The information in this brochure is intended to introduce you to Vektek and our devices for power workholding. We have discovered that successfully implementing a power workholding system is a team effort. This collaboration consists of: Team Vektek, possibly an outside fixture designer, and you...the customer.

Team Vektek is here to assist in any way to see that your move to, or improvement of, Power Workholding is easy and cost effective.

Like you, we are a metalworking manufacturer.
Vektek Quality & Support

Quality is designed into our products

Vektek does exhaustive research, design development and testing to insure our products set the global workholding standard.

Vektek engineers extensively utilize a special black hard coating (BHC™) that gives device bodies extra durability. This high tech metallurgic surface hardening process virtually eliminates the bore scoring and scratching that are the most common reasons for seal failures and leakage in many cylinders.

Extensive use of Hard Chrome Plating provides improved durability of load bearing surfaces where it is critical to device life. Special seals and wipers prevent leaks and keep contaminants out.

Warranty is an indication of a manufacturer’s confidence in the ability of the product to run “trouble-free” for a specified time. Our hydraulic products are warranted to be free of defects for one year from the date of shipment.

Please compare the durability and long life of our devices with that of our competitors. Prove it to yourself. We welcome any head-to-head challenge.

Product Availability

We do our best to have products in stock. We keep shelf stock to be ready to ship rush orders quickly. We can ship the next day or even the same day if necessary.

Vektek Services

• A trained sales staff to assist you
• Technical advice and support
• Fixture concepts at no charge
• Technically trained field reps

• On-site Training - By appointment, we will come to your location for workholding training.
• Prompt price quotes.
• Order follow-up...we make sure you received your order promptly and have what you need!
• We stay connected.

Vektek’s Website:
www.vektek.com

• Order online 24/7
• PDF catalog
• CAD 2D & 3D drawings (Various formats)
• Parts lists
• Technical resources
• Site search
• Local reps

Repair and Maintenance

Seal kits are readily available when needed. Videos on our website show how to change a seal.

For those who do not wish to perform maintenance on their devices, Vektek offers a repair service. Contact us for details and scheduling.

Vektek is proud to have been an honoree of the Kansas Governor’s Exporter of the Year Award
Questions? Just ask Team Vektek - We are here to help!  
800-992-0236 • sales@vektek.com

Hydraulic clamps are either Single or Double Acting

**SINGLE ACTING**

Single acting clamps use hydraulic pressure to clamp the plunger/arm and a spring unclamps it.

**DOUBLE ACTING**

Double acting clamps increase reliability and use hydraulic pressure to clamp and unclamp the plunger/arm.

Q. What does LIVE and DECOUPLED system mean?  
A. How the hydraulic fluid is supplied to the system.

**LIVE SYSTEM...**

...the clamping devices on a fixture depend on a continuous hydraulic feed to maintain pressure during the machining process. This is accomplished by feeding pressure through directly connected hoses (ILL. A). For twin pallet machines, a rotating union is used (ILL. B).

**DECOUPLED SYSTEM...**

...a fixture is fed and pressurized with a pump, then hoses are disconnected once the part is loaded and clamped. The fixture, by itself, must retain pressure during the machining cycle. At part unload, pump hoses are re-connected allowing oil from the fixture to return to the pump tank.

**How to figure clamping FORCE**

To determine the force applied by a clamp you must know the pump operating pressure and the square inches of effective piston area. Piston area are listed in the specification charts in our catalog.

\[ \text{PRESSURE} \times \text{EFFECTIVE PISTON AREA} = \text{FORCE} \]

**Example**

\[ \begin{align*} 
\text{Inch:} & \quad 5000 \text{ psi} \times 0.626 \text{ in}^2 = 3130 \text{ lbs FORCE} \\
\text{Metric:} & \quad 350 \text{ Bar} \times 4.04 \text{ cm}^2 = 14.14 \text{ kN force} 
\end{align*} \]

**Clamping POSITION TIME formula**

VOLUME is the total cubic inches/cubic centimeters of oil to fill the fixture. The INPUT FLOW RATE is the pump’s capacity of flow per minute.

