

## Flow Sensors – NPT

### Flow Sensing for IQ4, Maxicom2®, SiteControl™ and ESP-LX Series Controllers

Rain Bird flow sensors send flow data to central control or stand-alone control systems for precise and accurate flow monitoring. Rain Bird flow sensors enable you to capitalize on the advantages of Flow Sensing functionality.

#### Features (Ultrasonic Sensors)

Designed for outdoor and underground applications, Rain Bird Ultrasonic Flow Sensors offer the highest performance in flow sensing. Using internal ultrasonic transducers and acoustical reflectors, the UFS Series reads high and very low flow rates reliably and accurately. The UFS has a special body constructed of Glass Filled Nylon, enabling high pressure ratings, and has no straight pipe requirements, allowing more flexible installation location selection.

#### Features (Impeller Sensors)

Plastic and Brass Body Flow Sensors from Rain Bird use a simple six bladed impeller to read flow. Impeller Sensors are available as pre-installed in a tee for fitment in line, or as threaded inserts. Impeller Meters are more traditional offerings, and require standard straight pipe requirements to ensure accurate readings, and are designed for outdoor or underground applications.

Use any Rain Bird Flow Sensor with Rain Bird IQ4, Maxicom2 and SiteControl central control systems or in standalone systems using Rain Bird LXIVM, LXD and LXME2PRO controllers to benefit from:

**Flo-Watch™.** Flo-Watch constantly monitors for low or excess flow conditions such as those caused by broken lines or heads, automatically quarantines and shuts down the problem area and continues to irrigate non affected areas. Saves water, saves plant material and enables irrigation programs to continue and complete. (Note: SiteControl does not offer low flow detection.)

**Learned Flow.** The controller automatically learns station flow rates resulting in more accurate flow rates as compared to manually established flow rates. The automatic collection prevents you from having to manually enter data from drawings or physically visiting each valve to collect flow data and manually entering the data into a controller. (Note: Maxicom and SiteControl do not offer Learned Flow.)

**FloManager®.** FloManager determines the optimal station irrigating sequence. The system runs at its fullest capacity until programs are complete. The controller automatically selects and runs multiple valves at the same time within hydraulic parameters allowing for shorter water windows. Flow rates may be manually

measured and entered into the controller to utilize FloManager functionality. Using a flow sensor and Learned Flow capabilities can help to optimize system performance.

**IQ4 (Central Control).** Add IQ4 to remotely manage your LXIVM, LXD, LXME2PRO controllers. Centrally managing your controllers with IQ4 saves labor and time by eliminating constant monitoring of the site and trips to the controllers. Retrieve alarms or receive alarms via email and SMS message regarding problem areas to dispatch maintenance personnel to check and repair. (Note: In addition to IQ4, Maxicom and SiteControl can also be used to remotely monitor flow from a computer.)

#### Configuration

**Maxicom2 and SiteControl - (Hard Wire) Two-Wire Satellite Systems:** The Flow Sensor is installed with a Pulse Transmitter (PT322 or PT5002) and a Rain Bird Pulse Decoder (DECPULLR). (Note: Pulse Decoders can be connected directly to a two wire path.)

**Maxicom2 - Link Radio Satellite Systems:** The Flow Sensor is installed with a Pulse Transmitter (PT322 or PT5002 no decoder required). (Note: Pulse Transmitter connects to the Satellite sensor input.)

**SiteControl - Decoder System:** Software version 2.X or lower, the flow sensor is installed with a Pulse Transmitter and a Two-Wire Decoder Sensor Decoder (SD210TURF). Software version 3.X or higher, the flow sensor is installed with a Two-Wire Decoder Sensor Decoder (pulse transmitter is optional). (Note: Sensor Decoders can be hooked up directly to a two wire path.)

**ESP-LXD Two-Wire Controller:** The Flow Sensor is installed with a Two-Wire Decoder Sensor Decoder (SD210TURF) connected to the two-wire path (no pulse transmitter required).

**ESP-LXIVM SmartValve Two-Wire Controller:** The Flow Sensor is installed with an IVM-SEN SmartValve Sensor Decoder connected to the two-wire path (no pulse transmitter required).

