

N E T A F I M U S A

NETAFIM FLOW COMPUTER

QUICK START INSTALLATION,
OPERATION AND
MAINTENANCE GUIDE



NFC 110-0
NFC 110-24
NFC 110-D-bat



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NETAFIM FLOW COMPUTER (NFC) CAPABILITIES:

- Flow rate and total measurement for most pulse type water meters
- Internal data logging - stores up to 64 totals for each 24 hour period (64 days of data)
- Local readout with flow rate as 4 - 20 mA signal and total retransmission as a scaled pulse output
- Metering pump dosing control. Ratio control based on flow
- Adjustable time delay for filtering flow rate display and current output
- Flow rate alarm - high or low, $\pm 1\%$ accuracy

APPLICATIONS

Remote display – for reading difficult to reach underground meters

- Data recording
- Output devices – fertilizer pumps, variable speed drive pumps, Netafim and most other manufacturer controllers

SPECIFICATIONS

- Operating temperature: -4° F to 158° F
- Power Supply:
 - Netafim Flow Computer 110-0 is not available with a power supply. 12 or 24 VDC via a converter or battery is required. 24 VDC is required for use of 4 - 20 mA output. Battery must have charger to support photo diode register input.
 - Netafim Flow Computer 110-24 is equipped with a 24 VAC converter (built in 24 VAC to 24 VDC converter)
 - Netafim Flow Computer 110-D-bat is equipped with battery power supply

INPUTS & OUTPUTS

INPUT TYPES (PULSES FROM NETAFIM WATER METER)

- Flow Signal Input from one of the following:
 - Netafim Hydrometer Pulse Reed Switch (RS)
 - Photo Diode (PD)
 - Photo Diode High Frequency (PDH) Register
- No Flow Switch Input - used to drive the flow rate display and the 4 - 20 mA flow rate output to zero and 4 mA respectively when pump is cut off, or valve is closed, stopping flow. This prevents display of flow continuing due to long delay (dLY) settings.

OUTPUT TYPES

- Scaled pulse output or programmable alarm output
- 4 - 20 mA out

OUTPUT SPECIFICATIONS

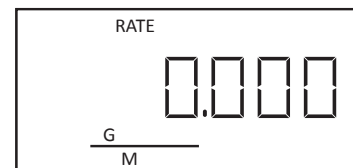
- Models with battery power
 - Output is 100 VDC/100 mA DC open drain sinking with reverse polarity protection.
- Netafim Flow Computers not powered by a battery
 - Output is 100 VDC/100 mA isolated, no polarity.

DISPLAYS

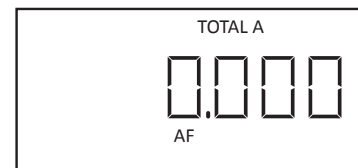
NORMAL (OPERATING) MODE DISPLAYS

Use the UP button to alternate between the displays.

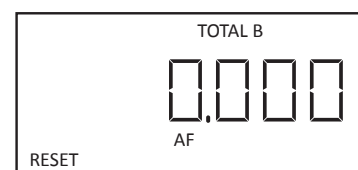
- RATE
- TOTALS
 - Total A - Default programmed to be non-resettable. Total A is stored into memory every 50 seconds and will record up to 10,000,000 units. After 10,000,000 is reached it will start recording from 0 units.
 - Total B or C - Resettable. Reset by pressing and holding RIGHT button for 5-10 seconds.



RATE DISPLAY



TOTAL A DISPLAY



TOTAL B DISPLAY

PROGRAMMING BASICS

PROGRAM OPTIONS INCLUDE:

Flow Rate Alarm: high flow or low flow, with +/- 1% triggers. This function is not available with NFC110-D-bat Model.

High Flow Alarm Example: The high flow alarm is programmed at 100.00 GPM. If the flow rate **exceeds** 101.00 GPM a digital output (sinking current) is activated stopping the flow. If the flow **drops** below 99.00 GPM then the digital output (sinking current) will turn off.

Low Flow Alarm Example: The low flow alarm is programmed at 1000.00 GPM, when the flow rate **drops** below 990.00 GPM a digital output (sinking current) is activated stopping the flow. If the flow rises **above** 1100.00 GPM the the digital output (sinking current) will turn off.



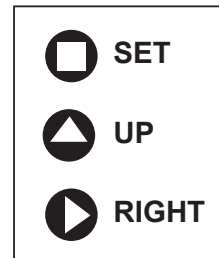
Pulse Output: Intended for use with metering/dosing pumps or to drive another remote totalizer unit.

