



PCI AFRICA

Paterson Candy International (SA) (PTY) Limited t/a PCI AFRICA | Company Registration Number 53/001821/07

☎ +27 11 794 5004 ☎ +27 11 794 6357

P O Box 308, North Riding, 2162, RSA | 11 Ridge Road, Laser Park, Honeydew, 2170

## **PCI AFRICA – RANGE OF PRE-ENGINEERED WATER TREATMENT PLANTS**

### **INTRODUCTION**

These particular pre-engineered Potable Water Treatment Plants were developed to meet an increasing demand for pre-fabricated treatment plants for both community based and institutional water supplies, especially in rural environments. These types of plants are suitable for 800 to 32,000 people, with a wide range of capacities from 4 m<sup>3</sup>/hr, to 60 m<sup>3</sup>/hr output, using the vertical type filtration design, and from 8,000 to 118,000 people, with a range of capacities from 40 m<sup>3</sup>/hr, to 200 m<sup>3</sup>/hr output, using the horizontal type filtration design



Typical plant installation showing Clarifiers, pressure type Sand Filters and Treated water storage tank.

Because of their basic design, they can be quickly and easily installed, which eliminates (as far as possible) costly civil engineering work, and are capable of being operated by unskilled personnel, and require the minimum of attendance and maintenance.

## GENERAL DESCRIPTION

The PCI Africa pre-engineered Potable Water Treatment Plants provide equipment for any one, or a combination of the following treatment processes:

- Chemical pre-treatment such as pre-chlorination, and coagulation etc.
- Clarification to reduce the turbidity or colour content of the raw water.
- Filtration to remove all suspended matter.
- Chemical post-treatment such as pH correction, post-chlorination, sterilisation etc.



Installation of pressure type Sand Filters in a bank of three vessels.

In addition this range of water treatment plant can provide (as an extra) equipment for storage of the treated water, and wash water for the filters. Pumping plant can be offered to suit the particular hydraulic conditions on site.

The principal features of this type of package water treatment plant are as follows:

- Vertical flow, sludge blanket clarification tanks.
- Vertical or horizontal sand filters, complete with PCI Africa proprietary filter nozzles and first charge of suitable filter media.

- Elevated, (if necessary) pressed mild steel storage tanks (galvanised), with built in wash compartments.
- All mild steel (suitably corrosion protected) pipework.
- All valves, and associated fittings.

### **FILTER BED CLEANING**

The standard filter bed usually has a total depth of 0,85 metres, and the grading of the filter sand (and/or other filter media) is selected according to the working conditions.

The sequence for cleaning the filter bed is by closing the inlet and outlet valves, and opening the air scour valve and turning of the air scour equipment for approximately 5 to 8 minutes. After which the air scour machinery should be stopped, and the air scour valve closed.

Thereafter the washout valve should be opened, and the backwashing machinery started for a period of approximately 8 to 10 minutes according to conditions.

### **AIR SCOUR SUPPLY**

Air for scouring the filter is required at a pressure of approximately 35 kPa (or 0,35 bar), and is usually provided by a motor driven rotary air compressor designed to deliver the correct flow at the prescribed rate.

### **WASHWATER SUPPLY**

In a supply system, where the filtered water is pumped directly through the filters into the bottom of a clear water reservoir at a higher level, the washwater can be directed back from the reservoir, provided that the filtered water main is sufficiently large enough to supply the necessary wash rate.

Where the installation consists of three or more filters, cleaning can be carried out without drawing from the reservoir, but rather from the two or more filters in operation, which provide the necessary backwash water.

Where the washwater supply is to be independent of the system, a storage tank can be provided to give an available head of not less than 4 metres, measured from the filter outlet nozzle. This may be charged by a connection from the filtered water main or by pumps. Alternatively, the clear water reservoir may be positioned at ground level, and the filtered water pumped from it.

