Tech Spec

Flow Sensors – NPT

Flow Sensing for Maxicom²,® SiteControl,™ IQ™ v2.0, LXD, LXME, LXMEF

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 Management functionality. Use Rain Bird Flow Sensors with Rain Bird Maxicom², SiteControl and IQ v2.0 central control applications or in standalone systems using Rain Bird LXD, LXME and LXMEF controllers to benefit from:

Flo-Watch™. Flo-Watch constantly monitors for low flow and excess flow conditions 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.

Learned Flow. The controller automatically learns station flow rates resulting in more accurate 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.

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. Pressure and 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.

Customers with ESP-LXME units only need to purchase a Flow Smart Module for the ESP-LXME to capitalize on Flo-Watch, Learned Flow and FloManager. Add IQ v2.0 to remotely manage your ESP-LXD, ESP-LXMEF and ESP-LXME controllers. Centrally managing your controllers with IQ v2.0 saves labor and time by eliminating constant monitoring of the site and trips to the controllers. Retrieve alarms or receive alarms via email regarding problem areas to dispatch maintenance personnel to check and repair.

Configuration

Maxicom² and SiteControl - (Hard Wire) Two-Wire Satellite Systems: The Flow Sensor is installed with a Pulse Transmitter and a Rain Bird Pulse Decoder (DECPULLR).

Maxicom² - Link Radio Satellite Systems: The Flow Sensor is installed with a Pulse Transmitter (no decoder required).

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).

IQ v2.0 - (Hard Wire) Two-Wire Systems: The Flow Sensor is installed with a Two-Wire Decoder Sensor Decoder (SD210TURF) (no pulse transmitter required).

IQ2 v2.0 - Traditional Wired Systems: Only the flow sensor is installed (no pulse transmitter, no decoder required).

LXD - (Hard Wire) Two-Wire Systems: The Flow Sensor is installed with a Two-Wire Decoder Sensor Decoder (SD210TURF) (no pulse transmitter required).

LXME/LXMEF - Traditional Wired Systems: Only the flow sensor is installed (no pulse transmitter, no decoder required).

Surge protection (FSSURKIT) is recommended for all systems - One at the Flow Sensor, and if more than 50' of wire run, one at the Pulse Transmitter.

Features (Sensors)

- Simple six-bladed impeller design
- Designed for outdoor or underground applications
- Available in PVC, brass or stainless steel construction
- Pre-installed in tee or insert versions

Features (Transmitters)

- Reliable solid-state design
- Display or signal-alone versions
- Easy-to-program, menu-driven design
- Programmable from a laptop computer (PT322)
- Operates with both MAXILink™ and (hard wire) two-wire satellite systems
- Mounted in optional NEMA enclosure (PT3002 only)

How To Specify

FS - 100 - B (Flow Sensors)

FS = Flow Sensor

B = Brass
P = Plastic (PVC)
SS = Stainless Steel

50 = ½" (12mm)
75 = ¾" (20mm)
100 = 1" (25mm)
150 = 1½" (40mm)
200 = 2" (50mm)
300 = 3" (75mm)
400 = 4" (110mm)
350 = 3" (75mm) and higher

PT - 322 (Pulse Transmitters)

PT = Pulse Transmitter

322 = No read out
3002 = Digital readout

Operating Specifications (Sensors)

- Accuracy: ± 1% (full scale)
- Velocity: 1⁄2 - 30 feet (0,15 - 9,2 meters) per second, depending on model
- Pressure: 400 psi (27,5 bars) (max) on metal models; 100 psi (6,9 bars) (max) on plastic models
- Temperature: 220° F (105° C) (max) on metal models; 140° F (60° C) (max) on plastic models

Operating Specifications (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)

Rain Bird Flow Sensor K, Offset and Suggested Operating Range

The following tables indicate the suggested flow range for Rain Bird Flow Sensors. Rain Bird Sensors will operate both above and below the indicated flow rates. However, good design practice dictates the use of this range for best performance. Sensors should be sized for flow rather than pipe size.

Flow Sensor Models

Part Number	Model Number	Description	Dimensions
Brass Tee's			
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)
Plastic Tee's			
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)
M80109	FS075P	¾" (20mm) PVC Tee Flow Sensor	3.31" x 3.85" x 1.05" (84mm x 98mm x 27mm)
M80119	FS050P	½" (12mm) PVC Tee Flow Sensor	3.06" x 3.85" x 0.84" (78mm x 98mm x 21mm)
Inserts			
M80106	FS350SS	Stainless Steel Insert	7.13" x 3"(diameter) (181mm x 76mm (diameter))
M80105	FS350B	Brass Insert	7.13" x 3"(diameter) (181mm x 76mm (diameter))
Wind Sensor			
M80302	ANEMOMETER	Wind Speed Monitor - Anemometer	22" x 8" x 8" (56cm x 20cm x 20cm)
Pulse Transmitters			
M80201	PT322	Pulse Transmitter, no display	3.65" x 1.75" x 1.0" (93mm x 44m x 25mm)
M80206	PT3002	Pulse Transmitter, LCD display	3.78" x 3.78" x 2.21" (96mm x 96mm x 56mm)
M80202	PT322SW	PT322 Programming Software	–
M80204	PTPWRSUPP	Pulse Transmitter Power Supply	–
M80205	NEMACAB	NEMA Enclosure for PT3002 (only)	–
Accessories			
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	–

