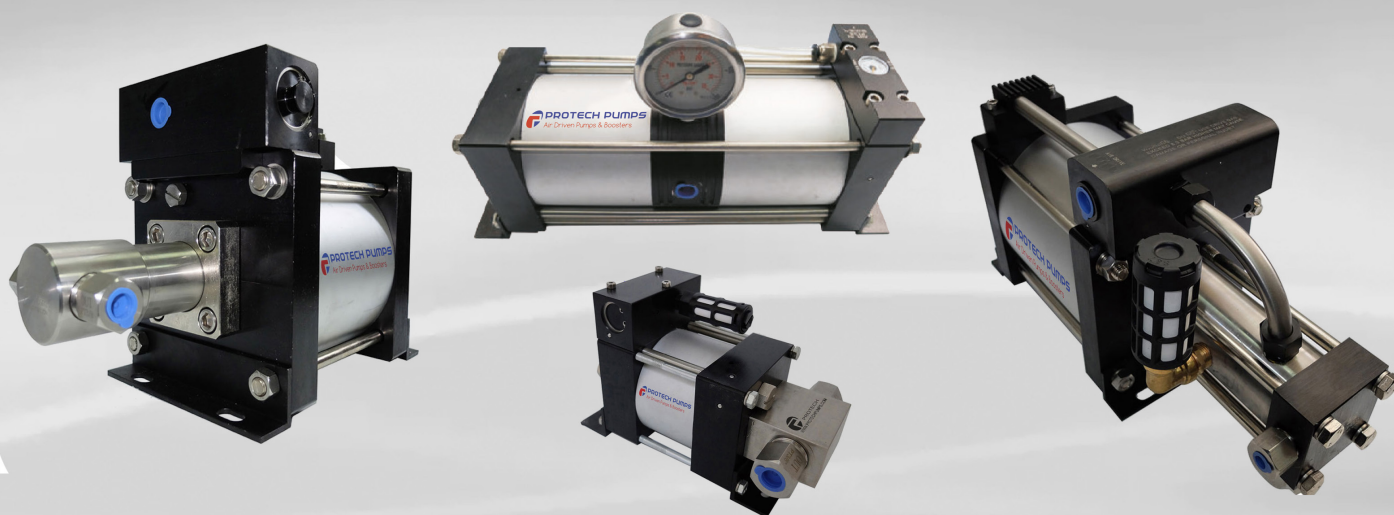


# Product Catalogue



## High Performance

Measured for capability of ultimate pressure, flow & output horsepower.



## High Quality

From design to construction, quality is paramount.



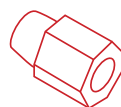
## Complete Range

Delivering a comprehensive range of flows and pressures.



## Accessories & Spares

Access all the valves, fittings and spare parts you'll need.



## Systems

All pumps, boosters and amplifiers available in systems.



## Guarantee

Full year warranty on all pumps.



# COMPANY PROFILE

ProTech Pumps has more than 50 years of hydraulic and pneumatic engineering experience in the design and manufacture of pumps and systems for pressure testing and chemical injection.

Continuous investment in new machinery and advanced technology keeps ProTech Pumps at the forefront of our field.

We offer one of the most complete range of Air Driven Pumps & Boosters in the industry measured for:

- Capability of ultimate pressure, flow or output horsepower.
- Compatibility with a broad variety of liquids and gases.

With a predominately online sales channel that allows us to keep costs down, we provide full technical support for via:

- Online selection guides (liquid pumps & gas boosters) and product comparison charts
- 24/7 technical email support system
- Phone-based technical support
- Web-based technical chat facility

## **Our History**

ProTech Pumps is a Solar Injection Australia brand. Solar Injection (SIA) has manufactured high quality chemical injection pumps in its Brisbane, Australia manufacturing centre for over 10 years.

Prior to becoming a high-pressure pump manufacturer, SIA's roots go back over 40 years, mainly as the technical distributor for Haskel Air Driven Liquid Pumps, Gas Boosters and High Pressure Valves and Fittings. SIA have designed numerous high and low pressure hydraulic, chemical, liquid and gas booster systems as well as many off-shore wellhead systems since its beginning in 1975.

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## A Note on Ratios

All ProTech Air Driven Air Amplifiers, Gas Boosters and Liquid Pumps operate using the RATIO principal. The ratio is that between a larger diameter (area) lower pressure compressed air drive piston (within the air drive) and a mechanically connected higher pressure but smaller diameter (area) piston or plunger within the liquid/gas section. They all reach a stall condition when the opposing forces, created between the lower pressure air drive and the higher pressure fluid outlet, become balanced. This stall pressure is the maximum that can be attained for the given actual ratio of the device and the compressed air drive pressure used. At this stall point, the pump can hold the stall pressure but delivers zero flow. The ratio referred to in the part numbering system (nominal ratio) for most liquid pumps is generally about 10% lower than the actual ratio. This allows slightly higher stall pressures to be reached and allows the unit to continue to cycle and deliver fluid past the pressure reached when the nominal ratio is multiplied by the air drive pressure.

As an example, a Model PM22 liquid pump driven with 8 Bar air supply has an actual ratio of 25:1 and will stall at a fluid outlet pressure of 200 Bar rather than 176 Bar as the nominal ratio implies. By using an air pressure regulator on the air drive supply line, the desired stall pressure can be set to any point less than the maximum air supply pressure multiplied by the actual ratio of the pump.

It stands to reason that the higher the nominal ratio of the device, the higher fluid *or gas* outlet pressure can be achieved. The ProTech range includes a number of different series of pumps and boosters each having larger diameter air drives. Each series has numerous nominal ratios so that, with careful selection, the correct unit can be selected for a given flow vs pressure application.

All ProTech Pumps consist of a lower pressure (<10 Bar) linear reciprocating air motor (air drive) directly connected to a higher pressure fluid end. In the case of most liquid pumps, the fluid ends mainly use plungers while all gas boosters use pistons.



## A Note on Air Consumption & Air Quality

To obtain maximum continuous performance of our pumps and boosters, we recommend the use of an air compressor with a minimum free air delivery (FAD) to the pump that corresponds to the pressure you wish to use. The table below can be used as a guide.

Series	FAD required at the inlet of the pump
PM	30 scfm (48 nm <sup>3</sup> /hr)
PX/PXD	45 scfm (72 nm <sup>3</sup> /hr)
PG/PGD/PEX PB/PBD/PBT	70 scfm (113 nm <sup>3</sup> /hr)
2PG/2PGD 2PB/2PBD/2PBT	85 scfm (137 nm <sup>3</sup> /hr)
PT/PH	225 scfm (362 nm <sup>3</sup> /hr)

Air line filters are recommended and should be installed to ensure clean, dry air is supplied to the pump or booster. Additionally, air line pressure regulators should be used to ensure the air drive pressure is not higher than is recommended or required.

## How the Air Drive Section Works

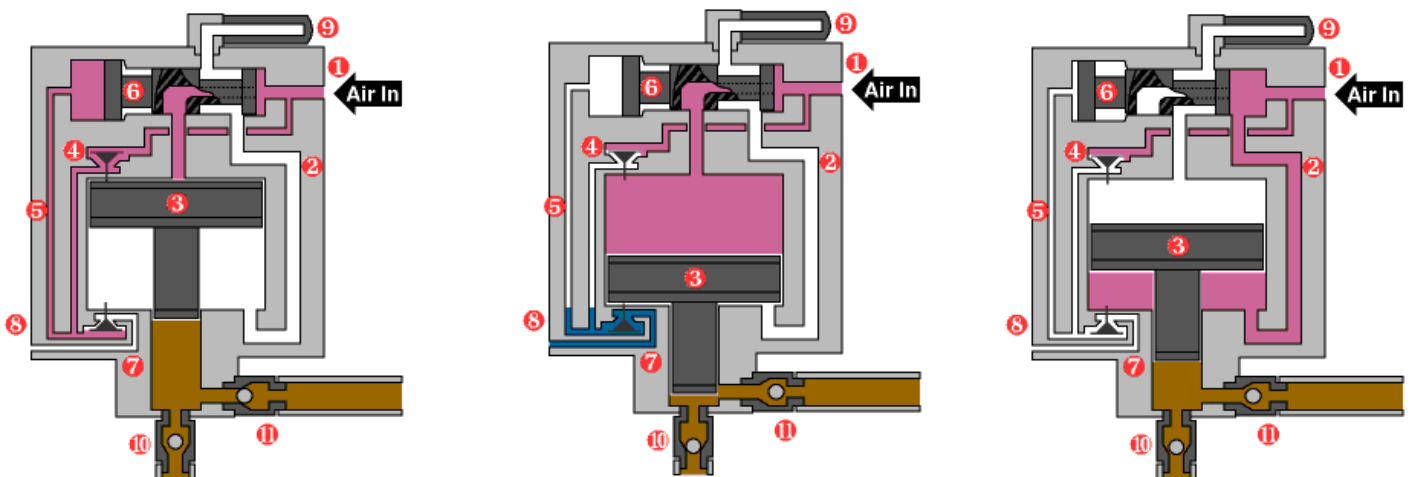
The air drive section consists of a light weight piston complete with seals running inside an aluminum barrel.

When compressed air is supplied to the pump, the air pushes the air piston (3) down on a compression stroke, which forces fluid out of the liquid end for Liquid Pumps; or gas out of the gas end for Gas Boosters and Air Amplifiers (11).

Under the control of pilot pins (7 & 4) triggered at each end of the stroke, the air is then diverted by way of a flow tube (2) to drive the air piston up on a suction stroke, which pulls fluid into the liquid end for Liquid Pumps; or gas into the gas end for Gas Boosters and Air Amplifiers (10).

The automatic cycling characteristics are enabled by use of an unbalanced, internally pilot operated spool (6) that directs the air through a 4-way cycling sleeve to either side of the air piston. The operation of the cycling spool is controlled by 2 pilot pins. The air is exhausted through the spool and then to atmosphere via the provided muffler (9).

The air drive section of the pump is pre-lubricated at assembly and as such, air line lubrication is neither required nor recommended.



## How the Gas Section Works (Gas Boosters)

The gas section of a ProTech air driven gas booster consists of 4 main pieces, the gas barrel, the piston, the check valves and the main high pressure seal. The gas piston is directly linked to the air piston and it is housed inside the gas barrel and its movement up and down creates the gas flow into and out of the booster through the check valves. The check valves are spring loaded and on the suction stroke the inlet check valve opens to the maximum allowing gas into the gas barrel and on the compression stroke the inlet check valve closes and the discharge check valve opens forcing the pumped gas into the process.

The main high pressure seal is located on the gas piston and they seal against the gas barrel during operation. There are different materials and designs of high pressure seals depending on the gas being pumped and the maximum pressures of the pump, however the standard PTFE seals are suitable for the vast majority of gases encountered.

Other materials of construction can be supplied to meet more aggressive services. The standard series of boosters are NOT suitable for underground coal mine applications. ProTech do manufacture models of air driven gas boosters that are suitable for underground coal mine applications, please enquire with our technical staff.

The gas booster cycles automatically. As the outlet pressure increases, the resistance also increases and the cycle rate decreases until the output pressure forces are equal and the pump stops automatically. This is referred to as the stall condition. The pump will restart with a slight drop in the outlet pressure or an increase in the air drive pressure. Booster performance can be affected by a number of conditions, such as freezing of the exhaust muffler or pilot valves (which is caused by moisture in air lines), inadequate inlet air line sizes and dirty filters. When operating the boosters on a continuous basis, we recommend you use a maximum cycle rate of 50-60 cycles per minute. This will both increase service intervals and assist in preventing ice forming at the exhaust. An air supply dryer will also assist in reducing icing up.

ProTech gas boosters have a 120mm stroke, which reduces cycle rates at any given flow and pressure when compared with most other brands. This lower respective cycle rate results in a reduction in freeze-up condition.

To obtain the best overall performance, do not reduce the indicated port sizes.

We offer complete technical and service support for all ProTech gas boosters.

## How the Hydraulic Section Works (Liquid Pumps)

The hydraulic section of a ProTech air driven liquid pump consists of 4 main pieces, the hydraulic body, the piston/plunger, the check valves and the main high pressure seal. The hydraulic piston/plunger is directly linked to the air piston and it is housed inside the hydraulic body and its movement up and down creates the liquid flow into and out of the pump through the check valves. The check valves are spring loaded and on the suction stroke the inlet check valve opens to the maximum allowing fluid into the hydraulic body and on the compression stroke the inlet check valve closes and the discharge check valve opens forcing the pumped fluid into the process.

The main high pressure seal is located within the hydraulic body and the piston/plunger seals against this during operation. There are different materials and designs of high pressure seals depending on the fluid being pumped and the maximum pressures of the pump, however the standard seals are suitable for both water and hydraulic fluid use. All wetted materials are of stainless steel and are suitable for water and hydraulic fluid applications in their standard form.

Other materials of construction can be supplied to meet more aggressive services. The standard series of pumps are NOT suitable for underground coal mine applications. ProTech do manufacture models of air driven liquid pumps that are suitable for underground coal mine applications including a range suitable for chemical injection, please enquire with our technical staff.

The liquid pump cycles automatically. As the outlet pressure increases, the resistance also increases and the cycle rate decreases until the output pressure forces are equal and the pump stops automatically. This is referred to as the stall condition. The pump will restart with a slight drop in the outlet pressure or an increase in the air drive pressure. Pump performance can be affected by a number of conditions, such as freezing of the exhaust muffler or pilot valves (which is caused by moisture in air lines), inadequate inlet air line sizes and dirty filters. When operating the pumps on a continuous basis, we recommend you use a maximum cycle rate of 50-60 cycles per minute. This will both increase service intervals and assist in preventing ice forming at the exhaust. An air supply dryer will also assist in reducing icing up.

ProTech pumps have an 80mm stroke, which reduces cycle rates at any given flow and pressure when compared with most other brands. This lower respective cycle rate results in a reduction in freeze-up condition.

To obtain best overall performance, do not reduce the indicated port sizes.

We offer complete technical and service support for all ProTech Liquid Pumps.

# Air Pressure Amplifiers



**Intrinsically safe** - no heat, sparks or flames produced

**No Contamination** - separation between gas and pneumatic seals

**No Lubrication Required** - on air/gas drive section

**Built-in Cooling of Gas Barrels** - available on most models

**Increased Life** - 120mm stroke reduces cycle rate

**Hazardous Area Suitability** - for most applications

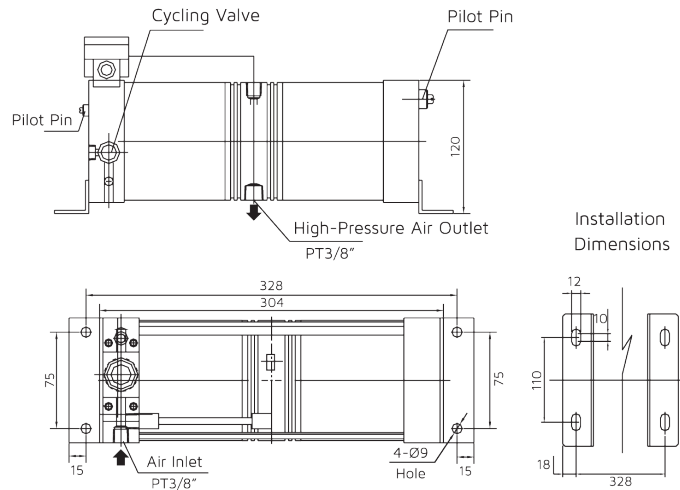
Buy online at [www.protechpumps.com](http://www.protechpumps.com)

## PA Series - Air Pressure Amplifiers

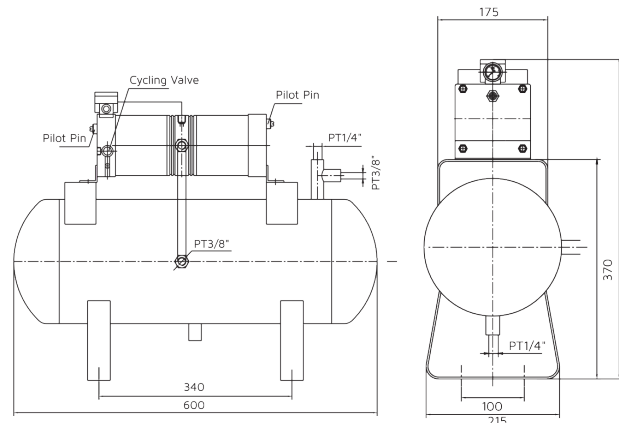
The ProTech Air Amplifier is designed to increase (boost) the drive air pressure that is applied to the unit within the scope of the nominal ratio of the particular model. Many machines require a supply pressure greater than the "plant" air supply and amplifiers offer a simple inexpensive solution. No airline lubrication is required for the air amplifier and its outlet pressure can be regulated with a simple air line pressure regulator.



PA2



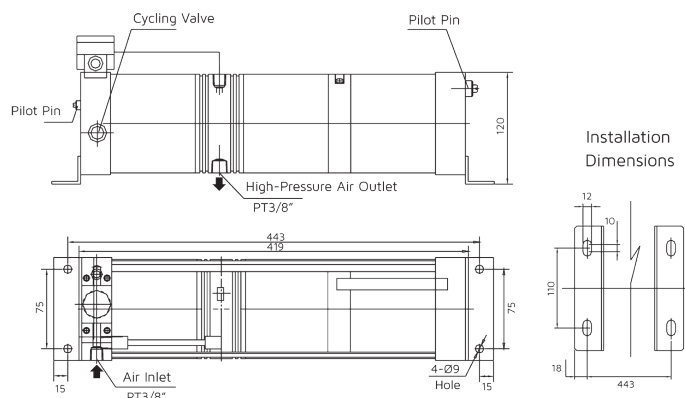
PA2-B



PA2-B model has a receiver mounted to the air amplifier to allow storage of the higher pressure air.



