

# Subsurface Barrier Valves

**Caledyne**

*Innovation and Integrity by Design*

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## Introduction

Caledyne have a wide range of sub surface barrier valves that can be split into two main product lines. The Fluid Loss Valve is an unidirectional barrier, designed to hold pressure from above. The Mechanical Isolation Valve and Completion Barrier Valve are bidirectional barrier valves, forming a complete barrier in the well.

The Fluid Loss Valve (FLV) is an ISO28781 type AA valve used to hold pressure from above and used in pre and post-production pressure applications such as to protect the formation when the pump is switched off.

The Mechanical Isolation Valve (MIV) and Completion Barrier Valve (CBV) are ISO28781 type CC valves used to hold pressure from above and below and used in pre and post-production pressure applications such as isolating lower completions.

## Caledyne FLV

### Description

The Caledyne Fluid Loss Valve (FLV) is designed as a cost effective solution for ESP completions, to protect the formation when the pump is switched off. Installed below the pump, the FLV is open to allow flow. A lock open facility gives the option to carry out operations below the FLV.

### Key Features

- Proven technology. The primary seal is a ball, with a non-elastomeric ball seat.
- Optimised design to reduce part count and complexity.
- Secondary dome seal pilots from open to closed to form a temporary restriction to activate the primary seal.
- Lock open facility to allow bull heading or intervention.
- Minimal pressure drop. The piloting mechanism is effectively invisible when producing.
- Pull up to open and close facilitates use of coil tubing to lock open and reset the FLV.

### Applications

- Under-balanced drilling. The valve allows the completion to be installed without causing damage to the formation.
- Packer setting. The FLV is installed below a hydraulically set sump packer. Pressuring up the tubing against the FLV sets the packer.

### Technical Information for FLV

Parameter	69 x 125 mm	3 1/2" x 7" SC	3 1/2" x 7"	4 1/2" x 7 5/8"	5 1/2" x 9 5/8"
Maximum OD	4.924" (125.08mm)	5.200" (132.08mm)	5.500" (139.70mm)	6.000" (152.40mm)	8.349" (212.06mm)
Minimum ID	2.713" (68.91mm)	2.874" (73.00mm)	2.874" (73.00mm)	3.250" (82.55mm)	4.75" (120.65mm)
Length	67" (1702.0mm)	69" (1752.6mm)	69" (1752.6mm)	78" (1981.2mm)	109" (2768.6mm)
Upper connection	3 1/2" 9.2# premium box	3 1/2" 9.2# premium box	3 1/2" 9.2# premium box	4 1/2" 12.6# premium box	5 1/2" 17# premium box
Lower Connection	3-1/2" 9.2# premium pin	3-1/2" 9.2# premium pin	3-1/2" 9.2# premium pin	4 1/2" 12.6# premium pin	5 1/2" 17# premium pin
Pressure Rating	5000psi				
Temperature Rating	0-150 °C				
Maximum hang off weight	46,500lbf	44,500lbf	214,500lbf	118,000lbf	192,000lbf
Metallurgy	AISI 4140-45 18-22 Rc 80ksi / AISI 420 18-22Rc 80 ksi 13%Cr / Inconel 718 (UNS N07718) / per NACE MR0175				
Elastomer	As required, viton as standard				
Ballseat	Peek compound				



## Mechanical Isolation Valve / Completion Barrier Valve (patent applied for)

### Description

**The Caledyne Mechanical Isolation Valve (MIV)** is a mechanically actuated ball valve, which may be used to isolate the formation during installation of the upper completion or other such operations. The valve is actuated by a shifting tool, which may be attached to the lower end of a wash string. When the wash string is removed, the valve is then automatically closed. The shifting tool may be re-orientated and used to open the valve. Alternatively, a stinger attached to the upper completion, which opens the valve when the upper completion is installed, may actuate the tool. When the upper completion is removed, the stinger automatically closes the valve as it is being removed.

An equalising feature may be incorporated to ensure pressure is balanced across the ball prior to opening.

**The Caledyne Completion Barrier Valve (CBV)** is a variant of the MIV which features a remote opening mechanism allowing the CBV to be opened remotely by applying tubing pressure cycles, which actuate an opening mechanism at the top of the tool. The CBV may be mechanically opened and closed with a shifting tool both before and after it is cycled open.

### Key Features

- Bi-directional seal acts as a down hole barrier.
- Forces due to pressure differentials across the ball do not affect the open/close mechanism or the remote opening module.
- Equalising feature operates across the ball and does not equalise to the annulus, therefore the MIV/CBV may be run above a packer.
- Unlimited mechanical open or close cycles.
- Optimised design to reduce part count and complexity.
- Smooth internal bore with a minimal number of locations for debris to collect.
- Remote opening module can be replaced for different actuation modules or to vary the number of pressure cycles to open.
- Tool joint design allows for full redundancy across this part of the tool.
- Remote opening mechanism can be independently tested prior to assembling inside the valve.

### Applications

- Isolation of the wellbore during completion operations.
- Isolation of the wellbore during production operations.
- Isolation of the wellbore during maintenance operations.
- Isolation of the wellbore during testing operations.
- Isolation of the wellbore during workover operations.



