

New standard design minimizes water use and simplifies installation

HeadCell® Technology is Continuously Evolving

As of 2021, Hydro has standardized on a new HeadCell tank design that incorporates a shorter stainless-steel inlet duct and intermittent fluidizing with the option for intermittent pumping on the 9' and 12' diameter units. These new features have been developed to offer flexibility in design, remove an area susceptible to corrosion and reduce water usage. Our original stainless steel inlet duct and smaller grit sump are still available to meet project specific requirements.

Concrete Inlet Design

The new inlet duct design connects to the opening at the inside face of the tank structure to minimize the steel exposed to the corrosive environment at and above the air/water interface.

Therefore, the tapered transition upstream of the tank wall will need to be formed with concrete during tank construction. Concrete work from the upstream channel to the tank wall needs to reflect the proper slope (angling downward from the influent channel invert towards the inlet flume opening) and taper (narrowing the influent channel width to match the width of the duct opening), as shown on the equipment drawings.



HeadCell® inlet duct mounted to inner tank wall



Formed transition from inlet channel

Intermittent Fluidizing & Optional Intermittent Pumping

The intermittent fluidizing grit collection sump is larger in diameter and formed from concrete/grout. The sump includes a fluidizing ring to resuspend settled grit more aggressively prior to pumping which allows for intermittent fluidizing. While the fluidizing ring does require a higher flow rate, the water is used intermittently resulting lower daily water usage. The larger grit sump also allows for the grit pump to operate intermittently in lieu of 24/7 where appropriate.



Intermittent underflow grit sump

Required Fluidizing Water Components

The following minimum recommended components for the fluidizing water supply line are typically supplied by Hydro, but can be supplied by others, and are to be installed by the contractor in the contractor supplied NPW piping. If the NPW water source is known to contain debris, a filter prior to the fluidizing system is recommended. Components are listed in order of placement from furthest to closest to the HeadCell tank:

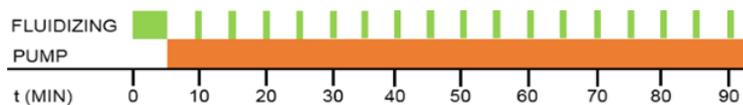
- *Globe valve* – throttling to set flow rate
- *Solenoid valve or actuated ball valve* (120V, 1ph) – for automation (timers/switches or programming in a PLC to be integrated into the Plant's control system if a control panel is not supplied by Hydro)
- *Rotometer* – manual read for NPW flow rate
- *Ball valve* – isolation

Fluidizing System Operational Controls

Hydro typically recommends continuous pumping of grit from the collection sump to ensure the pump is in operation during wet weather events to process the higher grit volumes and minimize the potential for plugging. If the grit pump is not in operation when a flush of grit enters the plant, it can be difficult to clear a buried grit suction line which can take the entire grit system out of service. Intermittent grit pumping can be considered under several conditions including plants that have a wide peak to average flow ratio, as can be seen when plants are designed for flow rates far into the future, and in smaller plants with low influent grit loadings and/or low overnight influent flows.

Continuous Pumping

When operating the grit pump continuously, and in order to minimize HeadCell water usage during continuous pump operation the fluidizing may be operated on an intermittent basis, typically for 1 minute intervals every 5 to 10 minutes. Fluidizing duration and frequency are adjustable to suit site conditions.



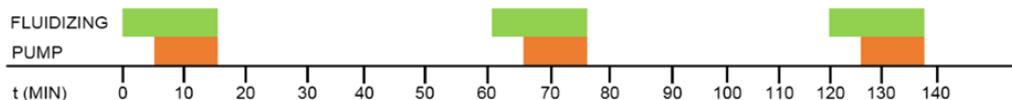
Intermittent Pumping

When the grit pump is to be run intermittently, grit will settle and may compact in the grit pot between discharge cycles. The main function of the fluidizing system is to re-suspend settled grit and provide motive force to transport the grit towards the pump suction line, so it is evacuated from the grit sump. To accommodate varying grit loads, it is recommended to provide most intermittently operated systems with both a dry weather and wet weather mode. Normally the HeadCell will operate in Dry Weather Mode. The Wet Weather Mode can be initiated by either:

- Influent flow sensing: Wet Weather Mode is initiated once a predetermined plant influent flow rate is reached. After the flow rate falls below that value for certain period of time, the grit pump returns to Dry Weather Mode
- A wet/dry operation switch on the control panel: The operator manually selects the mode based on weather and the grit load experienced at the plant

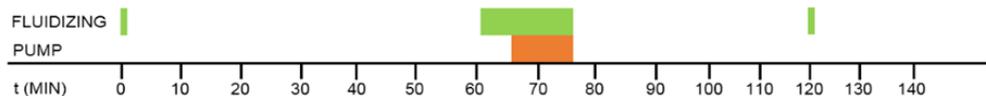
Dry Weather

The fluidizing on the HeadCell should initiate for 3-5 minutes before each grit removal cycle and continue operating while the grit pump is running to ensure that grit is constantly moved towards the suction pipe. The grit pump should be operated for a minimum of 10 minutes or enough time to clear the grit slurry line of material and minimum frequency of every 2 hours.



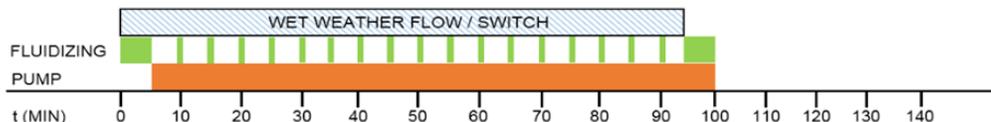
Extended Interval

During dry weather conditions and in instances when flows are very low or very low grit loads are entering the plant, it may be beneficial to extend the grit pumping intervals beyond every 2 hours to conserve energy and fluidizing water and reduce runtime of the pump and secondary grit equipment. Under these conditions, very low flow and/or low grit load, it is recommended to run the fluidizing system for 1 minute on an hourly basis in between grit discharge cycles to prevent grit from solidifying in the grit sump. The grit pump should be operated a minimum of 10 minutes or enough time to clear the grit slurry line of material.



Wet Weather (Continuous pumping)

We recommend the pump be operated continuously during wet weather events. Similar to when normally running the pump continuously, during wet weather conditions when the pump is in continuous operation the fluidizing may be operated on an intermittent basis, typically for 1 minute intervals every 5 to 10 minutes to decrease the fluidizing water usage.



Learn more

To learn more about how **Hydro International's HeadCell®** can improve your plant, visit hydro-int.com, or contact us:

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