

**SERIES 100
 METERS AND
 ACCESSORIES**
**Series 190 Totalizer, Indicator
 and Transmitter Option for
 Mechanical Drive
 Propeller Flowmeters**
**PDS-190-111
 Issue Date: October 2010**
DESCRIPTION

For applications where the environment is unfriendly to a digital microprocessor device, Sparling has updated its FT190 to incorporate a 4-20 mA and scaled pulse output. The FT190 is a rugged mechanical transmitter that has been successfully used in the field for over 30 years and the FT190-111 continues Sparlings' tradition of highly robust solutions for the flow metering world.

The FT190-111 mechanical indicator/totalizer is used in combination with, and mounted on, Sparling mechanical propeller flowmeters to provide mechanical totalization (registration), mechanical indication (flow rate) and a 4-20mA and scaled pulse output.



| READOUT AND OUTPUT CAPABILITIES | | | | | | |
|---------------------------------|-------------------------|----------------------------|---------|-----------------|------------------------------|----------------------|
| Type | Mechanical Totalization | Mechanical Rate Indication | Outputs | 4-20mA (2-wire) | Scaled Electronic Pulse Rate | Approx. Shipping Wt. |
| FT190-111 | YES | YES | YES | YES | YES | 20 lbs. |

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SPECIFICATIONS:

MECHANICAL RATE INDICATOR

Scale Length 6 inches
 Accuracy 5% full scale
 Available Scales See Table 4

MECHANICAL TOTALIZER

Number of digits 6
 Accuracy ±2% actual flow
 Units of registration See Table 2
 Test Hand One full rotation per least significant digit of totalizer

4-20mA OUTPUT

True two-wire requiring external power supply
 External Power Supply 18-30 vDC
 Output Load Capacity See power supply vs. output load curve
 Reverse polarity protection 35vDC (max.)
 Accuracy 0.5% of full scale

SCALED ELECTRONIC PULSE RATE

Two-wire isolated solid state switch (photocoupled)
 External Power Supply 10-30 vDC
 Pulse amplitude 0 vDC (off) to external supply voltage minus 3 vDC (on)
 Output load 4 watts maximum
 Pulse on time 100ms
 Pulse output registration Equal to mechanical totalizer least significant digit
 Accuracy 2% actual flow

ALL OUTPUT CONNECTIONS

Pigtail leads through 1/2 NPT grommets or potted sealed conduit connection.

MATERIAL OF CONSTRUCTION

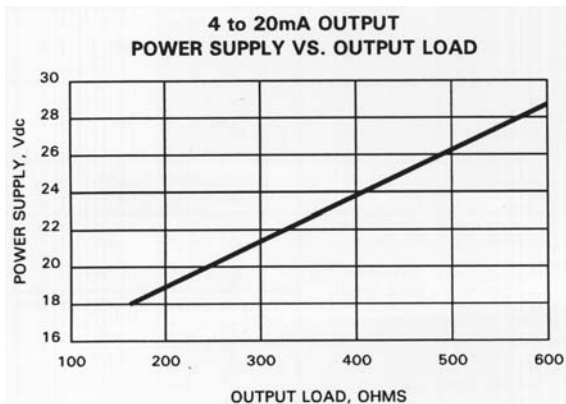
Painted Die Cast Aluminum.

ENCLOSURE RATING NEMA 3R

ELECTRICAL RATING General Purpose

AMBIENT TEMPERATURE LIMITS

+30°F (-1°C) to 130°F (+55°C)



