

# USER GUIDE

# RAINY

Dual Intensity Rainwater  
Harvesting Filter®



## Farmland Rainwater Harvesting Systems

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Winner of National & International Awards from



**JSW** - THE TIMES OF INDIA

**EARTH CARE AWARDS 2010 & 2014**  
Awards for Excellence in Climate Change Mitigation & Adaptation  
'Innovation for Climate Protection'



As a 'Most Innovative  
Water Saving Product'

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## **PLEASE NOTE**

1. Read and understand all instructions in the USER GUIDE for the best result.
2. To set up the system, see the INSTALLATION SECTION Page No. 10.
3. If you have performance problem, see the TROUBLE SHOOTING SECTION page No. 26 in the USER GUIDE.
4. There may be chances of certain variation in efficiency of Filter, due to the type of roof, pipes, fittings and angles of installations, pattern of rainfall etc.
5. The Product Specifications are subject to change without prior notice.

## **WARRANTY**

1. Warranty will be entertained only when original bill of the Distributor/Dealer/Sub Dealer presented with the product under complaint.

# Contents

<b>1. General Information about Rainwater Harvesting</b> .....	2
Quality of Rain water	
Why Filters are required	
<b>2. Various Applications</b> .....	3
<b>3. Borewell Recharging</b> .....	4
<b>4. General Technical Information</b> .....	5
<b>5. Introduction</b> .....	6
<b>6. Rainy FL Series - Technical Parameters</b> .....	8
<b>7. Overall view of the Dual Intensity RWH Filter</b> .....	9
<b>8. Filter Installation - Instructions</b> .....	10
<b>9. Care and Maintenance</b> .....	23
<b>10. Trouble Shooting Information</b> .....	26
<b>11. Precautions</b> .....	27
<b>12. Warranty</b> .....	29

## General information about Rainwater Harvesting System

Water harvesting is the activity of direct collection of rain water. The rainwater collected can be stored for direct use or can be re-charged into the ground water. Rain is the first form of water that we know in the hydrological cycle, hence it is a primary source of water for us. Rivers, lakes and ground water are all secondary sources of water. In present times, we depend entirely on such secondary sources of water. In the process, it is forgotten that rain is the fundamental source that feeds all these secondary sources. Water harvesting is a concept to understand the value of rain and to make optimum use of the rainwater at the place where it falls.

### Quality of Rainwater

All the natural water contains dissolved ions (positive valency anions and negative valency cations) within them.

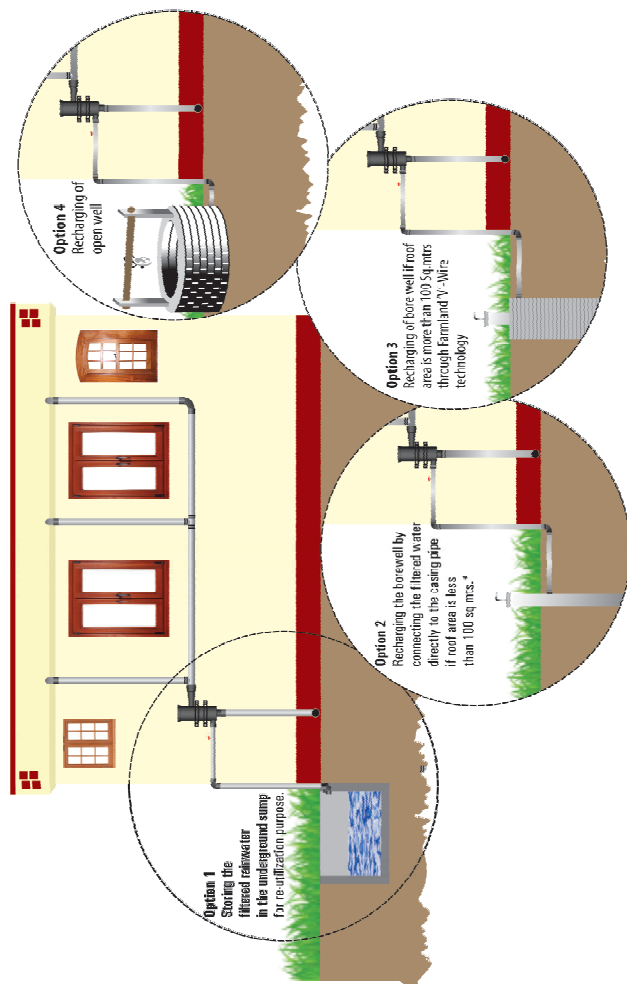
Rainwater which is formed due to natural distillation process (i.e.) evaporation, condensation and precipitation. It is supposed to be in very dilute solution with very less dissolved solids generally between 10-20 mg /liter.

