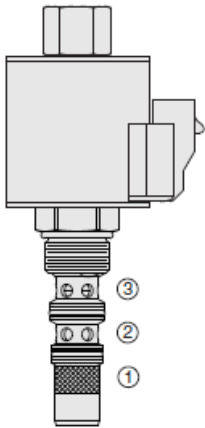




## Overview



### Description

TS90-31 is a pilot operated, spool type, proportional pressure reducing/relieving valve. The regulated pressure is proportional to the input electrical current. Protected by 50 x 50 mesh screen.

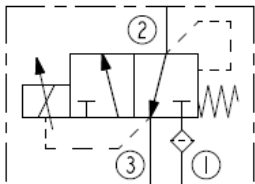
### Operation

Without applied current, the TS90-31 allows bidirectional flow from port 2 to port 3, while blocking port 1. When the coil is energized, port 2 is connected to port 1, and pressure at port 2 is controlled proportional to the amount of current applied to the coil. If pressure at port 2 exceeds the setting induced by the coil, pressure is relieved to port 3.

### Features

- o 12 and 24 volt coils standard.
- o Optional waterproof E-Coils rated up to IP69K.
- o Valve spool protected by a 50x50 mesh screen.

## Symbol



## Ratings

### Pressure Ratings

Pressure rating	206.8 bar (3000 psi)	- Note: Ports 1, 2
	68.9 bar (1000 psi)	- Note: Port 3
Burst pressure	344.7 bar (5000 psi)	
Adjustable pressure range	0 to 137.9 bar (0 to 2000 psi)	
Note	Tank port pressure is additive to valve setting	

### Flow Ratings

Flow rating	37.9 lpm (10 gpm)
Maximum pilot flow	0.85 lpm (0.23 gpm)

### Temperature Ratings

Operating fluid temperature	-40 to 100 °C (-40 to 212 °F)	- Note: With buna N seals
	-26 to 204 °C (-15 to 400 °F)	- Note: With fluorocarbon seals
Storage temperature	-40 to 70 °C (-40 to 160 °F)	
Ambient temperature	-40 to 70 °C (-40 to 160 °F)	

### Other Ratings

Corrosion protection	960 hr salt spray per ASTM b117
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## Operating Parameters

Fluids	Mineral based or synthetic with lubricating properties
Fluid viscosity range	7.4 to 420 cSt
Maximum operating contamination level	18/16/13 per ISO 4406

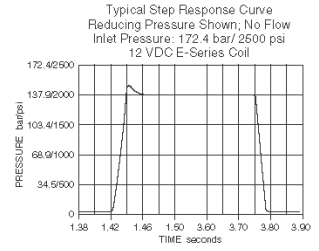
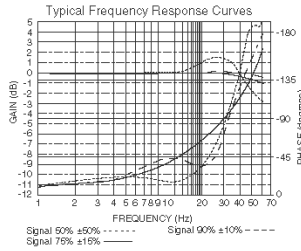
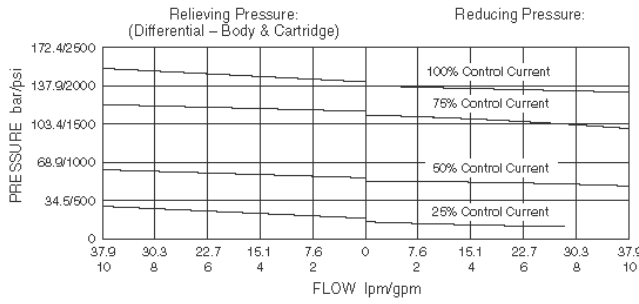
## Properties

Unit weight	0.25 kg (0.55 lb)
Internal wetted surface area	223 cm <sup>2</sup> (34.6 in <sup>2</sup> )

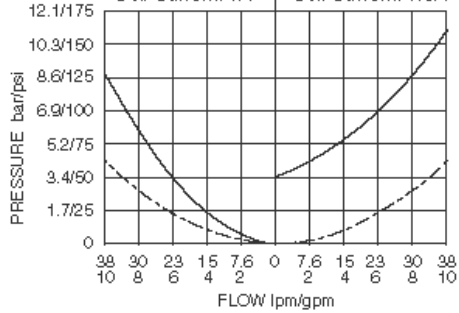


Performance

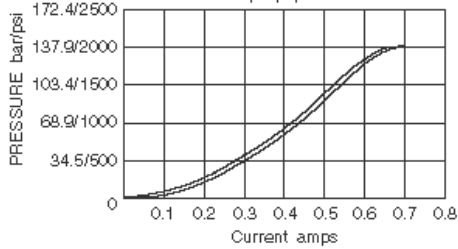
Typical Reducing/Relieving Pressure vs. Flow  
For a Regulated Pressure with 172.4 bar (2500 psi) Inlet Pressure  
for Various Percentages of Nominal Control Currents



Typical Pressure Drop vs. Flow  
Cartridge, Body & Line —; Body & Line - - -  
Relieving Pressure Port 3 to 4  
Reducing Pressure Port 2 to 3  
Coil Current: 0A  
Coil Current: 0.5A

