

1 YEAR
WARRANTY



DPF143W - wall mounted
DPF144W - wall mounted
DPF143P - panel mounted
DPF144P - panel mounted

Ω OMEGA® User's Guide

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With optional cover

DPF143/144 Rate/Total Indicator



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The **DPF143/144** flow computers are microcontroller-based indicator/transmitters that interface with pulse output flow sensors to compute and display flow rate, flow total, and also generate output signals representing flow. The DPF143 has one scaled pulse output and one pulse pass through. The DPF144 has two scaled pulse outputs. Galvanic isolation is provided for most pulse outputs.

The DPF143 may be powered by an external DC power source or an optional internal AC power supply*. The DPF144 is a "two-wire" or "loop powered" device, meaning that it is powered by the 4-20 mA loop circuit itself. An optional internal AC power supply* is available for the DPF144 with dual 24 and 12VDC outputs to power both the loop and sensors requiring more power than the loop can supply.

Pulse and 4-20mA analog outputs can be used to signal external devices, e.g. certain metering pumps and water treatment controls. Alternatively, one or more pulse outputs can be configured as alarm outputs. These flow computers can be password protected to prevent resetting the total or changing configuration settings.

The DPF143/144 meters are available in wall and meter mount configurations, and can also be panel mounted. Some configurations can be converted from wall to meter or meter to wall after installation if needed. Consult Omega for details.

Order the DPF144 only if a 4-20mA output signal is a requirement. Otherwise the DPF143 offers the most flexibility.

**Internal power supply is available for the wall mount option only.*

Specifications*

		DPF143 Series	DPF144 Series
Power		7-30Vdc, 4mA	7-30Vdc, 4mA (4-20 mA when loop-powered)
Display	Rate	5-digit autorange	5-digit autorange
	Total	8-digit	8-digit
Units	Rate Units	Gallons/Second/Minute/Hour/Day, Liter/Second/Minute/Hour/Day, Cubic Feet/Second/Minute/Hour/Day, Cubic Meters/Second/Minute/Hour/Day, Miner's Inch, Mega Liters/Day, Million Gallons/Day, Fluid Oz/Second/Minute/Hour/Day, Barrels(42 gal)/ Second/Minute/Hour/Day	
	Total Units	Gallon, Gallon x 1000, Liters, Mega Liter, Cubic Meter, Acre Feet, Cubic Feet, Cubic Feet x 1000, Million Gallon, Miner's Inch Day, Acre Inch, Fluid Ounce, Barrels(42 gal)	
Outputs	Pulse Output 1	Scaled pulse output, high alarm output or low alarm output - optoisolated ¹	
	Pulse Output 2	Pulse pass through	Scaled pulse output, high alarm output or low alarm output ¹
	Loop Power Output	N/A	4-20mA Loop
Set P Range		0.1 - 99999.9 units/pulse	0.1 - 99999.9 units/pulse
Input		5V pulse or contact closure	5V pulse or contact closure
Input Range		0.75 ² - 2000Hz	0.75 ² - 2000Hz
K-Factor Range		.001 - 999999.999	.001 - 999999.999
Flow Alarm Output Range		0.1 - 99999.9	0.1 - 99999.9
Operating Temperature		0° to 55° C (-32° to 131° F)	0° to 55° C (-32° to 131° F)
Non-Operating Temperature		-40° to 75° C (-40° to 158° F)	-40° to 75° C (-40° to 158° F)
Environmental		NEMA 4X, IP67	NEMA 4X, IP67
Regulatory		CE Mark	CE Mark

* Specifications subject to change. Please consult our website for current data (omega.com).

¹ Scaled output pulses have a fixed width of 100ms. Maximum pulses per second is 6.5Hz

² For pulse frequencies <1 Hz, increase setting in SET F menu to 3 or higher.

Features



* Includes password protection for tamper prevention when needed

Options

Description	Option #
Tamper-evident kit, wire seal	TE
Non-resettable total	NR
Hinged display cover	HC
Built-in dual power supply	DPS
Built-in single power supply	SPS