**LXME2PRO/ LXMEF Traditionally-Wired Controllers:** The flow sensor connects to the controller Flow Smart Module (no pulse transmitter, no decoder required). Maximum distance from flow sensor to controller is 2000ft.

Surge protection (FSSURGEKIT) is recommended for most systems - One at the Flow Sensor, and if more than 50' of wire run, one at the Pulse Transmitter. FSSURGEKIT is not required for Two-Wire Decoder Systems and not compatible with the ESP-LXMEF Flow Smart Module.



#### How to Specify

##### FS - 100 - B

FS = Flow Sensor  
 B = Brass  
 P = Plastic (PVC)

100 = 1" (25mm)	300 = 3" (75mm)
150 = 1 1/2" (40mm)	400 = 4" (110mm)
200 = 2" (50mm)	350 = 3" (75mm) and higher

##### UFS - 100

UFS = Ultrasonic Flow Sensor

100 = 1" (25mm)	200 = 2" (50mm)
150 = 1.5" (40mm)	

## Operating Specifications

### Ultrasonic Sensors

- Accuracy: +/- 2% across full flow range
- Velocity: 2-20 Feet (0.6-6.1 meters) per second depending on model and system specifications
- Pressure: 200 PSI Working Pressure
- Temperature: 32° - 150° F (0° - 65 C) Working Temperature

### Impeller Sensors

- Accuracy: Up to 1% variable across full scale of flow range
- Velocity 2-20 Feet (0.6-6.1 meters) per second depending on model and system specifications
- Pressure: 75 psi (5.1 bars) at 110° F (43° C) (max) on metal models; 150 psi (10.3 bars) at 73° F (23° C) (max) on plastic models  
Temperature: 110° F (43° C) (max) on metal
- Temperature: 110° F (43° C) (max) on metal models; 140° F (60° C) (max) on plastic models

### Transmitters

- Input required:
  - 12-30 VDC/VAC on PT322
  - 10.5-26 VAC (12-24 VAC rec.) on PT 1502
  - 12-24 VAC/VDC on PT 3002
- Output: pulse output
- Operating Temp: -4° F-158° F (-20° C to 70° C)

Models			
Part Number	Model Number	Description	Dimensions (Length x Width x Height)
<b>Ultrasonic</b>			
M80132	UFS200	2" (50mm) Ultrasonic Flow Sensor	10½" x 4 ¾" H = 4 7⁄8" (267mm x 121mm x 124mm)
M80131	UFS150	1 ½" (40mm) Ultrasonic Flow Sensor	10½" x 4 ¾" H = 4 ¾" (267mm x 121mm x 111mm)
M80130	UFS100	1" (25mm) Ultrasonic Flow Sensor	10 ½" x 4 ¾" H = 3 7⁄8" (267mm x 121mm x 98mm)
<b>Brass Tees (Impeller)</b>			
M80111	FS200B	2" (50mm) Brass Tee Flow Sensor	4.25" x 8.35" x 2.94" ( 108mm x 212mm x 75mm )
M80110	FS150B	1 ½" (40mm) Brass Tee Flow Sensor	6.5" x 5.19" x 2.5" (165mm x 132mm x 64mm)
M80101	FS100B	1" (25mm) Brass Tee Flow Sensor	5.45" x 4.94" x 2.21" (138mm x 126mm x 56mm)
<b>Plastic Tees (Impeller)</b>			
M80107	FS400P	4" (110mm) PVC Tee Flow Sensor	7.38" x 7.83" x 5.38" (187mm x 199mm x 137mm)
M80104	FS300P	3" (75mm) PVC Tee Flow Sensor	6.50" x 6.83" x 4.23" (165mm x 173mm x 107mm)
M80103	FS200P	2" (50mm) PVC Tee Flow Sensor	5.63" x 5.64" x 2.88" (143mm x 143mm x 73mm)
M80102	FS150P	1 ½" (40mm) PVC Tee Flow Sensor	5.0" x 5.16" x 2.38" (127mm x 131mm x 60mm)
M80108	FS100P	1" (25mm) PVC Tee Flow Sensor	3.50" x 3.94" x 1.315" (89mm x 100mm x 33mm)
<b>Insert (Impeller)</b>			
M80105	FS350B	Brass Insert	7.13" x 3"(diameter) (181mm x 76mm (diameter))
<b>Wind Sensor</b>			
M80302	ANEMOMETER	Wind Speed Monitor - Anemometer	22" x 8" x 8" (56cm x 20cm x 20cm)
<b>Pulse Transmitters</b>			
M80201	PT322	Pulse Transmitter, no display	3.65" x 1.75" x 1.0" (93mm x 44m x 25mm)
M80208	PT5002	PT5002 Flow Monitor Panel Mount	3.07" x 6.22" x 3.50" (78mm x 158mm x 89mm)
M80210	PT5002 WM	PT5002 Flow Monitor Wall Mount	4.88" x 8.00" x 9.38" (124mm x 203mm x 238 mm)
<b>Accessories</b>			
M80303	FSTINSERT	Flanged Irrigation PPS Insert Assembly	-
M80301	FSSURGEKIT	Flow Sensor Surge Protection Kit	-
M13009	SD210TURF	Sensor Decoder for Decoder Systems	-
M51200	DECPULLR	Pulse Decoder For Two Wire Satellites	-

