



PROCON VENTURES

ENGINEERING • INNOVATION • EXCELLENCE

*"Don't fight it.
Change its **behaviour**."*

PV WCS

WATER CONDITIONING SYSTEM

FIELD INTELLIGENCE & TRAINING MANUAL

SALES • APPLICATION • OPERATION



INFLUENCES MINERAL BEHAVIOUR
Reduces scale adhesion tendencies



SUPPORTS SYSTEM EFFICIENCY
Improves circulation & operational stability



NON-CHEMICAL SOLUTION
No chemicals, no consumables



PROGRESSIVE & STABLE
Gradual improvement during normal operation



SYSTEM CATEGORIES



CATEGORY 1

DIRECT PIPELINE SYSTEM

(SINGLE-PASS CONFIGURATION)

Simple. Effective. Efficient.



CATEGORY 2

STAND-ALONE RECIRCULATION SYSTEM

(MULTI-PASS CONFIGURATION)

Premium. Controlled. Advanced.



ENGINEERED
FOR PERFORMANCE



BUILT FOR
SUSTAINABILITY



TRUSTED FOR
RELIABILITY

PROCON VENTURES
ISO 9001:2015 CERTIFIED



02 UNDERSTANDING HARD WATER

THE FOUNDATION OF EFFECTIVE WATER CONDITIONING

To design the right approach, we must first understand what hard water is, what it contains, and why it behaves the way it does.



WHAT IS HARD WATER?

Hard water contains naturally occurring dissolved minerals, primarily calcium, magnesium and other inorganic compounds.



KEY MINERALS FOUND IN HARD WATER



CALCIUM Ca²⁺

Contributes to scale hardness and deposits.



MAGNESIUM Mg²⁺

Enhances scale formation and hardness.



SILICA & OTHER MINERALS
SiO₂, Iron, etc.
Contribute to scale structure and fouling behaviour.



IMPORTANT UNDERSTANDING

Hard water itself is not the enemy.

The real issue begins when these minerals tend to react, combine and adhere to surfaces under certain operating conditions.



FIELD NOTE

Water quality may vary, but mineral behaviour is predictable. Understanding it is the first step to controlling it.



03 HOW SCALE FORMS

Scale formation is a natural process. It happens in stages.



DISSOLVED MINERALS

Minerals are present in dissolved form in water.



CONDITION CHANGE

Change in temperature, pressure, pH or water movement initiates instability.



CRYSTAL FORMATION

Minerals start forming tiny crystals (nucleation).



ADHESION

Crystals adhere to surfaces inside pipes, heaters, tanks and fittings.



HARD SCALE BUILD-UP

Layer grows thicker, becomes hard and reduces system efficiency.



WHY IT BECOMES A PROBLEM



Reduces pipe diameter and flow



Restricts water flow and pressure



Reduces heat transfer efficiency



Increases energy consumption



Increases maintenance and downtime



Shortens life of equipment and systems



KEY TAKEAWAY

The goal is not to remove minerals from water.

The goal is to influence mineral behaviour.

PV WCS is designed to influence how minerals behave, so that scale adhesion is reduced and system performance is improved.





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PV WCS PHILOSOPHY SCIENCE. NOT CHEMISTRY.

PV WCS is a physical water conditioning system based on proven principles of controlled nucleation and crystal modification.

HOW PV WCS WORKS



CONDITIONING ZONE
Water passes through the conditioning chamber.



ENERGY INTERACTION
The system induces controlled physical changes in minerals.



CRYSTAL MODIFICATION
Mineral crystals are modified to a stable, non-adherent form.



SCALE PREVENTION
Modified crystals remain in suspension and pass through.



SYSTEM PROTECTION
No scale deposition. Better efficiency. Longer equipment life.

KEY BENEFITS OF PV WCS



PREVENTS SCALE
Prevents hard scale formation on critical surfaces.



IMPROVES EFFICIENCY
Maintains heat transfer efficiency and reduces energy consumption.



ENSURES SMOOTH FLOW
Reduces blockages and maintains optimal flow.



EXTENDS EQUIPMENT LIFE
Reduces wear, tear and maintenance requirements.



ECO FRIENDLY
No chemicals. No salt. No waste. Just smart conditioning.



FIELD INSIGHT

PV WCS does not remove minerals.
It changes the way minerals behave.
That's why it is safe, sustainable and effective.



PV WCS
WATER CONDITIONING SYSTEM

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'Don't fight it.
Change its behaviour.'

05

SYSTEM CATEGORIES TWO ARCHITECTURES. ONE GOAL.

PV WCS is available in two system configurations to suit different application needs and performance expectations.

CATEGORY 1

DIRECT PIPELINE SYSTEM (SINGLE PASS CONFIGURATION)

SIMPLE. EFFECTIVE. EFFICIENT.



RECOMMENDED FOR

- Standard Residential Systems
- Villas / Independent Houses
- Moderate Application Conditions

KEY HIGHLIGHTS

- ✓ Single pass through the PV WCS unit.
- ✓ Easy to install and maintain.
- ✓ Cost effective solution.
- ✓ Ideal where flow rates are moderate and system complexity is low.

The right choice for standard residential needs.

CATEGORY 2

STAND-ALONE RECIRCULATION SYSTEM (MULTI PASS CONFIGURATION)

CONTROLLED. STABLE. ESSENTIAL.



RECOMMENDED FOR

- Premium Residential Systems
- Commercial Establishments
- Industrial Circulation Systems
- Cooling Towers & Process Loops

KEY HIGHLIGHTS

- ✓ Water is conditioned multiple times.
- ✓ Ensures uniform conditioning throughout the entire system.
- ✓ Essential for high load and critical applications.
- ✓ Delivers superior protection and performance.

