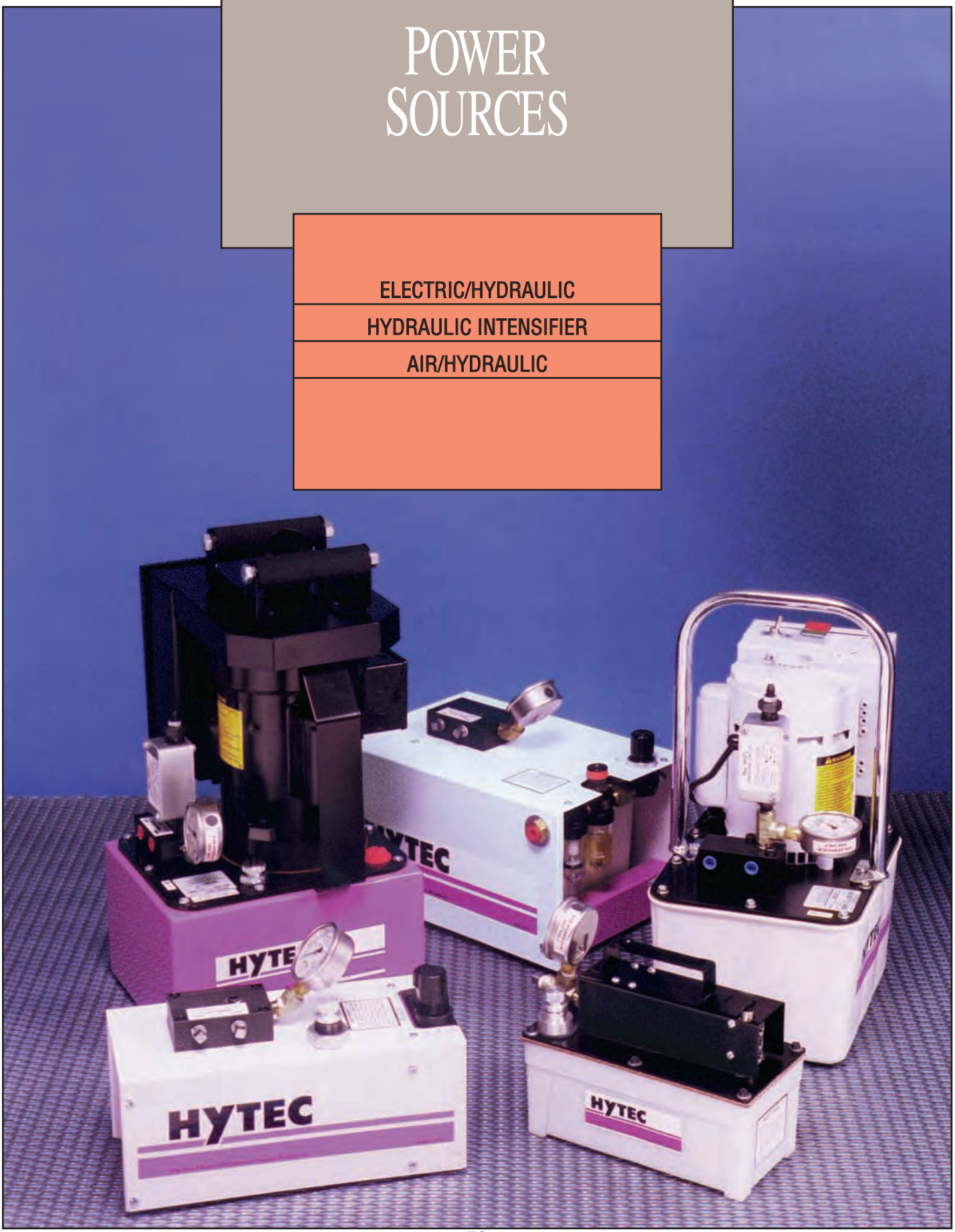
POWER SOURCES

ELECTRIC/HYDRAULIC

HYDRAULIC INTENSIFIER

AIR/HYDRAULIC



Power Source Information

Hytec power workholding systems use constant pressure or demand-type power sources. This means that the power source continuously supplies pressure to the circuit control valves for instantaneous response when the valves are shifted. The power source then automatically starts to maintain system pressure, but when the demand is met, shuts off to conserve energy and prevent heat build-up.

Hytec offers two basic hydraulic pump types – electric and air powered. Hytec also has a line of control valves for use with these pumps. The valves have virtually zero leakage and are ideally suited for constant pressure hydraulic workholding systems. **Note that valves with internal leakage (such as spool valves) are not appropriate for use with Hytec pumps and pallet valve systems.**

Electric/Hydraulic Pumps

All of Hytec's electric/hydraulic pumps are two-stage, continuous pressure (demand) pumps that contain all the necessary controls and circuitry for powering any single- or double-acting, continuous pressure workholding system. They contain a pressure switch and pressure regulator, and each is infinitely adjustable throughout the operating pressure range of 1,000 to 5,000 psi. An internal safety relief valve prevents possible damage from exceeding the maximum rated pressure.

The first stage provides high flow at low pressure to rapidly extend clamps and cylinders. The second stage piston pump builds and maintains pressure in the system at a preset level.

The pumps' electrical controls include a RUN/JOG switch. When the pump is started in the RUN mode, it automatically starts and runs any time the pressure switch indicates the need for oil. When pressure builds to the switch setting, the pump stops until the next demand for oil lowers the pressure, causing the switch to start the pump again. The pump continues to cycle in this manner without operator intervention.

In the JOG mode, useful for set up and special applications, the pump will run only when the operator activates and holds the start switch. When released, the pump will stop immediately. If the pump builds pressure to the pressure switch setting, it will also stop. The pump cannot be forced to run after the pressure switch setting has been reached in either the RUN or the JOG mode.

Pumps having thermal overload protection have an integral "electrical shut-down" circuit which prevents the pump from restarting without manual intervention after either thermal overload or electrical service interruption.

Motor electrical specifications are listed for each pump. For voltages and frequencies not listed, contact Hytec for more information

An optional fluid level temperature gauge is available. See page 135.

Air/Hydraulic Pumps

Hytec's air/hydraulic pumps are all continuous pressure, reciprocating, stall-type pumps: air pressure is simply converted to hydraulic pressure. Operated by any compressed air source, these pumps save energy by stalling when pressure is developed, and require no energy use to maintain system pressure. Single- and two-stage pumps are available.

Pumps of this type typically have much more usable oil capacity than ordinary boosters. Boosters stop after only one stroke, and if pressure is not built by the end of the stroke, or if any leakage is present, system pressure will not be maintained. Hytec air/hydraulic pumps will maintain pressure levels because they continue to reciprocate until pressure develops. Once pressure is developed, the pump stalls and maintains consistent system pressure. If additional flow is necessary for maintaining pressure, the pump will again reciprocate any time the end of its stroke is reached.

These pumps all operate within an air pressure range of 40-125 psi. Hydraulic operating pressures range from 400-5,000 psi.

Selected Hytec air/hydraulic pumps come with an air supply filter/lubricator/regulator for making hydraulic pressure adjustments. There is even a version that includes a selector valve and the circuitry required to provide control of single acting circuits without the need for additional directional control valves.

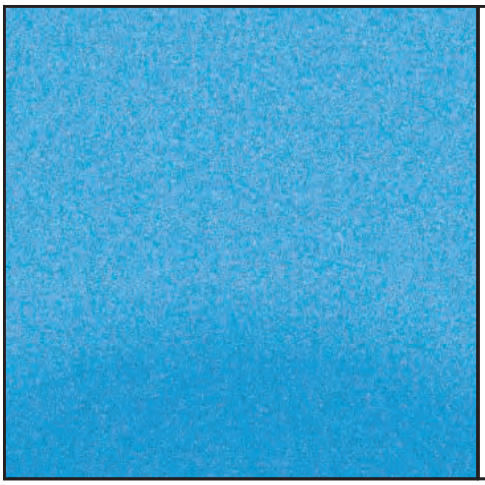
Intensifiers

Intensifiers are used in applications where an existing low pressure hydraulic source is available. They amplify low pressure to a range better suited to workholding systems.

Intensifiers use a reciprocating pumping mechanism to generate the high pressure flow so their volume is not limited as with piston style intensifiers. This allows the intensifier to compensate for any oil consumption on the high pressure side. The outlet pressure is directly proportional to the inlet pressure. High pressure adjustment is achieved by varying the inlet pressure.

Flow from the low pressure source is directed through the intensifier to the downstream circuit. As system pressure increases, the intensifier begins to cycle and intensifies the system pressure by the ratio specified.

Models without a dump valve do not allow reverse flow so directional control must take place downstream in the pressure circuit. Models with the dump valve allow directional control in the low pressure supply circuit. The optional directional valve manifold block has an industry standard size-10 four-way cavity to accept a variety of manual and solenoid valves.



This two-stage, continuous pressure (demand) pump contains all the necessary controls and circuitry for powering single- or double-acting continuous pressure workholding systems. It has a pressure switch and pressure regulator, both infinitely adjustable throughout the operating pressure range of 1,000 to 5,000 psi. An internal safety relief valve prevents damage from exceeding the maximum rated pressure. It's an economical gerotor/radial piston pump designed for remote mounted valves only. Consult Hytec for information on pump mounted valves. Shipped with 1.5 gallons of oil.

Features:

- Drip proof induction motor
- CSA approved
- Filtered filler/breather cap
- Liquid filled gauge
- Carrying handle
- Thermal overload protection
- 2-gallon, high density polyethylene reservoir
- ¼" NPTF outlet manifold
- 33 cu. in./min. oil flow at max. pressure
- 295 cu. in. usable oil

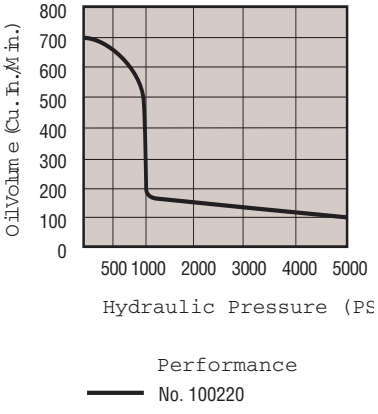
Electric/Hydraulic Pumps

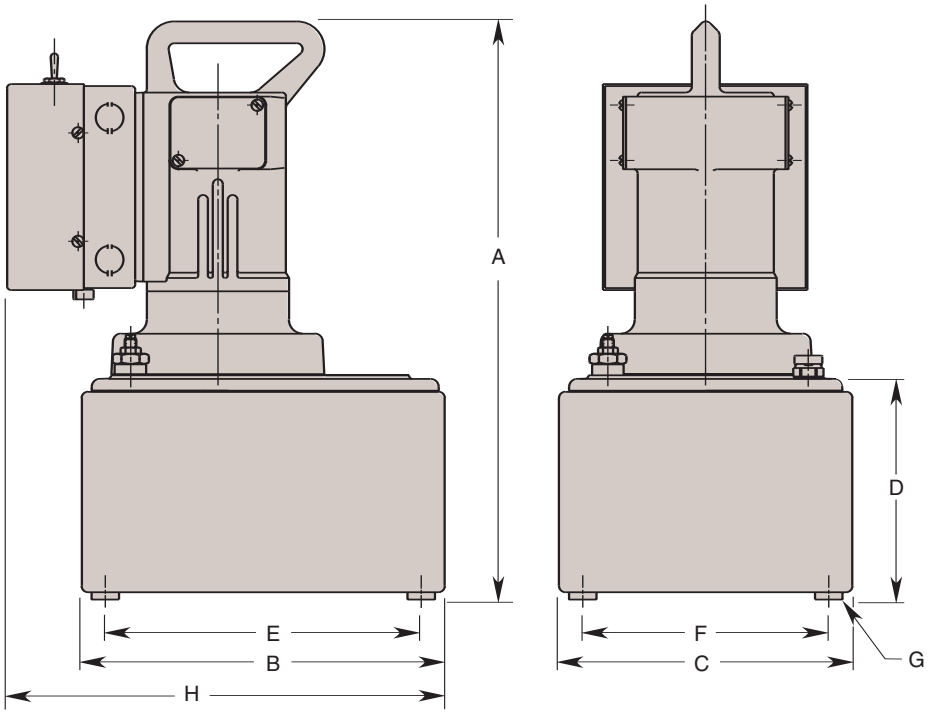
This electric/hydraulic pump is a two-stage, continuous pressure (demand) pump that contains all the necessary controls and circuitry for powering any single- or double-acting continuous pressure workholding system. It has a pressure switch and an external pressure regulator, both infinitely adjustable throughout the operating pressure range of 1,000 to 5,000 psi. An internal safety relief valve prevents damage from exceeding the maximum rated pressure.

It's a gear/axial piston pump designed for use in single or multiple station applications. Its high torque universal motor is low voltage tolerant. Includes a ¼" NPTF outlet manifold and will accept any Hytec pump-mounted valve. Shipped with two gallons of oil.

Features:

- CSA approved model available
- Drip proof universal motor
- Filtered filler/breather cap
- Liquid filled gauge
- Carrying handle
- 2.5-gallon metal reservoir
- 525 cu. in. usable oil
- Oil flow at max. pressure: 100 cu. in./min.





Cat. No.	Specifications			Dimensions (In Inches)							
	Electric Motor	Supply Voltage	Noise Level @ Idle/Max. Press. (dBA)	A	B	C	D	E	F	G Thread Size	H
100220	1⅛ hp; 12,000 rpm; 115 VAC; 25 amps max.; 50/60 Hz; single phase	115 VAC	80/85	18.250	12.500	10.500	7.000	10.000	8.000	½-20 UNF	14.000
100220-230	1⅛ hp; 12,000 rpm; 230 VAC; 14 amps max.; 50/60 Hz; single phase	230 VAC									

NOTE: An optional fluid level / temperature gauge is available, see page 135.

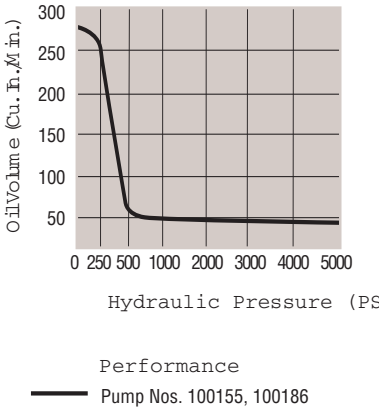
Electric/Hydraulic Pumps

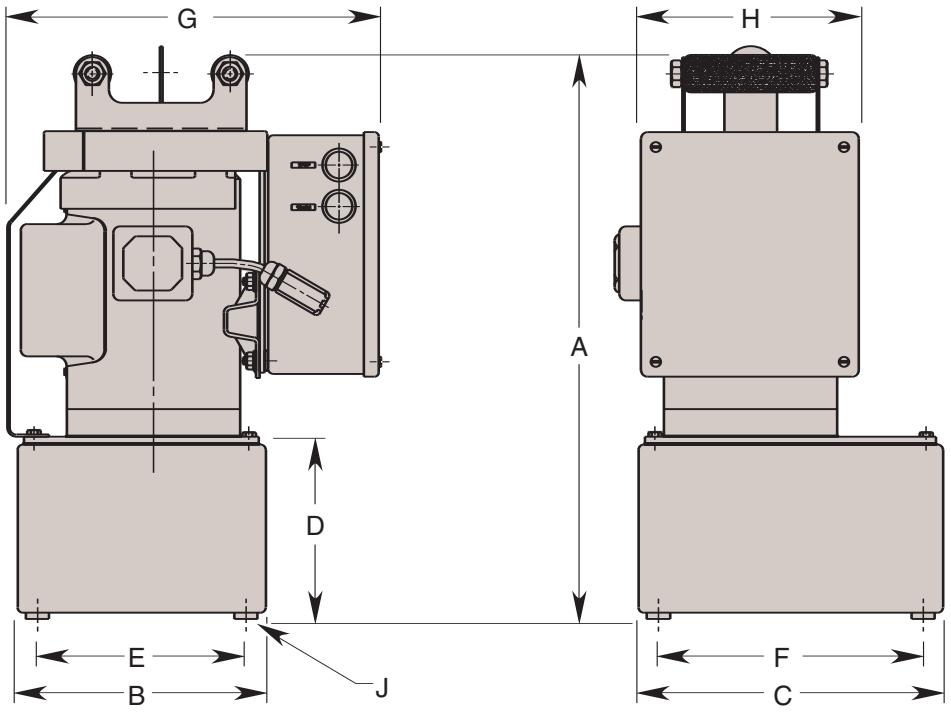
These electric/hydraulic pumps are two-stage, continuous pressure (demand) pumps that contain all the necessary controls and circuitry for powering any single- or double-acting continuous pressure workholding system. They have a pressure switch and an external pressure regulator, both infinitely adjustable throughout the operating pressure range of 1,000 to 5,000 psi. An internal safety relief valve prevents damage from exceeding the maximum rated pressure.

They are gerotor/axial piston pumps with a totally enclosed fan cooled (TEFC) induction motor. The ¼" NPTF outlet manifold can be replaced by any Hytec pump-mounted valve. Shipped with two gallons of hydraulic oil.

Features:

- NEMA 12 electrical enclosure and controls
- CSA approved
- Drip/chip cover
- Liquid filled gauge
- Dual carrying handles
- Thermal overload protection
- 2.5-gallon metal reservoir
- 44 cu. in./min. oil flow at max. pressure
- 590 cu. in. usable oil





Cat. No.	Specifications			Dimensions (In Inches)								
	Electric Motor	Supply Voltage	Noise Level @ Idle/Max. Press. (dBA)	A	B	C	D	E	F	G	H	J Thread Size
100155	1 hp; 1,725 rpm; 230/460 VAC; 3.8/1.9 amps max.; 60 Hz; three phase	460 VAC	70	21.375	9.500	11.500	6.500	8.000	10.000	14.125	9.500	½-20 UNF
100155-230		230 VAC										
*100186	1 hp; 1,725 rpm; 115/230 VAC; 16/8 amps max.; 60 Hz; single phase	115 VAC										
100186-230		230 VAC										

NOTE: *For field conversion to 230 VAC, order conversion kit No. 250186.
An optional fluid level / temperature gauge is available, see page 135.

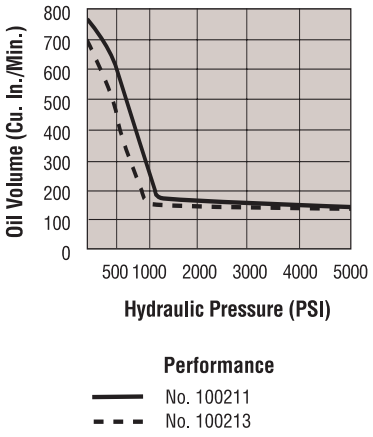
Electric/Hydraulic Pumps

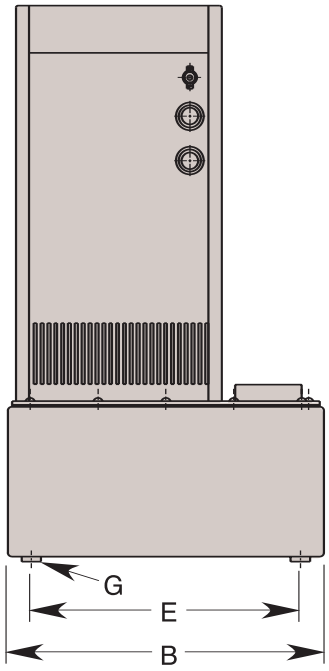
These electric/hydraulic pumps are two-stage, continuous pressure (demand) pumps that contain all the necessary controls and circuitry for powering any single- or double-acting continuous pressure workholding system. They contain a pressure switch and pressure regulator that are infinitely adjustable throughout the operating pressure range of 1,000 to 5,000 psi.

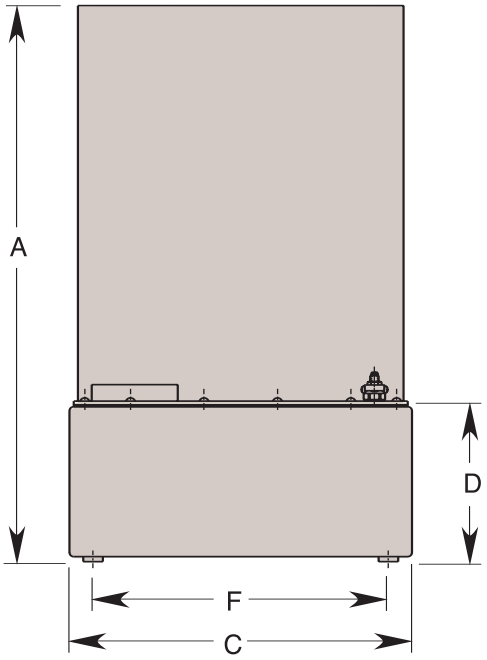
They are gerotor/axial piston pumps, ideal for use in single or multiple station applications, and include a ¼" NPTF outlet manifold and will accept any Hytec pump-mounted valve. Shipped with four gallons of oil.

Features:

- Enclosed induction motor
- Filtered filler/breather cap
- Liquid filled gauge
- Carrying handles
- Thermal overload protection
- 5.7-gallon metal reservoir
- Oil flow at max. press.: 125 cu. in./min.
- 1,250 cu. in. usable oil
- External pressure regulator
- Pressure switch







Cat. No.	Specifications			Dimensions (In Inches)						
	Electric Motor	Supply Voltage	Noise Level @ Idle/Max. Press. (dBA)	A	B	C	D	E	F	G Thread Size
100211†	2 hp; 1,725 rpm; 115/230 VAC; 27/14 amps max.; 50/60 Hz; single phase	115/230 VAC	74/76	25.125	14.250	15.500	7.250	12.125	13.312	½-20 UNF

NOTE: † CSA Approved.

Hydraulic Intensifiers

SPX HYTEC

Intensifiers are used in applications where an existing low pressure hydraulic source is available. They amplify low pressure to a range better suited to workholding systems

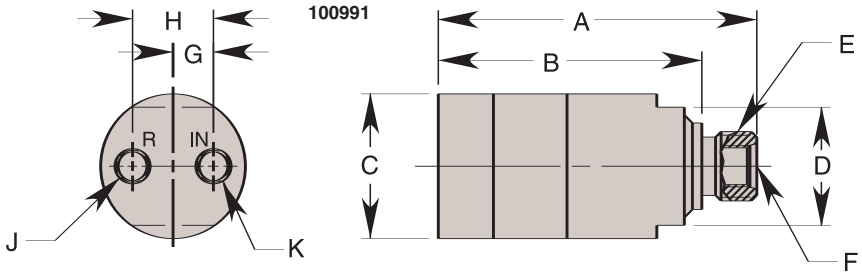
Intensifiers use a reciprocating pumping mechanism to generate the high pressure flow so their volume is not limited as with piston style intensifiers. This allows the intensifier to compensate for any oil consumption on the high pressure side. The outlet pressure is directly proportional to the inlet pressure. High pressure adjustment is achieved by varying the inlet pressure.

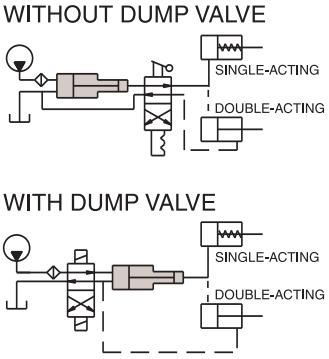
Flow from the low pressure source is directed through the intensifier to the downstream circuit. As system pressure increases, the intensifier begins to cycle and intensifies the system pressure by the ratio specified.

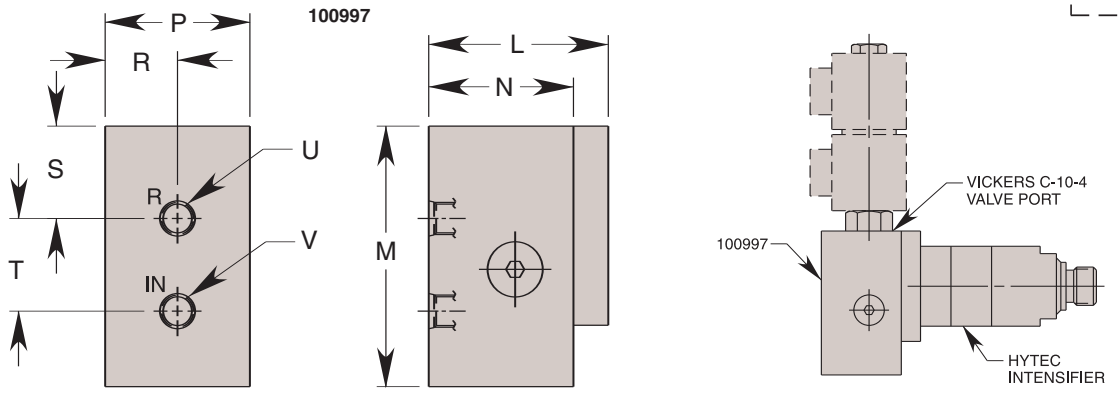
Models without a dump valve do not allow reverse flow so directional control must take place downstream in the high pressure circuit. Models with the dump valve allow directional control in the low pressure supply circuit. The optional directional valve manifold block has a standard Vickers C-10-4 cavity to accept a variety of manual and solenoid valves. Fitting No. 253288 can be used with part No. 100997. See page 126 for specs.

Features:

- 5,000 psi max.
- 3.2, 4 and 5.1 ratios available
- Optional valve manifold
- Extremely compact size







Cat No.		Specifications					Dimensions (In Inches)					
With Dump Valve	W/O Dump Valve	Pressure Intensification Ratio	Inlet Flow Max. (Cu. in./min.)	Outlet Flow Max. (Cu. in./min.)	Inlet Pressure Min. (psi)	Inlet Pressure Max. (psi)	A	B	C Dia.	D Flats	E Thread Size	F Outlet Thread Size
100991	100994	3.2 to 1	610	150	300	1,560	4.331	3.583	1.968	1.606	M24 x 1.5	9/16-18 UNF SAE-6
100992	100995	4.0 to 1	580	120		1,250						
100993	100996	5.0 to 1	550	95		1,000						

Cat No.		Dimensions (In Inches)			
With Dump Valve	W/O Dump Valve	G	H	J Return Thread Size	K Inlet Thread Size
100991	100994	.551	1.102	7/16-20 UNF SAE-4	7/16-20 UNF SAE-4
100992	100995				
100993	100996				

Cat No.	Dimensions (In Inches)								
	L	M	N	P	R	S	T	U Return Thread Size	V Inlet Thread Size
100997	2.441	3.543	1.968	1.968	.984	1.256	1.260	¼ BSPP	¼ BSPP

NOTE: Approximate inlet to outlet leakage is 1 cu. in./min. Requires 10 micron nominal filtration. Hytec filter 100919 is ideal for protecting the inlet port. M24-1.5 nut included.

IMPORTANT: Demands created by the addition of this device to an existing hydraulic system can cause fluctuations in available pressure and flow to that system. The effects of these fluctuations on the original system must be evaluated by the designer of that system.

Air/Hydraulic Pump Application Guide

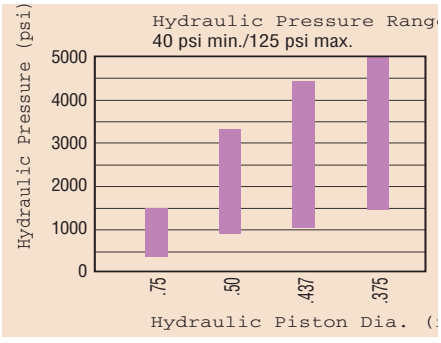
Use this guide to determine the right pump for your application.

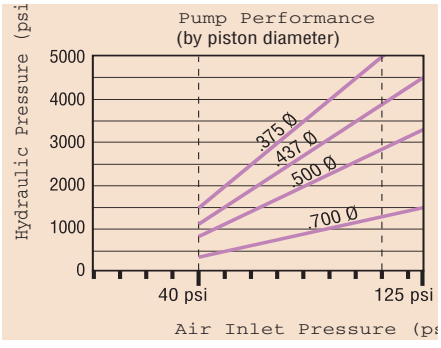
Some of Hytec's pumps can be used for many different applications – and others are intended for specific applications.

- Reciprocating piston pump mechanism available in any of four pressure ranges
- Hydraulic pressure is varied by changing air pressure at the pumps inlet
- Filtered breather and dipstick built into filler cap
- Elevated fill port keeps contaminants out of reservoir
- More usable oil capacity than ordinary boosters

Once pressure is developed, these pumps stall and then no energy is required to maintain consistent system pressure. Boosters stop after only one stroke, and if pressure is not built after that first stroke, or if leakage is present, system pressure will not be maintained. Hytec air/hydraulic pumps will maintain pressure levels because they continue to reciprocate until pressure develops. If additional flow is necessary for maintaining pressure, the pump again reciprocates to meet that demand.

All of Hytec's air/hydraulic pumps can be built in any of 4 different pressure ranges by changing the size of the pump piston. All of the most common versions are available from stock. Any other combinations can be easily assembled to order.





* Air pressures higher than 110 psi will open the pump's internal relief valve to protect the pump and the circuit. The pump will continue to reciprocate rather than stall. This will cause unnecessary wear, noise, heat and air usage.

100190

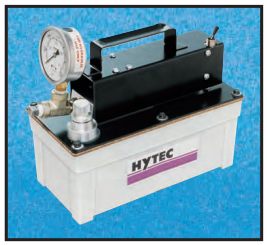
This single-stage design is the flagship of Hytec air/hydraulic pumps. Used with a hydraulic directional control valve, these pumps are ***suited for either single-acting or double-acting systems***. Primarily for use with their manifold and remote mounted valves, they are used to power systems with a single valve or as the centralized pump for systems using multiple valves. Pump mounted valves can simplify plumbing but limit the application to one circuit per pump. The built-in air filter/regulator/lubricator provides hydraulic pressure adjustment. A metal case increases durability and resists contamination.

100200

This pump style provides all of the same operational and design features of the pump style discussed above but ***provides much higher low pressure flow rates***. Under the cover are two of Hytec's reciprocating air/hydraulic pumps. Both share the same inlet and outlet ports. This two-stage design provides higher flows at lower pressures. The first stage pump receives full airline pressure. When its maximum hydraulic pressure is reached, it stalls and allows the second stage pump (usually a higher pressure version) to take over to develop system pressure. The second stage pump is controlled by the built-in air filter/regulator/lubricator.

100280

This pump style provides all of the same operational features of the single-stage pumps discussed above except that it ***makes use of a user-supplied air filter/regulator/lubricator to control pressure***. External shrouding is removed to decrease its overall size and allow mounting in tight quarters; either on or off the fixture. Primarily for use with their manifold and remote mounted valves. Pump mounted valves can simplify plumbing but limit the application to one circuit per pump. Like the pumps above, a pressure gauge and a manifold with pressure and return ports are included.



58219

This series of pumps has a ***built-in directional control valve***. Circuits using this pump require only a single line between the pump and the workholding circuit. For single-acting systems only, directional control is provided by a two-position air valve mounted on the pump. This valve can be remote mounted with two, user-supplied air lines between the valve and the pump. Supply (air) pressure is then connected to the valve. This pump is not intended for use with additional directional control valves and allows only one circuit per pump. This simple, inexpensive design eliminates the cost and clutter of a separate hydraulic directional control valve.

100279

This style of pump is designed specifically for ***use with our manual pallet valve***. It is controlled by the foot pedal. Rocking it toe-down releases hydraulic pressure. Rocking it back to the heel-down position causes the pump to start. When released, the pedal returns to a center position and the pump stops. Because the pump runs only when holding the pedal down, this style of air/hydraulic power source is not suitable for constant pressure workholding systems. Use this pump for single-acting systems where an operator is in control of the pump, hold and release functions. In addition to our manual pallet valve, this pump can be useful for non-clamping process functions like pressing or positioning.

