

CONVAC S⁴

LNV Suction Bypass



The all new Linear Needle Valve (LNV) is specifically designed to function as a dredge suction bypass inlet. The revolutionary design of the LNV was guided by the design philosophy of rugged maintainability. The massive inlet “needle” is configured to allow smooth and controlled flow into the bypass pipe. The actuator is directly connected to the inlet needle support tube, there are no extra pivot pins and linkages that can bend and break. Other features include a standard 150# bolt flange mounting pattern, a bubble tight seal when fully closed, a field replaceable seal ring, an inline and shrouded actuator, steel tubing internal connections, internal position sensor with 4-20mA position signal, a linear inlet opening and field replaceable linear bearings.

The robust LNV is designed for continuous “proportional modulation” cycling to maximize dredge production. The LNV “brawn” and the CONVAC S4 “brain” combine to offer unsurpassed bypass valve operation and reliability.

TWINKLE CO

LNV

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The bypass valve assembly is a key component of a suction bypass control system. The bypass valve assembly has to be simple, rugged and designed for continuous duty underwater operation. It is puzzling that many suction bypass control systems use a butterfly valve as the bypass valve. Butterfly valves are a tried and true technology, but as a suction bypass valve they are truly tired. Other than a cheap price, which allows those who use them to buy low and sell high, butterfly valves have little to offer. The following table compares ten critical suction bypass valve characteristics and shows that the Linear Needle Valve (LNV) is superior to the butterfly valve.

A comparison of bypass valve characteristics.

Twinkle Co LNV	Valve characteristic	Butterfly valve
Bubble tight. Inexpensive field replaceable O-ring seal and sealing face.	SEALABILITY	Bubble tight. Disc and disc seat are costly and difficult to repair.
Linear opening area.	LINEARITY	Opening area is not linear with valve position.
Specifically designed for continuous modulating operation.	SUITABILITY	Best used for sporadic emergency operation.
Valve actuator is directly connected to the valve flow control "needle".	DURABILITY	Valve actuator is lashed to the valve shaft with failure prone linkages and couplings.
Modern design for use as a dredge suction bypass valve.	ORIGINALITY	Old technology, first used as a suction bypass valve in 1936.
Large bearings. Easily rotated or replaced using hand tools.	MAINTAINABILITY	Small bearings. Requires valve disassembly to remove and replace.
Single point mounting onto standard 150# flange bolt pattern.	SIMPLICITY	Often require a separate mounting bracket for the actuator.
Unrestricted water passage. Smooth flow.	CONTROLLABILITY	Restricted water passage. Turbulent flow.
Simple and direct linear arrangement cannot "overtravel".	REPEATABILITY	Worn or damaged links, pins or couplings will allow "overtravel".
Compact, rugged design. Installation envelope same OD as mounting flange.	INSTALLABILITY	Awkward shape. Installation envelope much larger than OD of mounting flange.