## Rain Bird Flow Sensor K, Offset and Suggested Operating Range

The following tables contain detail on Rain Bird Flow Sensors.

K-Factor and Offset are key data points for programming controllers to properly convert pulse output from the Flow Sensor to a Gallon Per Minute reading. Flow Sensors may operate above or below suggested ranges, but in all cases Sensors should be used within these ranges for performance as intended. When sizing a Flow Sensor, consider expected flow rates, rather than solely focusing on pipe sizes.

K-Factor, Offset and Suggested Operating Range						
Model	Description	K-Factor	Offset	Suggested Operating Range (Gallons/Minute)	Suggested Operating Range (Liters/Minute)	Suggested Operating Range (Cubic Meters/Hour)
<b>Ultrasonic</b>						
UFS200	2" Ultrasonic Flow Sensor	2.849	0.1439	1.0-200	3.8-757	0.23-45.4
UFS150	1 ½" Ultrasonic Flow Sensor	1.70	-0.316	0.5-110	1.9-416	0.1-24.9
UFS100	1" Ultrasonic Flow Sensor	0.25	0.000	0.3-50	1.14-189	0.1-11.3
<b>Brass Tees (Impeller)</b>						
FS200B	2" Brass Tee Flow Sensor	2.747	0	10 - 100	38 - 380	2.3 - 23
FS150B	1 ½" Brass Tee Flow Sensor	1.06526	0.0892	4 - 80	15 - 300	1 - 18
FS100B	1" Brass Tee Flow Sensor	0.3974	0.2618	2 - 40	7.6 - 150	0.5 - 9
<b>Plastic Tees (Impeller)</b>						
FS400P	4" PVC Tee Flow Sensor	13.7424	0.2307	40 - 500	150 - 1900	9 - 110
FS300P	3" PVC Tee Flow Sensor	8.309	0.227	20 - 300	75 - 1130	4.5 - 70
FS200P	2" PVC Tee Flow Sensor	2.8429	0.1435	10 - 200	40 - 750	2.3 - 45
FS150P	1 ½" PVC Tee Flow Sensor	1.697	-0.316	5 - 100	19 - 380	1.1 - 23
FS100P	1" PVC Tee Flow Sensor	0.2611	1.2	5.4 - 54	20 - 200	1.2 - 12
FS075P	¾" PVC Tee Flow Sensor	0.1563	0.9	3.3 - 33.2	12.6 - 125.8	0.75 - 7.5
FS050P	½" PVC Tee Flow Sensor	0.078	0.9	1.9 - 18.9	7.2 - 71.7	0.43 - 4.3
<b>Inserts</b>						
FS350B	Brass Insert Flow Sensor	Depends on Pipe Type and Size - See Chart below				
FS350SS	Stainless Steel Insert Flow Sensor	Depends on Pipe Type and Size - See Chart below				

