

Water Treatment



Engineering & Construction

ISD Softeners

OVERVIEW

Softening using ion-exchange resins maintains Calcium and Magnesium Salts (that determine the hardness of water) with the release in water of Sodium Salts in substitution. The resins softening does not substantially modify the saline contents, but the saline composition. The hardness of water is responsible for the formation of crusts on piping or on the equipment crossed by the water (heat exchanger, boilers, cooling towers, etc.). The ISD softeners in pairs (Duplex) with exchange running: while a softener is in "operation" phase, the other one is in "regeneration" or in "stand-by". The exchange of the kind of function is given by a volumetric counter pulse-thrower calibrated for a specific cyclic capacity according to the hardness of water to be treated and to other parameters. When the resin can no longer exchange Sodium salts with Calcium Salts, it means that its exchange capacity runs out. The resin is regenerated by a Sodium chloride non-saturated solution (brine). Depending on the regeneration level provided for (NaCl grams per resin litre), the resin has different exchange capacities: higher is the regenerative level, higher will be the exchange capacity. But the increase of the exchange capacity isn't directly proportional to the increase of the chosen regenerative level.

The ISD softeners are used in industrial, civil and hospital fields. They guarantee reliability, safety, life, especially under their simplicity and tested application.

APPLIANCE

- Tap water softening.
- Well water softening.
- In industrial field.
(laundries, vapour generators supply, cooling towers supply, etc).
- In civil field (potabilization, commun big boilers supply).
- In hospital field (thermal power plant supply, etc.).

OPERATING DATA

- | | | |
|---|---------|------|
| ➤ Operating pressure min/max | 2,5/5 | bar |
| ➤ Project/testing pressure | 5/7,5 | bar |
| ➤ Backwashing pressure | 1,5 | bar |
| ➤ Water temperature range | 3÷40 | °C |
| ➤ Electric power voltage/frequency | 220/50 | V/Hz |
| ➤ Electric absorption | 20 | W |
| ➤ Load losses with (read values at pressure gauges) | | |
| medium/high flow | 0,3/1,2 | bar |
| ➤ Valves control service station | 5-7 | bar |

CHOISE OF A SOFTENER

Cycle values in Technical Data Schedule refer to a conventional hardness of 1°F (1°F is equivalent to 10 mg/l expressed as CaCO₃).

Here follows the procedure required for the choice of the softener (single):

- To know the hardness of water to be treated;
- To fix the cycle, i.e. the quantity of water can cross the softener before of the resins exhaustion, also according to the regenerative level of the chosen salt (for ISD models, the quantity of water must guarantee the operation of the softener for 8 hours at least);
- To multiply the hardness value in °F by the above fixed quantity of cyclic water;
- The outcome found must be included in two cycle values in the Schedule (Normal cycle-maximum cycle)
- To check the model of chosen softener is able to supply the required water delivery.
- For ISD models the supply rate must satisfy the water request for the regenerative operations of one of the 2 softeners while the other one is in operation (backwashing, brine suction, moving, final washing).

CONSTRUCTION

- Tank: vertical cylindrical in electro-welded carbon steel with convex bottoms, complete with 2 inspection hatches for loading filtering media, supplied in bags. The interior and exterior tanks are sanded to a finish class of SA 2.5. The internal surface is subsequently treated with a coat of epoxy food paint to obtain a total dry film of 250 µm. The external surface, after a coat of epoxy base, is protected with epoxy base paint RAL 1018.
- Water distribution system: the lower distribution system comprises a nozzle plate complete with nozzles and PVC/PP calibrated outlets. The upper section is fitted with a flow break disk with a calibrated design
- Automatic valves: butterfly type in painted cast iron, lens in stainless steel, double actuator with relative solenoid valve. Seal packing into contact with the fluid suitable for drinking use.
- Filter piping in AISI 304 stainless steel, flat stub in AISI 304, flanges in hard aluminium.
- Pressure gauges diameter 100 mm, scale 0-10 bar, complete with pressure gauge holder valve and test point.
- Brine suction ejector
- Tank/s for salt complete with brine filter/s
- Brine valves
- Volumetric counter pulse-thrower