Contact Hytec or your distributor

Air/Hydraulic Pumps

SPX HYTEC®

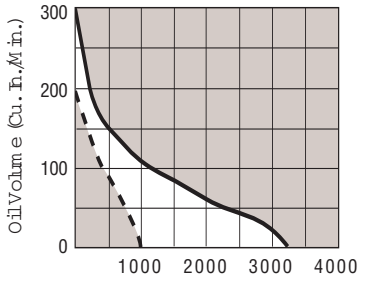
Available with all piston options, this single-stage pump is a continuous pressure, reciprocating, stall-type pump: air pressure is simply converted to hydraulic pressure. Operated by any compressed air source, this pump saves energy by stalling when pressure is developed, and requires no energy to maintain system pressure. It features single-stage operation, and can accept any Hytec pump-mounted valve. An air supply filter/lubricator/ regulator (not included) is required for making hydraulic pressure adjustments.

Features:

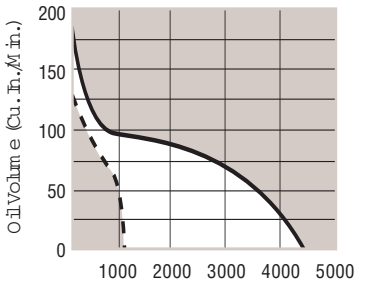
- Filtered fill cap with dipstick
- Liquid filled gauge
- 105 cu. in., high-density polyethylene reservoir
- ¼" NPTF outlet manifold
- ¼" NPTF air inlet port
- 98 cu. in. usable oil
- Shipped filled with oil
- Operating Pressure Range (nominal):

100280- 4,475 psi @ 125 psi air, max.
1,150 psi @ 40 psi air, min.
.437 dia. piston size

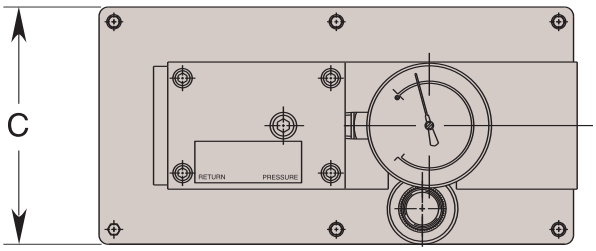
100987- 3,325 psi @ 125 psi air, max.
925 psi @ 40 psi air, min.
.50 dia. piston size

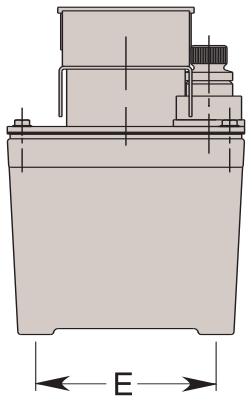


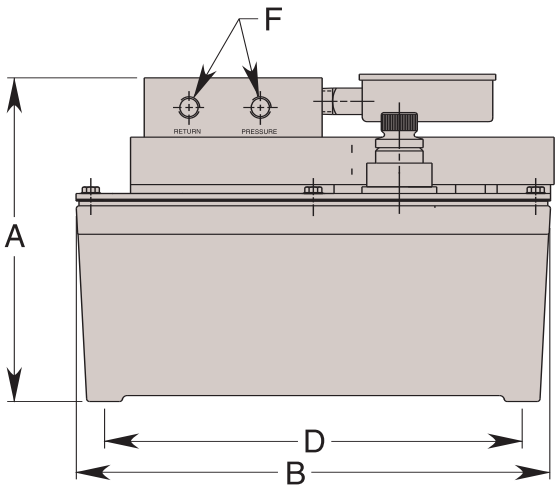
Performance
No. 100987
40 psi Air Pressure
125 psi Air Pressure



Performance
No. 100280
40 psi Air Pressure
125 psi Air Pressure



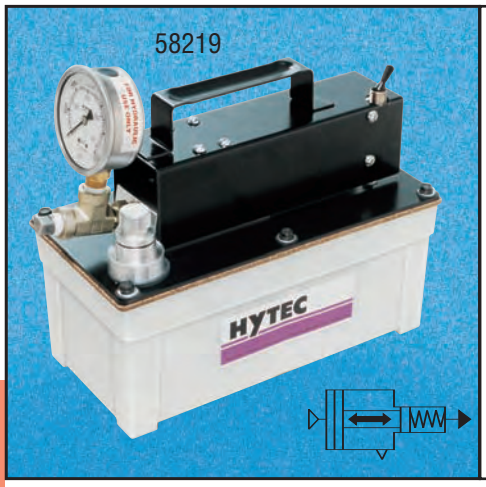




Cat. No.	Specifications			Dimensions (In Inches)					
	Piston Dia.	Operating Pressure Range		A	B	C	D	E	F Ports
		@ 125 psi Air Max.	@ 40 psi Air Min.						
100280	.437	4,475	1,150	7.000	10.000	5.000	9.000	4.000	¼ NPT
100987	.500	3,325	925						

NOTE: Mounting screws included (9-15 x 1.000 Lg.).
AIR REQUIREMENTS: 20 CFM (max.) at low hydraulic pressure decreasing to 0 CFM when pump stalls.

Air/Hydraulic Pumps

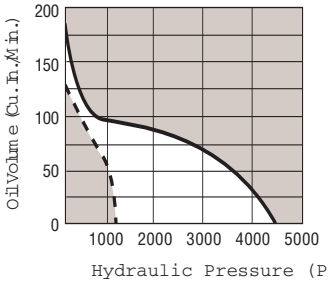


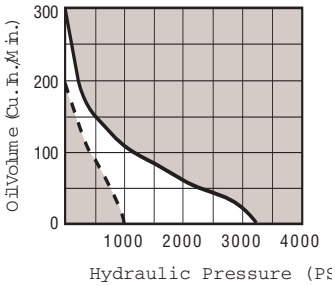
Available with all piston options, this single-stage power source is a continuous pressure, reciprocating, stall-type pump. Air pressure is simply converted to usable hydraulic pressure. Operated by any compressed air source, this pump saves energy by stalling when hydraulic pressure is developed and then requires no additional energy to maintain system pressure.

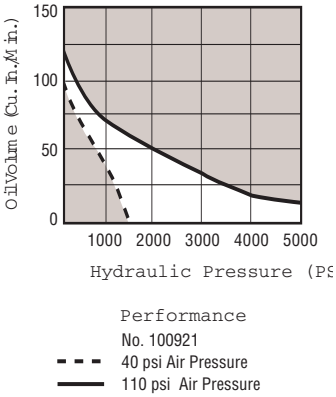
Designed for single acting systems, this pump has a built-in selector valve to choose either the pressurize or release mode. No additional valving is required. An air supply filter/regulator/lubricator (not included) is required for making pressure adjustments.

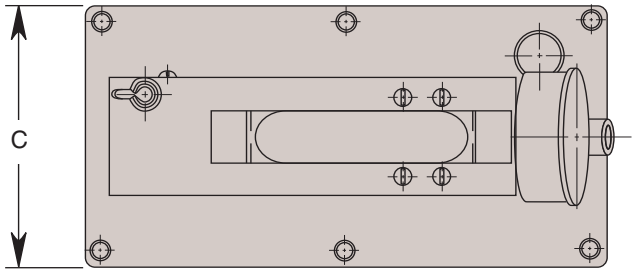
Features:

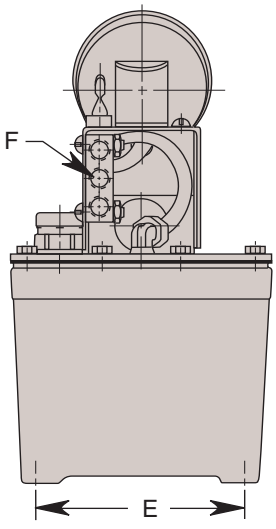
- Filtered fill cap with dipstick
- Liquid filled gauge
- 105 in^3., high-density polyethylene reservoir
- ¼" NPTF outlet port
- ⅛" NPTF air inlet port
- 98 cu. in. usable oil
- Shipped filled with oil
- Carrying handle for easy portability
- Operating Pressure Range (nominal):
  100921- 5,000 psi @ 110 psi air, max.
  1,500 psi @ 40 psi air, min., .375 dia. piston size
  58219- 4,475 psi @ 125 psi air, max.
  1,150 psi @ 40 psi air, min., .437 dia. piston size
  100918- 3,325 psi @ 125 psi air, max.
  925 psi @ 40 psi air, min., .50 dia. piston size

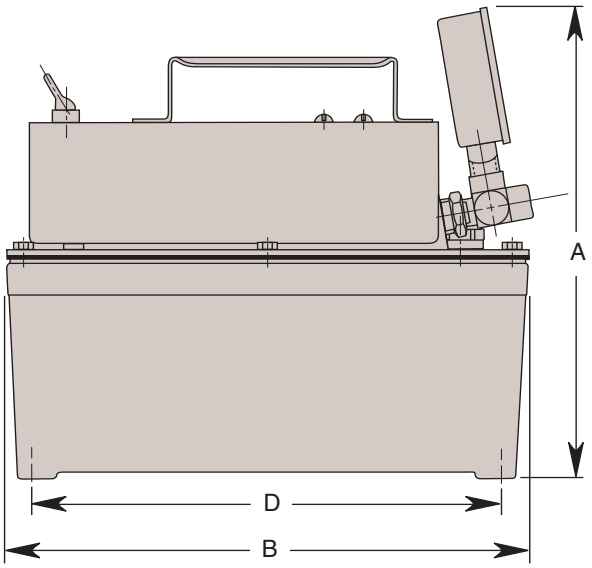








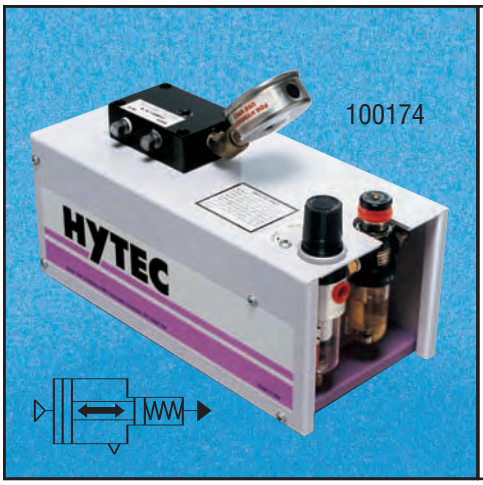




Cat. No.	Specifications			Dimensions (In Inches)					
	Piston Dia.	Operating Pressure Range		A	B	C	D	E	F Air Inlet Port
		@ 125 psi Air Max.	@ 40 psi Air Min.						
100921	.375	5,000	1,500	9.032	10.000	5.000	9.000	4.000	⅛ NPT
58219	.437	4,475	1,150						
100918	.500	3,325	925						

NOTE: Mounting screws included (9-15 x 1.000 Lg.).
AIR REQUIREMENTS: 20 CFM (max.) at low hydraulic pressure decreasing to 0 CFM when pump stalls.

Air/Hydraulic Pumps

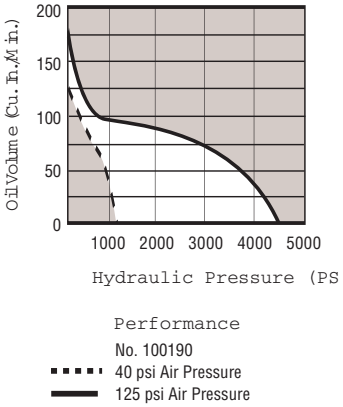


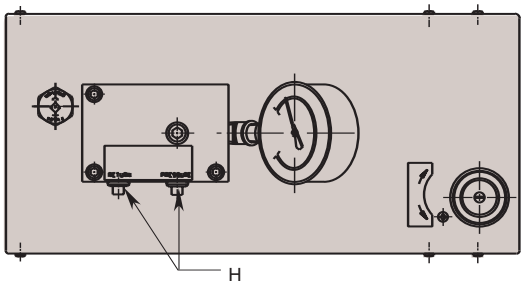
These single-stage pumps are continuous pressure, reciprocating, stall-type pumps: Air pressure is simply converted to hydraulic pressure. Operated by any compressed air source, these pumps save energy by stalling when pressure is developed, and require no energy use to maintain system pressure. They will accept any Hytec pump-mounted valve.

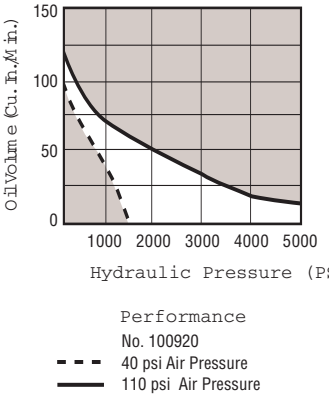
Features:

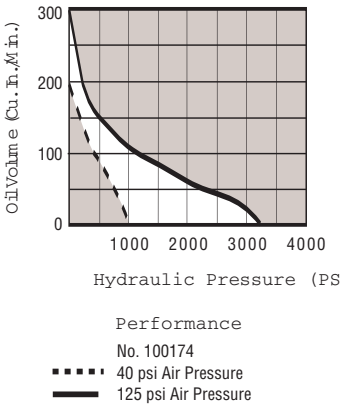
- 105 cu. in., high-density polyethylene reservoir
- Filtered fill cap with dipstick
- Liquid filled gauge
- ¼" NPTF outlet manifold

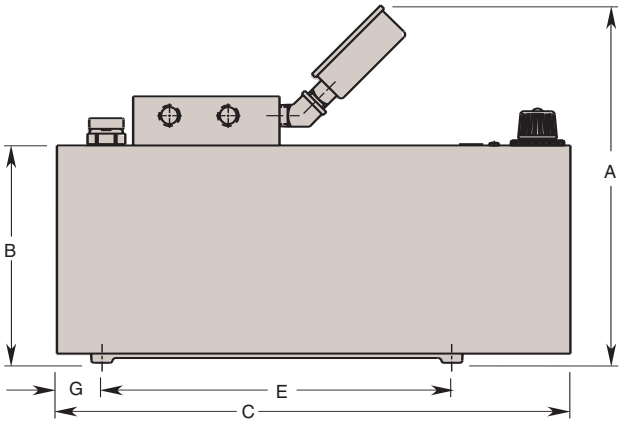
- ¼" NPTF air inlet port
- 98 cu. in usable oil
- Shipped filled with oil
- Operating Pressure Range (nominal):
  100920 – 5,000 psi @ 110 psi air, max.
  1,500 psi @ 40 psi air, min.
  .375 dia. piston size
  100190 – 4,475 psi @ 125 psi air, max.
  1,150 psi @ 40 psi air, min.
  .437 dia. piston size
  100174 – 3,325 psi @ 125 psi air, max.
  925 psi @ 40 psi air, min.
  .50 dia. piston size
  100191 – 1,500 psi @ 125 psi air, max.
  400 psi @ 40 psi air, min.
  .75 dia. piston size

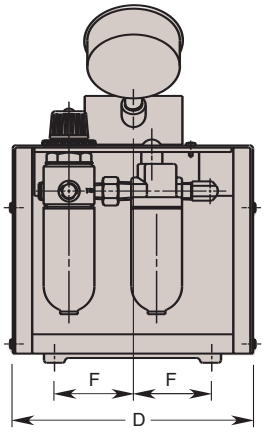


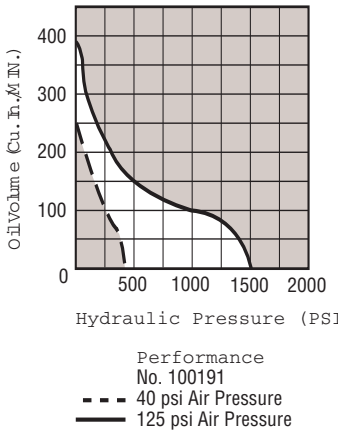












Cat. No.	Specifications			Dimensions (In Inches)							
	Piston Dia.	Operating Pressure Range		A	B	C	D	E	F	G	H Ports
		@ 125 psi Air Max.	@ 40 psi Air Min.								
100920	.375	*	1,500	9.500	5.500	13.062	6.125	9.000	2.000	1.250	¼ NPTF
100190	.437	4,475	1,150								
100174	.500	3,325	925								
100191	.750	1,500	400								

NOTE: Mounting screws included (9-15 x 1.000 Lg.).
AIR REQUIREMENTS: 20 CFM (max.) at low hydraulic pressure decreasing to 0 CFM when pump stalls.
* Air pressure higher than 110 psi will cause the pump to exceed its 5,000 psi maximum rating. The internal relief valve will open to protect the pump and the circuit, but the pump will continue to reciprocate rather than stall. This will cause unnecessary wear, noise, heat and air usage.

Air/Hydraulic Pumps

Available with any combination of available pistons, this pump is designed for applications where air is the preferred source of energy, this two-stage pump gives you high speed oil advance. The first stage provides high flow at low pressure for rapid advance of clamps and cylinders. The second stage builds and maintains pressure at a preset level. And because it has a manifold, it will accept any Hytec pump-mounted valve.

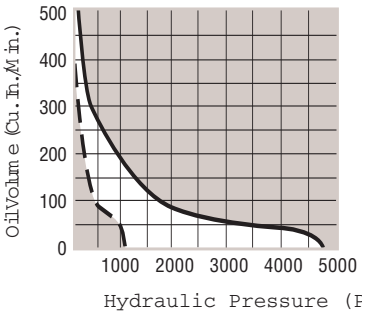
Each stage is an individual air/hydraulic pump which stalls when hydraulic pressure exceeds the air pressure times the pump ratio. Only the second stage pump is controlled by the built-in adjustable pressure regulator. The first stage is limited only by air supply pressure.

Features:

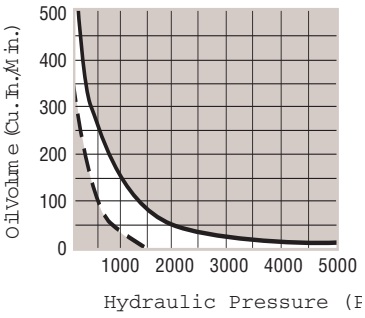
- Filtered fill cap with dipstick
- Liquid filled gauge
- 2-gal.n, high-density polyethylene reservoir
- ¼" NPTF air inlet port
- ¼" NPTF outlet manifold
- Shipped with 1.5 gallons hydraulic oil
- 425 cu. in. usable oil

100922 - 5,000 psi @ 110 psi air, max.
1,500 psi @ 40 psi air, min.
.75 and .375 dia. piston size

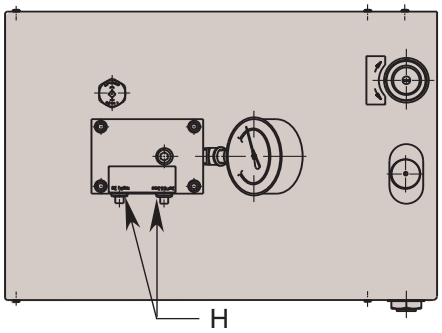
100200 - 4,475 psi @ 125 psi air, max.
1,150 psi @ 40 psi air, min.
.75 and .437 dia. piston size

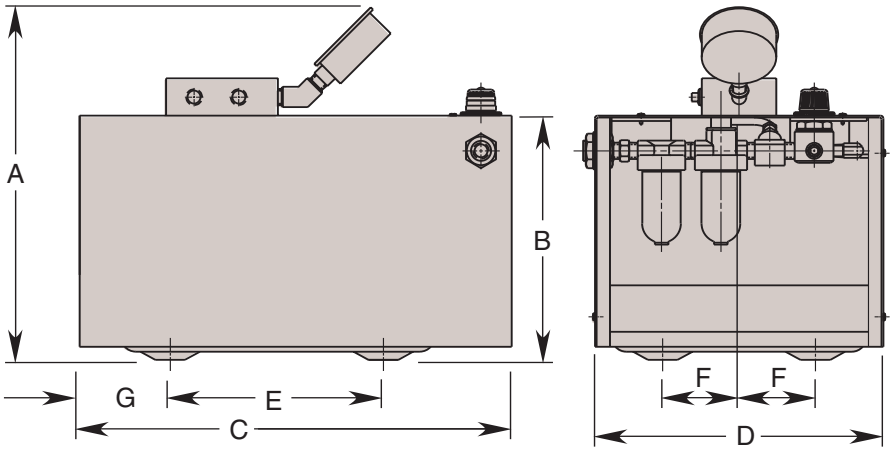


Performance
No. 100200
40 psi Air Pressure
125 psi Air Pressure



Performance
No. 100922
40 psi Air Pressure
125 psi Air Pressure



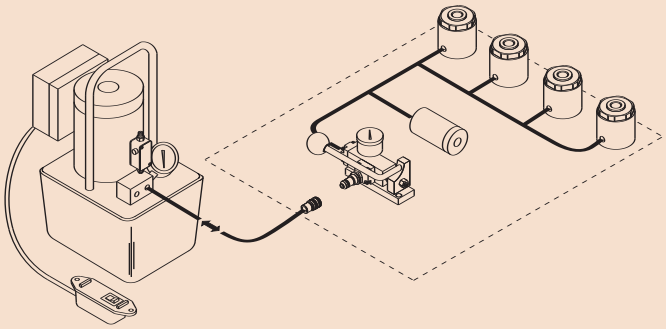


Cat. No.	Specifications			Dimensions (In Inches)							
	Piston Dia.	Operating Pressure Range		A	B	C	D	E	F	G	H Ports
		@ 125 psi Air Max.	@ 40 psi Air Min.								
100922	.750/.375	*	1,500	12.000	8.500	14.250	9.625	7.125	2.562	1.438	¼ NPTF
100200	.750/.437	4,475	1,150								

NOTE: Mounting screws included (¼-10 x .875 Lg.).
To properly control system pressure in low pressure applications, air supply pressure should be limited to less than 6% (125 psi max.) of desired hydraulic pressure.
AIR REQUIREMENTS: 37 CFM (max.) at low hydraulic pressure decreasing to 0 CFM when pump stalls.
* Air pressure higher than 110 psi will cause the pump to exceed its 5,000 psi maximum rating. The internal relief valve will open to protect the pump and the circuit, but the pump will continue to reciprocate rather than stall. This will cause unnecessary wear, noise, heat and air usage.

While Hytec has a pump applicable to most applications, not all pumps can be used in all systems. Please use the application chart below and the following pages to identify the pump that best fits your needs.

Powering a Single Acting Manual Pallet Coupling System



100179

Similar to the 100178, this economical pump has a special electrical circuit as well as an automatic dump valve. This pump is well suited for use with Hytec's manual pallet valve.

Page 113

100879, 100888

These pumps are based on Hytec's popular one horsepower, TEFC, NEMA 12, hydraulic power source. They are modified both electrically and hydraulically for use with our pallet valve.

Page 114

1002

For faster flow rates, these are the highest capacity, standard Hytec pumps for ou

Page

100279

Like all of the others above, this air powered, reciprocating hydraulic pump is designed and outfitted specifically for the manual pallet valve.

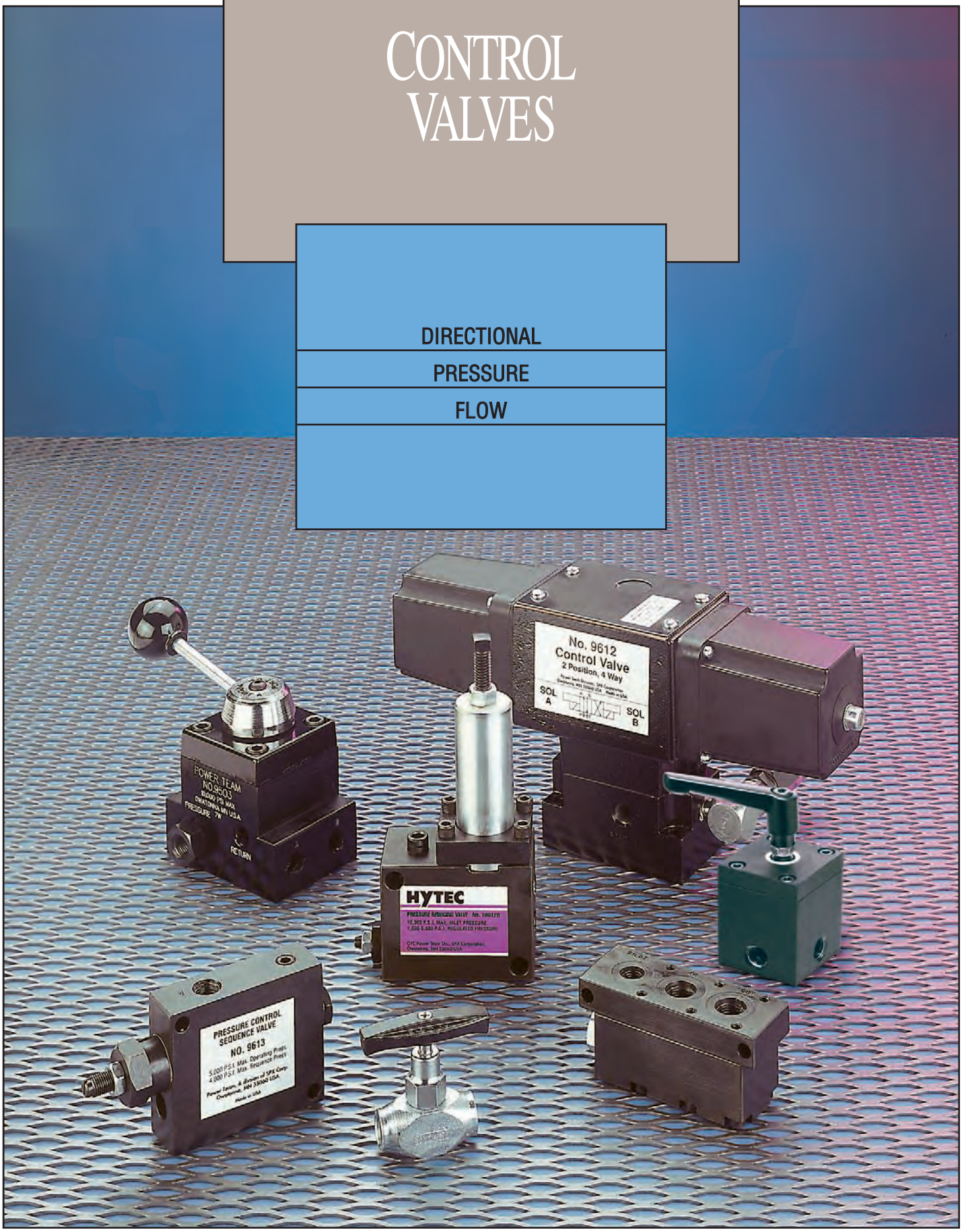
Page 116

CONTROL VALVES

DIRECTIONAL

PRESSURE

FLOW



Control Valve Information

Hytec has created a line of control valves designed and manufactured so precisely that there is virtually zero leakage, making them ideal for constant pressure hydraulic workholding systems. **Valves with internal leakage (such as spool valves) are not appropriate for use with Hytec pumps and pallet valve systems.**

Directional Control Valves

Available in many versions, each of these valves is capable of operating double or single-acting spring return systems. Mounting configurations available are pump mounted, remote mounted, and manifold mounted, and operation is either manual or through electric solenoids.

Manually operated valves are used in applications where the valves can be mounted near the operator on the fixture, pump, or any convenient location at the workstation. The electrically operated valve is ideal for systems requiring push-button simplicity or automated systems where the valve is controlled by machine logic instead of the operator. Since it's controlled by an electrical signal, it can be mounted in any convenient location and need not take up valuable fixture or workstation space.

All remote mounted directional control valves are installed by connecting the pump or pressure port (labeled "P") to the pressure source and the return or tank port (labeled "T") to the return line. The outlets or work ports (labeled "A" and "B") are connected to the component or system to be controlled.

In single-acting systems, the valves are used as 3-way valves. One port, A or B, is plugged and the other is connected to a single-acting actuator or system. In one handle position, the port to the actuator will be pressurized and the plugged port open to the reservoir. In the other handle position, the actuator will retract because that port is open to the reservoir. This pressurizes the remaining port, but since it's plugged, the pump will build pressure and shut off.

In double-acting systems, these valves act as 4-way valves: ports A and B are connected to a double-acting actuator or system. In handle position A, port A is pressurized and port B is open to the reservoir. Handle position B pressurizes port B and port A is open to the reservoir. Shifting the valve will cause the actuator to alternately extend and retract.

Selected Hytec remote mounted directional control valves include a check valve in the pressure port to maintain system pressure during periods of fluctuating supply pressure. Carefully review check valve requirements on each product selected. With pump mounted valves, the pump outlet check valve serves the same purpose.

Pressure Control Valves

Two types are available for specialized workholding systems – sequence and pressure reducing. Both are available in manifold and conventionally mounted styles.

Pressure Sequence Valves control the order of events within a hydraulic system by directing pressure into two circuits in a pressure-controlled sequence. For example, this allows clamps to be actuated before work supports are locked.

Initially, the valve is closed. Oil flows to the primary circuit until pressure reaches the valve setting. The valve then opens to deliver oil to the secondary circuit while holding pressure on the primary circuit. Once secondary and primary pressures are equal, the pressure increases uniformly in both circuits.

This valve is installed by connecting the pressure port (labeled "P") to a tee in the portion of the circuit to be actuated first. The part of the circuit to be sequenced later is connected to the outlet port (labeled "A"). The vent port must be open to atmosphere for proper operation.

Pressure Reducing Valves are designed to reduce the maximum pressure in a portion of a hydraulic circuit – the need for a separate power source for each pressure level is eliminated. The valve is open from the inlet to the outlet until a pre-selected pressure is reached, at which point the valve closes to limit pressure in the secondary circuit. Valve seats and poppets are precision ground, assuring virtually zero leakage and eliminating the need for a case drain line.

This valve is connected "in line" with the circuit requiring the reduced pressure. The inlet or pressure port (labeled "P") is on the high pressure side. The outlet or reduced pressure port (labeled "A") is connected to the lower pressure circuit. The drain or tank port (labeled "T") is connected to the power source return line if necessary. Ordinary pressure limiting valves close when their pressure setting is reached. Once closed, it will not re-open until system pressure is released. Even minor leakage in the system can not be made up. Hytec's pressure reducing valve uses a balanced poppet design which will re-open any time flow downstream is required.

Flow Control Valves

The types of flow control valves available from Hytec are: pilot operated check valve and needle-type flow restrictor valves.

Hytec's **Pilot Operated Check Valve** offers a unique poppet seal design making it ideal for pallet applications or other specialized control circuits where zero leakage is essential. It can be used in any application where pressure must be maintained in a portion of a circuit until a separate pilot signal opens the valve and allows free flow in the reverse direction.

This 5,000 psi valve is used with Hytec's Automatic Pallet Coupling System and double-acting manual pallet valve. Replaceable filter elements protect the check valve and your other system components from contamination. No disassembly of circuit plumbing is required to service the filters or check valve cartridges.

When the port labeled "INLET" is pressurized, hydraulic fluid can flow freely into the valve, leaving through the port labeled "OUTLET". Pressurized fluid at the outlet port cannot flow back into the valve unless the port labeled "PILOT" is pressurized to open the valve allowing reverse flow.

Needle Valves are multiple-turn flow restrictor valves which provide finely adjustable flow control for components or circuits requiring reduced flow rates. They are also used in some non-critical sequencing applications where restriction in part of a circuit will tend to cause the actuators in the remainder of the circuit to operate first.

Needle valves are available that:

a) restrict flow in both directions, or
b) restrict flow in one direction through the use of an internal free-flow check valve.

Valves without the free-flow check are typically used in a part of a circuit where there is flow in only one direction. They can also be used in double-acting circuits where restriction is desirable in both directions.

Valves with the reverse free-flow check are most effectively used in single-acting circuits where the actuation speed must be reduced without affecting the system return time.

Our high pressure **Ball Valves** provide full unrestricted flow and positive shut-off of fluids. They have a 90 degree actuation and are available in SAE or NPT ports.