All the dissolved ions present in them are in the range of 1-3 mg /liter. So it is considered to be pure and can be used for regular usage. Moreover their PH is between 6.7 and 7.2 for consumption purposes. But concentration varies from region to region.

### Why filters are required?

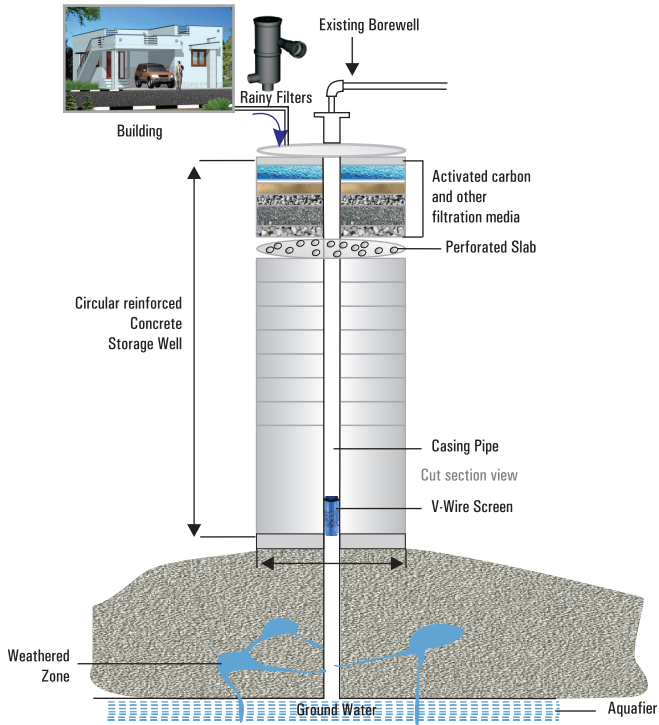
Rainwater is the purest form of water but while it pours down on the roof of the buildings it gets mixed with dirt particles, leaves and debris deposited on the roof and flows through the Rainwater Drain pipes. To flush out these dirt & debris before letting the water into the Sump or Recharging well, proper Filters to be incorporated by studying the size of the Building Roof area, intensity of rainfall, sizes of the Pipeline, sump capacity and Filter capacity etc.

## Various applications through 'Rainy' Filters



\*Please note that the intake of rainwater depends upon the characteristics of individual bore wells. Sometimes, the water may percolate through the casing quickly and in some cases, the bore well may overflow. In that situation, it is advisable to go for a recharging well as in Fig.3

## Rainwater Harvesting from Roof top Buildings (Bore Well Recharge Injection Well)



- ❑ If the rooftop area is more than 100 Sq. meters, A recharge well has to be constructed around the Bore well casing pipe by using reinforced concrete rings to hold the Filtered rainwater, storage well is indispensable to hold the water and slow percolating into the groundwater source since any bore well will not be able to percolate all the received rainwater at a stretch.
- ❑ Specially designed `V` wire Non clogging Strainer is to be fixed to the casing pipe of bore well to allow the water into the casing pipe to recharge the groundwater source
- ❑ Before letting the rainwater into the Recharge well , proper filtration media is to be used.

## General Technical Information

1 meter	= 3.281 feet	1 Imp gallons	= 4.546 liters
1 Square feet	= 0.092 Square Meter	1 cubic feet	= 28.32 liters
1 Square Meter	= 10.7584 Square Feet	1 cubic feet	= 6.23 imp. Gallons
1 Inch	= 2.54 centimeters (25.4 mm)	1 cusec	= 28.32 liters/ second
1 feet	= 304.8 millimeters	1 Mtr <sup>3</sup>	= 0.277 liters per second
1 Hectare	= 2.475 Acres	1 LPS	= 3.6 Mtr <sup>3</sup> /hour
1 Acre	= 0.404 Hectare	1 kg/cm <sup>2</sup>	= 14.3 Pound per square inch
1 Acre	= 4050 Square Meter	1 kg/cm <sup>2</sup>	= 32.8 feet of water
1 Acre	= 43560 Square Feet	1 PSI	= 2.3 feet of water

1 square meter of area at the rate of 25.4 mm precipitation of rain fall, the collection of water=25.43 liters, so, 1 acre of area (43560 SQFT or 4050 SQMTRS) yields 103012.36 liters of water

**Example:** Considering 100 Square Meters of Roof area.

### Calculation:

Roof area in Square meter x coefficient of friction of roof x filter efficiency x rainfall in mm=water in liters.