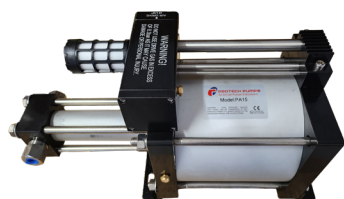
PA3



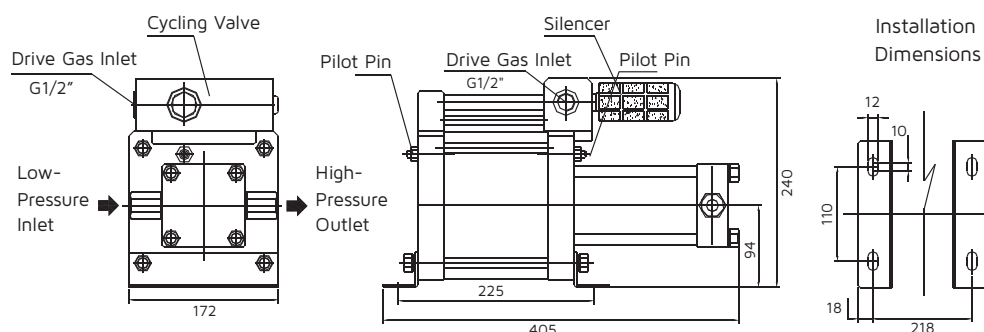
All dimensions are in mm unless otherwise stated.

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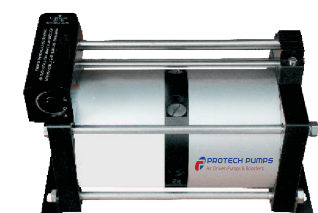
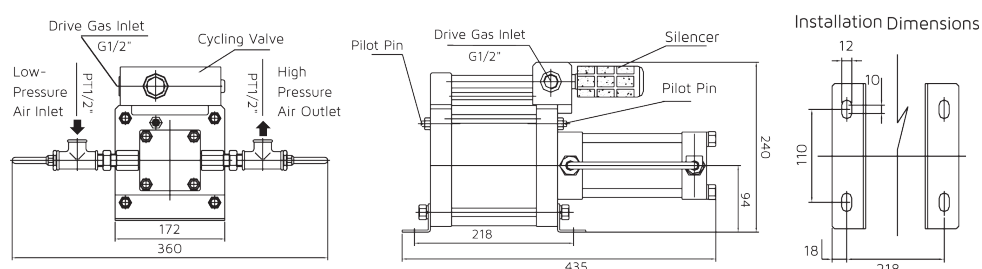
## PA Series - Air Pressure Amplifiers



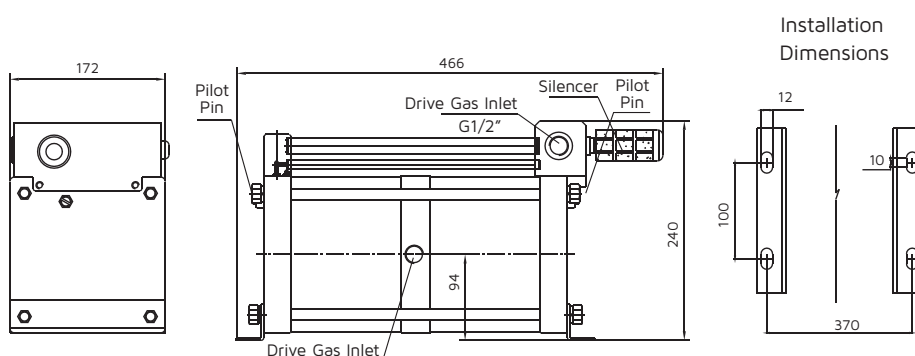
PA4 | PA7 | PA10 | PA15



PA5T | PA8T



4PA2



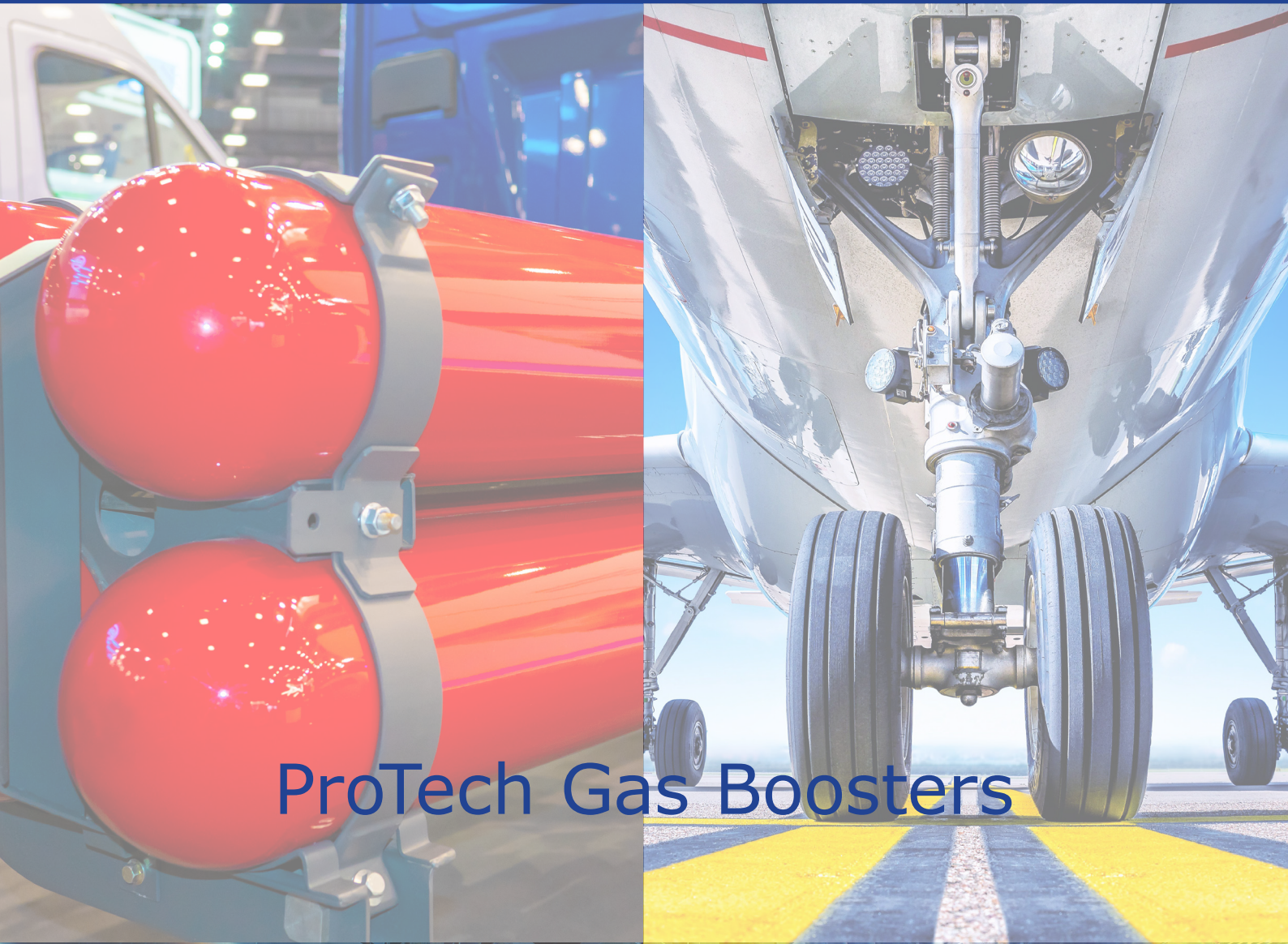
## PA Series Technical Data

Model	Actual Ratio	Displacement Per Cycle -cc	Minimum Gas Inlet Pressure (Pi) -Barg	Maximum Gas Outlet Pressure (Po) - Barg	Po Formula (where Pa=air drive pressure)	Gas Inlet	Gas Outlet	Flow (where Pa = 7 Bar) - NL/min
PA2	2:1	235.62	1	16	2Pa	NPT3/8"	NPT3/8"	513@ Pi=7
PA3	3:1	402.12	1	24	3Pa	NPT3/8"	NPT3/8"	420@ Pi=7
4PA2	2:1	1963.48	1	16	2Pa	NPT1/2"	NPT1/2"	1,450@ Pi=7
PA4	4:1	402.12	2	33	4Pa	NPT3/8"	NPT3/8"	382@ Pi=7
PA5T	5:1	321.70	2	41	4Pa+Pi	NPT1/2"	NPT1/2"	710@ Pi=7
PA7	7:1	229.78	4	58	7Pa	NPT3/8"	NPT3/8"	274@ Pi=7
PA8T	8:1	201.06	4	66	7Pa+Pi	NPT3/8"	NPT3/8"	482@ Pi=7
PA10	10:1	241.27	4	83	10Pa	NPT3/8"	NPT3/8"	225@ Pi=7
PA15	15:1	160.85	8	124	15Pa	NPT3/8"	NPT3/8"	185@ Pi=7

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

Buy online at [www.protechpumps.com](http://www.protechpumps.com)





## ProTech Gas Boosters



Buy online at [www.protechpumps.com](http://www.protechpumps.com)



# Gas Boosters

Our broad range of air driven gas boosters require no airline lubrication; have separation between the air drive supply and the gas being boosted, ensuring clean gas outlet flow; and are reliable and easy to maintain.



**Intrinsically safe** - no heat, sparks or flames produced

**No Contamination** - complete separation between gas and pneumatic seals

**No Lubrication Required** - on air/gas drive section

**Built-in Cooling of Gas Barrels** - available on most models

**Increased Life** - 120mm stroke reduces cycle rate

**Suitable for Hazardous Area** - for most applications and environments

**Suitable for Breathing and Diving Gases** - can be supplied "Oxygen Use Cleaned"

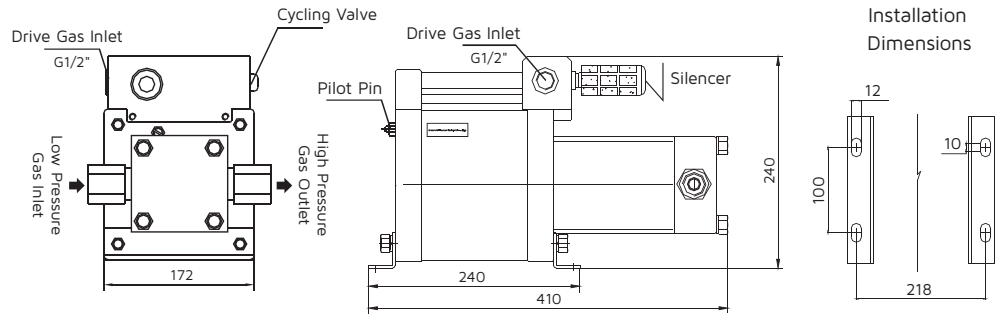
Buy online at [www.protechpumps.com](http://www.protechpumps.com)

## PB Series - Single Acting Single Stage Gas Boosters

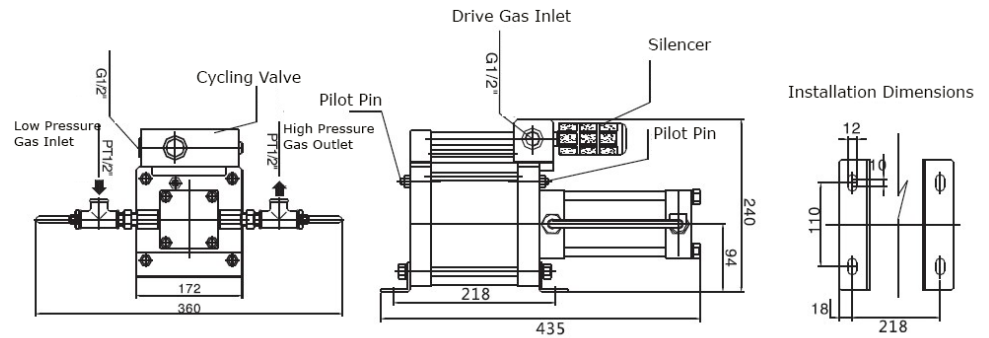
A flexible and efficient air-driven gas booster for delivering high-pressure gases. The PB Series offers a method of economically boosting pressures where flow rates and a high compression ratio are not key factors.



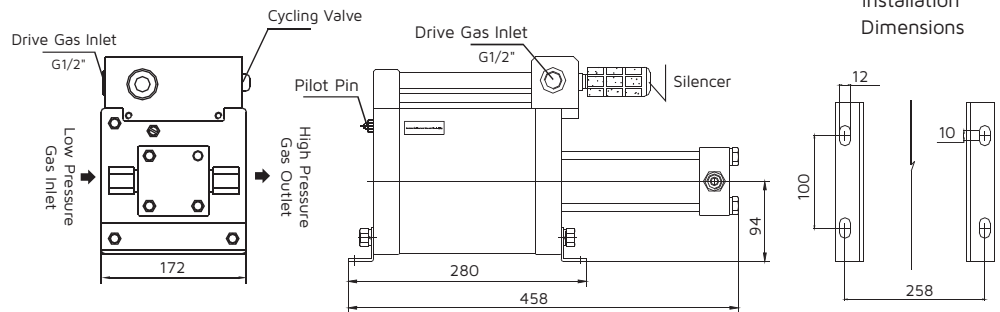
PB2T | PB4



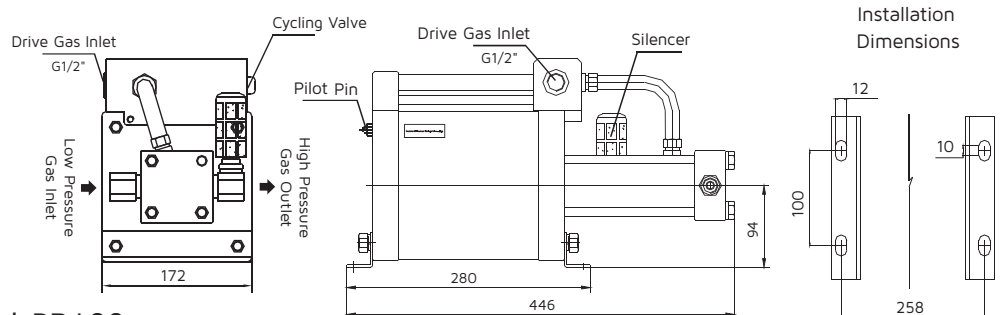
PB5T | PB8T



PB7 | PB10 | PB15



PB25 | PB30 | PB40 | PB60 | PB100



All dimensions are in mm unless otherwise stated.

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## PB Series - Single Acting Single Stage Gas Boosters

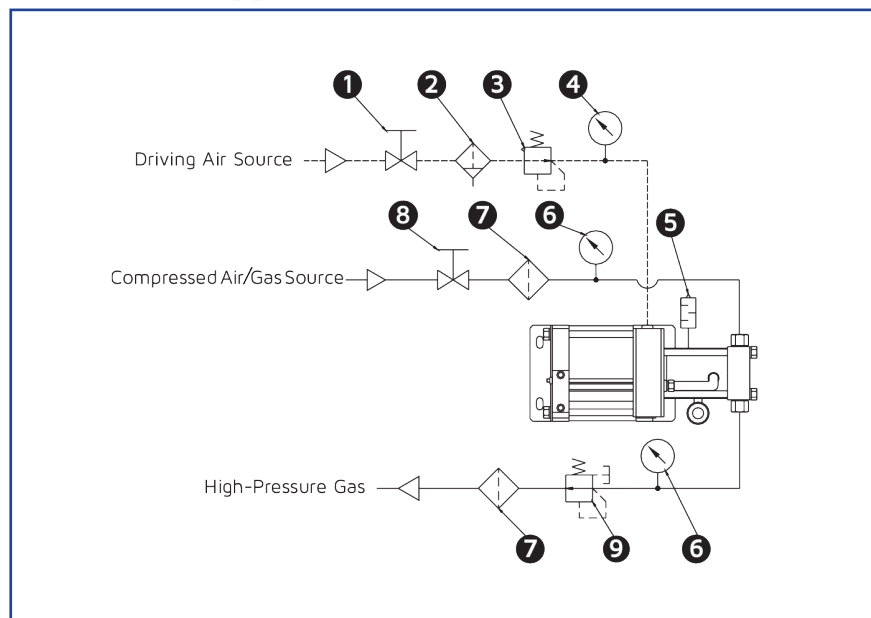
### PB Series Technical Data

Model	Actual Ratio	Displacement Per Cycle -cc	Minimum Gas Inlet Pressure ( <b>Pi</b> ) -Barg	Maximum Gas Outlet Pressure ( <b>Po</b> ) - Barg	<b>Po</b> Formula (where <b>Pa</b> =air drive pressure)	Gas Inlet	Gas Outlet	Flow (where <b>Pa</b> = 7 Barg) - NL/min
PB2T	2.5:1	804.24	0	16	2Pa	NPT1/2"	NPT1/2"	520@ $P_i=7$
PB4	4:1	402.12	2	33	4Pa	NPT1/2"	NPT1/2"	354@ $P_i=7$
PB5T	5:1	321.70	2	41	4Pa+ $P_i$	NPT1/2"	NPT1/2"	572@ $P_i=7$
PB7	7:1	344.67	4	58	7Pa	NPT3/8"	NPT3/8"	252@ $P_i=7$
PB8T	8:1	201.06	4	66	7Pa+ $P_i$	NPT3/8"	NPT3/8"	362@ $P_i=7$
PB10	10:1	241.27	7	83	10Pa	NPT3/8"	NPT3/8"	196@ $P_i=7$
PB15	15:1	160.85	8	124	15Pa	NPT3/8"	NPT3/8"	164@ $P_i=10$
PB25	25:1	96.51	15	207	25Pa	NPT1/4"	NPT1/4"	114@ $P_i=20$
PB30	30:1	80.42	18	265	32Pa	NPT1/4"	NPT1/4"	91@ $P_i=20$
PB40	40:1	60.32	25	332	40Pa	NPT1/4"	NPT1/4"	156@ $P_i=40$
PB60	60:1	40.21	32	498	60Pa	NPT1/4"	NPT1/4"	112@ $P_i=40$
PB75	75:1	32.17	32	622	75Pa	NPT1/4"	NPT1/4"	86@ $P_i=40$
PB100	100:1	24.13	40	830	100Pa	NPT1/4"	HF4	65@ $P_i=40$

Type T is able to be turned into double acting or two stage units.

