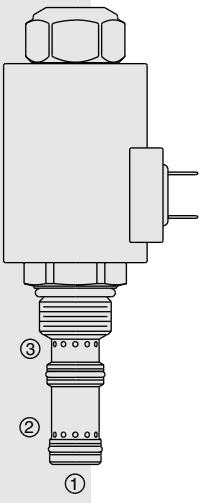
ZL70-36 Proportional, Bi-Directional Flow Control,

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.

OPERATION

The **ZL70-36** provides priority 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.

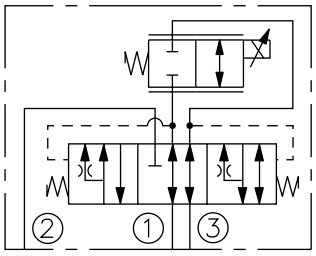
Application Notes: The ZL70-36 may be used for single-acting cylinder applications where lowering is provided by gravity force. The ZL 70-36 has no minimum load restrictions provided the load is enough to overcome cylinder friction and other frictions in the system. At low loads, the lowering speed can be slower than at heavier load if pressure drop is less than the compensation value of the valve.

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 ZL70-36 valve, if possible in the same manifold. See Application Guide.

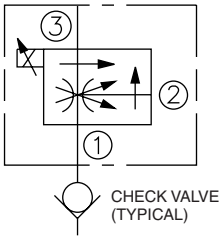
Operation of Manual Override: To Engage: Turn clockwise approximately 1 turn to reach start point. Continue another approximately 5 turns to full shift. To Disengage: Turn counterclockwise approximately 6 turns until positive stop is found.

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	Resistance @ 20°C	Threshold Current	Max. Control Current
12 VDC	4.7 ohms	300 ± 100 mA	1400 ± 100 mA
24 VDC	19.0 ohms	150 ± 50 mA	700 ± 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)

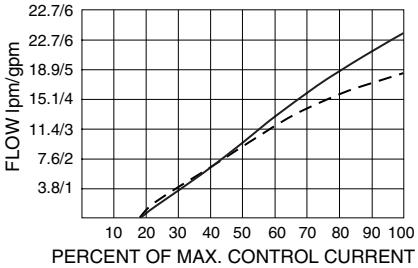
Installation: No restrictions; See page 9.020.1.

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

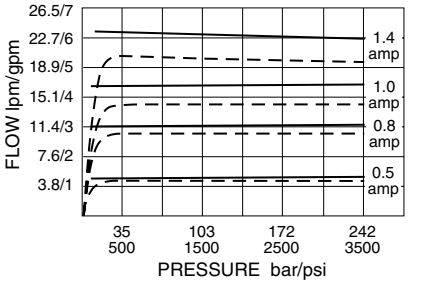
Seal Kit: SK10-3X-MM; See page 8.650.1

PERFORMANCE

FLOW RANGE "A"
Regulated Flow vs. Current
Input Flow 24.6 lpm/6.5 gpm; Port ② to Tank
① to ③ 207 bar/3000 psi at Port 3 ———
③ to ② 240 bar/3500 psi at Port 3 – – – –
12V Coil; 110 Hz PWM; 32 cSt/150 sus oil at 40°C



FLOW RANGE "A"
Regulated Flow vs. Pressure
Inlet Flow: 24.5 lpm/6.5 gpm; Port ② to Tank
① to ③ ——— ③ to ② — — —
12V Coil; 110 Hz PWM; 32 cSt/150 sus oil at 40°C



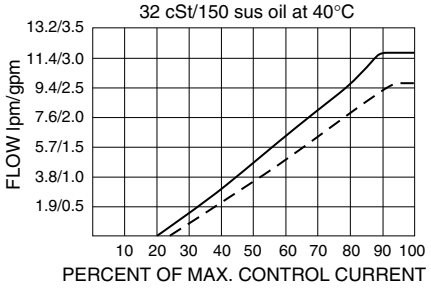
Recommended Controllers (See Section 3)

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

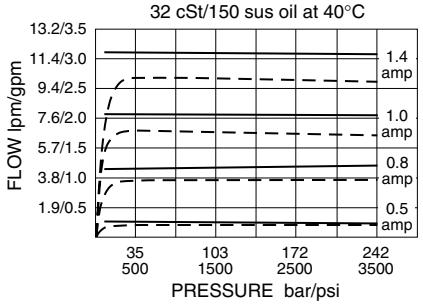
Normally Closed — ZL70-36

PERFORMANCE (continued)