\[ \text{VOLUME} \div \text{INPUT FLOW RATE} = \text{POSITION TIME} \]

**Example**

\[ \begin{align*} 
\text{Inch:} & \quad 10 \text{ in}^3 \div 50 \text{ in}^3/\text{min.} = 0.2 \text{ minutes or 12 sec.} \\
\text{Metric:} & \quad 163.9 \text{ in}^3 \div 819 \text{ cm}^3/\text{min.} = 0.2 \text{ minutes or 12 sec.} 
\end{align*} \]

Vektek offers four lines of workholding products.

**HYDRAULIC INCH**

Operating Pressure: 5000 psi  
Minimum operating pressure for single acting devices is 750 psi. For double acting devices it is 500 psi

**HYDRAULIC METRIC**

Operating Pressure: 350 bar  
Minimum operating pressure for single acting devices is 51.7 bar. For double acting devices it is 34.5 bar

**HYDRAULIC LOW PRESSURE METRIC**

Operating Pressure: 1000 psi (7MPa) 70 bar  
Minimum operating pressure is 1.0 MPa (10 bar)

**PNEUMATIC**

Operating Pressure: 250 psig or less  
Minimum operating pressure is 30 psig
Q. How does a decoupled fixture maintain pressure?

A. With the use of an Accumulator and Shutoff Valve Decoupler.

Shutoff Valve Decouplers are either manual or automatically operated. They are self-contained units that include quick connect coupling(s)*, filters, pilot operated check valve, accumulator and over pressure relief valve. After the fixture is pressurized the valve is closed and the hydraulic supply hose is disconnected.

* One quick connect coupling for single acting systems, two for double acting system and possibly a third coupling for compressed air.

Accumulator
As hydraulic pressure builds in the system, fluid compresses the precharged inert gas in the accumulator. This creates a power source to maintain pressure.

Manual Shutoff Valve Decoupler
Used for Single Acting Systems with quick connect coupling, external accumulator and pressure gauge.

SELECTING A HYDRAULIC PUMP

First thing to consider; will the pump be operating single or double acting devices? Air/Hydraulic boosters are not typically used for double acting systems. It would require two boosters.

Next, will it be connected to the application all the time, or will it need to be disconnected (pallet decoupler)? Air/hydraulic pumps for pallet decoupled applications are not recommended because it demands quite a bit of its energy to pressurize an accumulator. Our electric/hydraulic pumps are recommended.

Is clamp and unclamp time an issue? If so, our Workholding and Advanced Workholding pumps have the highest flow rate.

Do you want the pump to interface with a machine controller? While it can be done with the 1/3 hp pump, it is not typically installed that way because it is not readily configured to have the electrical controls altered. Our Workholding and Advanced Workholding pump has an option to interface the PLC of your CNC machine.

Will it require a higher voltage than 115 VAC? Vektek’s Workholding and Advanced Workholding pumps are the only option for a higher voltage.

Does it need to have more than one control valve? If so, will the valve be mounted on the pump or remote mounted? All control valves located on the pump requires it to be one of our Workholding series pump. Remote mounted valves can be operated with any of our “pumps” including air/hydraulic.

OVERVIEW OF USABLE OIL VOLUME PER POWER SUPPLY

<table>
<thead>
<tr>
<th>Booster</th>
<th>Compact Pump Horz. 68 cu. in. Vert. 80 cu. in.</th>
<th>Compact Pump Horz. 128.15 cu. in. Vert. 91.54 cu. in.</th>
<th>Portable 1/3 HP Pump 108 cu. in.</th>
<th>Advanced Workholding 762 cu. in. (3.5 gal)</th>
</tr>
</thead>
</table>

Simple strap fixture improvement
Enhance a manual strap clamp fixture with a hydraulic powered work support and screw pump. To eliminate vibration and movement on the unsupported end of the part, one or more supports may be activated remotely by a single screw pump (A pressure gauge should be incorporated to assure proper working pressure is supplied.)