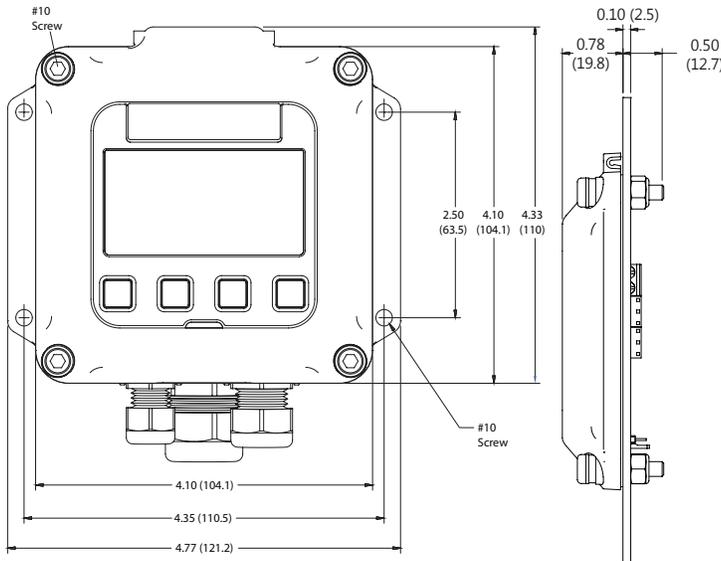
Accessories

Description		Electronics module	Lower wall housing	Lower meter housing
Convert wall to meter mount	DPF140-MK10	Blue	Blue	Blue
Convert wall to meter mount	DPF140-MK15	White	White	White
Convert meter to wall mount	FTB700D-WMB	Blue	Blue	Blue
Convert meter to wall mount	DPF140-MK25	White	White	White
Adapter kit to mount white electronics to blue housing	DPF140-W2M	White	Blue	Blue
Adapter kit to mount white electronics to blue housing/ Temper evident	DPF140-W2M-TE	White	Blue	Blue
Hinged display cover kit	DPF140-HC	White	n/a	n/a

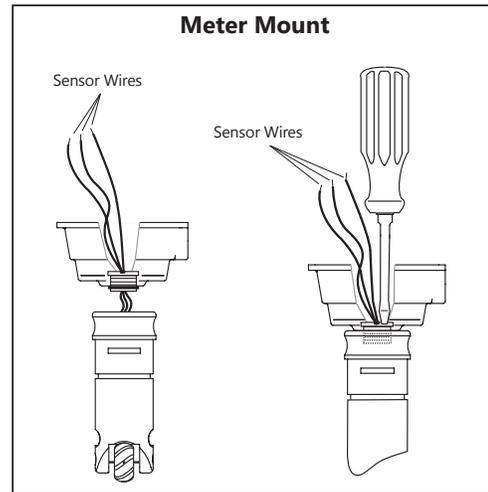
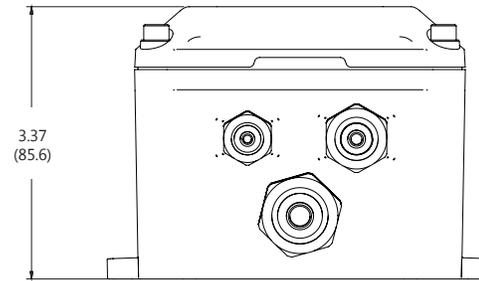
Pulse Output Function Table

PULSE OUTPUT 1 (SCALED)	DPF143	DPF144
TYPE	Current sinking	Current sinking
MAX. VOLTAGE	45 Vdc	45 Vdc
MAX. CURRENT	100 mA	100 mA
MAX. FREQUENCY	6.5 Hz	6.5 Hz
PULSE WIDTH	100 ms	100 ms
ISOLATION	300 V	300 V
CONFIGURABLE AS ALARM	YES (High or Low)	YES (High or Low)
PULSE OUTPUT 2 (SCALED)	DPF143	DPF144 (Note 2)
TYPE	Not Available	Current sinking
MAX. VOLTAGE		45 Vdc
MAX. CURRENT		100 mA
MAX. FREQUENCY		6.5 Hz
PULSE WIDTH		100 ms
ISOLATION		300 V
CONFIGURABLE AS ALARM		YES (High or Low)
PULSE OUTPUT 2 (PASS-THROUGH)	DPF143	DPF144
TYPE	Current sinking	Not Available
MAX. VOLTAGE	45 Vdc	
MAX. CURRENT	10 mA	
MAX. FREQUENCY	2000 Hz ^{NOTE 2}	
PULSE WIDTH	SAME AS SENSOR INPUT	
ISOLATION	300 V	
CONFIGURABLE AS ALARM	NO	

NOTE 1: 150 V effective isolation when using Omega micropower sensors. • NOTE 2: With 2000 ohm or lower pull-up resistance.



Dimensions are in Inches (Millimeters)