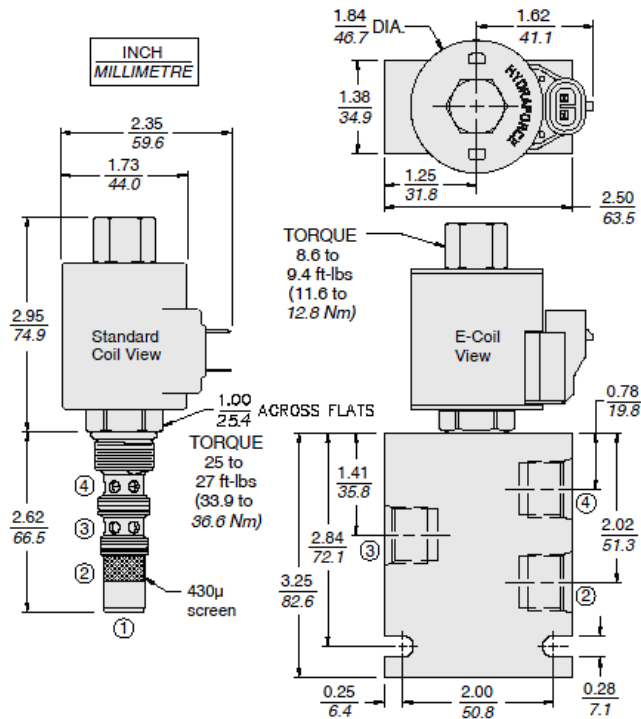


Reducing Pressure vs. Current  
Inlet Pressure 172 bar (2500 psi) at No Flow  
Control Current (amps) with 100 Hz Dither





Dimensions



Installation Specifications

Cavity	VC98-3
Cartridge installation torque	32.5 to 33.9 N-m (24 to 25 ft-lb)
Coil nut torque	6.8 to 9.5 N-m (5 to 7 ft-lb)
Orientation restriction	None

Accessories

Seal kit	SK90-3X-BM	- <b>Note:</b> X = seal option
Housings		
Coils		

Order Code

TS90-31 - - - -

Porting	Termination Std. D-Coil
Cartridge Only 0	DS Dual Spades
SAE 6 6T	DG DIN 43650
SAE 8 8T	DL Leadwires (2)
	DL/W Leads w/Weatherpak® Connectors
	DR Deutsch DT04-2P
Seals	Termination E-Coil
Buna N N	EG DIN 43650 (IP65 Rated)
Fluorocarbon Y	EL Leadwires (2) (IP69K Rated)
	ER Deutsch DT04-2P (IP69K Rated)
Voltage	EY Metri-Pack® 150 (IP69K Rated)
Less Coil 0	EJ Amp Jr. Timer (IP69K Rated)
12 VDC (0.88 amps max.) 12	
24 VDC (0.44 amps max.) 24	

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.

POSITION	CODE	DESCRIPTION
		TS90-31-H-J-L
H		Line Body
H	0	No Body
J		Seal
J	N	Buna-N



POSITION	CODE	DESCRIPTION
J	V	Fluorocarbon
L		Coil
L	0	No Coil
L	10DG	10 VDC, D-Coil, DIN 43650
L	10DL	10 VDC, D-Coil, Dual Lead Wires
L	10DS	10 VDC, D-Coil, Dual Spade
L	10EL	10 VDC, E-Coil, Dual Lead Wires
L	10ER	10 VDC, E-Coil, Deutsch
L	12DG	12 VDC, D-Coil, DIN 43650
L	12DL	12 VDC, D-Coil, Dual Lead Wires, 18 inches long
L	12DL/36	12 VDC, D-Coil, Dual Lead Wires, 36 inches long
L	12DL/W	12 VDC, D-Coil, Dual Lead Wires with Weatherpak
L	12DR	12 VDC, D-Coil, Deutsch
L	12DS	12 VDC, D-Coil, Dual Spade
L	12EG	12 VDC, E-Coil, DIN 43650
L	12EJ	12 VDC, E-Coil, AMP Jr.
L	12EL	12 VDC, E-Coil, Dual Lead Wires, 18 inches long
L	12EL/36	12 VDC, E-Coil, Dual Lead Wires, 36 inches long
L	12ER	12 VDC, E-Coil, Deutsch
L	12EY	12 VDC, E-Coil, Metri-Pack 150
L	20DS	20 VDC, D-Coil, Dual Spade
L	20ER	20 VDC, E-Coil, Deutsch
L	24AG	24 VDC, D-Coil, DIN 43650
L	24AP	24 VDC, D-Coil, 1/2" Conduit and Dual Lead Wires
L	24DG	24 VDC, D-Coil, DIN 43650
L	24DL	24 VDC, D-Coil, Dual Lead Wires
L	24DL/W	24 VDC, D-Coil, Dual Lead Wires with Weatherpak
L	24DP	24 VDC, D-Coil, 1/2" Conduit and Dual Lead Wires
L	24DR	24 VDC, D-Coil, Deutsch
L	24DS	24 VDC, D-Coil, Dual Spade
L	24EG	24 VDC, E-Coil, DIN 43650
L	24EJ	24 VDC, E-Coil, AMP Jr.
L	24EL	24 VDC, E-Coil, Dual Lead Wires, 18 inches long
L	24EL/36	24 VDC, E-Coil, Dual Lead Wires, 36 inches long
L	24ER	24 VDC, E-Coil, Deutsch
L	24EY	24 VDC, E-Coil, Metri-Pack 150
L	36DS	36 VDC, D-Coil, Dual Spade