

A wide range of turbine flow sensors are available to measure either flow out of a sprayer or the flow into a tank. There are 5 turbine sizes (1/2", 3/4", 1", 1-1/2" and 2") each size available in 3 types of material, coded:-

N/C	Plastic body	Maximum operating pressure - 20 bar
A/C or A/G	Aluminium body	Maximum operating pressure - 40 bar
S/C	Stainless steel body	Maximum operating pressure - 40 bar for highly corrosive applications

Turbines are kitted with hose fittings to suit one of six hose sizes :- 1/2", 3/4", 1", 1-1/4" (1" turbine), 1-1/2" and 2". Before fitting the flow sensor please ensure that you have ordered and been supplied with the correct sensor i.e. that the rated pressure, maximum flow rate and body material is suitable for your application (see specification overleaf).

The pickup sensor is screwed into the turbine housing. There is no direct contact with fluid in the system and so it can be removed and replaced very easily, without leakage.

Depending on the particular sensor kit ordered, the hose tail couplings and turbine body may look different than that illustrated.

**Turbine Kits - Specification**

Size	Flow Range (litres/min)	Max Flow (litres/min)	Cal Factor (pulses/litre)	Part No:	Kit Ref:
1/2" N/C	3 - 30	30	3700	S/SNR/FLOW/005	K/FLW/SNR/006
1/2" A/G	3 - 30	30	3700	S/SR/220-1-009	K/FLW/SNR/010
1/2" S/C	3 - 30	30	3700	S/SR/220-1-017	K/FLW/SNR/009
3/4" N/C	7 - 65	65	1786	S/SNR/FLOW/006	K/FLW/SNR/002
3/4" A/C	7 - 65	65	1786	S/SR/220-1-008	K/FLW/SNR/012
3/4" S/C	7 - 65	65	1786	S/SR/220-1-018	K/FLW/SNR/011
1" N/C	10 - 100	180	650	S/SNR/FLOW/004	K/FLW/SNR/003
1" A/C	10 - 100	180	650	S/SR/500-2-006	K/FLW/SNR/013
1" S/C	10 - 100	180	650	S/SR/220-1-037	K/FLW/SNR/014
1-1/4" N/C*	10 - 100	180	650	S/SNR/FLOW/004	K/FLW/SNR/004
1-1/4" A/C*	10 - 100	180	650	S/SR/500-2-006	K/FLW/SNR/016
1-1/4" S/C*	10 - 100	180	650	S/SR/220-1-037	K/FLW/SNR/015
1-1/2" N/C	35 - 350	700	165.0	S/SNR/FLOW/009	K/FLW/SNR/005
1-1/2" A/C	35 - 350	700	165.0	S/SR/500-2-040	K/FLW/SNR/018
1-1/2" S/C	35 - 350	700	165.0	S/SR/220-1-038	K/FLW/SNR/017
2" N/C	72 - 750	1100	100.0	S/SNR/FLOW/005	K/FLW/SNR/006
2" A/C	72 - 750	1100	100.0	S/SR/500-2-041	K/FLW/SNR/020
2" S/C	72 - 750	1100	100.0	S/SR/220-1-039	K/FLW/SNR/019

\* 1" turbine with 1-1/4" hose tails



K/FLOW/SNR + ALL TURBINE KITS

Standard Pickup Kit K/FLOW/SNR

This sensor is fitted to all turbines except the 1/2" turbine, which requires a special 1/2" pickup.

Pt No.	Description
S/SR/500-2-005	Flow Sensor Pickup
S/CB/220-1-002	Sensor Cable

1/2" Pickup Kit K/FLW/PU-1/2"

Pt No.	Description
S/SR/500-2-017	Flow Sensor Pickup
S/CB/220-1-002	Sensor Cable

Calculating the flow rate

If you are in doubt about the flow range required, you can calculate the flow rate through the sensor as follows;

$$\text{Litres/min} = \frac{\text{Fwd speed (kph)} \times \text{App. rate (l/ha)} \times \text{Nozzle spacing (m)} \times \text{No. of nozzles}}{600}$$

$$\text{Galls/min} = \frac{\text{Fwd speed (mph)} \times \text{App. rate (galls/acre)} \times \text{Noz. spacing (inches)} \times \text{No. of nozzles}}{5940}$$

Installation:

These instructions give important guidelines which apply to any installation. If in doubt about any aspect of installation, please contact an RDS engineer for further advice. The sensor is installed in the pipework of the sprayer at a point which will measure the quantity of liquid being applied to the field. i.e. it must be installed *downstream* of any returns to the tank. In cases where the flow rate is very low i.e. some fruit sprayers, the sensor should be mounted vertically with the flow direction upwards. This ensures that the area around the turbine remains full of liquid.

