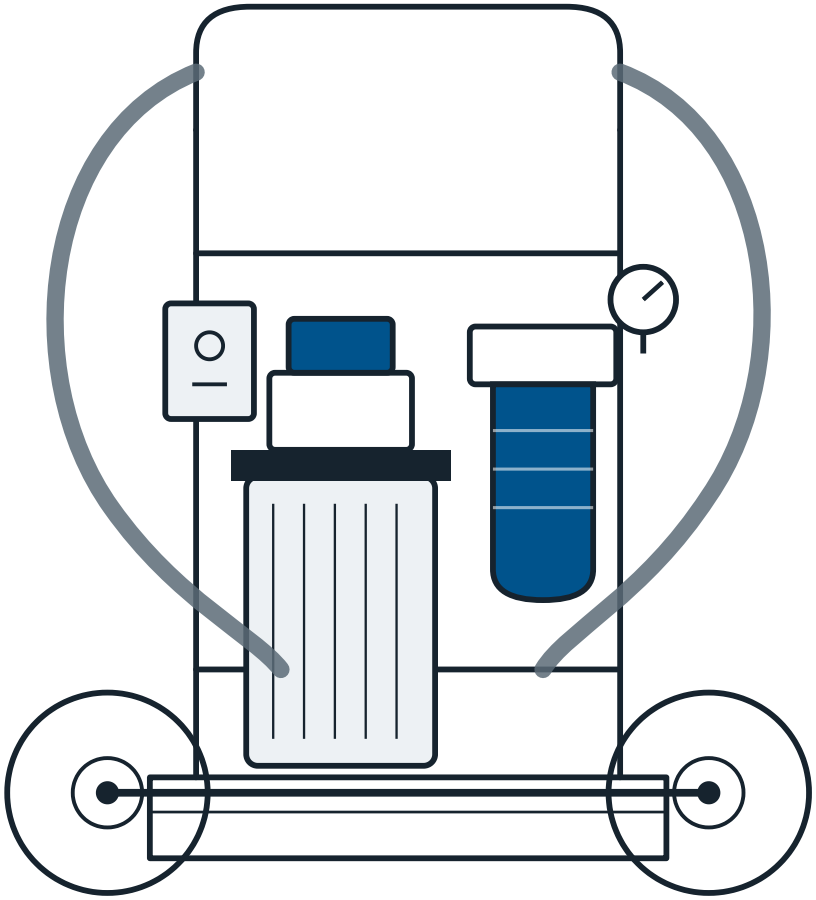


# PORTABLE FILTRATION TROLLEY

Model SHS-PFT-30

**SUYOG HYDROSYSTEMS**
PUNE · INDIA

# PFT-30

## Applications

- Filtering new oil before it is put into service
- Transferring oil from drums or storage tanks to system reservoirs
- Conditioning oil that is already in use
- Supplementing the filtration built into a system
- Topping up reservoirs during maintenance
- For hydraulic, gear, lube and turbine oils

New oil is not clean oil. Oil delivered in a drum is typically no cleaner than ISO 20/18/15, which is worse than every pump and valve in a normal hydraulic system will tolerate. Contamination is picked up during blending, handling, storage and decanting.

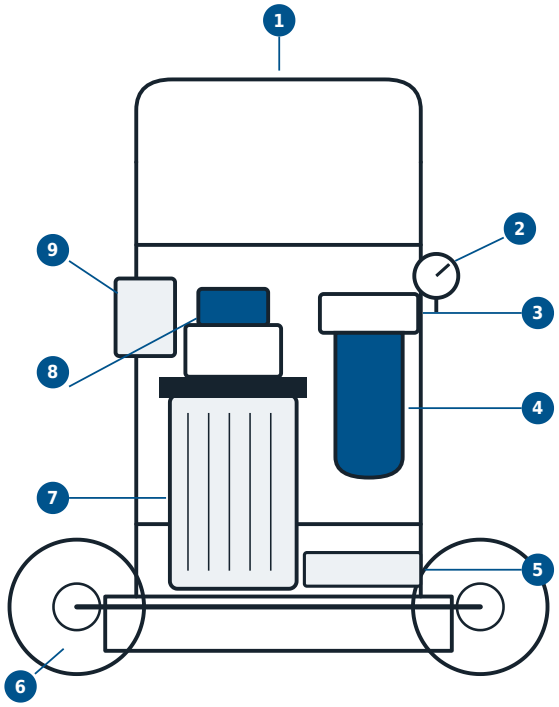
The PFT-30 lets one person filter that oil into the reservoir instead of pouring it in, and lets the same person clean the oil already in a machine without draining it.