FT190-111-2 PROPELLER FLOWMETER TRANSMITTER MODEL NUMER SCHEDULE

Table 1 - Base Model Number
 FT190 - Mechanical Flow Totalizer and Indicator

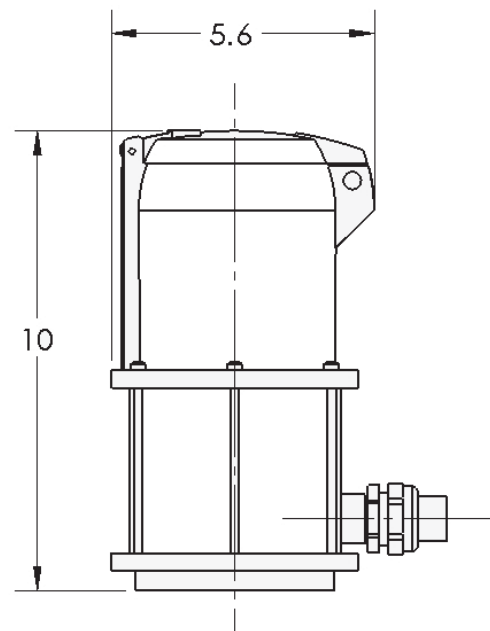
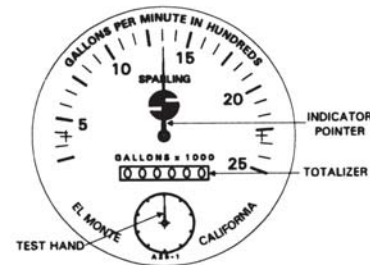
Table 2 - Outputs
 111 - 4-20mA and Scaled Pulse Output

Table 3 - Mounting
 2 For Mounting on Meterhead on Same Order
 3 Replacement for Existing Meterheads

FT190-111-__

ORDERING INFORMATION

- Construct model number by selecting one code for each category.
- If ordered with a new meter-head, state base model number and size of meter-head. If replacement for an existing meterhead, state serial number of existing meter-head.
- Provide the following information from Tables 2 & 3.
 - Mechanical indicator scale and units
 - Mechanical totalizer registration and units



