

SELECTING TABLES

HOW TO SELECT THE CONTROL FOR A WATER TREATMENT UNIT

The automatic regeneration control of a softener, a filter or a deionizer, includes :

- the hydraulic control to regenerate the unit.
- another control to start the regeneration, the action of which is to decide WHEN the unit has to be regenerated.

hydraulic control

- A. Hand-driven system : the unit is regenerated simply hand-driving several mechanicals valves to divert the flows of water and chemicals during the several cycles (this is the most simple system, but now is almost never used)
- B. Fully automatic control with a multiport compact valve. This is the most common system, especially to control softeners regeneration.
- C. Fully automatic with several mechanical valves (diaphragm, butterfly, etc), controlled by an electrical or electronic (PLC) board. It is the most reliable system, and is used to control mainly industrial plants and/or large capacity systems

type of controls

1. Hand-driven. The regeneration is manually started according to the value of a water meter, a pressure gauge or else. Usually, the regeneration will be completed automatically; it is the semi-automatic working mode of most (or all) automatic units.
2. Time control (automatic). The regeneration starts at a pre-set time and day(s), even if the resins or else are not yet exhausted.
3. Volume control. The regeneration starts when a pre-set quantity of water has been treated, at any time.
4. Time-volume control. The regeneration starts when a pre-set quantity of water has been treated, but at a pre-set time.
5. According to other features (pressure drops, pH, conductivity, others)

When B/2 or B/4 control are used (time or time-volume control), a built-in emergency by-pass line warrants the supplying of (untreated) water during the regeneration cycle.

Other controls instead are equipped with a shut-off valve to avoid supplying of water during the regeneration cycle. In these cases, a buffer tank of treated water should be provided, in order to supply treated water during regeneration, otherwise, if no-stop water supplying is required, a dual line system alternatively working, is required. The selection of the control should be made according to the equipment to be controlled and the special application of the plant.

The chemicals can be added in the systems by a dosing pump on-off type (electrical command); an automatic proportional dosage instead will be made with a (proportional) dosing pump controlled by a pulse sender water meter.

The constant flow (on-off) dosing pump can be also controlled by a timer to select a spot dosage by time schedule (for example antialgae in cooling system).

However, for any plant it is recommended the installation of a proper safety filter, upstream of any treatment.

The choice of one automatic control among several available type depends mainly on the type of water treatment equipment, but the request of the end user.

Suggested selection for the most common applications are below listed; they are identified with a letter and a number with reference to the descriptions at the above page.

HEATING SYSTEM, SUPERHEATED WATER SYSTEM, COOLING SYSTEM (CLOSED SYSTEMS)

- Since the system is closed, an hand-driven (B1) softener could be suitable; for practical equipped with (B1) control; if a continuously or partially make up of fresh water is required, a softener must be equipped with B2 or B3 control.
- Note: a proper pre-filtration is required.
- Usually a chemical conditioning is required (corrosion inhibitor).

HOT WATER SYSTEM

- Softener equipped with B2 or B4 control
Note : a proper pre-filtration is required

DRINKING WATER

- Softener equipped with B4 control; special applications (hotels, residence, touristic villages) should require a duplex system
- Note: a proper pre-filtration is required .

OPEN COOLING SYSTEM - (COOLING TOWERS)

- Softener equipped with B4 or B3 duplex system control.
- The addition of adequate corrosion inhibitors and antialgae provided.
- Note: a proper pre-filtration is required.
Usually a chemical conditioning is required. (corrosion inhibitor, antialgae)

STEAM BOILERS

- softeners (for low capacity, low pressure working, boilers) equipped with B3 control; a buffer storage tank for treated water or a duplex system softener should be provided.
- deionizers (high capacity, high pressure working boilers) equipped with C5 control; a storage tank for treated water or a duplex system deionizer should be provided
- demineralization by reverse osmosis system, as alternative of the deionizer.
- Note: a proper pre-filtration is required.
Usually a good chemical conditioning is required. (corrosion inhibitor)

TABLE OF NOBEL EQUIPMENTS CORRESPONDENT TO AVAILABLE AUTOMATIC COMMAND

- A1 filters series FTA, ML
- B1 auxiliary command available for all equipments with controls B2, B3, B4, B5
- B2 softeners series AC/AT, AC/T, AS/AT, AS/T, AM/T
filters series FCV/T, FACV/T, FFV/T, FDV/T, FD/T
- B3 softeners series AS/METER, AM/METER, AS/V DUPLEX, AM/V DUPLEX
- B4 softeners series AC/AV, AC/SV, AS/AV, AS/SV, AS/V, AM/V
- B5 deionizers WD/V
- C1 auxiliary command available for all equipments with controls C2, C3, C4, C5
- C2 softeners serie AM/DT
filters series FCD, FACD, FFD, FD/D, FTA/A, ML/A
- C3 softeners series AM/D METER, AM/D DUPLEX
- C4 softeners series AM/DV
- C5 deionizers DA
filters ML/A

DATA TO BE MENTIONED FOR A CORRECT IDENTIFICATION OF THE EQUIPMENTS FOR WATER TREATMENT

Sediment filters

- type (cartridge, basket, self-cleaning semi or automatic, etc.)
- material of the head (for cartridge filters only)
- material of the bowl (for cartridge filters only)
- material body (for basket filters)
- material filtering element
- service flow rate
- operating max pressure
- temperature of water
- filtration
- \emptyset connections

Sand filters

- material vessel-containing media filter
- type of lining of the vessel (whether in steel)
- service flow rate
- operating max pressure
- temperature of water
- linear flow of diameter of the filter
- type of hydraulic automatic control (single valves or multi-flow valves)

Activated carbon filters

- material vessel-containing media filter
- type of lining of the vessel (whether in steel)
- service flow rate
- operating max pressure
- temperature of water
- contact time or quantity of activated carbon
- type of hydraulic automatic control (single valves or multi-flow valves)

Iron removal filters

- contents of iron and/or managanese in raw water
- pH of raw water
- material vessel-containing media filter
- type of lining of the vessel (whether in steel)
- service flow rate
- operating max pressure
- temperature of water
- linear flow of diameter of the filter
- type of hydraulic automatic control (single valves or multi-flow valves)
- backwashing designed with craw water or filtered

Softeners

- material vessel-containing resins
- type of lining of the vessel (whether in steel)
- service flow rate
- operating max pressure
- temperature of water
- cycle in $m^3 \times \text{°Fr}$ or quantity of resons contained
- type of hydraulic automatic control (single valves or multi-flow valves)
- type of automatic control (time, volume, time/volume)
- single or dual system

Deionizers

- analysis of raw water
- material vessel-containing resins
- type of lining of the vessel (whether in steel)
- service flow rate
- operating max pressure
- temperature of water
- required quality of treated water (for a separated bed < 10 microsiemens/cm)
- daily consumption of water in m^3
- hours/day of working
- type of automatic control (time, volume, time/volume)
- single or dual system

Reverse Osmosis

- analysis of raw water
- temperature of water
- daily consumption of water in m^3
- hours/day of working
- single or 2-pass
- material vessel
- material pump
- material pipes and accessories

Apply Nobel service for further information about application of NOBEL equipments.