A gear pump draws oil through a Y-type strainer and delivers it through a spin-on filter element. A check valve across the filter opens if the element blocks, protecting the element and the pump.

| Feature | Advantage | Benefit |
|---|---|---|
| Spin-on filter element | Element changed in under a minute with no tools and no spillage | Shorter maintenance stops, and no partly dismantled housing left open to dirt |
| Check valve across the filter | Flow bypasses a blocked element at 5 bar instead of collapsing it | The element cannot rupture and shed its own debris into clean oil |
| Y-type suction strainer | Coarse debris is stopped before it reaches the pump | Longer pump life and fewer breakdowns in service |
| Pressure gauge upstream of the filter | Element condition read at a glance while the unit runs | Elements changed when they are actually blocked, not on a guess |
| 0.55 kW TEFC motor, 415 V | Standard Indian industrial supply, no transformer needed | Plugs into any plant socket and runs |
| Two wheel trolley, 52 kg | Tips and moves like a sack barrow | One person operation, no lifting tackle |
| 5 m suction and 10 m delivery hose | Reaches a drum on the floor and a reservoir across the bay | The unit stays put while the operator works both ends |
| Removable drip tray | Carry-over oil is caught and emptied | Clean floor around the machine and around the operator |
| Bought-out components from established makes | Pump, motor, filter and starter are all catalogue items | Spares available anywhere in India, not only from the builder |

# PFT-30

## Features




| | | |
|---|---|---|
| 1 | **Tubular handle** | Balanced so one person can tip and tow the unit. |
| 2 | **Pressure gauge, 0 to 100 psi** | Reads element condition while the unit is running. |
| 3 | **Filter head** | Carries the 5 bar bypass check valve. Flow passes the element rather than collapsing it. |
| 4 | **Spin-on element, 10 µm** | Changed by hand in under a minute. No tools, no open housing, no spillage. |
| 5 | **Removable drip tray** | Lifts out to empty. Keeps the floor around the operator clean. |
| 6 | **10 inch wheels** | Roll over cable, hose and door thresholds without lifting. |
| 7 | **Motor, 0.55 kW TEFC** | 415 V, 3 phase, 50 Hz, class F insulation, B35 flange mounting. |
| 8 | **Gear pump, 21 cc/rev** | 28 lpm at 1440 rpm, close coupled through a bell housing. |
| 9 | **DOL starter** | Thermal overload protection, in an enclosed housing. |

### Not shown

Y-type suction strainer, 149 µm, cleanable · 5 m suction hose and 10 m delivery hose, both with wands · 20 m supply cable with 4 pin plug · one spare element.

# PFT-30

## Specification

**Delivered flow**
28 lpm at 1440 rpm, measured at 5 bar
The model designation refers to the nominal frame and pump size, not to delivered flow.