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

### PB Series Typical Installation Circuit Drawing



#### Index

- ① Air Drive Isolation
- ② Air Filter
- ③ Pressure Regulator
- ④ Air Gauge
- ⑤ Exhaust Silencer
- ⑥ Gas Gauge
- ⑦ Gas Filter
- ⑧ Gas Inlet Isolation
- ⑨ Pressure Safety Valve

Optional extras such as HP release (vent) valve, HP pressure isolation valve, HP gas filter, air/gas pilot switches (APS) for auto stop/start purposes and other accessories can be included in our design and supply to accommodate your precise needs.

Details of the inclusions in our standard Propak Gas Booster Systems can be found on page 41.

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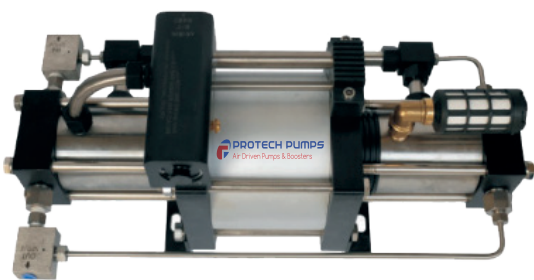
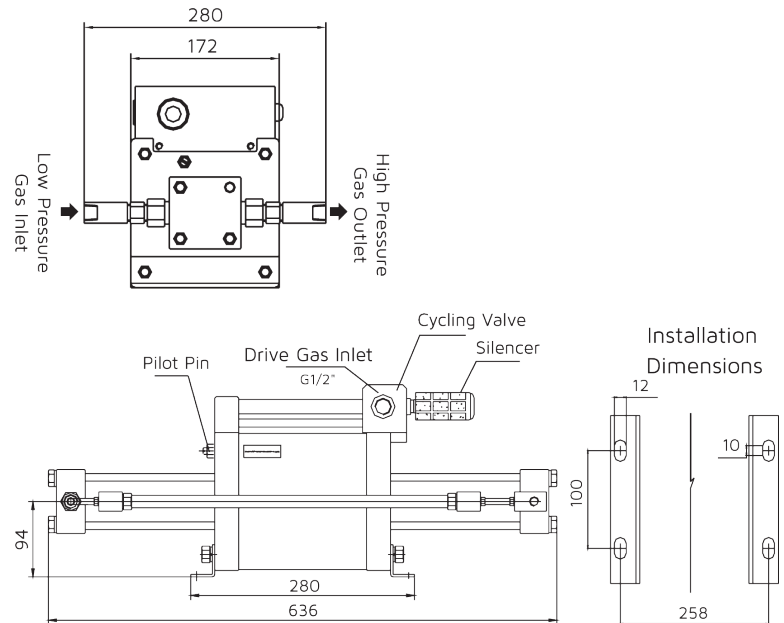
## PBD Series - Double Acting Single Stage Gas Boosters

The ProTech Double Acting Gas Booster is twice as efficient as the single acting unit because it delivers gas flow in both directions of the air drive reciprocating motor.

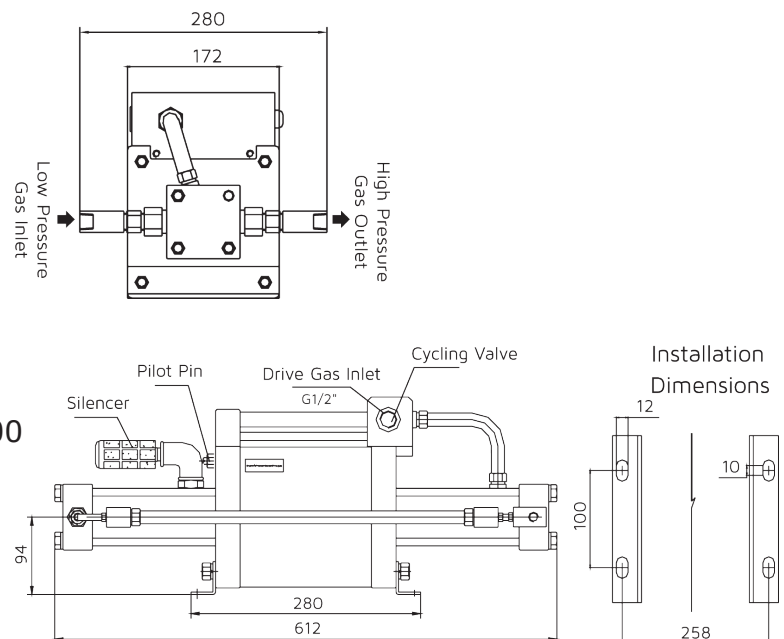
All the benefits of the single acting booster, including barrel cooling and no requirements for airline lubrication, can be found in the double acting models.



PBD7 | PBD10 | PBD15



PBD25 | PBD30 | PBD40 | PBD60 | PBD100



All dimensions are in mm unless otherwise stated.

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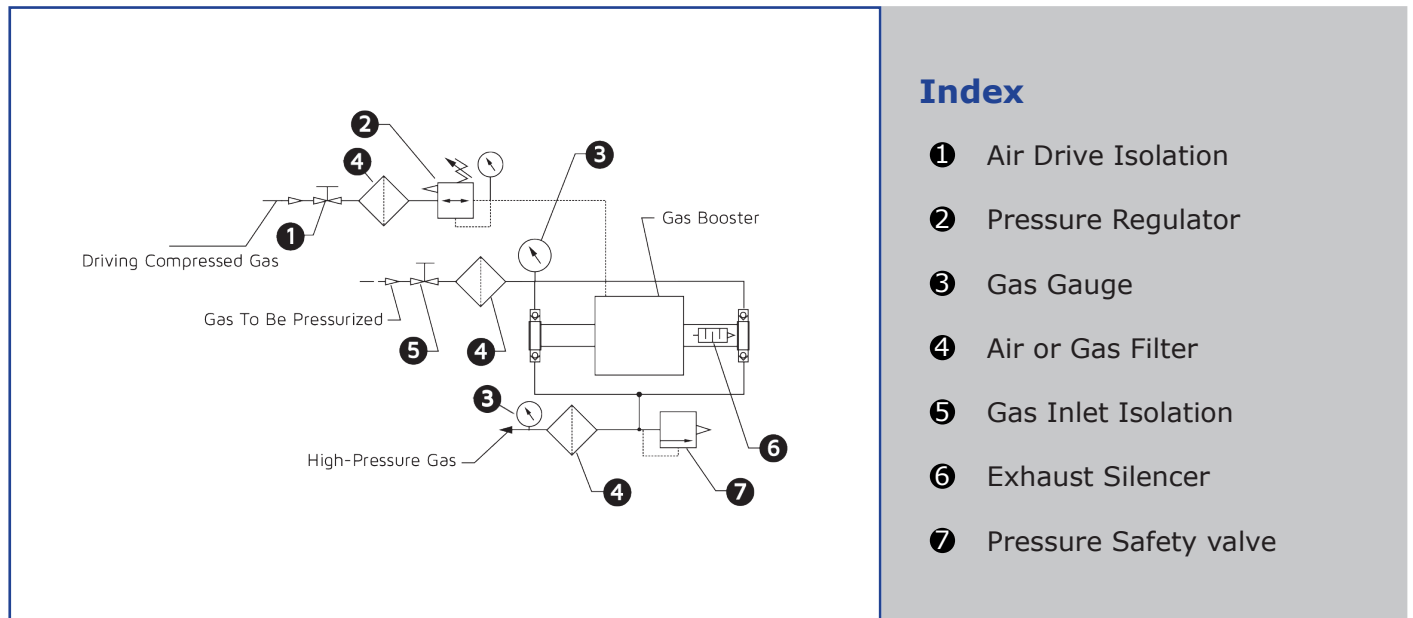
## PBD Series - Double Acting Single Stage Gas Boosters

### PBD Series Technical Data

Model	Actual Ratio	Displacement Per Cycle -cc	Minimum Gas Inlet Pressure ( <b>Pi</b> ) -Barg	Maximum Gas Outlet Pressure ( <b>Po</b> ) - Barg	<b>Po</b> Formula (where <b>Pa</b> =air drive pressure)	Gas Inlet	Gas Outlet	Flow (where <b>Pa</b> = 7 Barg) - NL/min
PBD7	7:1	689.35	4	66	$7Pa + P_i$	NPT3/8"	NPT3/8"	392@ $P_i=7$
PBD10	10:1	482.54	7	83	$10Pa + P_i$	NPT3/8"	NPT3/8"	352@ $P_i=7$
PBD15	15:1	321.70	8	124	$15Pa + P_i$	NPT3/8"	NPT3/8"	289@ $P_i=10$
PBD25	25:1	193.02	15	207	$25Pa + P_i$	NPT1/4"	NPT1/4"	186@ $P_i=20$
PBD30	30:1	160.85	18	265	$32Pa + P_i$	NPT1/4"	NPT1/4"	165@ $P_i=20$
PBD40	40:1	120.64	25	332	$40Pa + P_i$	NPT1/4"	NPT1/4"	273@ $P_i=40$
PBD60	60:1	80.42	32	498	$60Pa + P_i$	NPT1/4"	NPT1/4"	175@ $P_i=40$
PBD100	100:1	48.25	40	830	$100Pa + P_i$	NPT1/4"	NPT1/4"	136@ $P_i=60$

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

### PBD Series Typical Installation Circuit Drawing

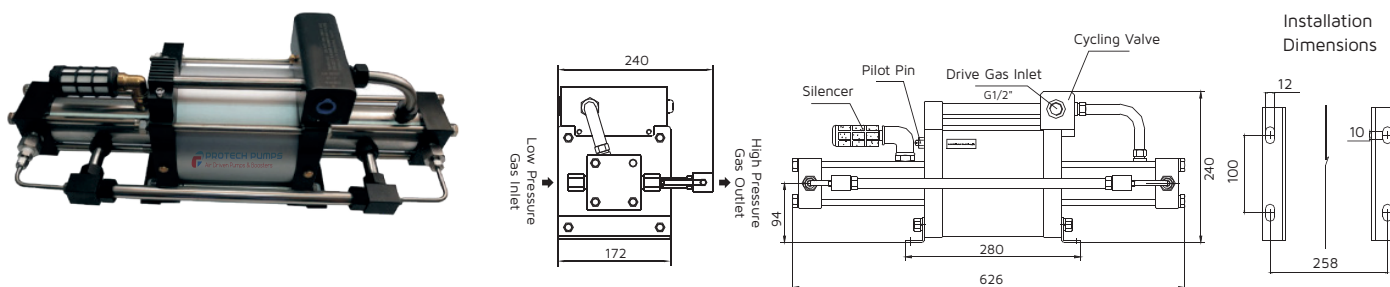


Optional extras such as HP release (vent) valve, HP pressure isolation valve, HP gas filter, air/gas pilot switches (APS) for auto stop/start purposes and other accessories can be included in our design and supply to accommodate your precise needs.

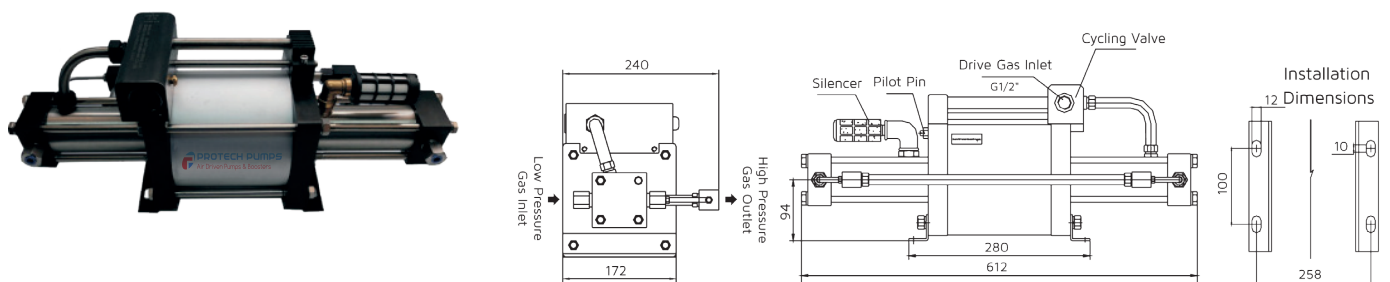
Details of the inclusions in our standard Propak Gas Booster Systems can be found on page 41.

## PBT Series - Two Stage Gas Boosters

The ProTech Two Stage Gas Booster is an efficient booster that allows gas to be boosted to higher compression ratios (and usually higher outlet gas pressures) than the single stage boosters. Although best practice suggests the use of boosters with the lowest nominal ratios, ProTech two stage boosters can effectively and efficiently boost pressure up to 36 times the inlet gas pressure. In addition to all the benefits of single stage gas boosters, the two stage gas booster utilises an intercooler between gas stages.



PBT7/15 | PBT7/30 | PBT15/30 | PBT15/40 | PBT15/60 | PBT15/100



PBT30/60 | PBT30/100

## PBT Series Technical Data

Model	Actual Ratio	Displacement Per Cycle -cc	Minimum Gas Inlet Pressure ( <b>Pi</b> ) -Barg	Maximum Gas Outlet Pressure ( <b>Po</b> ) - Barg	<b>Po</b> Formula (where <b>Pa</b> =air drive pressure)	Gas Inlet	Gas Outlet	Flow (where <b>Pa</b> = 7 Barg) - NL/min
PBT7/15	15:1	344.67	4 (12*)	124	$15P_a + 2P_i$	NPT3/8"	NPT3/8"	215@ $P_i=7$
PBT7/30	30:1	344.67	4 (14*)	249	$32P_a + 4P_i$	NPT3/8"	NPT1/4"	118@ $P_i=7$
PBT15/30	30:1	160.85	7 (63*)	249	$32P_a + 2P_i$	NPT3/8"	NPT1/4"	156@ $P_i=10$
PBT15/40	40:1	160.85	7 (68*)	332	$40P_a + 2.5P_i$	NPT3/8"	NPT1/4"	125@ $P_i=10$
PBT15/60	60:1	160.85	7 (25*)	498	$60P_a + 4P_i$	NPT3/8"	NPT1/4"	92@ $P_i=10$
PBT30/60	60:1	80.42	30 (48*)	498	$60P_a + 2P_i$	NPT1/4"	NPT1/4"	245@ $P_i=40$
PBT30/100	100:1	80.42	30 (165*)	830	$100P_a + 3P_i$	NPT1/4"	NPT1/4"	192@ $P_i=40$

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

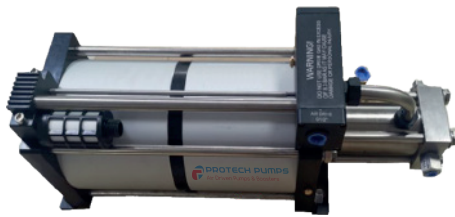
\* The maximum gas inlet pressure to avoid inter-stage stall. Full outlet pressure can pass through the booster.

All dimensions are in mm unless otherwise stated.

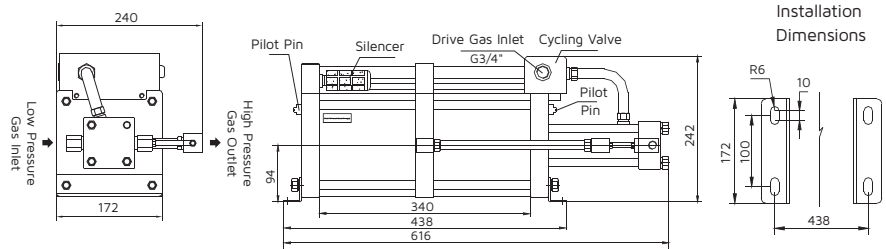
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## 2PB Series - Single Acting Single Stage Double Air Drive Gas Boosters

The 2PB Series offers the same economical pressure boosting as the PB Series, but with a greater flow capability. As with the PB Series, the 2PB Series are single stage, so are limited to effectively boosting inlet gas pressures to around 6 times the gas supply pressure (referred to as the 6:1 Compression Ratio).