**TABLE 2
STANDARD INDICATOR SCALE AND REGISTRATION FOR FT190-111-2**

| Sz | Full Scale Indication | Registration | Sz | Full Scale Indication | Registration | Sz | Full Scale Indication | Registration | Sz | Full Scale Indication | Registration |
|------------------------|------------------------|----------------|----------------|-----------------------|----------------|-------------|-----------------------|----------------|-----|-----------------------|----------------|
| 2" | 100 GPM | 10 GALLONS | 6" cont | 1000 GPM | 100 CF | 10" cont | 4.0 CFS | 0.001 AF | 14" | 3500 GPM | 1000 GALLONS |
| | 100 IGPM | 10 IMP. GAL. | | 1000 GPM | 0.001 AF | | 5.5 CFS | 0.001 AF | | 3500 IGPM | 1000 IMP. GAL. |
| | 100 GPM | 10 CF | | 2.0 CFS | 10 CF | | 2.5 MGD | 1000 GALLONS | | 3500 GPM | 100 CF |
| | 200 GPM | 100 GALLONS | | 3.0 CFS | 10 CF | | 100 LPS | 1000 LITERS | | 3500 GPM | 1000 CF |
| | 200 IGPM | 10 IMP. GAL. | | 3.0 CFS | 100 CF | | 100 LPS | UNIT CU. MTRS. | | 3500 GPM | 0.01 AF |
| | 300 GPM | 10 CF | | 3.0 CFS | 0.001 AF | | 125 LPS | 1000 LITERS | | 4500 GPM | 1000 GALLONS |
| | 0.25 CFS | 10 CF | | 1.5 MGD | 1000 GALLONS | | 2500 GPM | 1000 GALLONS | | 4500 IGPM | 1000 IMP. GAL. |
| | 0.5 CFS | 10 CF | | 60 LPS | 1000 LITERS | | 2500 IGPM | 1000 IMP. GAL. | | 4500 GPM | 0.01 AF |
| | 6 LPS | 100 LITERS | | 60 LPS | UNIT CU. MTRS. | | 2500 GPM | 100 CF | | 4500 GPM | 100 CF |
| | 12.5 LPS | 0.1 CU. MTRS. | | 75 LPS | UNIT CU. MTRS. | | 2500 GPM | 0.01 AF | | 10.0 CFS | 100 CF |
| | | | | 1400 GPM | 1000 GALLONS | | 2500 GPM | 0.1 ACRE IN. | | 10.0 CFS | 0.01 AF |
| | | | | 1400 IGPM | 1000 IMP. GAL. | | 6.0 CFS | 100 CF | | 7.5 MGD | 1000 GALLONS |
| | | | | 1400 GPM | 100 CF | | 6.0 CFS | 0.01 AF | | 250 LPS | 10000 LITERS |
| | | | | 1400 GPM | 0.001 AF | | 4.0 MGD | 1000 GALLONS | | 250 LPS | 10 CU. MTRS. |
| | | | | 1400 GPM | UNIT CU. MTRS. | | 200 LPS | 10 CU. MTRS. | | 5000 GPM | 1000 GALLONS |
| 3" | 200 GPM | 10 GALLONS | 8" | 1400 GPM | 1000 GALLONS | 12" | 2500 GPM | 1000 GALLONS | 16" | 4500 GPM | 1000 GALLONS |
| | 200 IGPM | 10 IMP. GAL. | | 1400 IGPM | 1000 IMP. GAL. | | 2500 IGPM | 1000 IMP. GAL. | | 4500 IGPM | 1000 IMP. GAL. |
| | 300 GPM | 10 GALLONS | | 1400 GPM | 100 CF | | 2500 GPM | 100 CF | | 4500 GPM | 0.01 AF |
| | 300 IGPM | 10 IMP. GAL. | | 1400 GPM | 0.001 CF | | 2500 GPM | 0.01 AF | | 4500 GPM | 0.01 AF |
| | 300 GPM | UNIT CF | | 1400 GPM | UNIT CU. MTRS. | | 6.0 CFS | 100 CF | | 10.0 CFS | 100 CF |
| | 300 GPM | 10 CF | | 1400 GPM | 0.01 ACRE IN. | | 6.0 CFS | 0.01 AF | | 10.0 CFS | 0.01 AF |