**Working pressure**
2 to 5 bar

**Maximum system rating**
10 bar, set by the hose assemblies

**Filtration**
Spin-on element, 10 µm
25 µm available to order

**Filter bypass**
Check valve, 5 bar cracking pressure

**Suction strainer**
Y type, 149 µm, 1" BSP, cleanable

**Pump**
External gear, 21 cc/rev

**Electric motor**
0.55 kW, 4 pole, TEFC, class F, B35, frame 80

**Electrical supply**
415 V ±10%, 3 phase, 50 Hz ±5%
DOL starter with thermal overload

**Supply cable**
20 m, 4 core, 1.5 sq mm, with 4 pin 20 A plug

**Suction hose**
5 m, 1" ID, PVC with helical spring, swivel nuts

**Delivery hose**
10 m, ¾" ID, PVC with helical spring, swivel nuts

**Fluids**
Mineral hydraulic, gear, lube and turbine oils

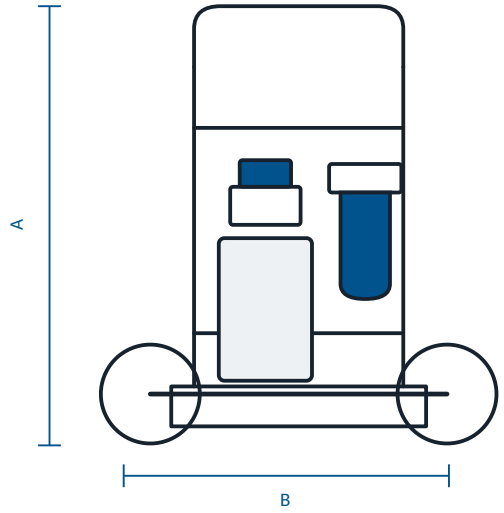
**Fluid temperature**
−10 °C to +60 °C, set by the hose assemblies

**Viscosity at start-up**
150 cSt maximum

**Seals**
Nitrile standard, fluorocarbon to order

**Construction**
Frame, base and drip tray in fabricated steel
Two pack epoxy paint over blast cleaned surfaces

**Dry weight**
52 kg, without oil




| | |
|---|---|
| A — Height | 1000 mm |
| B — Width | 560 mm |
| C — Depth | 480 mm |

Dimensions are nominal, with hoses stowed on the frame.

### Cold oil and the suction line

Start the unit on oil at 150 cSt or lighter. Above that figure the pressure drop through 5 m of suction hose exceeds what a gear pump can draw, and the unit will not prime. Do not reduce the suction hose bore, do not add fittings to it, and keep the lift from oil level to pump below 2 m.

**Ratings are not duties.** The unit works at 2 to 5 bar. The filter head is rated 20 bar, but the PVC hose assemblies are rated 10 bar, and the lower figure is the rating of the machine as supplied. A 0.55 kW motor cannot in any case deliver 28 lpm above roughly 9 bar.

# PFT-30

## Performance

### Cleanliness a component needs

Component makers set a cleanliness level for their products. Compare it with the oil you are actually putting in.

| Component | ISO 4406 |
|---|---|
| Servo valves | 16/14/11 |
| Proportional valves | 17/15/12 |
| Piston and vane pumps | 18/16/13 |
| Directional and pressure valves | 18/16/13 |
| Gear pumps and motors | 19/17/14 |
| Cylinders and flow controls | 20/18/15 |
| New oil, as delivered in the drum | 20/18/15 |

A 10 µm element will typically improve oil cleanliness by **three to four ISO codes** over repeated passes, which is enough to bring new drum oil into the range that gear pumps, piston and vane pumps, directional and pressure valves and cylinders are specified for. Systems built around servo or proportional valves need finer, two stage filtration; ask for a quotation against that duty.

### Planning a clean-up run

Oil is cleaned by passing it through the filter repeatedly. Seven passes is the usual working figure for a noticeable improvement.

| Reservoir | One pass | Seven passes |
|---|---|---|
| 200 litre | 7 min | 50 min |
| 400 litre | 14 min | 1 h 40 min |
| 800 litre | 29 min | 3 h 20 min |

Times are the reservoir volume divided by 28 lpm. They assume the reservoir is well mixed and that the suction and delivery wands are placed well apart. How much the oil actually improves depends on how dirty it was, how fast the system takes in fresh dirt, and the condition of the element.

