Frequently Asked Questions

Some questions about pallet and tombstone clamping systems are common to both novices and experienced users. The answers to the following questions may help users better understand palletized hydraulic systems. Contact Vektek for assistance in determining if you should use a decoupled fixture or leave the fixture connected to the pump.

What is a pallet decoupler and what is its purpose within a clamping system?

A pallet decoupler is a device which serves as the interface between the stationary pump and the moving pallet. It is the point where the hose(s) from the pump is connected and disconnected from the pallet. The decoupler "rides along" on the pallet and is the source of pressurized hydraulic fluid for the clamping circuit while it is disconnected from the pump. A decoupler must contain a shutoff valve to trap pressurized fluid from the pump within the clamping circuit and allow the hose(s) to be disconnected from the pallet. A decoupler must also contain:

* A coupler(s) for connecting the hose(s)
* Filter screens to minimize the amount of contamination that enters the pallet hydraulic circuit.
* An accumulator to store pressurized hydraulic fluid. The accumulator maintains pressure to the clamping circuit while the pallet is disconnected from the pump.
* Ports for the connection of the pallet hydraulic circuit.
* May include a pressure gauge and an over-pressure relief valve.

What are the basic types of pallet decouplers?

We divide pallet decouplers into two basic types based on whether the shutoff valve operates automatically or manually. In Manual Decouplers, the operator closes the shutoff valve to trap pressure on the pallet (keeping parts clamped) and opens it to release pressure from the pallet (unclamp the parts). The operator must also control the pump to add and release pressure from the hose(s) for disconnection. For ease of operation, most Manual Decouplers are used with single acting clamp circuits.

Automatic Shutoff Valve Decouplers are actuated by Clamp and Unclamp pressures from the pump, which is controlled by the operator. Automatic Decouplers are used with both single and double acting circuits with equal ease.

What is the difference between a pallet decoupler and a tombstone top plate?

A tombstone Top Plate is an expanded type of Manual Shutoff Valve Decoupler. A decoupler has one shutoff valve to control one pallet circuit. A tombstone top plate has multiple shutoff valves to provide separate control of each single acting circuit (face) and a common accumulator to keep all circuits pressurized when the tombstone is disconnected from the pump. Tombstones that require double acting clamping circuits must use one Automatic Shutoff Valve Decoupler per face or circuit.

If I don't have enough space for a decoupler (or top plate) with its accumulator, can I use just a shutoff valve and a disconnect coupler?

Absolutely not, every hydraulic clamping pallet and tombstone must have an accumulator to be safe! We offer decouplers with integral accumulators to minimize their size, and decouplers and top plates that allow the accumulator to be located in a place on the pallet or tombstone that has more space. In addition, we can provide all the individual components required to implement a distributed decoupling system to safely conform to space limits.

What type of pump do I need to operate decouplers and tombstone Top Plates?

Manual Shutoff Valve Decouplers and tombstone Top Plates require an on-demand pump that includes a 2-Position 3-Port directional control valve and a mating coupler with suitable hose.

Automatic Shutoff Valve Decouplers require an on-demand pump that includes a 3-Position 4-Port, pressure-blocked-center directional control valve and a decoupler Operating Handle with suitable hoses.

Pumps for palletized fixtures must be configured to de-pressurize the hose(s) for connection and disconnection. See Basic Pump recommendations for each type of decoupler on the following pages. Pumps can also be configured to operate any combination of Manual Shutoff and Automatic Shutoff Valve Decouplers and Top Plates.

Most users prefer pendant controlled, pump mounted and electric control valves for decoupling operations. However, pumps can be configured for remote mounted electric and manual control valves, and with valves for integration into the machine control or machining cell PLC (Programmable Logic Control). Pumps can be configured with an automatic pressure monitoring system to assure that the pallets and tombstone are properly pressurized before entering the machine. Pumps can be configured to deliver a different operating pressure to each pallet and tombstone and to deliver different pressures to the Clamp/Unclamp side of double acting circuits. Pumps can be configured to meet your palletized system and control requirements.
NOTE: Please check accumulator’s gas pre-charge during your annual maintenance check. Consult factory if you require assistance.

