

INJECTOR OF PRIMARY SOLUTIONS WITH HYDRAULIC CONTROL

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Abstract

The injector within the structure of the equipment usable for fertigation of horticultural crops, developed under the PN-II-PT-PCCA-2013-4-0114-*FERTIRIG* project, Financial Agreement no. 158 /2014, is the type double diaphragm pump, compact design, its body embedding both the hydraulically controlled directional valve, which controls the change in the direction of motion of the mobile assembly with membranes, and the valves for intake/ discharge of primary solution. The injection device uses irrigation water as the working (driving) fluid; this water is taken from the same pipeline in which the primary solution (that in a mixture with the irrigation water forms the fertilizing solution) is injected, which provides autonomy in operation of the fertigation equipment in any spot of the irrigation enclosure. The overpressure needed to perform injection is achieved on the principle of difference between the active surfaces of driving chambers and injection chambers. The injector shall be installed in bypass against the pipeline which supplies the drip or micro sprinklers irrigation plant, with which it forms a working assembly. The pump working pressure is 2.5...3 bar, and it is limited to such values by the pressure allowable in the irrigation water distribution network. Laboratory tests have highlighted that for the previously defined pressure range, at flow rates of the irrigation plant of 10.5...13.5 l/min, the device achieves injection flow rates of 2.5...3 l/min, at frequencies of the mobile assembly of 90...110 double strokes/min. Tests on the fertigation equipment, in real operating conditions, will be conducted at the premises of project partners USAMV Iasi and ICDP Pitesti Maracineni.

Key words: Injection device, fertigation, primary solution, hydraulic control