

NIAGARA[®]

Series WPX

Models 210 and 221

***Installation, Operation
& Maintenance Manual***



***Model 210 – hot
Sizes 2”, 3”, and 4”
Sizes 6”, 8”, and 10”
(red)***

***Models 221 – cold
Sizes 2”, 3”, and 4”
Sizes 6”, 8”, and 10”
(blue)***

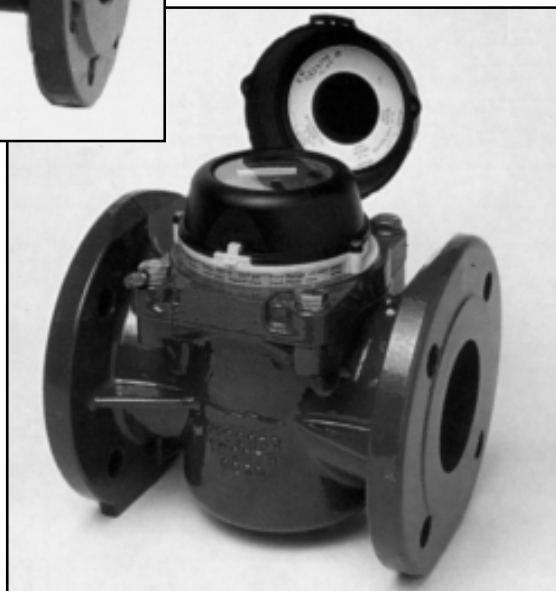


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Model 210 – Hot Water Installation & Operation

GENERAL

The red Niagara Series WPX turbine flowmeters are ideal for the measurement of water up to 250°F in commercial and industrial applications. These high performance meters are unsurpassed in the market place today.

INSTALLATION

The Niagara Series WPX turbine meter may be mounted in a horizontal or vertical pipe.

In order to have accurate measurement, the meter must have 5 pipe diameters upstream and 3 pipe diameters downstream of straight uninterrupted pipe.

The WPX turbine must be placed in a pipeline free of scale, sediment, and debris. If there is excessive sediment in the pipeline, protect the meter by putting a strainer (20 mesh) upstream of the meter.

OPERATION

Air must be evacuated from the WPX turbine before operating. Slowly open valve to let water into the meter. Gradually increase the flow rate to drive out the air. If the meter is not filled slowly, the surge of water can damage the measuring elements.

OPTIONS

Model 860

- Provides a high frequency pulse output for interface with Venture Measurement instrumentation.
- Supply Voltage: 30 VDC max.
- Current Requirement: 15-20 mA.
- Output Signal: Non-symmetrical square pulse train (equal to supply voltage).
- Wiring: Pigtail, 36", 3-wire conductor.
- Max. Output Current: 20 mA.

Model 840

- Provides a calibrated contact closure.
- Contact Rating
Switching Voltage: 30 VDC max.
Current DC Resistive 0.2A max.
Wattage: 3 WDC max.
- Wiring: Pigtail, 36", 22 gauge

Model 210 Maintenance

REGISTER REMOVAL

Model 210

Totalizer with Reed Switch and Infrared Transmitter

1. Remove strain relief nut and draw out washer and binding nut.
2. Remove screws from register cover.
3. Remove register cover.
4. Slide reed switch or infrared transmitter out of the dovetail slot in the register.
5. Remove sealing wire out of sealing segment and working clamp ring.
6. Pull sealing segment out of ring.
7. Turn working clamp ring and register 90 degrees to the left or the right and lift off.
8. The register cannot be disassembled further. It is hermetically sealed and must be replaced as a unit if damaged.

Straight Totalizer

1. Remove the fillister head screws from the register cover and lift off cover.
2. Remove sealing wire.
3. Lift of sealing segment.
4. Turn clamp ring 90 degrees to the left or the right and lift it up with the counter.

REMOVING MEASURING CHAMBER

Model 210 – Sizes 2”, 3”, 4”, 6” & 8”

1. Loosen sealing wire.
2. Remove hex head screws.
3. Lift out measuring chamber housing.
4. If measuring unit is stuck, loosen it by prying on the cast recesses with a screw driver.
5. Check O-Ring for damage. Replace if necessary.

Model 210 – Size 10”

1. Loosen sealing wire.
2. Remove hex screws.
3. Grip measuring chamber housing by the two lifting eye bolts and lift out.
4. Check O-Ring for damage and wear. Replace if necessary.

INSTALLATION OF MEASURING CHAMBER

Model 210

Install the Model 210 by following the reverse order of the removal instructions. The following items should be checked:

- O-rings and lip washers should be checked for damages before installation.
- Slightly lubricate O-rings and regulator shaft.
- The slot of regulator drive has to be in line with the regulator vane in the starting position.

Models 221 – Cold Water Installation & Operation

GENERAL

The blue Niagara Series WPX turbine flowmeters are ideal for the measurement of water up to 120°F in commercial and industrial applications. These high performance meters are unsurpassed in the market place today.

INSTALLATION

The Niagara Series WPX turbine meter may be mounted in a horizontal or vertical pipe.

In order to have accurate measurement, the meter must have 5 pipe diameters upstream and 3 pipe diameters downstream of straight uninterrupted pipe.

