Micro Sprinkler Based Module Cleaning Automation Systems

Plasmaberry specializes into automation of various module cleaning systems & Solutions

The solutions are chosen based on various aspects like type of Installation like Rooftop / Ground Mount

1. Environmental conditions , like soiling type and density

2. Availability of Water at site

Types of Automation -

Fundamentally module cleaning system is divided into major groups

1. **Water Based Cleaning using Micro-Sprinklers** - In this cleaning system, specially designed water micro-sprinklers are used. The micro-sprinkler is dedicated to every module and serves cleaning process independently to module. Portrait geometry modules require one sprinkler, however for landscape geometry, pair of sprinklers are required. The entire system is divided into following subsystems.

   a. **uPVC Piping** - for circulating plain water across all the micro-sprinklers. uPVC (Sch-40) quality of pipe ensure long life even though pipes are exposed to UV rays in open environment.

   b. **Micro Sprinkler**s - Micro Sprinklers are connected to uPVC piping through drip laterals. The unit has a capacity to create water umbrella of radius 1.5-1.8 m in single direction (180 degree) at terminal pressure of 3 BAR.

   c. **Filtration Unit** - The water screen filtration unit ensures no dust gets transferred to tinny micro-sprinklers nozzles.

   d. **Pumping Unit** - The water needs to be pumped in the entire system with enough pressure and discharge. Every micro-sprinkler required terminal pressure of 3 BAR with discharge of 100 LPH. The pumping system needs to be designed based on the no. Of sprinklers in use and site demography.

   e. **Storage System -** Typically pumping system is connected with water storage of minimum one cleaning cycle.

   f. **Automation Controller** - The microprocessor based controller helps setting up cleaning schedules of `day / week. There is facility to set more than one cleaning cycles in a day if required . Automation controller divides large no. Of micro-sprinklers into physical zones and sequentially fired. The entire system is operationally human independent.

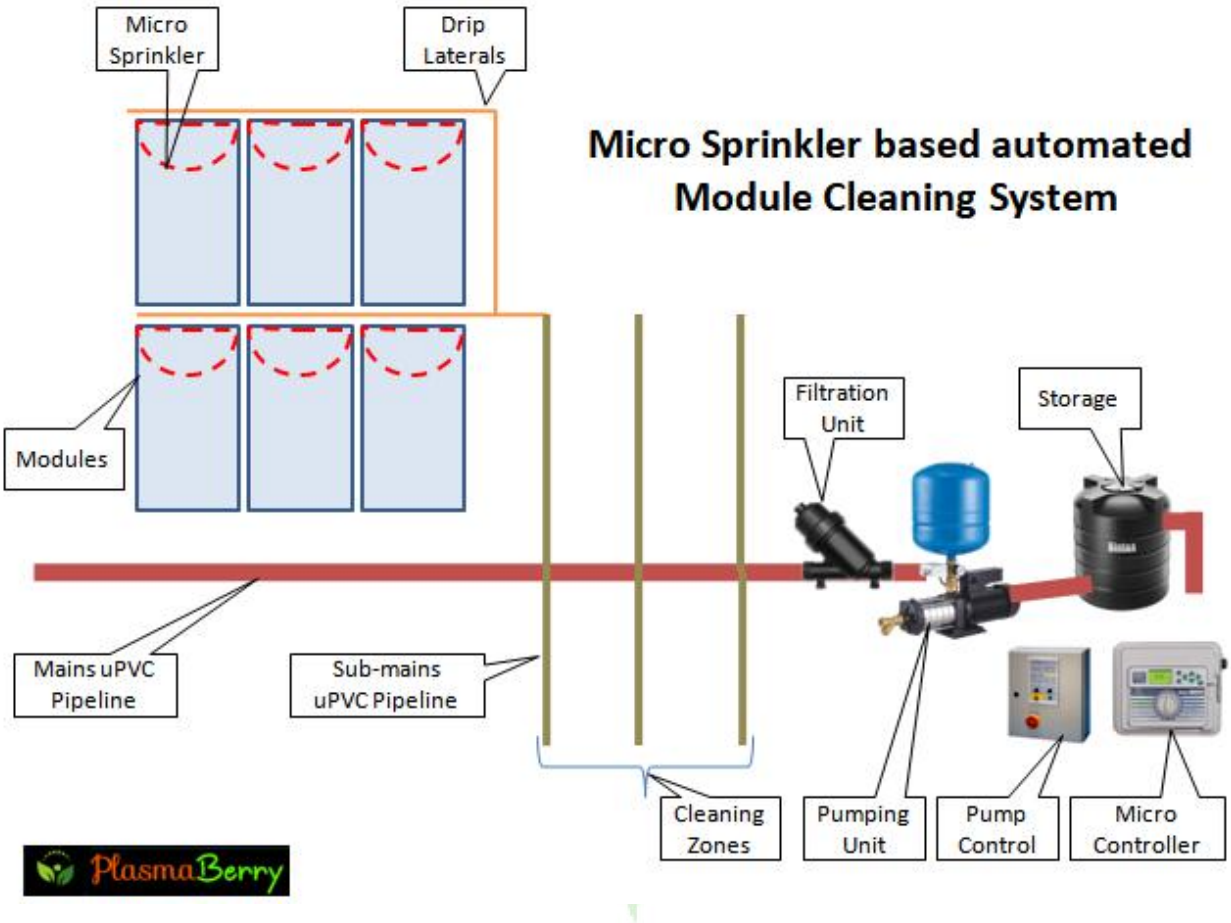
   System uses approximately 1.5 to 1.7 Ltr of water per module per cleaning cycles and virtually requires no maintenance since there are no moving parts in operation.