POSITIONING

The premium choice for premium residential.
The essential choice for industrial systems.
Here, we cannot compromise.

SELECTION GUIDELINE

APPLICATION TYPE

Standard Residential
Premium Residential
Commercial Establishments
Industrial Circulation Systems

RECOMMENDED CONFIGURATION

Direct Pipeline System (Single Pass)
Stand-Alone Recirculation System (Multi Pass)
Stand-Alone Recirculation System (Multi Pass)
Stand-Alone Recirculation System (Multi Pass) – ESSENTIAL



SMART CONDITIONING.
STRONGER SYSTEMS.

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WHY CIRCULATION MATTERS

MOVING WATER STAYS STABLE.
STAGNANT WATER CREATES PROBLEMS.

Water that moves stays conditioned. Water that doesn't, creates scale, sludge, corrosion and inefficiency. PV WCS works best in systems with continuous and proper circulation.

STAGNANT vs MOVING WATER

STAGNANT WATER	MOVING WATER
- Minerals settle down - Concentration increases - Scale & sludge formation - Corrosion risk increases - Heat transfer efficiency drops - Energy consumption goes up - Equipment life reduces	- Minerals stay in suspension - Uniform concentration - No scale, no sludge - Corrosion risk reduces - Heat transfer efficiency improves - Energy consumption reduces - Equipment life extends

KEY BENEFITS OF PV WCS

PREVENTS SCALE Prevents hard scale formation on critical surfaces.	IMPROVES EFFICIENCY Maintains heat transfer efficiency and reduces energy consumption.	ENSURES SMOOTH FLOW Reduces blockages and maintains optimal flow.	EXTENDS EQUIPMENT LIFE Reduces wear, tear and maintenance requirements.	ECO FRIENDLY No chemicals. No salt. No waste. Just smart conditioning.
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FIELD INSIGHT

Circulation is not just flow.
It is the continuous distribution of conditioned water to every part of the system.



PV WCS
WATER CONDITIONING SYSTEM
FIELD INTELLIGENCE & TRAINING MANUAL



CIRCULATION BEHAVIOUR IN SYSTEMS

	Uniform flow, no dead legs. WCS performs at its best.
	Some dead zones present. Risk of scale & sludge in those areas.
	Water not moving in dead legs. High risk of scaling and corrosion.
	Complete stagnation. Severe scale, sludge and corrosion.



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INSTALLATION DISCIPLINE

RIGHT INSTALLATION. RIGHT RESULTS.

Correct installation and system hygiene are critical for PV WCS effectiveness. Follow these guidelines to achieve best performance and long-term benefits.



'Don't fight it.
Change its behaviour.'

PRE-INSTALLATION CHECKLIST



- ✓ Tank / System cleaned
- ✓ Sludge / Deposits removed
- ✓ System leak-free
- ✓ Proper make-up water control
- ✓ Electrical connection safe

SYSTEM CONFIGURATIONS

CATEGORY 1

SINGLE PASS SYSTEM

(SIMPLE, EFFECTIVE.)

Water passes once through the WCS unit. Ideal for systems with normal consumption.



INSTALLATION

- ✓ Install PV WCS unit on the PUMP DISCHARGE SIDE.
- Never install on suction side.

CATEGORY 2

MULTI PASS SYSTEM

(CONTROLLED, STABLE, INTELLIGENT.)

Water circulates repeatedly through the WCS unit. Ideal for critical systems and high load applications.



SYSTEM INCLUDES

- ✓ Dedicated recirculation pump
- ✓ PV WCS unit
- ✓ Electrical control panel with timer
- ✓ Automatic operation (Auto ON / OFF cycles)

CRITICAL INSTALLATION GUIDELINES

- ✓ Install PV WCS on the PUMP DISCHARGE SIDE.
- ✓ Install a suitable STRAINER on the PUMP SUCTION SIDE.
- ✓ Ensure minimum water level above pump suction at all times (min. 1 ft / 300 mm). Suction must always remain flooded.
- ✓ Avoid installation in sludge settling zone or dead legs.
- ✓ Ensure proper support for the unit and all piping.
- ✓ Provide power through stable supply.
- ✓ Use automatic operation with system pump.

CORRECT vs INCORRECT INSTALLATION

CORRECT INSTALLATION

- ✓ WCS unit on pump discharge line.
- ✓ Maintain minimum 1 ft (300 mm) water level above pump suction.
- ✓ Pump suction always flooded.
- ✓ Smooth circulation, stable performance.

INCORRECT INSTALLATION

- ✗ WCS unit on suction side. (Not effective)
- ✗ Insufficient water level. Suction not flooded. (Risk of air, cavitation, pump damage)
- ✗ Dead leg / bypass installation. (High risk of scale, sludge & corrosion)

FIELD NOTE

The best technology will not perform if installation is wrong.
Discipline in installation is the first step towards problem-free operation.

SELECTION GUIDELINE

APPLICATION TYPE

Standard Residential
Premium Residential
Commercial Establishments
Industrial Circulation Systems

RECOMMENDED CONFIGURATION

Direct Pipeline System (Single Pass)
Stand-Alone Recirculation System (Multi Pass)
Stand-Alone Recirculation System (Multi Pass)
Stand-Alone Recirculation System (Multi Pass) – ESSENTIAL

DISCLAIMER

The information in this manual is based on field experience and engineering understanding. Results may vary depending on water chemistry, system design, operating conditions and maintenance practices.



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Installation & Circulation
Best Practices Video



SMART CONDITIONING.
STRONGER SYSTEMS.

06

PV WCS
WATER CONDITIONING SYSTEM

BETTER WATER BEHAVIOUR.



BETTER SYSTEM PERFORMANCE.