\* discontinued models

FS350B and FS350SS: K Value, Offset and Suggested Operating Range							
Pipe Size	Pipe O.D.	Pipe I.D.	K-Factor	Offset	Suggested Operating Range (Gallons/Minute)	Suggested Operating Range (Liters/Minute)	Suggested Operating Range (Cubic Meters/Hour)
3 inch Sch 10S	3.500"	3.260"	5.009	0.09	12-400	50-1500	1-90
Std. Wt., Sch 40	3.5"	3.068"	4.362	0.063	12-400	50-1500	1-90
Extra Strong, Sch 80	3.5"	2.900"	3.858	0.043	12-400	50-1500	1-90
PVC Class 125	3.5"	3.284"	5.094	0.093	12-400	50-1500	1-90
PVC Class 160	3.5"	3.230"	4.902	0.085	12-400	50-1500	1-90
PVC Class 200	3.5"	3.166"	4.682	0.076	12-400	50-1500	1-90
4 inch Sch 10S	4.5"	4.260"	9.597	0.241	20-600	80-2300	1-140
Std. Wt., Sch 40	4.5"	4.026"	8.34	0.229	20-600	80-2300	1-140
Extra Strong, Sch 80	4.5"	3.826"	7.354	0.188	20-600	80-2300	1-140
PVC Class 125	4.5"	4.224"	9.396	0.24	20-600	80-2300	1-140
PVC Class 160	4.5"	4.154"	9.013	0.24	20-600	80-2300	1-140
PVC Class 200	4.5"	4.072"	8.578	0.239	20-600	80-2300	1-140
5 inch Sch 10S	5.563"	5.295"	16.305	0.25	30-900	110-3400	10-200
Std. Wt., Sch 40	5.50"	5.047"	14.674	0.248	30-900	110-3400	10-200
Extra Strong, Sch 80	5.50"	4.813"	13.165	0.246	30-900	110-3400	10-200
6 inch Sch 10S	6.625"	6.357"	24.089	0.26	50-1,500	190-5700	10-340
Std. Wt., Sch 40	6.5"	6.065"	21.574	0.257	50-1,500	190-5700	10-340