### Reading the gauge

| Gauge | Condition | Action |
|---|---|---|
| 0 – 25 psi | Element clean | Run |
| 25 – 50 psi | Element loading | Order a replacement |
| Above 50 psi | Element close to bypass | Change before further use |

The bypass check valve opens at 5 bar, about 72 psi. Change the element before the gauge reaches that figure, or oil will pass the element unfiltered. Read the gauge with the unit running and the oil warm; a cold reading is always high and does not mean the element is blocked.

### Element life

Element life depends entirely on how dirty the oil is. On routine drum filtering expect several hundred hours. On the first clean-up of a neglected system, expect to change the element during the job and keep a spare on the trolley.

# PFT-30

## Operating and maintenance instructions

### Before starting

1. Connect the suction hose to the strainer inlet and the delivery hose to the filter outlet. Tighten the swivel nuts by hand and then one turn with a spanner.
2. Fit the wands to the free end of each hose.
3. Put the suction wand into the supply drum and the delivery wand into the receiving reservoir. Both must be below the oil surface before starting.
4. Check the oil is at or below 150 cSt. If it is cold and heavy, warm it before starting.
5. Check the earth connection, then plug into a 415 V 3 phase socket.

### Running

1. Start at the DOL starter and check the direction of rotation against the arrow on the pump. Reversed rotation will damage the pump.
2. Allow up to 60 seconds for the filter to fill and for oil to appear at the delivery wand.
3. If no oil flows, stop and check the suction connections for air leaks before restarting.
4. Watch the gauge once the oil is warm and change the element when the gauge passes 50 psi.
5. Do not run the pump dry, and do not let the suction wand break the oil surface.

### Stopping

1. Stop at the starter and unplug.
2. Lift the wands clear of the oil to stop siphoning.
3. Empty the drip tray and coil the hoses on the frame.

**Warning.** The check valve across the filter is a protective device. Do not restrict, throttle or block the delivery hose. Doing so raises pressure in the unit and can be dangerous to the operator.

### Changing the element

1. Stop the unit and unplug it.
2. Place a tray under the filter head.
3. Unscrew the spin-on element by hand, turning anticlockwise. Use a strap wrench only if it is stuck.
4. Wipe the sealing face on the head clean.
5. Smear clean oil on the seal of the new element.
6. Screw it on until the seal touches the head, then tighten three quarters of a turn by hand. Do not use a tool to tighten.
7. Run the unit and check for leaks.

### Cleaning the strainer

Every 100 hours or whenever the pump becomes noisy: stop the unit, drain the strainer through the plug, remove the cap, lift out the screen, wash it in clean solvent, dry it with compressed air from the inside out, and refit with a new gasket.

| Problem | Cause | Action |
|---|---|---|
| Motor will not start | No supply, tripped overload, blown fuse | Check supply, reset overload, replace fuse |
| Motor runs, no oil delivered | Wrong rotation | Interchange two supply phases |
| | Suction wand above oil level | Submerge the wand |
| | Air leak on the suction side | Tighten connections, check hose for damage |
| Pump noisy, flow erratic | Oil too cold or too heavy | Warm the oil below 150 cSt |
| | Strainer blocked | Clean the strainer screen |
| Gauge reads high, oil warm | Element blocked | Change the element |
| Gauge reads high from cold | Normal on cold oil | Allow the oil to warm before judging |
| Oil delivered but not getting cleaner | Element blocked, flow passing through the bypass | Change the element |
| Leak at the element | Seal not oiled, or overtightened | Remove, oil the seal, refit hand tight |