NOTE: This Manual Shutoff Valve Decoupler must be used with a suitable pump which includes a 2-position/3-port, directional control valve for operation of one single acting circuit. Contact Vektek for considerations in the use of this Manual Shutoff Valve Decoupler to control double acting circuits.

**Manual Shutoff Valve Decoupler**

**for Single Acting Systems**

- This Decoupler is a convenient, self-contained package that includes a quick connect coupling, manual shutoff valve, accumulator (choose from horizontal or vertical arrangement), filter screen, pressure gauge, and over-pressure relief valve.
- Includes auxiliary ports that can be used for double acting pallet circuits or compressed air.
- External accumulator can be repositioned horizontally or vertically to suit the pallet layout.
- Quick Connect with female G 1/4, Model No. 49-5600-00, sold separately.

### Manual Shutoff Valve Decoupler

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Pressure Range</th>
<th>Precharged Accumulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6001-01</td>
<td>140-350 bar (14-35 MPa)</td>
<td>52 cm³</td>
</tr>
<tr>
<td>45-6001-02</td>
<td>70-250 bar (7-25 MPa)</td>
<td>59 cm³</td>
</tr>
<tr>
<td>45-6001-03</td>
<td>30-100 bar (3-10 MPa)</td>
<td>62 cm³</td>
</tr>
</tbody>
</table>

**Female Quick Disconnect**

Model No. 49-5600-00

---

_Palletized Fixture Accessories_
Automatic Shutoff Valve Decouplers, Two-Handed Operating Handle

Automatic Shutoff Valve Decouplers for Single and Double Acting Systems

- Decouplers are a complete, self-contained package for disconnecting a fixture from its power supply while machining.
- Everything is there for you: Quick connect coupling, accumulator, filters, pilot operated check valve and over pressure relief valve!
- Robust pilot operated check valve with 1 to 5 ratio of pilot to check pressure for proven long-term reliability.
- Internal 25 micron filters for added protection of pilot operated check valve thru ports A1, A2, A3, A4 & C1. Additional filtration provided at port B1. (filtration for A3, B3 or A4, B4 available by purchasing Vektek filter block 47-0842-05 or 47-0842-06 depending on mounting orientation.)
- G1/4 ports and manifold mounting (bottom and rear) connections on all models.
- Single acting pallet circuits require 2 hoses to the operating handle for pressure release. For single hose systems see the Manual Shutoff Valve Decoupler.

Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Pressure Range Bar</th>
<th>Accumulator Capacity (cu. cm.)</th>
<th>In-Line Filter Cartridge</th>
<th>Filter Plate (For Manifold Mount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6007-20</td>
<td>30-100 (3-10 MPa)</td>
<td>62</td>
<td>47-0048-81</td>
<td>(47-0842-05 (Bottom A4 &amp; B4) or 47-0842-06 (Rear A3 &amp; B3))</td>
</tr>
<tr>
<td>45-6007-21</td>
<td>70-250 (7-25 MPa)</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-6007-22</td>
<td>140-350 (14-35 MPa)</td>
<td>52</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE:
These automatic shutoff valve decouplers and operating handle must be used with a suitable pump which includes a 4 port/3 position, P-blocked center ("A" & "B" connected to tank) directional control valve for operation of single or double acting systems. One automatic shutoff valve decoupler can be used to operate only one double acting or one single acting circuit. For operation of a single acting circuit, plug the decoupler outlet port "B" (as shown in the schematic).