SPX HYTEC®

Remote Mounted Control Valves

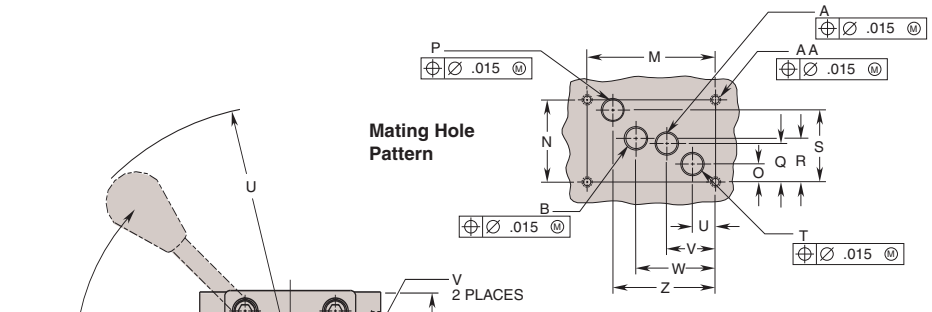
These valves are ideal for mounting directly on the machine or fixture for maximum operator convenience. They also permit the pump to be located away from the operator's workstation. Each of these valves allows several circuits to be controlled with a single pump.

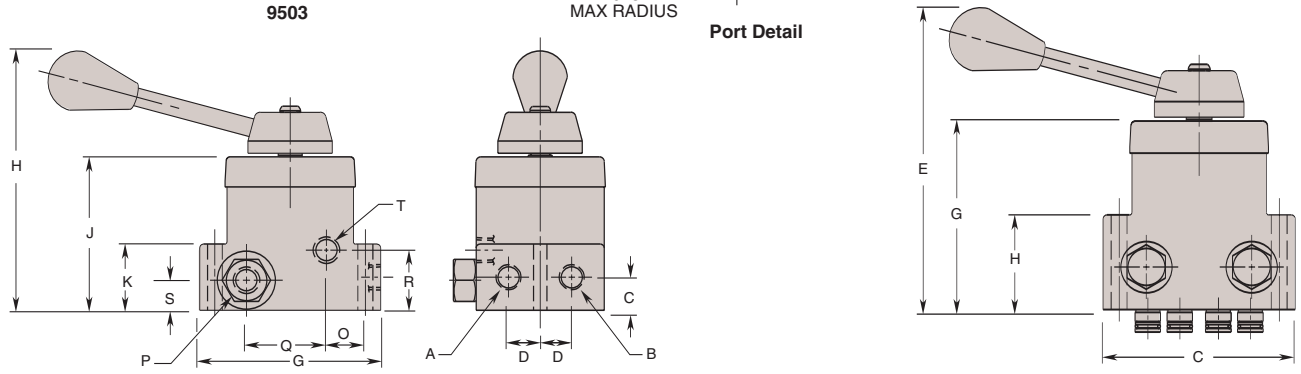
Features:

- 3-way/4-way, 2-position, detented
- Manually operated
- Remote mounted
- Single- or double-acting systems
- Handle swings 90° and may be repositioned in 22.5° intervals
- Pressure port check valves

- 5,000 psi max.
- 5 gpm max.
- 500 psi max. return line pressure
- No. 9503 includes mounting hardware, ¼-20 UNC x 1.875" cap screws

Note: When using No. 9503 valve in multiple fixture applications with a single power source, Hytec recommends that check valve No. 206330 or No. 500171 be connected to the tank port to prevent return line back pressure from actuating released single-acting components, or causing pressure fluctuations in double-acting systems. Valve No. 100154 has a built-in check valve.





Cat. No.	Dimensions (In Inches)																				
	A Port	B Port	C	D	E	F	G	H	J	K	L	M	N	O	P Port	Q	R	S	T Port	U Rad.	V Dia.
9503	¼ NPTF	¼ NPTF	.687	.656	2.660	1.330	3.750	5.420	3.188	1.375	.312	3.125	.469	.812	¼ NPTF	1.656	1.250	.625	¼ NPTF	5.031	.281

Cat. No.	Dimensions (In Inches)																								
	A	B	C	D	E	F	G	H	J	K	L Rad.	M	N	O	P	Q	R	S	T	U	V	W	X Dia.	Y	Z	AA Thd. Size
100154	*	*	3.750	2.656	6.047	.213	3.675	1.845	.312	.312	5.032	3.125	2.000	.438	*	.938	1.063	1.750	*	.560	1.185	1.935	.500 .503	.515 .535	2.560	¼–20 UNC

NOTE: *See Port Detail drawing for ports A, B, P and T.

Remote Mounted Control Valves

SPX HYTEC

These 3-way/4-way, two-position directional control valves are ideal for workholding applications. Their zero-leakage design is the right choice for constant pressure applications. Their smaller size allows you to maximize usable fixture space.

To improve operator ergonomics, you can instantly position the control lever in any of 24 positions without tools. Finer adjustments are possible by loosening a locknut. Internal stops and detents along with a shaft wiper seal provide excellent contamination resistance.

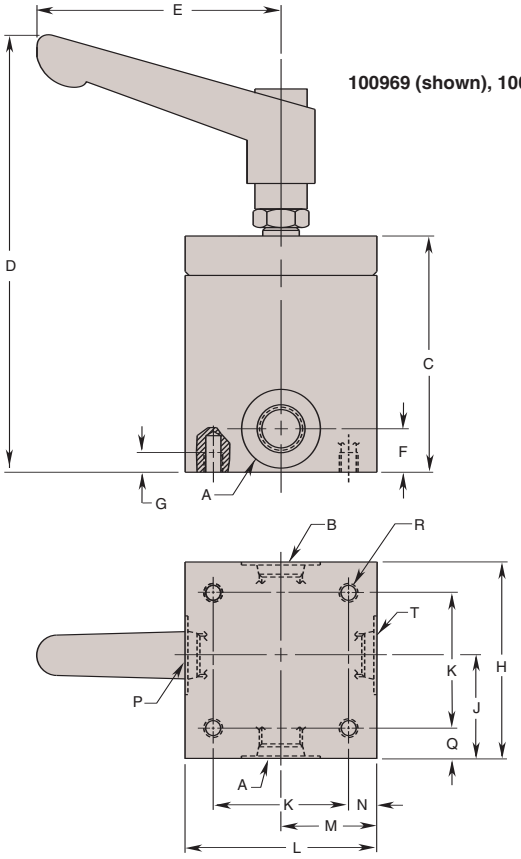
Built without check valves, these directional valves are intended **only** for systems with one valve per hydraulic pressure source.

For multiple valve applications install appropriate pressure ("P") and tank ("T") port check valves (page 96) or use our 100971 directional valve with 100974 check valve subplate. Ported subplates 100972 and 100973 or 2-station manifold 100975 can be added as appropriate.

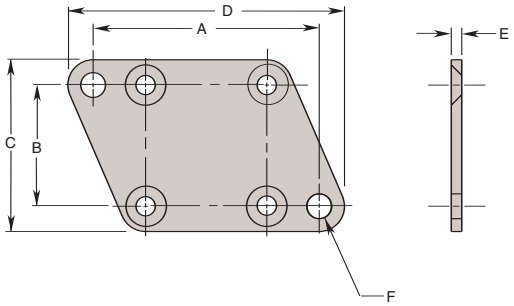
Features:

- 3-way/4-way, 2-position, detented
- Single or double acting systems
- Manually operated, 90 deg. swing
- 1500 psi max. return line pressure
- Remote mounted, SAE or NPT ports
- Infinite handle adjustment
- 5,000 psi max.
- Shaft wiper excludes contaminants
- Optional mounting bracket (No. 500175)
- Single valve applications

100969 (shown), 100970



500175



Cat. No.	Dimensions (In Inches)					
	A	B	C	D	E	F Dia.
500175	2.565	1.375	1.948	3.138	.119	.281

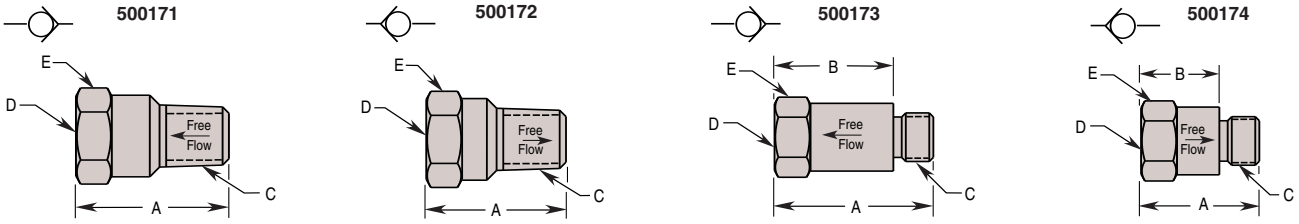
Note: #10-24 UNC x .375 Lg. flat head screws (4) included.

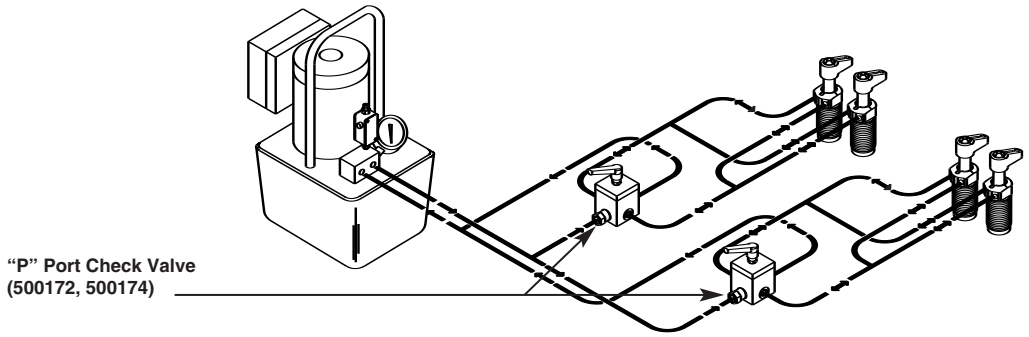
Cat. No.	Dimensions (In Inches)																
	"A" Port	"B" Port	C	D	E Rad.	F	G Min. Thread	H	J	K	L	M	N	"P"	Q	R Thread size	"T" Port
100969	7/16-20UNF SAE-4	7/16-20UNF SAE-4	2.400	4.444	2.480	.442	.375	2.000	.947	1.375	1.948	.974	.287	7/16-20UNF SAE-4	.313	10-24 UNC	7/16-20UNF SAE-4
100970	¼ NPTF	¼ NPTF												¼ NPTF			¼ NPTF

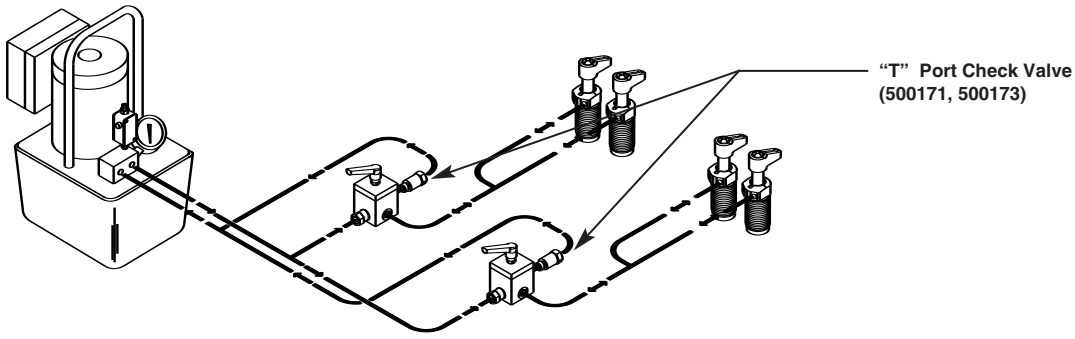
Check Valves

Both the ¼ NPT "T" Port Check Valve (part number 500171) and the SAE-4 (part number 500173) are recommended on single acting circuits where there is more than one directional valve per power source. These check valves are ideal for use in circuits where return line pressure fluctuations may affect released clamps. Use this anytime a return line pressure spike could cause unclamped actuators to move and affect operator safety. They are designed specifically for Hytec's No. 100969 and No. 100970 Directional Control Valves.

The ¼ NPT (500172) and the SAE-4 (500174) "P" port check valves are required on all single acting or double acting circuits where there is more than one directional valve per power source. These check valves prevent power source pressure fluctuations from affecting the pressure in clamped circuits. Without this check valve, shifting the directional control valve in one circuit will cause a temporary loss of clamping pressure in the other circuit.







Cat. No.	Specifications			Dimensions (In Inches)				
	Check Valve Location	Cracking Pressure (psi)	Use With Directional Valve No.	A	B	C Thread Size	D Thread Size	E Hex
500171	Outlet	2	100970	1.349	–	¼ NPTF	¼ NPTF	.750
500172	Inlet			1.259				
500173	Outlet		100969	1.431	1.071	7/16-20UNF SAE-4	7/16-20UNF SAE-4	.625
500174	Inlet			1.065	.705			

Manifold Mounted Control Valve

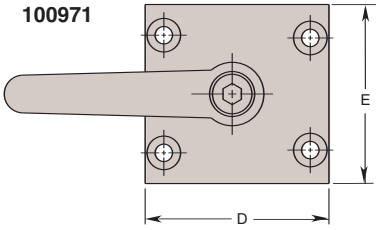
Similar to Hytec's 100969 and 100970, this 3-way/4-way, two-position directional control valve is ideal for manifold mounting on your fixture. The valve's zero-leakage design is the right choice for constant pressure applications. Its smaller size allows you to maximize usable fixture space.

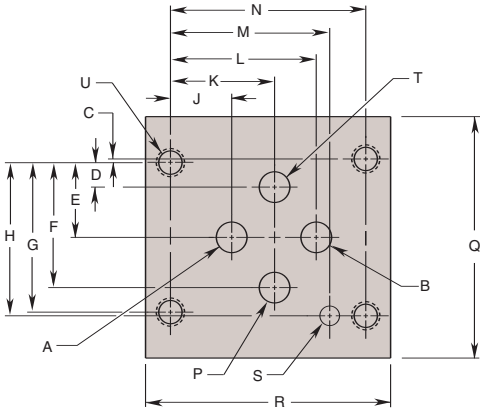
This valve is designed with a standard ANSI, DO3 mounting and port configuration. The control lever can be placed in any of 24 positions without tools. Infinite adjustments are possible by loosening a locknut. Internal stops and detents along with a shaft wiper seal provide excellent contamination resistance.

Built without check valves, this valve is intended **only** for systems with one valve per hydraulic pressure source. For multiple valve applications, simply add the 100974 check valve sub-plate. Ported subplates 100972 and 100973 or manifold 100975 can also be added as appropriate.

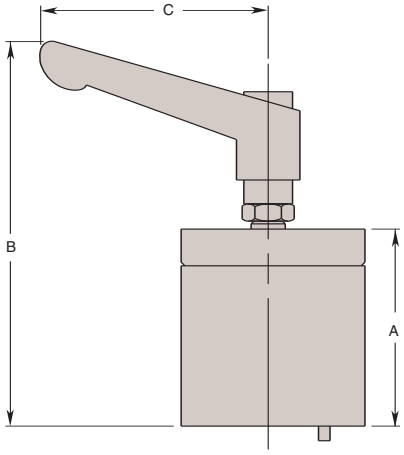
Features:

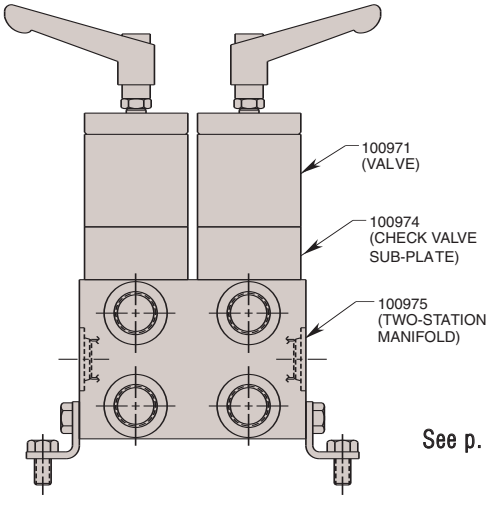
- 3-way/4-way, 2-position, detented
- ANSI, DO3 mounting configuration
- Single or double acting systems
- Manually operated, 90 deg. swing
- 1500 psi max. return line pressure
- Optional SAE or NPT ported subplates
- Infinite handle adjustment
- 5,000 psi max.
- Shaft wiper excludes contaminants
- Optional check-valve subplate

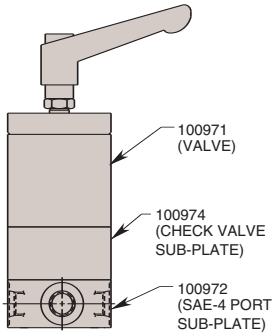




DO3 Manifold Mounting Surface







Cat. No.	Dimensions (In Inches)				
	A	B	C Rad.	D	E
100971	2.144	4.187	2.480	2.000	1.948

#10-24UNC X 2.25 Lg. Mounting screws (4) Included.

See p. 98 for sub-plates and manifolds.

DO3 Mounting Pattern	Dimensions (In Inches)																		
	"A" Port Dia. Max	"B" Port Dia. Max	C	D	E	F	G	H	J	K	L	M	N	"P" Port Dia. Max.	Q Min.	R Min.	† S Dia.	"T" Port Dia. Max.	†† U Thread Size
	.250	.250	.030	.200	.610	1.020	1.220	1.250	.500	.850	1.190	1.300	1.594	.250	1.970	2.000	.160	.250	10-24 UNC

NOTE: † Location hole to be .160 deep min.
†† Minimum thread depth .200

Control Valve Accessories

Single-station Sub-Plates No. 100972 and 100973

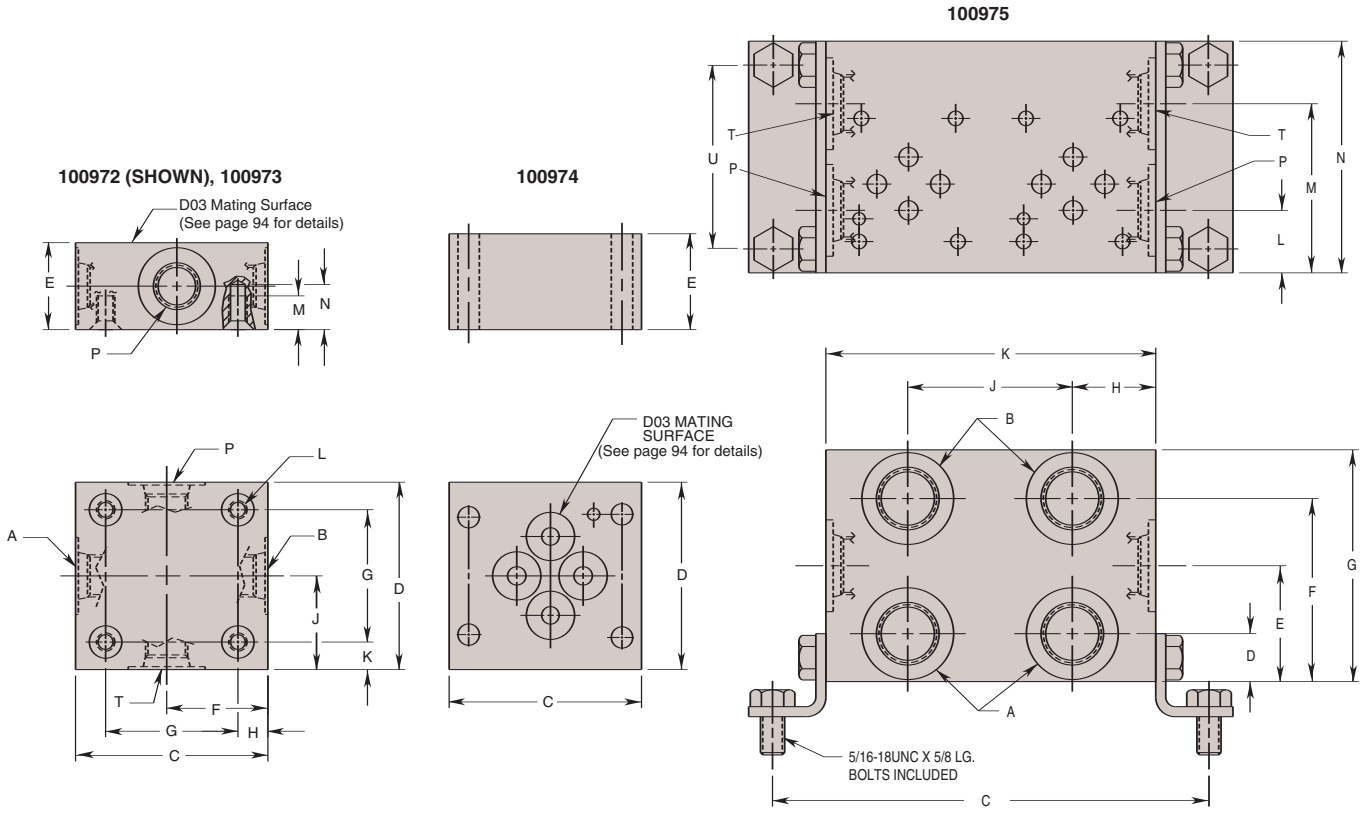
These D03 sub-plates are for use with the 100971 directional control valve and 100974 check valve sub-plate. These assemblies will provide conventionally ported, remote mounted, directional control valves for use in multiple valve systems. These sub-plates may also be used with the 100971 directional control valve only in single valve systems. (For single valve applications, consider using valves 100969 and 100970.) Optional mounting bracket (No. 500175) is available (see p. 95).

Two-Station Manifold No. 100975

This manifold provides for mounting two, 100971 directional control valves. External plumbing is reduced because both D03 mounting patterns share the same pressure and tank ports. Check valve sub-plate 100974 must also be used in workholding circuits.

Check Valve Sub-Plate No. 100974

Use this in directional control valve in applications requiring inlet and outlet checks. (Ports P and T) When two or more valves are connected to the same pressure source, these check valves prevent pressure fluctuations in one system from affecting the other. Without this check valve sub-plate, the shifting of one valve in a system can cause the loss of clamping pressure in another. This check valve sub-plate uses the same D03 mounting configuration as our 100971 directional control valve. It is simply placed underneath the valve. Mounting screws are included.



Cat. No.	Dimensions (In Inches) "A" Port	"B" Port	C	D	E	F	G Mtng.	H Mtng.	J	K Mtng.	L Thread Size	M Min. Thread	N	"P" Port	"T" Port
100972	7/16-20 UNF SAE-4	7/16-20 UNF SAE-4	2.00	1.948	.904	.947	1.375	.313	.974	.287	10-24 UNC	.260	.452	7/16-20 UNF SAE-4	7/16-20 UNF SAE-4
100973	¼ NPTF	¼ NPTF												¼ NPTF	¼ NPTF
100974†	—	—			.997	—	—	—	—	—	—	—	—	—	—

NOTE: † 100974 Check Valve includes (4) #10-24 UNC x 3.25 Lg. Mounting Screws.

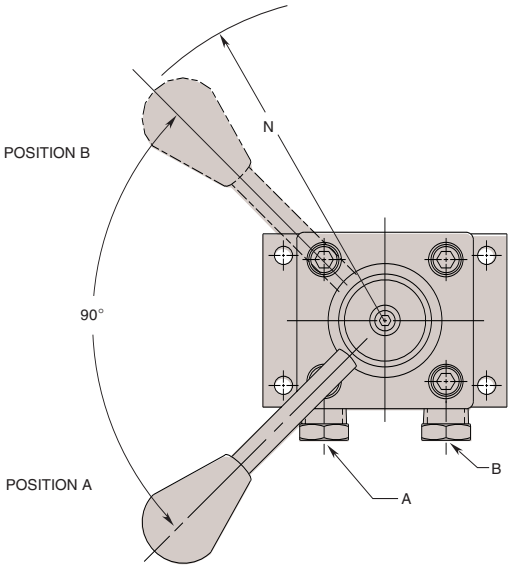
Cat. No.	Dimensions (In Inches) "A" Port	"B" Port	C	D	E	F	G	H	J	K	L	M	N	"P" Port	"T" Port	U
100975	¾-16UNF SAE-8	¾-16UNF SAE-8	5.630	.630	1.500	2.380	3.000	1.060	2.130	4.250	.810	2.190	3.000	⅞-14UNF SAE-10	⅞-14UNF SAE-10	2.38

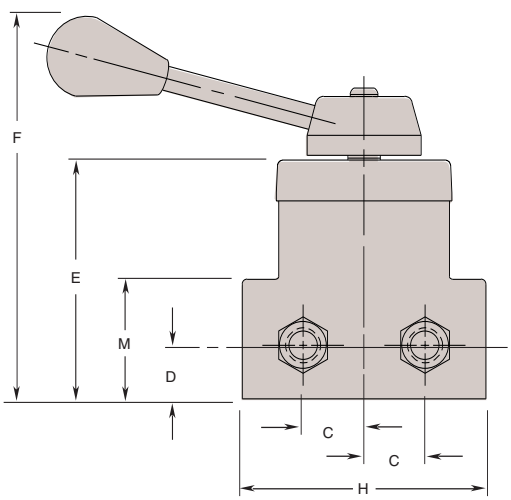
Pump Mounted Control Valve

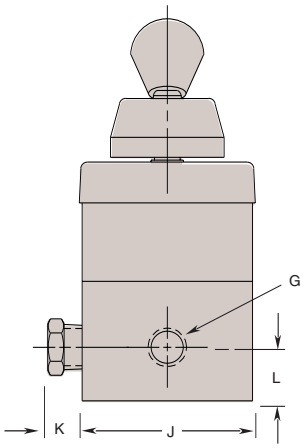
Designed to be used in applications where the pump is located near the operator with the valve mounted directly on the pump. This configuration eliminates the need for pressure and return lines between the pump and remote mounted control valves. It will replace the outlet manifold on most Hytec constant pressure pumps having that feature. (For use with Hytec No. 100178 pump, contact Hytec Technical Services.) One pump/valve combination is required for each circuit to be controlled.

Features:

- 3-way/4-way, 2-position, detented
- Manually operated
- Pump mounted
- Handle swings 90° and can be repositioned in 22.5° intervals
- Single- or double-acting systems
- ¼" NPTF reducer bushing
- Includes mounting hardware, return tube
- 5,000 psi max.
- 5 gpm max.

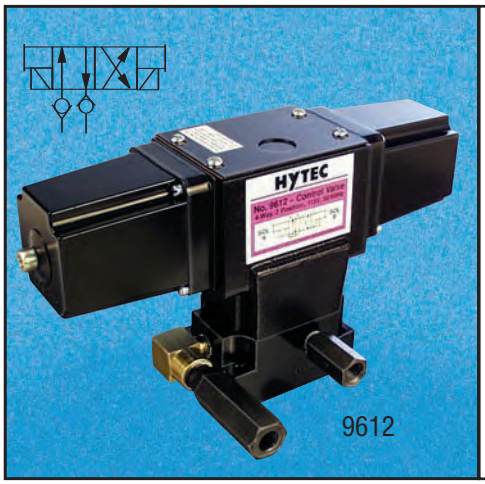






Cat. No.	Dimensions (In Inches)												
	A Port	B Port	C	D	E	F	G Gauge-Port	H	J	K	L	M	N Rad.
9504	¼ NPTF	¼ NPTF	.937	.750	3.188	5.562	¼ NPTF	3.750	2.660	.531	.812	1.437	5.031

Remote Mounted Control Valves

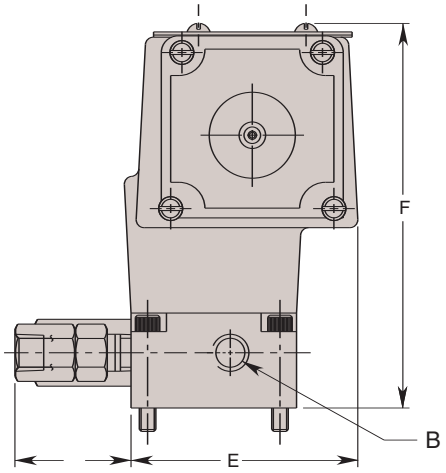


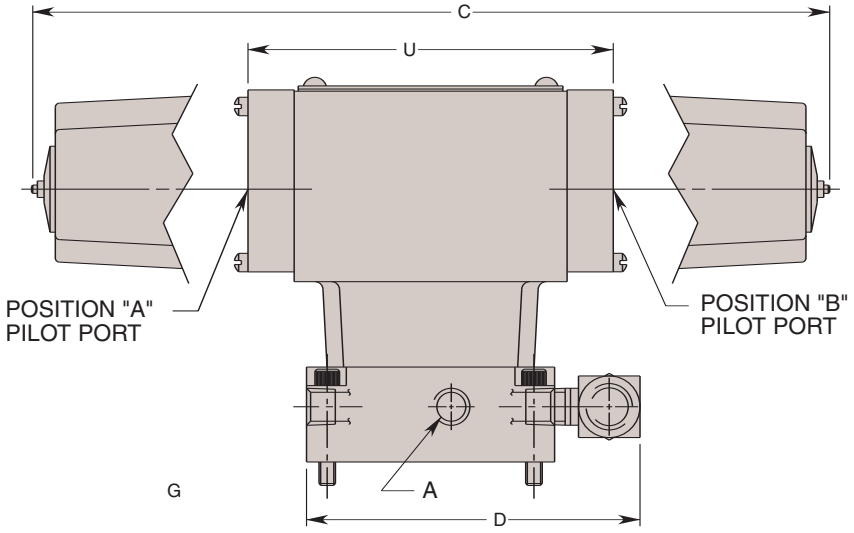
Designed for applications where the valve can be mounted remotely from the pump and where electrical operation is required.

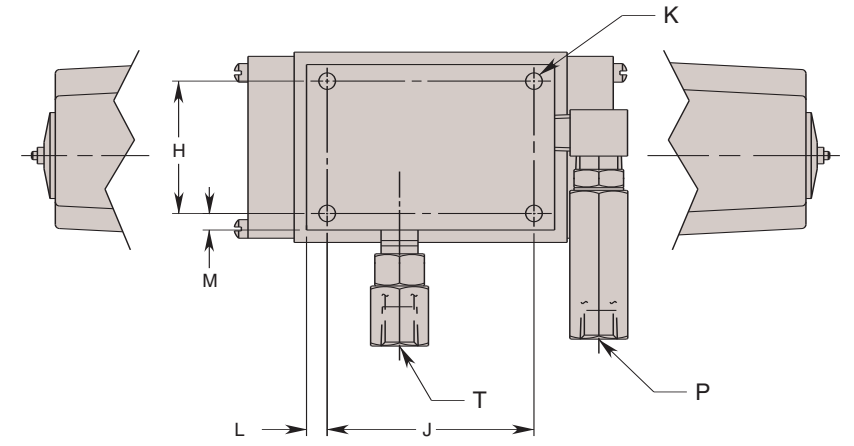
Detented action needs only a momentary signal to shift valve positions. Electrical power interruption won't cause the valve to shift and release clamping pressure or pressurize the system unexpectedly.

Features:

- 3-way/4-way, 2-position, detented
- Electrically operated; continuous duty rated
- Remote mounted
- Single- or double-acting systems
- 5,000 psi max.; 1,000 psi max. return line pressure
- 5 gpm max.
- Includes mounting hardware: ¼-20 UNC X 1.5" cap screws (4)
- Tank port check valve included to prevent return line back pressure from actuating released single-acting components, or causing pressure fluctuations in double-acting systems.