The system is more applicable and useful, for Rooftop solar System from size of 3 KW to 900KW. It is advisable to plan atleast one cleaning cycle per day for , better cleaning effectiveness.

System work more efficiently, if the solar panels are treated with Anti Dust Shielding so that moist soiling and bird dropping does not stick to PV areas of the module.

Click on the following Video links for better visibility of the solution

https://drive.google.com/drive/folders/1CKRtmnT3LdkQ6pU4d8xz2kuJhE_rmoJ-?usp=sharing



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Technical Comparison between Manual and Sprinkler based Module Cleaning System

	Sprinkler Module Cleaning System	Manual Module Cleaning System
1	Sprinkler water umbrella (1.6m) uses gravitation force and inner pressure (2 BAR) to clean the modules	Require water, pipe and MOP along with minimum team of 2 persons for cleaning cycle
2	Fully automated cleaning	Fully dependent on persons for cleaning
	Since there is no rubbing, Module PV area is protected from scratches and undue pressure on PV area	The modules are subjected to undue pressure and scratches due to manual Mopping
3	Automatic rain sensor for cancelling cleaning cycle during actual raining	Cancellation of cleaning cycle due to rain may still cost as the manpower would be on ground then
4	Uses 1.75 Ltr of water per module cleaning	Requires on an average of 2.5 ltr to 3 Ltr of water per module cleaning
5	Least water wastage on ground	High water wastage on ground
6	No risk and threat to human life when modules are installed on height	Risk to human life while cleaning the modules on steep and heighted rooftops
8	All Sprinkler system accessory components being special plastic , no regular maintenance is required	MOP, Water Pipe requires replacement after few cleaning cycles and skilled people required to undertake cleaning
9	Can be connected to existing water harvesting system	Water harvesting not possible
10	Module Cleaning can be done on every day basis , hence the generation results are better	Cleaning cycle lower than week turns out to be very costly

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AUTOMATED, SPRINKLER SYSTEM FOR MODULE CLEANING

Uplift Solar power generation by 5% to 10%



BENEFITS

1. Fully automatic, No human intervention.
2. Power generation uplift by at least 5% to 10%.
3. Mere 1.75Ltr water required per module

CONTACT US

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SPRINKLER VIDEOS

https://drive.google.com/file/d/1CC9xcqhiZEgVb_EvaSKIFI3VLjhtqEPs/view?usp=sharing

https://drive.google.com/file/d/15AfulAbyP-u3Kc7aqFeolG0WPOtx7xcj/view?usp=sharing

DOWNLOAD- WHITE PAPER

HTTPS://DRIVE.GOOGLE.COM/FILE/D/1GBX8V13IIDQPWHTSGZL3D43R7ECBTDPO/VIEW?USP=SHARING

EFFECT OF SOILING

Airborne dust particles, sticky tree and plant sap, lichen, soot and bird droppings are just a few of the things that can contribute to a build-up of dirt on your modules which leads to generation losses of up to 10% to 25%. Most of the time modules are not cleaned regularly due to

1. *Unavailability of skilled manpower*
2. *Non accessibility to panel areas*
3. *Risk in Climbing high rooftops*

SPRINKLER SYSTEM

We offer is water-sprinkler based programmable & automated Module cleaning systems that helps module cleaning without getting into any inhibitions, and maximizes production from solar system. We use specially designed micro sprinklers controlled by intelligent controller which help entire system custom based schedule driven. System once installed requires minimal maintenance & highly useful where the available water the roofs are risky to operate

SPRINKLER AS A SERVICE – We offer Sprinkler System on Rent. Please contact our sales team for more details.