Pulse Output Example: If you are adding chlorine or fertilizer to the water and have connected the control input of a pump to this pulse output, program the "SETP" factor at 40 gallons per pulse. The pump will then inject its preset dose amount one time for every 40 gallons of water and add the chlorine or the fertilizer in exact proportions to the water flow

PROGRAMMING BASICS

Three buttons:

- SET - Enter and exit menus and confirm options chosen
- UP - Change the data
- RIGHT - Move the cursor (blinking digit or icon) to the right.



When you reach the rightmost digit, pushing right again brings you to the leftmost digit, completing a circle.

All programming steps must be completed for the unit to save changes. If all steps are not completed, the unit will timeout and default to previously saved settings.

PROGRAMMING

START → To begin programming, hold the SET button for about 8 seconds, the screen will display KFACTOR.

1 KFACTOR

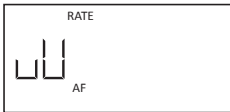
KFACTOR is the number of pulses the flow computer receives per gallon. The flow computer needs to know how many pulses it will be receiving per 1 gallon of measure. The KFACTOR is always in pulses per gallon. If your KFACTOR is in other units, you must convert to pulses per gallon or the NFC totalizer will not totalize correctly.

Use the RIGHT arrow to move to next digit. Use the UP arrow to change the blinking number. When satisfied, push SET to advance to next programming step.

To move the decimal point, press the RIGHT arrow until all numbers stop blinking. Press the UP arrow to move the decimal point to the right.

While in the KFACTOR menu, the settings can be locked so they cannot be accidentally changed. Use the RIGHT arrow to move the cursor to the rightmost digit and then hold SET for about 8 seconds. Use the UP arrow to lock or unlock the settings. Then press SET to return to the KFACTOR menu. If the program settings are locked then ALL settings can only be viewed but not changed. Factory default is set to unlocked.

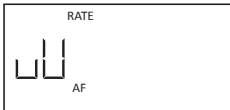
NOTE: KFACTOR must be set in order to move to the next step.



2 UPPER UNITS FLOW RATE

Use the UP arrow to choose the volume units for the flow rate. Unit options: mL (milliliters), L (liter), G (gallons), CF (cubic feet), M3 (cubic meters), AF (acre feet). When satisfied, push SET to advance to the next step.

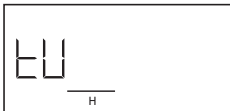
EXAMPLE: To read current flow in gallons, set this to G.



3 UPPER UNITS TOTAL

Use the UP arrow to choose the volume total units display. Unit display options: mL (milliliters), L (liter), G (gallons), CF (cubic feet), M3 (cubic meters), AF (acre feet). When satisfied, push SET to advance to the next step.

EXAMPLE: To read totalized flow in acre feet, set this to AF.



4 TIME UNITS

Use the UP arrow to choose the time units. Time units include: S (seconds), M (minutes), H (hours) and D (days). When satisfied, push SET to advance to the next step.

EXAMPLE: To read the current flow per minute, set to M.

PROGRAMMING



5 DECIMAL POSITION - FLOW RATE

Push the UP arrow to choose decimal position display preference for the flow rate. Selections include: 4444, 444.4, 44.44, 4.444, or AUTO. Select AUTO to have the decimal position automatically selected based on settings. When satisfied, push SET to advance to the next step.



6 DECIMAL POSITION - TOTALS

Push the UP arrow to choose decimal position display preference for the flow total. Selections include: 3333, 333.3, 33.33, or 3.333, or AUTO. Select AUTO to have the decimal position automatically selected based on settings. When satisfied, push SET to advance to the next step.



7 DELAY

The DELAY setting can be used to extend the time the unit waits for pulses from the water meter before updating the display. It can be helpful in situations where the pulses are infrequent. Push RIGHT arrow to select the digit and use the UP arrow to incrementally increase the digits to the desired time delay. The default value is 30 seconds. All values are in seconds and can be set from 001 to 299 seconds. If time elapses that is greater than the delay, the display will read zero. The use of longer DELAY settings has no effect on the totals in the flow computer. Every pulse input from your water meter is always counted, regardless of the value you select for the DELAY setting. When satisfied, push SET to advance to the next step.