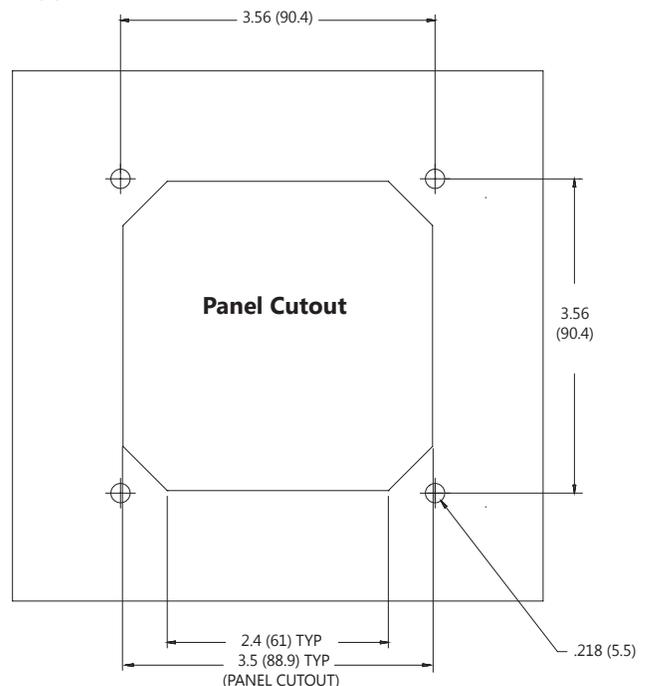
Wall Mount. To mount an DPF143/144 indicator to the wall, hold the unit in the desired position, mark the holes in the mounting feet, drill and mount with screws. A meter-mounted indicator can be converted to a wall mount using an adapter mounting kit.

Meter Mount. If the DPF143/144 indicator was ordered as a meter mount model, the housing is already mounted directly to the flow sensor and needs no further installation.

An DPF143/144 module can be converted from a wall-mount to a meter-mount using the mounting kit that includes a lower housing and associated hardware and installs as follows:

1. Remove the strain relief through which the flow sensor cable runs.
2. Cut the cable to about 6" in length. Carefully strip the cable jacket to expose the three colored wires (red, white, and black) inside.
3. Route the wires through the threaded connector pre-installed in the bottom of the housing.
4. Start the threaded connector into the female thread on the top of the flow sensor. Be sure to match the oblong shape on the bottom of the housing to the depression on the top of the flow sensor.
5. Using an ordinary screwdriver inserted in one side of the slot (see drawing), tighten the screw as much as possible.
6. Strip the wire ends, make the connections to the indicator as shown in Connections Diagrams, and then use the cover screws to attach the indicator to the top of the housing.

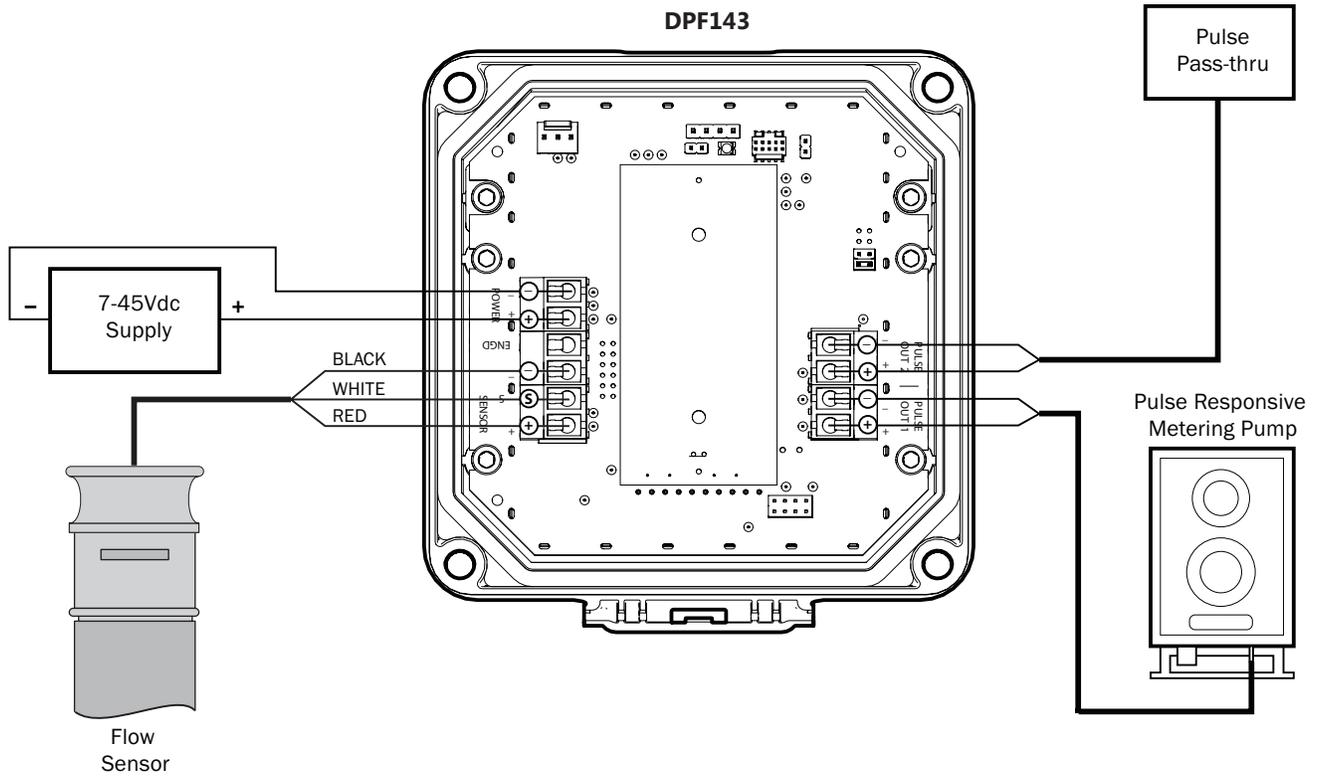
Panel Mount. Using the "Panel Cutout" drawing as a guide, cut a hole in the panel. Place the DPF143/144 indicator on the panel and mark the holes, drill, and mount with the supplied screws and washers.