**FS350B and FS350SS: K Value, Offset and Suggested Operating Range**

<b>Pipe Size</b>	<b>Pipe O.D.</b>	<b>Pipe I.D.</b>	<b>K-Factor</b>	<b>Offset</b>	<b>Suggested Operating Range (Gallons/Minute)</b>	<b>Suggested Operating Range (Liters/Minute)</b>	<b>Suggested Operating Range (Cubic Meters/Hour)</b>
Extra Strong, Sch 80	6.5"	5.761"	19.457	0.254	50-1,500	190-5700	10-340
PVC Class 125	6.625"	6.217"	22.853	0.258	50-1,500	190-5700	10-340
PVC Class 160	6.625"	6.115"	21.968	0.257	50-1,500	190-5700	10-340
PVC Class 200	6.625"	5.993"	21.068	0.256	50-1,500	190-5700	10-340
8 inch Sch 10S	8.625"	8.329"	43.914	0.286	80-2,500	300-9500	20-570
Sch 20	8.625"	8.125"	41.653	0.283	80-2,500	300-9500	20-570
Sch 30	8.625"	8.071"	41.063	0.283	80-2,500	300-9500	20-570
Std. Wt., Sch 40	8.625"	7.981"	40.086	0.281	80-2,500	300-9500	20-570
Sch 60	8.625"	7.813"	38.288	0.279	80-2,500	300-9500	20-570
Extra Strong, Sch 80	8.625"	7.625"	36.315	0.276	80-2,500	300-9500	20-570
PVC Class 125	8.625"	8.095"	41.324	0.283	80-2,500	300-9500	20-570
PVC Class 160	8.625"	7.961"	39.869	0.281	80-2,500	300-9500	20-570
PVC Class 200	8.625"	7.805"	38.203	0.279	80-2,500	300-9500	20-570
10 inch Sch 10S	10.75"	10.420"	70.195	0.321	125-4,000	470-15100	30-910
Sch 20	10.75"	10.250"	67.668	0.318	125-4,000	470-15100	30-910
Sch 30	10.75"	10.136"	66.069	0.316	125-4,000	470-15100	30-910
Sch 40, Std.Wt.	10.75"	10.020"	64.532	0.314	125-4,000	470-15100	30-910
Extra Strong, Sch 60	10.75"	9.750"	61.016	0.309	125-4,000	470-15100	30-910
Sch 80	10.75"	9.564"	58.644	0.306	125-4,000	470-15100	30-910
PVC Class 125	10.75"	10.088"	65.431	0.315	125-4,000	470-15100	30-910
PVC Class 160	10.75"	9.924"	63.272	0.312	125-4,000	470-15100	30-910
PVC Class 200	10.75"	9.728"	60.733	0.309	125-4,000	470-15100	30-910
12 inch Sch 10S	12.75"	12.390"	104.636	0.367	175-5,000	660-18900	40-1140
Sch 20	12.75"	12.250"	102.553	0.364	175-5,000	660-18900	40-1140
Sch 30	12.75"	12.090"	99.347	0.36	175-5,000	660-18900	40-1140
Std. Wt., Sch 40S	12.75"	12.000"	97.576	0.358	175-5,000	660-18900	40-1140
Sch 40	12.75"	11.938"	96.369	0.356	175-5,000	660-18900	40-1140
Sch 60	12.75"	11.625"	90.441	0.348	175-5,000	660-18900	40-1140
Extra Strong	12.75"	11.750"	92.775	0.351	175-5,000	660-18900	40-1140
Sch 80	12.74"	11.376"	85.922	0.342	175-5,000	660-18900	40-1140
PVC Class 125	12.75"	11.966"	96.912	0.357	175-5,000	660-18900	40-1140
PVC Class 160	12.75"	11.770"	93.152	0.352	175-5,000	660-18900	40-1140
PVC Class 200	12.75"	11.538"	88.842	0.346	175-5,000	660-18900	40-1140
14 inch Sch 10S	14.00"	13.500"	122.307	0.391	200-6,000	760-22700	50-1360
Sch 20	14.00"	13.375"	120.216	0.388	200-6,000	760-22700	50-1360
Std. Wt., Sch 30	14.00"	13.250"	118.151	0.385	200-6,000	760-22700	50-1360
Sch 40	14.00"	13.124"	116.096	0.382	200-6,000	760-22700	50-1360
Sch 60	14.00"	12.814"	111.148	0.376	200-6,000	760-22700	50-1360
Extra Strong	14.00"	13.00"	114.098	0.33	200-6,000	760-22700	50-1360
Sch 80	14.00"	12.50"	106.299	0.369	200-6,000	760-22700	50-1360
16 inch Sch 10S	16.00"	15.500"	159.243	0.44	300-9,000	1140-34100	70-2040
Sch 20	16.00"	15.375"	156.742	0.436	300-9,000	1140-34100	70-2040
Std. Wt., Sch 30	16.00"	15.250"	154.267	0.433	300-9,000	1140-34100	70-2040
Sch 60	16.00"	14.688"	143.456	0.419	300-9,000	1140-34100	70-2040
Extra Strong, Sch 40	16.00"	15.000"	149.394	0.427	300-9,000	1140-34100	70-2040
Sch 80	16.00"	14.314"	136.548	0.41	300-9,000	1140-34100	70-2040

**FS350B and FS350SS: K Value, Offset and Suggested Operating Range**

<b>Pipe Size</b>	<b>Pipe O.D.</b>	<b>Pipe I.D.</b>	<b>K-Factor</b>	<b>Offset</b>	<b>Suggested Operating Range (Gallons/Minute)</b>	<b>Suggested Operating Range (Liters/Minute)</b>	<b>Suggested Operating Range (Cubic Meters/Hour)</b>
18 inch Sch 10S	18.00"	17.500"	202.739	0.498	350-10,000	1320-37900	80-2270
Sch 20	18.00"	17.375"	199.828	0.494	350-10,000	1320-37900	80-2270
Sch 30	18.00"	17.124"	194.061	0.486	350-10,000	1320-37900	80-2270
Std. Wt.	18.00"	17.250"	196.943	0.49	350-10,000	1320-37900	80-2270
Sch 40	18.00"	16.876"	188.464	0.479	350-10,000	1320-37900	80-2270
Sch 60	18.00"	16.500"	180.171	0.469	350-10,000	1320-37900	80-2270
Extra Strong	18.00"	17.000"	191.25	0.482	350-10,000	1320-37900	80-2270
Sch 80	18.00"	16.126"	172.152	0.457	350-10,000	1320-37900	80-2270
20 inch Std. Wt., Sch 20	20.00"	19.25"	246.179	0.555	400-12,000	1510-45400	90-2730
Sch 40	20.00"	18.812"	234.836	0.54	400-12,000	1510-45400	90-2730
Extra Strong, Sch 30	20.00"	19.000"	239.666	0.547	400-12,000	1510-45400	90-2730
Sch 80	20.00"	17.938"	213.14	0.511	400-12,000	1510-45400	90-2730
22 inch Std. Wt., Sch 20	22.00"	21.25"	301.975	0.621	500-15,000	1890-56800	110-3410
Extra Strong, Sch 30	22.00"	21.00"	294.642	0.616	500-15,000	1890-56800	110-3410
Sch 80	22.00"	19.75"	259.513	0.573	500-15,000	1890-56800	110-3410
24 inch Std. Wt., Sch 20	24.00"	23.25"	364.331	0.666	600-18,000	2270-68100	140-4090
Extra Strong	24.00"	23.00"	356.178	0.66	600-18,000	2270-68100	140-4090
Sch 40	24.00"	22.624"	344.109	0.652	600-18,000	2270-68100	140-4090
Sch 80	24.00"	21.562"	311.271	0.628	600-18,000	2270-68100	140-4090
26 inch Sch 10	26.00"	25.376"	437.809	0.719	700-21,000	2650-79500	160-4770
Std. Wt.	26.00"	25.25"	433.247	0.716	700-21,000	2650-79500	160-4770
Sch 20, Extra Strong	26.00"	25.00"	424.274	0.709	700-21,000	2650-79500	160-4770
28 inch Sch 10	28.00"	27.376"	513.698	0.774	900-23,000	3410-87100	200-5220
Std. Wt.	28.00"	27.25"	508.723	0.77	900-23,000	3410-87100	200-5220
Extra Strong, Sch 20	28.00"	27.00"	498.93	0.763	900-23,000	3410-87100	200-5220
30 inch Sch 10	30.00"	29.376"	596.147	0.833	1,000-30,000	3790-113600	230-6810
Std. Wt.	30.00"	29.25"	590.759	0.829	1,000-30,000	3790-113600	230-6810
Sch 20, Extra Strong	30.00"	29.00"	580.146	0.822	1,000-30,000	3790-113600	230-6810
32 inch Sch 10	32.00"	31.376"	685.156	0.897	1,200-35,000	4540-132500	270-7950
Std. Wt.	32.00"	31.25"	679.355	0.893	1,200-35,000	4540-132500	270-7950
Sch 20, Extra Strong	32.00"	31.00"	667.922	0.885	1,200-35,000	4540-132500	270-7950
Sch 40	32.00"	30.624"	650.919	0.873	1,200-35,000	4540-132500	270-7950
34 inch Sch 10	34.00"	33.312"	777.566	0.964	1,300-40,000	4920-151400	300-9080
Std. Wt.	34.00"	33.25"	774.511	0.962	1,300-40,000	4920-151400	300-9080
Extra Strong, Sch 20	34.00"	33.00"	762.258	0.953	1,300-40,000	4920-151400	300-9080
Sch 40	34.00"	32.624"	744.022	0.94	1,300-40,000	4920-151400	300-9080
36 inch Sch 10	36.00"	35.376"	882.855	1.04	1,500-45,000	5680-170300	340-10220
Std. Wt.	36.00"	35.25"	876.227	1.035	1,500-45,000	5680-170300	340-10220
Sch 20, Extra Strong	36.00"	35.00"	863.154	1.025	1,500-45,000	5680-170300	340-10220
Sch 40	36.00"	34.50"	837.315	1.007	1,500-45,000	5680-170300	340-10220

## Model UFS100, UFS150, or UFS200 Ultrasonic Flow Sensor

The flow sensor shall be an in-line type with Ultrasonic transducers and acoustical reflectors, and no moving parts. The body material shall be Glass Filled Nylon (GFN). The upper electronics housing shall be Poly Phenyl Oxide (PPO). The flow sensor shall be rated for IP 68 and/or NEMA 4X, suitable for pollution degree 4 environments, outdoor use below grade, and submerged installations <3 feet of water. Electrical connections shall be 4 feet of 2-conductor AWG 18 UL PTLT drain wire provided for connection to irrigation controller. Rated to 221° F. May be extended to a maximum of 2000 feet with 20 AWG (or larger) shielded flow sensing cable (Paige Electric P7162D or equal) suitable for direct burial, or appropriate for installation. The sensor shall be capable of operating in line pressure up to 200 psi (13.7 bars) and liquid temperatures ranging 32° F (0° C) to 150° F (65° C). Flow measurement shall be 0.3 to 50 GPM (gallons per minute) for 1" pipe diameters, 0.5 to 110 GPM for 1.5" pipe diameters, and 1.0 to 200 GPM for 2" pipe diameters. Measurement shall have accuracy of ±2% and repeatability of ±2%. The flow sensor shall be available in 1", 1.5", and 2" (25 MM, 40 MM, 50 MM) with socket end connections. This flow sensor shall be Rain Bird Model UFS100, UFS150, or UFS200.

## Model FS100B & FS150B Impeller Flow Sensor

The flow sensor shall be an in line type with a nonmagnetic, spinning impeller (paddle wheel) as the only moving part. The electronics housing shall be glass-filled PPS. The impeller shall be glass-filled nylon or Tefzel® with a UHMWPE or Tefzel sleeve bearing. The shaft material shall be tungsten carbide. The electronics housing shall have two, ethylenepropylene O-Rings and shall be easily removed from the meter body. The sensor electronics will be potted in an epoxy compound designed for prolonged immersion. Electrical connections shall be 2 single conductor 18 AWG leads 48 inches (1,2 meters) long. Insulation shall be direct burial "UF" type colored red for the positive lead and black for the negative lead.

The sensor shall be capable of operating in line pressures up to 400 psi (27,5 bars) and liquid temperatures up to 220° F (105°C), and operating in flows of 1/2 foot (0,15 meters) per second to 15 feet (4,5 meters) per second with linearity of ±1% and repeatability of ±1%. The meter body shall be cast 85-5-5-5 bronze, in 1" (25 mm) and 1 1/2" (40 mm), female iron pipe thread sizes. This flow sensor shall be Rain Bird Model FS100B or FS150B.

## Model FS200B Impeller Flow Sensor

The flow sensor shall be an insertion type with a nonmagnetic, spinning impeller (paddle

wheel) as the only moving part. The sensor sleeve shall be bronze, with the sensor housing being PPS. The sensor shall be mounted in a 2" malleable bronze tee. The sensor shall be a nonmagnetic, spinning impeller (paddle wheel) as the only moving part. The impeller shall be glass-filled nylon with a UHMWPE sleeve bearing. The shaft material shall be tungsten carbide. The sensor electronics will be potted in an epoxy compound designed for prolonged immersion. Electrical connections shall be 2 single conductor 18 AWG leads 48 inches long, U.L Style type PTLT wire. The sensor shall operate in line pressures up to 200 psi and liquid temperatures up to 100° F, and operate in flows of 1/2 foot per second to 30 feet per second with accuracy of ± 1% of full scale and repeatability of ± 0.3%. This flow sensor shall be Rain Bird Model FS200B.