8 RESET

Push UP arrow to choose EN (enable) or DIS (disable). EN allows Total A to be resettable, DIS keeps Total A non-resettable. Total A is set to DIS as the factory default. If enabled and in normal mode, RESET will be displayed while viewing Total A display. Resetting Total A can be performed by pushing the RIGHT arrow and holding for at least 5 seconds. When satisfied, push SET to advance to the next step.

9 4 - 20 mA DEVICE

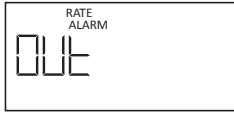
Set the value of 20 mA for flow rate analog output. Use UP arrow and RIGHT arrow to set units/time (example: Gallons/Minute) for the uppermost limit of your flow as it relates to a 4 - 20mA output. NOTE: 4 mA is automatically set as zero flow. When satisfied, push SET to advance to the next step.

EXAMPLE: If set to 700 Gallons/Minute your 4 - 20 mA output would give 20 mA at 700 gallons/minute

NON 4 - 20 mA DEVICE

If you leave all digits as zero, the 4 - 20 mA output is turned OFF. The output is 3.85 mA. Previous selections for UPPER UNITS FLOW RATE and TIME UNITS will change the units/time on this display to the selected units. When satisfied, push SET to advance to the next step.

PROGRAMMING



OUTPUT VALUE

Use UP arrow to move between RATE ALARM and PULSE, press SET to select.

NOTE: The NFC 110-D-bat (delay) uses the digital input switch to drive the rate indicator to zero when the flow is turned off.

RATE ALARM

Use UP arrow to select Lo ALARM or Hi ALARM. Press SET to enter the unit to activate the alarm. Regardless of the units chosen for DISPLAY and TOTAL, the value of the RATE ALARM must be in gallons/minute (G/M).

EXAMPLE: Choose Lo ALARM then enter 00300.00 G/M to activate the alarm when flow drops below 300 gallons/minute.

PULSE

Use UP arrow to select Hi TYPE or Lo TYPE. The maximum number of pulses in Lo TYPE is limited to 480 per/minute. The maximum number of pulses in Hi TYPE is limited to 1100 per/second. The value for SETP must be in GALLONS per PULSE. The computer will not accept zero for those settings. If satisfied, push SET to go to next parameter.

IMPORTANT NOTES:

MATCHING WATER RATES

In the selection of the water meter for your application, matching the minimum and maximum flow rates to actual flows will reduce the need for long flow rate delay values, and give a more responsive display and output. Consult your authorized Netafim USA Distributor for assistance in selecting the best meter for your application.

FIELD WIRING

Proper caution and care should always be used when wiring 110 or 24 VAC line powered equipment to minimize the risk of shock hazard. Wiring should only be done with proper shutoff and lock-out of power. The enclosure is Nema 4 and should NOT be installed where the possibility of hazardous gas or explosive vapors are present. Compliance to local electrical codes is the responsibility of the installer/purchaser. If there are any questions, please contact your Authorized Netafim USA Distributor prior to installation. See the back page for typical water meter wiring.

All programming steps must be completed for the unit to save changes. If all steps are not completed, the unit will timeout and default to previously saved settings.

K FACTORS

M WATER METERS

ITEM NUMBER	MODEL NUMBER	DESCRIPTION	GALLONS OR ACRE FEET	OUTPUT TYPE	K FACTOR PULSE/GALLON	GALLON/PULSE	MIN TIME DELAY	MIN FLOW RATE GPM
70261-002445	36M201T.1	¾" M Type Meter	Gallons	Reed Switch (RS)	10	0.1	7	0.9
70261-002450	36M201T	¾" M Type Meter	Gallons	Reed Switch (RS)	1	1	67	0.9
70261-002447	36M201T.0015	¾" M Type Meter	Gallons	Photo Diode (PDH)	653.300	0.0015	5	0.9
70261-002720	36M251T	1" M Type Meter	Gallons	Reed Switch (RS)	1	1	50	1.2
-	36M251T.0021w	1" M Type Meter	Gallons	Photo Diode (PDH)	480.500	0.002	5	1.2
70261-003230	36M401.5T	1½" M Type Meter	Gallons	Reed Switch (RS)	1	1	17	3.5
70261-003240	36M401.5T.0074	1½" M Type Meter	Gallons	Photo Diode (PDH)	327.510	0.0074	5	3.5