07



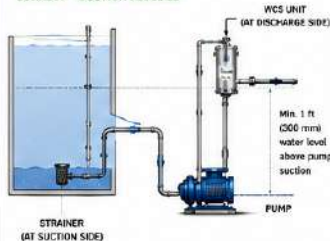
08 WATER LEVEL & SUCTION DISCIPLINE FLOODED SUCTION. RELIABLE OPERATION.

Maintaining proper water level is critical to ensure the pump suction is always flooded. This prevents air ingress, cavitation, damage and unstable circulation.

KEY PRINCIPLE
A PUMP CAN LIFT WATER, BUT IT CANNOT LIFT AIR.
Always keep the suction flooded.

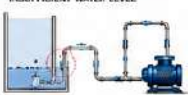
MAINTAIN PROPER WATER LEVEL

CORRECT - SUCTION FLOODED



INCORRECT - SUCTION STARVED

INSUFFICIENT WATER LEVEL



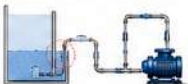
- 1 Air enters suction
- 2 Cavitation risk
- 3 Noisy operation
- 4 Pump damage
- 5 Unstable flow

PUMP NOT FLOODED (RISK OF AIR LOCK)



- 1 Air lock in suction
- 2 Loss of prime
- 3 Frequent failures
- 4 High maintenance

DEAD LEG / BYPASS EFFECT



- 1 Water stagnation
- 2 Poor circulation
- 3 Scale & sludge accumulation
- 4 Ineffective conditioning

MINIMUM RECOMMENDED WATER LEVEL

PUMP LOCATION	MIN. WATER LEVEL ABOVE PUMP SUCTION
Pump on same level as tank bottom	300 mm (1 ft)
Pump below tank bottom level	300 mm (1 ft) minimum (measured from suction orifice)
High temperature systems	Increase level for better stability
Systems with sludge tendency	Maintain higher level to avoid suction of sludge

WHY FLOODED SUCTION MATTERS

- Prevents cavitation and pump damage
- Improves system efficiency
- Ensures smooth and silent operation
- Reduces maintenance
- Maintains uniform circulation
- Extends equipment life

REMEMBER

- Keep suction line short and straight.
- Use proper strainer and keep it clean.
- Never allow the pump to run dry.
- Check water level regularly.

FIELD NOTE

Most pump failures in water systems are not due to pump quality, but due to improper installation and suction starvation.



09 SYSTEM PROTECTION & RELIABILITY SAFEGUARDING THE SYSTEM. ENSURING CONTINUITY.

A well-protected system ensures consistent performance, protects equipment, and reduces downtime. Follow these guidelines for long-term reliability.

PRE-OPERATION CHECKLIST

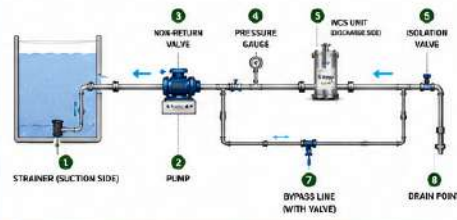


- Water level adequate
- Strainer clean
- All valves open
- No leakage
- Electrical panel healthy
- Timer / Control set

ESSENTIAL PROTECTION DEVICES

DEVICE	PURPOSE
Strainer (Suction Side)	Prevents solids, scale & sludge from entering the pump.
Non-Return Valve (After Pump)	Prevents backflow and protects the pump during stop.
Pressure Gauge (Discharge Side)	Helps monitor system pressure and detect abnormalities.
Isolation Valve	Allows easy maintenance without draining the system.
Bypass Line (With Valve)	Ensures uninterrupted operation during maintenance.
Drain Point	For cleaning, flushing and maintenance.

TYPICAL INSTALLATION WITH PROTECTION



NOTE: WCS unit is always installed on the PUMP DISCHARGE SIDE.

AUTOMATIC OPERATION - MULTI PASS SYSTEM

DEDICATED SYSTEM WITH AUTO CONTROL



BENEFITS OF AUTO OPERATION

- Consistent conditioning cycles
- No manual intervention
- Energy efficient
- Better system stability
- Reduced human error
- Longer equipment life

RECOMMENDED MAINTENANCE SCHEDULE

TASK	FREQUENCY
Clean strainer	Weekly / As required
Check water level	Daily
Check for leaks	Weekly
Check pressure	Weekly
Inspect electrical panel	Monthly
Flush & drain system	Monthly / As required
Check timer settings	Monthly
General inspection	Monthly



MAINTENANCE MANTRA

Small inspections today prevent big failures tomorrow.

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STRONGER SYSTEMS.





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10 WATER QUALITY & SYSTEM COMPATIBILITY

GOOD WATER BEHAVIOUR STARTS WITH GOOD QUALITY.

PV WCS works best with controlled water quality. Extreme deviations can affect efficiency and system components. Maintain within recommended ranges for optimal performance.

RECOMMENDED WATER QUALITY PARAMETERS

PARAMETER	IDEAL RANGE	MAXIMUM LIMIT	IMPACT IF HIGH	TEST FREQUENCY
pH	7.0 - 8.5	9.0	Scale, corrosion, reduced efficiency	Weekly
Total Hardness (as CaCO ₃)	100 - 300 ppm	600 ppm	Scale formation	Weekly
Calcium (as Ca)	20 - 100 ppm	200 ppm	Scale formation	Weekly
TDS	< 1000 ppm	2000 ppm	Scaling, ineffective conditioning	Weekly
Chloride (as Cl)	< 250 ppm	500 ppm	Corrosion (pitting)	Weekly
Sulfate (as SO ₄ ²⁻)	< 250 ppm	500 ppm	Scale, corrosion	Weekly
Iron (as Fe)	< 0.3 ppm	1.0 ppm	Staining, fouling	Monthly
Silica (as SiO ₂)	< 50 ppm	100 ppm	Scale (silica)	Monthly
Temperature	< 60 °C	70 °C	Reduced system life	Continuous

NOTE: Water quality outside recommended limits may require chemical treatment in addition to PV WCS.