The WPX turbine must be placed in a pipeline free of scale, sediment, and debris. If there is excessive sediment in the pipeline, protect the meter by putting a strainer (20 mesh) upstream of the meter.

OPERATION

Air must be evacuated from the WPX turbine before operating. Slowly open valve to let water into the meter. Gradually increase the flow rate to drive out the air. If the meter is not filled slowly, the surge of water can damage the measuring elements.

OPTIONS

Model 860

- Provides a high frequency pulse output for interface with Venture Measurement instrumentation.
- Supply Voltage: 30 VDC max.
- Current Requirement: 15-20 mA.
- Output Signal: Non-symmetrical square pulse train (equal to supply voltage).
- Wiring: Pigtail, 36", 3-wire conductor.
- Max. Output Current: 20 mA.

Model 840

- Provides a calibrated contact closure.
- Contact Rating
 - Switching Voltage: 30 VDC max.
 - Current DC Resistive 0.2A max.
 - Wattage: 3 WDC max.
- Wiring: Pigtail, 36", 22 gauge

Models 221 Maintenance

REGISTER REMOVAL

Model 221

1. Open register cover to reveal two retaining screws.
2. Remove the two retaining screws.
3. Gently squeeze and lift off register cover.
4. Remove the two lead seals.
5. Remove the three remaining screws.
6. Lift off register.

REMOVING MEASURING CHAMBER

Model 221 – Sizes 2”, 3”, & 4”

Model 221 – Sizes 6” & 8”

1. Loosen sealing wire.
2. Remove hex head screws.
3. Lift out measuring chamber housing.
4. If measuring unit is stuck, loosen it by prying on the cast recesses with a screw driver.
5. Check O-Ring for damage. Replace if necessary.

Model 221 – Size 10”

1. Loosen sealing wire.
2. Remove hex screws.
3. Grip measuring chamber housing by the two lifting eyebolts and lift out.
4. Check O-Ring for damage and wear. Replace if necessary.

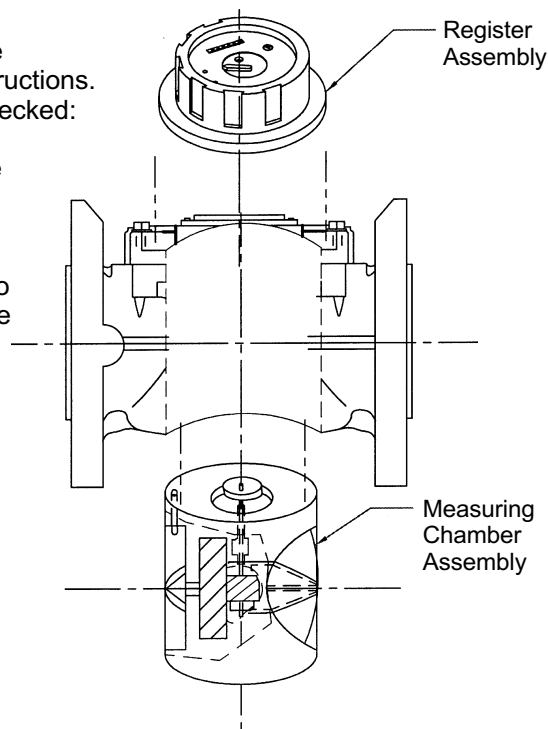
INSTALLATION OF MEASURING CHAMBER

Model 221

Install Model 221 by following the reverse order of the removal instructions.

The following items should be checked:

- O-rings and lip washers should be checked for damages before installation.
- Slightly lubricate O-rings and regulator shaft.
- The slot of regulator drive has to be in line with the regulator vane in the starting position.



REPLACEMENT PARTS

- Measuring chamber complete
- Register assembly

Note: Part numbers are listed in the parts price book.

Models 210 (hot) and 221 (cold) Specifications

Size		2"	3"	4"	6"	8"	10"
Flow Rate	gpm	8-305	20-660	30-1100	45-1870	60-2860	80-4400
Pressure	psi	227	227	227	227	227	227
Temperature	Cold	120°F	120°F	120°F	120°F	120°F	120°F
	Hot	250°F	250°F	250°F	250°F	250°F	250°F
Accuracy		± 1%	± 1%	± 1%	± 1%	± 1%	± 1%
Registration*		USG	USG	USG	USG	USG	USG
Gallons per contact with 840 Switch		10	100	100	100	100	1000
		or 100	or 1000	or 1000	or 1000	or 1000	or 10000
Full Scale Freq. Hz with 860 Pulser	Cold	50.8	22	36.67	31.15	47.7	14.67
	Hot	50.8	22	36.67	31.15	47.7	14.67
Pulses per Gallon*	Cold	10	2	2	1	1	.2
	Hot	10	2	2	1	1	.2

* Other units of registration available (consult factory). $Hz = \frac{GPM \times PPG}{60}$ $PPG = \frac{Hz \times 60}{GPM}$

Wetted Material of Construction

Body: Cast Iron
 Measuring Element: 120°F - Noryl
 250°F - Polyethersulfone
 Rotor: Polyamid
 O-Ring Seals: EPDM



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