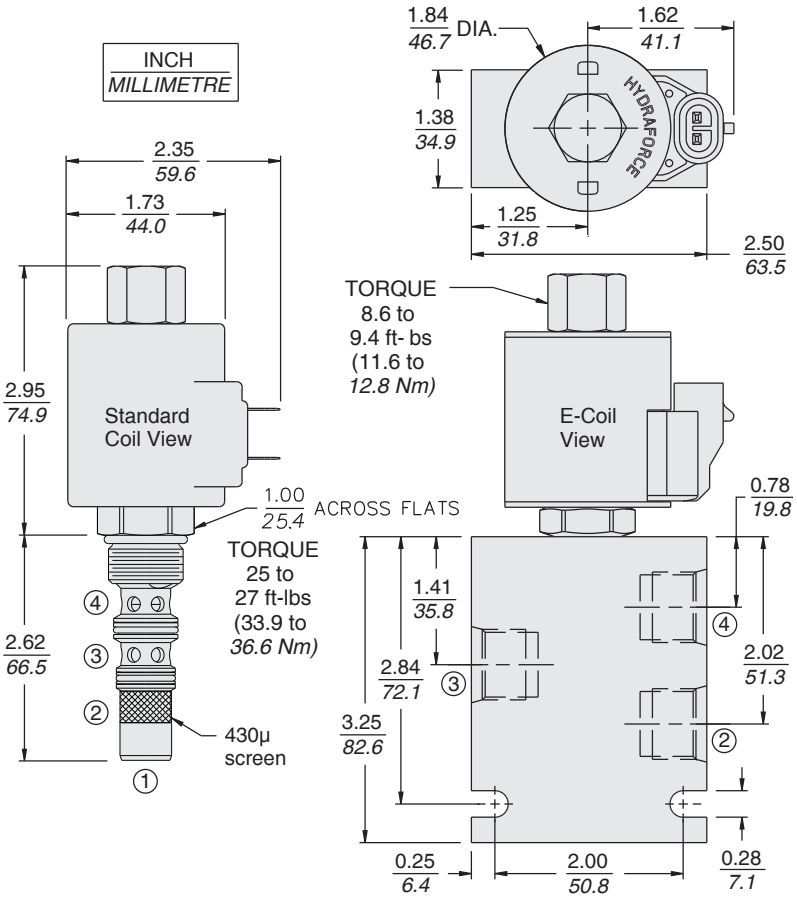


Typical Step Response Curve
Reducing Pressure Shown; No Flow
Inlet Pressure: 172.4 bar/ 2500 psi
12 VDC E-Series Coil



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

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.25 kg. (0.55 lbs.); Steel with hardened work surfaces. Zinc-plated exposed surfaces. O-rings standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

Standard Coil: Weight: 0.32 kg. (0.70 lbs.) Unitized thermoplastic encapsulated, Class H high temperature magnet-wire. 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.
Note: See page 3.400.1 for all E-Coil retrofit applications.

TO ORDER

TS90-31 - __ - __ - __ __ __ __

Porting
Cartridge Only **0**
SAE 6 **6T**
SAE 8 **8T**

Seals
Buna N **N**
Fluorocarbon **V**

Voltage
Less Coil **0**
12 VDC (0.88 amps max.) **12**
24 VDC (0.44 amps max.) **24**
Consult factory for other voltages

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

Termination E-Coil
EG DIN 43650 (IP65 Rated)
EL Leadwires (2) (IP69K Rated)
ER Deutsch DT04-2P (IP69K Rated)
EY Metri-Pack® 150 (IP69K Rated)
EJ Amp Jr. Timer (IP69K Rated)

Coils with internal diode are available. Consult factory.

Note: This valve uses a 10-size coil and the VC98-3 cavity, which is a variation of a 10-size cavity.