Work Support
Manual Screw Pump with Gauge

WORKHOLDING PUMP
700 cu. in. (2.2 gal)

ADVANCED WORKHOLDING
762 cu. in. (3.5 gal)
The 12 Degrees of Freedom
To properly locate any workpiece, you must surround and immobilize all 12 degrees of freedom.

Workpieces must be restricted during the manufacturing process. Every workpiece has 12 fundamental directions that it can move. These are called the 12 degrees of freedom. Understanding these possible movements will help you create accurate workholding fixtures that make it easy to locate the part.

The 12 degrees of freedom consist of six axial degrees of freedom and six radial degrees of freedom (see illustration). Each axis of the workpiece, length (X), depth (Y) and height (Z), has four degrees of freedom; two rotational and two sliding possibilities.

Make a simple Block Cylinder Fixture
Block cylinders are easy to use devices that require no special hardware, just bolt them down. Force range is variable from “negligible” to maximum cylinder capacity, simply by adjusting the input pressure.

To determine the output force for your application, multiply the piston area by your system operating pressure.

Easily plumbed from bottom or side ports. The threaded piston end allow the use of custom end attachments. Double acting block cylinders are recommended when used to activate mechanisms.

Threaded cylinders are the most economical workholding devices.

Threaded cylinders are easy to use. Vektek offers mounting brackets, blocks and flanges to make fixture design even simpler.

Designed for long life in high production applications, threaded cylinders reduce or eliminate part distortion by providing accurate, repeatable clamping force.

Double acting cylinders assure complete powered retraction for CNC controlled operations or when using heavy end effectors. Single acting cylinders should be used with small end effectors only.

3-2-1 Location Method
The primary bottom surface requires at least three points of contact. This restricts five degrees of freedom: downward Z-axis (#6) linear movement and both rotational movements around X-axis and Y-axis (#’s 7, 8, 9 & 10). A second surface requires at least two point of contact. This restricts three more degrees of freedom: Y-axis (#3 OR 4) linear movement in one direction and both rotational movements around the Z-axis (#11 & 12). A third surface requires only one point of contact. This restricts X-axis (#1 OR 2) linear movement in one direction.

This 3-2-1 method restricts nine degrees of freedom. The remaining three movement possibilities are addressed by proper clamping.

It is recommended that cutting forces be transmitted into fixed stops. Cylinders can be sized adequately to allow clamping across or against cutter forces.
Q. **What does 3 X 4 valve mean?**
A. **Three-position/Four-way valve.**

A Three-Position/Four-Way valve has three different valve operator positions, left, center, and right position. It is described as a four-way valve because there are four separate fluid flow paths or ports. They are commonly referred to as “P”, “T”, “A”, & “B”.

“P” = Pressure Port  
“T” = Tank  
“A” & “B” = Two working branches of the circuit, which are typically connected to a clamp, or actuator.

When the valve operator is in the left or right position, the valve directs the fluid flow through two separate flow paths at the same time. One position sends fluid from the pump (“P”) path to the working ("A") side of an actuator while the path from the opposite ("B") side of the actuator is directed back to ("T") tank. When the valve is shifted to the opposite position, the internal flow paths are reversed, sending fluid from “P” to “B” and “A” to “T”. This valve configuration is most commonly used to control double acting devices. The third or center position of a three-way valve allows for various circuit control operations or functions.

**2 X 3 Valve**

A two-position three-way valve has two different valve operator positions, open or closed. It is described as a three-way valve because there are three separate fluid flow paths, or ports. These paths or ports are commonly referred to as “P”, “T”, and “A”.

“P” = Pressure Port  
“T” = Tank  
“A” = The working branch of the circuit which is typically connected to the clamp, or actuator.

**2 X 3 Normally Closed Solenoid Valve** blocks the flow path from the pump while allowing fluid to flow from the actuator to tank in the unactuated (no electrical signal) position. When the valve is electrically actuated, the flow path is blocked from the pump and the flow path from the actuator is directed back to tank.