EFFECT OF POOR WATER QUALITY



BEST PRACTICES

- Use treated make-up water
- Avoid sudden changes in water quality
- Monitor regularly and maintain logs
- Act before problems become visible
- Combine PV WCS with proper system discipline



FIELD TIP

Good water quality reduces the load on PV WCS and extends the life of the entire system.

WATER QUALITY MONITORING LOG (SAMPLE FORMAT)

DATE	pH	TH (ppm)	TDS (ppm)	CHLORIDE (ppm)	TEMP (°C)	REMARKS	CHECKED BY



QUALITY PRINCIPLE

GOOD QUALITY + CORRECT CIRCULATION + DISCIPLINE = STABLE SYSTEM PERFORMANCE



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'Don't fight it. Change its behaviour.'

11 COMMISSIONING & START-UP PROCESS

DISCIPLINED START-UP. RELIABLE PERFORMANCE.

A systematic start-up ensures the system is clean, air-free, and operating under stable conditions for best results from day one.



START-UP PRINCIPLE

CLEAN SYSTEM → AIR FREE → CORRECT CIRCULATION → STABLE OPERATION

STEP-BY-STEP COMMISSIONING PROCEDURE



IMPORTANT START-UP NOTES

- Never start the pump without water in the system.
- Ensure pump suction is always flooded (minimum 1 ft water level above pump suction).
- WCS unit must be on pump discharge side.
- Ensure all valves are in the correct position as per design.
- Start at low flow and gradually bring to normal flow.
- Monitor for vibration, noise, and abnormal readings.
- Recheck and tighten connections after 2-4 hours of operation.

DO NOTS DURING START-UP

- Do not run pump with closed discharge valve.
- Do not bypass WCS unit.
- Do not ignore air pockets in high points.
- Do not start with dirty or partially filled system.
- Do not exceed design pressure or temperature.

TYPICAL START-UP CHECK POINTS

CHECK POINT	ACCEPTABLE CONDITION	REMARKS
Pump suction	Flooded (min. 1 ft water level above suction)	Always maintain
Strainer	Clean and not bypassed	Check regularly
WCS unit	On discharge side, flow confirmed	Single or Multi pass
Pressure	Within design range	Stable
Temperature	Within design range	Stable
Leaks	No leakage at any joint	None
Air removal	All vents closed after de-aeration	System air-free

MULTI PASS SYSTEM - INITIAL SETTINGS



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Commissioning & Start-up
Best Practices Video



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STRONGER SYSTEMS.





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TROUBLESHOOTING GUIDE QUICK IDENTIFICATION, FAST RESOLUTION.

Most issues can be prevented with proper installation, operation and maintenance.
Use this guide to quickly identify the cause and apply the right action.



TROUBLESHOOT SMART

OBSERVE → IDENTIFY →
ANALYZE → CORRECT → VERIFY
Small actions today prevent
big failures tomorrow.

ISSUE	POSSIBLE CAUSE	OBSERVATION / SYMPTOMS	CORRECTIVE ACTION
Low or No Flow	- Pump not running - Air lock in suction - Strainer blocked - Low water level	- Pump ON but no flow - Air sounds in piping - Low suction pressure	- Start pump / Check power - Release air from system - Clean strainer - Maintain minimum 1 ft water level
High Pressure	- Strainer clogged - Scale build-up - Valve partially closed	- Pressure gauge high - Flow reduced	- Clean strainer - Flush system - Open valves fully
Pump Vibration / Noise	- Air in system - Loose mounting - Cavitation (low suction)	- Vibration / unusual noise - Fluctuating pressure	- Remove air - Tighten mounting - Ensure flooded suction
Poor Conditioning	- Wrong WCS location - Incorrect system type - Insufficient circulation	- Scale / sludge continues - No improvement	- Ensure WCS on pump discharge - Verify Single Pass / Multi Pass - Check circulation and timer
Frequent On/Off (Pump)	- Leaks in system - Air ingress - Pressure setting issue	- Pressure drops quickly - Pump cycles repeatedly	- Check and fix leaks - Remove air - Adjust pressure settings
Timer Not Working (Multi Pass)	- Timer setting incorrect - Power failure - Control panel issue	Pump not starting / stopping as per schedule	- Reset / Correct timer - Check power supply - Inspect control panel
Strainer Bypass / Leak	- Gasket damaged - Loose cover - Wrong installation	- Water leakage - Reduced efficiency	- Replace gasket - Tighten cover bolts - Install properly (suction side)
Air in System	- Low water level - Leaky joints - Improper venting	- Air pockets - Noise / unstable flow	- Maintain water level - Tighten joints - Open air vents and release air

PREVENTIVE MAINTENANCE CHECKLIST

TASK	FREQUENCY
Check water level in the tank	Daily
Inspect and clean strainer	Weekly
Check all valves and connections	Weekly
Verify WCS unit and pump operation	Weekly
Check pressure and flow readings	Weekly
Inspect electrical panel and timer	Monthly
Flush & drain system (if required)	Monthly
General inspection of system	Monthly

WHY PREVENTIVE MAINTENANCE?

- Prevents unexpected breakdowns
- Ensures consistent system performance
- Extends equipment life
- Reduces maintenance cost
- Saves energy and water
- Improves system reliability

SAFETY REMINDERS

- Do not open any component when system is under pressure.
- Ensure electrical supply is OFF before inspection.
- Use proper PPE during maintenance.
- Follow LOTO (Lock Out Tag Out) where applicable.
- Only trained personnel should operate the system.