2PB130 | 2PB200



### 2PB Series Technical Data

Model	Actual Ratio	Displacement Per Cycle -cc	Minimum Gas Inlet Pressure ( <b>Pi</b> ) -Barg	Maximum Gas Outlet Pressure ( <b>Po</b> ) - Barg	<b>Po</b> Formula (where <b>Pa</b> =air drive) pressure)	Gas Inlet	Gas Outlet	Flow (where <b>Pa</b> = 7 Barg) - NL/min
2PB150	150:1	32.17	60	1245	150Pa	NPT1/4"	※HF4	132@ Pi=100
2PB200	200:1	24.13	80	1660	200Pa	NPT1/4"	※HF4	95@ Pi=100

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

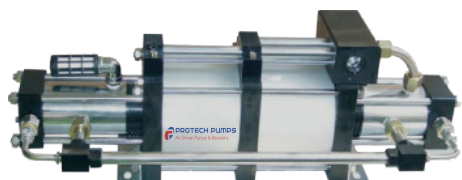
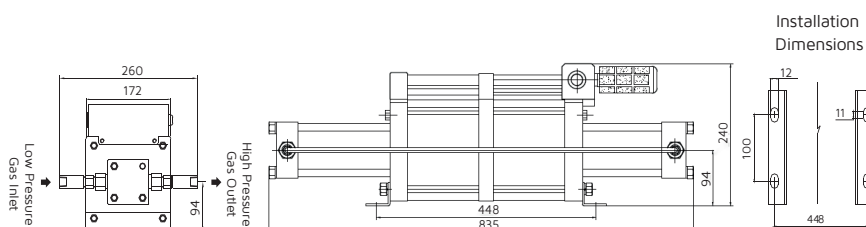


## 2PBD Series - Double Acting Single Stage Double Air Drive Gas Boosters

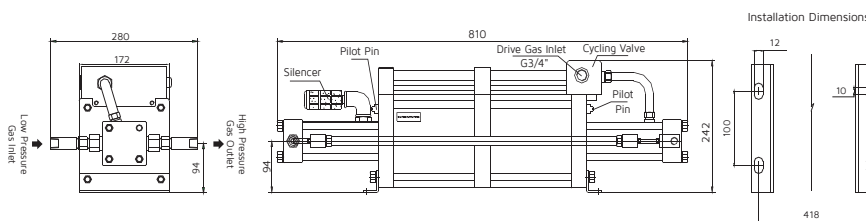
The ProTech 2PBD series gas booster pump is a double air drive, single stage gas booster pump. The series has two driving air pistons, with a diameter of 160mm, effectively doubling the area ratio from standard PBD series gas boosters. The 2PBD series gas boosters are primarily used in high-pressure gas filling, and pressure maintenance. E.g. high pressure nitrogen plastics moulding, CO<sub>2</sub>, wire cables, foams and pressure testing.



2PBD7 | 2PBD15



2PBD30 | 2PBD50 | 2PBD60 | 2PBD80 | 2PBD130 | 2PBD200



### 2PBD Series Technical Data

Model	Actual Ratio	Displacement Per Cycle -cc	Minimum Gas Inlet Pressure ( <b>Pi</b> ) -Barg	Maximum Gas Outlet Pressure ( <b>Po</b> ) - Barg	<b>Po</b> Formula (where <b>Pa</b> =air drive pressure)	Gas Inlet	Gas Outlet	Flow (where <b>Pa</b> = 7 Barg) - NL/min
2PBD7	8:1	1378.70	4	66	8Pa+Pi	NPT3/8"	NPT3/8"	774@ Pi=7
2PBD15	15:1	643.39	4	99	15Pa+Pi	NPT3/8"	NPT3/8"	614@ Pi=7
2PBD30	30:1	321.70	8	265	30Pa+Pi	NPT3/8"	NPT3/8"	530@ Pi=10
2PBD50	50:1	193.02	25	415	50Pa+Pi	NPT3/8"	NPT3/8"	353@ Pi=25
2PBD60	65:1	160.85	25	539	65Pa+Pi	NPT3/8"	NPT3/8"	327@ Pi=25
2PBD80	82:1	120.64	40	680	82Pa+Pi	NPT1/4"	NPT1/4"	385@ Pi=40
2PBD150	150:1	64.34	60	1245	150Pa+Pi	NPT1/4"	※HF4	297@ Pi=100
2PBD200	200:1	48.25	80	1660	200Pa+Pi	NPT1/4"	※HF4	187@ Pi=100

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

All dimensions are in mm unless otherwise stated.

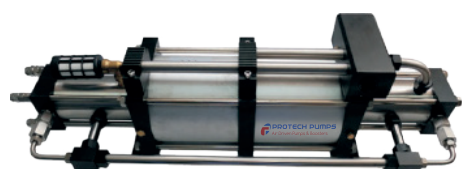
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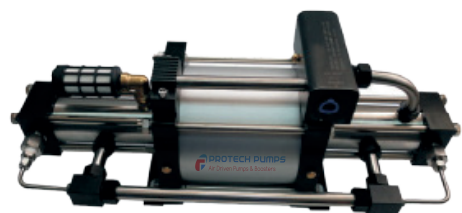
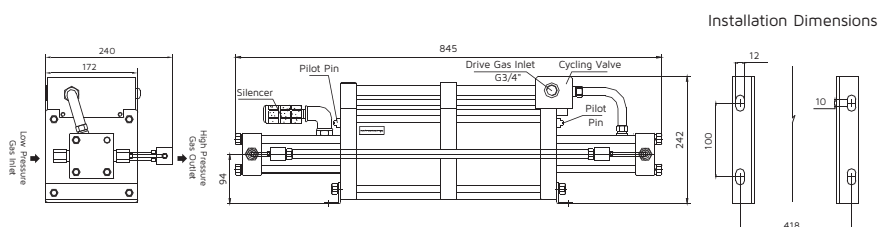
## 2PBT Series - Two Stage Double Air Drive Gas Boosters

The ProTech Two Stage Double Air Drive Gas Boosters are two stage units with two air drives connected in series thus, effectively, doubling the area ratio between the low pressure air drive and the higher outlet pressure gas pistons. This allows for even higher gas outlet pressures although the overall Compression Ratio of 36:1 is best not exceeded, for efficiency reasons.

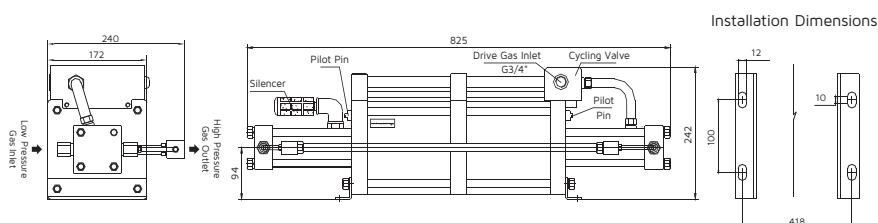
The double air drive boosters have all the benefits and features of the single acting two stage booster.



2PBT7/15 | 2PBT7/30



2PBT15/30 | 2PBT15/60 | 2PBT30/60 | 2PBT30/130 | 2PBT60/200



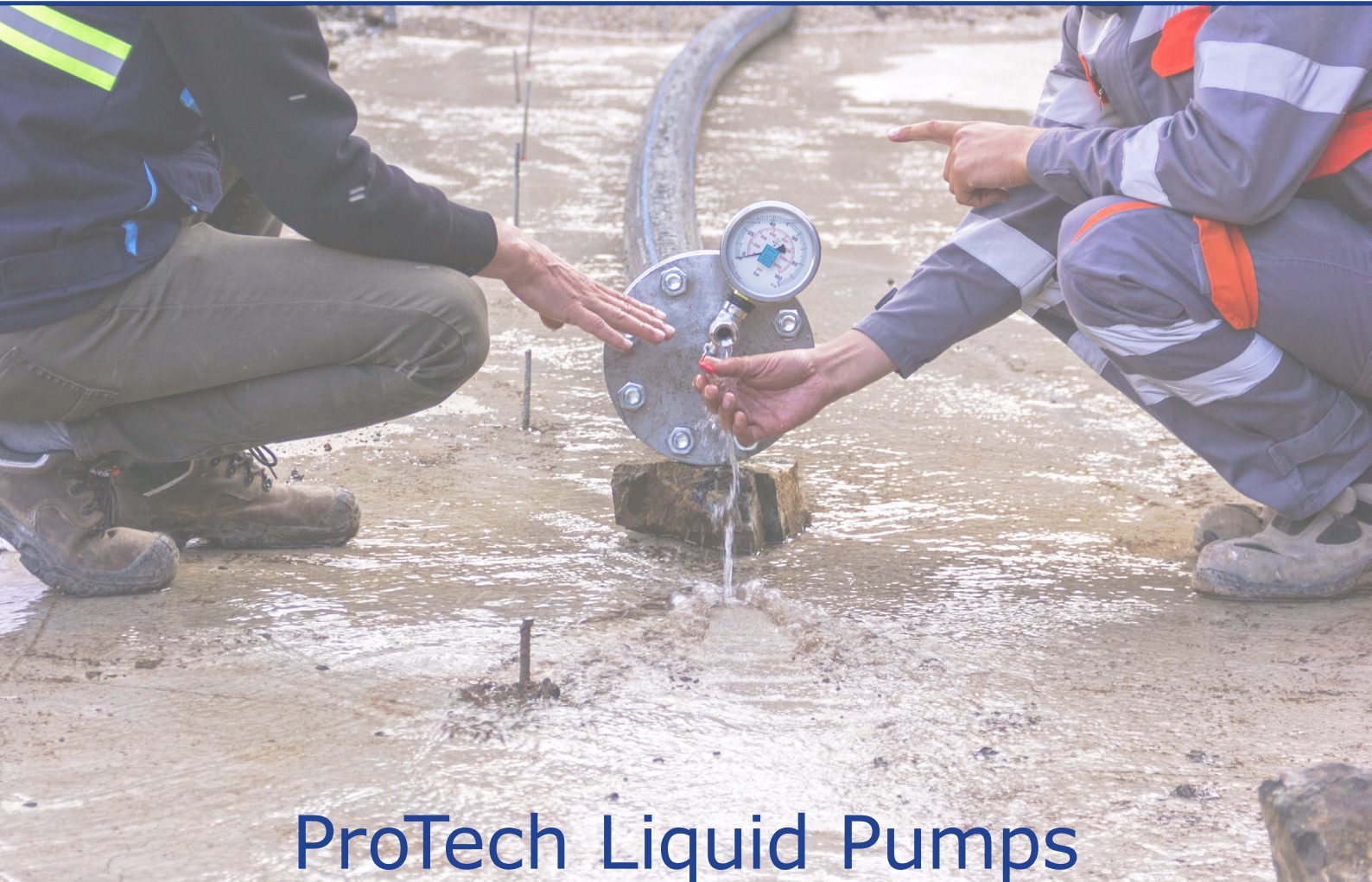
### 2PBT Series Technical Data

Model	Actual Ratio	Displacement Per Cycle -cc	Minimum Gas Inlet Pressure (Pi) -Barg	Maximum Gas Outlet Pressure (Po) - Barg	Po Formula (where Pa=air drive pressure)	Gas Inlet	Gas Outlet	Flow (where Pa = 7 Bar) - NL/min
2PBT7/15	15:1	689.35	4 (12*)	124	15Pa+2Pi	NPT3/8"	NPT3/8"	390@Pi=10
2PBT7/30	30:1	689.35	4 (14*)	309	32Pa+4Pi	NPT3/8"	NPT3/8"	
2PBT15/30	30:1	321.70	7 (63*)	332	32Pa+2Pi	NPT3/8"	NPT3/8"	286@Pi=10
2PBT15/60	65:1	321.70	7 (25*)	498	65Pa+4Pi	NPT3/8"	NPT3/8"	165@Pi=10
2PBT30/60	65:1	160.85	30 (48*)	498	65Pa+2Pi	NPT3/8"	NPT3/8"	455@Pi=40
2PBT80/150	150:1	60.32	45 (*)	1245	150Pa+4Pi	NPT1/4"	※HF4	146@Pi=40
2PBT80/200	200:1	80.42	60 (*)	1660	200Pa+3Pi	NPT1/4"	※HF4	70@Pi=40

The maximum acceptable air drive pressure (Pa) is 8.3 Barg.

\* The minimum gas inlet pressure to avoid inter-stage stall. Full outlet pressure can pass through the booster.





## ProTech Liquid Pumps

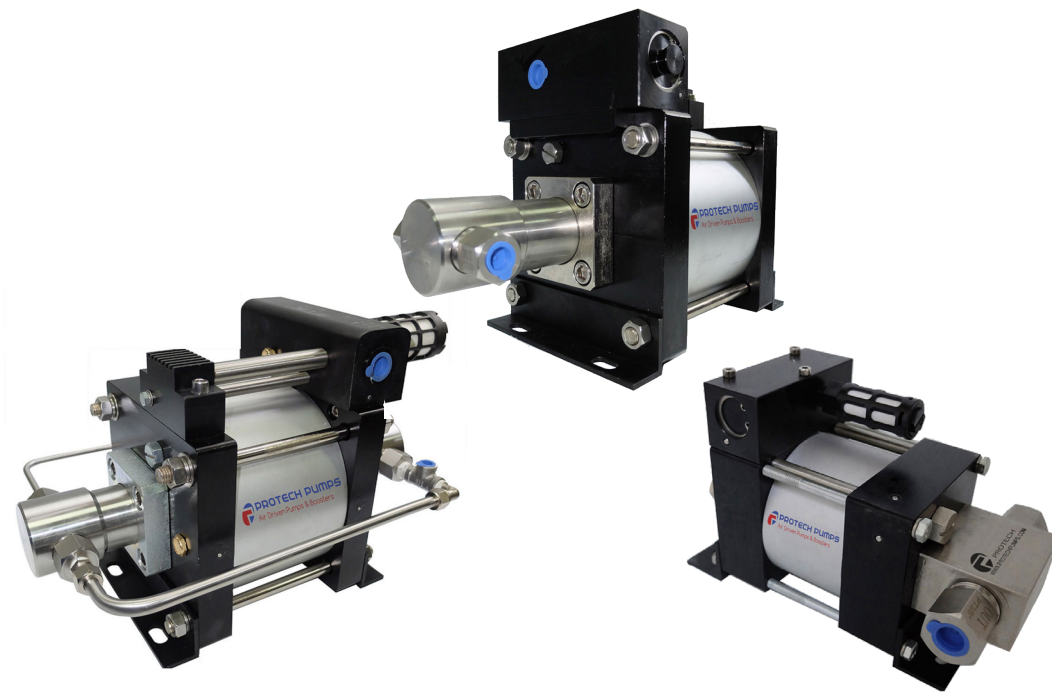


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# Air Driven Liquid Pumps

Our broad range of air driven liquid pumps require no airline lubrication; are reliable and easy to maintain and can achieve pressure to 6,640 barg.



**Intrinsically safe** - no heat, sparks or flames produced

**No Contamination** - complete separation between driving gas and compressed liquids

**No Lubrication Required** - on air/gas drive section

**High Fluid Compatibility** - hydraulic oil, water and corrosive gasses and liquids

**Start & Stop Against Load** - stall occurs when pressure balance is achieved

**Driven with Air or other Gases** - including nitrogen, CO<sub>2</sub> and natural gas

**Suitable for Hazardous Area** - with models for underground coal mines and offshore

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## Applications for ProTech Air Driven Liquid Pumps

First and foremost, it is paramount to consider the inherent advantages of ProTech air driven liquid pumps. These are:

- No requirement for electricity and can be driven by any inert gas.
- Can be stalled and started on full load indefinitely without heat build-up or power usage.
- Stay cool when working hard due to drive air expansion at the exhaust.
- These advantages make Protech air driven liquid pumps excellent Pressure Test Pumps in that they can sustain high pressures indefinitely.

Models fitted with liquid end pistons, rather than plungers, can efficiently pump gaseous liquids (G liquids) such as refrigerant and fire-fighting media and can achieve a high level of vacuum (negative) pressure.

Plunger models can achieve and hold very high liquid (hydraulic) pressures.

### Industries that have Pressure Testing Applications:

- Diving Industry with requirements for certifying Divers' Air Bottles and equipment.
- LPG/CNG Industry with requirements for certifying storage bottles, tanks and associated equipment.
- Fire Fighting Industry with requirements to certify extinguishers and associated equipment.
- Industrial Gas Manufacturers and Suppliers with requirements to certify gas storage bottles, tanks and associated pipework and equipment.
- Manufacturers of Pressure Vessels that require certification and testing.
- Installers of Oil and Gas Pipelines that require testing and certification prior to use.
- Manufacturers of Tubes, Pipes and Fittings.
- Manufacturers and Suppliers of Hydraulic (and other types) Hoses.
- Defence Industries

### Industries that have Fluid Transfer Applications:

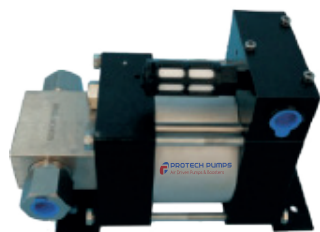
- Fire Fighting Industry with the filling of extinguishers with CO<sub>2</sub>.
- Refrigeration and Air-Conditioning Industry with the evacuating and re-filling of refrigerant systems.
- Defence Industries.

### Other Applications:

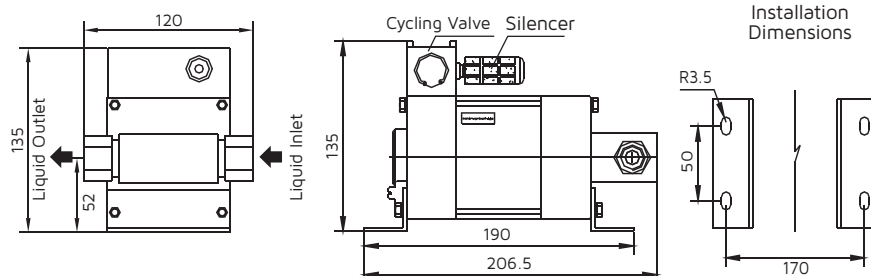
- Fluid Power applications where a non-electric high pressure hydraulic source is required.
- High and very high applications for hydraulic and isostatic presses.
- Off-shore Oil and Gas Platforms for an emergency non-electric high pressure hydraulic source is required.
- To pump fluids in Hazardous Areas.
- To pump Hazardous Fluids.
- For supplying hydraulic pressure for many kinds of in-field jacking applications.
- Supplying Dust Suppressant Fluids in Open and Underground Mining
- As Chemical Injection Pumps for Upstream Oil and Gas Gathering Systems.
- As Chemical Injection Pumps in Downstream Oil and Gas Plants.