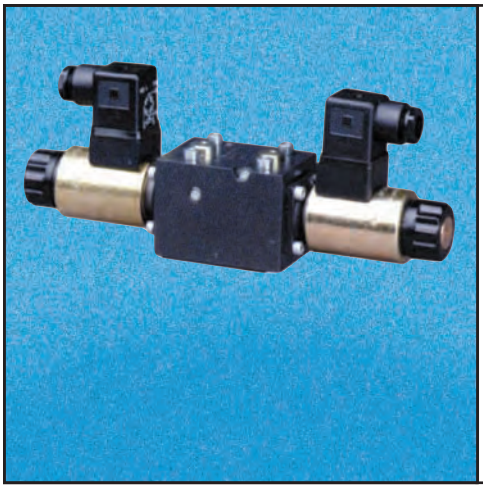




Cat. No.	Specifications: Actuation	Dimensions (In Inches): "A" Port	"B" Port	Position A Pilot Port	Position B Pilot Port	C	D	E	F	G	H	J	K Dia.	L	M	"P" Port	"T" Port	U
9612	115 VAC, 50/60 Hz 5.3 Amps inrush, .6 Amps holding	¼ NPTF	¼ NPTF	—	—	12.062	5.000	3.375	5.812	2.500	2.000	3.125	.281	.312	.250	¼ NPTF	¼ NPTF	—
9573	24 VAC, 50/60 Hz 25.4 Amps inrush, 2.8 Amps holding																	
9574	230 VAC, 50/60 Hz 2.8 Amps inrush, .31 Amps holding																	
9611	50 psi min./150 psi max. air pressure			⅛ NPTF	⅛ NPTF	—												6.125

Remote Mounted Control Valve

SPX HYTEC



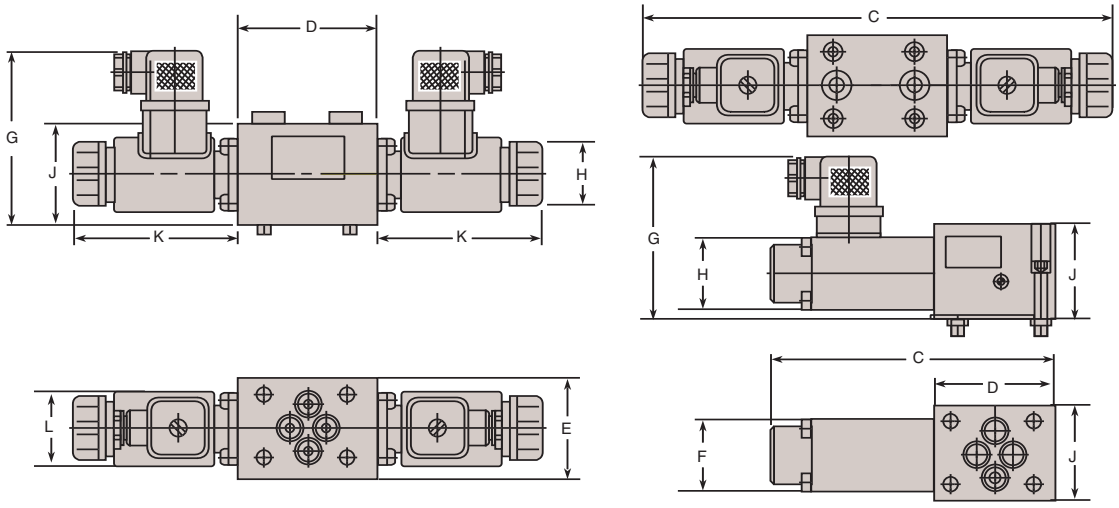
These exremely compact valves have zero leakage poppet design and are great for applications where the valve is remotely mounted from the pump.

- For use in single- and double-acting applications.
- DO3 Mounting.
- Heavy duty continuous duty coils last longer.

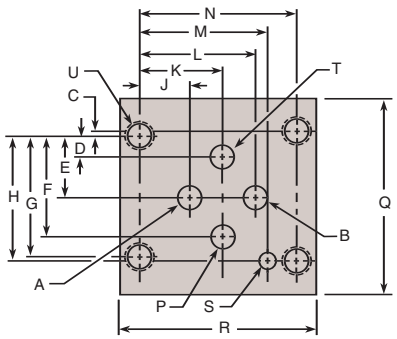
Comes in:

- 24 or 115 volt versions
- 3-position, 4-way version
- 2-position, 3-way version
- 5,000 PSI

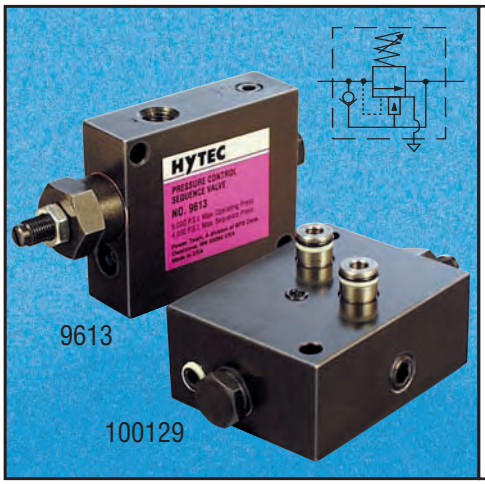
Cat. No.	Dimensions (In Inches)											Description
	"A" Port Dia. Max	"B" Port Dia. Max	C	D	E	F	G	H	J	K	L	
110166	.25	.25	9.06	2.76	1.92	-	3.46	-	1.96	3.15	1.47	4-way, 3-pos., closed center 110V
110167	.25	.25	9.06	2.76	1.92	-	3.46	-	1.96	3.15	1.47	4-way, 3-pos., closed center 24V DC
110168	.25	.25	5.39	2.28	1.77	1.38	3.07	1.38	1.77	-	-	3-way, 2-pos., 110V
110169	.25	.25	5.39	2.28	1.77	1.38	3.07	1.38	1.77	-	-	3-way, 2-pos., 24V DC



DO3 Mounting System	Dimensions (In Inches)																	
	"A" Port Dia. Max	"B" Port Dia. Max	C	D	E	F	G	H	J	K	L	M	N	"P" Port Dia. Max	Q Min.	R Min.	†† U Dia.	"T" Port Dia. Max	†† U Thread Size
	.250	.250	.030	.200	.610	1.020	1.220	1.250	.500	.850	1.190	1.300	1.594	.250	1.970	2.00	.160	.250	10-24 UNC



Pressure Sequence Control Valves

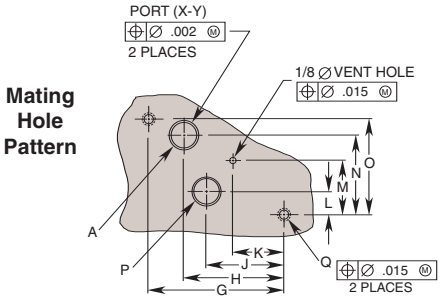


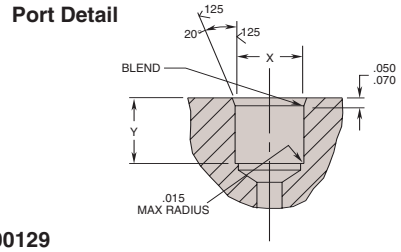
Sequence valves control the order of events within a hydraulic system by directing pressure to the two circuits in a pressure-controlled sequence. For example, this allows clamps to be actuated before work supports are locked.

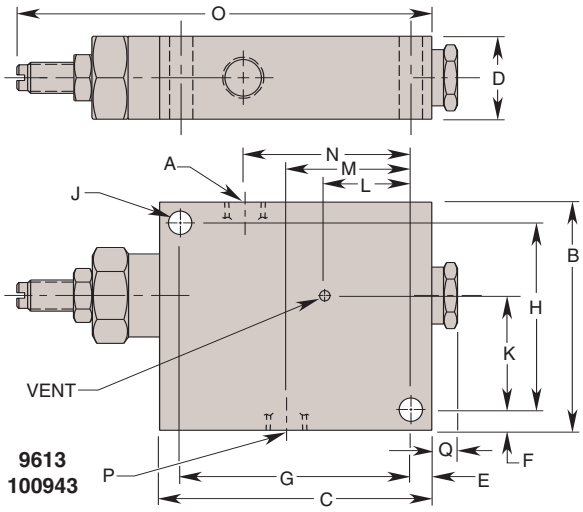
Initially, the valve is closed. Oil flows to the primary circuit until pressure reaches the valve setting. The valve then opens to deliver oil to the secondary circuit while holding pressure on the primary circuit. Once secondary and primary pressures are equal, the pressure increases uniformly in both circuits. There is no reduction of pressure available to either circuit.

Features:

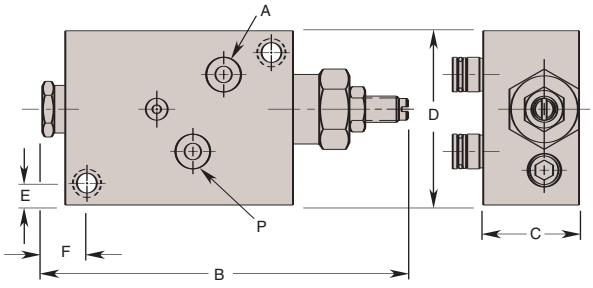
- Sequence pressure range is adjustable from 0 to 4,000 psi
- Usable with hydraulic systems operating up to 5,000 psi
- Will not reduce pressure to the secondary circuit
- Minimum operation pressure should be 120% of sequence pressure setting
- Internal check valve allows free flow in reverse direction
- Maximum flow rate 5 gpm
- Suitable for single- and double-acting circuits
- NPT, SAE or manifold mounting

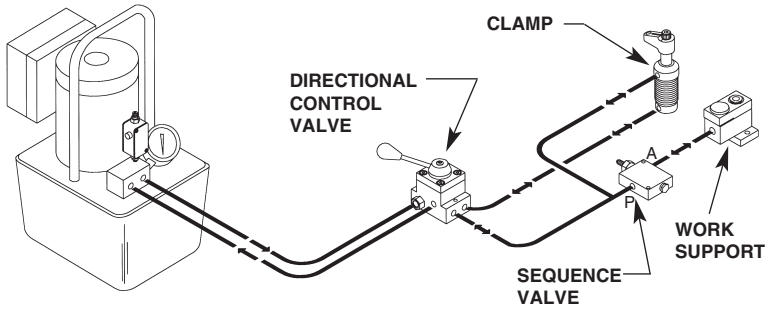






100129





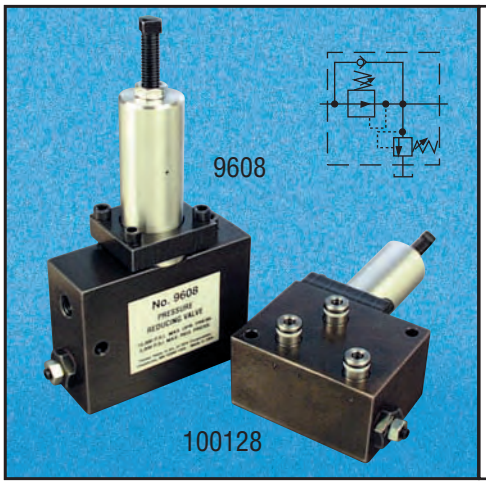
Cat. No.	Dimensions (In Inches)																	
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	X Dia.	Y
100129	*	5.250	1.375	2.500	.312	.625	2.645	1.960	1.520	1.000	.456	1.063	1.560	1.875	*	¼-20 UNC	.500 .503	.515 .535

NOTE: *See Port Detail drawing for Ports A and P.

Cat. No.	Dimensions (In Inches)															
	"A" Port	B	C	D	E	F	G	H	J Dia.	K	L	M	N	O	"P" Port	Q
9613	¼ NPTF	2.750	3.281	1.000	.250	.250	2.781	2.250	.281	1.375	1.040	1.500	2.000	5.000	¼ NPTF	.312
100943	7/16-20UNF SAE-4														7/16-20UNF SAE-4	

Pressure Reducing Control Valves

SPX HYTEC



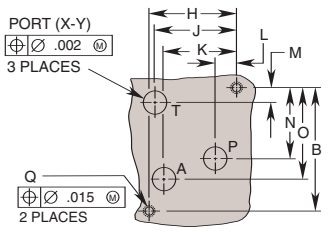
Pressure reducing valves are designed to reduce the maximum pressure in a portion of a hydraulic circuit: the valve is open from the inlet to the outlet until a pre-selected pressure is reached, at which point the valve closes to limit pressure in the secondary circuit. The need for a separate power source for each pressure level is eliminated.

Valves seats and poppets are precision ground, assuring virtually zero leakage and eliminating the need for a case drain line. The drain port (T) is used only during set up of the internal safety relief valve. This adjustable relief valve can be set to just above the reduced pressure setting so it will open only if contamination or another malfunction prevents the pressure reducing valve from closing, causing the outlet pressure to rise above the relief valve setting. The drain port should never be plugged, although it is seldom permanently plumbed into the circuit.

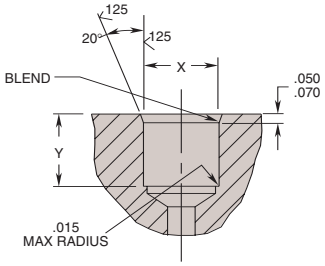
Features:

- Valves are adjustable from 1,000 to 5,000 psi outlet pressure
- Internal check valve allows free flow in reverse direction
- Maximum flow rate at 5 gpm
- NPT, SAE or manifold mount
- Automatically reopens to replenish lost pressure

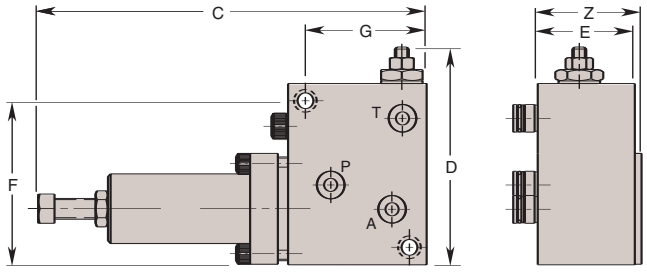
Mating Hole Pattern



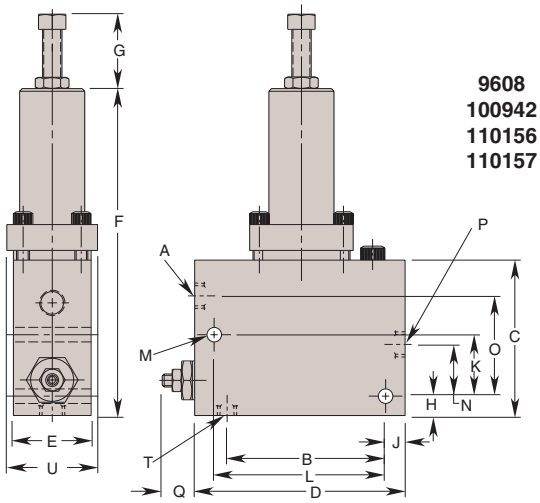
Port Detail

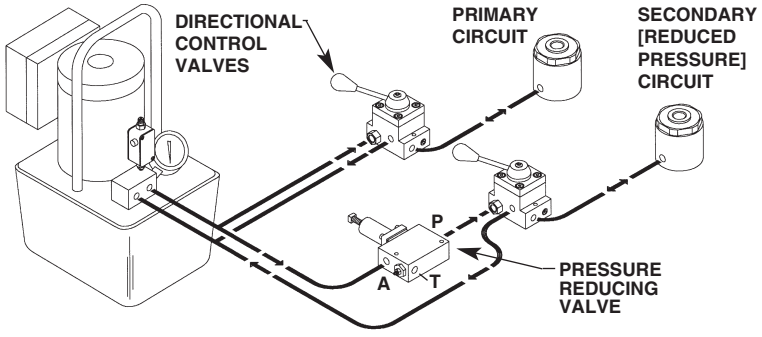


100128



9608
100942
110156
110157





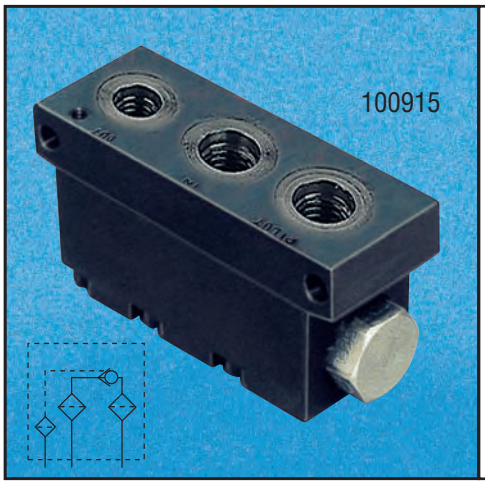
Cat. No.	Dimension (In Inches)																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q Thread Size	T	X Dia.	Y	Z
100128	*	2.645	7.000	4.000	1.750	2.960	2.188	1.875	1.750	1.560	.456	.316	1.520	1.960	*	¼-20 UNC	*	.500 .503	.515 .535	1.875

NOTE: *See Port Detail drawing for ports A, P and T.

Cat. No.	Dimensions (In Inches)																	
	"A" Port	B	C	D	E	F	G	H	J	K	L	M Dia.	N	O	"P" Port	Q	"T" Port	U
9608	¼ NPTF	3.062	3.000	4.062	1.500	6.312	1.438	.375	.375	1.188	3.312	.281	1.000	1.938	¼ NPTF	.625	⅛ NPTF	1.820
100942	7/16-20UNF SAE-4														7/16-20UNF SAE-4		7/16-20UNF SAE-4	
110156	7/16-20UNF SAE-4										3.321			2.000	7/16-20UNF SAE-4**		7/16-20UNF SAE-4**	
110157	¼ NPTF														¼ NPTF**		¼ NPTF**	

NOTE: **Include filters on P port and T port.

Pilot Operated Check Valves



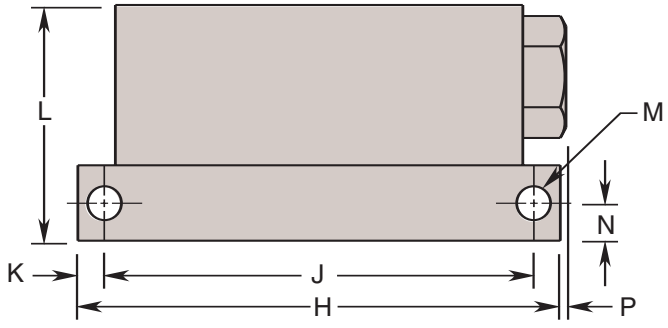
Hytec's pilot operated check valve offers a unique poppet seal design making them ideal for pallet applications or other specialized control circuits where zero leakage is essential. They can be used in any application where pressure must be maintained in a portion of a circuit until a separate pilot signal opens the valve and allows free flow in the reverse direction.

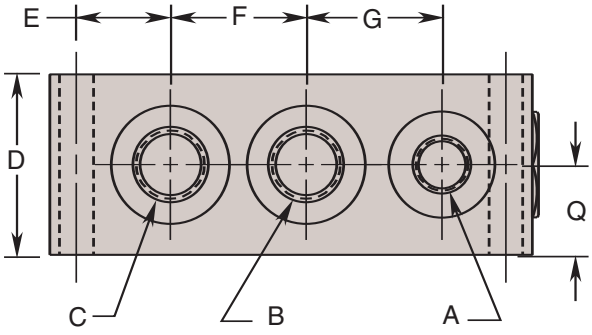
The pilot pressure required to release the valves is approximately one third of the pressure being released. The pilot piston is sealed to prevent pilot flow through the valve.

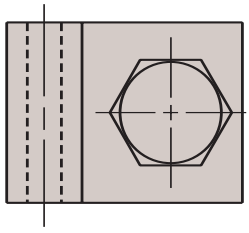
These valves are used with Hytec's Automatic Pallet Coupling System and double-acting manual pallet valve. The replaceable filter elements protect the check valve and your other system components from contamination. No disassembly of circuit plumbing is required to service the filters or the check valve cartridge. An additional filter is recommended for protection of the return side of double-acting clamping circuits.

Features:

- Replaceable, cartridge design valve
- Filters in all three ports protect the check valve and downstream components
- Filters are replaceable without disassembly of plumbing
- SAE O-rings ports
- 10 micron (25 micron absolute) filtration level
- Specially reinforced filter elements resist fatigue from pressure spikes
- 5,000 psi maximum
- No. 100915 replaces and directly interchanges with No. 100856

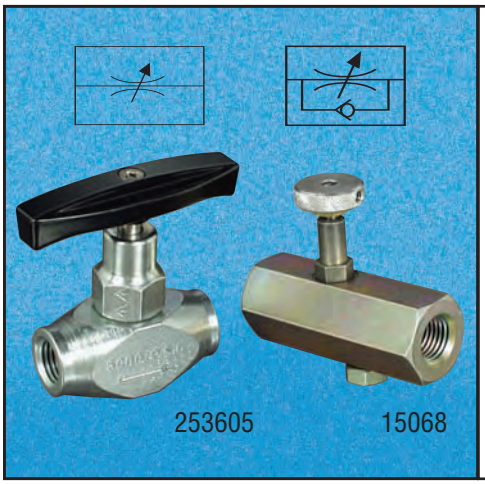






Cat. No.	Specifications		Dimensions (In Inches)						
	Maximum Flow (GPM)	System/ Pilot Pressure Ratio	A Pilot Port	B Inlet Port	C Outlet	D	E	F	G
100915	5	3:1	SAE-4 7/16-20 UNF	SAE-6 9/16-18 UNF	SAE-6 9/16-18 UNF	1.500	.781	1.125	1.125

Cat. No.	Dimension (In Inches)							
	H	J	K	L	M Dia.	N	P	Q
100915	4.000	3.562	.219	1.955	.281	.312	.050	.750



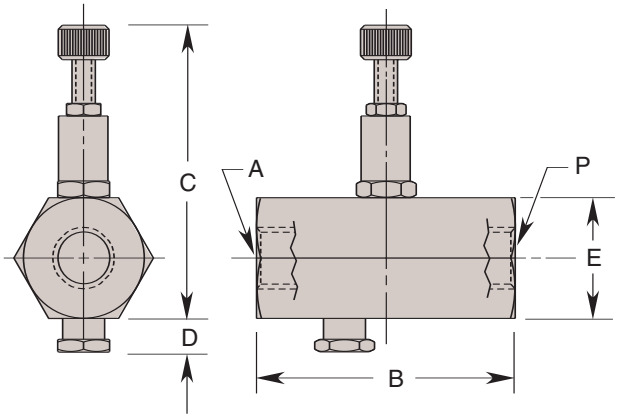
Hytec's **Needle Valves** are multiple-turn flow restrictor valves which provide finely adjustable flow control for components or circuits requiring reduced flow rates. They are also used in some non-critical sequencing applications where restriction in part of a circuit will tend to cause the actuators in the remainder of the circuit to operate first.

Needle valve No. 253605 restricts flow in both directions.

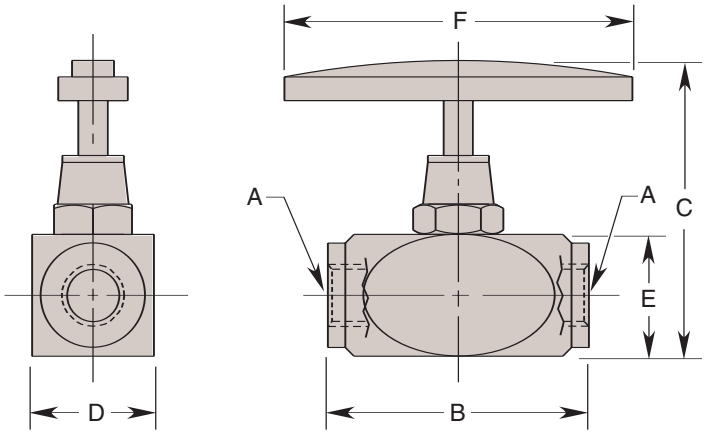
Features:

- Corrosion resistant construction
- 5,000 psi maximum

15068



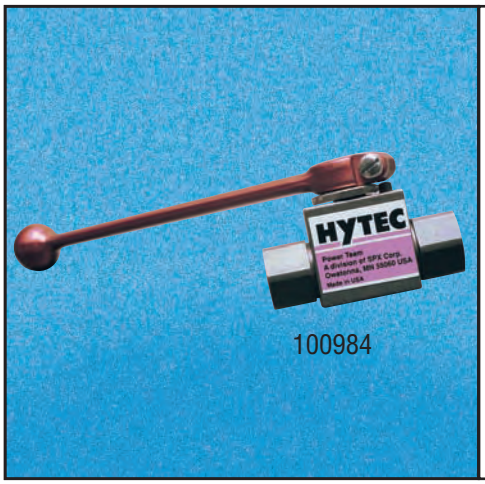
253605



Cat. No.	Dimensions (In Inches)					
	A Port	B	C Max.	D	E Hex.	P Port
15068	¼ NPTF	2.375	2.125	.312	.875	¼ NPTF

Cat. No.	Dimensions (In Inches)					
	A Port	B	C Max.	D	E	F
253605	¼ NPTF	1.875	2.781	.875	.875	2.500

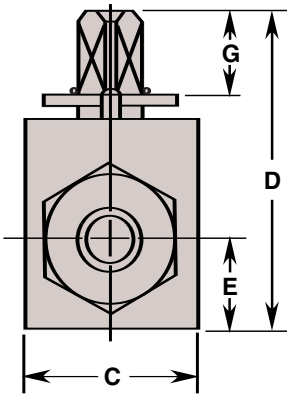
High Pressure Ball Valves

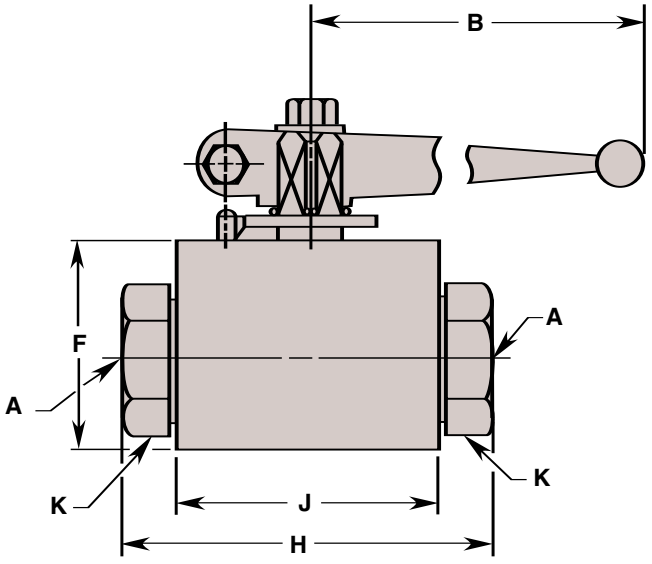


These two new high pressure ball valves provide full unrestricted flow and positive shut-off of fluids under extremely rugged service conditions making them perfect for workholding applications. Based on the "floating" ball principle, this design allows the ball to turn freely between the ball seals. A positive seal is attained by fluid pressure acting on the upstream surface of the ball and producing a constant uniform contact between the downstream ball seal and ball. The ball is operated by a single spindle with a projecting square end to which the handle is attached.

Features:

- Positive stops
- 90 degree actuation
- Easy Rotating
- Designed for shifting under high differential pressures
- Handle easily modified to fit application
- 5000 psi max.
- SAE or NPT ports

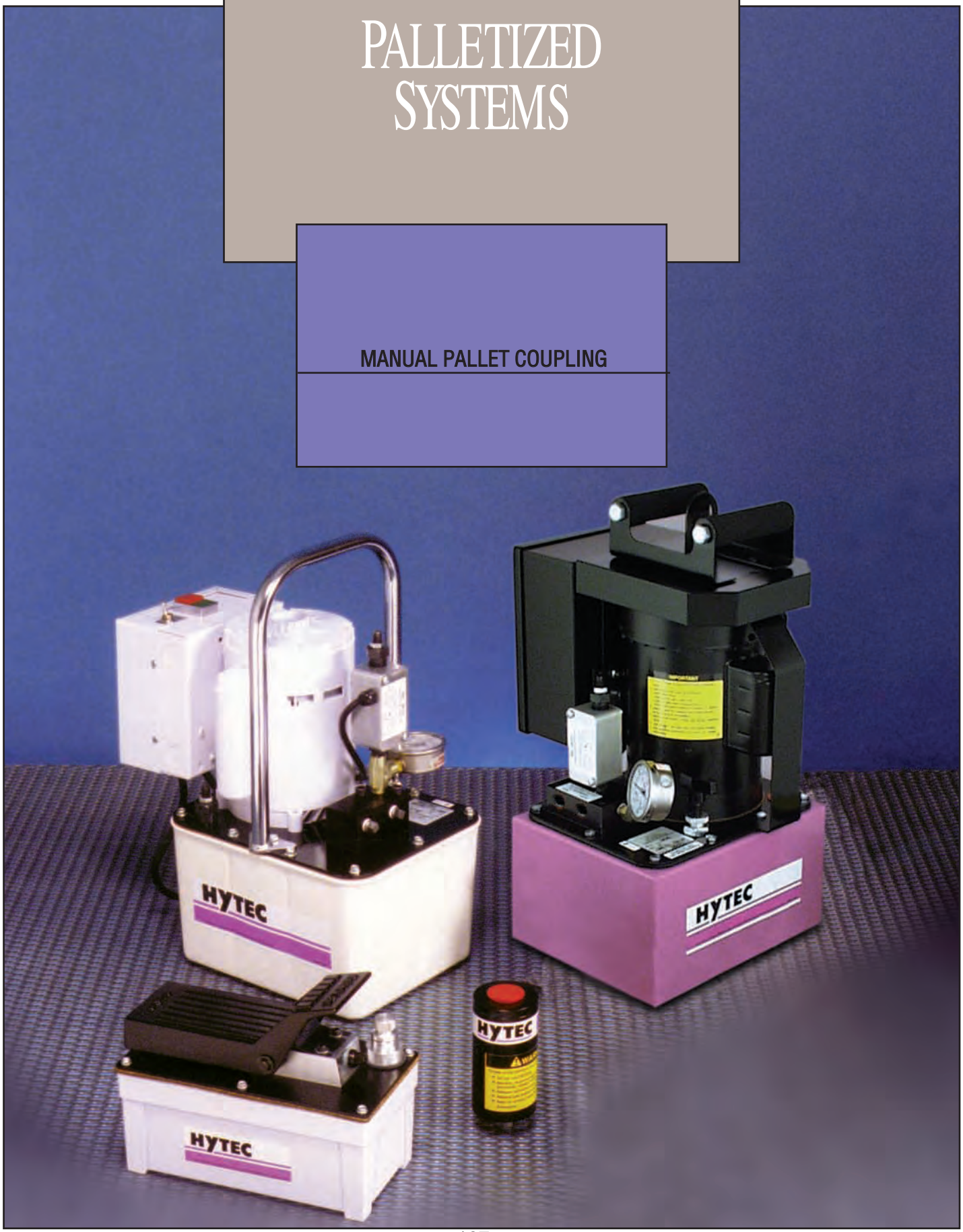




Cat. No.	Dimensions (In Inches)										
	Max PSI	A	B	C	D	E	F	G	H	J	K Hex.
100984 (NPT)	5000	1/4 NPTF	6.000	1.000	1.970	.510	1.380	.470	2.720	1.380	.750
100985 (SAE)		7/16-20 UNF SAE-4									1.000

PALLETIZED SYSTEMS

MANUAL PALLET COUPLING



Palletizing Information

Palletized or flexible machining centers (FMC's) are revolutionizing many aspects of metalworking. Their potential for the elimination of set up, regardless of lot size, is the very foundation of JIT programs worldwide. The application of hydraulic power workholding and its advantages to palletized machining is a Hytec breakthrough which offers exciting productivity potential.

This type of equipment is often able to shuttle the machining table, or pallet, in and out of the machine, rotate it both during machining and at the work station, invert it for washing before part removal, and even send it across the factory to a different machining cell or into storage. This concept has gained such popularity that machining centers with pallet changers are fast becoming the industry norm. During the infancy of this concept, fixture design flexibility was limited by the use of mechanical, hand operated workholding devices due to the difficulty of having an external power source continually connected. Hytec has developed systems to successfully remove the power source from the pallet and still make use of hydraulic power clamping and all of its associated advantages. Hytec offers the widest and most versatile selection of palletized system components available today.