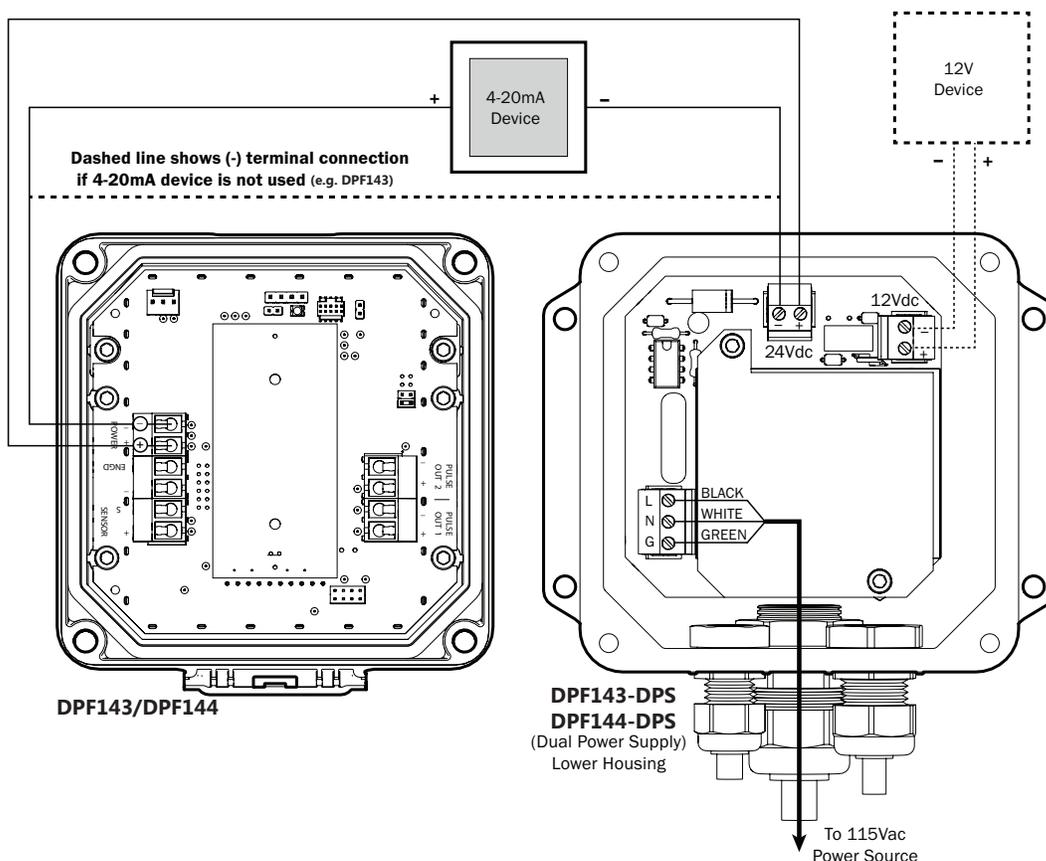
Connections

To connect the flow computer to a flow sensor or an external device such as a chemical metering pump, follow the Standard Connections diagrams on this and the following pages.