- Coefficient of friction: evaporation, friction and absorption of water by the roof etc  
Usually 15 to 25% loss of water will be occurred depending upon the type of roofs
- Filter efficiency: It depends upon the type of filter and manufacturers guarantee on performance and efficiency of filter
- Rainfall in millimeter: Per day's highest rainfall or per year's average rainfall to be considered.

Roof area-100 SQMTRS, Coefficient of friction-0.85%, Filter Efficiency-90%, Average Rainfall/year considered 800 mm.

$$100 \times 0.85 \times 0.90 \times 800 = 61200 \text{ liters}$$

### To calculate the required tank size:

Size of the water storage tank can be decided based on the Roof area available for harvesting the rain water and highest rainfall per day or 5% of average rain fall of a year. For the above said area the ideal tank capacity would be 4000 liters.

For the purpose of safe calculation to select the right size of Rain water harvesting filter and to decide Size of Half Round & Normal PVC pipes to collect the Rain water, it is better to consider 20% more capacity than the actuals.

## Introduction

Congratulations for adapting RAINWATER HARVESTING SYSTEM by installing Rainy Dual Intensity Rainwater Harvesting Filter.

'RAINY' First of its kind Rainwater Harvesting Filters with self cleaning and auto flush out arrangements.

'RAINY' Filter in your possession is the result of over 15 years continuous R&D done by the team of FARMLAND RAINWATER HARVESTING SYSTEM, by studying the pattern of rainfall in rural and urban India, intensity of rainfall, type of houses, pipeline used for rainwater outlets, re utilization, recharging of ground water and Tube well etc.

Our continuous efforts, extensive research and development work of over one and half decade resulted in the invention of a completely revolutionary type dual intensity Rainwater Harvesting Filters, works by gravity, based on the working principle of cohesion and centrifugal force. The key point of this filter is the self cleaning mechanism in eliminating the need of periodic maintenance. Constant innovations with the help of cutting edge technologies led to further improvement in the design and manufacture of the rainwater harvesting filters.

It is scientifically designed and built to give you a long and dependable service. Careful selection of materials and manufacturing assures you a satisfactory performance as per the filter rating. All materials used in this technology are eco-friendly and recyclable.

In recognition of the successful implementation of the technology, involving, Rooftop 'Rainy' rainwater Harvesting filters which enabled various walks of life overcome the water crises in most drought prone districts of the state and in some parts of India. The implementation of the technology was recognised and awarded TWO National Awards, one in the year 2009 from Confederation of Indian Industry (CII) as "Most innovative Water Saving Product" and another in the year 2010 from JSW - The times of India "Earth Care Award for Innovation for Climate Protection". In addition to various other recognitions FLRWHS has received the prestigious "Green Champions Award" in the year 2011 presented by Indian Green Building Council. In the year 2014 another International award from JSW - The Times of India "Earth Care Award" Awarded to FLRWHS in relation to our Innovative FL-V Wire Injection Well Technology involving ground water recharge in the Category of 'Innovation for Climate Protection'.

'RAINY' Filter will give you years of trouble free performance if handled with care. This manual is a step in this direction. It covers general instructions about installation and operation of 'Rainy' Filters. Read this manual and comply with the instructions so that your Rainy Filter is bound to serve you well.



# Introduction

## Function of the Filter

Rainy Filters are designed with self-cleaning mechanism and can be fixed to the wall by connecting Rooftop Rainwater Drain Pipes. The Rainwater along with dirt & debris Flows by Gravity through the pipeline, enters into the filter, starts rotating in anticlockwise direction at the periphery of the upper Housing so as to flow into the SS-304 filter element placed in the lower housing in angular Motion at specific speed & velocity which creates Cohesive force at low intensity & centrifugal force during high intensity of rainfall. In both situations, involving low & High Intensity of rainfall, the working principle of the filter based on Cohesive & centrifugal force respectively, aids the filter element to flush out automatically the dirt & debris through the Drain Outlet and simultaneously divert clean water into the Sump or recharging well through the Clean water Outlet, which can be used for reutilization or Recharging of Groundwater Source.