GOLDEN RULE

A well-maintained system is a reliable system.
Prevention is always better than cure.



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13

CASE STUDIES & FIELD EXPERIENCES

REAL INSTALLATIONS. REAL RESULTS.

PV WCS is trusted across industries for effective water conditioning in diverse operating environments.

FIELD CASE STUDIES

CASE STUDY 1

COOLING TOWER SYSTEM

Application : Industrial Cooling Tower
System Type : Multi Pass Recirculation
Challenge : Scale formation, high TDS, frequent cleaning
Solution : Installed PV WCS Multi Pass system with auto operation
Result :

- 80% reduction in scale
- Extended equipment life
- Reduced downtime
- Water & energy saving



CASE STUDY 2

BOILER FEED WATER SYSTEM

Application : Boiler Feed Water
System Type : Single Pass
Challenge : Scale in boiler tubes, high maintenance
Solution : Installed PV WCS on pump discharge line
Result :

- Improved heat transfer
- Reduced fuel consumption
- No scale-related shutdowns
- Low maintenance



CASE STUDY 3

HVAC CHILLED WATER SYSTEM

Application : HVAC Chilled Water System
System Type : Single Pass
Challenge : Scale & sludge in chiller and heat exchangers
Solution : Installed PV WCS on pump discharge line
Result :

- Improved chiller efficiency
- Stable operation
- Reduced chemical usage
- Extended system life



CUSTOMER FEEDBACK

"After installing PV WCS, our scale issues reduced drastically. System runs smoother and maintenance costs are down."

– Maintenance Head,
Chemical Plant

★★★★★

"Multi Pass system with timer is a game changer for us. Auto operation ensures consistent conditioning."

– Plant Engineer,
Power Plant

★★★★★

"Excellent support, easy to install and very effective results. Highly recommended!"

– Facility Manager,
Commercial Building

★★★★★

KEY TAKEAWAYS

- Correct installation is critical
- Maintain flooded suction (min. 1 ft water level)
- WCS on pump discharge side
- Regular maintenance ensures long system life
- Discipline in operation delivers best results

DO's AND DON'Ts SUMMARY

DO's

- Maintain minimum 1 ft water level above pump suction
- Install strainer on pump suction side
- Install WCS unit on pump discharge side
- Use proper system (Single Pass or Multi Pass) as per need
- Ensure all valves are in correct position
- Follow preventive maintenance schedule
- Monitor system parameters regularly

DON'Ts

- Do not run pump with closed discharge valve
- Do not bypass WCS unit
- Do not ignore air pockets in high points
- Do not allow suction to run dry
- Do not start with dirty or partially filled system
- Do not exceed design pressure or temperature
- Do not neglect maintenance

OUR COMMITMENT



We are committed to providing reliable solutions, quality products and continuous support for better water behaviour and stronger systems.

DISCLAIMER

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Field Case Studies &
Customer Testimonials Video



SMART CONDITIONING.
STRONGER SYSTEMS.

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14 DEALER / INSTALLER RESPONSIBILITIES

DISCIPLINE IN INSTALLATION. COMMITMENT IN SERVICE.

The performance of PV WCS depends not only on the technology, but also on correct installation, system discipline and regular maintenance. Your responsibility ensures customer satisfaction and long-term trust.

OUR SHARED GOAL
Problem-free operation,
Happy customer,
Long lasting relationship.

INSTALLATION RESPONSIBILITIES - TOP TO BOTTOM

	SITE SURVEY	Understand site conditions, water source, usage pattern and customer expectations before proposing.
	CORRECT DESIGN	Select correct system type (Single Pass / Multi Pass), pipe size, pump and WCS unit as per application.
	PROPER INSTALLATION	Install WCS on pump discharge side. Ensure strainer on suction side and flooded suction (min. 1 ft water level).
	QUALITY MATERIALS	Use recommended quality pipes, fittings, valves, strainers and electrical components.
	SYSTEM FLUSHING	Flush the system before starting to remove debris, scale, welding slag, rust and dirt.
	ELECTRICAL SAFETY	Ensure proper earthing, MCS protection and correct wiring as per electrical diagram.
	START-UP & TESTING	Follow start-up procedure, check for leaks, pressure, flow and timer settings (if Multi Pass).
	HANDOVER & TRAINING	Explain system working, maintenance and do's & don'ts to customer. Share user manual.
	DOCUMENTATION	Fill installation checklist, site details, photos and handover report. Keep record for future reference.

AVOID COMMON MISTAKES

- ❌ Installing WCS on suction side
- ❌ No strainer on suction side
- ❌ Insufficient water level / dry suction
- ❌ Improper pipe size causing low flow
- ❌ Dead legs / bypass in circulation
- ❌ No flushing before start-up
- ❌ Loose electrical connections
- ❌ No timer setting in Multi Pass system
- ❌ Not explaining system to customer
- ❌ No documentation / no records

INSTALLER CHECKLIST (QUICK REFERENCE)

- ✓ Strainer installed on suction side
- ✓ WCS on pump discharge side
- ✓ Min. 1 ft water level above suction
- ✓ All valves open (as per requirement)
- ✓ No leakage in piping & connections
- ✓ Electrical panel healthy & earthed
- ✓ Timer setting verified (if Multi Pass)
- ✓ System flushed and clean
- ✓ Pump running smooth & silent
- ✓ Handover done & record completed

YOUR ROLE = CUSTOMER CONFIDENCE

	TECHNICAL COMPETENCE Correct design and installation builds a reliable system.		PROFESSIONAL ATTITUDE Follow process, be neat, be disciplined and stay responsible.		AFTER SALES SUPPORT Regular follow-up and maintenance support ensure happy customers.		BRAND REPRESENTATION You are the face of PV WCS in the market. Keep the trust strong.
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15 CUSTOMER COMMUNICATION & EXPECTATION MANAGEMENT

CLEAR COMMUNICATION. REAL EXPECTATIONS. HAPPY CUSTOMER.