**2 X 3 Normally Opened Solenoid Valve** allows the fluid to flow from the pump to the actuator, while blocking flow path to the tank in the un-actuated (no electrical signal) position. When the valve is electrically actuated, the flow path is blocked from the pump and the flow path from the actuator is directed back to tank.
**THE MOST POPULAR SWING CLAMP**

TuffCam™ Swing Clamps were designed to meet the growing demand for high-speed, precise positioning, and heavy arm applications. TuffCam™ is a three cam design that will accurately swing, position and clamp in less than one second. TuffCam™ swing clamps are dedicated left swing or right swing. TuffCam™ has the patented Cam Follower Ball Seat and Vektek V-Groove technology.

**Single or Double Acting**

Swing clamps are either single or double acting (only available in double acting on low pressure - 7MPa swing clamps). Single acting clamps use hydraulic pressure to clamp the plunger/arm and a spring unclamps it. Double acting devices insure positive hydraulic pressure to clamp and unclamp the plunger/arm.

**Size**

Vektek swing clamps come in a variety of sizes and cylinder capacities. See inch, metric or 7MPa catalog for details of sizes available.

**www.vektek.com**

Visit our website for product information and specifications. Download 2D or 3D CAD files. Give us a call with any questions.
**Swing Arm Angle with Options**
All swing clamps come with a 90° swing. Vektek has swing restrictors available which can limit this swing to a 30°, 45°, 60° or call for a custom angle.

**Clocking**
Arm clocking is a feature that is available on all Vektek swing clamps. Clocking, indicated by drill points on the plunger, can help by standardizing arm location at a known position. Arm clocking, if implemented, reduces the time it takes for design, setup, future maintenance or replacement of the arms and provides easier alignment for custom-made arms.

The clocking feature shown in this illustration is for a 7MPa metric swing clamp. Note there are three drill points at 120° on the plunger. This is also true for TuffCam Low Profile swing clamps. TuffCam high pressure swing clamps have six drill points spaced 60° apart and the Standard Swing clamp group has four drill points spaced 90° apart.
Vektek work supports are available in these styles:

- Spring Advance
- Air Advance
- Fluid Advance

**Spring Advance Work Supports**

These work supports adapt to support fragile parts, deflection prone areas of heavy parts and are well fitted to heavy material removal applications. Spring extended plungers maintain contact with the part during loading exerting only spring force. As hydraulic pressure is applied, the plunger “freezes” and does not exert any additional force on the part.

**Air Advance Work Supports**

These work supports are ideally suited to use in harsh environments or on fragile parts where pre-support contact forces must be adjusted to prevent part distortion. A continuous flow of air can serve as an “air spring” and can be left connected during machining. This “air curtain” or “purge” can help keep harsh contaminants from getting between the plunger and sleeve.

**Fluid Advance Work Supports**

An internal piston in a fluid advance work support advances a spring which in turn lifts the plunger to contact the workpiece. Hydraulic pressure automatically sequences, “freezing” the plunger properly against the workpiece surface. This is accomplished with a single hydraulic line.

**Double Acting Work Supports**

Vektek’s innovative design features a spring advanced work support within a double acting shuttle mechanism. This inch product exclusive design eliminates part ejection of any workpiece and the need for ancillary part retention devices. TuffGrip™ has positive extension and retraction making it superior in precision applications. The TuffGrip™ double acting work support is ideal for robotic applications.

TuffGrip™ is also available with Return Position Sensing. Position sensing is critical in automated systems where an extended work support can cause a crash. This is particularly valuable in robot loaded applications.

Work Supports that confirm the part is present and contacted

Plungers stay retracted during part loading while air flow travels through the work support. Hydraulic pressure advances the plunger exerting only spring force as it makes contact with the part. This closes the integral air valve to indicate part is present and contacted. Hydraulic pressure then automatically sequences, “freezing” the plunger.