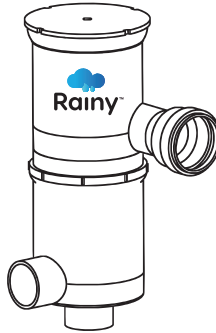
## Special Features:

- ❑ Filters works on the principle of Cohesive & centrifugal force
- ❑ Does not allow stagnation of water & dirt particles
- ❑ Works on gravitational force, Inbuilt Self Cleaning mechanism
- ❑ Automatic Flush out of dirt particles, leaves and debris
- ❑ No consumables are required
- ❑ Filter Pipe connections can be turned up to 360°
- ❑ Provision of Bypass valve
- ❑ No moving Parts, No wear & tear, hence long lasting
- ❑ The filter efficiency remains unchanged even with the variation of intensity of rainfall

## Advantages:

- ❑ Savings in annual requirement of water to the extent of 35%
- ❑ Rejuvenation of dried bore wells.
- ❑ Reduces hardness , salinity and TDS contents in the bore well
- ❑ Reduces significant carbon foot prints, Prevents water logging in low lying areas.
- ❑ The groundwater reserves will remain intact for future generations reducing the dependency on corporation water supply / water tankers.

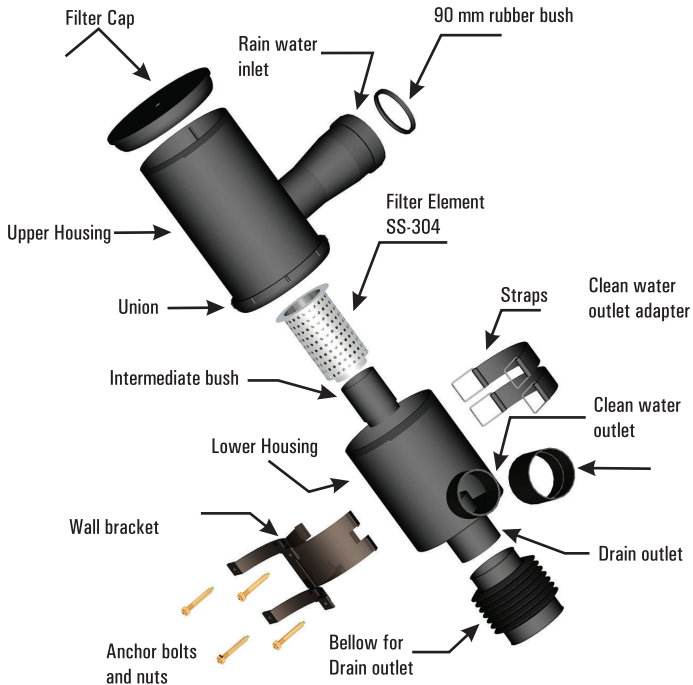
## Rainy FL Series - Technical Parameters



Technical Specifications & Parameters of various models of Rainy FL Series Dual Intensity RWH Filter			
	Rainy FL-200	Rainy FL-300	Rainy FL-500
Suitable up to roof area:	225 SQMTRS	350 SQMTRS	500 SQMTRS
Max: Intensity of Rainfall:	75 mm/hr	75 mm/hr	75 mm/hr
Working Principle:	Cohesive Force & Centrifugal force		
Operating Pressure:	Less Than 2 feet of head (0.060kg/cm <sup>2</sup> )		
Capacity:	225 LPM	340 LPM	480 LPM
Filter Element:	SS-304 Screen	SS-304 Screen	SS-304 Screen
Mesh Size:	250 Microns	250 Microns	250 Microns
Inlet:	110 MM	110 MM	110 MM
Clean Water Outlet:	75 MM	90 MM	90 MM
Drain Outlet:	90 MM	90 MM	110 MM
Housing:	High Density Polyethylene		
Efficiency of Filter:	Above 90%	Above 90 %	Above 90%
Source of power:	Gravity	Gravity	Gravity

The characteristic features of FL Series Dual Intensity RWH Filters are its capacity to take up the load up to 50 to 500 square meters of Roof area even at highest intensity of rainfall of 75 mm/ hour with a discharge capacity of 105 to 480 LPM. This filter can be conveniently used for Harvesting Rainwater for Individual households, Schools, apartments, institutions, and commercial Buildings of Medium and large sizes.