Setting the right expectations and explaining the system properly ensures satisfaction, reduces complaints and builds long-term trust.

COMMUNICATION PRINCIPLE
Explain simply. Be transparent.
Deliver what is promised.

WHAT TO EXPLAIN TO CUSTOMER

- ✓ What is PV WCS and how it works
- ✓ Benefits of proper circulation and conditioned water
- ✓ Why WCS is installed on discharge side
- ✓ Why minimum water level is important
- ✓ System type: Single Pass or Multi Pass (if applicable)
- ✓ Automatic operation with timer (Multi Pass)
- ✓ Maintenance requirements and frequency
- ✓ Expected results and timelines (see below)
- ✓ Do's and Don'ts for daily use
- ✓ Importance of regular maintenance for best results



WHAT CUSTOMER SHOULD EXPECT

- ✓ Reduced scale, sludge and corrosion
- ✓ Better heat transfer and efficiency
- ✓ Lower maintenance and cleaning cost
- ✓ Extended equipment life
- ✓ Consistent performance over time
- ✓ Smoother operation of pumps & system
- ✓ Energy saving (in some applications)



EXPLAIN REALISTIC TIMELINES (REVISED)

APPLICATION	VISIBLE IMPROVEMENT (First noticeable changes)	OPTIMAL RESULTS (Best performance)
Domestic / Villa	15 - 30 Days	90 - 120 Days
Cooling Tower	4 - 8 Weeks	12 - 16 Weeks
Boiler Feed Water	4 - 8 Weeks	12 - 16 Weeks
Chilled Water System	4 - 8 Weeks	12 - 16 Weeks
Industrial Closed Loop	6 - 12 Weeks	16 - 24 Weeks

Note: Many improvements become visible progressively during normal operating and maintenance cycles. Results may vary depending upon water chemistry, circulation behaviour, existing deposits, operating conditions and maintenance practices.

MANAGE EXPECTATIONS - KEY POINTS

- ✓ PV WCS is not a chemical - it conditions water.
- ✓ Existing heavy scale may take time to soften and reduce.
- ✓ Regular maintenance is important for best performance.
- ✓ Results improve with consistent operation.
- ✓ WCS is a long-term conditioning solution, not an instant fix.
- ✓ System performance also depends on overall maintenance practices.

SIMPLE COMMUNICATION FLOW



DO'S AND DON'TS SUMMARY

- DO'S**
- ✓ Maintain minimum 1 ft water level above pump suction
 - ✓ Install strainer on pump suction side
 - ✓ Install WCS unit on pump discharge side
 - ✓ Use proper system (Single Pass or Multi Pass) as per need
 - ✓ Ensure all valves are in correct position
 - ✓ Follow preventive maintenance schedule
 - ✓ Monitor system parameters regularly

- DON'Ts**
- ❌ Do not run pump with closed discharge valve
 - ❌ Do not bypass WCS unit
 - ❌ Do not ignore air pockets in high points
 - ❌ Do not allow suction to run dry
 - ❌ Do not start with dirty or partially filled system
 - ❌ Do not exceed design pressure or temperature
 - ❌ Do not neglect maintenance

THE RESULT WE AIM FOR

- ✓ Happy Customer
- ✓ Long lasting Trust
- ✓ Stronger Relationship
- ✓ Repeat Business
- ✓ Referrals

DISCLAIMER
The information in this manual is based on field experience and engineering understanding. Results may vary depending on water chemistry, system design, operating conditions and maintenance practices.



Scan to watch
Customer Communication &
Best Practices Video



**SMART CONDITIONING.
STRONGER SYSTEMS.**

16 FAQ + MYTHS VS REALITY

CLEAR ANSWERS. CORRECT UNDERSTANDING.

These frequently asked questions help in setting right expectations and building customer confidence.

FREQUENTLY ASKED QUESTIONS (FAQ)

- Q** Does PV WCS remove hardness (TDS / Calcium)?
A No. PV WCS conditions water physically. It does not remove TDS, calcium, or any dissolved minerals.
- Q** Will this system soften water?
A No. PV WCS does not soften water. It changes the behaviour of scale-forming minerals to keep the system clean.
- Q** Is electricity required to operate PV WCS?
A No. PV WCS is a passive system. No electricity is required.
- Q** How often does PV WCS need maintenance?
A Very low maintenance. Regular inspection and system discipline are key. No consumables.
- Q** Can PV WCS be installed with RO / water filter?
A Yes. It is highly recommended before RO to improve membrane life and reduce scaling.
- Q** When will I see results?
A Visible improvements start progressively. Refer realistic timelines on previous page (15).
- Q** Is PV WCS suitable for borewell and municipal water?
A Yes. Effective for all types of water sources. Results depend on water chemistry and usage.
- Q** Can old scale be removed?
A Existing scale softens, loosens and is gradually removed by normal operation and maintenance cycles.
- Q** Can I install PV WCS myself?
A Installation should be done by trained personnel as per manual for best results and warranty validity.

