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INDION®

Ultra High Rate Solids Contact Clarifier (UHRSCC)

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The INDION Ultra High Rate Solids Contact Clarifier (UHRSCC) is a compact, efficient and low-cost clarifier for clarification of surface water and wastewater. The UHRSCC design combines technologies of the solids contact clarifier and lamella clarifier, offering the advantages of both with enhanced performance at an increased rise rate.

The INDION UHRSCC unit is a true solids contact clarifier that combines mixing, flocculation and sedimentation in a single basin. Raw water and chemicals mix with previously formed sludge and then pass through distinct zones within the basin for reaction, flocculation, separation, sludge removal and clarification. All occur in a single treatment basin for maximum treated water production in minimal space, making the INDION UHRSCC the best choice among solids contact clarifiers.

Applications

- Clarification of surface water
- Removal of iron & manganese for potable water

Process Parameters

- Handles high inlet suspended solids in feed up to 3000 mg/l while giving consistent treated water quality of < 10 mg/l.
- Wide flow rate range – flow rates as high as 3800 m^3/h. Customized designs can be offered for higher flow rates.
- Rise rates are higher than conventional clarifiers or even other High Rate Solids Contact Clarifiers being supplied in India.
- Sludge concentrations up to 3% are achieved depending on the application.

Features	Advantages
Combined technology of solid contact clarifier and inclined plate clarifier	Improved performance at very high flow rates
Reaction, flocculation, separation, sludge removal and clarification occur in a single treatment basin	Minimal space requirement
Intimate and prolonged contact with large quantities of previously formed solids	Rapid chemical reaction Complete chemical reaction Dense, easily settled precipitates Minimum chemical requirement
Positive uniform recirculation of solids independent of feed flow	Thorough contact with solids Sudden flow fluctuation does not affect performance Uniform results obtained regardless of feed suspended solid fluctuation Minimum energy consumed
Lamella plates in clarification zone	Utilisation of complete area Handles higher flow rate Reduces the overall size of the equipment, and cost Better outlet quality
Entire bottom of INDION UHRSCC unit is used for settling and collection of dense precipitates	Effective solid handling and sludge removal Maximum consistency of sludge
Thickening pickets concentrate the settled sludge, which is then removed as high concentrated slurry	Minimum amount of water lost through sludge blowdown Maximum solids concentration for subsequent dewatering

Principle of Operation

Mixing Zone: Raw water and chemicals are vigorously mixed in the draft tube in presence of previously formed sludge re-circulated from the bottom of the basin. A high efficiency impeller re-circulates the sludge into the reaction-flocculation zone.

Reaction-Flocculation Zone: The reaction-flocculation zone, also called Detention Zone, receives the total mixed flow from the mixing zone. Flocculation is accelerated here by the intimate contact between reacting chemicals and re-circulating precipitated solids on which the newly formed material is deposited. Part of the flow, equal to the raw water rate is then discharged into the separation (clarification) zone and the remaining flow is re-circulated into the mixing zone.

Clarification Zone: The large area under the edge of the Detention Zone ensures even distribution and low velocity entrance to the clarification zone. The water enters the outer clarification zone with dense and bigger size of particles, which settle rapidly. The settling area of the clarification zone is greatly enhanced by inclined lamella plates installed near its top surface, ultimately reducing the unit size, handling more flow and giving better quality. The overflow from the clarification zone is collected from both sides of the plates through adjustable overflow weirs. This ensures equal distribution of flow among the plates and eliminates uneven loading.