One-Handed Operating Handle

- Maximum working pressure - 350 bar (35 MPa)
- Provides a fast, positive connection to the decoupler.
- Ergonomic design reduces operator fatigue.
- The One-Handed Handle may be used with the optional Handle Docking Module to assure that the hoses are disconnected from the pallet before it is shuttled into the machine.
- SAFETY: See Docking Station -(End of Section K)
**Automatic Shutoff Valve Decouplers for Single and Double Acting Systems**

- Decouplers are a complete, self-contained package for disconnecting a fixture from its power supply while machining.
- Everything is there for you: Quick connect coupling, accumulator, filters, pilot operated check valve and over pressure relief valve!
- Robust pilot operated check valve with 1 to 5 ratio of pilot to check pressure for proven long term reliability.
- Internal 25 micron filters for added protection of pilot operated check valve thru ports A1, A2, A3, A4 & C1. Additional filtration provided at port B1. (filtration for A3, B3 or A4, B4 available by purchasing Vektek filter block 47-0842-05 or 47-0842-06 depending on mounting orientation.)
- G1/4 ports and manifold mounting (bottom and rear) connections on all models.
- Single acting pallet circuits require 2 hoses to the operating handle for pressure release. For single hose systems see the Manual Shutoff Valve Decoupler.

### Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Pressure Range Bar</th>
<th>Accumulator Capacity (cu. cm.)</th>
<th>In-Line Filter Cartridge</th>
<th>Filter Plate (For Manifold Mount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6007-23</td>
<td>NO ACCUMULATOR 350 BAR MAX</td>
<td>47-0048-81</td>
<td>47-0842-05 (Bottom A4 &amp; B4) or 47-0842-06 (Rear A3 &amp; B3)</td>
<td></td>
</tr>
<tr>
<td>45-6007-24</td>
<td>30-100 (3-10MPa)</td>
<td>62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-6007-25</td>
<td>70-250 (7.25 MPa)</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-6007-26</td>
<td>140-350 (14.35 MPa)</td>
<td>52</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For use with Operating Handle Model No. 45-6005-00.

### Pallet Decoupler Cover

- Customers that have previously bought a decoupler can purchase a new cover for their old decoupler. New orders of decouplers will come with cover.
### Automatic Shutoff Valve Decouplers for Single and Double Acting Systems

- Decouplers are a complete, self-contained package for disconnecting a fixture from its power supply while machining.
- Everything is there for you: Quick connect coupling, accumulator, filters, pilot operated check valve and over pressure relief valve!
- Robust pilot operated check valve with 1 to 5 ratio of pilot to check pressure for proven long term reliability.
- Internal 25 micron filters for added protection of pilot operated check valve thru ports A1, A2, A3, A4 & C1. Additional filtration provided at port B1 (filtration for A3, B3 or A4, B4 available by purchasing Vektek filter block 47-0842-05 or 47-0842-06 depending on mounting orientation.)
- G1/4 ports and manifold mounting (bottom and rear) connections on all models.
- Single acting pallet circuits require 2 hoses to the operating handle for pressure release. For single hose systems see the Manual Shutoff Valve Decoupler.

### Dimensions

<table>
<thead>
<tr>
<th>Model No</th>
<th>Pressure Range Bar</th>
<th>Accumulator Capacity (cu. cm)</th>
<th>In-Line Filter Cartridge</th>
<th>Filter Plate (For Manifold Mount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6007-27</td>
<td>30-100 (3-10 MPa)</td>
<td>62</td>
<td>47-0048-81</td>
<td>47-0842-05 (Bottom A4 &amp; B4)</td>
</tr>
<tr>
<td>45-6007-28</td>
<td>70-250 (7-25 MPa)</td>
<td>59</td>
<td></td>
<td>47-0842-06 (Rear A3 &amp; B3)</td>
</tr>
<tr>
<td>45-6007-29</td>
<td>140-350 (14-35 MPa)</td>
<td>52</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For use with Operating Handle Model No. 45-6005-04.

### Two-Handed Operating Handle

- Maximum working pressure - 350 bar (35 MPa)
- Provides a fast, positive connection to the decoupler.
- Ergonomic design reduces operator fatigue.
- The Two-Handed Handle may be used with the optional Handle Docking Module to assure that the hoses are disconnected from the pallet before it is shuttered into the machine.
- SAFETY: See Docking Station (End of Section K)

### Two-Handed Operating Handle

- Model No. 45-6005-04
- For use with Decoupler Model Number 45-6007-27, 45-6007-28, 45-6007-29, 45-6007-03, 45-6007-30, 45-6007-31, 45-6007-32

### SAFETY HANDLE DOCKING

(See end of this section)