| | 300 GPM | .0001 AF | | 2.0 MGD | 1000 GALLONS | | 4.0 MGD | 1000 GALLONS | | 7.5 MGD | 1000 GALLONS |
| | 500 GPM | 100 GALLONS | | 1700 GPM | 1000 GALLONS | | 3500 GPM | 1000 GALLONS | | 250 LPS | 10000 LITERS |
| | 500 IGPM | 100 IMP. GAL. | | 1700 IGPM | 1000 IMP. GAL. | | 3500 GPM | 1000 IMP. GAL. | | 250 LPS | 10 CU. MTRS. |
| | 500 GPM | 10 CF | | 1700 GPM | 100 CF | | 3500 GPM | 100 CF | | 5000 GPM | 1000 GALLONS |
| | 500 GPM | 0.001 AF | | 1700 GPM | 0.01 AF | | 3500 GPM | 1000 GALLONS | | 5000 GPM | 1000 IMP. GAL. |
| | 0.5 CFS | 10 CF | | 4.0 CFS | 100 CF | | 3500 IGPM | 1000 IMP. GAL. | | 5000 GPM | 100 CF |
| | 1.0 CFS | 10 CF | | 4.0 CFS | 0.001 AF | | 3500 GPM | 1000 GALLONS | | 5000 GPM | 100 CF |
| | 0.5 MGD | 100 GALLONS | | 5.5 CFS | 0.001 AF | | 3500 GPM | 1000 GALLONS | | 14.0 CFS | 100 CF |
| | 12.5 LPS | 0.1 CU. MTRS. | | 2.5 MGD | 1000 GALLONS | | 3500 GPM | 100 CF | | 300 LPS | 10 CU. MTRS. |
| 25 LPS | 1000 LITERS | 100 LPS | 1000 LITERS | 3500 GPM | 1000 CF | | | | | | |
| 30 LPS | 1000 LITERS | 100 LPS | UNIT CU. MTRS. | 3500 GPM | 0.01 AF | | | | | | |
| 100 M ³ /HR | UNIT CU. MTRS. | 125 LPS | 1000 LITERS | | | | | | | | |
| 4" | 500 GPM | 100 GALLONS | 10" | 1700 GPM | 1000 GALLONS | 14" | 3000 GPM | 1000 GALLONS | 18" | 5000 GPM | 1000 GALLONS |
| | 500 IGPM | 100 IMP. GAL. | | 1700 IGPM | 1000 IMP. GAL. | | 3000 IGPM | 1000 IMP. GAL. | | 5000 IGPM | 1000 IMP. GAL. |
| | 500 GPM | 10 CF | | 1700 GPM | 100 CF | | 2500 GPM | 100 CF | | 5000 GPM | 100 CF |
| | 500 GPM | 0.001 AF | | 1700 GPM | 0.01 AF | | 2500 GPM | 0.01 AF | | 14.0 CFS | 100 CF |
| | 1000 GPM | 10 CF | | 4.0 CFS | 100 CF | | 6.0 CFS | 100 CF | | 6000 GPM | 1000 GALLONS |
| | 1.0 CFS | 10 CF | | 4.0 CFS | 0.001 AF | | 6.0 CFS | 0.01 AF | | 6000 IGPM | 1000 IMP. GAL. |
| | 1.0 CFS | 100 CF | | 3.0 CFS | 10 CF | | 4.0 MGD | 1000 GALLONS | | 6000 GPM | 10000 GALLONS |
| | 1.0 CFS | 0.001 AF | | 3.0 CFS | 100 CF | | 200 LPS | 10 CU. MTRS. | | 6000 GPM | 100 CF |
| | 30 LPS | 1000 LITERS | | 3.0 CFS | 0.001 AF | | 200 LPS | 0.01 MEGA LTR. | | 7500 GPM | 10000 GALLONS |
| | 50 LPS | UNIT CU. MTRS. | | 2.0 MGD | 1000 GALLONS | | 3000 GPM | 1000 GALLONS | | 15.0 CFS | 100 CF |
| | 100 M ³ /HR | UNIT CU. MTRS. | | 75 LPS | UNIT CU. MTRS. | | 3000 IGPM | 1000 IMP. GAL. | | 15.0 CFS | 0.01 AF |
| | | | | 100 LPS | 1000 LITERS | | 7.5 CFS | 0.001 AF | | 10.0 MGD | 1000 GALLONS |
| | | | | 100 LPS | UNIT CU. MTRS. | | 8.0 CFS | 100 CF | | 10.0 MGD | 10000 GALLONS |
| | | | | 1700 GPM | 1000 GALLONS | | 8.0 CFS | 0.01 AF | | 350 LPS | 10 CU. MTRS. |
