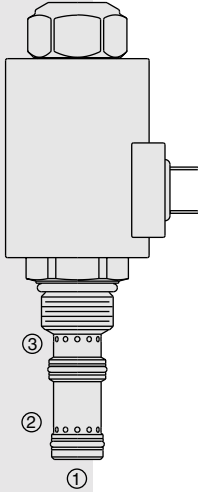


ELECTRO-PROPORTIONAL VALVES—FLOW CONTROL

ZL70-33 Proportional, Bi-Directional Flow Control,

U.S. Patent
6,116,263



DESCRIPTION

A solenoid-operated, electrically-variable, three-port, pressure-compensated, spool-type, normally closed when de-energized, proportional, bi-directional, priority-type flow control valve. An internal compensator spool provides compensated flow across the proportional orifice regardless of flow direction.

OPERATION

The ZL70-33 provides regulated flow from port ① to port ③ with bypass at port ②; or regulated flow from port ③ to port ② with port ① blocked externally, typically with a check valve (see symbol drawing). Regulated flow is proportional to electric current applied to the solenoid.

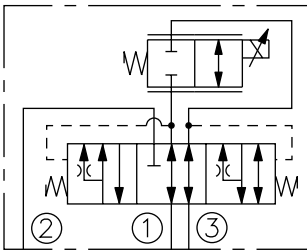
Application Notes: The ZL70-33 may be used for single-acting cylinder applications where lowering is provided by gravity force. A minimum load (defined on performance curve as minimum pressure at port ③) is required for uninterrupted lowering.

The hydraulic circuit must include a check valve and a poppet-type solenoid valve (SV08-20 type) connected as shown on the circuit symbol and placed close to the ZL70-33 valve, if possible in the same manifold. See Application Guide.

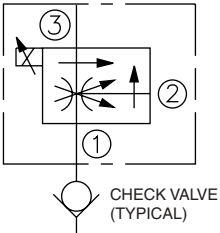
Operation of Manual Override: To Engage: Turn clockwise approximately 1 turn to reach start point. Continue another approximately 5 turns to full shift. To Disengage: Turn counterclockwise approximately 6 turns until positive stop is found.

SYMBOLS

USASI/ISO:



ABBREVIATED SYMBOL:



FEATURES

- Excellent linearity and hysteresis.
- Hardened spool and cage for long life.
- Optional coil voltages and terminations.
- Efficient wet armature construction.
- Manual Override option.

RATINGS

Maximum Operating Pressure: 240 bar (3500 psi)

Regulated Flow: Range A: 0–19 lpm (0–5.0 gpm); Range B: 0–9.5 lpm (0–2.5 gpm)

Input Flow: Range A: 0–25.5 lpm (0–6.5 gpm); Range B: 0–15 lpm (0–4.0 gpm)

Internal Leakage: 0.38 lpm (0.10 gpm) maximum at zero current

Electrical: 2 standard voltage ratings

Coil Voltage	Threshold Current	Max. Control Current
12 VDC	250 ± 100 mA	1400 ± 100 mA
24 VDC	125 ± 50 mA	750 ± 50 mA

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

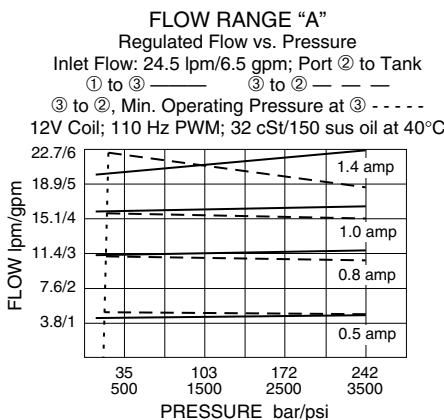
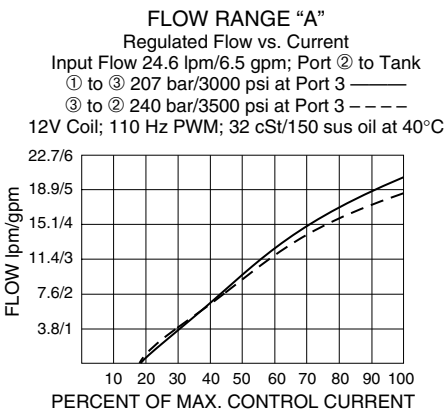
Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 ssu)

Installation: No restrictions; See page 9.020.1.