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Inside US 1-800-992-0236
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Automatic Shutoff Valve Decouplers for Single and Double Acting Systems

- Decouplers are a complete, self contained package for disconnecting a fixture from its power supply while machining.
- Everything is there for you: Quick connect coupling, accumulator, filters, pilot operated check valve and over pressure relief valve!
- Robust pilot operated check valve with 1 to 5 ratio of pilot to check pressure for proven long term reliability.
- Internal 25 micron filters for added protection of pilot operated check valve thru ports A1, A2, A3, A4 & C1. Additional filtration provided at port B1 (filtration for A3, B3 or A4, B4 available by purchasing Vektek filter block 47-0842-05 or 47-0842-06 depending on mounting orientation.)
- G1/4 ports and manifold mounting (bottom and rear) connections on all models.
- Single acting pallet circuits require 2 hoses to the operating handle for pressure release. For single hose systems see the Manual Shutoff Valve Decoupler.

Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Pressure Range Bar</th>
<th>Accumulator Capacity (cu. cm.)</th>
<th>In-Line Filter Cartridge</th>
<th>Filter Plate (For Manifold Mount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6007-33</td>
<td>30-100 (3-10 MPa)</td>
<td>62</td>
<td></td>
<td>47-0048-81</td>
</tr>
<tr>
<td>45-6007-34</td>
<td>70-250 (7-25 MPa)</td>
<td>59</td>
<td></td>
<td>47-0842-05 (Bottom A4 &amp; B4)</td>
</tr>
<tr>
<td>45-6007-35</td>
<td>140-350 (14-35 MPa)</td>
<td>52</td>
<td></td>
<td>47-0842-06 (Rear A3 &amp; B3)</td>
</tr>
</tbody>
</table>

Pallet Decoupler Cover

<table>
<thead>
<tr>
<th>Model No.</th>
<th>A</th>
<th>For use with Decoupler Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6007-05</td>
<td>12.7</td>
<td>45-6007-27, 45-6007-28, 45-6007-29, 45-6007-33, 45-6007-34 and 45-6007-35</td>
</tr>
</tbody>
</table>

Customers that have previously bought a decoupler can purchase a new cover for their old decoupler. New orders of decouplers will come with cover.

Two-Handed Operating Handle with Air

- Maximum working pressure - 350 bar (35 MPa)
- Provides a fast, positive connection to the decoupler.
- Ergonomic design reduces operator fatigue.
- The Two-Handed Handle may be used with the optional Handle Docking Module to assure that the hoses are disconnected from the pallet before it is shuttled into the machine.
- SAFETY: See Docking Station - (End of Section K)
Accumulators

Accumulators*

- Maintains circuit pressure while the pallet or tombstone is disconnected from the pump using a Decoupler or tombstone Top Plate.
- Piston-type, inert gas precharged accumulators compensate for pallet pressure changes during machining.
- Available in three operating ranges providing up to 62 cm³ of pressurized fluid reserve.
- G 1/4 Threads.

Hydraulic fluid compresses the precharged inert gas across the piston during circuit pressurization. The pressurized gas provides additional fluid to the circuit to reduce pressure changes in the event of small seeps, thermal expansion or contraction while the pallet or tombstone is in the machine.

- The 140 bar (14 MPa) to 350 bar (35 MPa) operating pressure model has gas precharged of 100 bar (10 MPa).
- The 70 bar (7 MPa) to 250 bar (25 MPa) operating pressure model has gas precharged of 50 bar (5 MPa).
- The 20 bar (2 MPa) to 100 bar (10 MPa) operating pressure model has gas precharged of 17 bar (1.7 MPa).

Perform annual maintenance in accordance with the instructions provided with each accumulator. Contact Vektek for additional copies of the annual maintenance instructions or to arrange for factory performed annual maintenance.

* Strictly observe all safety precautions provided with each accumulator.