Manual Pallet Coupling System

Single Acting

The Hytec Manual Pallet Coupling System consists of one of Hytec's specially designed valves along with one of the various pumps designed specifically for this system and single-acting components. The valve is used to maintain pressure on the pallet after the power source has been completely disconnected. This system is ideally suited to manually serviced transfer lines, palletized machining centers and rotary installations. The design of each of the valves offered makes disconnecting the power source possible. Key components include the pallet valve, an accumulator (to maintain system pressure despite temperature changes or minor leakage somewhere in the system), a hydraulic pumping unit and push-to-connect couplings. This system is designed for operating pressures up to 5,000 psi.

Double Acting

A double-acting system utilizes a pilot-operated check valve, a 4-way, 3-position remote mounted control valve, an accumulator and any standard Hytec constant pressure pump. Double acting manual pallet systems make unclamping faster and more positive. The control valve is located at the load/unload station and not on the pallet, so you only invest in one directional valve per load/unload station. Hytec's double-acting manual pallet valve system can be powered by any of our air or electrically operated constant pressure pumps.

Single-Acting Manual Pallet Coupling System

This system is ideal for manually serviced palletized machining centers, transfer lines, and rotary installations where it is impractical to have continuous connection to a power source.

The concept of this system is to attach a source of hydraulic flow only when that flow is necessary to actuate the components in the system. Once the actuators are extended, system pressure builds to a preset level. In a properly designed system with no significant internal or external leakage, no additional flow is required to maintain the system pressure. It then follows that the hydraulic power source can be disconnected with no detrimental effects on system pressure.

Designed for operating pressures up to 5,000 psi, all of Hytec's pallet coupling systems make use of our unique check valves that maintain hydraulic pressure on workholding systems and virtually eliminates leakage. Because of the check valve, the power source can be disconnected. An accumulator is all that is needed to compensate for temperature changes and minor leakage within the system.

The heart of the system is the manual pallet valve, which allows the hydraulic power source to be disconnected after the fixture has been clamped. During system pressurization, the pallet valve automatically closes, maintaining the set pressure without manual intervention. The pallet valve also easily converts from conventional to manifold mounting.

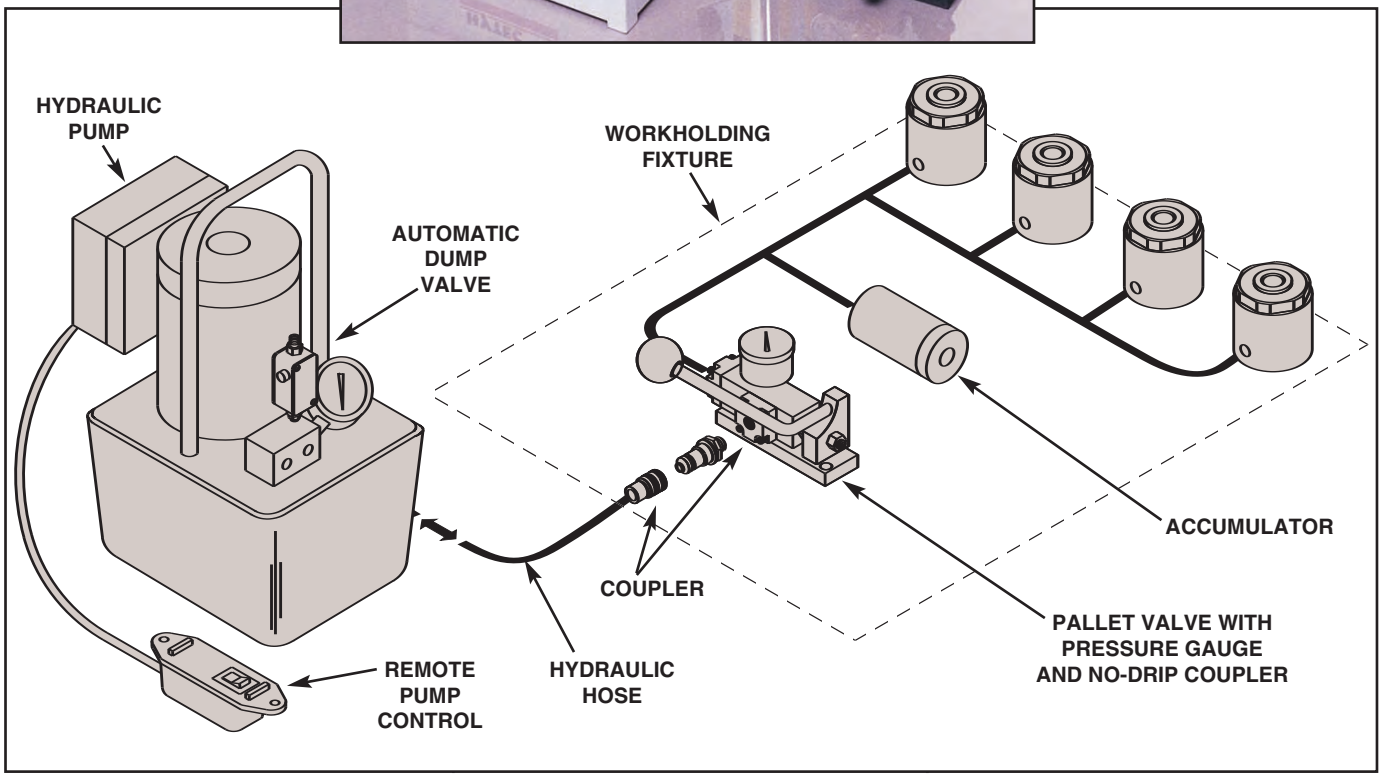
Hytec offers several specially designed pumps for servicing the system, all of which make use of the manual pallet valve's self-closing feature. After the hydraulic system is pressurized, there is no need to maintain pressure while the operator manually closes the valve. Since the Hytec valve is a true check valve, flow can enter the system easily but cannot escape until the valve is manually opened. Once the pallet valve has closed, the pump pressure can be released immediately after clamping. This releases pressure on the hose and coupler for easy, drip-free operation.

The manual pallet valve pumps are all shipped with a female coupler that mates with the coupler on the manual pallet valve. Air and electric powered versions are available.

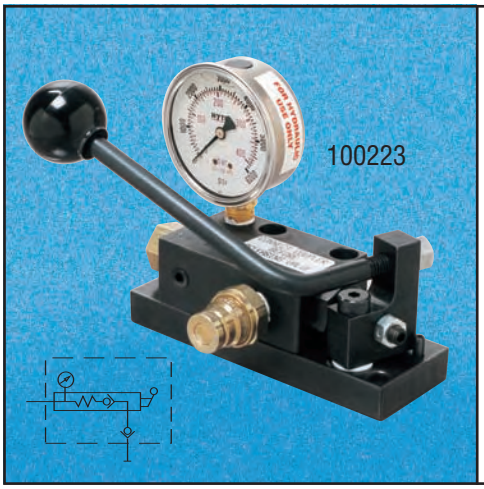
All these features add up to a simple, two-step operation:

1. To unclamp, connect the hose and pull the release handle on the pallet valve.

2. To clamp, simply start the pump to pressurize the fixture. When the pump stops, it releases pressure at the coupler allowing disconnection of the hose.



Manual Pallet Valve



This valve allows the hydraulic power source to be disconnected after the fixture has been clamped. As the system is pressurized, the valve automatically closes to maintain pressure without manual intervention, and a liquid filled gauge lets you constantly check system pressure.

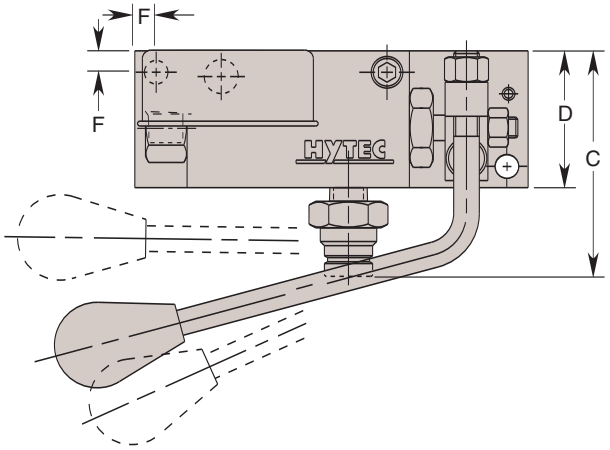
To convert from conventional to manifold mounting, simply plug the outlet and remove the screw used to block flow to the base plate port. A bushing is included to complete the connection.

Also included is the male half of a push-to-connect flat face coupler (No. 100907) for easy connection and no-drip operation. Hytec pumps designed for use with this valve all come with the mating female coupler half. Self-locking feature helps prevent release handle from actuating when coupler is not attached. For double-acting systems, use valve No. 100843 (see page 119).

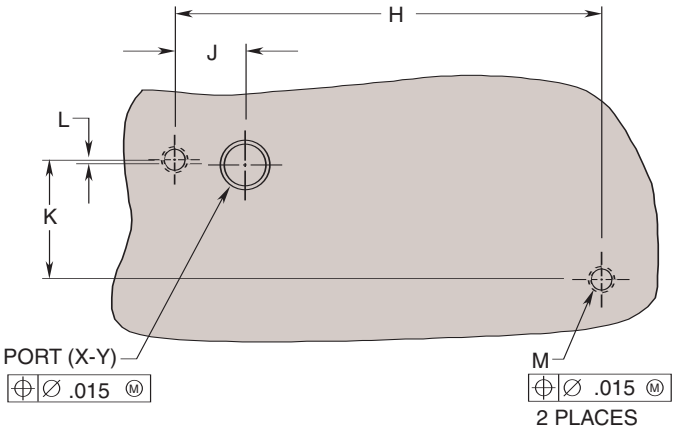
Features:

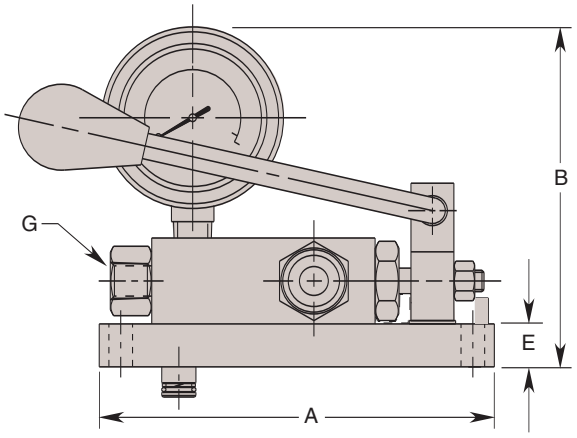
- Soft seal, self-closing valve
- Coupler protective cap
- 5,000 psi max.
- Liquid filled gauge
- Manifold or conventional mounting
- Automatic locking release handle
- Single-acting

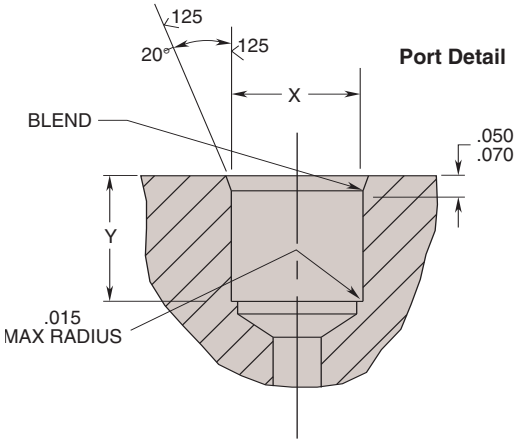
Note: Bi-directional filter No. 100857 is recommended, see page 130.



Mating Hole Pattern



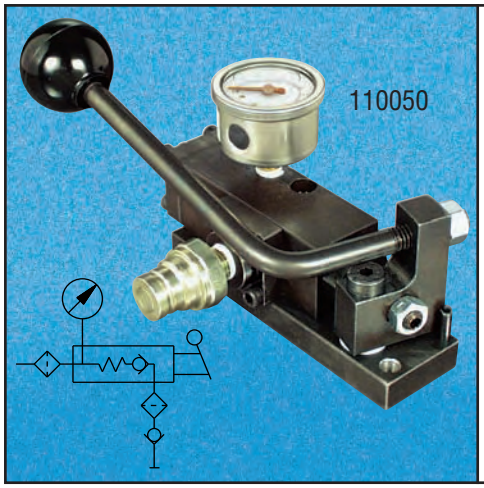




Note: Use PN 110050 on next page for new product design

Cat. No.	Dimension (In Inches)													
	A	B	C	D	E	F	G Outlet Port	H	J	K	L	M Thread Size	X Dia.	Y
100223	5.750	4.875	3.410	2.000	.625	.312	¼ NPTF	5.125	.951	1.375	.063	5/16-18UNC	.500 .503	.515 .535

Manual Pallet Valve



This valve allows the hydraulic pressure source to be disconnected from the pallet after the fixture has been clamped, allowing flexible machining center applications to realize the advantages of hydraulic workholding.

Hytec's newest Manual Pallet Valve has the features you should demand. Its smaller size takes up less fixture space. 10 Micron filters in both the inlet and outlet ports protect the valve from contaminants. Its self closing feature saves the operator time and effort. Versions are available for conventional plumbing or select the manifold mount model.

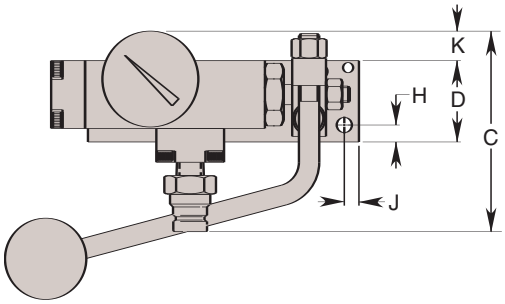
For an easy no-drip connection, our male half coupler (No. 100907) is included. Hytec pumps designed for use with this valve come with the mating coupler half. Refer to pages 114-116 for these pumps. A self-locking feature helps prevent accidental release of the valve when the coupler is not connected.

Intended for single-acting systems only. See page 118 for double-acting system applications.

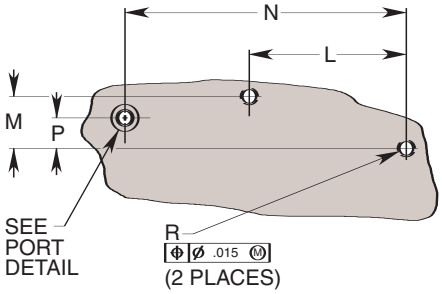
Features:

- Single-acting
- Minimal space requirements
- 5,000 psi maximum
- Inlet and outlet filtration
- Liquid filled pressure gauge
- Self-closing operation
- SAE, NPT and manifold mount versions
- Coupler protective cap

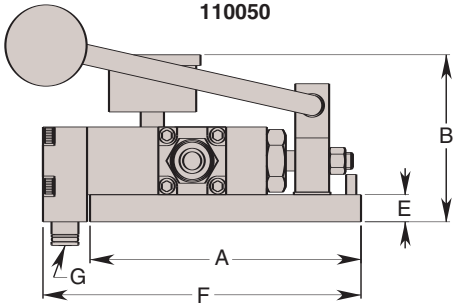
110050, 110051, 110052

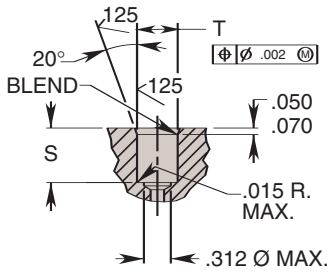


110050, 110051, 110052 Mating Hole Pattern



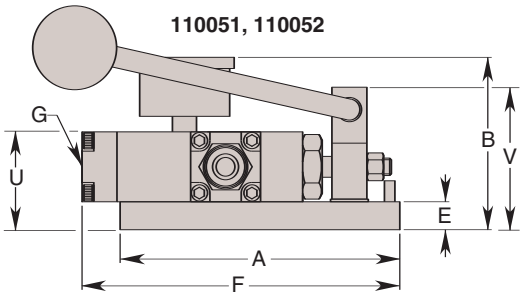
110050





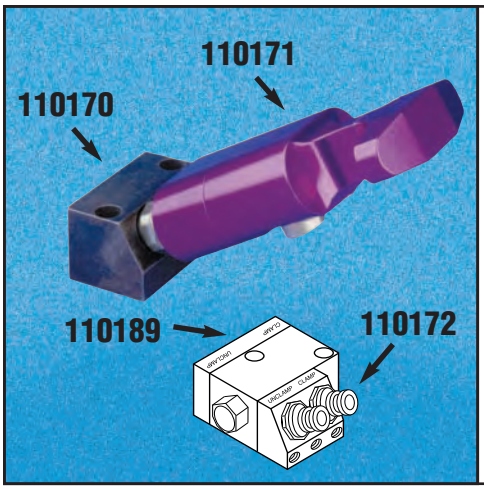
Port Detail

110051, 110052

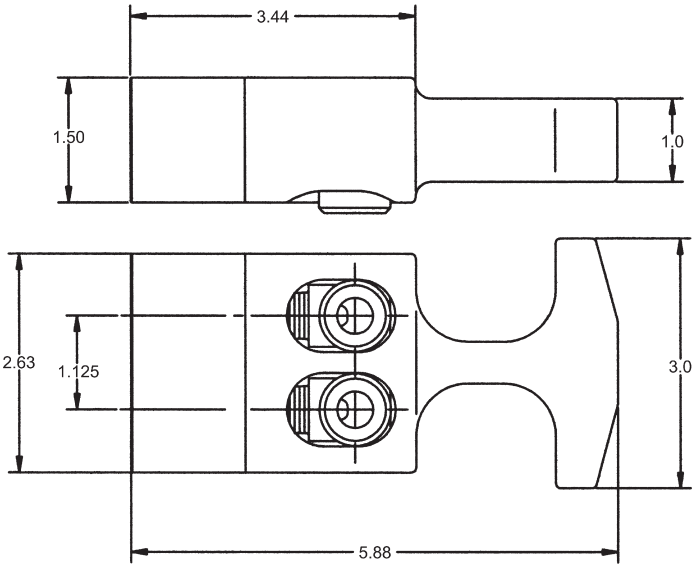


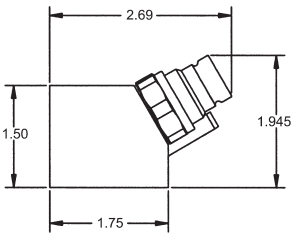
Cat. No.	Dimensions (In Inches)																		
	A	B	C	D	E	F	G Outlet Port	H	J	K	L	M	N	P	R	S	T Dia.	U	V
110050	5.000	3.083	3.700	1.500	.500	5.868	Manifold Mount	.312	.270	.545	2.595	.960	5.191	.564	¼-20 UNC	.485 .505	.500 .503	—	—
110051						5.680	7/16-20 UNF SAE-4						—	—		—	—	1.75	2.55
110052							¼ NPT												

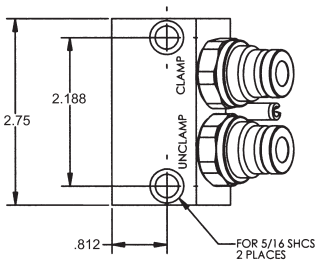
Pallet Disconnect Handle

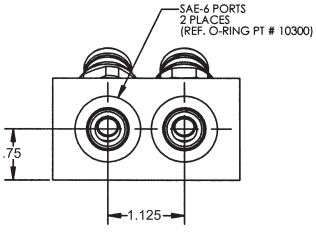


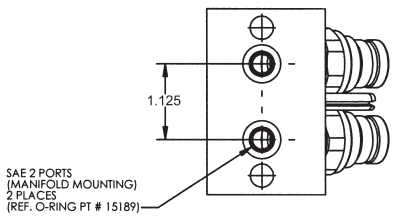
- Ideal for machining tool pallets or other applications where convenient connection of hydraulic lines are desired.
- Automatically latches when pressure is present.
- Designed for double-acting hydraulic applications.
- Ergonomically designed to minimize hand fatigue.
- Precision machined lightweight aluminum construction.











Cat. No.	Product Description	Operating Pressure
110171	Handle Assembly	1,500 to 5,000 PSI
110170	Standard manifold without check valve	1,500 to 5,000 PSI
110189	Manifold with built in check valve	1,500 to 5,000 PSI
110172	Coupler, male-half (replacement)	1,500 to 5,000 PSI

Manual Pallet Coupling Pump

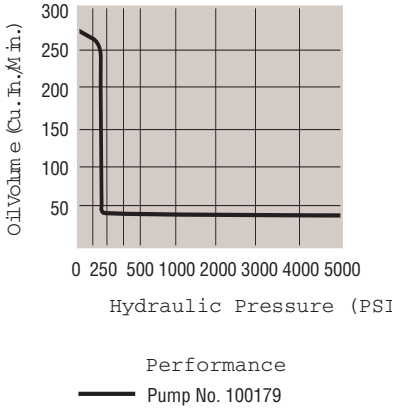
This pump has been designed specifically for use with manual pallet valve No. 100223.

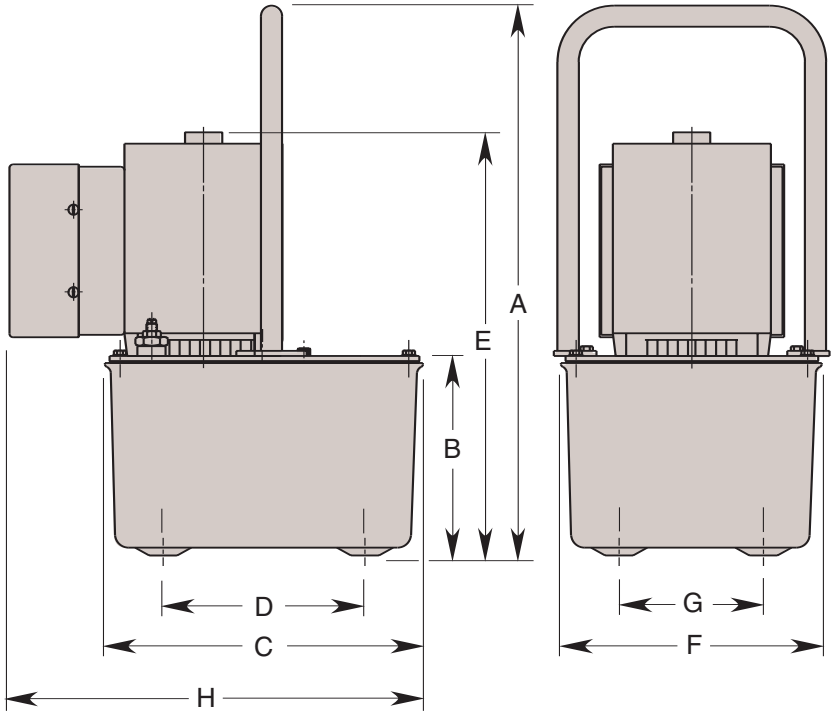
To clamp the pallet, simply start the pump using the remote hand switch. It runs until its pressure setting is reached, then stops automatically and drops pressure. The hose may now be disconnected.

Controlled by a pressure switch and external pressure regulator, this pump is adjustable from 1,000 to 5,000 psi. An internal relief valve is preset at 5,000 psi. It has thermal overload protection and integral "electrical shut-down" to prevent unintentional restarting after electrical service interruption or thermal overload.

Features:

- Drip proof induction motor
- Motor-mounted electrical enclosure
- 2-gallon plastic reservoir
- Liquid-filled gauge
- Filtered, pressure/vacuum relief fill cap
- External pressure switch and regulator
- Carrying handle
- ¼" NPTF outlet manifold
- 295 cu. in. usable oil
- Shipped with 1 gallon of oil
- Includes No. 100908 female coupler
- CSA approved
- Max. flow 33 cu. in./min. at max. pressure.

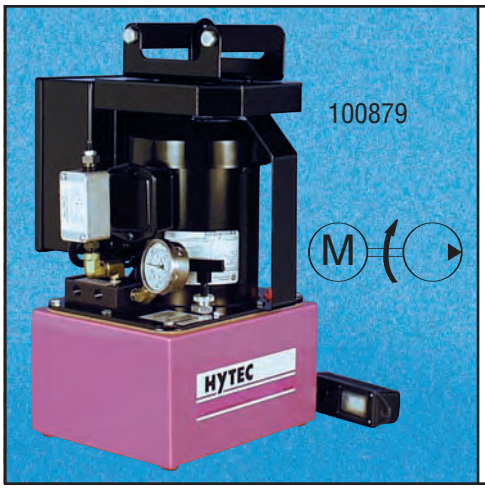




Cat. No.	Specifications			Dimensions (In Inches)							
	Electric Motor	Supply Voltage	Noise Level @ Idle/Max. Press. (dBA)	A	B	C	D	E	F	G	H
100179	½ hp; 3,450 rpm 115 VAC; 10 amps max.; 60 Hz; single phase	115 VAC	67/81	19.875	7.000	11.375	7.125	14.875	9.250	5.125	14.875
100179-230	½ hp; 3,450 rpm 230 VAC; 5 amps max.; 60 Hz; single phase	230 VAC									

NOTE: Mounting screws included (1/4-10 x .875 Lg.).
An optional metal reservoir is available, see page 135.
An optional fluid level/temperature gauge is available, see page 135.
Hose requiring 1/4" NPTF male connections not included – order separately, see page 127.

Manual Pallet Coupling Pumps



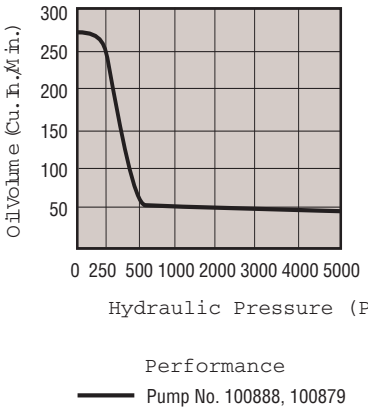
This is Hytec's popular 1 horsepower, totally enclosed-fan cooled induction motor pump, outfitted to operate Hytec's single-acting manual pallet valves.

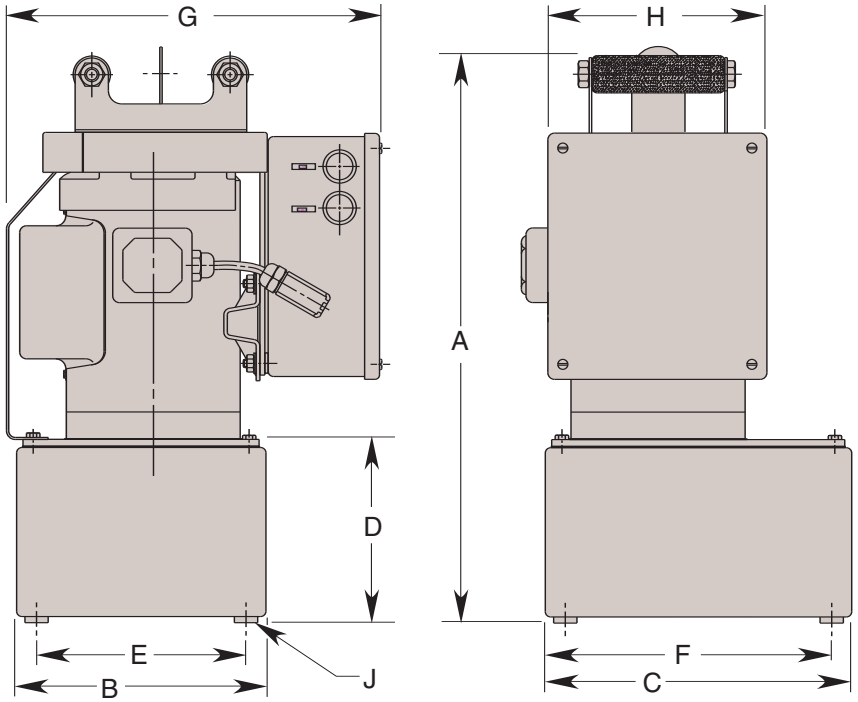
To pressurize the clamping components on the pallet, simply start the pump using the remote hand switch. It runs until its pressure setting is reached, then stops automatically and drops pressure. The coupler and hose may now be easily disconnected and later reconnected.

The output of this gerotor/axial piston pump is controlled by a pressure switch and externally adjustable pressure regulator, both adjustable from 1,000 to 5,000 psi. It is shipped with a coupler and 2 gallons of hydraulic oil. Order a hose to fit your application separately.

Features:

- NEMA 12 electrical enclosure and controls
- CSA approved
- Drip/chip cover
- Liquid filled gauge
- Dual carrying handles
- Thermal overload protection
- 2.5-gallon metal reservoir
- 44 cu. in./min. oil flow at max. pressure
- 590 cu. in. usable oil
- TEFC motor
- Filtered filler/breather cap
- Includes 100908 hydraulic coupler





Cat. No.	Specifications			Dimensions (In Inches)								
	Electric Motor	Supply Voltage	Noise Level @ Max. Press. (dBA)	A	B	C	D	E	F	G	H	J Thread Size
*100888	1 hp; 1,725 rpm; 115/230 VAC; 16/8 amps max.; 60 Hz; single phase	115 VAC	70	21.375	9.500	11.500	6.500	8.000	10.000	14.125	9.500	½-20 UNF
100888-230		230 VAC										
100879	1 hp; 1,725 rpm; 230/460 VAC; 3.8/1.9 amps max.; 60 Hz; three phase	460 VAC										
100879-230		230 VAC										

NOTE: *For field conversion to 230 VAC, order conversion kit No. 250186.
An optional fluid level/temperature gauge is available, see page 135.
Hose requiring ¼" NPTF male connections not included – order separately, see page 127.

Manual Pallet Coupling Pump

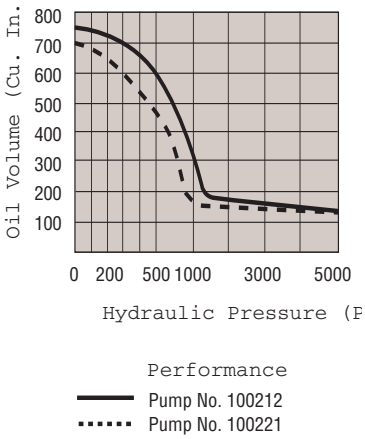
SPX HYTEC

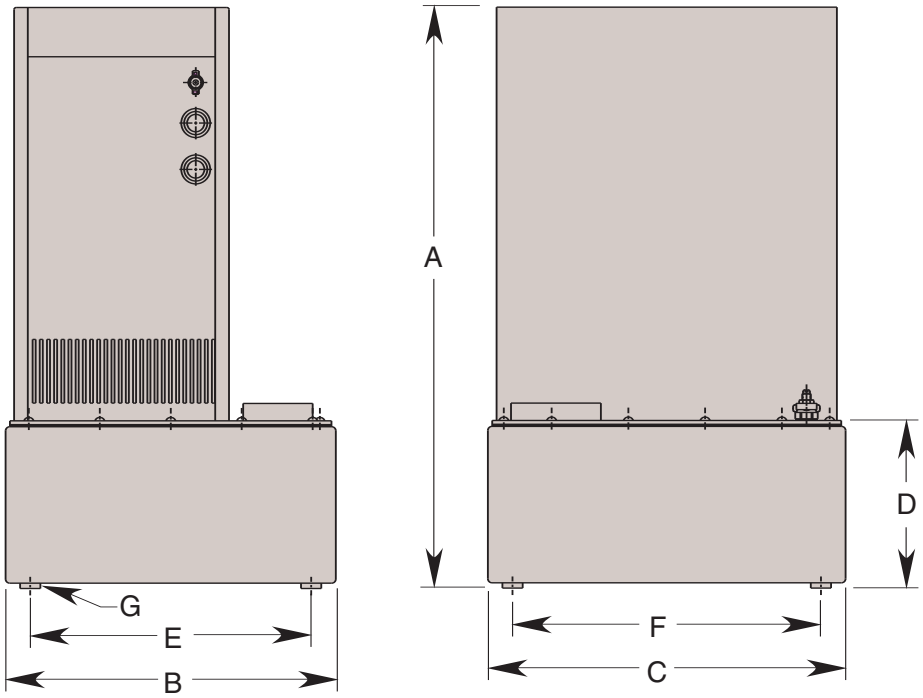
Very similar to Hytec's standard electric/hydraulic pumps, these two-stage, gerotor/axial piston pumps' electrical circuitry has been redesigned specifically to be used with Hytec's manual pallet valve.