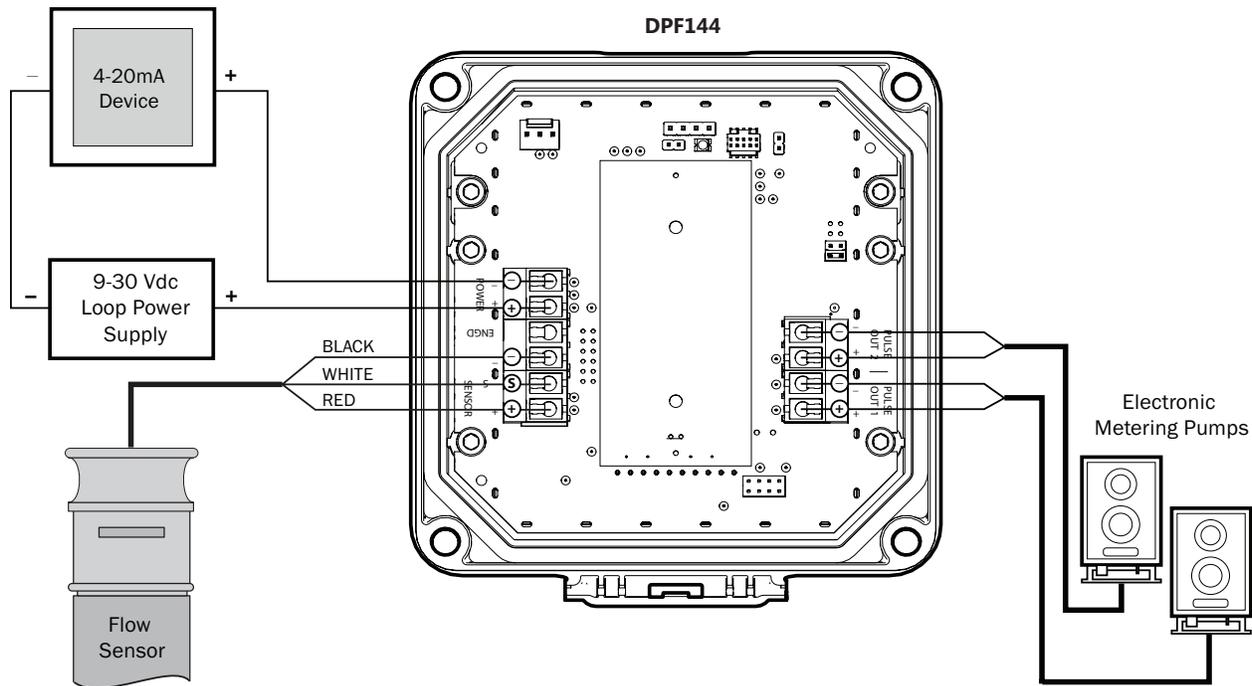
Connections for DPF143/3-Wire Mechanical Meter



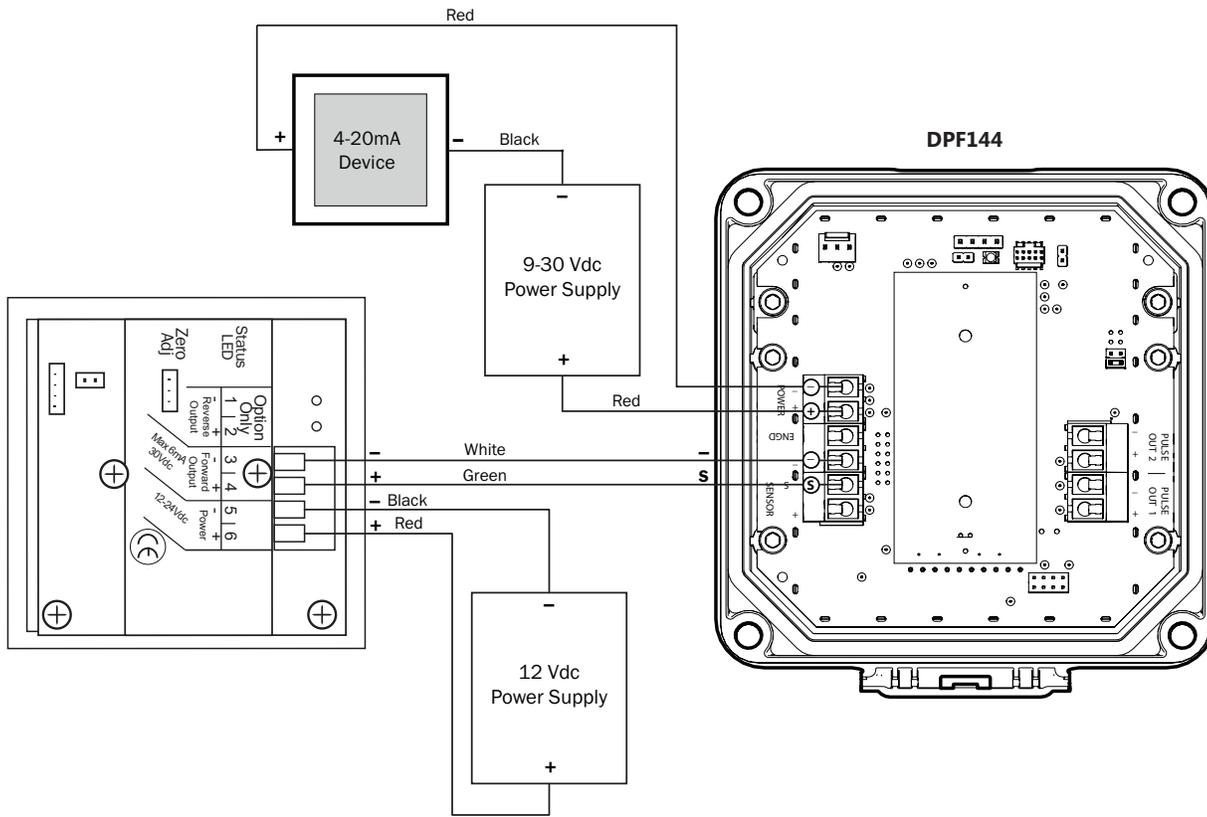
Connections for DPF143-DPS/DPF144-DPS—115Vac Option



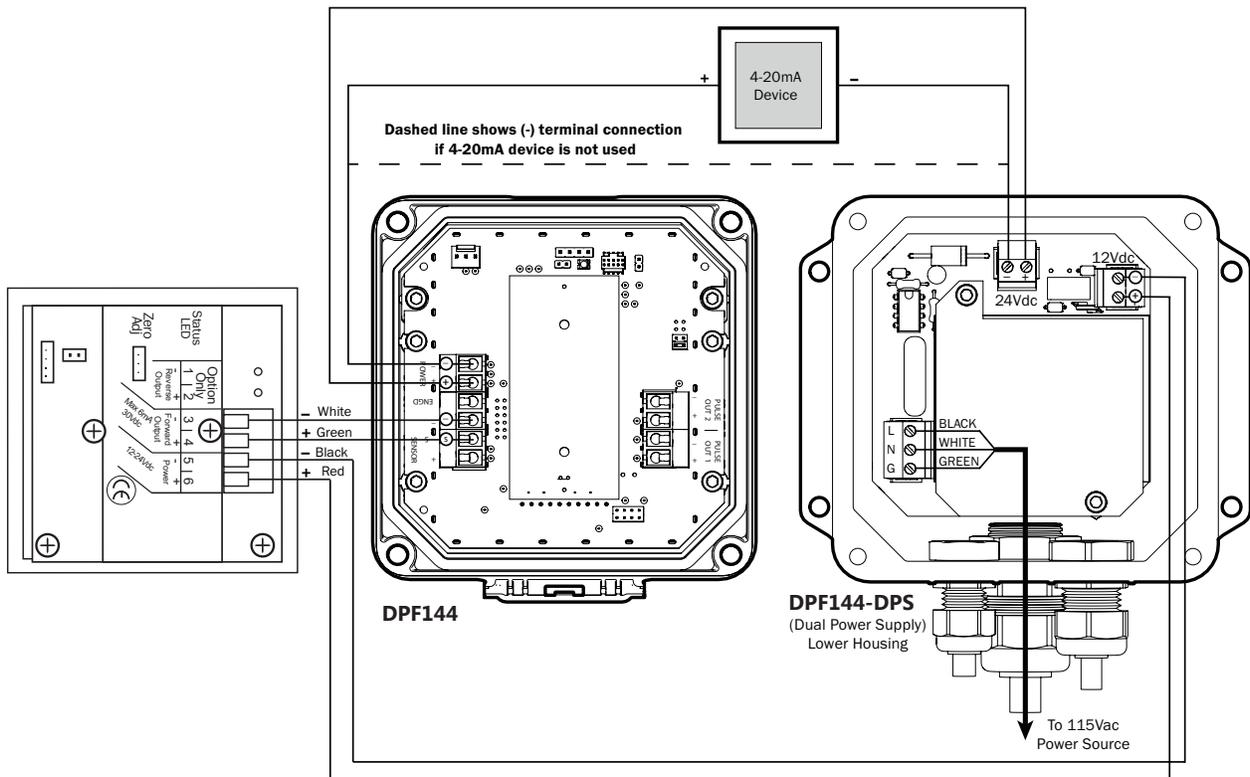
Connections for DPF144/3-wire Mechanical/ Dual Scaled Pulse Out



Connections for DPF144/FMG900/980 Series



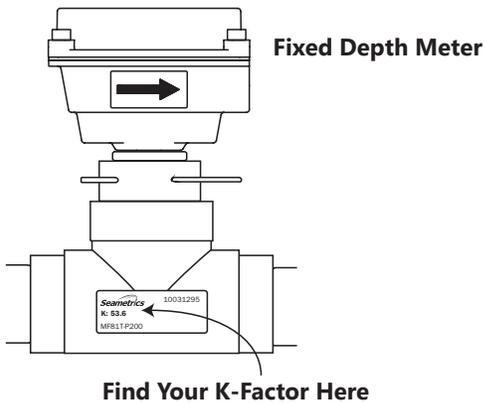
Connections for DPF144-DPS/FMG900/980 Series



K-Factor

At a minimum, every DPF143/144 flow computer must be programmed with the "K-factor". (This is the number of pulses that the meter produces per gallon of flow.) If you wish to read in units other than gallons, see below.

The K-factor on any Omega flow sensor fitting or in-line meter can be found on the model-serial label. The line reading K = xxxx gives the desired number. For depth-adjustable sensors (110, 210, 150, 250 models).



