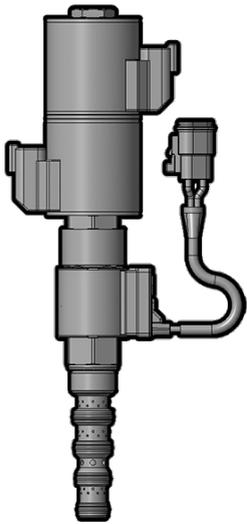




## Overview



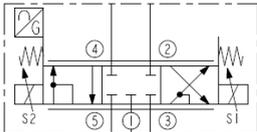
### Description

A direct-acting, 3 position, 5 port, proportional, directional control, screw-in cartridge valve with position feedback. The valve is operated by a hydraforce ESDR controller where the command input to the esdr to operate the valve is via can wiring. The valve's spool position from neutral to fully shifted is monitored by the valve's lvdt coil to provide feedback signal voltage via Vout wiring to the ESDR for closed loop valve control. Port 1 is used as a load sense port.

### Features

- Fast response time
- Low flow option for maximum resolution
- Integral load sensing
- Near zero hysteresis
- On-coil PID control with LVDT feedback
- Plug-and-play operation by CAN message

### Symbol



## Ratings

### Pressure Ratings

Pressure rating	250 bar (3625 psi)
Proof pressure	345 bar (5000 psi)
Burst pressure	779 bar (11300 psi)

### Flow Ratings

Flow rating	11.35 lpm (3.0 gpm)
Maximum internal leakage	1016 ml/min (62 in <sup>3</sup> /min) - <b>Note:</b> At 207 bar (3000 psi) 82 ml/min (5 in <sup>3</sup> /min) - <b>Note:</b> At 17.2 bar (250 psi)

### Temperature Ratings

Operating fluid temperature	<b>!</b> Limited by sensor operating temperature -40 to 100 °C (-40 to 212 °F) - <b>Note:</b> With buna N seals -26 to 204 °C (-15 to 400 °F) - <b>Note:</b> With fluorocarbon seals -54 to 107 °C (-65 to 225 °F) - <b>Note:</b> With polyurethane 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
Response	62 ms - <b>Note:</b> S1 nominal, pull-in 21 ms - <b>Note:</b> S1 nominal, drop-out 41 ms - <b>Note:</b> S2 nominal, pull-in 19 ms - <b>Note:</b> S2 nominal, drop-out
Hysteresis	Less than 1% FSO - <b>Note:</b> Typical, between 20 to 80% of flow range
Linearity	Less than 2.5% FSO - <b>Note:</b> Typical, between 20 to 80% of flow range
LVDT output position repeatability	Less than 0.3% difference



## Operating Parameters

### Fluids

Operating fluids	Mineral based or synthetic hydraulic fluid with lubricating properties	
Fluid viscosity range	7.4 to 420 cSt	
Maximum operating contamination level	20/18/14 per ISO 4406	

## Properties

Unit weight	1.47 kg (3.24 lb)	- <b>Note:</b> Cartridge, coils, and controller
Internal wetted surface area	813.5 cm <sup>2</sup> (49.64 in <sup>2</sup> )	

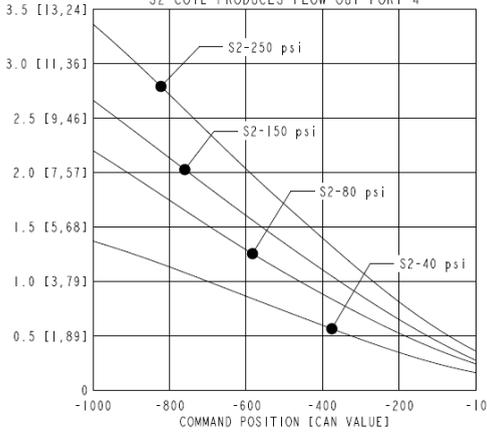
## LVDT Coil Specifications

Supply voltage (Vcc)	+5 to +14 Vdc	
Calibrated output voltage (Vout)	2.6 to 4.5 Vdc	- <b>Note:</b> S1 coil
	2.4 to 0.5 Vdc	- <b>Note:</b> S2 coil
Maximum output voltage (Vout)	4.6 Vdc	- <b>Note:</b> S1 coil
	0.4 Vdc	- <b>Note:</b> S2 coil
Failure mode voltage	+0.15 Vdc	
Environmental rating	IP69K	
Vibration	10 G	- <b>Note:</b> 10 to 2000 Hz sinusoidal
Mechanical shock	50 G	- <b>Note:</b> 11 ms half-sine
ESD	±15 kV	- <b>Note:</b> Air discharge, nondestructive
EMI	EN 13766-1	- <b>Note:</b> With ESDR controller
Operating temperature	-40 to 85 °C (-40 to 185 °F)	
Connection	See Wiring	