# PFT-30

## Parts list

| Item | Description | Specification | Qty | Make |
|---|---|---|---|---|
| 1 | Trolley frame with wheels | Fabricated steel, two wheel, handle and kick bar | 1 | SHS |
| 2 | Drip tray | Fabricated steel, removable | 1 | SHS |
| 3 | Gear pump | 21 cc/rev | 1 | Dowty or equivalent |
| 4 | Electric motor | 0.55 kW, 3 ph, 415 V, 50 Hz, TEFC, class F, B35, frame 80 | 1 | ABB or Siemens |
| 5 | Bell housing | To suit pump and motor | 1 | Jacktech or equivalent |
| 6 | Coupling, motor side | Size 19 | 1 | Hydax or equivalent |
| 7 | Coupling, pump side | Size 19 | 1 | Hydax or equivalent |
| 8 | Y type suction strainer | 149 µm, NB25, 1" BSP female | 1 | Reputed |
| 9 | Spin-on filter head with element | 10 µm, rated 20 bar | 1 | Parker or equivalent |
| 10 | Check valve, filter bypass | 25 OD, 5 bar cracking pressure | 1 | Parker or equivalent |
| 11 | Pressure gauge | 0 to 100 psi, glycerine filled, upstream of the filter | 1 | Reputed |
| 12 | Suction hose | PVC with internal helical spring, 1" ID, swivel nuts both ends, 5 m | 1 | Reputed |
| 13 | Delivery hose | PVC with internal helical spring, ¾" ID, swivel nuts both ends, 10 m | 1 | Reputed |
| 14 | Wand assembly | Rigid tube with swivel fitting | 2 | Reputed |
| 15 | DOL starter | For 0.55 kW motor, with thermal overload, enclosed | 1 | Siemens or equivalent |
| 16 | Supply cable | Flexible copper, 4 core, 1.5 sq mm | 20 m | Reputed |
| 17 | Plug and socket | 4 pin, 20 A, 500 V | 1 | Reputed |
| 18 | Adaptors, fittings and fasteners | BSP, carbon steel, zinc plated | Set | Reputed |

### Replacement elements and consumables

| Part number | Description |
|---|---|
| SHS-E-10Q | Spin-on element, 10 µm |
| SHS-E-25Q | Spin-on element, 25 µm |
| SHS-S-149 | Strainer screen, 149 µm |
| SHS-H-S5 | Suction hose set, 5 m, with wand |
| SHS-H-D10 | Delivery hose set, 10 m, with wand |
| SHS-K-SEAL | Seal kit |

Quote the full unit model code when ordering elements.

### Documents issued with each unit

- Operation and maintenance manual in English, three sets
- General arrangement drawing and hydraulic circuit
- Electrical schematic and terminal chart
- Works test certificate
- Manufacturing guarantee certificate, four copies
- Parts and consumables list

### Tested before despatch

- Flow at rated speed
- Pressure hold and leak test
- Bypass check valve cracking pressure
- Insulation resistance and earth continuity
- Continuous run on oil, two hours

# PFT-30

## How to order

Build the model code by selecting one symbol from each box. Every box must be filled.

| BOX 1 | BOX 2 | BOX 3 | BOX 4 |
|---|---|---|---|
| **PFT30** | **10Q** | **N** | **S** |

Example: **PFT30-10Q-N-S** — 28 lpm trolley, 10 µm element, nitrile seals, standard hose set.

### Box 1 — Model

| Symbol | Description |
|---|---|
| PFT30 | 28 lpm |

### Box 2 — Element

| Symbol | Description |
|---|---|
| 10Q | 10 µm |
| 25Q | 25 µm |

### Box 3 — Seal

| Symbol | Description |
|---|---|
| N | Nitrile |
| V | Fluorocarbon |

### Box 4 — Hose set

| Symbol | Description |
|---|---|
| S | 5 m suction, 10 m delivery |
| X | Special, state lengths with the order |

### Electrical supply

Every unit is built for 415 V, 3 phase, 50 Hz. Other supplies are not a catalogue option; ask for a quotation and we will confirm what can be offered and the delivery it carries.

### Special executions

Marine, four wheel and other special executions are engineered to order against a written specification. They are not standard products and are not covered by this catalogue.