WMR WATER METERS

ITEM NUMBER	MODEL NUMBER	DESCRIPTION	GALLONS OR ACRE FEET	OUTPUT TYPE	K FACTOR PULSE/GALLON	GALLON/PULSE	MIN TIME DELAY	MIN FLOW RATE GPM
70261-005050	36WMR2T1	2" WMR Meter	Gallons	Reed Switch (RS)	1	1	7	8.8
70261-005060	36WMR2T10	2" WMR Meter	Gallons	Reed Switch (RS)	0.1	10	68	8.8
70261-005010	36WMR2T.055	2" WMR Meter	Gallons	Photo Diode (PDH)	18.160	0.0551	5	8.8
70261-004900	36WMR2T10-AF	2" WMR Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	222	8.8

IRT WATER METERS

ITEM NUMBER	MODEL NUMBER	DESCRIPTION	GALLONS OR ACRE FEET	OUTPUT TYPE	K FACTOR PULSE/GALLON	GALLON/PULSE	MIN TIME DELAY	MIN FLOW RATE GPM
70261-009200	36IRT3F	3" IRT Meter	Gallons	Reed Switch (RS)	0.1	10	13	45
70261-001230	36IRT3FPH	3" IRT Meter	Gallons	Photo Diode (PD)	1	1	5	45
70261-009100	36IRT3F-AF	3" IRT Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	43	45
70261-009500	36IRT4F	4" IRT Meter	Gallons	Reed Switch (RS)	0.1	10	12	50
70261-009510	36IRT4F-1	4" IRT Meter	Gallons	Photo Diode (PD)	1	1	5	50
70261-009340	36IRT4F-AF	4" IRT Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	39	50
70261-009740	36IRT6F	6" IRT Meter	Gallons	Reed Switch (RS)	0.01	100	92	65
-	36IRT6F10	6" IRT Meter	Gallons	Photo Diode (PD)	0.1	10	9	65
70261-009720	36IRT6F-AF	6" IRT Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	30	65
70261-009920	36IRT8F	8" IRT Meter	Gallons	Reed Switch (RS)	0.01	100	46	130
70261-001597	36IRT8-PH-10	8" IRT Meter	Gallons	Photo Diode (PD)	0.1	10	5	130
70261-009850	36IRT8F-AF	8" IRT Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	15	130
70261-010000	36IRT10F	10" IRT Meter	Gallons	Reed Switch (RS)	0.01	100	20	300
70261-001615	36IRT10-PH	10" IRT Meter	Gallons	Photo Diode (PD)	0.1	10	5	300
70261-008730	36IRT10F-AF	10" IRT Meter	Acre Feet	Reed Switch (RS)	0.0031	325.9	65	300

K FACTORS

WST WATER METERS

ITEM NUMBER	MODEL NUMBER	DESCRIPTION	GALLONS OR ACRE FEET	OUTPUT TYPE	K FACTOR PULSE/GALLON	GALLON/PULSE	MIN TIME DELAY	MIN FLOW RATE GPM
70261-010220	36WST3F	3" WST Meter	Gallons	Reed Switch (RS)	0.1	10	150	4
70261-001272	36WST3-PH.1172	3" WST Meter	Gallons	Photo Diode (PDH)	8.547	0.117	55	4
70261-010230	36WST3F-AF	3" WST Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	299	4
70261-010360	36WST4F	4" WST Meter	Gallons	Reed Switch (RS)	0.1	10	100	6
70261-001370	36WST4-PH.1097	4" WST Meter	Gallons	Photo Diode (PDH)	9.116	0.110	5	6
70261-010370	36WST4F-AF	4" WST Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	299	6
70261-010460	36WST6F	6" WST Meter	Gallons	Reed Switch (RS)	0.010	100	299	15
70261-001498	36WST6-PH.2027	6" WST Meter	Gallons	Photo Diode (PDH)	4.933	0.203	5	15
70261-010450	36WST6F-AF	6" WST Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	130	15
70261-010600	36WST8F	8" WST Meter	Gallons	Reed Switch (RS)	0.010	100	158	38
70261-010601	36WST8F-.378	8" WST Meter	Gallons	Photo Diode (PDH)	2.646	0.378	5	38
70261-010605	36WST8F-AF	8" WST Meter	Acre Feet	Reed Switch (RS)	0.031	32.6	51	38