CUSTOMER OBSERVATION CHECKLIST (DOMESTIC)

- Encourage customer to observe and note changes over time.
- ☐ RO water flow improvement Date: _____
 - ☐ RO TDS stability Date: _____
 - ☐ Shower flow improvement Date: _____
 - ☐ Reduction in scaling or fittings Date: _____
 - ☐ Cleaner bathroom accessories Date: _____
 - ☐ Better soap lather and rinse Date: _____
 - ☐ Geyser / heater performance Date: _____
 - ☐ Overall system cleanliness Date: _____

MYTHS VS REALITY

MYTH	REALITY
❌ WCS removes hardness from water.	✅ WCS does not remove hardness. It conditions water to prevent scale formation.
❌ Results are instant and visible in 1-2 days.	✅ Improvements are progressive and become visible over time (see realistic timelines).
❌ WCS is a chemical treatment.	✅ WCS is a physical water conditioning technology. No chemicals used.
❌ Only new systems need WCS.	✅ Existing systems benefit significantly. Old scale is gradually managed.
❌ WCS is maintenance free.	✅ WCS is low maintenance. System discipline and regular checks are essential.
❌ WCS can solve all water problems.	✅ WCS reduces scaling and related issues. For other problems, identify and correct the root cause.
❌ Bigger the WCS, better the result.	✅ Correct sizing and proper installation with good circulation is what delivers results.
❌ Once installed, no inspection needed.	✅ Regular inspection ensures consistent performance and early prevention.

RESULTS ASSESSMENT INDICATORS

- Improvements are measured through system behaviour.
- ④ Reduced scale & deposition
 - ④ Improved heat transfer
 - ④ Lower maintenance & cleaning frequency
 - ④ Reduced pressure drop
 - ④ Better flow & circulation
 - ④ Extended equipment & system life
 - ④ Energy savings (in applicable systems)
 - ④ Overall system reliability



REMEMBER

Clear answers today build trust for years.

17 FIELD OBSERVATION GUIDE

SEE. UNDERSTAND. ENSURE. DELIVER RESULTS.

Regular field observation helps in early detection, customer confidence and consistent system performance.



FIELD RULE

What gets observed, gets improved.

WHAT TO OBSERVE (DOMESTIC SYSTEMS)

RO SYSTEM	BATHROOM FITTINGS	GEYSER / HEATER	VISIBLE SURFACES	OVERALL SYSTEM
 - Water flow rate - TDS stability - Membrane life improvement - Reduced cleaning frequency	 - Shower flow - Scaling on shower face - Tap aerator condition - Smooth operation	 - Heating efficiency - Scaling inside tank - Time taken to heat - Energy consumption	 - Scale on taps & mirrors - Stains in sink / wash basin - Cleanliness over time	 - Noise / vibration - Flow consistency - Leakage check - System cleanliness

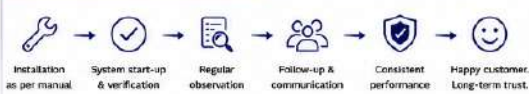
TIPS FOR INSTALLERS & DEALERS

- Educate customer on how WCS works and what to observe.
- Encourage regular inspection and simple observations.
- Take photos during installation and follow-up visits.
- Maintain service records and observations.
- Build trust through communication and follow-through.

WHAT TO OBSERVE (INDUSTRIAL SYSTEMS)

COOLING TOWER	BOILER SYSTEM	CHILLED WATER SYSTEM	CLOSED LOOP SYSTEM	GENERAL OBSERVATION
 - Scale & deposition - Water distribution - Basin cleanliness - Blowdown reduction	 - Scale in boiler tubes - Steam quality - Blowdown rate - Fuel efficiency	 - Heat exchanger cleanliness - Delta T improvement - Pressure drop - Energy efficiency	 - System cleanliness - Corrosion signs - Pressure stability - Water quality	 - Instrument readings - Noise / vibration - Leakage - Overall performance

SUPPORT JOURNEY - WE ARE WITH YOU



IMPORTANT NOTE

Improvements are progressive. Results depend on water chemistry, existing conditions, circulation, usage pattern and maintenance practices.

Your observation + our technology = Better water behaviour and better system performance.

DISCLAIMER

The information in this manual is based on field experience and engineering understanding. Results may vary depending on water chemistry, system design, operating conditions and maintenance practices.



Scan to watch Field Observation Best Practices Video



SMART CONDITIONING.
STRONGER SYSTEMS.

18 TECHNOLOGY INSIGHT

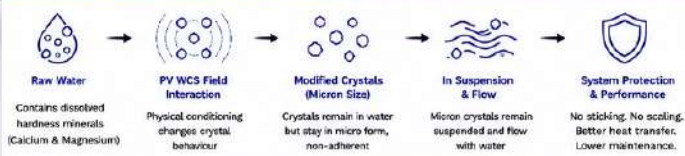
WHY PV WCS WORKS & WHAT MAKES IT UNIQUE.

PV WCS is a physical water conditioning system. It does not remove minerals, it changes the way they behave.



THE CORE PRINCIPLE
Condition the water.
Change the behaviour.
Control the scale.
Protect the system.

HOW PV WCS CONDITIONS WATER (SIMPLIFIED VIEW)



SCIENCE BEHIND THE BENEFITS

- Prevents crystal growth and scale formation.
- Reduces adhesion tendency of hardness minerals.
- Helps in removing existing loose & soft scale gradually.
- Maintains system efficiency and heat transfer.
- Increases equipment life and reduces breakdown.
- Reduces chemical usage and operational cost.
- Works continuously 24x7 with no consumables.

WHAT PV WCS DOES NOT DO

- Does not remove TDS.
- Does not soften water.
- Does not change water chemistry.
- Does not replace filtration or treatment systems.
- Does not provide instant clearing of heavy hard scale.
- Does not remove sludge, biofilm or dirt.
- Does not work if system circulation is not proper.