## PM Series- 80mm Single Acting Liquid Pumps

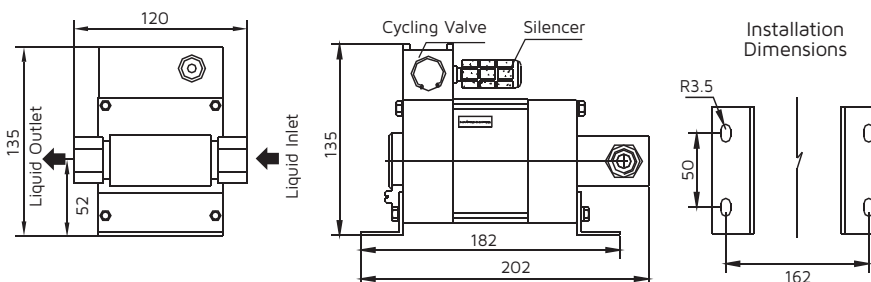
The smallest of the ProTech Air Driven Liquid Pumps, the PM Series, can fit in your hand. Despite this it is available with nominal ratios up to 125:1 thus making it an ideal pump for pressure testing to very high pressures where the volume of test fluid is low.



PM6



PM9 | PM15 | PM22 | PM40 | PM60 | PM100 | PM125



### PM Series Technical Data

Model	Piston/ Rod Diameter -mm	Flow per Cycle -cc	Liquid Inlet -NPT	Liquid Outlet -NPT	Maximum Output Pressure @ Drive 8.3 -Barg	Output Fluid Pressure (Barg)    1 Barg=0.1 Mpa=1.019 Kg/cm²													
						0	25	50	75	100	150	175	200	250	300	350	400	700	
						Flow Rate/Minute (L/min)													
PM6	30	21.21	3/8"	3/8"	58.1	6.36	2.97	0.85											
PM9	25	15.08	3/8"	3/8"	83	4.42	3.83	1.62	0.59										
PM15	20	9.43	3/8"	3/8"	132.8	2.83	2.45	2.07	1.41	0.57									
PM22	16	6.03	3/8"	3/8"	207.5	1.81	1.57	1.33	0.90	0.72	0.60	0.42	0.12						
PM40	12	3.35	3/8"	3/8"	373.5	1.02	0.88	0.85	0.81	0.78	0.75	0.68	0.51	0.31	0.27	0.14			
PM60	10	2.36	3/8"	1/4"	531.2	0.71	0.61	0.59	0.57	0.54	0.52	0.49	0.47	0.45	0.38	0.19	0.09		
PM100	8	1.51	1/4"	1/4"	830	0.45	0.39	0.38	0.36	0.35	0.33	0.32	0.31	0.30	0.29	0.27	0.23	0.00	
PM125	7	1.15	1/4"	1/4"	1079	0.35	0.30	0.29	0.28	0.26	0.25	0.24	0.23	0.22	0.21	0.20	0.17	0.12	

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

All dimensions are in mm unless otherwise stated.

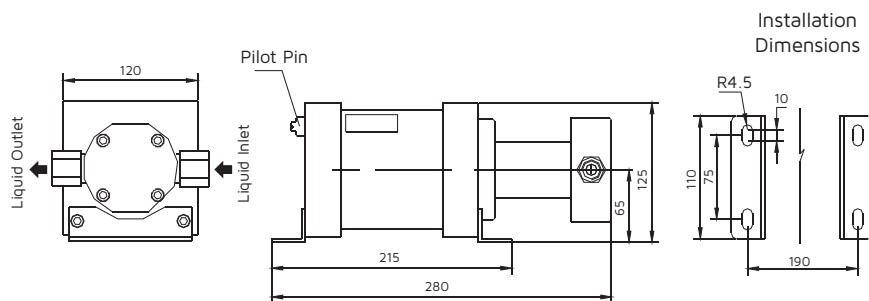
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## PX Series - 100mm Single Acting Liquid Pumps

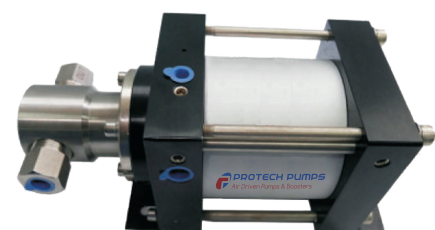
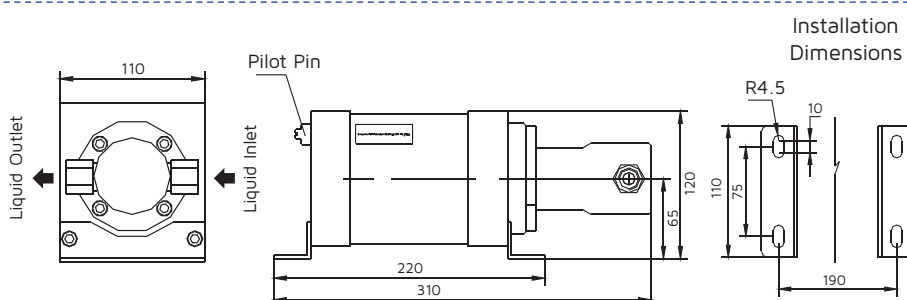
The PX series pump is a medium sized unit, offering the next step up in flows from those available in the PM series. These units are inexpensive and simple to apply and are a popular choice for pressure testing and work-holding applications.



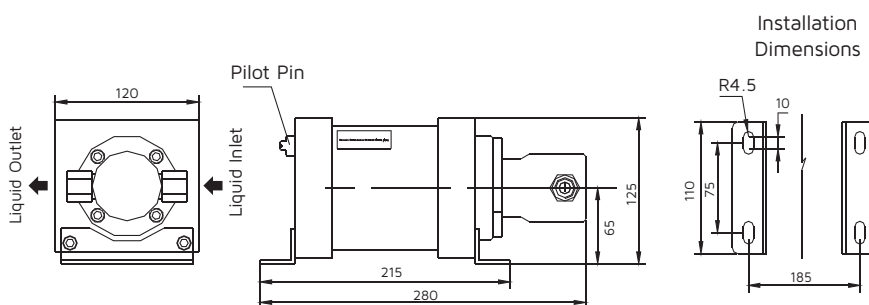
PX1.5 | PX3 | PX5



PX9 | PX15 | PX22 | PX36



PX60 | PX100 | PX120 | PX150



### PX Series Technical Data

Model	Piston/ Rod Diameter -mm	Flow per Cycle -cc	Liquid Inlet -NPT	Liquid Outlet -NPT	Maximum Output Pressure@ Drive 8.3 -Barg	Output Fluid Pressure (Barg) 1 Barg=0.1 Mpa=1.019 Kg/cm <sup>2</sup>												
						0	25	50	75	100	150	175	200	250	300	350	400	700
						Flow Rate/Minute (L/min)												
PX1.5	63	187.03	3/8"	3/8"	20.7	33.67												
PX3	50	117.81	3/8"	3/8"	33.2	28.27	16.49											
PX5	40	75.40	3/8"	3/8"	49.6	18.1	12.82	0.00										
PX9	30	42.41	3/8"	3/8"	83.0	10.18	8.48	6.36	2.12									
PX15	25	29.45	3/8"	3/8"	132.8	7.07	6.48	5.89	4.42	3.53								
PX22	20	18.85	3/8"	3/8"	207.5	4.52	4.15	3.77	3.39	3.02	2.64	1.89						
PX36	16	12.06	3/8"	3/8"	373.5	2.89	2.65	2.41	2.17	1.93	1.69	1.45	1.33	1.21				
PX60	12	6.79	3/8"	3/8"	531.2	1.63	1.49	1.36	1.29	1.22	1.15	1.09	1.02	0.95	0.88	0.81	0.34	
PX100	10	4.71	3/8"	3/8"	830	1.13	1.08	1.04	0.99	0.89	0.85	0.80	0.75	0.71	0.66	0.61	0.57	0.00
PX120	9	3.82	1/4"	1/4"	1079	0.92	0.88	0.84	0.80	0.73	0.69	0.65	0.61	0.57	0.53	0.50	0.46	0.31
PX150	8	3.02	1/4"	1/4"	1294	0.72	0.69	0.66	0.63	0.57	0.54	0.51	0.48	0.45	0.42	0.39	0.36	0.33

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

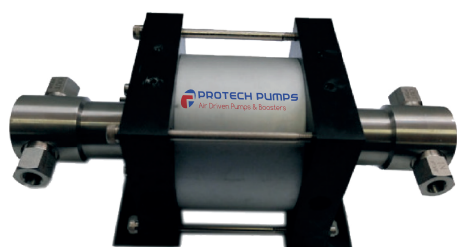
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## PXD Series - 100mm Double Acting Liquid Pumps

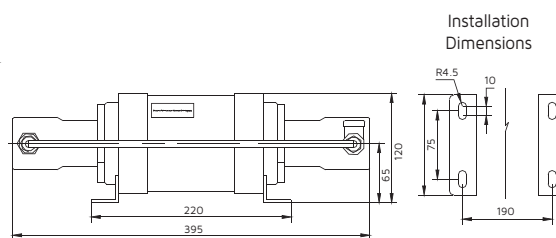
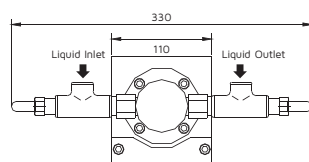
The ProTech PXD Air Driven Pump is a medium sized unit that uses a 100 mm diameter double acting air drive with a liquid end connected to each end of the air drive. Due to the two liquid ends, the pump is double acting and delivers high pressure liquid outlet on both strokes of the reciprocating air drive. This makes the PXD series almost twice as efficient as the PX series.

These pumps can be supplied with interconnecting tubing that connects both liquid inlets to a common port and both liquid outlets to a common port making for a simple installation.

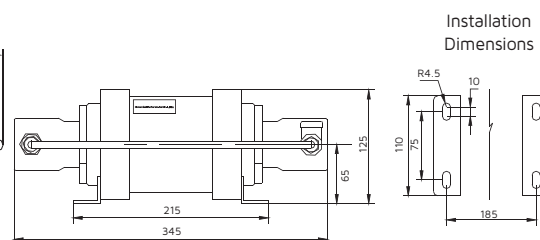
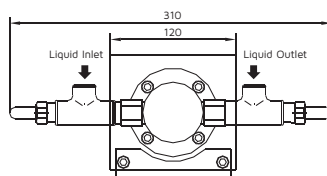
PXD pumps are generally used when more flow is required than that delivered by it corresponding PX unit.



PXD9 | PXD15 | PXD22 | PXD36



PXD60 | PXD100 | PXD120 | PXD150



### PXD Series Technical Data

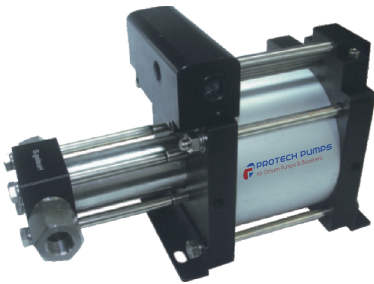
Model	Piston/ Rod Diameter -mm	Flow per Cycle -cc	Liquid Inlet -NPT	Liquid Outlet -NPT	Maximum Output Pressure @ Drive 8.3 -Bar	Output Fluid Pressure (Barg)    1 Barg=0.1 Mpa=1.019 Kg/cm²													
						0	25	50	75	100	150	175	200	250	300	350	400	700	
						Flow Rate/Minute (L/min)													
PXD9	30	56.55	3/8"	3/8"	83	13.57	11.31	8.48	2.83										
PXD15	25	54.00	3/8"	3/8"	132.8	12.96	11.88	10.80	8.10	6.48									
PXD22	20	34.56	3/8"	3/8"	207.5	8.29	7.60	6.91	6.22	5.53	4.84	3.46							
PXD36	16	22.12	3/8"	3/8"	323.7	5.31	4.87	4.42	3.98	3.54	3.10	2.65	2.43	2.21					
PXD60	12	12.44	3/8"	3/8"	531.2	2.99	2.74	2.49	2.36	2.24	2.11	1.99	1.87	1.74	1.62	1.49	0.62		
PXD100	10	8.64	3/8"	3/8"	830	2.07	1.99	1.90	1.81	1.64	1.56	1.47	1.38	1.30	1.21	1.21	1.04	0.00	
PXD120	9	7.00	1/4"	1/4"	1079	1.68	1.61	1.54	1.47	1.33	1.26	1.19	1.12	1.05	0.98	0.91	0.84	0.56	
PXD150	8	5.53	1/4"	1/4"	1294	1.33	1.27	1.22	1.16	1.05	1.00	0.94	0.88	0.83	0.77	0.72	0.66	0.61	

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

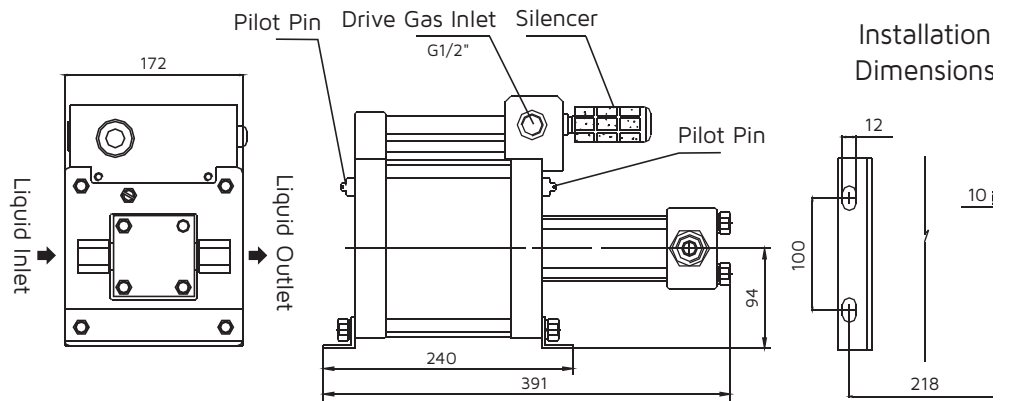
## PG Series - 160mm Single Acting Liquid Pumps

The ProTech PG Series Pump is the most commonly used series pump, capable of delivering very high outlet pressure at low flow rates; or high flow rates at lower pressures depending on the nominal ratio selected. They use a 160mm double acting air drive with a single liquid end.

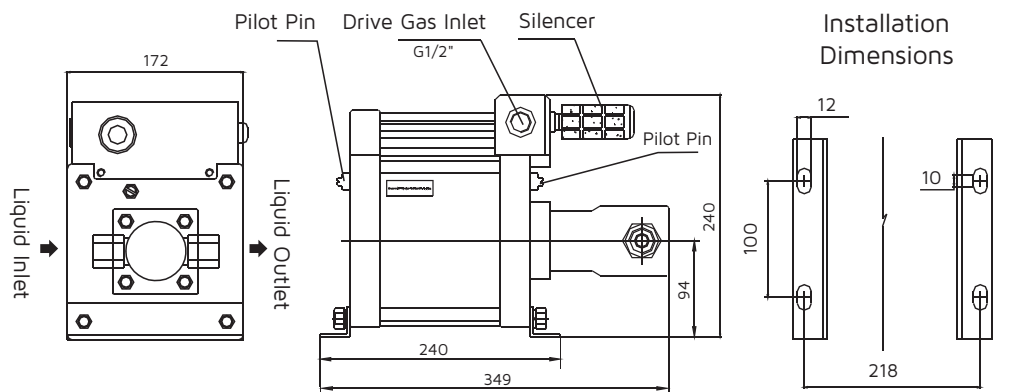
There are numerous standard modifications available for this series, such as a single-stroke mod, remote control and off-shore trim, making it the most versatile air driven liquid pump available.



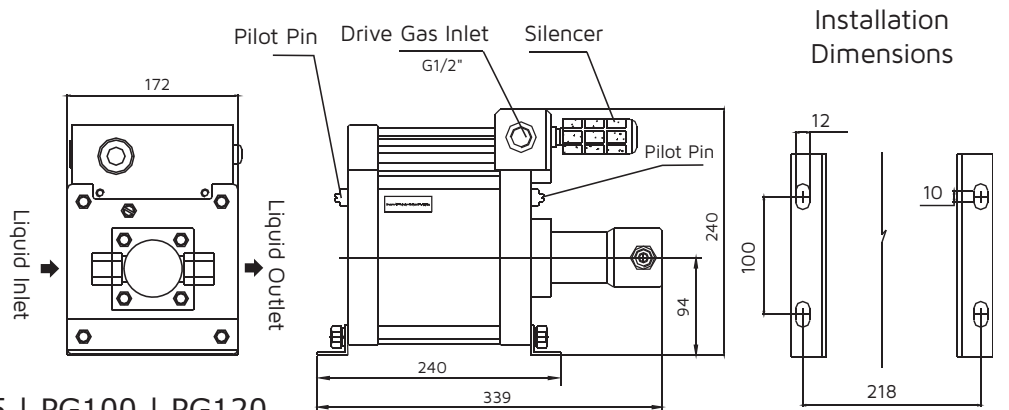
PG1.5 | PG3 | PG5 | PG9



PG15 | PG18



PG25 | PG36 | PG60 | PG75 | PG100 | PG120

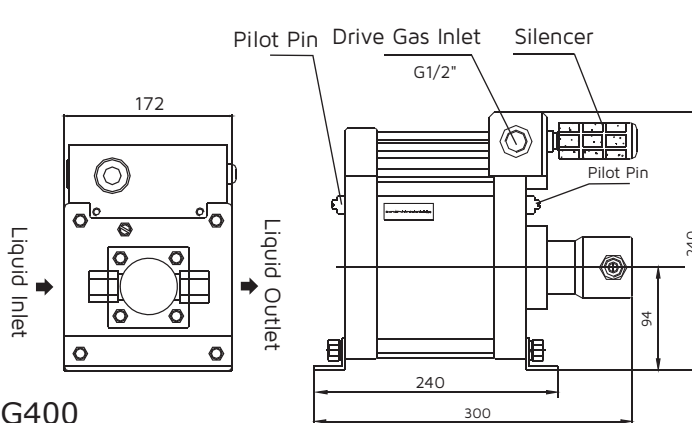


All dimensions are in mm unless otherwise stated.