FLOW RANGE "B"
Regulated Flow vs. Current
Input Flow 15 lpm/4.0 gpm
Port ② connected to Tank
① to ③ 207 bar/3000 psi at Port 3 ———
③ to ② 240 bar/3500 psi at Port 3 – – – –
12V Coil; 110 Hz PWM
32 cSt/150 sus oil at 40°C



FLOW RANGE "B"
Regulated Flow vs. Pressure
Inlet Flow: 15 lpm/4.0 gpm
Port ② Connected to Tank
① to ③ ——— ③ to ② — — —
12V Coil; 110 Hz PWM
32 cSt/150 sus oil at 40°C



DIMENSIONS

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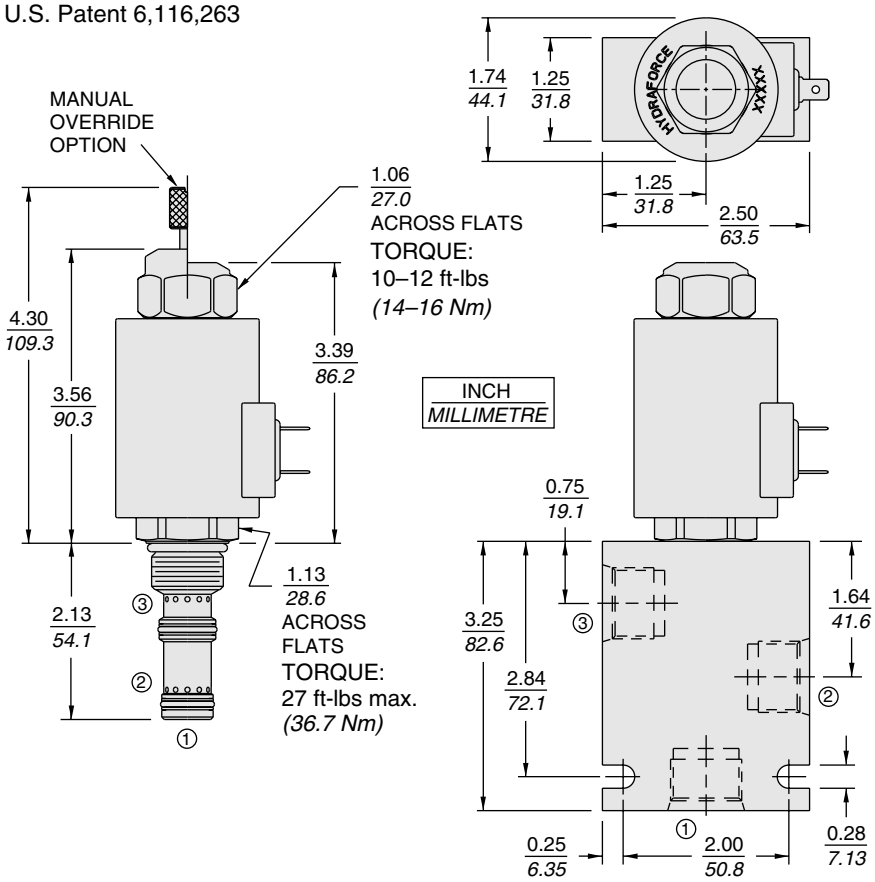

MATERIALS

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 bodies available; consult factory.

PV70 Series Coil: Weight: 0.32 kg. (0.7 lbs.); Unitized thermoplastic encapsulated, Class H high temperature magnet-wire; See page 3.270.1.

TO ORDER

ZL70-36 ___ - ___ - ___ - ___

Range
- **A** 0–19 lpm (0–5.0 gpm)
- **B** 0–9.5 lpm (0–2.5 gpm)

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

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

Seals
- **N** Buna N (Std.)
- **V** Fluorocarbon

Voltage
- **0** Less Coil
- **12** 12 VDC
- **24** 24 VDC

Coils with internal diode are available. Consult factory.

Terminations
- **DS** Dual Spades
- **DG** DIN 43650
- **DL** Leadwires (2)
- **DL/W** Leads w/Weatherpak® Connectors
- **DR** Deutsch DT04-2P