COMPARISON SNAPSHOT

FEATURE / PARAMETER	PV WCS (PHYSICAL CONDITIONING)	WATER SOFTENER (ION EXCHANGE)	CHEMICAL DOSING (SCALE INHIBITORS)	RO SYSTEM
Removes Hardness (Ca / Mg)	X No	✓ Yes	X No	✓ Yes
Changes Behaviour of Minerals	✓ Yes	X No	✓ (Partial)	X No
Prevents Scale Formation	✓ Yes	✓ Yes	✓ Yes	✓ Yes
Removes Existing Scale	✓ Gradual (Soft / Loose)	X No	✓ Minimum	✓ No
Requires Consumables	X No	✓ Yes (Salt)	✓ Yes (Chemicals)	✓ Yes (Membrane)
Affects Good Minerals	X No	✓ Yes	X No	✓ Yes
Maintenance	Very Low	Medium	Medium	High
Energy Required	Nil	Nil	Dosing Pump	High
Best Use	All Systems	Softening Required	Scale Control	Pure Water Need



KEY TAKEAWAY

PV WCS is not a replacement for treatment systems. It is a performance protection system that works with your existing setup.

19 DO'S, DON'TS & BEST PRACTICES

SIMPLE DISCIPLINES. CONSISTENT RESULTS.



FOLLOW THE BASICS. RESPECT THE SYSTEM. DELIVER EXCELLENCE.

DO'S - FOLLOW THESE ALWAYS

- Install PV WCS as per recommended location and direction.
- Ensure proper system circulation (min. 1 ft water level).
- Keep strainers clean and functional.
- Maintain all valves, unions and connections leak-free.
- Verify electrical panel health & proper earthing.
- Follow correct start-up and timer settings (if Multi Pass).
- Conduct regular inspection and maintenance.
- Keep system flushed and free from debris.
- Maintain logs and maintenance records.
- Educate customer and set right expectations.

DON'TS - AVOID THESE ALWAYS

- Do not install on suction side.
- Do not run pump with closed discharge valve.
- Do not bypass PV WCS unit.
- Do not ignore air pockets in high points.
- Do not allow suction to run dry.
- Do not start with dirty or partially filled system.
- Do not exceed design pressure or temperature.
- Do not neglect maintenance.
- Do not use harsh chemicals for flushing.
- Do not modify or tamper with PV WCS unit.

BEST PRACTICES - DELIVER LONG TERM VALUE

PROPER PLANNING	QUALITY INSTALLATION	SYSTEM BALANCE	REGULAR MAINTENANCE	CUSTOMER EDUCATION	CONTINUOUS IMPROVEMENT
Select right model, correct location and ensure space for maintenance.	Use recommended materials and follow installation guidelines.	Ensure proper flow, pressure and circulation for best performance.	Inspect, clean and verify system parameters on schedule.	Explain how it works, what to expect and importance of maintenance.	Observe, learn and optimize for better results and customer satisfaction.

RESULTS OVER TIME (WHAT TO EXPECT)

TIME FRAME	WHAT YOU MAY OBSERVE (DOMESTIC SYSTEMS)
15 - 30 DAYS	Early improvements in feel of water, reduced soap suds, less stickiness, better flow in some fixtures.
30 - 60 DAYS	Reduced scaling in bathroom fittings, better geyser performance, less frequent cleaning required.
60 - 120 DAYS	RO requires membrane cleaning less frequently, improved efficiency and consistent performance.
120 DAYS & BEYOND	Long-term benefits: extended equipment life, lower maintenance, energy savings and cost reduction.

NOTE: Improvements are progressive and depend on water chemistry, system condition, circulation, usage pattern and maintenance.

SUCCESS FORMULA

- Right Product - Right Installation - Right Operation - Right Maintenance - Right Expectations - Happy Customer	=	MAXIMUM PERFORMANCE & TRUST
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IMPORTANT REMINDER

Water behaviour improvement is a process. Your consistency today ensures system reliability tomorrow.



Scan to watch Do's, Don'ts & Best Practices Video



SMART CONDITIONING. STRONGER SYSTEMS.





PROCON VENTURES

ENGINEERING • INNOVATION • EXCELLENCE

PV WCS

WATER CONDITIONING SYSTEM

FIELD INTELLIGENCE & TRAINING MANUAL



'Don't fight it.
Change its **behaviour**.'

BETTER WATER. BETTER BEHAVIOUR. BETTER PERFORMANCE.

PV WCS is a philosophy in action.

We condition water at the physical level
to change its behaviour, protect your system,
improve performance and create long-term value.

When installed right, operated right and maintained right —
PV WCS delivers consistent, measurable and sustainable results.

Your discipline. Our technology.
Together, we create the best outcomes.



OUR COMMITMENT TO YOU

- ✓ Reliable Technology
- ✓ Engineering Integrity
- ✓ Performance That Lasts
- ✓ Support That Stays
- ✓ Trust That Grows

TOGETHER, WE DELIVER



PROTECT THE SYSTEM

Reduce scale, corrosion
and wear.



IMPROVE PERFORMANCE

Better heat transfer,
efficiency and life.



REDUCE MAINTENANCE

Lower downtime,
cleaning and breakdowns.



SAVE ENERGY & COSTS

Efficient systems
consume less.



DELIVER CUSTOMER SATISFACTION

Consistent results build
trust and relationships.

“ The quality of water
determines the quality of life
and the life of your system.

PV WCS ensures both.



KEY TAKEAWAYS

- ✓ PV WCS is a physical water conditioning system, not a chemical treatment system.
- ✓ It conditions water and changes its behaviour.
- ✓ Proper installation and correct circulation are critical.
- ✓ Regular maintenance ensures consistent performance.
- ✓ Results are progressive and become better over time.



THANK YOU FOR BEING OUR PARTNER

Your trust in PV WCS is our biggest motivation.
Together, we are building a future where systems
run cleaner, perform better and last longer.

Thank You!

NEED HELP? WE ARE HERE.

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Best Practices Downloads



Technical Support Portal



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*Thank you for being part of the
PV WCS journey.*



BETTER WATER
BEHAVIOUR



BETTER SYSTEM
PERFORMANCE



STRONGER
PARTNERSHIP

Follow us:

