

QS200 Best Practices

SELECT THE APPROPRIATE METER SIZE

Select size based on the expected flow range to optimize performance. Choose the smallest size when the expected flow range falls into more than one size. This will ensure proper flow velocities and improve the QS200's performance.

FLOW INSERT SELECTION CHART

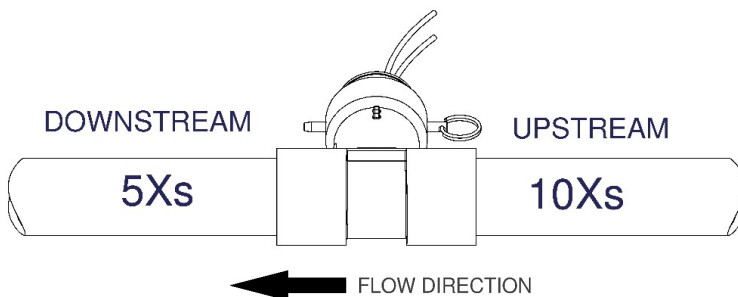
Flow Sensor Model	Pipe Size	Operating Range (Min.)	Operating Range (Max.)	Adjoining Pipe	Typical ¹ K-Factor	Hydrawise® ² K-Factor (Litre/Pulse)	Rain Master® K-Factor	Offset	Reference	
									Pulses/Gal	Pulses/Litre
QS200-10	1 in.	0.22 GPM (0.83 L/min) 0.1 ft/sec	33 GPM (124.92 L/min) 15 ft/sec	Sch 40	0.5575	0.0352	152	0	107.62	28.43
				Sch 80	0.5354	0.0338	146	0	112.06	29.60
QS200-15	1½ in.	0.55 GPM (2.08 L/min) 0.1 ft/sec	82 GPM (310.41 L/min) 15 ft/sec	Sch 40	0.7923	0.0500	216	0	75.73	20.00
				Sch 80	0.7860	0.0496	214	0	76.34	20.17
QS200-20	2 in.	0.92 GPM (3.48 L/min) 0.1 ft/sec	138 GPM (522.39 L/min) 15 ft/sec	Sch 40	1.4610	0.0922	398	0	41.07	10.85
				Sch 80	1.4568	0.0919	397	0	41.19	10.88
QS200-30	3 in.	2.06 GPM (7.80 L/min) 0.1 ft/sec	309 GPM (1169.70 L/min) 15 ft/sec	Sch 40	4.2630	0.2690	1163	0	14.07	3.72
				Sch 80	4.0850	0.2577	1114	0	14.69	3.88
QS200-40	4 in.	3.58 GPM (13.55 L/min) 0.1 ft/sec	537 GPM (2032.78 L/min) 15 ft/sec	Sch 40	8.0881	0.5103	2206	0	7.42	1.96
				Sch 80	7.9062	0.4988	2156	0	7.59	2.00
QS200	Insert Only			Sch 80	Use pipe size to determine value			0	Use pipe size to determine value	

Example: Application: Serving drip lines | Expected flow range: 7 GPM | Rotors max flow rate: 35 GPM
 Choose flow sensor model **QS200-15**, 1.5 in. (0.55 - 82 GPM)
 By selecting the smaller size, any air in the line will have a better chance of being flushed out due to higher water velocity.

SELECT CORRECT METER LOCATION

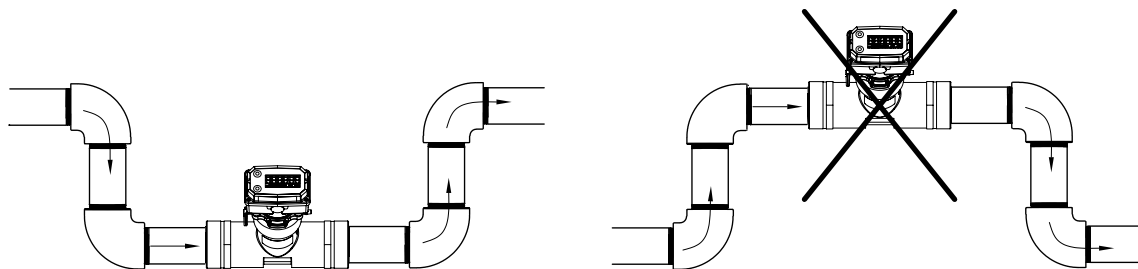
Straight runs before and after the meter are only necessary to achieve +/- 2% flow rate accuracy. The flow measurement will be repeatable without these straight runs and usually accurate within 5% of the rate. For 2% accuracy, install QS200 in a valve box with 10 pipe diameters of upstream straight run of plumbing and 5 pipe diameters of downstream straight run of plumbing.