| | | | | 1700 IGPM | 1000 IMP. GAL. | | 5.0 MGD | 1000 GALLONS | | 400 LPS | 10 K LTRS. |
| | | 1700 GPM | 100 CF | 3500 GPM | 1000 GALLONS | | | | | | |
| | | 1700 GPM | 0.01 AF | 3500 IGPM | 1000 IMP. GAL. | | | | | | |
| | | 4.0 CFS | 100 CF | 3500 GPM | 100 CF | | | | | | |
| | | 4.0 CFS | 0.001 AF | 3500 GPM | 1000 CF | | | | | | |
| | | 5.5 CFS | 0.001 AF | 4500 GPM | 1000 GALLONS | | | | | | |
| | | 2.5 MGD | 1000 GALLONS | 4500 GPM | 1000 IMP. GAL. | | | | | | |
| | | 125 LPS | 1000 LITERS | 4500 GPM | 0.01 AF | | | | | | |
| | | 2500 GPM | 1000 GALLONS | 4500 GPM | 100 CF | | | | | | |
| | | 2500 IGPM | 1000 IMP. GAL. | 4500 GPM | 1000 GALLONS | | | | | | |
| | | 2500 GPM | 100 CF | 4500 IGPM | 1000 IMP. GAL. | | | | | | |
| | | 2500 GPM | 0.01 AF | 4500 GPM | 1000 GALLONS | | | | | | |
| | | 2500 GPM | 0.1 ACRE IN. | 4500 GPM | 1000 IMP. GAL. | | | | | | |
| | | 6.0 CFS | 100 CF | 4500 GPM | 1000 GALLONS | | | | | | |
| | | 6.0 CFS | 0.02 AF | 4500 IGPM | 1000 IMP. GAL. | | | | | | |
| | | 4.0 MGD | 1000 GALLONS | 250 LPS | 10000 LITERS | | | | | | |
| | | 200 LPS | 0 CU. MTRS. | 250 LPS | 10 CU. MTRS. | | | | | | |
| | | 200 LPS | 0.01 MEGA LTR. | | | | | | | | |
| 6" | 1000 GPM | 100 GALLONS | 10" | 1700 GPM | 1000 GALLONS | 14" | 3000 GPM | 1000 GALLONS | 18" | 5000 GPM | 1000 GALLONS |
| | 1000 GPM | 1000 GALLONS | | 1700 IGPM | 1000 IMP. GAL. | | 3000 IGPM | 1000 IMP. GAL. | | 5000 IGPM | 1000 IMP. GAL. |
| | 1000 IGPM | 1000 IMP. GAL. | | 1700 GPM | 100 CF | | 7.5 CFS | 0.001 AF | | 5000 GPM | 100 CF |
| | 1000 GPM | 10 CF | | 1700 GPM | 0.01 AG | | 8.0 CFS | 100 CF | | 6000 GPM | 100 CF |
| | | | | 1700 GPM | 0.01 AF | | 8.0 CFS | 0.01 AF | | 14.0 CFS | 1000 CF |
| | | | | 4.0 CFS | 100 CF | | 5.0 MGD | 1000 GALLONS | | 7.5 MGD | 1000 GALLONS |
| | | | | 200 LPS | 10 CU. MTRS. | 300 KOS | 19 CU. MTRS | | | | |
| | | | | 200 LPS | 0.01 MEGA LTR. | 10000 GPM | 10000 GALLONS | | | | |
| | | | | | | 10000 IGPM | 10000 IMP. GAL. | | | | |
| | | | | | | 10000 GPM | 0.01 AF | | | | |
| | | | | | | 10000 GPM | 100 CF | | | | |
| | | | | | | 18.0 CFS | 100 CF | | | | |
| | | | | | | 18.0 CFS | 1000 CF | | | | |
| | | | | | | 18.0 CFS | 0.01 AF | | | | |
| | | | | | | 20.0 CFS | 1000 CF | | | | |
| | | | | | | 20.0 CFS | 0.01 AF | | | | |
| | | | | | | 25.0 CFS | 1000 CF | | | | |
| | | | | | | 25.0 CFS | 0.01 AF | | | | |
| | | | | | | 15.0 MGD | 1000 GALLONS | | | | |
| | | | | | | 15.0 MGD | 10000 GALLONS | | | | |
| | | | | | | 750 LPS | 10 CU. MTRS. | | | | |