WT WATER METERS

ITEM NUMBER	MODEL NUMBER	DESCRIPTION	GALLONS OR ACRE FEET	OUTPUT TYPE	K FACTOR PULSE/GALLON	GALLON/PULSE	MIN TIME DELAY	MIN FLOW RATE GPM
70261-010720	36WT10F	10" WT Meter	Gallons	Reed Switch (RS)	0.010	100	136	44
70261-001591	36WT10-PH4.5057	10" WT Meter	Gallons	Photo Diode (PDH)	0.222	4.505	6	44
70261-010670	36WT10F-AF	10" WT Meter	Acre Feet	Reed Switch (RS)	0.003	325.9	299	44
70261-010800	36WT12F	12" WT Meter	Gallons	Reed Switch (RS)	0.010	100	118	51
70261-001770	36WT12-PH.673	12" WT Meter	Gallons	Photo Diode (PDH)	0.149	6.73	8	51
70261-007270	36WT12F-AF	12" WT Meter	Acre Feet	Reed Switch (RS)	0.0031	325.9	299	51

K FACTORS

HYDROMETERS

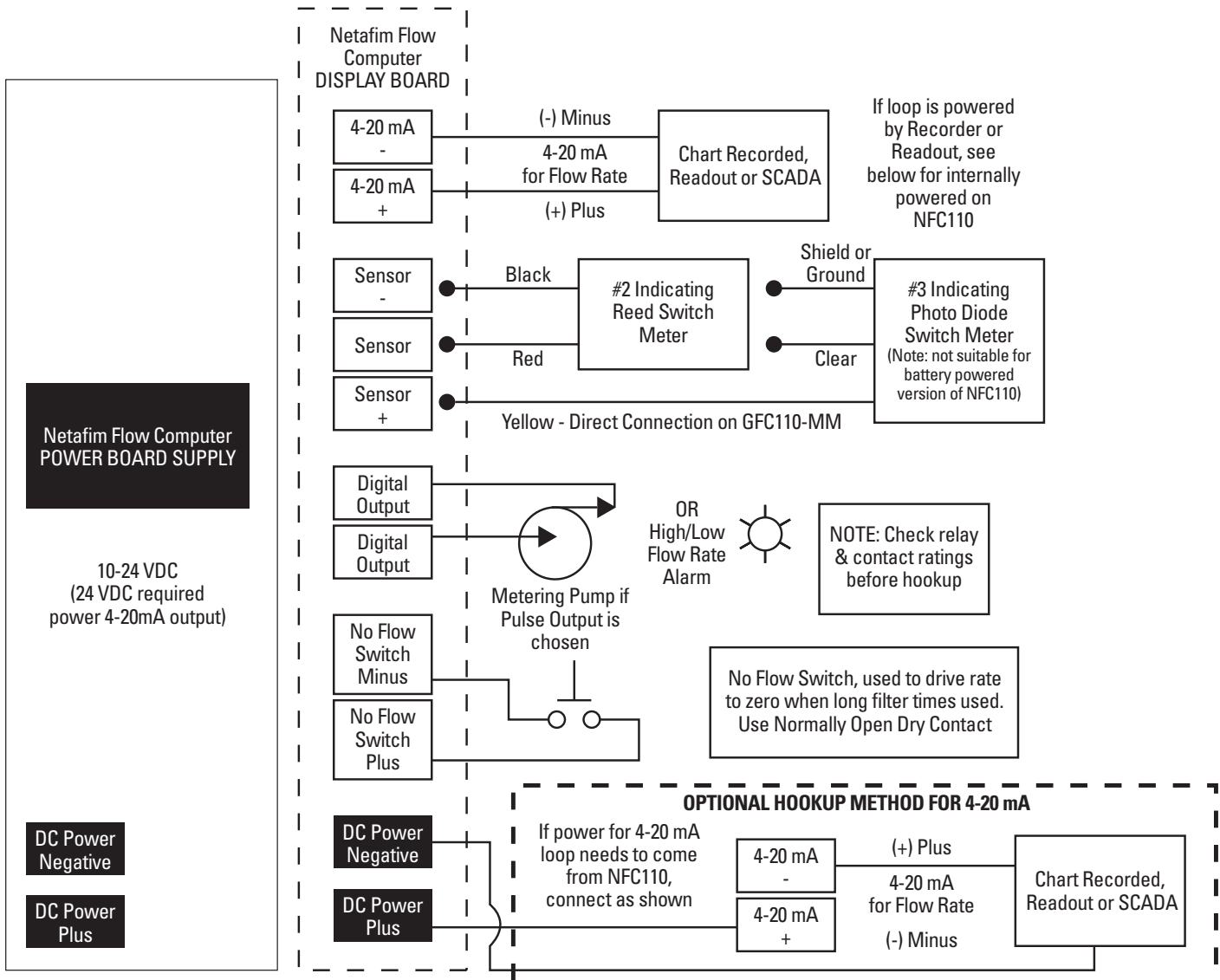
ITEM NUMBER	MODEL NUMBER	DESCRIPTION	GALLONS OR ACRE FEET	OUTPUT TYPE	K FACTOR PULSE/GALLON	GALLON/PULSE	MIN TIME DELAY	MIN FLOW RATE GPM
70261-014050	36HM1.5TG	1 ½" Hydrometer Globe	Gallons	Reed Switch (RS)	1	1	33	1.8
-	36HM1.5TG.1	1 ½" Hydrometer Globe	Gallons	Reed Switch (RS)	10	0.1	5	1.8
70261-014060	36HM1.5TG-.0053	1 ½" Hydrometer Globe	Gallons	Photo Diode (PDH)	188.679	0.0053	5	1.8
70261-014200	36HM2TG	2" Hydrometer Globe	Gallons	Reed Switch (RS)	1	1	11	5.3
-	36HM2TG.1	2" Hydrometer Globe	Gallons	Reed Switch (RS)	10	0.1	5	5.3
70261-014215	36HM2TG-.0085	2" Hydrometer Globe	Gallons	Photo Diode (PDH)	117.647	0.0085	5	5.3
70261-014630	36HM3FG-1	3" Hydrometer Globe	Gallons	Reed Switch (RS)	1	1	5	14
70261-014620	36HM3FG.1	3" Hydrometer Globe	Gallons	Reed Switch (RS)	10	0.1	5	14
70261-014640	36HM3FG-.0205	3" Hydrometer Globe	Gallons	Photo Diode (PDH)	48.780	0.0205	5	14
70261-015105	36HM4FG1	4" Hydrometer Globe	Gallons	Reed Switch (RS)	1	1	5	21
70261-015100	36HM4FG	4" Hydrometer Globe	Gallons	Reed Switch (RS)	0.1	10	29	21
70261-015107	36HM4FG.0566	4" Hydrometer Globe	Gallons	Photo Diode (PDH)	17.986	0.0566	5	21
70261-015550	36HM6FG	6" Hydrometer Globe	Gallons	Reed Switch (RS)	0.1	10	11	53
-	36HM6FG1	6" Hydrometer Globe	Gallons	Reed Switch (RS)	1	1	5	53
70261-001418	36HM6-PH.1739	6" Hydrometer Globe	Gallons	Photo Diode (PDH)	5.744	0.1739	5	53
70261-015840	36HM8FG-10	8" Hydrometer Globe	Gallons	Reed Switch (RS)	0.1	10	6	97
-	36HM8FG1	8" Hydrometer Globe	Gallons	Reed Switch (RS)	1	1	5	97
70261-001588	36HM8-PH.3173	8" Hydrometer Globe	Gallons	Photo Diode (PDH)	3.155	0.3173	5	97