Changing Flow Indicator Settings

THE HOME SCREEN



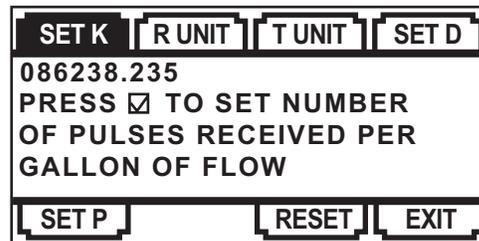
The HOME Screen, shown above, is the normal screen which displays TOTAL flow volume and flow RATE. The Four buttons below the LCD display are used to access menu screens for viewing and changing setup parameters.

Menu Navigation



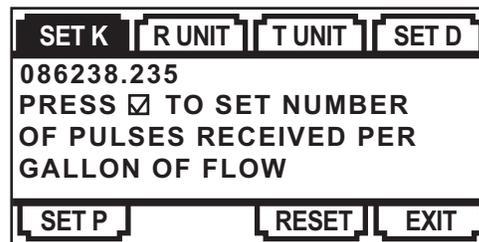
The left/right keys are used to move through the menus and position the cursor during data entry. The up arrow is used to scroll through the available values that are to be entered. (examples: numerical values for K factor entry or selection of units from the available options) The enter key (represented on the keypad by the check mark) is used to save selected entries and in conjunction with the exit tab to move between menu screens. As one navigates the menus the current parameter setting is shown and instructions are displayed for how to change the selected parameter.

MAIN MENU



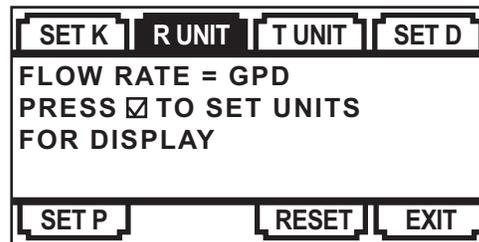
All menu screens consist of two rows of tabs surrounding a dialog box that lets you view and change setup parameters.

SET K



View or change the K factor. The K factor is the number of pulses the flow sensor provides for every gallon of flow. (Note that the decimal is fixed at three places. If you only have two decimal places for your K-factor, enter a zero for the third digit. If unable to set K-factor, the unit is "locked" to prevent tampering.

R UNIT



View or change the flow rate units

T UNIT

SET K	R UNIT	T UNIT	SET D
TOTAL = GALLONS PRESS <input checked="" type="checkbox"/> TO SET UNITS FOR DISPLAY			
SET P	RESET	EXIT	

View or change the total volume units

SET D

SET K	R UNIT	T UNIT	SET D
000 PRESS <input checked="" type="checkbox"/> TO CHOOSE NUMBER OF DECIMAL PLACES IN TOTAL DISPLAY			
SET P	RESET	EXIT	

View or change the number of decimals displayed in the total volume display

SET P OR SET A

SET K	R UNIT	T UNIT	SET D
00000.0 GALLONS PRESS <input checked="" type="checkbox"/> TO SET NUMBER OF GALLONS TOTALIZED PER PULSE SENT OUT PULSE1			
SET P	RESET	EXIT	

The factory setting will show Set P which allows one to view or change the volume of flow totalized per pulse sent to pulse out 1. The units for Set P follow the units selected for the rate display. *(With EXIT highlighted, pressing the up arrow four times will allow pulse out 1 to be an alarm. The alarm can be set to trigger on either a high or low flow condition as determined by the user.)*

SET 20 (DPF144 ONLY)

SET K	R UNIT	T UNIT	SET D
00000.0 GALLONS PRESS <input checked="" type="checkbox"/> TO SET THE FLOW RATE AT WHICH 20 mA (MAX) OUTPUT IS DESIRED			
SET P	SET 20	RESET	EXIT

Input the flow rate at which 20 mA (max) output is desired

RESET

SET K	R UNIT	T UNIT	SET D
PRESS <input checked="" type="checkbox"/> TO RESET TOTAL			
SET P	RESET	EXIT	

Reset the total flow volume to zero. This tab is not available when the -64 non resettable total option is ordered

EXIT

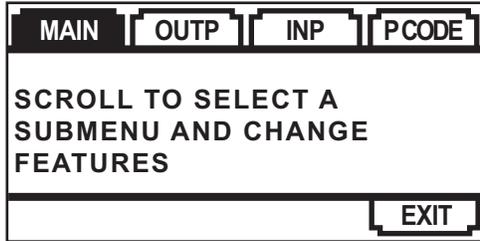
SET K	R UNIT	T UNIT	SET D
PRESS <input checked="" type="checkbox"/> TO EXIT MENU AND RETURN TO FLOW DISPLAY			
SET P	RESET	EXIT	

Return to the home screen, enter a submenu, or accept a parameter change

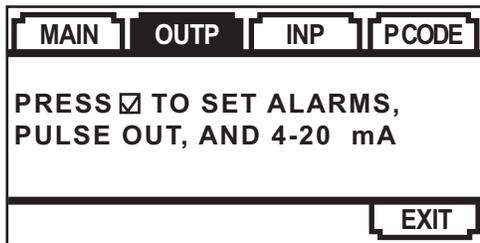
The Exit menu also allows access to the secondary menu, as described on the next page.