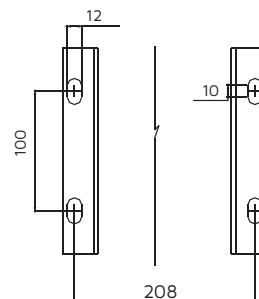
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## PG Series - 160mm Single Acting Liquid Pumps



Installation  
Dimensions



PG160 | PG220 | PG280 | PG400

### PG Series Technical Data

Model	Piston/ Rod Diameter -mm	Flow per Cycle -cc	Liquid Inlet	Liquid Outlet	Max. Output Pressure @ Drive 8.3 -Barg	Output Fluid Pressure (Barg) 1 Barg=0.1 Mpa=1.019 Kg/cm <sup>2</sup>															
						0	20	40	70	100	150	200	300	400	500	600	700	900	1200	1700	2350
						Flow Rate/Minute (L/min)															
PG1.5	100	471.24	NPT3/4"	NPT3/4"	16.6	56.55	0.00														
PG3	80	402.12	NPT3/4"	NPT3/4"	33.2	48.25	16.08														
PG5	63	249.38	NPT3/4"	NPT3/4"	58.1	29.93	9.98	4.99													
PG9	50	157.08	NPT3/4"	NPT3/4"	83.0	18.85	12.57	9.42	0.00												
PG15	40	100.53	NPT3/4"	NPT3/4"	132.8	12.06	9.05	7.04	6.03	4.02											
PG18	35	76.97	NPT3/4"	NPT3/4"	166.0	9.24	7.70	6.93	6.16	5.39	0.00										
PG25	30	56.55	NPT1/2"	NPT1/2"	232.4	6.79	5.66	5.09	4.52	3.96	3.39	0.00									
PG36	25	39.27	NPT1/2"	NPT1/2"	332.0	4.71	3.93	3.53	3.14	2.75	2.36	1.96	0.00								
PG60	20	25.13	NPT3/8"	NPT3/8"	498.0	3.02	2.51	2.26	2.01	2.75	1.51	1.26	1.01	0.75							
PG75	18	20.36	NPT3/8"	NPT3/8"	664.0	2.44	2.04	1.83	1.63	1.43	1.22	1.02	0.81	0.71	0.61						
PG100	16	16.08	NPT3/8"	NPT3/8"	830.0	1.93	1.77	1.61	1.53	1.37	1.21	0.96	0.80	0.64	0.56	0.48	0.00				
PG120	14	12.32	NPT3/8"	NPT3/8"	1079.0	1.48	1.42	1.36	1.23	1.11	0.99	0.86	0.74	0.62	0.49	0.43	0.37	0.12			
PG160	12	6.79	NPT3/8"	NPT3/8"	1411.0	0.81	0.78	0.75	0.71	0.68	0.61	0.54	0.48	0.41	0.34	0.27	0.24	0.20	0.07		
PG220	10	4.71	NPT3/8"	NPT1/4"	1992.0	0.57	0.54	0.52	0.49	0.47	0.42	0.38	0.33	0.28	0.24	0.19	0.16	0.14	0.12	0.09	
PG280	9	3.82	NPT1/4"	*HF4	2490.0	0.46	0.44	0.44	0.42	0.40	0.38	0.34	0.31	0.27	0.23	0.19	0.17	0.15	0.12	0.10	
PG400	8	3.02	NPT1/4"	*HF4	3320.0	0.36	0.35	0.35	0.33	0.32	0.30	0.27	0.24	0.21	0.18	0.15	0.14	0.12	0.11	0.11	0.08

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

## PGD Series - 160mm Double Acting Liquid Pumps

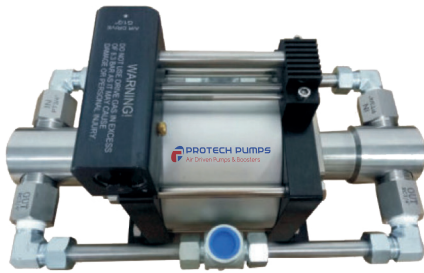
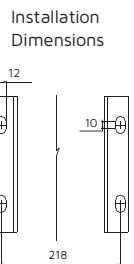
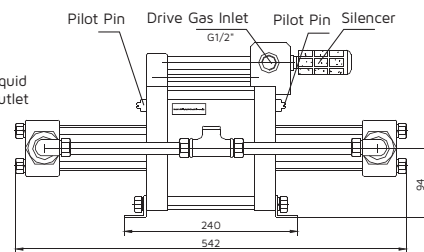
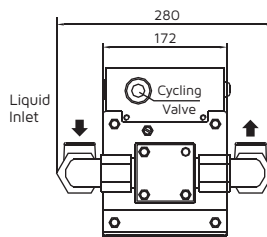
The ProTech PGD Series Pump that uses a 160 mm diameter double acting air drive with a liquid end connected to each end of the air drive.

Due to the two liquid ends the pump is double acting and delivers high pressure liquid outlet on both strokes of the reciprocating air drive. This makes the PGD series almost twice as efficient as the PG series. These pumps can be supplied with interconnecting tubing that connects both liquid inlets to a common port and both liquid outlets to a common port making for a simple installation.

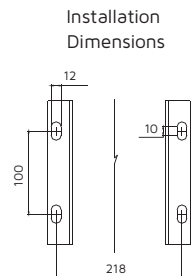
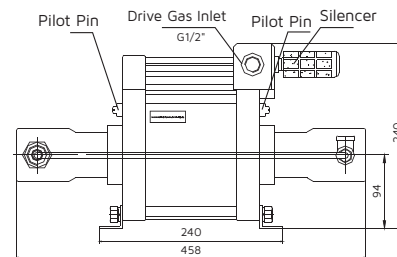
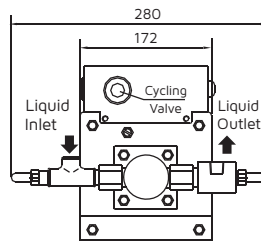
PGD pumps are generally used when more flow is required than that delivered by its corresponding PG unit.



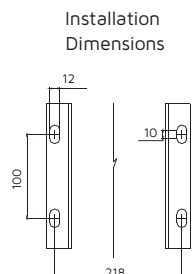
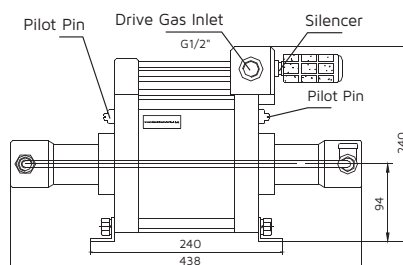
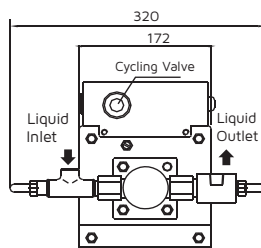
PGD9



PGD15 | PGD18



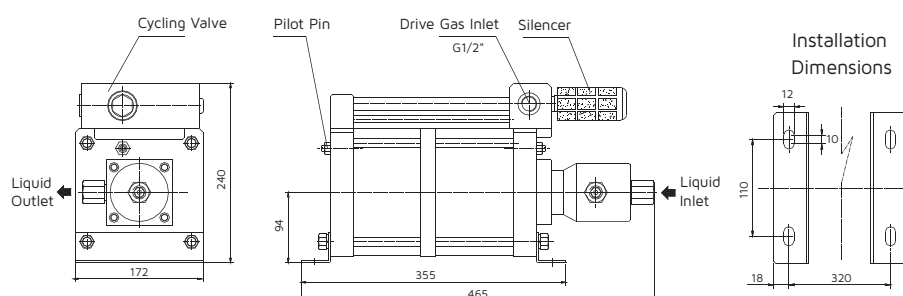
PGD25 | PGD36 | PGD60 | PGD75 | PGD100 | PGD120



All dimensions are in mm unless otherwise stated.

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## PGD Series - 160mm Double Acting Liquid Pumps



PGD160 | PGD220 | PGD280 | PGD400

### PGD Series Technical Data

Model	Displacement per Cycle -cc	Liquid Inlet	Liquid Outlet	Max. Output Pressure @ Drive 8.3 -Bar	Output Fluid Pressure (Barg) 1 Barg=0.1 Mpa=1.019 Kg/cm <sup>2</sup>															
					0	20	40	70	100	150	200	300	400	500	600	700	900	1200	1700	2350
					Flow Rate/Minute (L/min)															
PGD3	401.95	NPT3/4"	NPT3/4"	33																
PGD5	249.25	NPT3/4"	NPT3/4"	58																
PGD9	235.50	NPT3/4"	NPT3/4"	83	35.30	26.50	20.60	17.70	11.80											
PGD15	188.50	NPT3/4"	NPT3/4"	132	22.62	16.97	13.20	11.31	7.54											
PGD18	144.32	NPT3/4"	NPT3/4"	166	17.32	14.43	12.99	11.55	10.10	0.00										
PGD25	106.03	NPT1/2"	NPT1/2"	232	12.72	10.60	9.54	8.48	7.42	6.36	0.00									
PGD36	73.63	NPT1/2"	NPT1/2"	332	8.84	7.36	6.63	5.89	5.15	4.42	3.68	0.00								
PGD60	47.12	NPT3/8"	NPT3/8"	498	5.65	4.71	4.24	3.77	3.30	2.83	2.36	1.88	1.41							
PGD75	38.17	NPT3/8"	NPT3/8"	664	4.58	3.82	3.44	3.05	2.67	2.29	1.91	1.53	1.34	1.15						
PGD100	30.16	NPT3/8"	NPT3/8"	830	3.62	3.32	3.02	2.87	2.56	2.26	1.81	1.51	1.21	1.06	0.90	0.00				
PGD120	23.09	NPT3/8"	NPT3/8"	1079	2.77	2.66	2.54	2.31	2.08	1.85	1.62	1.39	1.15	0.92	0.81	0.69	0.23			
PGD160	12.44	NPT3/8"	NPT3/8"	1411	1.49	1.43	1.37	1.31	1.24	1.12	1.00	0.87	0.75	0.62	0.50	0.44	0.37	0.12		
PGD220	8.64	NPT3/8"	※HF4	1992	1.04	0.99	0.95	0.91	0.86	0.78	0.69	0.60	0.52	0.43	0.35	0.30	0.26	0.22	0.17	
PGD280	7.00	NPT1/4"	※HF4	2490	0.84	0.81	0.81	0.77	0.74	0.70	0.63	0.56	0.49	0.42	0.35	0.32	0.28	0.32	0.18	
PGD400	5.53	NPT1/4"	※HF4	3320	0.66	0.64	0.64	0.61	0.58	0.55	0.50	0.44	0.39	0.33	0.28	0.25	0.22	0.21	0.19	0.14

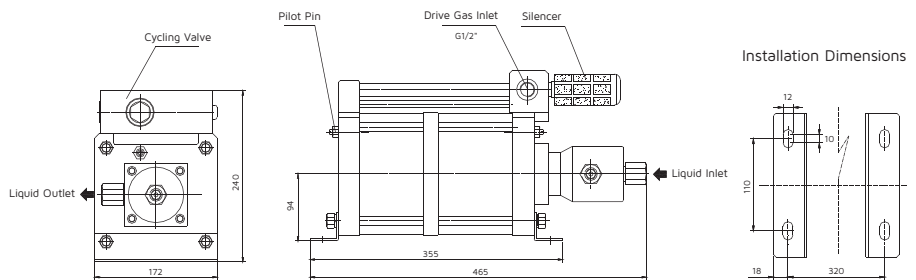
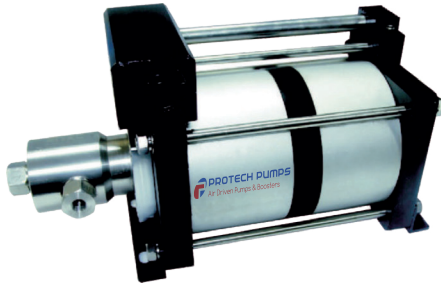
The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

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## 2PG Series - 160mm Single Acting Double Air Drive Liquid Pumps

The 2PG series pumps uses two 160mm **double** acting air drives connected, in series with a single liquid end. This effectively doubles the area of the air drive thus allowing for very high nominal ratios, although with the lower flow output of a single acting liquid pump.

Generally applied when extremely high pressures are required for testing or pressing applications.



2PG512 | 2PG630 | 2PG800

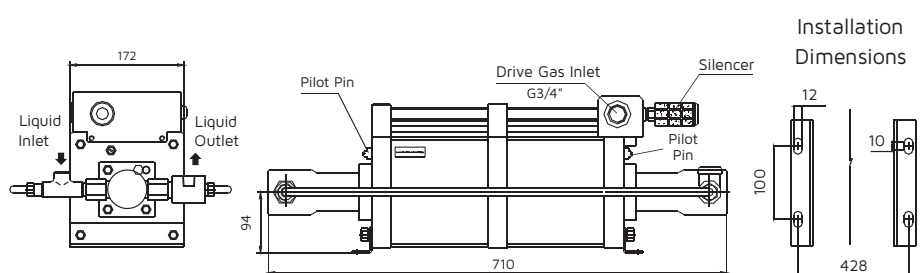
### 2PG Series Technical Data

Model	Piston/ Rod Diameter -mm	Flow per Cycle -cc	Liquid Inlet -NPT	Liquid Outlet	Max. Output Pressure @ Drive 8.3 -Barg	Output Fluid Pressure (Barg)    1 Barg=0.1 Mpa=1.019 Kg/cm²														
						0	100	200	300	400	500	600	700	900	1200	1700	2200	2700	3600	
						Flow Rate/Minute (L/min)														
2PG512	10	3.93	1/4"	※HF4	4249	0.47	0.45	0.43	0.41	0.39	0.35	0.31	0.28	0.24	0.20	0.16	0.14	0.12	0.10	

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

## 2PGD Series - 160mm Double Acting Double Air Drive Liquid Pumps

The 2PGD Series pumps are larger units that have two 160mm diameter double acting air drives connected in series, with a liquid end connected to each end of the air drives. Due to the two liquid ends, the pump is double acting and delivers high pressure liquid outlet on both strokes of the reciprocating air drives. These pumps can be supplied with interconnecting tubing that connects both liquid inlets to a common port and both liquid outlets to a common port making for simple installation.

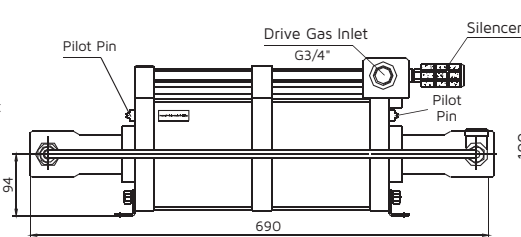
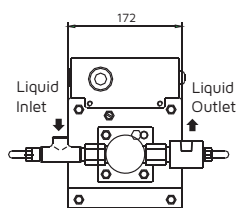
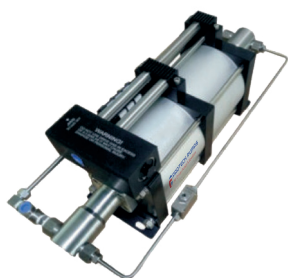


2PGD18 | 2PGD30

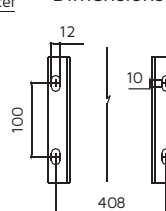
All dimensions are in mm unless otherwise stated.