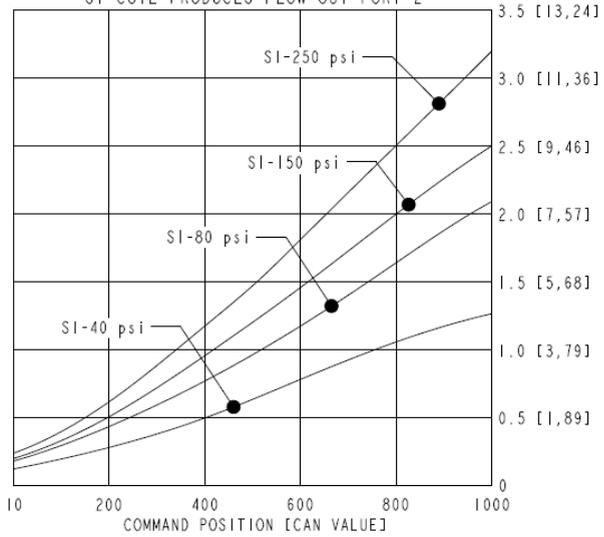


Performance

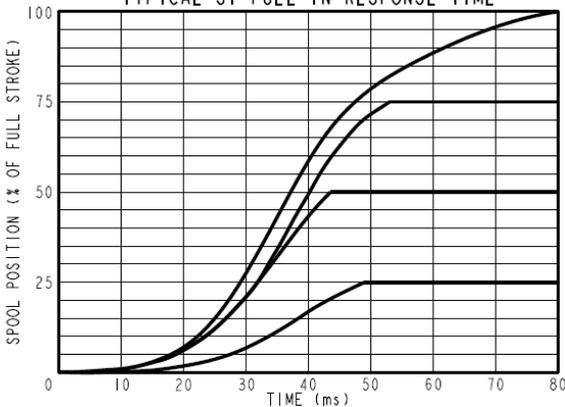
TYPICAL FLOW VS COMMAND POSITION  
WITH EC10-32-40, EC10-32-80, EC10-32-150, & EC10-32-250 12V E-COIL.  
S2 COIL PRODUCES FLOW OUT PORT 4



S1 COIL PRODUCES FLOW OUT PORT 2

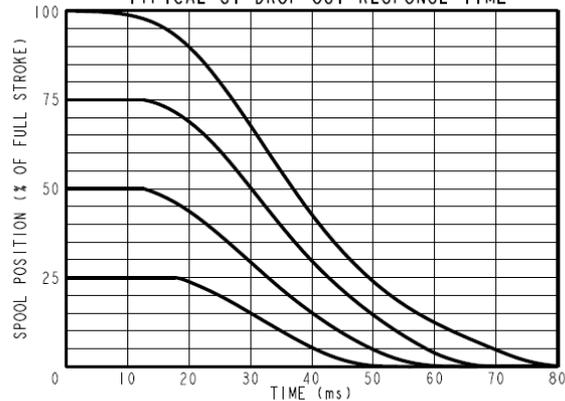


TYPICAL S1 PULL-IN RESPONSE TIME



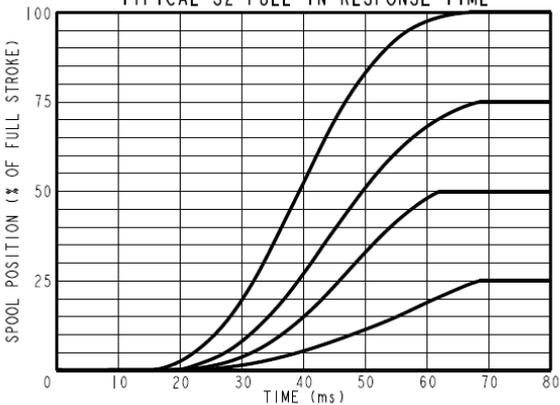
NOTE: OPTIMIZED PID SETTINGS USED TO ACHIEVE RESPONSE TIMES SHOWN