Example: 1" QS200 should be installed with 10" straight pipe run upstream and 5" downstream.

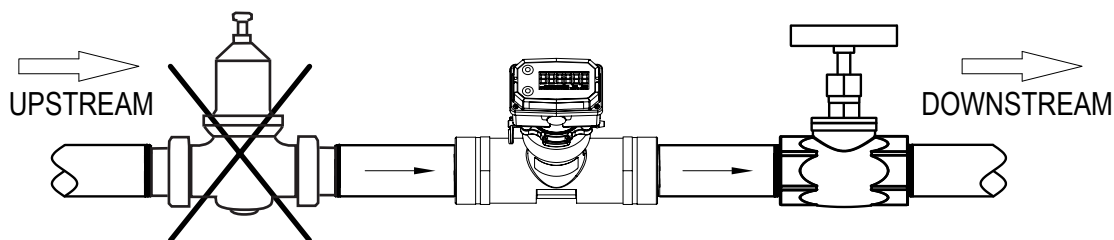


- » Ensure the QS200 is plumbed in the lowest elevation point* near the desired installation location. This will allow water to settle in the meter and not drain in either the upstream or downstream direction. This practice will also ensure that the pipe will be full of water and no air will be present to interfere with the ultrasonic sensors.

**When using horizontal runs of pipe.*



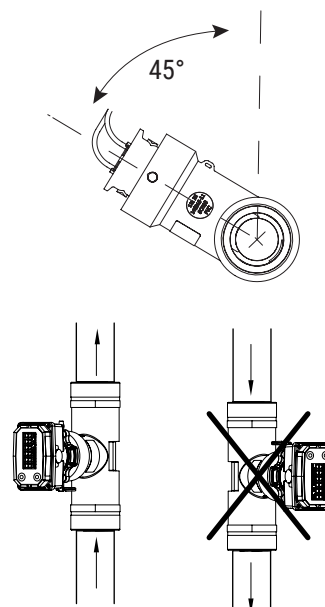
- » Install QS200, where the line typically stays full and does not drain when there is no scheduled flow. Such as between master and station valves when running on a well system or between the backflow preventer and the master valve in city water systems. Avoid installing the meter in plumbing that is expected to drain, such as between a station valve and drip line or self-draining rotors.
- » If the meter must be installed at a location that will not be the lowest point in the system or in a line that cannot be guaranteed to stay full of water when not in use, we recommend using an air release/vacuum relief valve. [Learn more](#) about common problems associated with air in irrigation systems and how to solve these problems.
- » Avoid installing a QS200 downstream of a pressure-reducing regulator because this can introduce air into the line. If this cannot be avoided, an air release/vacuum relief valve can be installed at the highest point in the plumbing close to the meter to evacuate the air pocket in the plumbing.



METER TEE ORIENTATION

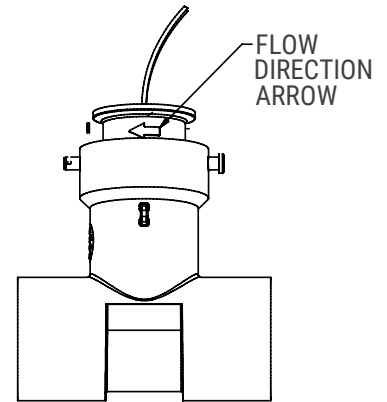
If possible, install the QS200 at a 45° orientation to get the ultrasonic sensors off the top of the pipe where air bubbles/pockets can interfere with the ultrasonic sound waves and cause the meter to indicate flow incorrectly.

When installing in vertical pipe runs, install QS200 with fluid flow going up through the meter; try to avoid flow going down through the meter. Downward flow can result in partially filled pipes (open channel flow) when running at low fluid velocities.