**TABLE 2
STANDARD INDICATOR SCALE AND REGISTRATION FOR FT190-111-2**

| Sz | Full Scale Indication | Registration | Sz | Full Scale Indication | Registration | Sz | Full Scale Indication | Registration | Sz | Full Scale Indication | Registration | | |
|---------|-----------------------|-----------------|-----------------|-----------------------|-----------------|---------------|-----------------------|-----------------|-----------------|-----------------------|-----------------|-----------------|-----------------|
| 20" | 6000 GPM | 1000 GALLONS | 24" cont | 18.0 CFS | 100 CF | 36" | 17000 GPM | 10000 GALLONS | 48" | 45000 GPM | 10000 GALLONS | | |
| | 6000 IGPM | 1000 IMP. GAL. | | 18.0 CFS | 1000 CF | | 17000 IGPM | 10000 IMP. GAL. | | 45000 IGPM | 10000 IMP. GAL. | | |
| | 6000 GPM | 10000 GALLONS | | 18.0 CFS | 0.01 AF | | 25000 GPM | 10000 GALLONS | | 75.0 CFS | 0.1 AF | | |
| | 7500 GPM | 10000 GALLONS | | 20.0 CFS | 1000 CF | | 25000 IGPM | 10000 IMP. GAL. | | 100 CFS | 1000 CF | | |
| | 10000 GPM | 10000 GALLONS | | 20.0 CFS | 0.01 AF | | 35000 GPM | 10000 GALLONS | | 60.0 MGD | 10000 GALLONS | | |
| | 10000 IGPM | 10000 GALLONS | | 25.0 CFS | 1000 CF | | 35000 IGPM | 10000 IMP. GAL. | | 75.0 MGD | 10000 GALLONS | | |
| | 10000 GPM | 0.01 AF | | 25.0 CFS | 0.01 AF | | 50.0 CFS | 1000 CF | | 2000 LPS | 100 CU. MTRS. | | |
| | 10000 GPM | 100 CF | | 30.0 CFS | 1000 CF | | 50.0 CFS | 0.01 AF | | 5000 LPS | 100 CU. MTRS. | | |
| | 15.0 CFS | 100 CF | | 34.0 CFS | 0.01 AF | | 75.0 CFS | 0.01 AF | | 54" | 40000 GPM | 10000 GALLONS | |
| | 15.0 CFS | 0.01 AF | | 15.0 MGD | 1000 GALLONS | | 30.0 MGD | 10000 GALLONS | | | 40000 IGPM | 10000 IMP. GAL. | |
| | 18.0 CFS | 100 CF | | 15.0 MGD | 10000 GALLONS | | 40.0 MGD | 10000 GALLONS | | 75.0 CFS | 1000 CF | | |
| | 18.0 CFS | 1000 CF | | 20.0 MGD | 10000 GALLONS | | 60.0 MGD | 10000 GALLONS | | 75.0 CFS | 0.1 AF | | |
| | 18.0 CFS | 0.01 AF | | 30.0 MGD | 10000 GALLONS | | 1500 LPS | 100 K LTRS. | | 75.0 MGD | 10000 GALLONS | | |
| | 20.0 CFS | 1000 CF | | 750 LPS | 10 CU. MTRS. | | 2000 LPS | 100 CU. MTRS. | | 3000 LPS | 100 CU. MTRS. | | |
| | 20.0 CFS | 0.01 AF | | 1000 LPS | 100 CU. MTRS. | | 42" | 25000 GPM | | 10000 GALLONS | 60" | 45000 GPM | 10000 GALLONS |
| | 25.0 CFS | 1000 CF | | 1500 LPS | 100 K LTRS. | | | 25000 IGPM | | 10000 IMP. GAL. | | 45000 IGPM | 10000 IMP. GAL. |
| | 25.0 CFS | 0.01 AF | | 30" | 15000 GPM | | 10000 GALLONS | 35000 GPM | | 10000 GALLONS | 60000 GPM | 10000 GALLONS | |
| | 10.0 MGD | 1000 GALLONS | | | 15000 IGPM | | 10000 IMP. GAL. | 35000 IGPM | | 10000 IMP. GAL. | 60000 IGPM | 10000 IMP. GAL. | |
| | 10.0 MGD | 10000 GALLONS | | 17000 GPM | 10000 GALLONS | | 45000 GPM | 10000 GALLONS | | 75000 GPM | 10000 GALLONS | | |
| | 15.0 MGD | 10000 GALLONS | | 17000 IGPM | 10000 IMP. GAL. | | 45000 IGPM | 10000 IMP. GAL. | | 75000 IGPM | 10000 IMP. GAL. | | |
| 350 LPS | 10 CU. MTRS. | 25000 GPM | 10000 GALLONS. | 50.0 CFS | 1000 CF | 100 CFS | 1000 CF | | | | | | |
| 400 LPS | 10 K LTRS | 15000 IGPM | 10000 IMP. GAL. | 50.0 CFS | 0.01 AF | 150 CFS | 10000 CF | | | | | | |
| 750 LPS | 10 CU. MTRS. | 30.0 CFS | 1000 CF | 75.0 CFS | 0.1 AF | 150 CFS | 0.01 AF | | | | | | |
| 24" | 10000 GPM | 10000 GALLONS | 34.0 CFS | 0.01 AF | 100 CFS | 1000 CF | 75.0 MGD | 10000 GALLONS | | | | | |
| | 10000 IGPM | 10000 IMP. GAL. | 50.0 CFS | 1000 CF | 40.0 MGD | 10000 GALLONS | 100 MGD | 10000 GALLONS | | | | | |
| | 10000 GPM | 0.01 AF | 50.0 CFS | 0.01 AF | 60.0 MGD | 10000 GALLONS | 5000 LPS | 100 CU. MTRS. | | | | | |
| | 10000 GPM | 100 CF | 20.0 MGD | 10000 GALLONS | 75.0 MGD | 10000 GALLONS | 66" and 72" | 60000 GPM | 10000 GALLONS | | | | |
| | 15000 GPM | 10000 GALLONS | 30.0 MGD | 10000 GALLONS | 2000 LPS | 100 CU. MTRS. | | 60000 IGPM | 10000 GALLONS | | | | |
| | 15000 IGPM | 10000 IMP. GAL. | 40.0 MGD | 10000 GALLONS | 5000 LPS | 100 CU. MTRS. | 75000 GPM | 10000 GALLONS | | | | | |
| | 17000 GPM | 10000 GALLONS | 1000 LPS | 100 CU. MTRS. | 48" | 35000 GPM | 10000 GALLONS | 75000 IGPM | 10000 IMP. GAL. | | | | |
| | 17000 IGPM | 10000 IMP. GAL. | 1500 LPS | 100 K LTRS. | | 35000 IGPM | 10000 IMP. GAL. | | | | | | |
| | | | 2000 LPS | 100 CU. MTRS. | | | | | | | | | |