SADDLE METERS

MODEL NUMBER	DESCRIPTION	GALLONS OR ACRE FEET	OUTPUT TYPE	K FACTOR PULSE/GALLON	GALLON/PULSE	MIN TIME DELAY	MIN FLOW RATE GPM
36WTSM6E*.*.*	6" Saddle Meter	Gallons	MPE Register	0.01	100	68	88
36WSTM6EAF*.*.*	6" Saddle Meter	Acre Feet	MPE Register	0.01	32.6	22	88
36WTSM8E*.*.*	8" Saddle Meter	Gallons	MPE Register	0.01	100	182	33
36WTSM8EAF*.*.*	8" Saddle Meter	Acre Feet	MPE Register	0.031	32.6	59	33
36WTSM10E*.*.*	10" Saddle Meter	Gallons	MPE Register	0.01	100	113	53
36WTSM10EAF*.*.*	10" Saddle Meter	Acre Feet	MPE Register	0.003	325.9	299	53
36WTSM12E*.*.*	12" Saddle Meter	Gallons	MPE Register	0.01	100	76	79
36WTSM12EAF*.*.*	12" Saddle Meter	Acre Feet	MPE Register	0.003	325.9	248	79

WIRING A NETAFIM FLOW COMPUTER

INSIDE THE NETAFIM FLOW COMPUTER - DISPLAY BOARD



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