K Value, Offset and Suggested Operating Range

Model	Description	K Value	Offset	Suggested Operating Range (Gallons/Minute)	Suggested Operating Range (Liters/Minute)	Suggested Operating Range (Cubic Meters/Hour)
Brass Tee's						
FS200B	2" Brass T Flow Sensor	2.747	0	4.9 - 294	18.5 - 1112	1.1 - 66.7
FS150B	1 ½" Brass T Flow Sensor	1.06526	0.0892	2 - 82.6	6.3 - 313	0.4 - 18.7
FS100B	1" Brass T Flow Sensor	0.41447	0.44117	2 - 40	6 - 150	0.5 - 9
Plastic Tee's						
FS400P	4" PVC T Flow Sensor	15.35	0.248	40 - 500	150 - 1890	9.1 - 113.6
FS300P	3" PVC T Flow Sensor	8.309	0.227	20 - 300	78 - 1134	4.5 - 68.1
FS200P	2" PVC T Flow Sensor	2.725	0.392	10 - 200	36 - 756	2.3 - 45.4
FS150P	1 ½" PVC T Flow Sensor	1.848	0.227	5 - 100	18 - 378	1.1 - 22.7
FS100P	1" PVC T Flow Sensor	0.261119	1.2	5.4 - 53.9	20.4 - 204	1.2 - 12.2
FS075P	¾" PVC T Flow Sensor	0.1563	0.9	3.3 - 33.2	12.6 - 125.8	0.75 - 7.5
FS050P	½" PVC T Flow Sensor	0.078	0.9	1.9 - 18.9	7.2 - 71.7	0.43 - 4.3
Inserts						
FS350B	Brass Insert Flow Sensor	Depends on Pipe Type and Size - See Chart on next page				
FS350SS	Stainless Steel Insert Flow Sensor	Depends on Pipe Type and Size - See Chart on next page				

FS350B and FS350SS: K Value, Offset and Sugested Operating Range							
Pipe Size	**Pipe O.D.**	**Pipe I.D.**	**K Value**	**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	0-90
Std. Wt., Sch 40	3.5"	3.068"	4.362	0.063	12-400	50-1500	0-90
Extra Strong, Sch 80	3.5"	2.900"	3.858	0.043	12-400	50-1500	0-90
PVC Class 125	3.5"	3.284"	5.094	0.093	12-400	50-1500	0-90
PVC Class 160	3.5"	3.230"	4.902	0.085	12-400	50-1500	0-90
PVC Class 200	3.5"	3.166"	4.682	0.076	12-400	50-1500	0-90
4 inch Sch 10S	4.5"	4.260"	9.597	0.241	20-600	80-2300	0-140
Std. Wt., Sch 40	4.5"	4.026"	8.34	0.229	20-600	80-2300	0-140
Extra Strong, Sch 80	4.5"	3.826"	7.354	0.188	20-600	80-2300	0-140
PVC Class 125	4.5"	4.224"	9.396	0.24	20-600	80-2300	0-140
PVC Class 160	4.5"	4.154"	9.013	0.24	20-600	80-2300	0-140
PVC Class 200	4.5"	4.072"	8.578	0.239	20-600	80-2300	0-140
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
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

FS350B and FS350SS: K Value, Offset and Sugested Operating Range							
Pipe Size	**Pipe O.D.**	**Pipe I.D.**	**K Value**	**Offset**	**Suggested Operating Range** (Gallons/Minute)	**Suggested Operating Range** (Liters/Minute)	**Suggested Operating Range** (Cubic Meters/Hour)
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
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

Specifications

Model FS100B & FS150B 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 ½ 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 1½" (40 mm) , female iron pipe thread sizes. This flow sensor shall be Rain Bird Model FS100B or FS150B.

Model FS200B 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 PTLC wire. The sensor shall operate in line pressures up to 200 psi and liquid temperatures up to 100° F, and operate in flows of ½ 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 FS050P, FS075P or 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 ½", ¾", and 1" (12mm, 20mm, and 25mm) solvent weld socket end connections. This flow sensor shall be Rain Bird Model FS050P, FS075P or FS100P.

Model FS150P, FS200P, FS300P or FS400P 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 prolongs 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 & FS350SS 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 (or 316 stainless steel) with the sensor housing being PPS. The impeller shall be glassfilled nylon or Tefzel with a UHMPWE 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 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 (FS350SS).

Model PT322 Pulse Output Transmitter

The Pulse Output Transmitter shall receive signals for any Rain Bird flow sensor and produce a dry contract 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. Models shall be provided in epoxy filled enclosures. The Pulse Output Transmitter shall be Rain Bird Model PT322.

Model PT3002 Flow Monitor

The flow monitor shall be a microprocessor based digital unit capable of calculating and displaying both rate of flow and total flow on a two line by sixteen character alpha-numeric LCD. The flow monitor shall accept digital inputs or optional sine wave or analog signal and may be field configured to display rate and total values in any unit of measure. All data shall be entered via five keys mounted on the front panel. The monitor shall feature a software lock to protect the entered data from unauthorized changes. A nonvolatile memory, requiring no battery backup shall protect the data from electronic losses. The Model PT3002 shall conform to DIN standard dimensions for panel mounting, and shall feature a NEMA 4X rated front panel, in an optional NEMA 4 wall mount cabinet. Monitor shall operate on power of 12-24 VAC/VDC. The flow monitor shall feature standard open collector transistor outputs, one based on rate and one based on total. Set points or time delays for rate, scaling or pulse width for total may be configured in the field. Options shall include analog inputs, analog output, or control relays, all programmable from the keypad. The flow monitor shall be Rain Bird Model PT3002.

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