Accumulators

<table>
<thead>
<tr>
<th>Accumulator Model No.</th>
<th>System Operating Pressure</th>
<th>Approx. Usable Volume At Max. System Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>49-0114-01</td>
<td>140 bar-350 bar (14-35 MPa)</td>
<td>16 cm³</td>
</tr>
<tr>
<td>49-0114-02</td>
<td>70 bar-250 bar (7-25 MPa)</td>
<td>16 cm³</td>
</tr>
<tr>
<td>49-0116-01</td>
<td>140 bar-350 bar (14-35 MPa)</td>
<td>52 cm³</td>
</tr>
<tr>
<td>49-0116-02</td>
<td>70 bar-250 bar (7-25 MPa)</td>
<td>59 cm³</td>
</tr>
<tr>
<td>49-0116-05</td>
<td>20 bar-100 bar (2-10 MPa)</td>
<td>62 cm³</td>
</tr>
</tbody>
</table>

NOTE: Please check accumulator’s gas pre-charge during your annual maintenance check. Consult factory if you require assistance.
### Automatic Shutoff Valve Decouplers for Single and Double Acting Systems

- Decouplers are a convenient, self-contained package that includes quick connect couplings, accumulator, filters, over pressure relief valve and a pilot operated check valve.
- External ports and manifold mounting connections (bottom and rear) are G 1/4 female.
- Robust pilot operated check valve with 1.5 pilot to check pressure extends proven long-term reliability.
- Check valve has added protection from the internal 25 micron filter.
- Single acting pallet circuits require 2 hoses to the Operating Handle for pressure release. For single hose systems see the Manual Shutoff Valve Decoupler.
- Additional filtration available for the B return port through the use of manifold mount and in-line filtration.

### Model Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Pressure Range Bar (MPa)</th>
<th>Accumulator Capacity (cm³)</th>
<th>In-Line Filter Cartridge</th>
<th>Filter Plate (For Manifold Mount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6007-03</td>
<td>NO ACCUMULATOR 350 BAR MAX</td>
<td>62</td>
<td>47-0048-81</td>
<td>47-0842-05 (Bottom A5 &amp; B5) or 47-0842-06 (Rear A4 &amp; B4)</td>
</tr>
<tr>
<td>45-6007-30</td>
<td>30-100 (3-10 MPa)</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-6007-31</td>
<td>70-250 (7-25 MPa)</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-6007-32</td>
<td>140-350 (14-35 MPa)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For use with Operating Handle Model No. 45-6005-04.

### Two-Handed Operating Handle

- **Maximum working pressure - 350 bar (35 MPa)**
- **Provides a fast, positive connection to the decoupler.**
- **Ergonomic design reduces operator fatigue.**
- The Two-Handed Handle may be used with the optional Handle Docking Module to assure that the hoses are disconnected from the pallet before it is shuttled into the machine.
- **SAFETY:** See Docking Station - (End of Section K)

### SAFETY: Docking Station

- **HANDLE DOCKING** (See end of this section)

---

**NOTE:**
These automatic shutoff valve decouplers and operating handle must be used with a suitable pump which includes a 4 port/3 position, P-blocked center ("A" & "B" connected to tank) directional control valve for operation of single or double acting systems. One automatic shutoff valve decoupler can be used to operate only one double acting or one single acting circuit. For operation of a single acting circuit, plug the decoupler outlet port "B" (as shown in the schematic).

---

**Two-Handed Operating Handle**

- **Model No. 45-6005-04**

For use with Decoupler Model Number 45-6007-27, 45-6007-28, 45-6007-29, 45-6007-03, 45-6007-30, 45-6007-31, 45-6007-32
Thread-In Coupling Specifications

Thread-In Coupling Elements

Coupling elements are made to give you a leak free connection — whether pressurized or depressurized. Two flow rates are allowed with your choice of two nominal diameter sizes. The compact design allows couplings to be recessed into the fixture plate. Stainless steel construction provides long service life with replaceable face seals.

- Axial face seal between coupling mechanism and coupling nipple.
- Both elements must be positioned and guided within specified tolerances before contact with sealing surfaces.
- Replaceable face seals.
- Coupling force at operating pressure ranges from 0-3.3 and 0-7.7 kN depending on model.
- Spanner and replacement seal installation tools available.

### Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>End Type</th>
<th>Coupling Type</th>
<th>Nom. Dia.</th>
<th>Thread</th>
<th>Max. Operating Pressure</th>
<th>Max Flow Rate (l/min)</th>
<th>Coupling Stroke (mm)</th>
<th>Min. Coupling Force @ 0 Bar</th>
<th>Axial Pos. Tol.</th>
<th>Radial Pos. Tol.</th>
<th>Permit Angle Tol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6101-30</td>
<td>Mech.</td>
<td>Pressurized</td>
<td>3</td>
<td>M20 x 1.5</td>
<td>350 Bar</td>
<td>8</td>
<td>4.5</td>
<td>94 N</td>
<td>+0.5 ± 0.3</td>
<td>± 1</td>
<td>± 1</td>
</tr>
<tr>
<td>45-6101-50</td>
<td>Mech.</td>
<td>Pressurized</td>
<td>5</td>
<td>M24 x 1.5</td>
<td>500 Bar</td>
<td>12</td>
<td>4.5</td>
<td>98 N</td>
<td>+0.5 ± 0.3</td>
<td>± 1</td>
<td>± 1</td>
</tr>
<tr>
<td>45-6111-30</td>
<td>Nipple</td>
<td>Pressurized</td>
<td>3</td>
<td>M20 x 1.5</td>
<td>350 Bar</td>
<td>8</td>
<td>4.5</td>
<td>94 N</td>
<td>+0.5 ± 0.3</td>
<td>± 1</td>
<td>± 1</td>
</tr>
<tr>
<td>45-6111-50</td>
<td>Nipple</td>
<td>Pressurized</td>
<td>5</td>
<td>M24 x 1.5</td>
<td>500 Bar</td>
<td>12</td>
<td>4.5</td>
<td>98 N</td>
<td>+0.5 ± 0.3</td>
<td>± 1</td>
<td>± 1</td>
</tr>
</tbody>
</table>

**NOTE:**

Clean face of coupling elements with compressed air prior to connecting coupling to protect from contamination intrusion. Both elements must be guided about 2-3 mm. before contact of sealing surfaces with radial positioning tolerances.

### Tools

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Spanner Tool</th>
<th>Seal Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6101-30</td>
<td>AT-5613-00</td>
<td>AT-5603-00</td>
</tr>
<tr>
<td>45-6101-50</td>
<td>AT-5615-00</td>
<td>AT-5605-00</td>
</tr>
<tr>
<td>45-6111-30</td>
<td>AT-5613-00</td>
<td>N/A</td>
</tr>
<tr>
<td>45-6111-50</td>
<td>AT-5615-00</td>
<td>N/A</td>
</tr>
<tr>
<td>45-6102-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-6102-50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-6112-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-6112-50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thread-In Coupling Cavity

<table>
<thead>
<tr>
<th>Model No.</th>
<th>End Type</th>
<th>Nom. Dia.</th>
<th>Torque (Nm)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>G</th>
<th>H</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6101-30</td>
<td>Mech.</td>
<td>M20 x 1.5</td>
<td>18</td>
<td>21.5</td>
<td>10</td>
<td>N/A</td>
<td>31</td>
<td>N/A</td>
<td>13</td>
<td>11.2</td>
<td>28</td>
<td>5</td>
<td>15.5</td>
<td>7</td>
<td>2.6</td>
<td>2</td>
<td>21.5</td>
<td>20.5</td>
<td></td>
</tr>
<tr>
<td>45-6101-50</td>
<td>Mech.</td>
<td>M24 x 1.5</td>
<td>22</td>
<td>21.5</td>
<td>10</td>
<td>23.5</td>
<td>31</td>
<td>12</td>
<td>12.5</td>
<td>11.2</td>
<td>28</td>
<td>5</td>
<td>18.5</td>
<td>7</td>
<td>2.8</td>
<td>4</td>
<td>21.5</td>
<td>24.5</td>
<td></td>
</tr>
</tbody>
</table>

*Minimum required coupling force between nipple and mechanism resulting from hydraulic operating pressure.

*Must be externally countered by some mechanical means.