The DPF144 Secondary Menu Functions

When using the DPF144, a secondary menu is available with further options. Enter the secondary menu by pressing the up arrow four times while EXIT is highlighted.



OUTP



View or change the function of Set P tab on the main menu.

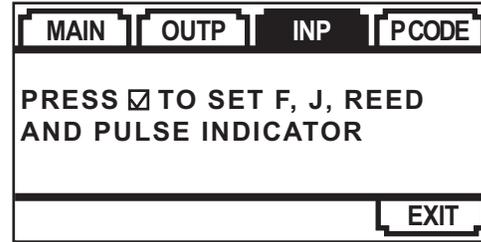
The P/A tab changes the function of the outputs. Default is scaled pulse out for both outputs. Either output can be changed to alarm high or alarm low. If alarm options are selected menu tabs for setting the alarms will be displayed on the main menu (alarm 1) or the secondary menu (alarm 2) If the alarm options are selected a Set H (hysteresis) tab is available. The hysteresis entry is a % value. The value defines the % change required for a change in alarm state to occur.

The factory setting will show Set P2 which allows one to view or change the volume of flow totalized per pulse sent to pulse out 2. The units for Set P2 follow the units selected for the rate display. If P2 is selected as an alarm the menus will change to Set A2 and a Set H (hysteresis) tab is available. The hysteresis entry is a % value. The value defines the % change required for a change in alarm state to occur.

Set 4 input the flow rate at which 4 mA (min) output is desired.

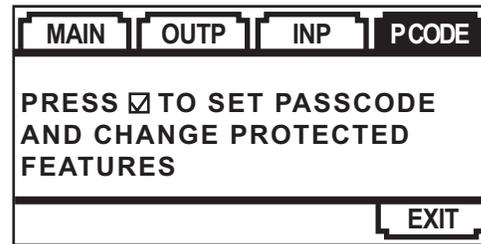
ADJ L allows the adjustment of the 4 mA and 20 mA values so that one can tune performance of the DPF144 to match the installed system values. The adjustment units range from 0-32. Positive values adjust the setting incrementally larger and negative values adjust the setting incrementally lower.

INP



View or change the filter (set F), jitter (set J), enable reed mode. Use the filter setting if the display is jumping excessively due to flow conditions. Use the jitter setting to enter a time delay to handle start up conditions. Jitter units are seconds.

PCODE



Enter the pass code for access to protected features.

Protected Features

To enter the protected features use the left/right arrow keys to navigate to the Pcode tab, found in the secondary menu. Press the enter key and then enter the pass code. The protected menu, shown below, will now be displayed. The tabs have the following functions:

- Set CD** Enter a user created numerical pass code.
- Lock** Lock menu functions to prevent unauthorized changes.
- E/D R** Disable or enable the total volume reset function.
- PCNT** Keeps a running tally of the number of times the pass code has been used.

Problem	Probable Causes	Things to try...
Display blank	No power to the unit Short in sensor circuit Display is in sleep mode	Check for minimum 12 Vdc at power terminals Disconnect sensor, see if display returns (zero flow rate) Push any button to reactivate display. (Display goes to sleep after about 3 minutes of non-use.)
Display missing pixels	Damaged display module	Contact Omega for return/replacement
Display showing meaningless characters	Unit's microcontroller crashed	Disconnect and reconnect power. If problem repeats, contact distributor for return/replacement.
Display reads normally but flow rate incorrect	Wrong K-factor or time base entered	Enter correct K-factor from meter, fitting, or manual
Display reads normally but incorrect pulse output	Wrong pulse output setting Polarity reversed on pulse output terminals	Use "Set P" to correct pulse output setting Reverse leads
Display reads normally, but no (or incorrect) 4-20mA output (DPF144 only)	Wrong 4mA setting or wrong 20mA setting Inadequate loop power supply voltage Polarity incorrect in 4-20mA loop circuit	Use "Set 4" to correct target minimum flow rate. Use "Set 20" to correct target top flow rate. Check voltage (For 4-20mA applications, 24 Vdc is recommended) Compare to Connections diagram
Display reads zero when there is flow	Flow sensor failed Break in flow sensor circuit	Consult flow sensor manual for how to test Check for continuity with multimeter
Display reads flow rate when there is none	Long flow sensor wire, running parallel to power wires Flow sensor malfunction Flow "jitter" (oscillating slosh) reads as flow	Reroute wire or change to shielded wire See flow sensor manual to check Consult factory for "anti-jitter" setting
Totalizer does not always appear to display the total flow	Break in power to meter	The totalizer's memory is only updated every 15 minutes. If power is lost, the totalizer will retain the value last written but will not be updated to reflect any flow between the last write and the time the power was lost.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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