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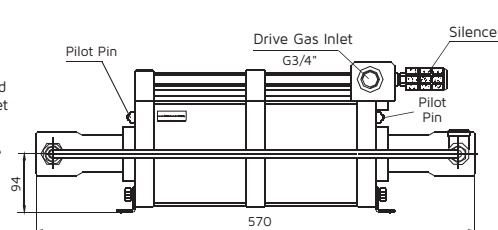
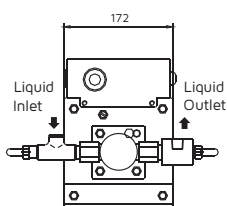
## 2PGD Series - 160mm Double Acting Double Air Drive Liquid Pumps



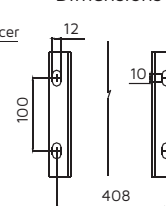
Installation  
Dimensions



2PGD36 | 2PGD50 | 2PGD75 | 2PGD120 | 2PGD150 | 2PGD180



Installation  
Dimensions



2PGD250 | 2PGD350

### 2PGD Series Technical Data

Model	Displacement per Cycle -cc	Liquid Inlet	Liquid Outlet	Max. Output Pressure @ Drive 8.3 -Barg	Output Fluid Pressure (Barg) 1 Barg=0.1 Mpa=1.019 Kg/cm <sup>2</sup>															
					0	20	40	70	100	150	200	300	400	500	600	700	900	1200	1700	2350
					Flow Rate/Minute (L/min)															
2PGD18	294.52	NPT3/4"	NPT3/4"	166	35.34	29.45	26.51	23.56	20.62	17.67	0.00									
2PGD30	188.50	NPT3/4"	NPT3/4"	265.6	22.62	18.85	16.97	15.08	13.20	11.31	9.43	0.00								
2PGD36	144.32	NPT1/2"	NPT1/2"	332	17.32	14.43	12.99	11.55	10.10	8.66	7.22	5.77	4.33							
2PGD50	106.03	NPT1/2"	NPT1/2"	464.8	12.72	10.60	9.54	8.48	7.42	6.36	5.30	4.24	3.71	3.18						
2PGD75	73.63	NPT3/8"	NPT3/8"	664	8.84	8.10	7.36	6.99	6.26	5.52	4.42	3.68	2.95	2.58	2.21	0.00				
2PGD120	47.12	NPT3/8"	NPT3/8"	1079	5.65	5.42	5.18	4.71	4.24	3.77	3.30	2.83	2.36	1.88	1.65	1.41	0.47			
2PGD150	38.17	NPT3/8"	NPT3/8"	1328	4.58	4.39	4.20	4.01	3.82	3.44	3.05	2.67	2.29	1.91	1.53	1.34	1.15	0.38		
2PGD180	30.16	NPT3/8"	※HF6	1660	3.62	3.47	3.32	3.17	3.02	2.71	2.41	2.11	1.81	1.51	1.21	1.06	0.90	0.75	0.60	
2PGD250	16.93	NPT3/8"	※HF4	2158	2.03	1.95	1.95	1.86	1.78	1.69	1.52	1.35	1.19	1.02	0.85	0.76	0.68	0.76	0.42	
2PGD350	12.44	NPT3/8"	※HF4	2947	1.49	1.43	1.43	1.37	1.31	1.24	1.12	1.00	0.87	0.75	0.62	0.56	0.50	0.47	0.44	0.31

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

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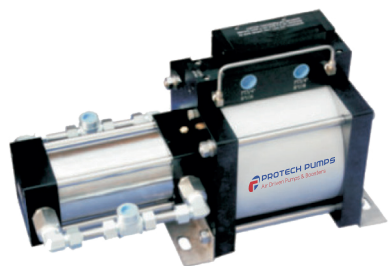
## PH Series - 250mm Single Acting Liquid Pumps

The pumps in the PH Series are very high flow pumps.

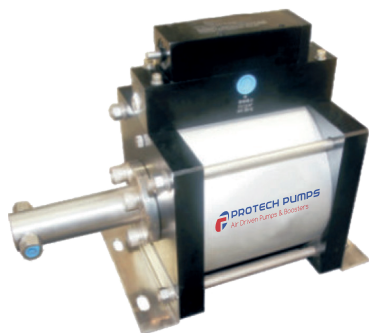
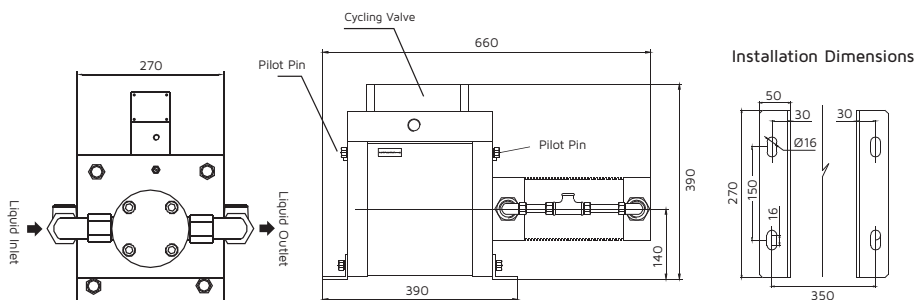
Similar in concept to the smaller PG series pump they use a 250 mm single acting air drive connected to a single liquid pump end.

Although still very versatile, it has fewer nominal ratios available. Applications for this series include methanol injection and LPG transfer.

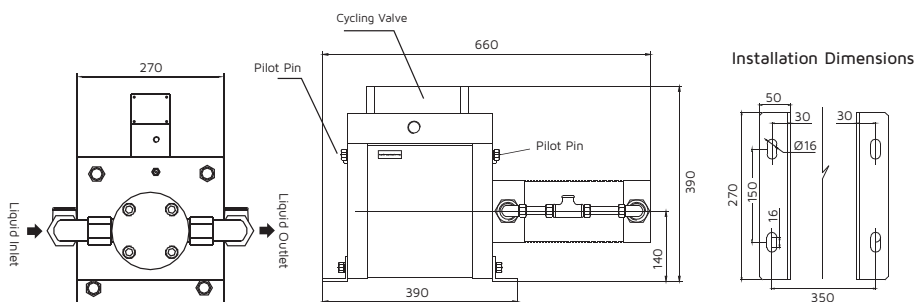
ProTech technical support can assist in the correct application of these very high performance pumps.



PH10T | PH22 | PH35



PH60 | PH100 | PH150 | PH180 | PH220



### PH Series Technical Data

Model	Displacement per Cycle -cc	Liquid Inlet	Liquid Outlet	Max. Output Pressure @ Drive 8.3 -Barg	Output Fluid Pressure (Barg)    1 Barg=0.1 Mpa=1.019 Kg/cm²														
					0	20	40	70	100	150	200	300	400	500	600	700	900	1200	1700
					Flow Rate/Minute (L/min)														
PH10T	753.98	NPT3/4"	NPT3/4"	83	75.40	60.32	52.78	26.39	0.00										
PH22	294.52	NPT3/4"	NPT3/4"	207	29.45	23.56	20.62	17.67	14.73	11.78	8.84	0.00							
PH35	188.50	NPT3/4"	NPT3/4"	332	18.85	15.08	13.20	11.31	9.43	8.48	7.54	5.66	0.00						
PH60	106.03	NPT3/4"	NPT1/2"	572	10.6	8.48	7.42	6.36	5.30	5.30	4.77	4.24	37.11	3.18	0.00				
PH100	73.63	NPT1/2"	NPT1/2"	830	7.36	6.26	5.89	5.15	4.79	4.42	4.05	3.68	3.31	2.95	2.58	2.21	0.00		
PH150	47.12	NPT1/2"	※HF6	1295	4.71	4.24	4.01	3.77	3.30	3.06	2.83	2.59	2.36	2.12	1.88	1.65	1.41	1.18	0.00
PH180	27.99	NPT3/8"	※HF6	1577	2.80	2.52	2.38	2.24	2.10	1.96	1.82	1.68	1.54	1.40	1.26	1.12	0.98	0.84	0.00
PH220	22.12	NPT3/8"	※HF6	2116	2.21	2.10	1.99	18.8	1.77	1.66	1.55	1.44	1.33	122	1.11	1.00	0.93	0.88	0.77

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

N.B. All dimensions are in mm unless otherwise stated.

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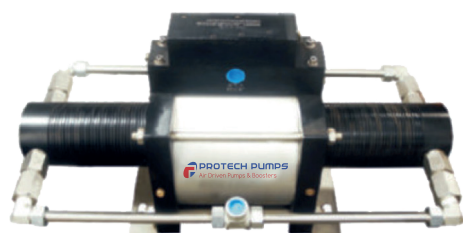


## PT Series - 250mm Double Acting Liquid Pumps

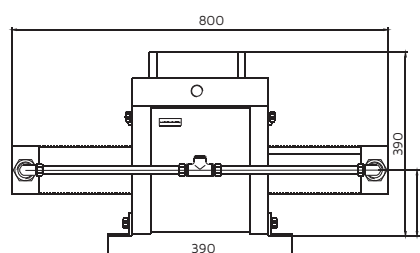
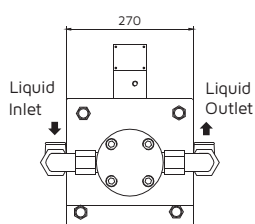
The PT 250 series pumps are very high flow pumps. Similar in concept to the smaller PGD series pumps but using a 250mm double acting air drive with a liquid end connected to each end of the air drive.

The two liquid ends make the pump double acting by delivering high pressure liquid outlet on both strokes of the reciprocating air drive. This makes the PT series almost twice as efficient as the PH series. These pumps can be supplied with interconnecting tubing that connects both liquid inlets to a common port and both liquid outlets to a common port making for a simple installation. PT pumps are generally used when more flow is required than that delivered by the corresponding PG or PGD unit.

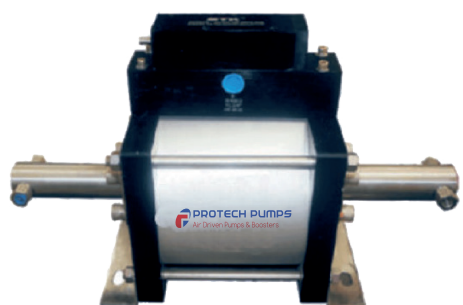
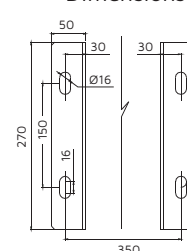
An important application for this series of air driven liquid pumps is methanol injection and LPG transfer.



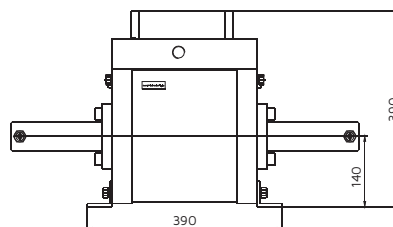
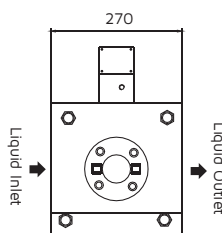
PT22 | PT35 | PT60 | PT100



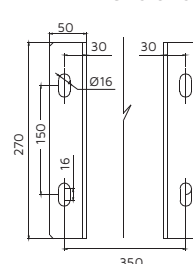
Installation Dimensions



PT150 | PT180 | PT220



Installation Dimensions



## PT Series Technical Data

Model	Displacement per Cycle -cc	Liquid Inlet	Liquid Outlet	Max. Output Pressure @ Drive 8.3 -Barg	Output Fluid Pressure (Barg)    1 Barg=0.1 Mpa=1.019 Kg/cm <sup>2</sup>											
					0	20	40	70	100	150	200	300	400	500	600	700
					Flow Rate/Minute (L/min)											
PT22	549.78	NPT3/4"	NPT3/4"	207	54.98	43.98	38.48	32.99	27.49	21.99	16.49	0.00				
PT35	351.86	NPT3/4"	NPT3/4"	332	35.19	28.15	24.63	21.11	17.59	15.83	14.07	10.56	0.00			
PT60	197.92	NPT3/4"	NPT1/2"	572	19.79	15.83	13.85	11.88	9.90	9.90	8.91	7.92	69.27	5.94	0.00	
PT100	137.44	NPT1/2"	NPT1/2"	830	13.74	11.68	11.00	9.62	8.93	8.25	7.56	6.87	6.18	5.50	4.81	4.12
PT150	87.96	NPT1/2"	※HF6	1295	8.80	7.92	7.48	7.04	6.16	5.72	5.28	4.84	4.40	3.96	3.52	3.08
PT180	71.25	NPT3/8"	※HF6	1577	7.13	6.41	6.06	5.70	5.34	4.99	4.63	4.28	3.92	3.56	3.21	2.85
PT220	56.30	NPT3/8"	※HF6	2116	5.63	5.35	5.07	47.86	4.50	4.22	3.94	3.66	3.38	3.10	2.82	2.53

The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

## PEX Series - 160mm Liquefied Gas Pumps

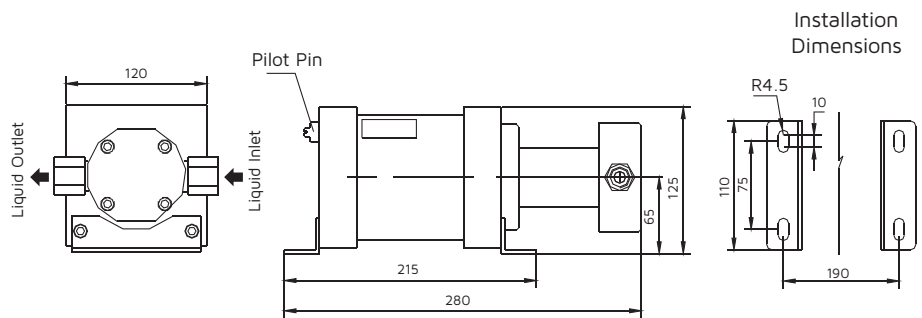
The PEX series of liquid pumps are unique in the ProTech range as they use pistons rather than plungers in the liquid ends. This enables them to achieve high pressure outlet flows in both directions of the reciprocating pump action, making them double acting and very efficient. All PEX Series pumps are suitable for liquids, gases and vapours. They are also capable of drawing a vacuum down to 11.25 psi(absolute) in the 2-stage configuration.

### Applications:

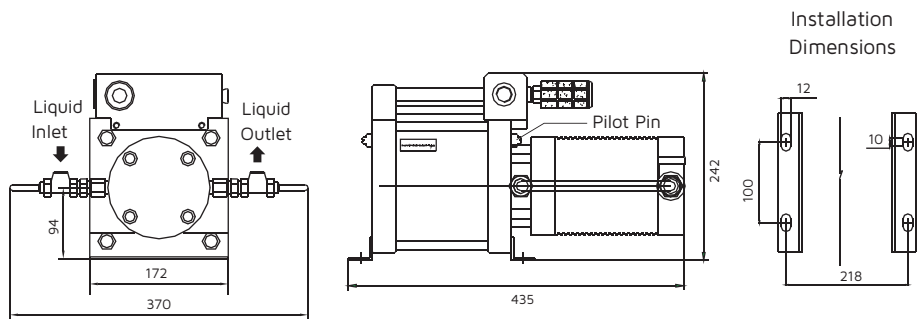
- Used in R22, R134a, R470C, R410A, CO<sub>2</sub>, Propane, Butane, LPG and other liquefied gases
- Super critical extraction including essential oils and caffeine
- Fire extinguisher pump out and charging
- Refrigerant charging or recovery of residual fluid from large tanks



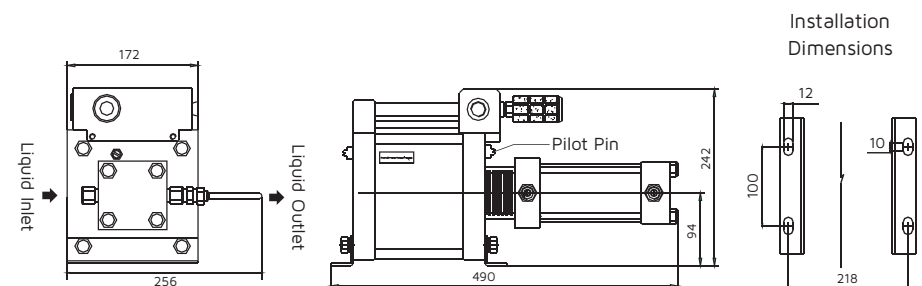
1PEX3 | 1PEX5



PEX4 | PEX7 | PEX10



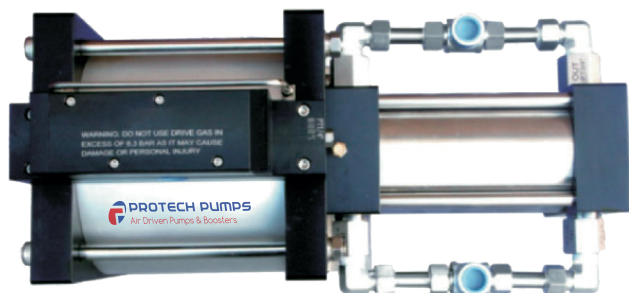
PEX4-D | PEX7-D



All dimensions are in mm unless otherwise stated.



## PEX Series - 160mm Liquefied Gas Pumps



4PEX6 | 4PEX10

### PEX Series Technical Data

Model	Actual Ratio	Displacement Per Cycle -cc	Minimum Inlet Pressure ( <b>Pi</b> ) -Barg	Maximum Outlet Pressure ( <b>Po</b> ) - Barg	Refrigerant Outlet Pressure Calculation Formula ( <b>Po</b> )	Inlet	Outlet
1PEX3	4:1	117.81	0.1	33.2	3Pa	NPT3/8"	NPT3/8"
1PEX5	6:1	75.40	0.1	49.6	5Pa	NPT3/8"	NPT3/8"
PEX4(-D)	4:1	779.00	0.1	33.2	4Pa+Pi	NPT3/8"	NPT3/8"
PEX7(-D)	7:1	473.00	3.4	56	7Pa	NPT3/8"	NPT3/8"
PEX10	10:1	402	3.4	83	10Pa	NPT3/8"	NPT3/8"
4PEX6	6:1	1636	3.4	48	6Pa+Pi	NPT3/4"	NPT3/4"
4PEX10	10:1	981	3.4	83	10Pa+Pi	NPT3/4"	NPT3/4"

Type D is isolated (completely isolated between the drive chamber and the boost chamber).