Full-flow measurement

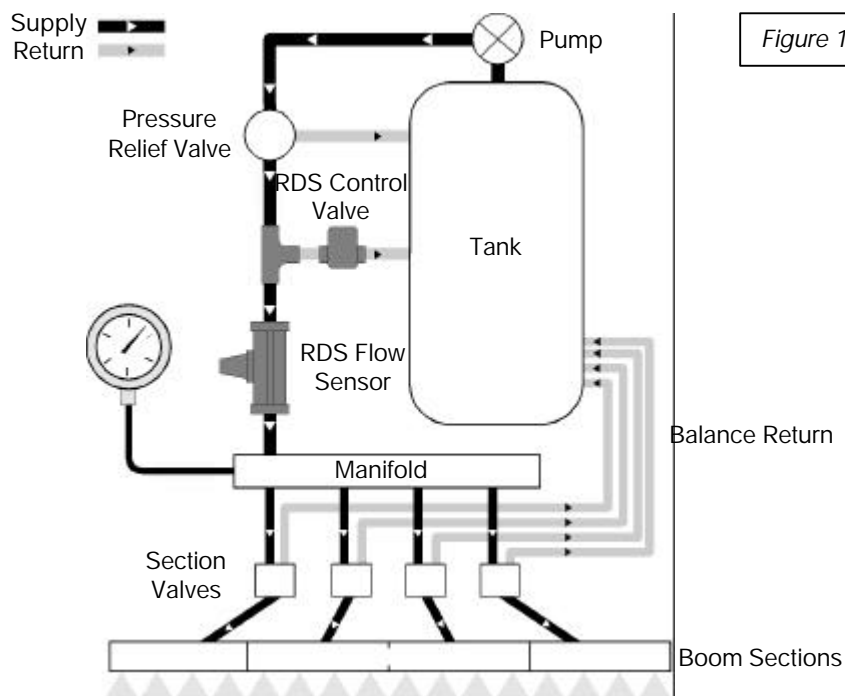


Figure 1

With full flow measurement (figure 1), the whole flow into the manifold is being measured, and this is the best method possible. The exact position of the sensor will depend on the particular sprayer. The sensor can also be fitted onto the end of a 'Hardi' manifold, by inserting a hose loop using 'Hardi' manifold fittings. These are available from sprayer dealers.



**One boom-section flow measurement**

On some sprayers the pressure control valve block and individual boom section outlets are inseparable. In these instances the sensor can be installed in one of the boom section outflows. If this is the only position that the flow sensor can be installed, the head unit must be connected to the boom section switch box using the Sprayer Control Interface cable, in order for the instrument to detect which sections are switched on, and therefore what width is being sprayed at any particular moment.

The main cut out switch must also be connected to the boom section switch controlling the section being monitored by the flow sensor. If not, automatic flow control will not function correctly.

**Boom section valve type**

Some sprayers have a recirculating-flow boom line (figure 1) where flow continually returns to the tank through a fixed orifice or restrictor. The standard flow sensor installation will cater for this configuration but the flow sensor will require re-calibration if the orifice or restrictor size is changed.

Other points to note are;

- (i) A 100 micron filter upstream of the sensor is desirable to ensure a long life for the turbine bearings.
- (ii) Screw hose fittings into the turbine body using PTFE tape, silicone sealant or other suitable thread sealant.
- (iii) The sensor turbine should be inspected and cleaned regularly to ensure that the turbine is running freely. **Do not allow liquid to remain in the sensor line when the sprayer is not in use. This is particularly important if there is a danger of freezing.**
- (iv) All internal wetted parts of the turbines are constructed from Nylon or Stainless Steel. When highly corrosive chemicals are sprayed, ensure that the turbine is thoroughly washed out after use.

**Wiring**

The Flow Sensor Pickup has a short lead terminating in a weatherproof connector. Connect using the extension cable S/CB/220-1-002 as follows,

<i>Sensor Lead</i>	<i>Extension Lead</i>	<i>Function</i>
Brown	Brown	+V
Green	Yellow/Green	Signal
White	Blue	0V

**Tank-filling Sensor**

The in-flow sensor capacity must match the maximum flow rate of the filling pump. It should be installed in the tank filling hose after the primary filter.