

CONVAC S4 LNV SUCTION BYPASS

TWINKLE CO



The time proven 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.

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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.

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

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