*Coupling Force Equations:
ND3: F (kN) = .0094 * P (bar)
ND5: F (kN) = .0154 * P (bar)
Palletized Fixture Accessories

Wireless Pressure Monitor

Guardian™
Vektak’s Machine Tool Protector

Ensures Positive-Pressure Monitoring

- Install pressure switches.
- Find a place on the fixture for your transmitter.
- Find a place on your machine for your receiver.
- Wire your control box.
- No more tool crashes. IT'S THAT SIMPLE!

The Guardian™ gives you full time, “In Cycle”, hydraulic pressure monitoring configured for your machine tool fixtures. Equipped with an IP 67 sealed pressure switch, sealed Fixture Transmitter and M12 connectors; Guardian™ ensures positive-pressure monitoring even in the harshest environments. Best of all, you will enjoy easy pressure monitoring and machine tool notification with no interference issues.

The Simple Guardian™ installs with four wires (two power wires and a pair of M-code wires). It is a quick and clean installation needing no modifications to the machine tool control. Leave the M-Code check instructions out of your part program for non-monitored fixtures.

The Base Guardian™ Continuous system requires six wires and continuously monitors only the pallet in the machining envelope. The pallet being loaded is ignored during the unload/reload process until it enters the machine. Once inside the machine enclosure, Guardian’s™ “focused field” monitors the pallet. Accomplish immediate full-time machine communication by wiring directly into a feed-hold or e-stop control. Guardian notifies your machine immediately of any critical pressure loss.

- Fixture Transmitters require no batteries, ever!
- Simplified connection via standard connectors and cables.
- Dedicated in-cycle monitoring or machine code polling of fixture status.
- Will not affect other plant wireless systems.
- Master Control Unit power requirements; 10-36 VDC from Machining Center.
- Fully Sealed Fixture Transmitters.

Simple and Base Guardian™ Continuous Systems

- 2 Single Circuit Fixture Transmitter Units
- 2 Pressure Switches and Cables
- 1 Machine Tool Receiver
- Master Control Unit
- All Necessary Wiring

<table>
<thead>
<tr>
<th>Convenience Packages</th>
<th>Model No.</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>43-3011-10 Simple</td>
<td>Simple</td>
<td>Simple Guardian Package for on demand monitoring. Includes Master Control Unit, Machine Tool Receiver, two fixture transmitters, two mechanical pressure switches and pressure setter/checker*</td>
<td></td>
</tr>
<tr>
<td>43-3011-20 Base</td>
<td>Base</td>
<td>Base Guardian Package for continuous monitoring. Included Master Control Unit, Machine Tool Receiver, two fixture transmitters, two mechanical pressure switches and pressure setter/checker*</td>
<td></td>
</tr>
</tbody>
</table>

Convenience Kits

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>43-3010-10 Simple</td>
<td>Simple Machine Kit with Master Control Unit and Machine Tool Receiver*</td>
<td></td>
</tr>
<tr>
<td>43-3010-20 Base</td>
<td>Base Machine Kit with Master Control Unit and Machine Tool Receiver*</td>
<td></td>
</tr>
<tr>
<td>43-3010-03 Single Circuit Transmitter</td>
<td>Single Circuit Transmitter with cable and pressure switch</td>
<td></td>
</tr>
<tr>
<td>43-3010-04 Dual Circuit Transmitter</td>
<td>Dual Circuit Transmitter with two cables and two pressure switches</td>
<td></td>
</tr>
<tr>
<td>43-3010-05 Quad Circuit Transmitter</td>
<td>Quad Circuit Transmitter with four cables and four pressure switches</td>
<td></td>
</tr>
</tbody>
</table>