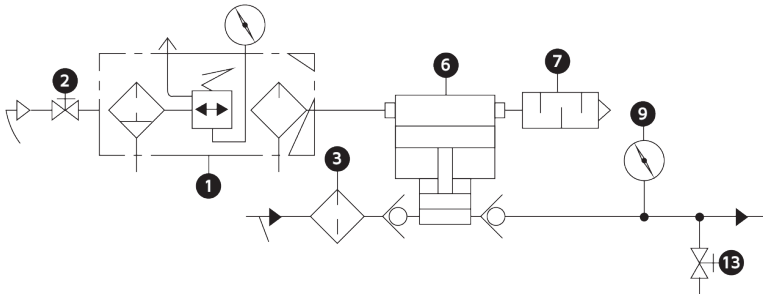
The maximum acceptable air drive pressure (**Pa**) is 8.3 Barg.

**We always recommend seeking advice when using the pump on gases and liquids that are potentially explosive or toxic to ensure that proper venting is considered during design.**

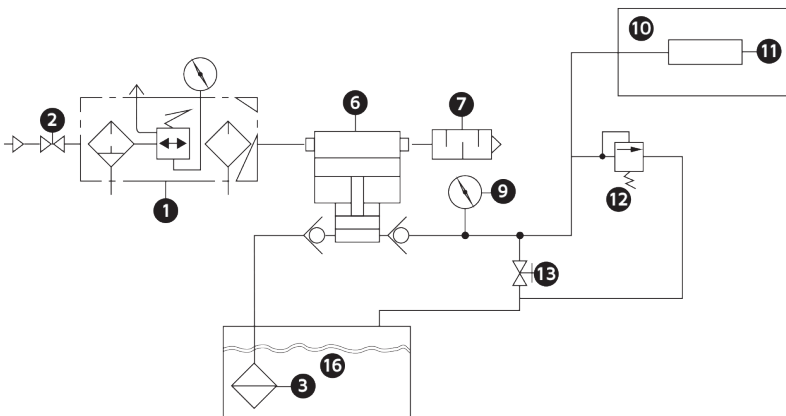
Buy online at [www.protechpumps.com](http://www.protechpumps.com)

## Typical Air Driven Liquid Pumps Typical Circuit Diagram

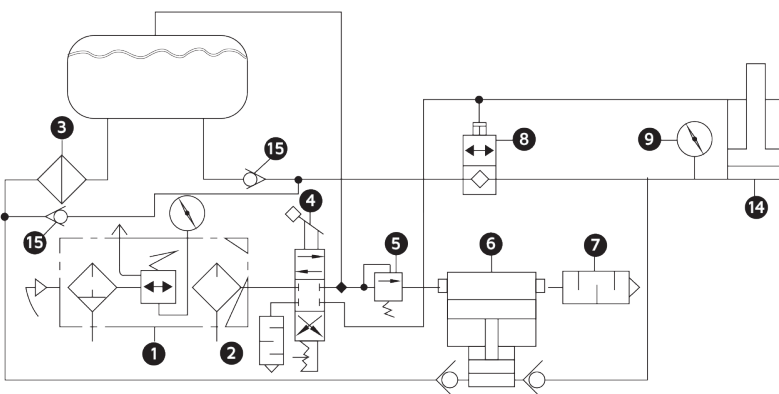
**Typical Installation Circuit Diagram**



**Typical Static Pressure Test**



**Typical Hydraulic Pressure Circuit**

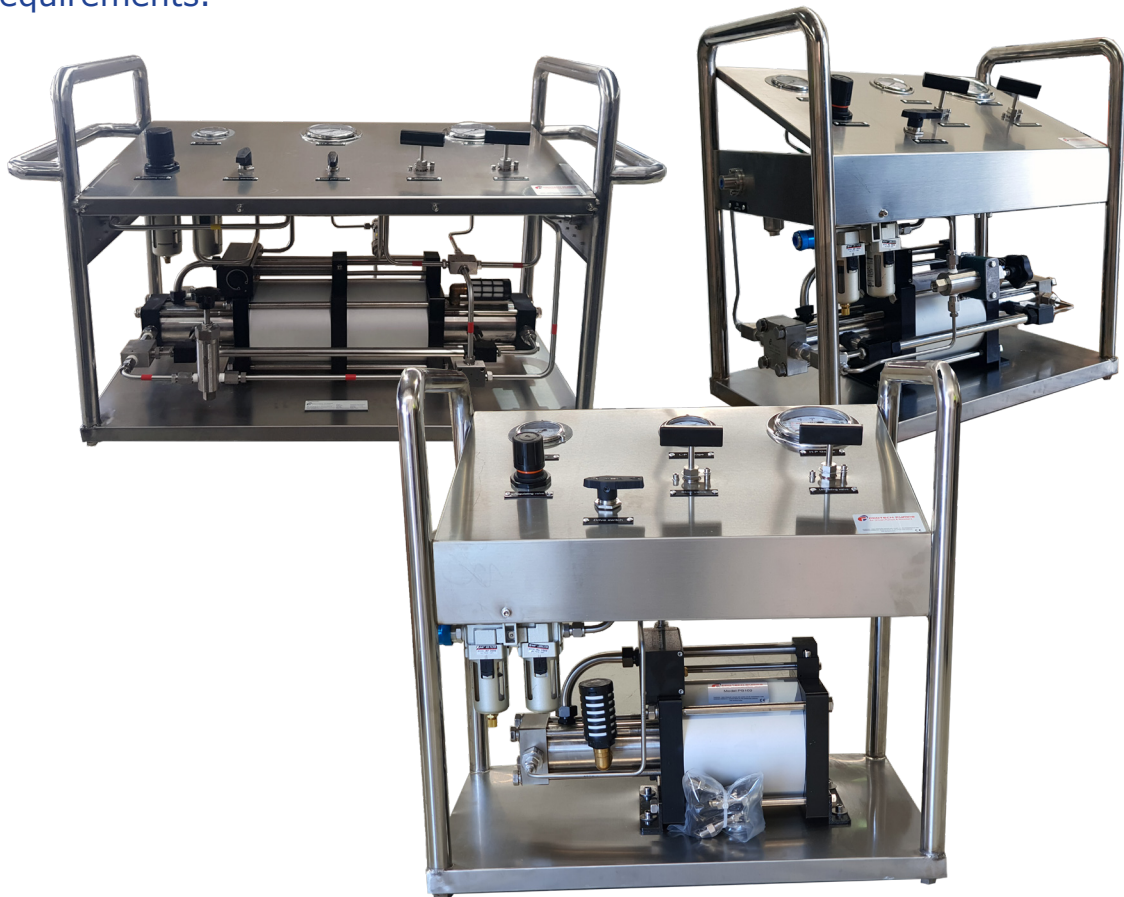


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- ❺ Air Pressure Regulator
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- ❽ Pneumatic Unloader Valve
- ❾ Pressure Gauge
- ❿ Tank
- ⓫ Tested Component
- ⓬ Pressure Safety Valve
- ⓭ Unloader Valve
- ⓮ Hydraulic Cylinder
- ⓯ Check Valve
- ⓰ Tank

## PROPAK PACKAGED SYSTEMS

ProPak is an off-the-shelf range of rollbar systems that include all the valves, fittings and gauges as standard. We can also customise these units to meet your application's exact requirements.



**Intrinsically safe** - no heat, sparks or flames produced

**No Contamination** - complete separation between driving gas and compressed liquids

**No Lubrication Required** - on air/gas drive section

**High Fluid Compatibility** - hydraulic oil, water and corrosive gasses and liquids

**Start & Stop Against Load** - stall occurs when pressure balance is achieved

**Driven with Air or other Gases** - including nitrogen, Co2 and natural gas

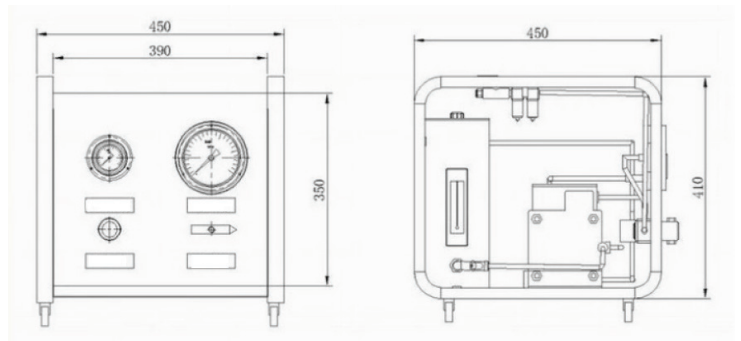
**Suitable for Hazardous Area** - with models for underground coal mines and offshore

Buy online at [www.protechpumps.com](http://www.protechpumps.com)

## ProPaks for Liquid Pumps

### Standard Inclusions:

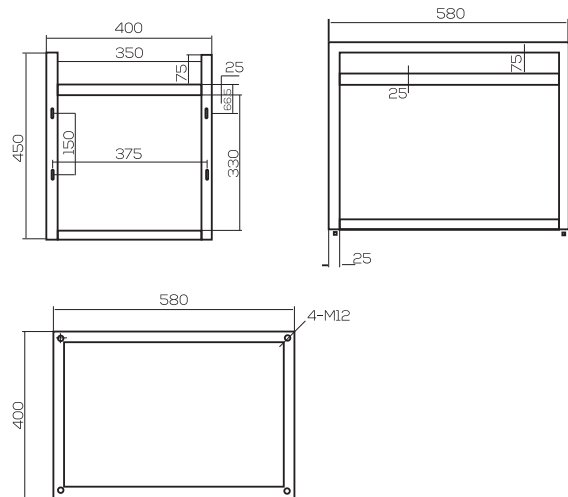
- Air pressure regulator
- Air filter
- Air pressure gauge
- On/Off speed control valve
- ProTech air driven liquid pump
- Stainless steel tank with suction strainer or external connection
- Sight Glass and filler/breather cap
- Outlet pressure gauge
- Return to tank valve
- Discharge outlet connection



PP1-PM, PS, PSH Series

Tank Size: 4L

Overall Dimensions: 450x350x410



PP2-PX, PXD, PG Series

Tank Size: 10L

Overall Dimensions: 580x400x450

PT, PH and PEX series pumps are also available on request.

## ProPaks for Gas Boosters

### Standard Inclusions:

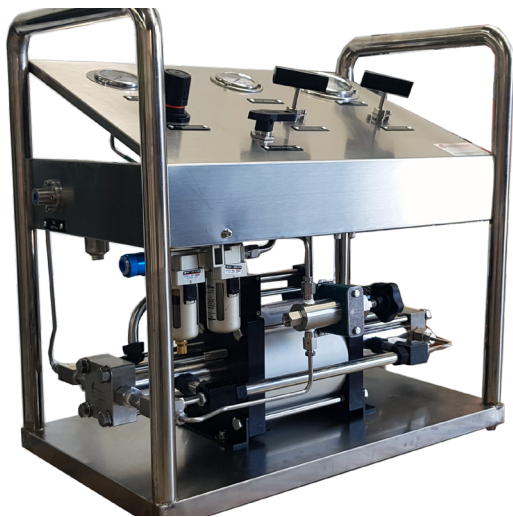
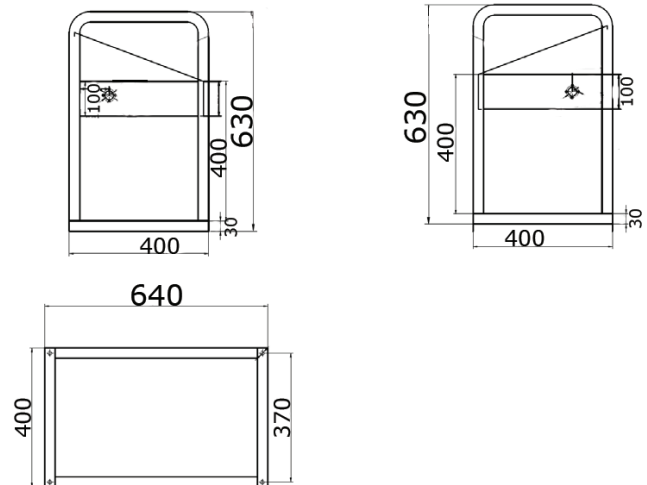
- Air pressure regulator
- Air filter
- Air pressure gauge
- On/Off speed control valve
- ProTech air driven gas booster
- Inlet and outlet gas filter
- Inlet and outlet pressure gauge
- Safety relief valve
- Inlet and outlet isolation valves



PP5-PB Series

Tank Size: No Tank

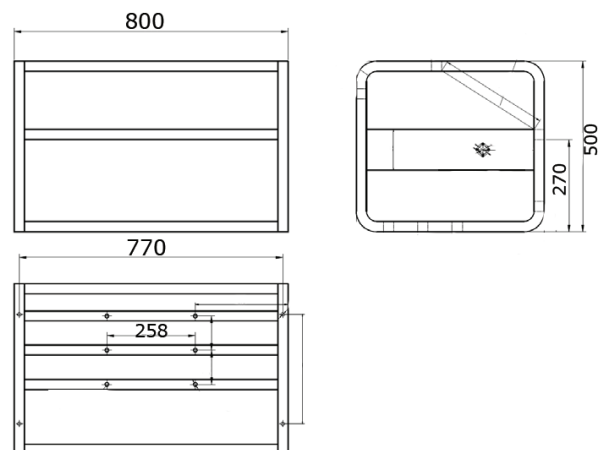
Overall Dimensions: 640x400x630



PP5-PBD, PBT Series

Tank Size: No Tank

Overall Dimensions: 800x550x500



All dimensions are in mm unless otherwise stated.

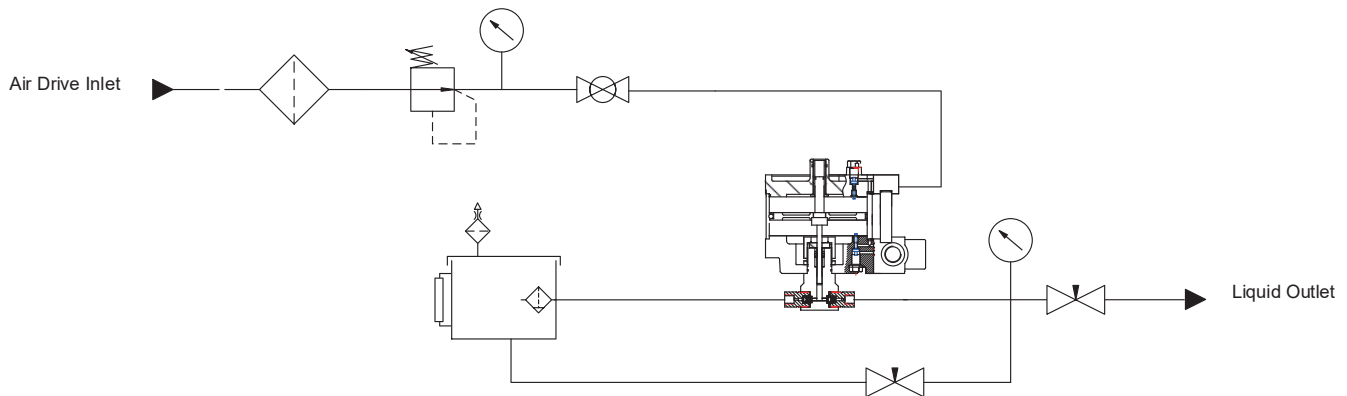
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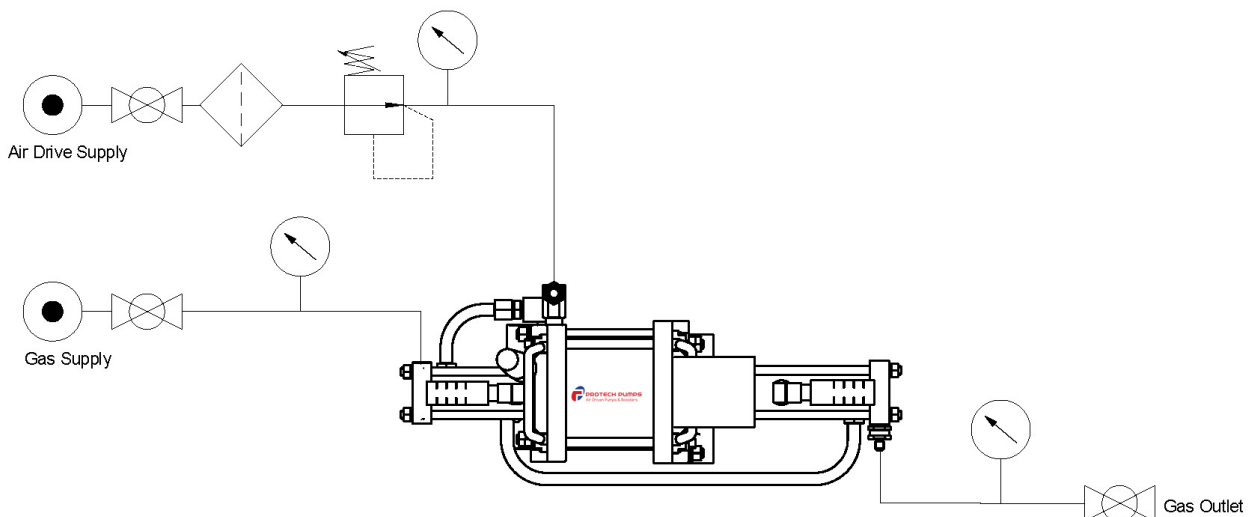
## ProPaks - Customised

For more complex applications, we can design and build fully customised skids: PP7- Custom Liquid Pumps and Custom Gas Boosters.

### Standard Air Driven Liquid Pump ProPak Circuit Diagram:



### Standard Gas Booster ProPak Circuit Diagram:



All dimensions are in mm unless otherwise stated.





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