**The Low Pressure (7MPa) Work Support and Clamp System**

Off the shelf arms and levers create a perfect working system between Work Support and Link Clamp or Swing Clamp. Center lines are matched and body clearance is available, a unique Vektek feature. Work supports and clamps work together at the same pressure. Sequencing is required.
Most clamping cylinders are intended for pushing against a part to hold it in place. They are not intended to move a load, as in power cylinder applications, where punching, bending or forming are performed. Cylinders are the least costly form of hydraulic clamping available. Good fixturing principles recommend clamping opposite fixed locators and transmitting cutter forces into the stationary locators.

Hollow Rod Cylinder
Also called “Power Nuts”, because they have a hole all the way through the plunger, hollow cylinders will draw or tighten a threaded bolt to clamp or actuate remote mechanisms. Easily used to add hydraulics to existing strap clamps or pull against “C” washers.

Spring/Hydraulic Part Crowder
Used to secure parts. Crowding and clamping pressure applied at the exact same point on parts.

Pull-Down Clamp
Used when lateral clamping is desired. These clamps generate straight clamping motion and force along with pull-down clamping force.

Edge Clamp
Downward clamping angle of the blade yields both horizontal and vertical force pushing your part firmly against locators and the work surface. Low profile allows slab milling over the clamp on most parts.

Another form of workholding utilizes a wedge driven clamp. A low profile edge clamp geared toward holding multiple smaller parts. Some types can only be manually tightened, but most can be hydraulically powered. Mitee-Bite Uniforce®, ID Expansion and Ok-Vise® are manufacturers of these types of wedge driven clamps.

Cartridge Cylinders for Wedge Driven Clamps
- “Slip-in”
- “Threaded”

Vektek offers two types of short stroke cartridge cylinders that are specifically designed to power these wedge driven clamps.
- “Slip-in” cartridge to easily replace competitors’ faltering cartridges.
- Threaded body cartridge mount, double acting, push/pull cylinders. Force range is adjustable to cylinder capacity by adjusting the input pressure. They can be easily converted to single acting by installing an extend spring.

Block Body Pull Cylinders for Wedge Driven Clamps

This advanced design block body cylinder mounts under the surface plate to pull a threaded fastener, making for easy-to-build fixturing on the new designs and giving you the option to add hydraulic control to many existing fixtures SAE porting receives fittings for either flexible or hard tubing external plumbing.
Vektek offers a variety of pre-configured power supplies designed to provide optimal functionality for most power clamping applications.

### Electric/Hydraulic

Electric power supplies consist of a pump configured with the necessary valves and controls. The pump motor is controlled by a pressure switch, which will shut off the pump when a preset pressure has been reached. If pressure should fall below the reset point of the pressure switch, the pump motor will kick on and replenish the system's pressure.

### Air/Hydraulic

A pneumatic power supply drives a reciprocating air piston to create hydraulic fluid flow and pressure. As the hydraulic flow in the system becomes restricted (pressure increase), the pump cycle rate decreases until the system’s pressure completely restricts and stalls the air motor.

### Manual Screw Pump

An inexpensive manually operated power supply for small systems. This pump can be driven by a “nut runner” for fast and precise actuation. The Vektek screw pump has a maximum working pressure of 5,000 psi (344 bar) and an oil capacity of 1.57 cu. in.

Please refer to the Vektek product catalog or website for specific details about power supplies.

www.vektek.com
Decoupled or Live Hydraulic Fixtures?

A palletized or tombstone fixture is a workholding mechanism that can be run with live (connected) hydraulic power or disconnected from the power source during machining.

Decoupled or Live Hydraulic Fixtures

There are two basic types of decouplers, automatic shutoff and manual shutoff.

In Manual Shutoff Valve Decouplers, the operator manually closes and opens the shutoff valve. Most Manual Shutoff Valve Decouplers are used with single acting clamp systems, but some can be configured for double acting use.

An Automatic Shutoff Valve Decoupler is actuated by Clamp and Unclamp pressure from the power supply. This leaves the operator free to connect hoses and control only the pump, not the valves. Automatic Shutoff Decouplers are used with both single and double acting circuits with equal ease.