METER INSERT SETUP

- » Ensure the QS200 insert is installed with the flow arrow pointing in the direction of the water flow.
- » Install QS200 insert in a FLOMEC® tee using the pre-installed square o-rings. We recommend using the supplied round o-rings when installing the QS200 insert in a non-FLOMEC tee for easy installation.
- » Install QS200 insert with proper environmentally sealed splices on the red/black wires.
- » Install the QS200 insert with lightning protection, as the irrigation controller manufacturer recommends.



CONTROLLER IRRIGATION SCHEDULING CONSIDERATIONS

We recommend setting up irrigation schedules that run a high fluid velocity (>3 ft/sec) station before running lower fluid velocity stations, such as drip lines or bubblers. If it is not possible due to application watering restriction schedule requirements, then refer to the best practices for proper plumbing location and installation practices for the QS200.

TROUBLESHOOTING GUIDE

MODE	LED BEHAVIOR
Power Disconnected or Meter Failure	Both GREEN and AMBER LEDs are OFF
No Flow Low Power Mode	GREEN LED flashes ON/OFF at a rate of approximately 2 blinks per second
No Flow or Reverse Flow Active Mode	GREEN LED flashes ON/OFF at a rate of approximately 8 blinks per second
Low Flow Active Mode	GREEN LED flashes ON/OFF at a rate of approximately 8 blinks per second and the AMBER LED flashes ON/OFF at a rate that is proportional to the rate of water flow through the meter
High Flow Active Mode	GREEN LED flashes ON/OFF at a rate of approximately 8 blinks per second and the AMBER LED will appear to be constantly ON, but will be dim.

- » **If a controller indicates NO flow when it should be indicating flow, there could be air in the plumbing where the meter tee is located.**
 - A.** Check to see if the green LED is flashing. If so, the QS200 is powered. **Go to step B.** If there is no power, check the controller and wiring
 - B.** Remove the QS200 insert to allow air to escape from the tee. After reinstalling the QS200 insert, **proceed to step C.**
 - C.** Run the Station with the highest flow rate to verify if the flow rate is indicated correctly for the high flow station.
 - D.** If the high flow stations are working correctly:
 - 1. Change the irrigation schedule to always run the lowest flow stations after the higher flow stations; this will help ensure the air has been purged from the plumbing when running the lower flow rate stations.
 - 2. If this is not an option, consider installing an air release/vacuum relief valve at the highest point immediately around the flow meter.

- E.** If the high flow stations are not working correctly:
 - 1. Verify that the K factor is entered into the controller.
 - 2. Verify that the QS200 tee location/orientation complies with the best practices correctly
 - 3. Call customer service for additional assistance.

» **If a controller indicates flow when no flow has been scheduled (and no line breaks have been found upon inspection).**

- A.** If the controller only indicates a main line break and has no additional reporting capability, check meter installation best practices and consider installing an air release/vacuum relief valve at the highest point immediately around the flow meter.
- B.** If the controller can report volume over 24 hours and:
 - 1. The controller reports the volume as less than 1,500 Gallons in 24 hrs; inspect all master/station valves for leaks.
 - 2. The controller reports the volume as more than 1,500 Gallons in 24 hrs.
Check the best practices for meter installation and consider installing an air release/vacuum relief valve at the highest point immediately around the flow meter.
- C.** If the controller can report volume every minute:
 - 1. If the volume is reported over an entire day as a low flow rate every minute when flow is not scheduled, there is likely a leak in the system, and the meter is detecting the leak.
 - 2. If the volume over 24 hours happens randomly and within a short period within the day, then there is air in the meter; check meter installation best practices and consider installing an air release/vacuum relief valve at the highest point immediately around the flow meter.

» **If a controller indicates flow higher than the expected/learned flow rate on a station (and no line breaks or broken rotors are found upon inspection).**

- A.** If the station reporting the high flow alarm is a drip line or low fluid velocity station, there is likely air in the meter.
 - 1. Change the irrigation schedule to always run the lowest flow stations after the higher flow stations; this will help ensure the air has been purged from the plumbing when running the lower flow rate stations.
 - 2. Check meter installation best practices.
 - 3. Consider installing an air release/vacuum relief valve at the highest point immediately around the flow meter.
- B.** If the station reporting the high flow alarm is a high flow station with multiple irrigation rotors.
 - 1. Verify if any below-grade leaks are not visible above grade.