## Overall View of Dual Intensity Rainwater Harvesting Filter



S.I.No.	Description	S.I.No.	Description
01	Filter cap	07	Straps
02	Upper housing	08	Wall bracket
03	Rubber bush	09	Anchor bolts & nuts
04	Union	10	Lower housing
05	Filter element-SS 304	11	Clean water outlet adapter
06	Intermediate bush	12	Bellow for drain outlet

## Filter installation - Instructions



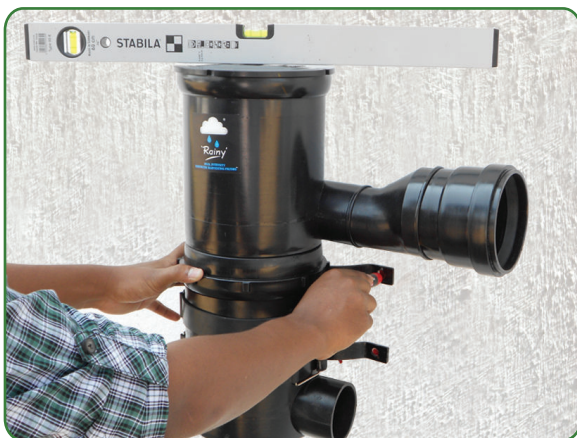
Keep the Roof clean.



Inter connect the down flow pipes and draw  
the line till the point of Filter location



Place the filter assembly on the wall bracket.  
Then, pull the strap and hook up to the wall bracket



Place the filter against the wall to spirit level as shown  
in the figure and mark the point to fix the wall bracket



Drill the holes to the wall as per the marking.



Fix the wall bracket with anchor bolts  
and tighten the nuts properly



Fix the Filter to the wall bracket through straps.



Set the direction of filter inlet and outlet just rotating by hand

## Rainwater Inlet Connection



Once the direction of filter inlet and outlet pipe connections are set connect the down spout pipe to the inlet of the filter.



Fix 'L' angular clamps with 'U' bolts and anchor bolts with adjustable 'C' Clamps at inlet pipe.



## Drain Outlet Connection



Insert the bellow to the drain outlet with clips



Insert PVC pipe with elbow into the bellow



Fix the 'L' angular clamps with 'U' Bolts and clips to sustain the weight of the drain pipe.

## Delivery Line



Insert rubber bush to the clean water outlet.



Fix bypass valve with suitable clamps and fixtures



Connect the delivery line to the sump / recharging well with necessary length of pipe and fixtures.



Remove the filter cap by rotating clockwise direction



Insert the intermediate bush inside the lower housing



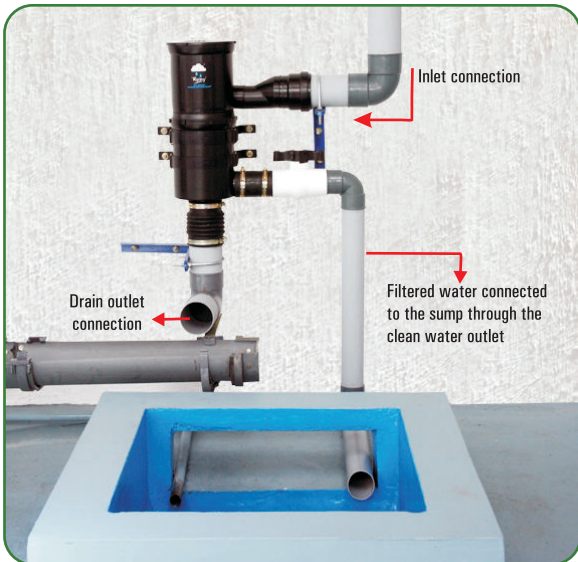
Insert the filter element inside the upper housing.



Lock the filter cap by rotating anticlockwise



Use special tool to tighten it fully



Completion of the filter installation



Keep always open the bypass valve during the rainy season.



Close the bypass valve after rainy season to divert the sudden summer rains into the drain

## Fitment of L Angular clamps



To sustain the weight of the Pipe line,  
“L” angler clamps should be used.