A Tombstone Top Plate is an expanded type of Manual Shutoff Valve Decoupler. A tombstone top plate has multiple shutoff valves to provide separate unclamp control of two or more single acting circuits and a common accumulator to keep all circuits pressurized when the column is disconnected from the pump.

Manual Shutoff Valve Decouplers and Tombstone Top Plates typically use an on-demand pump that includes a directional control valve and a mating coupler with suitable hose.

Rotating Unions

Rotating unions are a continuous rotary connection used with indexers or live hydraulic pallet systems. Rotating unions feed fluid to fixtures while allowing full rotation via 1-12 discrete circuits.

Rotating unions allow “live” or continuous hydraulic pressure to be supplied continuously to fixtures during the machining cycle.

Integral mounting holes, multiple plumbing options and electrical slip ring options make Vektik’s design easier to use than other industrial models.

Palletized (Decoupled) Tombstone Fixtures

A fixture’s disconnection is achieved using a pallet decoupler. A pallet decoupler serves as the interface between the stationary pump and the moving pallet. It is the point where the hydraulic hoses from the pump are connected and disconnected. The decoupler stays on the pallet/tombstone and its accumulator is the source of reserve pressurized fluid for the clamping circuit while it is disconnected from the pump.

A decoupler includes:

- A shutoff valve to contain pressurized fluid within the clamping circuit
- A quick disconnect for connecting the fluid supply
- Filter screens to minimize contamination
- A pressure gauge
- An over-pressure relief valve

• Rotating Unions are available in Single, Dual, Quad, 6, 8,12 flow path models.

NOT AVAILABLE IN METRIC

• Rotating Unions

• Automatic Shutoff Decoupler with internal accumulator

• Manual Shutoff Decoupler with external accumulator and gauge

• Two-Sided Tombstone Top Plate

• Four-Sided Tombstone Top Plate

• Operating Handle
A Vektek directional control valve’s function is the extension and retraction control for your hydraulic cylinders. It provides a flow path from the pump to the cylinders and a return path from the cylinders to the fluid reservoir. Whether manual or solenoid operated, they are specifically designed to control workholding fixture circuits.

All Vektek directional control valves are rated at 5,000 psi or 350 bar (35 MPa) working pressure. They typically incorporate international standard mounting and fluid flow patterns. Standardized mounting patterns also mean that valve operation can easily be upgraded from manual to electric without having to change system plumbing.

- 4 solenoid control valves shown on a 2HP Advanced Workholding Pump

**TYPICAL STEPS TO YOUR POWER WORKHOLDING PURCHASE**

After a few conversations with a Vektek sales representative, you may uncover an application where hydraulic clamping will pay for itself in a very short time. The next step would be to call and discuss your fixture concept with one of our Application Engineers. They may ask you to send information about your current fixture, part(s), machine and processes to study and propose a clamping concept. So you know what to expect, we do not “design” the fixture, we provide a concept. With the concept, we can provide component pricing and a Bill of Materials if you desire.

To aid in your fixture design, CAD files are available online at www.vektek.com or by requesting a CD from your sales representative.

After your design is complete, call us to place your order. We will deliver your components promptly. The relationship does not end here. We want your fixture to work right and keep on working.

Questions?
Just ask us...
800-992-0236
sales@vektek.com

**ACCESSORY VALVES**

Vektek accessory valve designs are specifically intended for use in hydraulic clamping systems. Manufactured with steel components and hardened operating parts, these valves are suited to the low flow demands of clamping systems. Vektek accessory valves prevent system damage and erratic operation frequently experienced when using valves designed for high flow general industrial applications.

- Precision In-Line Flow Control

**Flow Control**

Regulate the speed of clamping with a precision In-line or In-port flow control valve. These valves are especially useful on clamping fixtures where components must clamp at nearly the same time. They can also prevent component damage caused by excessive flow rates from pumps not specifically designed for clamping.