Both pumps are equipped with a dump valve for automatic pressure release on the hose and coupler. This allows coupling and uncoupling under no pressure for easy, no drip operation. Pressure range is 1,000 to 5,000 psi.

Features:

- Enclosed induction motor
- Remote hand switch with 10 ft. cord
- Includes No. 100908 female coupler
- Filtered filler/breather cap
- Liquid-filled gauge
- Carrying handles
- Pressure switch
- Pressure regulator
- Thermal overload protection
- 5.7 gallon metal reservoir
- ¼" NPTF outlet
- Shipped with 4 gallons of oil
- Oil flow: 125 cu. in./min. at max. pressure
- 1,250 cu. in. usable oil

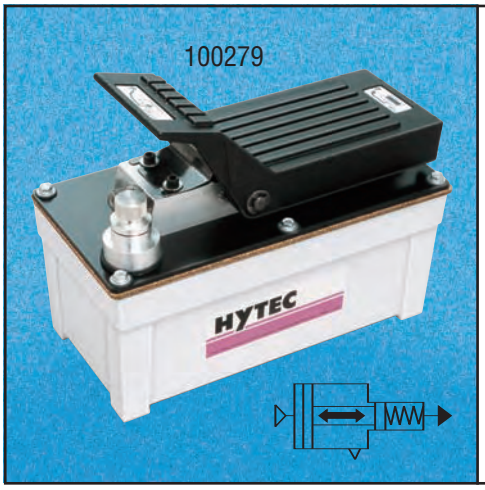




Cat. No.	Specifications			Dimensions (In Inches)						
	Electric Motors	Supply Voltage	Noise Level @ Idle/Max. Press. (dBA)	A	B	C	D	E	F	G Thread Size
††100212	2 hp; 1,725 rpm; 115/230 VAC; 27/14 amps max.; 50/60 Hz; single phase	115 VAC	74/76	25.125	14.250	15.500	7.250	12.125	13.312	½-20UNF
††100212-230		230 VAC								
100221	2 hp; 1,725 rpm; 230/460 VAC; 6.6/3.3 amps max.; 50/60 Hz; three phase	460 VAC	73/78							
100221-230		230 VAC								

NOTE: Hose requiring ¼" NPTF male connections not included–order separately, see page 127.
†† CSA Approved.
An optional fluid level/temperature gauge is available, see page 135.

Manual Pallet Coupling Pump



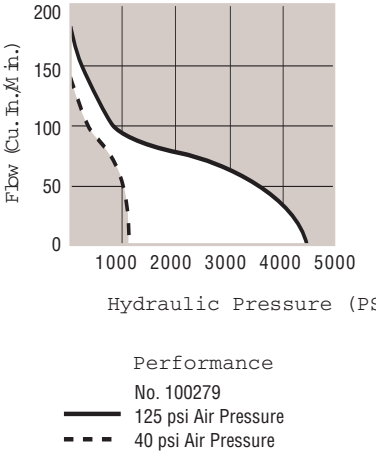
Designed specifically for use with manual pallet valves, this single-stage pump includes a 5 ft. hose and special coupler No. 100908 to mate with our manual pallet valves.

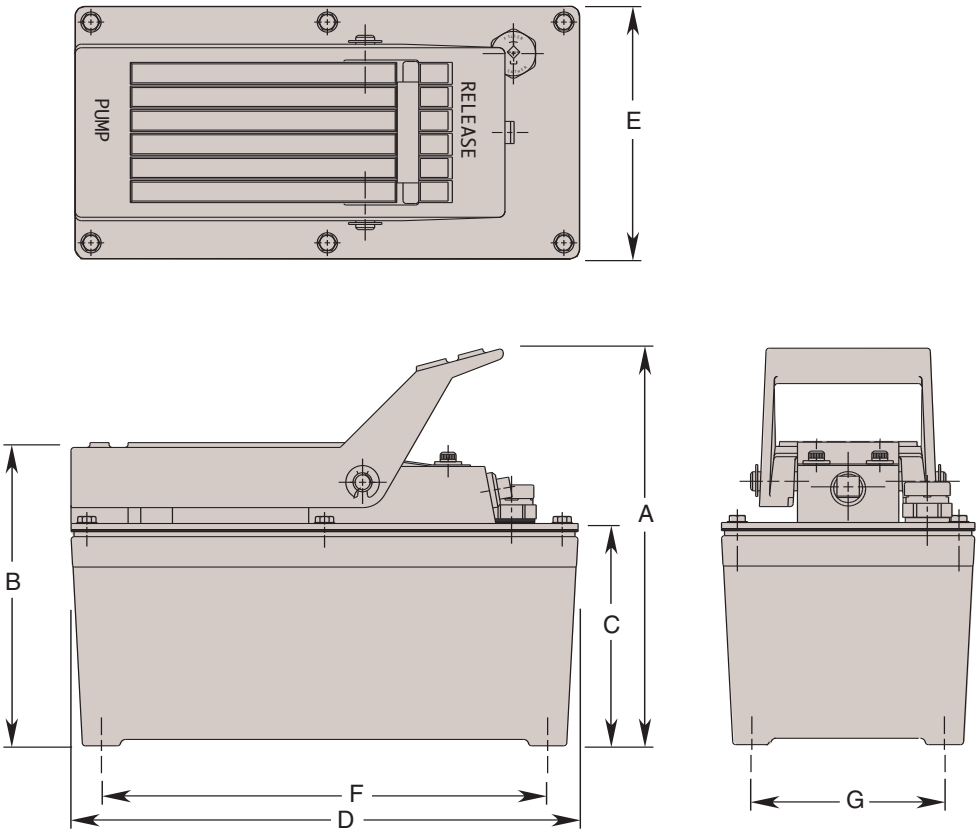
Operation is simple: connect the coupler and release the pallet valve. Change the workpiece, then press the foot pedal to start the pump and clamp the piece. Rocking the pedal forward releases pressure in the coupler while the pallet valve maintains pressure at the pallet. At this point, the coupler and hose may be disconnected.

Refer to page 89 for additional pump performance information.

Features:

- Filtered filler/breather cap with dipstick
- 105 cu. in. metal reservoir
- ⅜" NPTF outlet with ¼" NPTF reducer
- ¼" NPTF air inlet port
- Shipped with hydraulic oil
- Foot treadle control allows "hands free" operation
- Operating Pressure Range (nominal): 4,475 psi max. @ 125 psi air, max. 1,150 psi min. @ 40 psi air, min.
- 98 cu. in. usable oil





Cat. No.	Dimension (In Inches)						
	A	B	C	D	E	F	G
100279	7.750	5.875	4.250	10.000	5.000	9.000	4.000

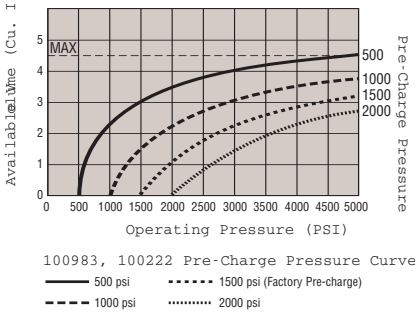
NOTE: This pump is not for use in normal "constant pressure" applications. Requires filtered, regulated, lubricated air supply. Air requirements: 20 CFM (max.) at low hydraulic pressure decreasing to 0 CFM when pump stalls.

SPX HYTEC

These accumulators are designed to store a small supply of pressurized oil, making them ideal for palletized machining workholding systems or any other system where supply pressure is disconnected temporarily. They are nitrogen charged, piston type accumulators allowing them to be mounted in any orientation. This type of accumulator has a wider operating range at any one charge pressure than any other type of accumulator. Depending on the application, they can be used at any pressure from 0-5,000 psi. Charge pressure is factory set at 1,500 psi and can be increased up to 2,000 psi. In general, a lower charge pressure will provide more total oil but a higher charge pressure will give more usable oil at a given allowable pressure drop. Refer to the performance charts to determine the best charge pressure for each application. Accumulators come in two sizes (2 & 5 cu. in.) and are available in conventional mount and the newly introduced manifold mount.

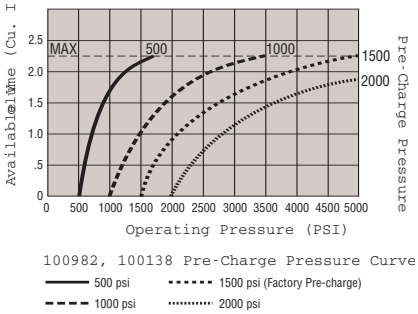
Features:

- Two sizes: 2 and 5 cu. in.
- Conventional or Manifold Mount
- Precharged to 1,500 psi
- Concealed charging valve
- SAE "O" ring fitting with ¼" NPT female adapter/restrictor valve (100222, 100138)
- Optional charging tool 500149 (See pg.124)



100983, 100222 Pre-Charge Pressure Curve

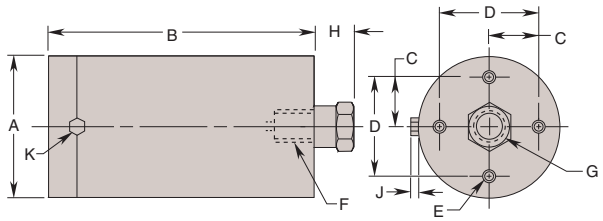
500 psi — 1500 psi (Factory Pre-charge)
1000 psi — 2000 psi



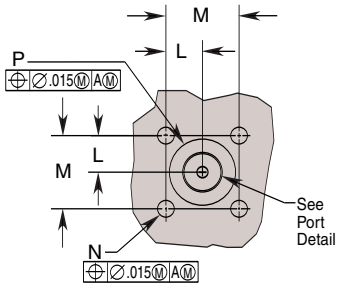
100982, 100138 Pre-Charge Pressure Curve

500 psi — 1500 psi (Factory Pre-charge)
1000 psi — 2000 psi

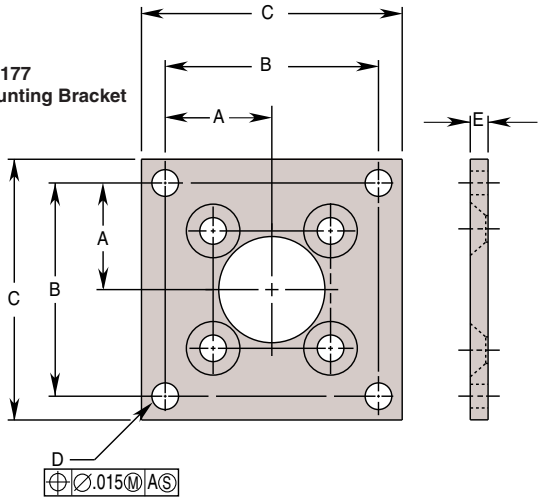
100222, 100138 (shown)

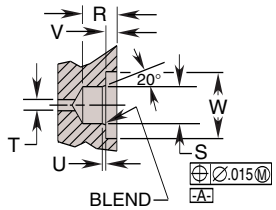


Mating Hole Pattern
100982, 100983



500177
Mounting Bracket



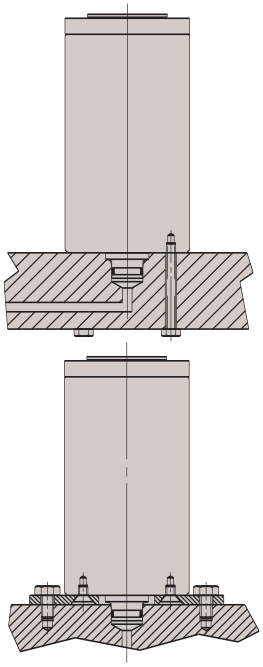


Cat. No.	Dimensions (In Inches)				
	A	B	C	D Dia.	E
500177	1.125	2.250	2.750	.285	.188

Cat. No.	Specifications		Dimensions (In Inches)										
	Mounting Configuration	Volume (Cu. In.)	A	B	C	D	E Thread Size	E Thread Depth	F Thread Size	G Thread Size	H	J	K Hex.
100138	Conventional	2	2.500	4.810	.875	1.750	10-32UNF	.200	9/16-18UNF SAE-6	¼ NPT	.698	.100	.250
100222		5		5.680									
100982	Manifold	2		4.810						–	.509		
100983		5		5.680									

Cat. No.	Mounting Option	Dimensions (In Inches)										
		L	M	N	P Dia.	P Depth	R Min.	S Dia.	T Dia. Min.	U	V	W
100982 100983	With 500177	1.125	2.250	¼-20UNC	–	–	.375	.625 .627	.188	.050 .070	–	–
100982 100983	Without 500177	.619	1.238	.280 .287	1.120 1.150	.183 .193	.563				.183 .193	1.120 1.150
100138 100222	Without 500177					Thru	–	–	–	–	–	–

Accumulator Applications



Double-Acting Manual Pallet Coupling System

Hytec's double-acting manual pallet system is an affordable choice where double-acting actuators are used in palletized applications. The system uses a pilot-operated check valve, a 4-way, 3-position remote mounted control valve, an accumulator and any standard Hytec "constant pressure" pump.

Hytec's double-acting manual pallet system has many advantages. With double-acting actuators, unclamping is faster and more positive. This enables you to utilize applications requiring both pushing and pulling forces on palletized machining systems. The control valve is located at the load/unload station and not on the pallet which means you only purchase one control valve per load/unload station, not one for every pallet. Filtration to ensure leak-free operation is built-in. The pilot-operated check valve and accumulator can be located in otherwise unusable areas of the fixture. The only components that must be accessible to the operator are the two couplers allowing you to utilize more of your fixture space.

Operation

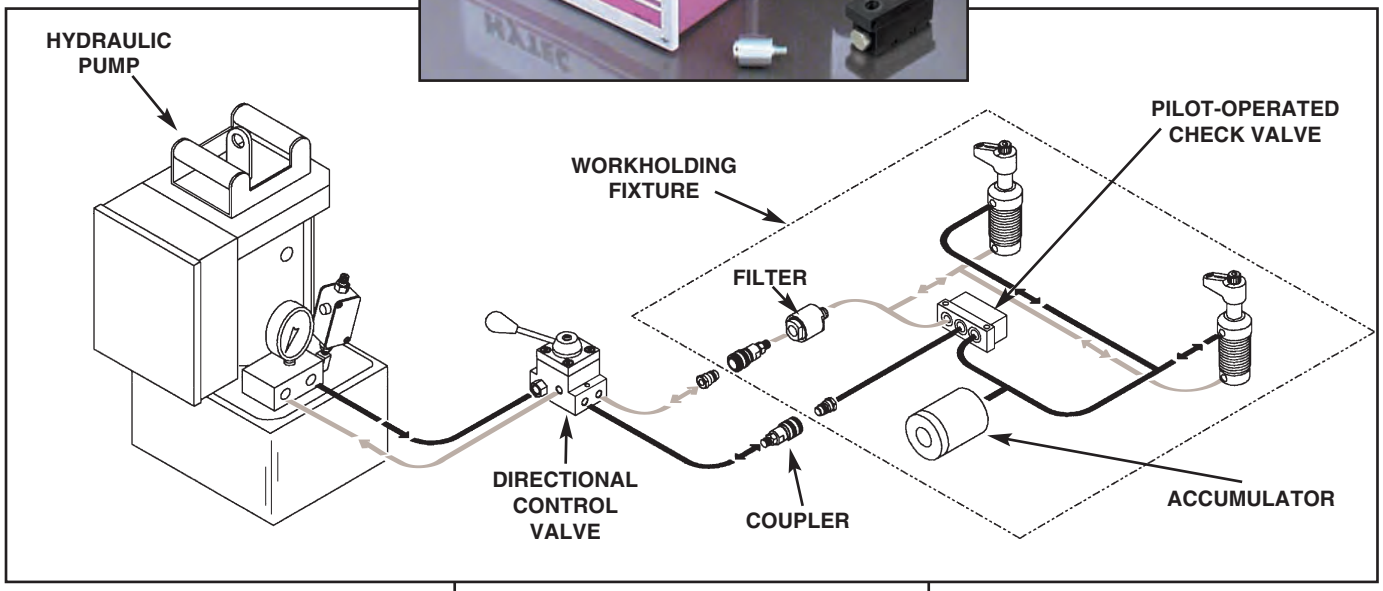
When the control valve is in the center position, inlet flow is blocked, so the pump builds pressure and automatically shuts off. However, since both hoses are connected back to tank, no pressure is on either of them - allowing for easy coupling or uncoupling.

Once coupled, when the valve is shifted to the "unclamp" position, the return ports of the double-acting components are pressurized - along with the pilot port of the specially designed pilot operated check valve.

As the pressure builds, pilot pressure causes the check valve to open allowing the workholding devices to unclamp. Oil is then allowed to flow back through the check valve to the reservoir. The operator changes the workpiece and the control valve is shifted to the clamp position. Hydraulic flow passes through the check valve and causes the workholding device to clamp. Once the system is pressurized, the pump automatically shuts off. The operator then shifts the valve back to the center position, allowing pressure in both hoses to be released. The couplers can now be easily disconnected, allowing the fixture to be indexed.

The pilot-operated check valve used in this system has a unique feature in that it has a filter in all three ports to protect against contamination. If desired, another filter can be added to protect the return portion of the circuit.

This double-acting manual pallet valve system can use any of Hytec's constant pressure pumps. Pumps specifically designed for our single-acting pallet valves are not appropriate for this application.



Remote Mounted Control Valve

This 4-way, 3-position valve has a center position that blocks the pressure (P) port and drains the two work (A and B) ports back to the tank (T) port. This configuration makes it ideal for an inexpensive double-acting manual pallet valve when used in conjunction with a Hytec pilot operated check valve and any constant pressure pump.

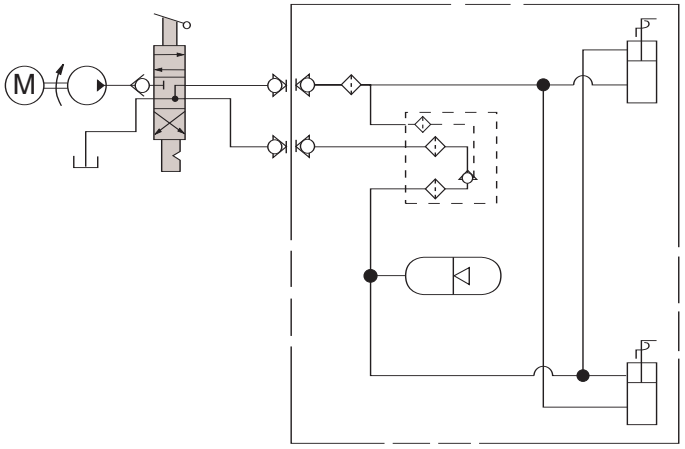
This system saves you money because the control valve is located at the load/unload station, not the pallet. This means you only purchase one control valve per load/unload station no matter how many pallets are involved. This system also frees up space on the pallet because the two couplers are the only components that must be accessible.

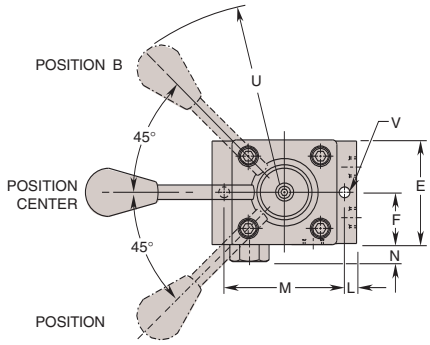
This valve is also ideal for service and troubleshooting of pallets used with the Hytec Automatic Pallet Coupling System. Use this valve to clamp and unclamp your fixtures off the machine.

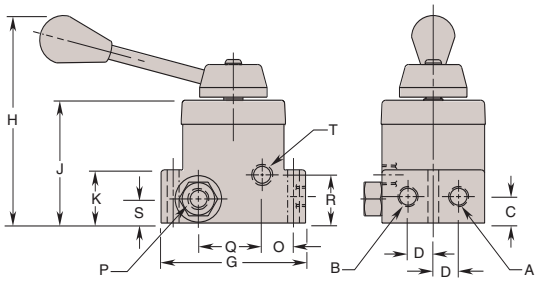
Features:

- 3-way/4-way, 3-position, detented
- Manually operated
- Remote mounted
- Handle swings 90° and may be repositioned in 22.5° intervals.
- 5,000 psi maximum
- 5 gpm
- 500 psi max. return line pressure
- Includes inlet check valve

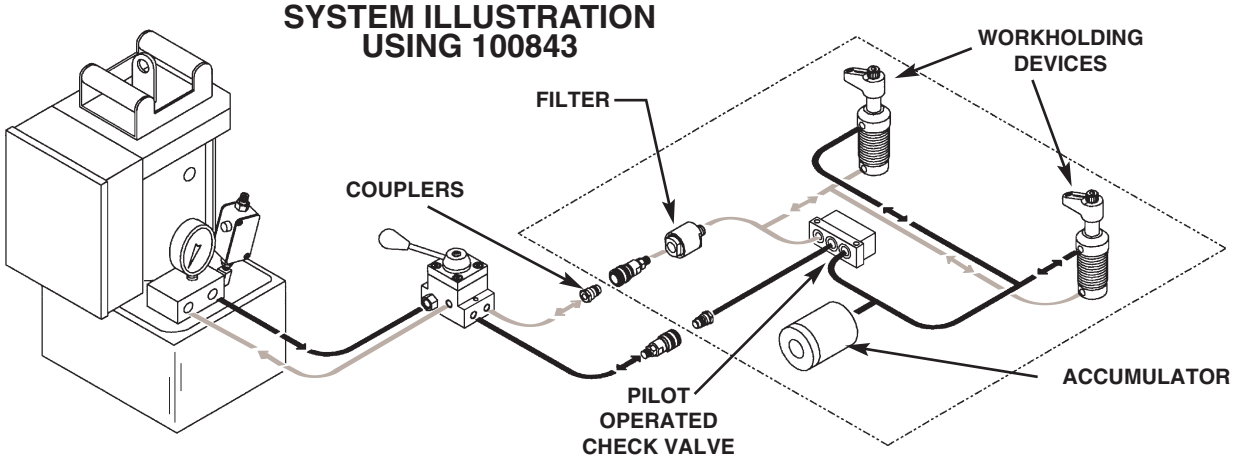
SYSTEM SCHEMATIC USING 100843







SYSTEM ILLUSTRATION USING 100843

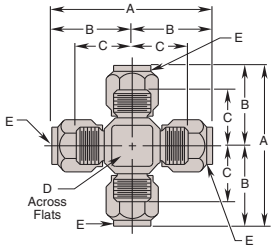


Cat. No.	Dimensions (In Inches)																			
	A Port	B Port	C	D	E	F	G	H	J	K	L	M	N	O	P Port	Q	R	S	T Port	U Rad.	V Dia.
100843	¼ NPTF	¼ NPTF	.687	.656	2.660	1.330	3.750	5.562	3.188	1.437	.312	3.125	.469	.812	¼ NPTF	1.656	1.250	.625	¼ NPTF	5.031	.281

ACCESSORIES

FITTINGS	PRESSURE GAUGES
HYDRAULIC FLUID	ROTATING UNIONS
HOSES & TUBING	PRESSURE SWITCH
COUPLERS	REMOTE CONTROLS
MANIFOLDS	TEMP./LEVEL GAUGE
IN-LINE FILTERS	RESERVOIRS

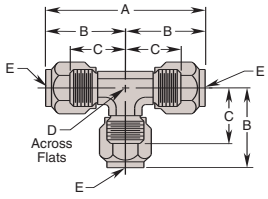
SPX HYTEC



Cross

Compression Tube

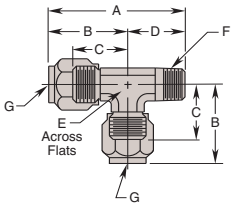
Cat. No.	Dimensions (In Inches)				
	A	B	C	D	E Tube Size
15058	2.156	1.078	.750	.750	.250
17278	2.781	1.391	.953	.750	.375



Union Tee

Compression Tube

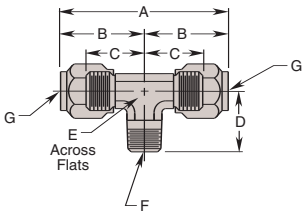
Cat. No.	Dimensions (In Inches)				
	A	B	C	D	E Tube Size
15054	2.156	1.078	.750	.438	.250
10659	2.844	1.422	.984	.625	.375



Male Run Tee

Compression Tube to NPTF

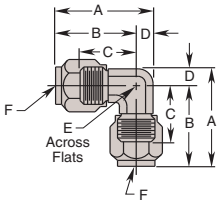
Cat. No.	Dimensions (In Inches)						
	A	B	C	D	E	F Thread Size	G Tube Size
15050	1.859	1.078	.750	.781	.438	⅛ NPTF	.250
205791	2.047	1.109	.781	.938	.500	¼ NPTF	.250
10669	2.484	1.422	.984	1.062	.625	¼ NPTF	.375



Male Branch Tee

Compression Tube to NPTF

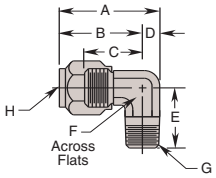
Cat. No.	Dimensions (In Inches)						
	A	B	C	D	E	F Thread Size	G Tube Size
15055	2.156	1.078	.750	.781	.438	⅛ NPTF	.250
205790	2.219	1.109	.781	.938	.500	¼ NPTF	.250
10670	2.844	1.422	.984	1.062	.625	¼ NPTF	.375



90° Male Elbow

Compression Tube

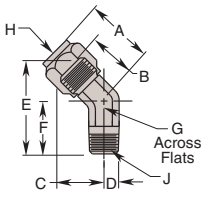
Cat. No.	Dimensions (In Inches)					
	A	B	C	D	E	F Tube Size
15059	1.297	1.078	.750	.219	.438	.250
250211	1.641	1.359	.922	.281	.562	.375



90° Male Elbow

Compression Tube to NPTF

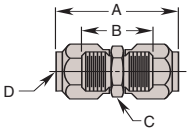
Cat. No.	Dimensions (In Inches)							
	A	B	C	D	E	F	G Thread Size	H Tube Size
15052	1.297	1.078	.750	.219	.781	.438	⅛ NPTF	.250
205792	1.484	1.203	.875	.281	1.062	.562	¼ NPTF	.250
10665	1.641	1.359	.922	.281	1.094	.562	¼ NPTF	.375



45° Male Elbow

Compression Tube to NPTF

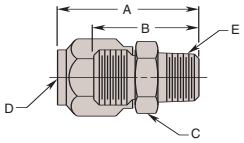
Cat. No.	Dimensions (In Inches)								
	A	B	C	D	E	F	G	H Tube Size	J Thd. Size
15053	.953	.625	.672	.281	1.359	.688	.562	.250	⅛ NPTF
10655	1.234	.797	.828	.281	1.708	.875	.562	.375	¼ NPTF



Male Union

Compression Tube

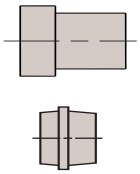
Cat. No.	Dimensions (In Inches)			
	A	B	C Hex.	D Tube Size
15060	1.562	.906	.500	.250
250212	1.875	1.000	.625	.375



Male Connector

Compression Tube to NPTF

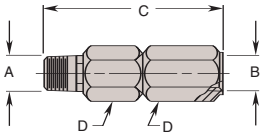
Cat. No.	Dimensions (In Inches)				
	A	B	C Hex.	D Tube Size	E Thread Size
15061	1.281	.953	.500	.250	⅛ NPTF
205793	1.484	1.156	.625	.250	¼ NPTF
10661	1.641	1.203	.625	.375	¼ NPTF



Tube Sleeve

Cat. No.	A Tube Size	Fitting Style
13031	.250	Compression
10430	.375	

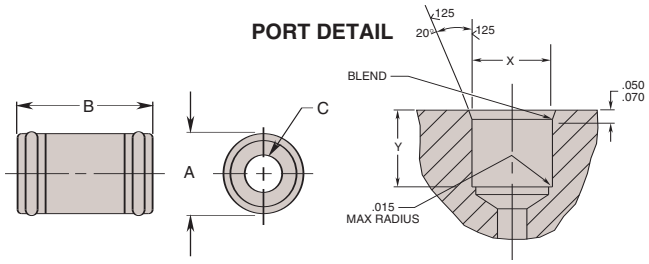
NOTE: Hytec tube sleeves may not be compatible with other tubing materials and grades.



Check Valve

Cat. No.	Dimensions (In Inches)			
	A Thread Size	B Thread Size	C	D Hex.
206330	¼ NPTF	¼ NPTF	2.250	.750

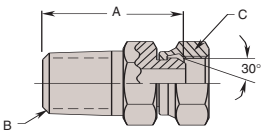
NOTE: Cracking pressure - 5 psi max.



Connector Bushing

Cat. No.	Dimensions (In Inches)				
	Bushing			Port	
	A Dia.	B	C Dia.	X Dia.	Y
*100169	.500	.844	.234	.500 .503	.515 .535

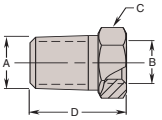
NOTE: * Box of Ten Connector Bushings.



Swivel Adapter

Caution - The female swivel end is a straight pipe thread (NPSM) with a 30° seat. All male pipe fittings that are used with these female swivel adapters must have an internal 30° seat to seal properly.

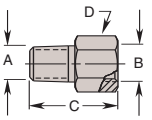
Cat. No.	Dimensions (In Inches)		
	A	B Thread Size	C Thread Size
15069	1.030	¼ NPTF	⅛ NPSM
11310	1.260	¼ NPTF	¼ NPSM



Reducer

NPTF

Cat. No.	Dimensions (In Inches)			
	A Thread Size	B Thread Size	C Hex.	D
13269	¼ NPTF	⅛ NPTF	.625	.781

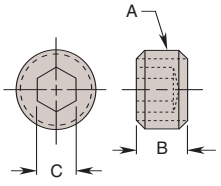


Adapter

NPTF

Cat. No.	Dimensions (In Inches)			
	A Thread Size	B Thread Size	C	D Hex.
15235	⅛ NPTF	¼ NPTF	1.140	.750
*252128	¼ NPTF	7/16 20UNF SAE-4	1.310	.688

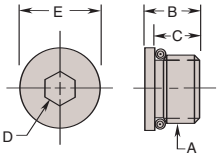
* Use with 216437 Metering Valve to control flow in ¼ NPTF actuators.



Plug

NPTF

PLUGS - NPTF			
Cat. No.	Dimensions (In Inches)		
	A Thread Size	B	C Hex.
15499	⅛ NPTF	.242	.188
10479	¼ NPTF	.437	.250
16232	⅜ NPTF	.400	.312

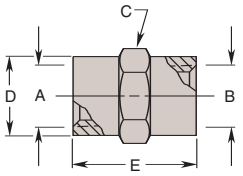


Plug

SAE O-Ring

PLUGS - SAE O-RING					
Cat. No.	Dimensions (In Inches)				
	A Thread Size	B	C	D Hex.	E Dia.
250883	7/16-20UNF SAE-4	.450	.360	.188	.563

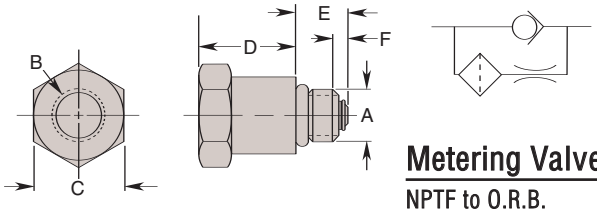
SPX HYTEC



Connector

NPTF

Cat. No.	Dimensions (In Inches)				
	A Thread Size	B Thread Size	C Hex.	D Dia.	E
12740	¼ NPTF	¼ NPTF	.750	.730	1.125

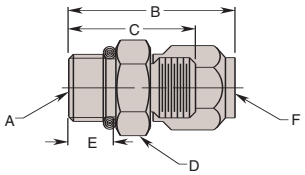


Metering Valve

NPTF to O.R.B.