OPTIONS

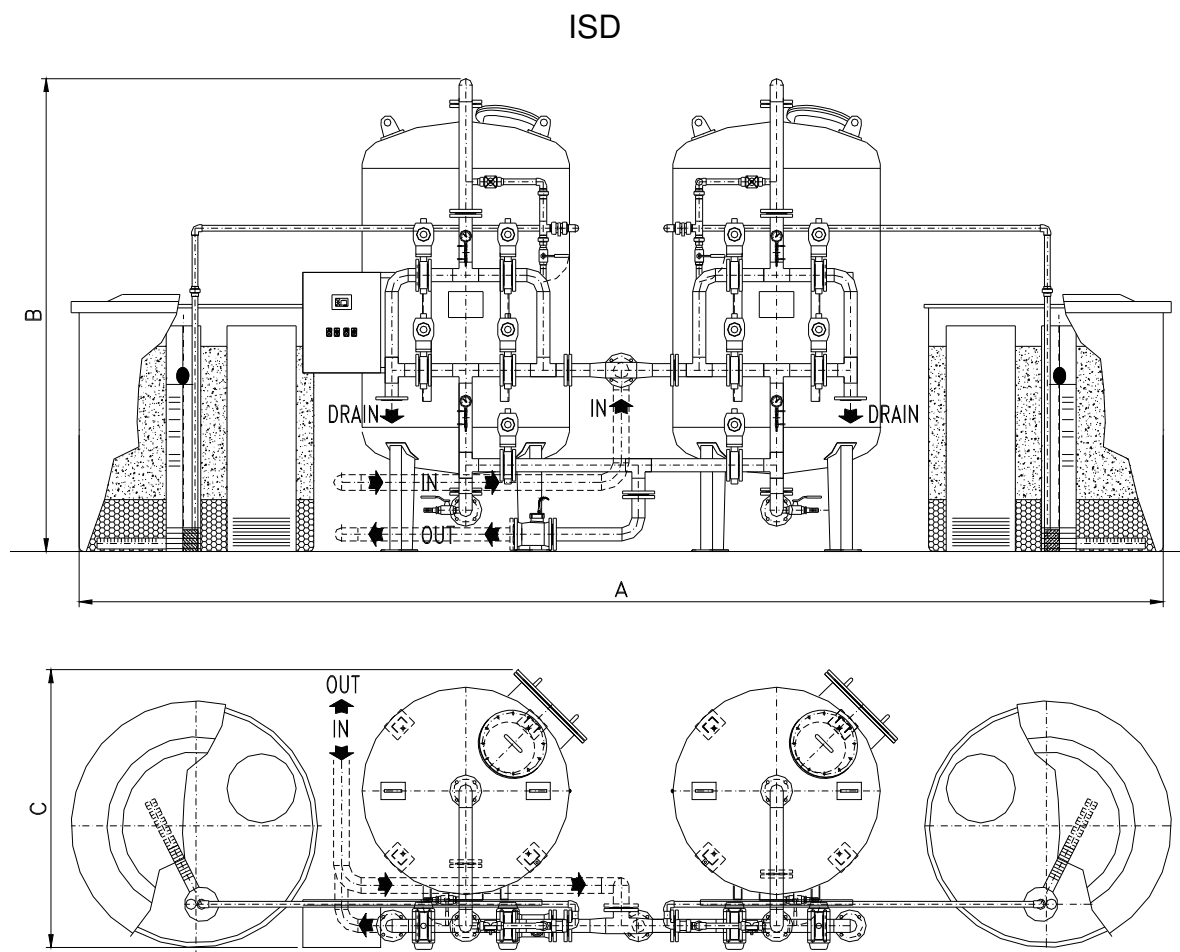
- PVC filter piping can also envisaged, with PVC pneumatic control valves (ISD-PVC Model)

AUTOMATION

Filter operation and regeneration cycle are ensured by solenoid valves, pneumatically connected to the valves on the filter piping, and electrically powered by a PLC fitted with an operator panel and display. The solenoid valves and PLC are inserted in a small panel in anti-corrosion material with IP55 protection rating. Operating times, and regeneration phases are adjustable as required according to the effective working conditions. Start-up can also be manual.

FILTERING MATERIAL

- The filtering bed is composed by quartziferous sand supporting the resins bed.
- Strong cationic resin bed, sodic cycle, food purpose.



TECHNICAL DATA

Model	Flow rate		
	Min	Nomin	Max
	m ³ /h	m ³ /h	m ³ /h
ISD 300	1,5	12	19
ISD 400	2,0	16	25
ISD 500	2,5	20	31
ISD 650	3,3	26	41
ISD 850	4,3	34	53
ISD 1150	6	46	72
ISD 1350	7,5	54	84
ISD 1600	8	64	100
ISD 1800	9	72	112
ISD 2100	11	84	131
ISD 2400	12	96	150

(*) Capacity carried out by two tanks each of them has half of capacity

- NB:**
- For constructional reasons dimensions and weights are not binding.
 - The company holds the right to modify the technical and aesthetic characteristics of each equipment

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