Before inserting the 'U' bolts to the L-clamp,  
tighten the lock nuts with washers



## Care and Maintenance

1. In Low roof units and drizzling rain like situations
2. In Asbestos sheet Roofs
3. In dust Prone areas
4. In areas covered by moss on rooftops.



Unlock the filter cap with special tool or with gentle hand pressure in clockwise direction and remove the filter element (Strainer).



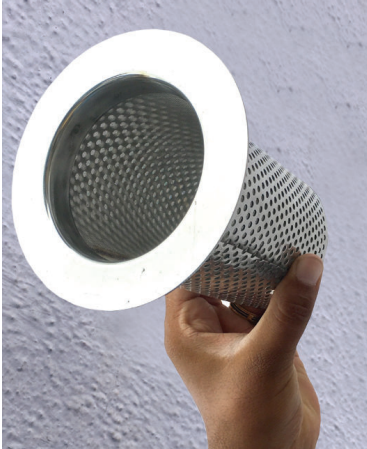
Wash the filter with a garden hose or under the tap



Clean it up with a Brush



Wash it thoroughly



Once cleaning is done, lift the filter element and observe the sunlight, light should pass through the filter element sieve. If sun light passes, re-insert the filter element.



Even after cleaning by brush in regular course, Light does not pass, is an indication that dirt remains in the sieve and blockage of Screen may hamper the filter efficiency, releasing more discharge at drain outlet.



In such instances kindly clean the filter element with high pressure nozzle by taking to the nearest water service station till clear light passes through the filter sieve.

## Trouble shooting information

Problems	Solutions
<p>When less discharge through the clean water outlet and more discharge of water through the drain water outlet</p>	<ol style="list-style-type: none"> <li>1. Open the filter cap and check if there is any blockage in housing or filter element. In case of any blockage of housing or filter element, clean the same.</li> <li>2. In low operating pressures, asbestos sheet rooftop and in dust prone areas frequent cleaning of filter element is advisable.</li> <li>3. Check the filter element (SS-304). In case of clogging remove the same and wash it with garden hose or under the tap, clean it up with a brush. After the wash and proper cleaning Re-insert the filter and tighten the filter cap and start operating the system. Clean the filter element periodically to avoid clogging.</li> </ol>
<p>During water logging on rooftop/ insufficient discharge to the filter INLET.</p>	<p>There might be chances of blockage at entry point of roof top rain inlet pipe, blockage in the elbows or joints of Rainwater pipe line connections, blockage at filter entry point, blockage in the horizontal pipeline, blockage in Drain outlet, Improper selection of pipe diameter, etc. Check all the above parameters, clean the roof top, remove the blockage, repair &amp; re-fit the pipeline and test the system for free flow.</p>

## Precautions

- A. Keep the rooftop clean don't keep any hazardous materials like paints, glass item, old junk materials etc, on ROOF TOP.
- B. The sheltering and leashing the domestic pets on RCC Rooftop is to be strictly avoided in order to maintain the cleanliness and to avoid the contamination of rainwater.
- C. **After the monsoon:** close the BYPASS VALVE, so that first Rain water will be drained out along with all dust & dirt particles on the roof top through drain water outlet.
- D. Don't wash clothes on the Rooftop and leave the detergent water to sump or Recharging well. It is very harmful to the health. Precautions should be taken to avoid the detergent water reaching to the sump or the Recharging well.
- E. Rainwater is the purest form of water, if you want to use for potable use, It is advisable to analyze the water by competent Authorities for potable use.
- F. Don't keep open your tank door. Expose of rainwater, form algae soon. Avoid exposing the water stored in the sumps to direct sunlight and air.



## WARRANTY

This filter carries a warranty against defects in material and workmanship, under normal use and service for a period of 12 months from the date of Dealer's/Sub dealer's invoice (purchase bill of the end user).

Customer's Name.....

Address.....

.....

Filter Model..... Sr. No.....

Date of Purchase..... Bill/ Cash Memo No.....

Customer's signature .....

Dealers Stamp and Signature.

### WARRANTY TERMS & CONDITIONS

1. Warranty will be entertained only when original bill of the distributor/ dealer/sub dealer presented with the product under complaint.
2. Warranty does not cover damage to the product caused by accident, misuse, and additional modification done to the system.

**SUBJECT TO CHIKAMAGALUR jurisdiction ONLY**

# RAINY

## Dual Intensity Rainwater Harvesting Filter<sup>®</sup>



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