## VERTICAL (PRESSURE TYPE FILTERS) – SIZES AND CAPACITIES

Model	CAPACITY		POPULATION		
	(m <sup>3</sup> /hr)	(lit/sec)	(Ml/day)	110 litres	45 litres
<b>PF 4</b>	4.01	1.11	0.10	874	2,137
<b>PF 8</b>	7.86	2.18	0.19	1,714	4,190
<b>PF 5</b>	5.30	1.47	0.13	1,156	2,826
<b>PF 10</b>	10.39	2.89	0.25	2,267	5,542
<b>PF 6</b>	6.26	1.74	0.15	1,366	3,339
<b>PF 12</b>	12.28	3.41	0.29	2,679	6,548
<b>PF 9</b>	9.02	2.50	0.22	1,967	4,809
<b>PF 18</b>	17.68	4.91	0.42	3,857	9,429
<b>PF 12</b>	12.27	3.41	0.29	2,677	6,545
<b>PF 24</b>	24.06	6.68	0.58	5,250	12,833
<b>PF 15</b>	16.03	4.45	0.38	3,497	8,549
<b>PF 30</b>	31.43	8.73	0.75	6,857	16,762
<b>PF 20</b>	20.29	5.64	0.49	4,426	10,819
<b>PF 40</b>	39.78	11.05	0.95	8,679	21,214
<b>PF 25</b>	25.04	6.96	0.60	5,464	13,357
<b>PF 50</b>	49.11	13.64	1.18	10,714	26,190
<b>PF 30</b>	30.30	8.42	0.73	6,612	16,162
<b>PF 60</b>	59.42	16.51	1.43	12,964	31,690

## VERTICAL (GRAVITY TYPE OPEN TOP FILTERS) – SIZES AND CAPACITIES

Model	CAPACITY		POPULATION		
	(m <sup>3</sup> /hr)	(lit/sec)	(Ml/day)	110 litres	45 litres
<b>PGF 6</b>	6.14	1.71	0.15	1,339	3,274
<b>PGF 9</b>	8.84	2.46	0.21	1,929	4,714
<b>PGF 12</b>	12.03	3.34	0.29	2,625	6,417
<b>PGF 16</b>	15.71	4.37	0.38	3,429	8,381
<b>PGF 20</b>	19.89	5.52	0.48	4,339	10,607
<b>PGF 25</b>	24.55	6.82	0.59	5,357	13,095
<b>PGF 30</b>	29.71	8.25	0.71	6,482	15,845
<b>PGF 41</b>	41.50	11.53	1.00	9,054	22,131

## VERTICAL (PRESSURE TYPE CLARIFIERS) – SIZES AND CAPACITIES

- **ARRANGEMENT 3 – CLOSED TOP CLARIFIERS**

Model	CAPACITY		POPULATION		
	(m <sup>3</sup> /hr)	(lit/sec)	(Ml/day)	110 litres	45 litres
<b>VSTP 5</b>	4.60	1.28	0.11	1,003	2,451
<b>VSTP 10</b>	10.34	2.87	0.25	2,256	5,516
<b>VSTP 15</b>	15.45	4.29	0.37	3,371	8,240
<b>VSTP 20</b>	21.58	5.99	0.52	4,708	11,508
<b>VSTP 25</b>	25.02	6.95	0.60	5,460	13,347

## VERTICAL (GRAVITY TYPE OPEN TOP CLARIFIERS) – SIZES AND CAPACITIES

- ARRANGEMENT 1 – OPEN TOP CLARIFIERS

Model	CAPACITY		POPULATION		
	(m <sup>3</sup> /hr)	(lit/sec)	(Ml/day)	110 litres	45 litres
VSTO 5	4.60	1.28	0.11	1,003	2,451
VSTO 10	10.34	2.87	0.25	2,256	5,516
VSTO 15	15.45	4.29	0.37	3,371	8,240
VSTO 20	21.58	5.99	0.52	4,708	11,508
VSTO 25	25.02	6.95	0.60	5,460	13,347
VSTO 30	32.69	9.08	0.78	7,131	17,432
VSTO 40	41.37	11.49	0.99	9,026	22,063

## VERTICAL (GRAVITY TYPE OPEN TOP CLARIFIERS) – SIZES AND CAPACITIES

- ARRANGEMENT 2 – OPEN TOP CLARIFIERS

Model	CAPACITY		POPULATION		
	(m <sup>3</sup> /hr)	(lit/sec)	(Ml/day)	110 litres	45 litres
VSTO 50	51.07	14.19	1.23	11,143	27,238
VSTO 60	61.80	17.17	1.48	13,483	32,958
VSTO 70	73.54	20.43	1.77	16,046	39,223