Cat. No.	Dimensions (In Inches)					
	A Thread Size	B Thread Size	C Hex.	D	E	F
216437	7/16-20UNF SAE–4	¼ NPTF	.750	.700	.435	.075

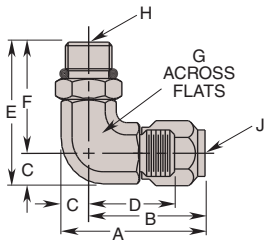
NOTE: Orifice size - .013/.017 dia.



Male Connector

O.R.B. to Compression Tube

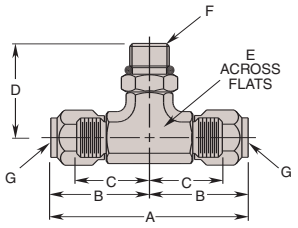
Cat. No.	Dimensions (In Inches)					
	A Thread Size	B	C	D Hex.	E	F Tube Size
250685	7/16-20 UNF SAE–4	1.203	.875	.562	.359	.250
250686	9/16-18 UNF SAE–6	1.453	1.016	.812	.391	.375



90° Male Elbow

Compression Tube to O.R.B.

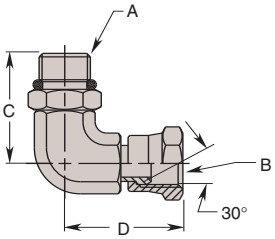
Cat. No.	Dimensions (In Inches)								
	A	B	C	D	E	F	G	H Thread Size	J Tube Size
250687	1.297	1.078	.219	.750	1.266	1.078	.438	7/16-20 UNF SAE–4	.250
250688	1.625	1.344	.281	.906	1.516	1.250	.562	9/16-18 UNF SAE–6	.375



Male Branch Tee

Compression Tube to O.R.B.

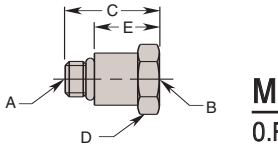
Cat. No.	Dimensions (In Inches)						
	A	B	C	D	E	F Thread Size	G Tube Size
250689	2.156	1.078	.750	1.047	.438	7/16-20 UNF SAE–4	.250



90° Swivel Adapter

Caution - The female swivel end is a straight pipe thread (NPSM) with a 30° seat. All male pipe fittings that are used with these female swivel adapters must have an internal 30° seat to seal properly.

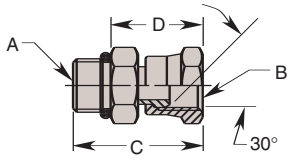
Cat. No.	Dimensions (In Inches)			
	A Thread Size	B Thread Size	C	D
250692	7/16-20 UNF SAE–4	¼ NPSM	1.120	.970



Male Adapter

O.R.B. to NPTF

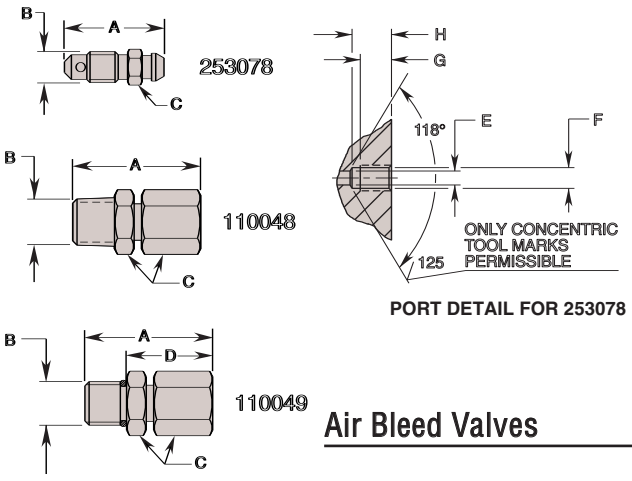
Cat. No.	Dimensions (In Inches)				
	A Thread Size	B Thread Size	C	D Hex.	E
210312	7/16-20 UNF SAE–4	¼ NPTF	1.062	.750	.710



Swivel Adapter

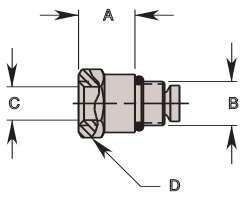
Caution - The female swivel end is a straight pipe thread (NPSM) with a 30° seat. All male pipe fittings that are used with these female swivel adapters must have an internal 30° seat to seal properly.

Cat. No.	Dimensions (In Inches)			
	A Thread Size	B Thread Size	C	D
250690	7/16-20 UNF SAE–4	¼ NPSM	1.320	.865

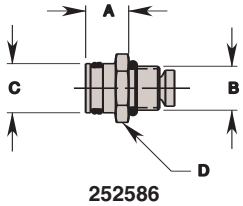


Air Bleed Valves

Cat. No.	Dimensions (In Inches)							
	A	B Thread Size	C Hex	D	E Dia. Max.	F Thread Size	G Min.	H
253078	1.000	9/16-24UNF	.312	–	.177	9/16-24UNF	.350	.450 .510
110048	1.630	1/4 NPTF	.562		–	–	–	–
110049	1.440	7/16-20UNF SAE-4	.562	1.080				



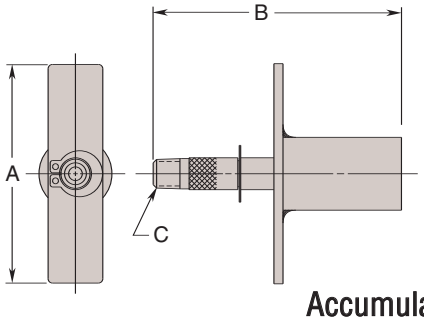
251827



252586

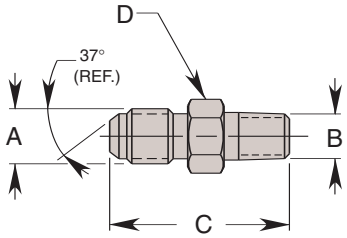
Accumulator Metering Valves

Cat. No.	Dimensions (In Inches)				
	A	B Thd. Size	C Thd. Dia.	C Dia.	D Hex
251827	.698	9/16-18 UNF	1/4 NPT	—	.750
252586	.544		—	.624 .622	



Accumulator Charging Tool

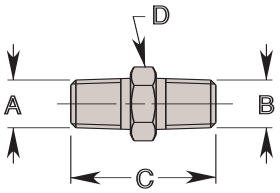
Cat. No.	Dimension (In Inches)		
	A	B	C Thread Size
500149	3.000	3.400	1/8 NPTF



Straight

37° Flared Tube to NPTF

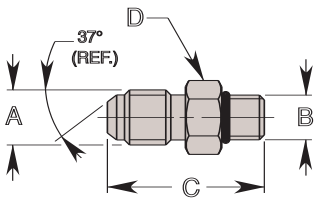
Cat. No.	Dimensions (In Inches)				
	A Thd. Size	B Thd. Size	C	D Hex	Tube Dia.
11628	9/16-18 UNF	3/8 NPTF	1.430	.750	.375
253019	7/16-20 UNF	1/8 NPTF	1.220	.500	.250
253076		1/4 NPTF	1.420	.562	
253174	9/16-18 UNF		1.430	.625	.375



Straight

NPTF

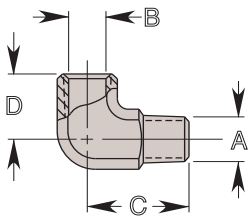
Cat. No.	Dimensions (In Inches)			
	A Thd. Size	B Thd Size	C	D Hex
10672	1/4 NPTF	1/4 NPTF	1.450	.625
11421	1/8 NPTF	1/8 NPTF	1.060	.437
12328	3/8 NPTF	1/4 NPTF	1.360	.750
16691	1/4 NPTF	1/8 NPTF	1.234	.593
215373	1/8 NPTF	1/16 NPTF	1.010	.438



Straight

37° Flared Tube to O.R.B.

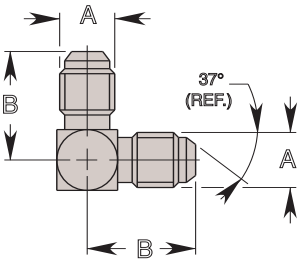
Cat. No.	Dimensions (In Inches)				
	A Thd. Size	B Thd Size	C	D Hex	Tube Dia.
253020	7/16-20 UNF	7/16-20 UNF SAE-4	1.230	.562	.250
253021	9/16-18 UNF	9/16-18 UNF SAE-6	1.300	.687	.375



90° Elbow Adapter

NPTF

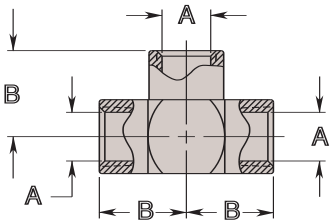
Cat. No.	Dimensions (In Inches)			
	A Thd. Size	B Thd Size	C	D
10617	1/4 NPTF	1/4 NPTF	1.090	.880
13229	1/8 NPTF	1/8 NPTF	.780	.660
13864		1/4 NPTF		.880



90° Male Elbow

37° Flared Tube

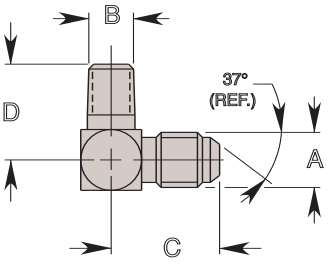
Cat. No.	Dimensions (In Inches)		
	A Thd. Size	B	Tube Dia.
253007	7/16-20 UNF	.890	.250
253008	9/16-18 UNF	1.060	.375



Female Tee

NPTF

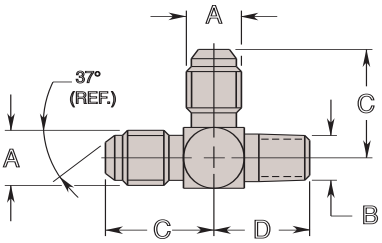
Cat. No.	Dimensions (In Inches)	
	A Thd. Size	B
252998	1/4 NPTF	.890



90° Male Elbow

37° Flared Tube to NPTF

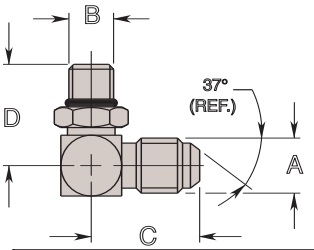
Cat. No.	Dimensions (In Inches)				
	A Thd. Size	B Thd. Size	C	D	Tube Dia.
253009	7/16-20 UNF	1/4 NPTF	1.060	1.090	.250
253010	9/16-18 UNF	3/8 NPTF	1.140	1.220	.375
253175	7/16-20 UNF	1/8 NPTF	.890	.780	.250



Male Run Tee

37° Flared Tube to NPTF

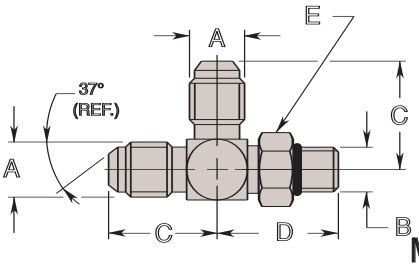
Cat. No.	Dimensions (In Inches)				
	A Thd. Size	B Thd. Size	C	D	Tube Dia.
253022	7/16-20 UNF	1/8 NPTF	.890	.780	.250
253023		1/4 NPTF	1.060	1.090	
253025	9/16-18 UNF				.375
253026		3/8 NPTF	1.140	1.220	



90° Male Elbow

37° Flared Tube to O.R.B.

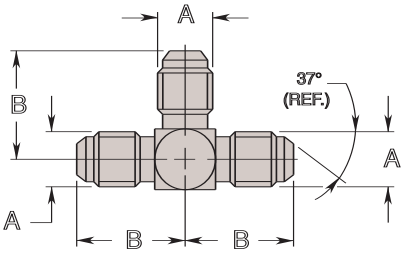
Cat. No.	Dimensions (In Inches)					
	A Thd. Size	B Thd. Size	C	D	E Hex.	Tube Dia.
250605	7/16-20 UNF	7/16-20 UNF SAE-4	.890	1.030	.562	.250
253011	9/16-18 UNF	9/16-18 UNF SAE-6	1.060	1.250	.687	.375
253012		3/4-16 UNF SAE-8	1.140	1.450	.875	
253013		7/8-14 UNF SAE-10	1.230	1.700	1.000	



Male Run Tee

37° Flared Tube to O.R.B.

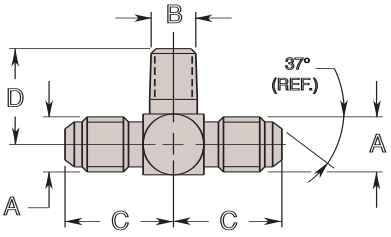
Cat. No.	Dimensions (In Inches)					
	A Thd. Size	B Thd. Size	C	D	E Hex.	Tube Dia.
253024	7/16-20 UNF	7/16-20 UNF SAE-4	.890	1.030	.562	.250
253027	9/16-18 UNF	9/16-18 UNF SAE-6	1.060	1.250	.687	.375



Male Tee

37° Flared Tube

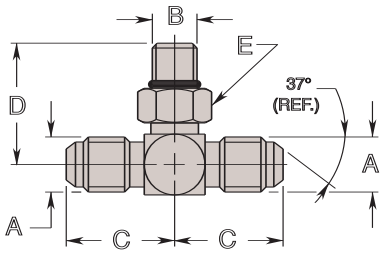
Cat. No.	Dimensions (In Inches)		
	A Thd. Size	B	Tube Dia.
252996	7/16-20 UNF	.890	.250
252997	9/16-18 UNF	1.060	.375



Male Branch Tee

37° Flared Tube to NPTF

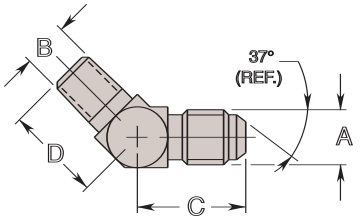
Cat. No.	Dimensions (In Inches)				
	A Thd. Size	B Thd. Size	C	D	Tube Dia.
253028	7/16-20 UNF	1/8 NPTF	.890	.780	.250
253030	9/16-18 UNF	1/4 NPTF	1.060	1.090	.375



Male Branch Tee

37° Flared Tube to O.R.B.

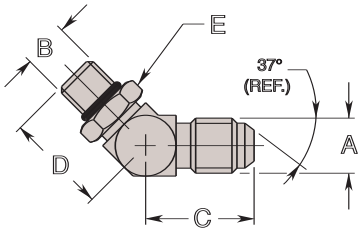
Cat. No.	Dimensions (In Inches)					
	A Thd. Size	B Thd. Size	C	D	E Hex.	Tube Dia.
253029	7/16-20 UNF	7/16-20 UNF SAE-4	.890	1.030	.562	.250
253031	9/16-18 UNF	9/16-18 UNF SAE-6	1.060	1.250	.687	.375



Male 45° Elbow

37° Flared Tube to NPTF

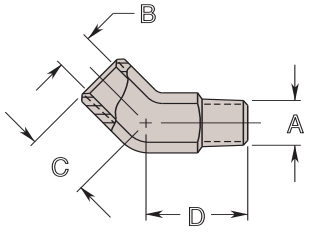
Cat. No.	Dimensions (In Inches)				
	A Thd. Size	B Thd. Size	C	D	Tube Dia.
253014	7/16-20 UNF	1/4 NPTF	.820	.860	.250
253016	9/16-18 UNF	1/4 NPTF	.840	.860	.375
253017	9/16-18 UNF	3/8 NPTF	.880	.950	.375



Male 45° Elbow

37° Flared Tube to O.R.B.

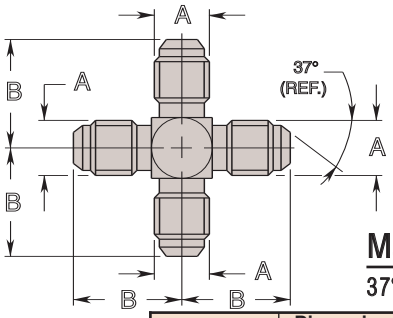
Cat. No.	Dimensions (In Inches)					
	A Thd. Size	B Thd. Size	C	D	E Hex.	Tube Dia.
253015	7/16-20 UNF	7/16-20 UNF SAE-4	.720	1.050	.562	.250
253018	9/16-18 UNF	9/16-18 UNF SAE-6	.830	1.180	.687	.375



45° Elbow Adapter

NPTF

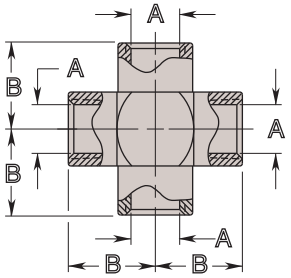
Cat. No.	Dimensions (In Inches)			
	A Thd. Size	B Thd. Size	C	D
19121	1/8 NPTF	1/8 NPTF	.470	.720
10645	1/4 NPTF	1/4 NPTF	.630	1.050



Male Cross

37° Flared Tube

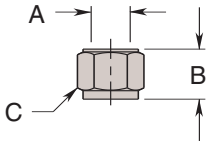
Cat. No.	Dimensions (In Inches)		
	A Thd. Size	B	Tube Dia.
252999	7/16-20 UNF	.890	.250
253000	9/16-18 UNF	1.060	.375



Female Cross

NPTF

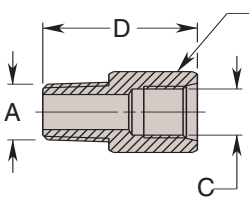
Cat. No.	Dimensions (In Inches)	
	A Thd. Size	B
253001	1/4 NPTF	.890



Nut

37° Flared Tube

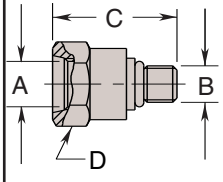
Cat. No.	Dimensions (In Inches)			
	A Thd. Size	B	C Hex.	Tube Dia.
253032	7/16-20 UNF	.610	.562	.250
253033	9/16-18 UNF	.720	.687	.375



Straight

BSPP to O.R.B.

Cat. No.	Dimensions (In Inches)			
	A Thd. Size	B Hex.	C	D
253288	1/4 BSPP	.750	7/16-20 UNF SAE-4	1.250



Straight

O.R.B.

Cat. No.	Dimensions (In Inches)			
	A Thd. Size	B Thd. Size	C	D Hex.
351816	7/16-20 UNF SAE-4	5/16-24 UNC SAE-2	1.065	.625

Hydraulic Fluid

For dependable performance of cylinders, clamps, valves, and pumps, these high-grade hydraulic fluids contain anti-rust, anti-foam, and anti-sludge additives. They provide maximum film protection lubricity, maximum heat transfer, and a wide operating temperature range.

Hytec's "environmentally friendly" hydraulic fluid is a biodegradable, non-toxic formulation which can withstand severe operating conditions and provide excellent anti-wear properties.

The "Flame-Out" fire resistant fluid has been approved by United States Mine Safety Health Administration under Referral Register Title 30, Part 35. All fire resistant fluids will burn if heat source is extreme, eg.: hot slabs, molten steel, etc. They will not, however, propagate the flame and are self-extinguishing in the absence of an ignition source.

The use of the fire resistant fluid does not require changing the seals in any Hytec equipment as it would when using other types of fire resistant fluids. The standard fluid need only be drained from the complete system and replaced with fire resistant hydraulic fluid.

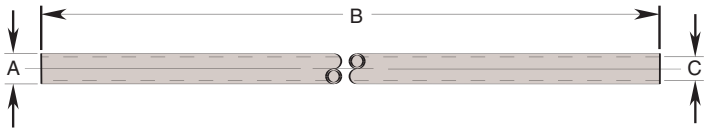
Tubing

Hytec's low carbon steel tubing conforms to SAE J525. Hytec fittings may not be compatible with other tubing materials and grades (eg. stainless steel). **DO NOT SUBSTITUTE.** Hytec tubing may not be compatible with other fittings. **DO NOT SUBSTITUTE.**

Hoses

Hytec thermoplastic hose conforms to SAE 100R8 specifications.

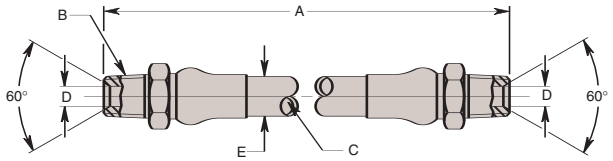
Tubing



TUBING			
Cat. No.	Dimensions (In Inches)		
	A Dia.	B (Ft.)	C Dia.
100290	.250	50	.180
9190	.375		.245

***NOTE:** Comes in 10 5-ft. pieces. 5,000 psi max.

Hose

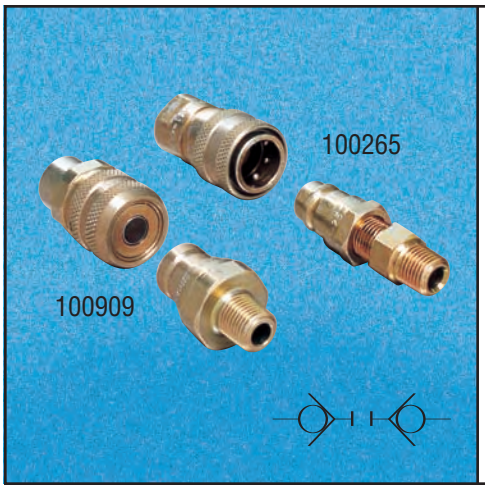


HOSES					
Cat. No.	Dimensions (In Inches)				
	A (ft.)	B Thd. Size	C Inside Dia.	D Thru Dia.	E Outside Dia.
100281	1	¼ NPTF	.250	.141	.620
100282	2				
100283	3				
100285	5				
100286	10				
100287	15				

NOTE: 4 in. min. bend radius. 5,000 psi max.

HYDRAULIC FLUID													
Cat. No.	Description	Size	Qty.	Grade (ASTM)	Specific Gravity @60°F	Color (ASTM)	Flash Point (°F)	Fire Point (°F)	Pour Point (°F)	Viscosity		Viscosity Index (Min.)	Foam Test (ASTM)
										SUS @ 100°F	SUS @ 210°F		
9636	Hydraulic Oil	1 Quart	1	215	.875	2.0	400	430	-30	215	48	100	Pass
9636-12			12										
9637		1 Gallon	1										
9637-4			4										
9638		2½ Gal.	1										
9638-2			2										
9639	Flame-Out fire resistant hydraulic fluid	1 Gallon	1	220	.910	Light Amber	500	550	-15	200	55	140	
9639-4			4										
9645	"Environmentally Friendly" hydraulic fluid		1	—	.922	2.0	432	—	-22	183	53	213	—
9646		2½ Gal.											

Couplers



Hytec offers both an economical standard poppet type coupler and labor-saving push-to-connect flat face coupler. Both styles are rated at 5,000 psi that has ¼" NPTF connections.

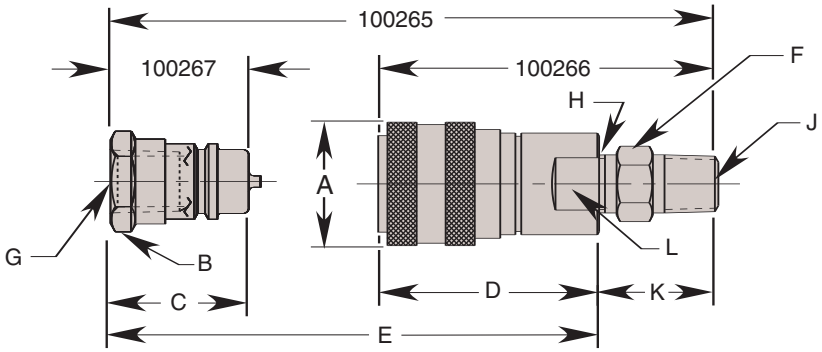
The standard coupler is recommended for lower cycle applications where two hand connections and slight spillage after disconnection is acceptable.

The push-to-connect coupler is easier to connect and keep clean, making it ideal for use in high cycle applications like pallet coupling. (This coupler is found on our manual pallet valve.) The flat face design eliminates the waste and mess associated with other types of hydraulic couplers. The coupler collar is lockable, making it even more secure in moving applications.

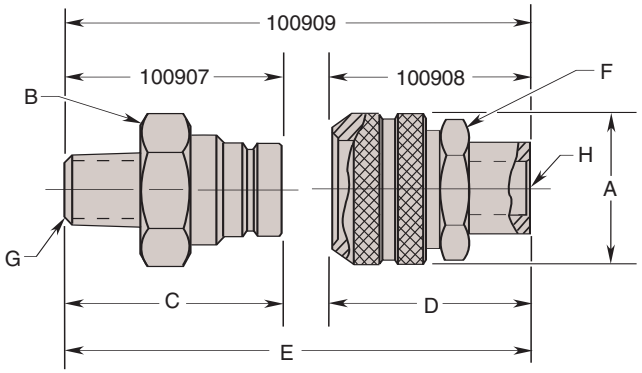
Features:

- Standard and push-to-connect versions
- ¼" NPTF connections
- 5,000 psi max. operating pressures

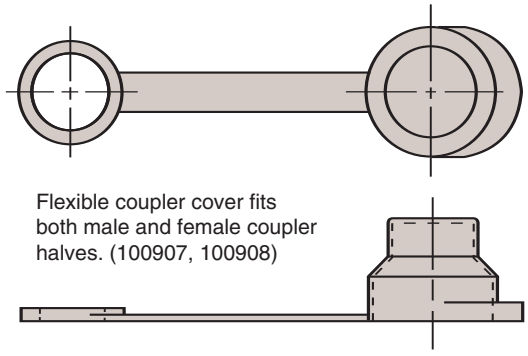
Standard



Push-to-connect



Coupler Cover - 251779



Flexible coupler cover fits both male and female coupler halves. (100907, 100908)

Cat. No.	Dimensions (In Inches)										
	A Dia.	B Hex.	C	D	E (Coupled)	F Hex.	G Thread Size	H Thread Size	J Thread Size	K	L Flats
100265	1.062	.750	1.190	1.900	2.400	.625	¼ NPTF	¼ NPTF	¼ NPTF	1.062	.750
100266					–		–				
100267	–			–	–	–	¼ NPTF		–	–	–
100907	–	1.000	1.720	–	–	–	¼ NPTF	–	–	–	–
100908	1.060	–	–	1.790	–	1.00	–	¼ NPTF			
100909		1.000	1.720		2.970		¼ NPTF				

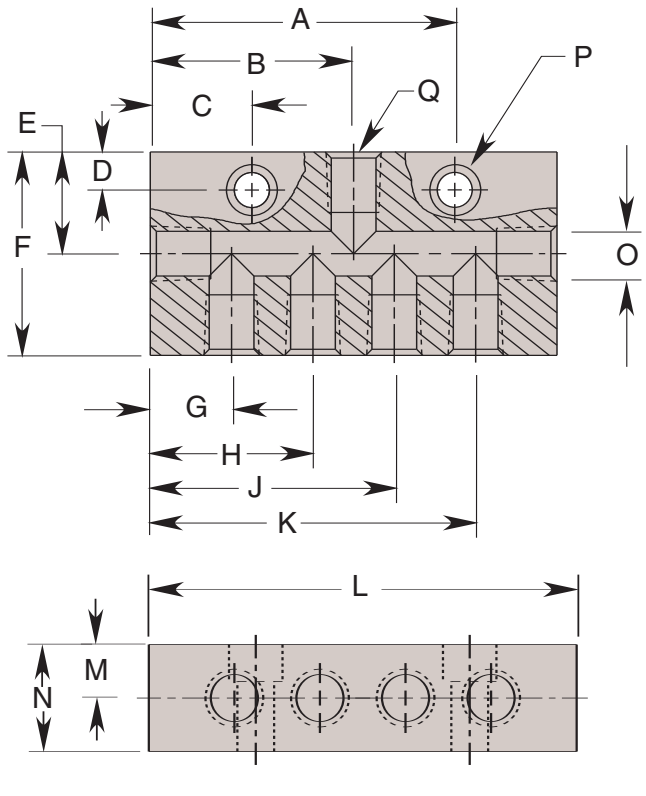
The 9614 manifold assembly comes as standard equipment on Hytec pumps No. 100186, 100280, 100190, 100200, 100174, 100220 and 100211. It provides the connection points for pressure and return lines as well as a gauge and/or pressure switch. These pumps are designed to have this manifold removed and directly replaced by our number 9504 pump-mounted control valve.

Use this manifold to convert these pumps back to manifold outlet, remote mounted valve applications. Includes manifold, reservoir return tube, mounting hardware and two ¼" NPT plugs. The 100944 is available for making SAE O-ring connections.

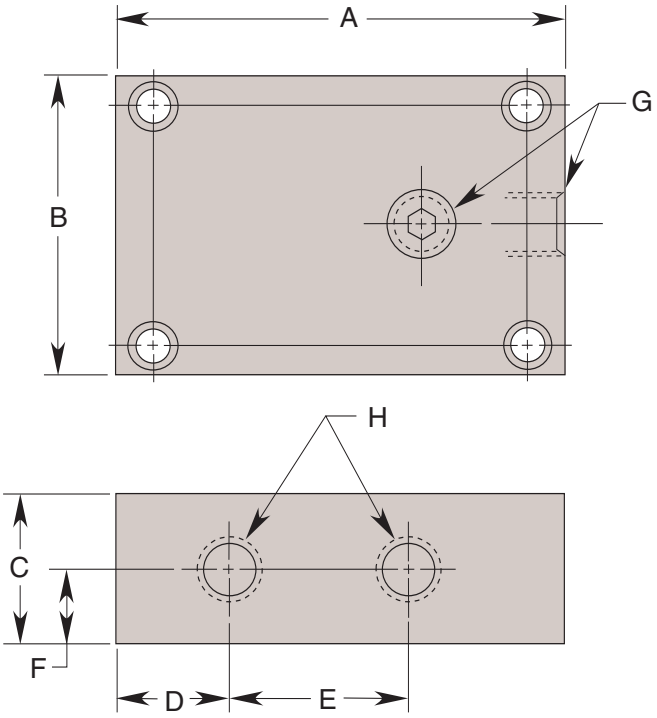
Manifold 36105 is ideal for connecting multiple actuators to a single pressure source. Used with conventional ¼" NPT fittings, the seven ports are internally connected with large diameter passages to reduce restriction. The ports on any of the four sides can be plugged if not used. Two mounting holes are provided in the manifold to secure it to the fixture or machine tool. Since there are no ports in the top or bottom mounting faces, multiple manifolds can be stacked to save space.

Manifold 100941 shares the same features but provides SAE O-ring ports.

100941
36105



100944
9614



Cat. No.	Dimension (In Inches)							
	A	B	C	D	E	F	G Thread Size	H Thread Size
9614	3.750	2.500	1.250	.938	1.500	.750	¼ NPTF	¼ NPTF
100944								9/16-18 UNF SAE-6

Cat. No.	Dimensions (In Inches)															
	A	B	C	D	E	F	G	H	J	K	L	M	N	O Thread Size (6 places)	P Dia.	Q Thread Size
36105	3.000	2.000	1.000	.375	1.000	2.000	.800	1.600	2.400	3.200	4.000	.500	1.000	¼ NPTF	.344	¼ NPTF
100941														7/16-20 UNF SAE-4		9/16-18 UNF SAE-6

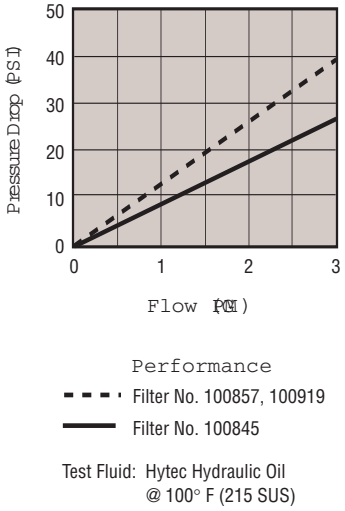
In-Line Filters

No. 100845 - This high pressure filter is intended for use in systems where there is flow in only one direction such as pressure or return lines between the power source and control valve. This in-line filter has a removable/replaceable sintered bronze element. The element is accessible without removing the filter body from the installation.