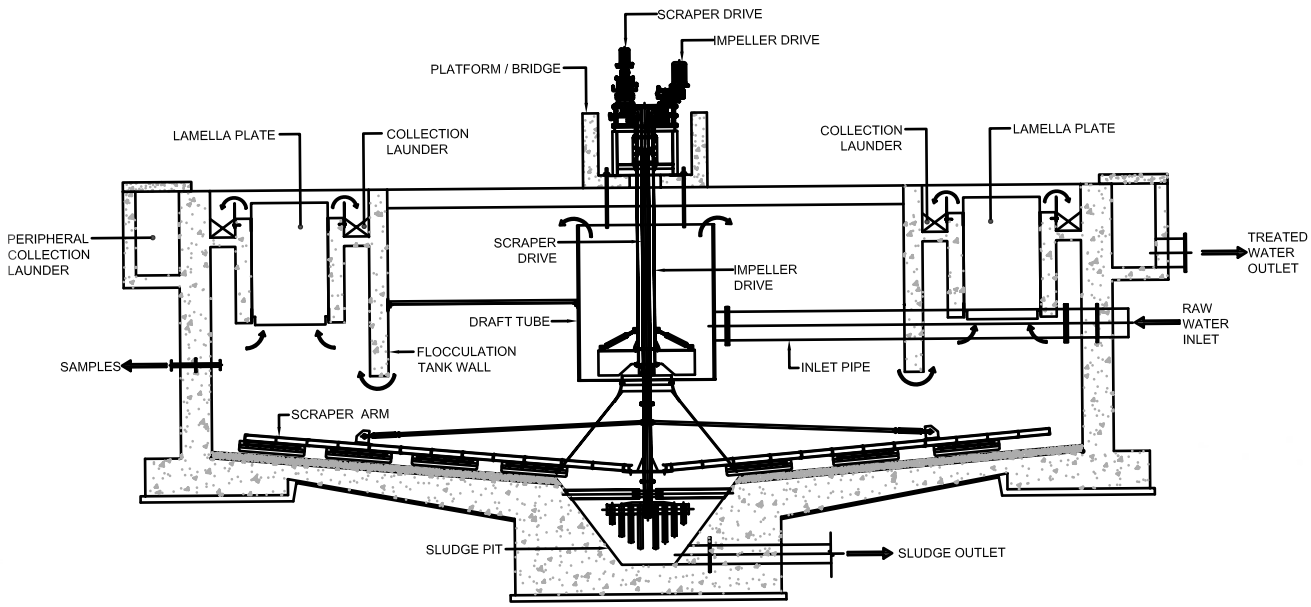
Sludge Removal and Re-circulation: A portion of the sludge on the re-circulation settles to the bottom of the basin. This settled sludge is moved to the centre of the basin by a slowly rotating scrapper. The scraped sludge falls into the sludge hopper where sludge thickening pickets concentrate the sludge and reduce the blow down.

The sludge is automatically or manually removed at regular intervals. The remainder of the sludge is re-circulated through the draft tube and used to increase the solids content in the flocculation zone and enhance floc formation.

Specifications

The equipment is complete with all required components including accessories and conforms to the following specifications:

- The system is designed for operating at atmospheric pressure
- Sidewalls and base of the UHRSCC are of Reinforced Cement Concrete (RCC)
- Material of Construction of components such as scrapers, inlet / outlet pipes, platforms, handrail, ladders and other wetted parts are in mild steel/epoxy or polyurethane coated or stainless steel construction, lamella plates are in FRP or stainless steel
- Rotating parts like gearboxes, driveshafts, electrical motors are as per standards



SECTIONAL VIEW OF UHRSCC

Technical Specifications

Model	Surface Water (TSS <3000 mg/l) Enhanced Flow rate in m^3/h	Unit Size (L × B) in m
UHRSCC – 40	400	11.2 x 11.2
UHRSCC – 50	500	12.1 x 12.1
UHRSCC – 80	800	13.8 x 13.8
UHRSCC – 120	1200	16.0 x 16.0
UHRSCC – 160	1600	19.0 x 19.0
UHRSCC – 200	2000	22.2 x 22.2
UHRSCC – 250	2500	23.5 x 23.5
UHRSCC – 300	3000	25.0 x 25.0
UHRSCC – 380	3800	27.0 x 27.0

Note: For applications other than surface water, please contact Ion Exchange (India) Ltd.

ION EXCHANGE (INDIA) LTD.

Corporate Office
Ion House, Dr. E. Moses Road, Mahalaxmi,
Mumbai - 400011 | Tel: +91 22 6231 2000
E-mail: ieil@ionexchange.co.in

International Division
R-14, T.T.C MIDC, Thane - Belapur Road, Rabale,
Navi Mumbai - 400 701 | Tel: +91 22 6857 2400
E-mail: export.sales@ionexchange.co.in

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