*All necessary wiring and hardware included.
Palletized Fixture Accessories

Guardian™ Accessories

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>End 1 Connection</th>
<th>End 2 Connection</th>
<th>Length (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-6424-04</td>
<td>Cable, M12 8 Pin*</td>
<td>Male Straight</td>
<td>Open End</td>
<td>10</td>
</tr>
<tr>
<td>27-9422-01</td>
<td>Cable, M12 5 Pin Master Control Unit to Machine Tool Receiver Communication Cable**</td>
<td>Male Straight</td>
<td>Female Straight</td>
<td>10</td>
</tr>
<tr>
<td>27-7422-03</td>
<td>Extension Cable, M8 3 Pin</td>
<td>Male Straight</td>
<td>Female Straight</td>
<td>5</td>
</tr>
<tr>
<td>27-7424-01</td>
<td>Pressure Switch to Fixture Transmitter</td>
<td>Male Straight</td>
<td>Female Straight</td>
<td>0.5</td>
</tr>
<tr>
<td>47-0700-78</td>
<td>55-350 Bar Pressure Switch with 0.5m Cable (Shown)</td>
<td>Male Straight</td>
<td>Female Straight</td>
<td>0.5</td>
</tr>
<tr>
<td>47-0700-74</td>
<td>55-350 Bar Pressure Switch with M8 Male Connection Only***</td>
<td>Male Straight</td>
<td>Female Straight</td>
<td>0.5</td>
</tr>
<tr>
<td>43-3010-15</td>
<td>Pressure Setter/Checker to assist setting mechanical pressure switches</td>
<td>Male Straight</td>
<td>Female Straight</td>
<td>0.5</td>
</tr>
</tbody>
</table>

NOTE: All Guardian cables are shielded and PUR jacketed.

* Included with Master control Units

43-3011-XX can be purchased separately for replacement or additional hook up.

** 27-9422-01 is included with 43-3011-XX. Cables can be purchased separately for extension or replacement.

*** 47-0700-74 requires User Provided 3 Pin M8 Shielded Cable.
Handle Docking Station
with optional feedback sensor

A Docking Station is now available for the 1-Handed and 2-Handed Automatic Shutoff Pallet Decoupler Handles. This handy device provides a standard contamination-free location for quick-disconnect handle storage. The Handle Docking Station has a drain pan to keep your work area free of slip and fall hazards created by dripping disconnects.

- The optional Proximity Switch confirms the decoupler handle and hoses are connected to the docking station. The pallet can then be safely shuttled into the machine.
- Adjustable five positions ensure the Docking Station is ergonomically friendly for operators.
- Couplers are BHC™ treated for long life.
- Flexible mounting allows for vertical, horizontal or pole applications.
- Mounting holes for M6 Diameter bolts.

### Metric Docking Station

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Proximity Switch</th>
<th>Handle Size</th>
<th>A Proximity Switch Height</th>
<th>B Dock Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-6005-28</td>
<td>No</td>
<td>Two-Hand</td>
<td>N/A</td>
<td>111.1</td>
</tr>
<tr>
<td>45-6005-29</td>
<td>Yes</td>
<td>Two-Hand</td>
<td>26.31</td>
<td>111.1</td>
</tr>
<tr>
<td>45-6008-01</td>
<td>No</td>
<td>One-Hand</td>
<td>N/A</td>
<td>74.93</td>
</tr>
<tr>
<td>45-6008-02</td>
<td>Yes</td>
<td>One-Hand</td>
<td>17.32</td>
<td>74.93</td>
</tr>
</tbody>
</table>

Available without Proximity Switch.

**PROXIMITY SWITCH PIN OUT:**

PIN 1: BROWN (+)  
PIN 2: WHITE (NOT CONNECTED)  
PIN 3: BLUE (NOT CONNECTED)  
PIN 4: BLACK (N/O)  
PIN 5: GREEN/YELLOW (NOT CONNECTED)

**PROXIMITY SWITCH WIRE DIAGRAM:**

**EXTENSION CABLE PIN OUT:**

- PIN 1: BROWN (+)  
- PIN 2: WHITE (NOT CONNECTED)  
- PIN 3: BLUE (NOT CONNECTED)  
- PIN 4: BLACK (N/O)  
- PIN 5: GREEN/YELLOW (NOT CONNECTED)

**SENSOR FEATURE:**

- NORMALLY OPEN CONTACT  
- LED INDICATOR LIGHT  
- 10 TO 36 VDC OPERATING RANGE  
- 100 mA OPERATING CURRENT  
- ILMV560030 REV B