Cavity: VC10-L3; See page 9.110.1; **Cavity Tool:** CT10-3X-XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

PERFORMANCE



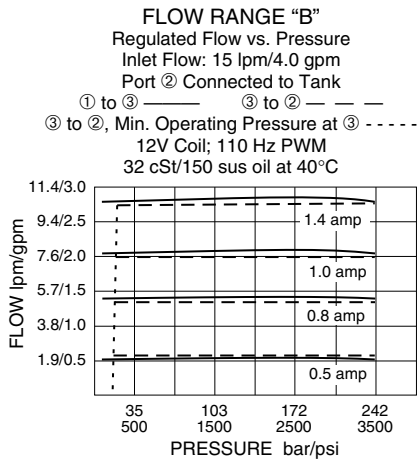
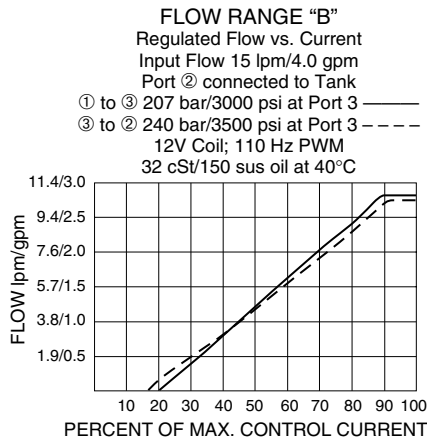
Recommended Controllers (See Section 3)

Input Sig. w/12V Coil	DIN Coil Mount	PCB Board	Metal Box	DIN Rail Mount
0-5 VDC	7114950	4000046	4000049	4000136
0-10 VDC	4000070	4000141	4000124	4000137
4-20 mA	4000123	4000143	4000130	4000139
PWM	—	4000144	4000133	4000140
w/24V Coil				
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

Normally Closed

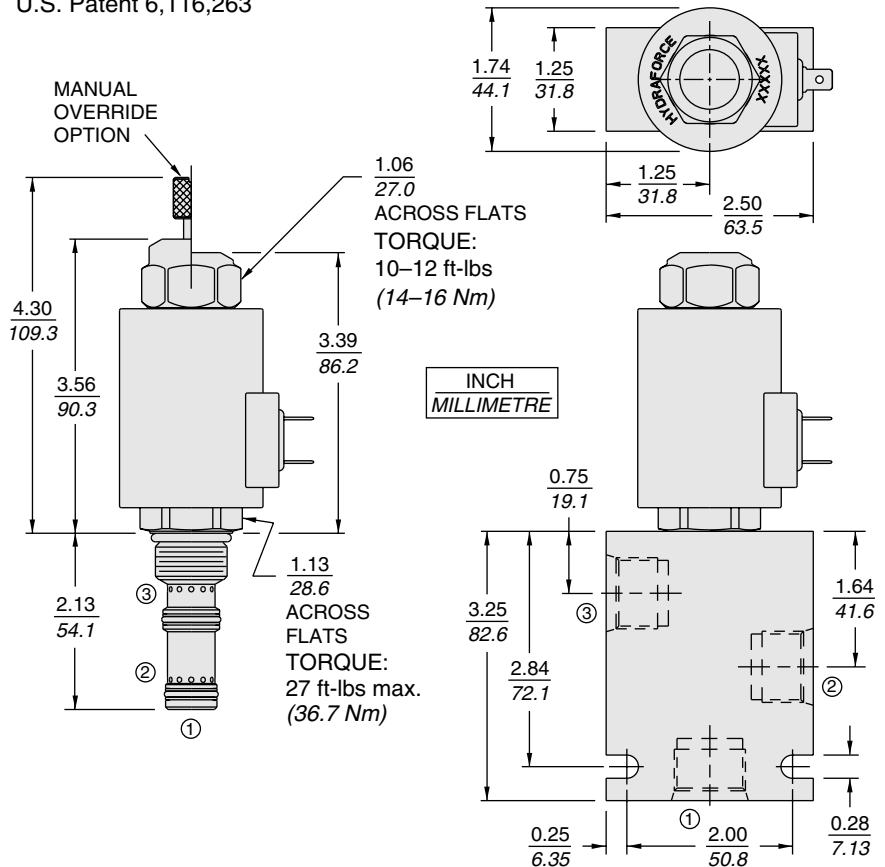
ZL70-33

PERFORMANCE (continued)



DIMENSIONS

U.S. Patent 6,116,263



MATERIALS

Cartridge: Weight: 0.32 kg. (0.7 lbs.); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.59 kg. (1.3 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 240 bar (3500 psi); See page 8.010.1. Steel and ductile iron bodies available; dimensions may differ; consult factory.

PV70 Series Coil: Weight: 0.32 kg. (0.7 lbs.); Unitized thermoplastic encapsulated, Class H high temperature magnet-wire; See page 3.200.7.

TO ORDER

ZL70-33		-	-	-	-	-	-	-
Range								
0-19 lpm (0-5.0 gpm)	A							
0-9.5 lpm (0-2.5 gpm)	B							
Option(s)								
None (Blank)								
Manual Override	M							
Porting								
Cartridge Only	0							
SAE 6	6T							
SAE 8	8T							
Seals								
Buna N (Std.)	N							
Fluorocarbon	V							
Terminations								
Dual Spades	DS							
DIN 43650	DG							
Leadwires (2)	DL							
Leads w/Weatherpak® Connectors	DL/W							
Deutsch DT04-2P	DR							
Voltage								
Less Coil	0							
12 VDC	12							
24 VDC	24							
Coils with internal diode are available. Consult factory.								