## Model FS100P Flow Sensor

The flow sensor shall be an in line type with a nonmagnetic, spinning impeller (paddle wheel) as the only moving part. The impeller shall be made of 300SST with a UHMWPE sleeve bearing. The shaft material shall be tungsten carbide. The electronics housing shall be made of PPS. The electronics housing shall have two EPDM O-Rings and shall be easily removed from the meter body. The sensor electronics will be potted in an epoxy compound designed for prolonged immersion with 2-conductor, 18AWG solid copper wire leads extending from the top of the sensor. The sensor shall operate in line pressures up to 150 psi at liquid temperatures up to 73° F, or up to 75 PSIG at liquid temperatures up to 110° F. The sensor shall operate in flows of 2 foot per second to 20 feet per second with linearity of ± 3% and repeatability of ± 1.5%. The flow sensor shall generate a frequency which is proportional to flow rate. The meter body shall be fabricated from Schedule 40 PVC Tees, Type 1, white, available in 1/2", 3/4", and 1" (12mm, 20mm, and 25mm) solvent weld socket end connections. This flow sensor shall be Rain Bird Model FS100P.

## Model FS150P, FS200P, FS300P or FS400P Impeller Flow Sensor

The flow sensor shall be an in-line type with a nonmagnetic, spinning impeller (paddle wheel) as the only moving part. The electronics housing shall be glass-filled PPS. The impeller shall be glass-filled nylon or Tefzel with a UHMWPE or Tefzel sleeve bearing. The shaft material shall be tungsten carbide. The electronics housing shall have two, ethylenepropylene O-Rings and shall be easily removed from the meter body. The sensor electronics will be potted in an epoxy compound designed for prolonged immersion. Electrical connections shall be 2 single conductor 18 AWG leads 48 inches (1,2 meters) long. Insulation shall be direct burial "UF" type colored red for the positive lead and black for

the negative lead. The sensor shall be capable of operating in line pressure up to 100 psi (6.9 bars) and liquid temperatures up to 140°F (60° C), and operating in flows of 1/2 foot (0,15 meters) per second to 30 feet (9,2 meters) per second with linearity of ±1% and repeatability of ±1%. The meter body shall be fabricated from Schedule 80 PVC Tees, available in 1 1/2", 2", 3", and 4" (40mm, 50mm, 75mm, and 110mm) with socket end connections. This flow sensor shall be Rain Bird Model FS150P, FS200P, FS300P or FS400P.

## Model FS350B Impeller Flow Sensors

The flow sensor shall be an insertion type with a nonmagnetic, spinning impeller (paddle wheel) as the only moving part. The sensor sleeve will be brass with the sensor housing being PPS.

The impeller shall be glassfilled nylon or Tefzel with a UHMWPE or Tefzel sleeve. The shaft material shall be tungsten carbide. The sensor will be supplied with a 2" (50mm) NPT adapter for installation into any commercially available weld-on fitting or pipe saddle. The adapter shall have two, ethylenepropylene O-Rings. The sensor electronics will be potted in an epoxy compound designed for prolonged immersion. Electrical connections shall be 2 single conductor 18AWG leads 48 inches (1,2 meters) long. Insulation shall be direct burial "UF" type colored red for the positive lead and black for the negative lead. Insertion of the sensor into any pipe size shall be 1 1/2" (40mm) from the inside wall to the end of the sensor housing. The sensor shall be capable of operating in line pressures up to 400 psi (27,5 bars) and liquid temperatures up to 220° F (105°C), and operating in flows of 1/2 foot (0,15 meters) per second to 30 feet (9,2 meters) per second. This flow sensor shall be Rain Bird Model FS350B.

## Model PT322 Pulse Output Transmitter

The Pulse Output Transmitter shall receive signals for any Rain Bird flow sensor and produce a dry contact closure in units of measure that can be defined by the user. Calibration shall be achieved by connecting to a computer with Rain Bird PT322SW software. All information set in the software is sent to the PT322 via a supplied cable. The PT322 shall feature two diagnostic LED's, one corresponding to the input signal and one corresponding to the output signal. Model PT322 transmitter shall operate on 12-30 VDC/VAC power (using PTPWRSUPP Power Supply.) Models shall be provided in epoxy filled enclosures. The Pulse Output Transmitter shall be Rain Bird Model PT322.

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