- Pilot Operated Check Valves

**Pilot Operated Check Valve**

Check valves allow fluid flow in one direction. A pilot operated check valve allows fluid through and holds until a pilot circuit opens the valve allowing fluid back through in opposite direction. Available in cartridge or manifold mount versions.
**Sequence Valves**
Sequence valves operate as pressure sensitive, normally closed (N/C), elements in a clamping system. When fluid first enters the system at low pressure, the valve is closed, blocking the flow of fluid to devices downstream. After the other devices have moved into position, pressure begins to increase and overcomes the spring force holding the valve closed. This forces the poppet off its seat and allows fluid to flow through the valve until maximum pressure is reached. They are highly effective multiple function timing controls. Vektek sequence valves are precise metering devices and less sensitive to contaminants than other brands.

**Pressure Reducing Valves (PRV)**
The Pressure Reducing Valve is a Normally Open (N/O) pressure control device. The valve remains open and fluid flows freely to downstream devices until the pressure in the valve reaches the pressure set-point (adjustable). At the set-point pressure the valve closes, blocking further flow and pressure to the downstream devices. If there is a sufficient downstream pressure loss (from the valve to devices), the PRV will re-open, allowing fluid to pass through the valve until the pressure again reaches the valve set-point. The PRV is designed for use in both single and double acting systems.

**Pressure Limiting Valves (PLV)**
The Pressure Limiting Valve is a Normally Open (N/O) pressure control device. The valve remains open and fluid flows freely to downstream devices until the pressure in the valve reaches the pressure set-point (adjustable). At the set-point pressure, the valve closes, blocking further flow and pressure to the downstream devices. The internal valve seal prevents fluid flow through the valve in either direction until the inlet pressure (power source to the valve) is reduced to near zero. The PLV is for use in single-acting systems only.

**Shutoff Valve**
Vekttek’s shutoff ball valve, with precision steel components and molded spherical seats, provides a positive seal to isolate your fixture. Valve handle is easy to move even under maximum pressure.

**In The Port Sequence Valve**
These sequence valves install directly into the device port. This allows you to control the timing of that individual devices on your fixture. They can be added after design and build to most any flange mount manifold swing clamps and link clamps.

**Air Sensing Control Kit for Pneumatic Confirmation Systems**
Ready-to-use kit with everything you need to feed back a confirmation signal of your choice! The electronic pressure switch is easily adjusted with 2 PNP* digital set points and 1 analog output to meet your specific needs. Use this kit with Pallet Decouplers, Pneumatic Confirmation Valves, Part Present Sensing Work Supports or self-made part location orifices.

**Unclamp Delay Valve**
This free flow valve feeds downstream devices, but as pressure in the system builds, the mechanical pilot piston moves away from the check valve allowing it to close. During unclamping, inlet pressure falls, but downstream pressure is held constant by the check valve. As pressure subsides, spring force opens the check to release downstream pressure -- delaying single acting device unclamp.

**Pressure Switches**
A pressure switch is used to monitor the hydraulic system to determine any change of pressure. The signal is used to control a pump or other peripheral devices. Vektek offers two types of pressure switches: Non-Powered and a powered LED electronic.
Since the 1980’s, Vektek has researched, designed, manufactured, direct-sold and serviced the VektorFlo® line of hydraulic clamping devices. During this time, we have often had requests for pneumatic products. While we have successfully converted many of our hydraulic clamps for air use, we wanted to offer a line of pneumatic clamps, specifically designed as an air device to meet the requests we were receiving.

We are proud to offer the VektorAir™ line of pneumatic swing clamps, toggles, valves, hardware and plumbing accessories, designed specifically for clamping. Durable enough for use in machining and welding operations, they are also a good fit for woodworking, assembly and testing fixtures. Moreover, we back them with applications staff, our VektorAir™ warranty and our signature service before and after the sale.

Machine Parts Better, Faster, and MORE Consistently

WITH POWER WORKHOLDING

- Achieve Greater Repeatability
- Use Higher Cutting Speeds
- Faster Clamping
- Produce Less Scrap

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