TYPICAL S1 DROP-OUT RESPONSE TIME



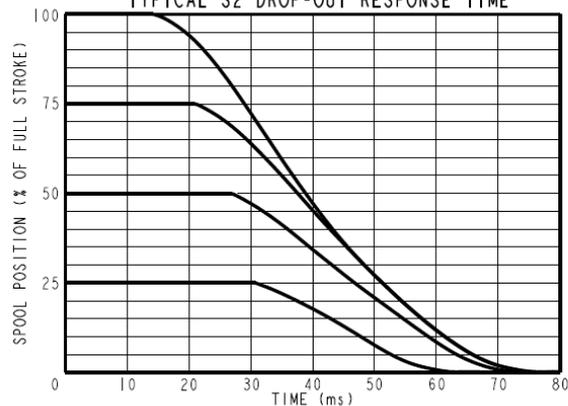
NOTE: OPTIMIZED PID SETTINGS USED TO ACHIEVE RESPONSE TIMES SHOWN

TYPICAL S2 PULL-IN RESPONSE TIME



NOTE: OPTIMIZED PID SETTINGS USED TO ACHIEVE RESPONSE TIMES SHOWN

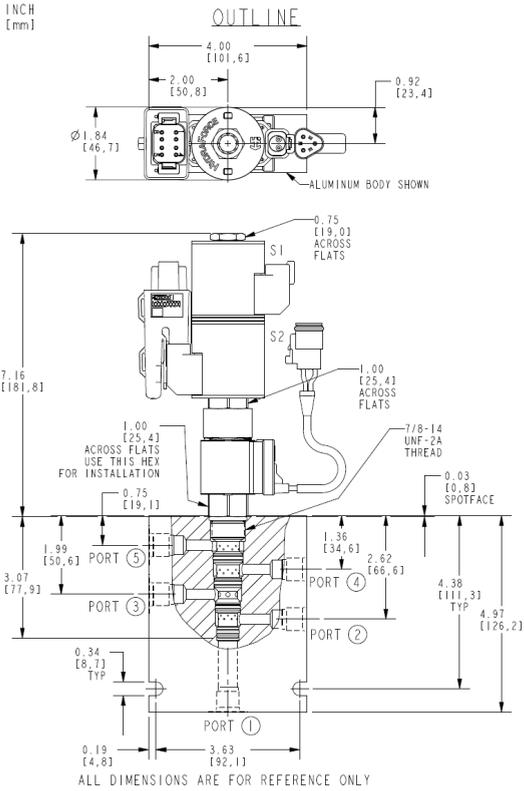
TYPICAL S2 DROP-OUT RESPONSE TIME



NOTE: OPTIMIZED PID SETTINGS USED TO ACHIEVE RESPONSE TIMES SHOWN



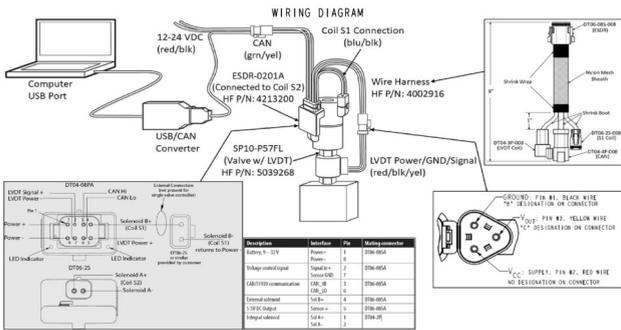
Dimensions



Installation Specifications

- Cavity: VC10-5
- Cartridge installation torque: 44.7 to 50.2 N-m (33 to 37 ft-lb)  
61.0 N-m (45 ft-lb) - **Note:** Maximum
- Coil nut torque: 6.8 to 9.5 N-m (5 to 7 ft-lb)
- Orientation restriction: None

Wiring



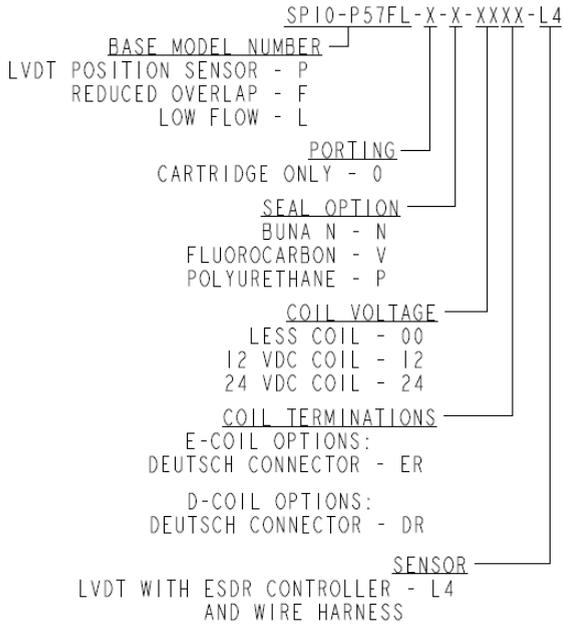
Accessories

- Seal kit: SK10-5X-MMMM - **Note:** X = seal option
- Wire harness: HF P/N: 4002916
- ESDR-0201A: HF P/N: 4213200
- SP10-P57FL: HF P/N: 5039268 - **Note:** Valve only w/LVDT sensor

Order Code



ORDERING INFORMATION



**Model Options**

**SP10-P57FL-H-J-L-M**

**H Line Body**

CODE	DESCRIPTION
0	No Body
6T	Aluminum SAE 6
8T	Aluminum SAE 8

**J Seal**

CODE	DESCRIPTION
N	Buna-N
V	Fluorocarbon
P	Polyurethane

**L Coil**

CODE	DESCRIPTION
0	No Coil, D-Coil Spacer
0E	No Coil, E-Coil Spacer
12DR	12 VDC, D-Coil, Deutsch
12ER	12 VDC, E-Coil, Deutsch
24DR	24 VDC, D-Coil, Deutsch
24ER	24 VDC, E-Coil, Deutsch

**M Position Sensor**

CODE	DESCRIPTION
L4	LVDT with ESDR controller and wire harness