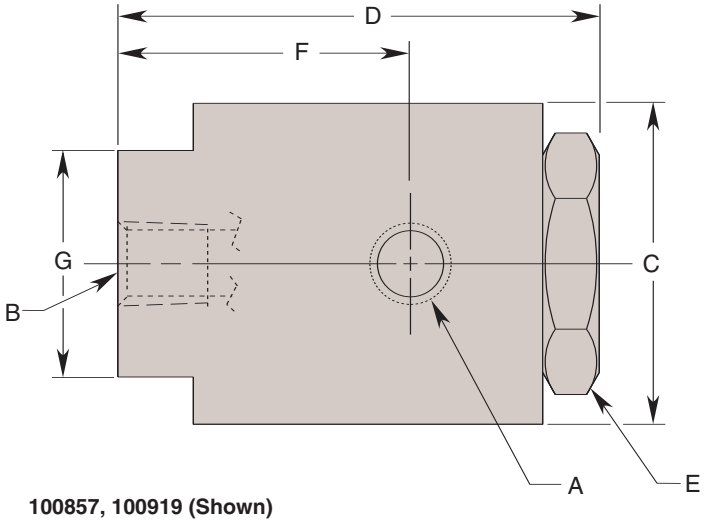
No. 100857, 100919 - These high pressure, non-bypass, in-line filters are suitable for both unidirectional and bi-directional circuits. This allows the filter to be installed in single acting or double acting circuits downstream from the control valve where the fluid flows in both directions. It's specially reinforced, stainless steel mesh filter element resists fatigue from pressure spikes. Both are ideal for use in pallet coupling circuits to protect components from contaminants introduced at the couplers. The No. 100857 is ideally suited for Hytec's No. 100223 manual pallet valve. Simply remove the coupler from the pallet valve and install this filter between the valve and coupler.

Features

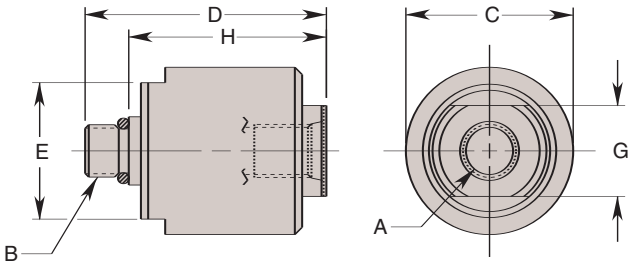
- 5,000 psi maximum operating pressure
- Low pressure drop
- Removable/replaceable elements



100845



100857, 100919 (Shown)



Cat. No.	Specifications		Dimensions (In Inches)								
	Filtration Nominal/ Absolute	Max. Operating Pressure (PSI)	A Inlet Port	B Outlet Port	C Dia.	D	E Hex	E Flats	F	G Flats	H
100845	10/- Micron	—	¼ NPTF	¼ NPTF	2.125	3.188	1.500	—	1.938	1.500	—
100857	10/25 Micron	5,000			1.380	2.100	—	1.125	—	.750	1.630
100919			7/16-20 UNF SAE-4	7/16-20 UNF SAE-4							

Pressure Gauges

Hytec offers standard hydraulic pressure gauges for monitoring system pressure. All have English and metric scales for convenience.

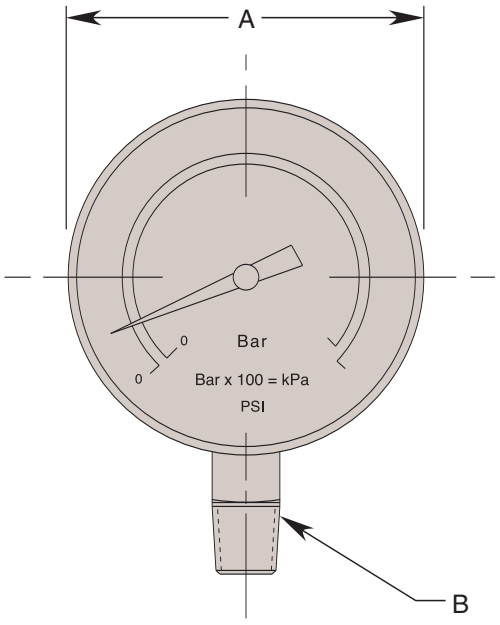
Liquid-filled gauges are recommended for high cycle or pulsating applications because the liquid tends to dampen vibration which protects the meter movement and calms "needle quiver." Dry gauges are recommended for applications where fast needle reaction is essential.

All gauges have built-in snubbers. In applications where pressure spikes are present, further snubbing may be necessary for the dry gauge.

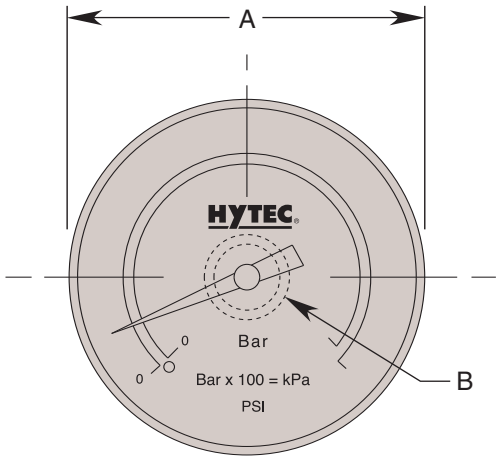
Features:

- Dual scales
- Liquid-filled or dry
- ¼" NPT brass connection, bottom and ⅛" NPT back mount

100236, 100238 & 100878

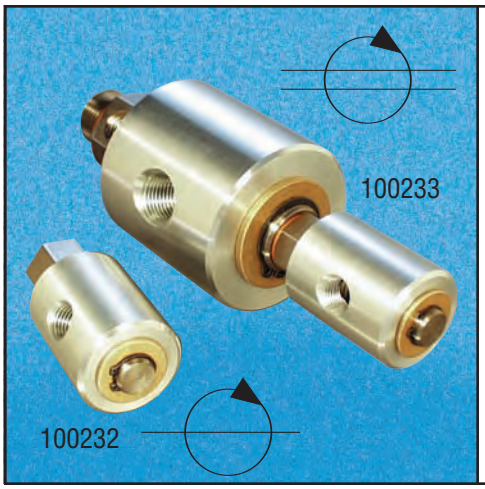


100917



Cat. No.	Specifications					Dimensions (In Inches)	
	Scale	Range	Graduations	Case	ANSI Accuracy	A	B
100236	PSI	0-6,000	100 PSI	Liquid Filled	1.6%	2.625	¼ NPT
	Bar	0-400	10 Bar				
100238	PSI	0-5,000	100 PSI	Dry	2%		
	kPa	0-35,000	1,000 kPa				
100878	PSI	0-2,000	50 PSI	Liquid Filled		2.640	
	Bar	0-140	2 Bar				
100917	PSI	0-6,000	1,000 PSI		1.6%	1.770	⅛ NPT Back Mount
	Bar	0-400	100 Bar				

Rotating Unions



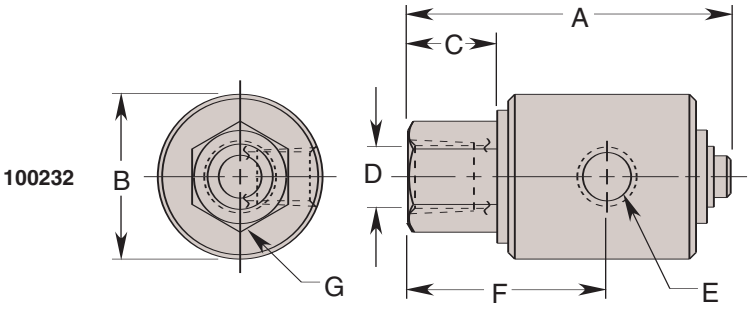
Rotating unions allow hydraulic or air power sources to be continuously connected in rotating applications allowing the use of constant pressure hydraulic workholding on lathes, boring machines, rotary transfer tables, etc. The single circuit union is used for single-acting systems. The dual circuit version is necessary for double-acting systems or for two separate single-acting circuits. The unique design of the dual circuit union eliminates the possibility of inter-passage leakage so different fluids can be used in each circuit without danger of intermixing.

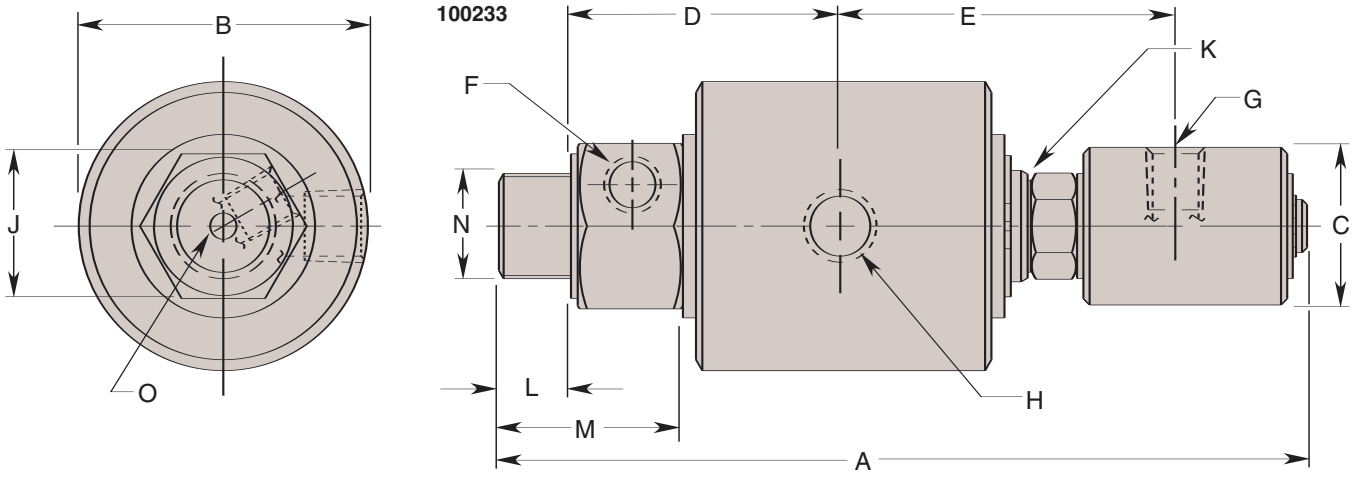
For maximum seal life, combined conditions of both maximum pressure and maximum rpm should be avoided.

Rotors are plated for wear and corrosion resistance. Both versions use a low torque, balanced seal design.

Features:

- Single and dual circuit designs
- Range 28 in. hg. to 3,000 psi max.
- 250 rpm max.
- Balanced seal design
- Low torque





Cat. No.	Specifications				Dimension (In Inches)						
	Circuits	†Max. Press. (PSI)		†Max. Speed (RPM)	A	B Dia.	C	D Thread Size	E Thread Size	F	G Hex.
		Air	Hyd.								
100232	1	150	3,000	250	2.938	1.500	.812	⅜ NPTF	¼ NPTF	1.812	.875

NOTE: † Operation at maximum pressure combined with maximum speed should be avoided.

Cat. No.	Specifications				Dimension (In Inches)													
	Circuits	†Max. Press. (PSI)		†Max. Speed (RPM)	A	B Dia.	C Dia.	D	E	F Port (Circuit A)	G Port (Circuit B)	H Port (Circuit A)	J Hex.	K Hex.	L	M	N Thread Size (Circuit B)	O Dia.
		Air	Hyd.															
*100233	2	150	3,000	250	7.688	2.750	1.500	2.562	3.188	¼ NPTF	¼ NPTF	⅜ NPTF	1.375	.875	.688	1.875	1-14 UNS	.250

NOTE: * For optimum performance, high pressure should be thru inner passage.
† Operation at maximum pressure combined with maximum speed should be avoided.

Pressure Switch

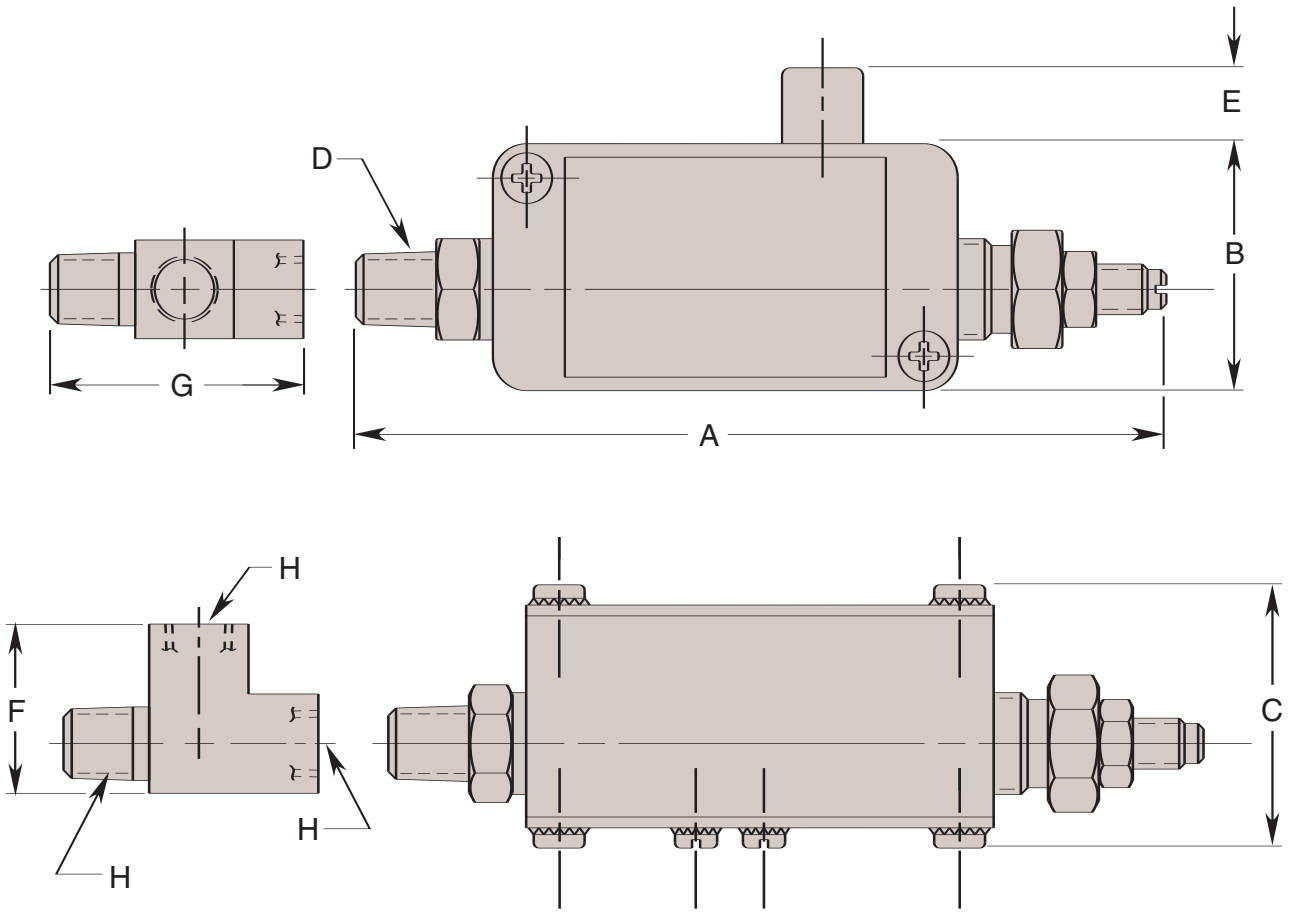
This hydraulic pressure switch is used to either control or monitor system pressure. To control system pressure the switch can be electrically wired into a pump's power circuit. At lower pressures, the switch is closed, causing the pump to run. When the pressure reaches the switch setting, the switch contacts open, stopping the pump. When system demands cause the pressure to drop 300 psi, the contacts will again close to start the pump. This switch is included with all Hytec electric pumps.

When used to monitor system pressure, the switch can be used to signal a warning light or other alarm, or can be interfaced with a machine tool to shut down a process if pressure falls below the switch setting.

Includes ¼" NPT tee for connecting to hydraulic circuit, and two feet of 18 AWG cable.

Features:

- Pressure range: 1,000 to 5,000 psi
- Differential: 200-600 psi, non-adjustable
- Contacts are normally closed – can be converted to normally open
- Contact rating: 250 VAC max.; 5 amps max.
- UL recognized
- Contacts are CSA approved



Cat. No.	Dimension (In Inches)							
	A Max.	B	C	D Thread Size	E	F	G	H Thread Size
9625	6.000	1.828	1.938	¼ NPTF	.562	1.281	1.969	¼ NPTF

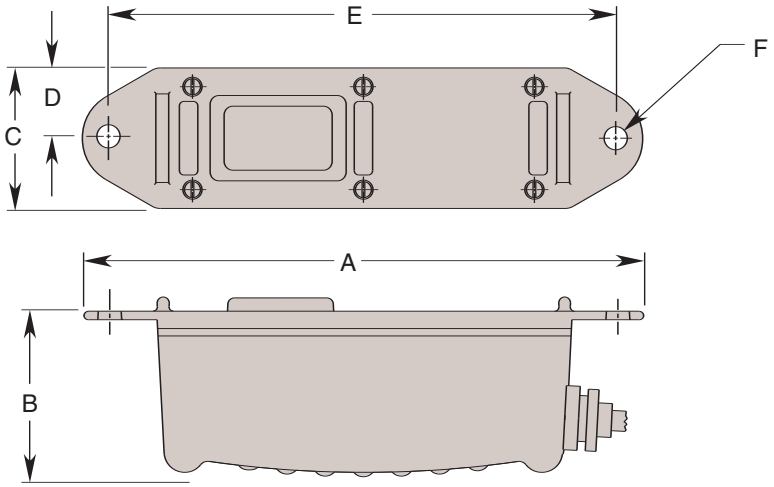
Remote Controls

Remote Hand Switch No. 202778

Ideal for use with the 9612 control valve. Includes 10 feet of 18 AWG 3-wire cable, and a sealed, CSA approved, single-pole double-throw momentary rocker switch in a glass reinforced thermoplastic enclosure.

NOTE: The electric solenoid remote control requires an electrical impulse to activate or release the Booster-Pac clamp control valve. The Booster-Pac will not lose clamping pressure in the event electrical power is lost. If electric power is lost while in the clamp position, pressure can be released manually.

202778



Cat. No.	Dimension (In Inches)					
	A	B	C	D	E	F Dia.
202778	7.630	2.460	1.930	.965	6.880	.315

Fluid Level/Temperature Gauge & Reservoirs

Fluid Level/Temperature Gauge No. 350431

This combination fluid level/temperature gauge allows you to visually check the level of the hydraulic fluid in your Hytec pump without opening the fill port. Its large 1¼" wide, 6⅜" high viewing area lets you see the fluid level from a distance. Built into the gauge is a dual scale thermometer that reads 32–212°F and 0-100°C. To mount, simply drill two ½" diameter holes in the reservoir and attach the gauge. This gauge is designed for use on pumps with 2.5 gal. and 5.7 gal. metal reservoirs as well as 2 gal. polyethylene reservoirs.

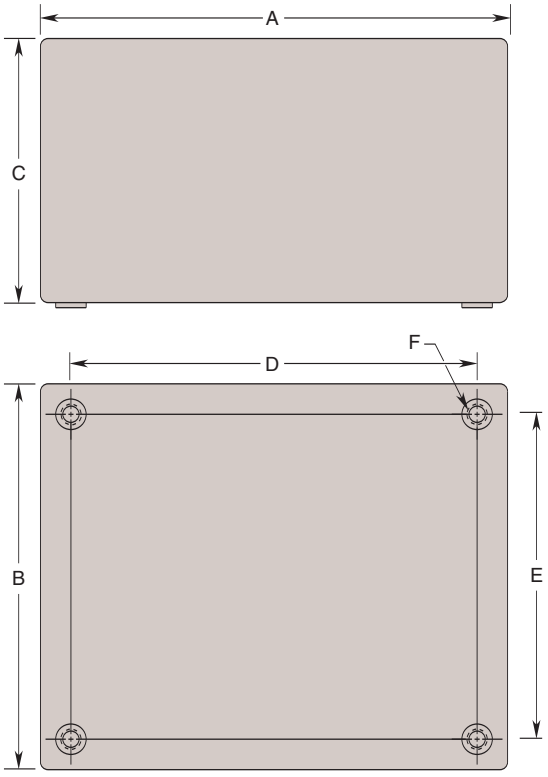
Reservoir Conversion Kit No. 260205

Includes 2.5 gallon (375 cu. in. usable) metal reservoir with a gasket and all the hardware needed to replace the plastic reservoir on pump Nos. 100178, 100179, 100178-230, 100179-230, 100922 and 100200.

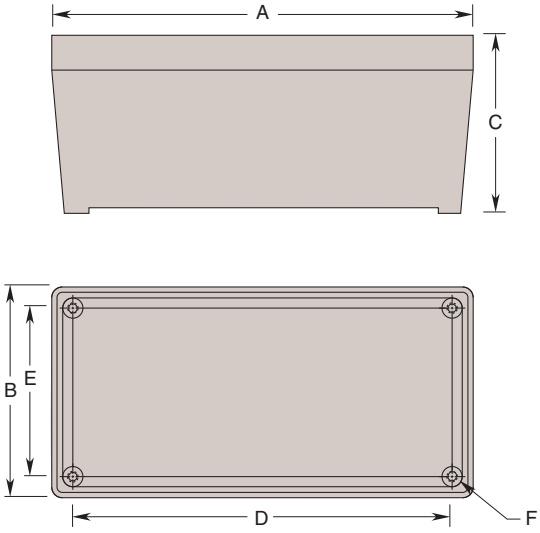
Reservoir Conversion Kit No. 213896

Includes 107 cu. in. (102 cu. in. usable) metal reservoir, plus gasket and fasteners needed to replace the plastic reservoir on pump Nos. 100280, 100190, 100180, 58219, 100921, 100918, 100174, 100191 and 100920.

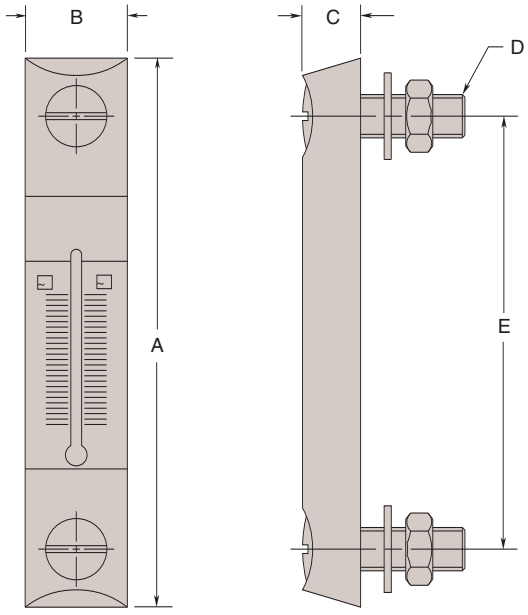
260205



213896



350431

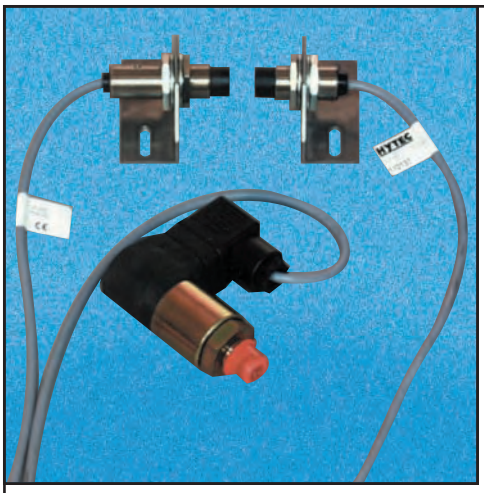


Cat. No.	Dimension (In Inches)						
	A	B	C	D	E	F Thread Size	F Thread Depth
260205	11.500	9.500	6.585	10.000	8.000	*.212 dia.	.600
213896	10.000	5.000	4.225	9.000	4.000	½-20 UNF	.600

NOTE: * Use 1/4-20 UNC self-tapping screw.

Cat. No.	Dimension (In Inches)				
	A	B	C	D Thread Size	E
350431	6.340	1.180	.670	M12 x 1.75	5.000

Pressure Monitoring System



What is the biggest fear you have about hydraulic pallet systems? For most operators, it is that you'll transfer a pallet into a machining center only to find that the hydraulic clamping system has failed to acuate. Or worse yet, slowly lost pressure while it was waiting in the pallet pool.

Pressure monitoring systems for hydraulic fixtures have always been a good idea. Unitl now, however, the systems were complex, high maintenance, took up space and were very expensive.

Hytec has introduced a new small, simple contact, pallet pressure monitoring system that eliminates the need for batteries on the pallet! The system consists of three parts: a pressure switch, a transmitter and a receiver.

On the pallet, the pressure switch is connected to the transmitter. At the worksetting station or in the machine, the receiver is connected to your machine's controller or cell PLC.

When the transmitter is in close proximity to the receiver, it inductively powers the on-pallet electrical system. No batteries are required! The transmitter sends a signal to the receiver indicating that the pallet is pressurized to above the minimum pressure set by the pressure switch.

Powered by your 24VDC PLC, you can program machine shut-down, pallet rejection or simply warn your operator should system pressure fall below the pressure switch setting.

A typical system for pallet pressure monitoring requires one receiver for each location where pressure is being monitored. Each pallet requires one transmitter and one pressure switch.

The system can be used to monitor pressure as the transmitter on the pallet passes near the receiver as it travels into the machining center. In applications where the receiver can be mounted in the machine where the pallet is fixed or where the receiver can follow the pallet, constant, non-contact monitoring is possible.

The transmitter and receiver pair can be used with any number of switchs in series to monitor multiple pressures or positions. (Switches must be designed for low amperage applications.) Additional switches might be used to monitor workpiece position or ensure that mechanical fixture elements have actuated. This system is also capable of powering one, non-contact proximity sensor, either with or without pressure switches. Contact Hytec for additional application information.

ORDERING INFORMATION

110137 - **Receiver**: Consists of a receiver with 6.5 ft. of cable, mounting bracket and two M18 jam nuts. 24VDC, Load current capacity - 100mA max. Maximum transmission sensing distance .157 in. PNP current sourcing, normally open.

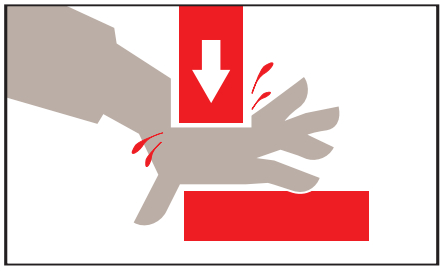
110138 - **Transmitter**: Consists of transmitter with 3.3 ft. of cable, mounting bracket and two M18 jam nuts.

110143 - **Pressure Switch**: 1000-5000 psi max. Normally open 1/8 NPT.

- Simple
- No Batteries
- Low Cost
- No Maintenance
- Small
- Non-Contact

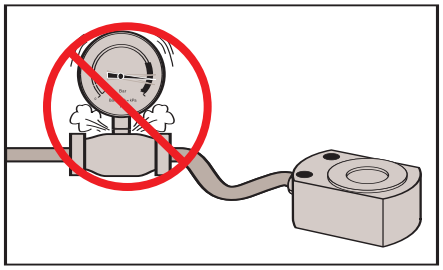
... a note on SAFETY

Safety means paying attention to the smallest details. A hastily assembled workholding system can result in a hazardous operator environment. Hydraulic workholding is not a generic technique where most anything will work nor is there one right or best answer for all situations. Each application is different and can be approached in many different ways. Because of this versatility, there is no rule-of-thumb to follow to guarantee safety. Knowledge, careful fixture design and common sense are likely the key to avoiding injuries.



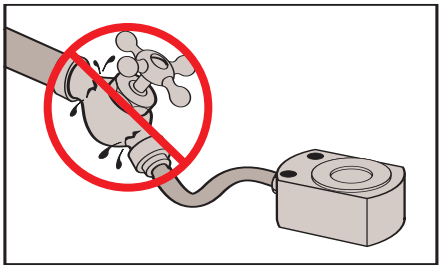
Plan your fixture installation with the operator's safety in mind. By nature, most clamping devices have pinch points. Many times the fixture can be designed to shield the operator from a pinching hazard. Often the placement of the clamping device in the fixture can minimize the gap between the clamp and the workpiece thus reducing or eliminating the pinch point. Perhaps the clamping control valve or switch can be located such that the operator cannot reach the fixture and the control at the same time. Dual palm buttons on electrically actuated systems serve the same purpose.

Don't require the operator to hold the workpiece in position during the clamping operation. Make sure that the workpiece is self supporting and self locating so that the operator's hands can be out of danger when the hydraulic system is actuated. Often a simple spring plunger is all that is necessary.

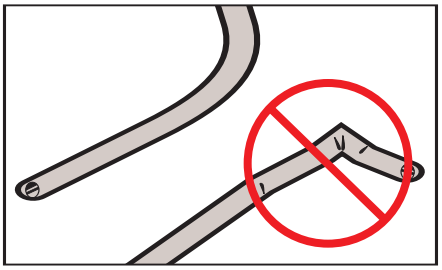


The **lowest** pressure rating of any component in the clamping system sets the **maximum** pressure rating for the entire system.

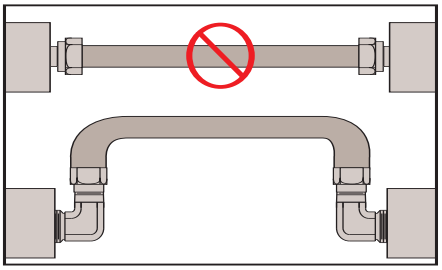
Most Hytec hydraulic workholding components are rated at 5,000 psi maximum. However, some components are rated at less than 5,000 psi. The maximum pressure is listed on each product page of this catalog. **Never exceed this rating.**



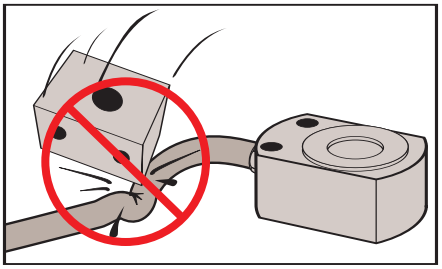
Just having a clamp that is rated at 5,000 psi is not enough. Every hose, fitting, valve, adapter and tube exposed to pressure must be rated at or above the maximum hydraulic system pressure. Most "hardware store" fittings are intended only for low pressure plumbing. Never use water pipe fittings or copper tubing and brass fittings for hydraulic service.



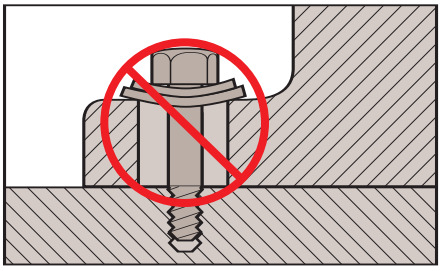
Use proper tools when bending tubing and maintain proper minimum bend radii for hoses and tubing. If a hose or tube is ever kinked, replace it. Don't risk a rupture. Fluid escaping under high pressure is dangerous. The resulting loss in pressure could release the workpiece from the fixture and cause serious injury and equipment damage by being ejected from the machine or breaking tooling.



Tubing and hoses do flex when pressurized. Allow for that movement by supporting the fluid lines away from surfaces which could abrade the surface and eventually cause damage. Avoid straight lengths of hose and tubing. A bend will allow for this deflection without putting too much stress on the line.



Even if proper hydraulic tubing and fittings are specified, be sure to protect them from abuse. Components damaged from abrasion or accidental dropping of a workpiece will no longer have the strength and safety originally designed.



Use proper mounting hardware when installing workholding clamps and other components. Always use the largest bolt available to fit in the mounting hole. In many cases, the recommended cap screw or thread is specified on the product page of this catalog. Sometimes the mounting hardware is included with the component. Always use supplied hardware.