COMBINED PUMPS Ltd

**P1 Series high accuracy chemical injection Pumps Data Sheet**

The P1 series pumps are small accurate pneumatically driven, single air drive, double acting, reciprocating positive displacement pumps producing near continuous flows. The P1 is the most versatile chemical injection pump in the series. It can be modified to produce extremely low injection rates and has a range from 0.1 ltrs/hr up to 175 ltrs/hr.

P1 Pumps are suitable and commonly used for chemical injection, where continuous injection rates from very small to medium flows at high accuracy are required. The P1 series can be modified from the double acting units shown to a single acting units, this will reduce the injection rates by half. The P1 pump can be further modified by using either a small air valve or a large air valve, this will give each pump size 4 different injection ranges depending on the set-up. There are 3 plunger sizes and each can be set-up in either single or double acting and fitted with either small or large air valves giving the total range of injection rates from 0.1 ltrs/hr to 175 ltrs/hr.

P1 series pumps are manufactured in three different plunger sizes, 7mm, 9.5mm & 13mm to provide a wide range of pressures and flows up to 13,000 psig.

The P1 pump utilises a common air motor, shuttle valve assembly, hydraulic section housings and check valves and has been designed to be modular using interchangeable inserts, pistons and components permitting the pump to be economically reconfigured to either the 7mm, 9.5mm or 13mm model for different pressures and flows within a short period of time.

All P1 series pumps are CE marked, ATEX compliant (94/9/EC) II 2 Gc T6 & NACE compliant as standard and suitable for H2S fluid service.

**Pump Overview:**

| | | | |
|---|---|---|---|
| **Air Motor:** | Single air drive motor, 316 stainless steel air chamber, 316 stainless steel air motor piston, 316 stainless steel air motor end flanges, viton seals. | | |
| **Air Shuttle Assembly:** | 316 stainless steel cylinder, aluminium shuttle, HNBR seals. | | |
| **Hydraulic Cylinders:** | 316 stainless steel cylinders & internal components. (The Hydraulic cylinders are isolated from the main air motor to ensure no fluids can be transferred to the motor and exhausted to atmosphere) | | |
| **Hydraulic Pistons:** | 7mm, 9.5mm, 13mm OD Hardened ceramic pistons for enhanced chemical resistance and seal wear. | | |
| **Main Hydraulic Seals:** | Ultra High Molecular Weight Polyethylene (Tecafine (PE)) UHMWPE-10. (PTFE compound available) | | |
| **Check Valves:** | 316 stainless steel cylinder & internal components, ceramic compound ball & seat. | | |
| **Total Net Weight:** | 11Kg | **Maximum Noise Level:** | 90 db |

**Pump Connection Sizes:**

| | | | | | |
|---|---|---|---|---|---|
| **Air Inlet:** | 1/4"NPT (F) | **Pilot Air Supply:** | 1/4" OD. | **Air Shuttle Exhaust:** | 1/2" NPT (F) |
| **Fluid Inlet:** | 1/4" NPT (M) | **Fluid Outlet**: | 1/4" NPT (M) | | |

**Pump Performance:**

| | | | |
|---|---|---|---|
| **Max Pump Air Supply:** | 100 psig. | **Max Pilot Air Supply:** | 100 psig. |
| **Max Air Consumption:** | <50 scfm. | **Air Quality Required:** | Cooled & dry plant air. |
| **Pump Ratio:** | 7mm: 129 - 1 | 9.5mm: 70 - 1 | 13mm: 37 - 1 |
| **Max Discharge Pressure Static:** | 7mm: 13,000 psig | 9.5mm: 7,000 psig | 13mm: 3,700 psig |
| **Discharge Volume per Stroke:** | 7mm: 1.62cc | 9.5mm: 2.7cc | 13mm: 5.3cc |
| **Min/Max Discharge Flow @ 0 psig:** | 7mm: 0.1 - 50 ltr/hr | 9.5mm: 0.162 - 90 ltr/hr | 13mm: 0.318 - 177 ltr/hr |

**Air input to hydraulic discharge pressure static/stall values.**

| Pump Model | Hydraulic Piston Diameter | Pump Ratio | 20 psig Air Supply | 40 psig Air Supply | 60 psig Air Supply | 80 psig Air Supply | 100 psig Air Supply |
|---|---|---|---|---|---|---|---|
| **CP-P1-7-D** | 7mm | 129 - 1 | 2,500 | 5,100 | 7,700 | 10,000 | 13,000 |
| **CP-P1-9-D** | 9.5mm | 70 - 1 | 1,400 | 2,800 | 4,200 | 5,600 | 7,000 |
| **CP-P1-13-D** | 13mm | 37 - 1 | 740 | 1,500 | 2,200 | 3,000 | 3,700 |

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