



**Instrumentation
Northwest**

**Manufacturer of Groundwater Monitoring
Systems and Submersible Sensors**

DEDICATOR[®]

Groundwater Sampling System

**INSTRUCTION
MANUAL**

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Introduction

The INW *DEDICATOR* dedicated sampling system has been especially designed for the Grundfos Redi-Flo2 electric submersible pump. The *DEDICATOR* makes installation, operation, and sampling with the Redi-Flo2 simple and easy. Please take time to carefully read this manual if you are not familiar with this product.

This manual is specified for the *DEDICATOR* system with HAPPY HOSE! This manual applies to both the outside diameter well seal “OD” and the inside diameter seal “ID” versions of the *DEDICATOR*. The drawings used in this manual show the “ID” version, but apply to both versions. The difference between the two versions is that the “OD” was designed to fit and seal against the outside diameter of your well head and the “ID” was designed to fit and seal against the inside diameter of your well head.

Initial Inspection and Handling

Upon receipt of your new system, inspect the shipping package and contents for damage. If any damage is apparent, contact the carrier and note the signs of damage on the appropriate shipping form. If any damage is found, immediately file a claim with the carrier. Check the cable length information attached to the well seal to make sure the appropriate amount of cable is included and that a sample tube assembly is included.

Please complete and return the questionnaire and the warranty registration card.

Do's and Don'ts

THIS SECTION IS VERY IMPORTANT. PLEASE READ BEFORE PROCEEDING WITH OPERATION OF YOUR SYSTEM.

Do lower the system slowly down the well.

Do tighten all the bolts before operating the system.

Do remove the sample fitting from the storage port and install it on the purge port before operating.

Do check the length on the *DEDICATOR* identification tag before installing.

Do leave the access port open during operation to vent the well.

Don't over-torque the sample hose fitting when installing it in the access hole for storage. It is only necessary to tighten until the O-ring is seated on the seal.

Don't allow water to build up inside well seal connector. If water build-up does occur, dry COMPLETELY before operation. The electrical connector is splash-proof but not submersible.

Features

1. Splash-resistant electrical connector with cap for connecting the *DEDICATOR* converter cable (P/N 3P150) to the converter (P/N 3P850 or P/N 3P855; required for operation).
2. Storage/access port for sample hose storage and access for using a water level indicator or other down-hole device with less than 0.5" O.D.
3. Discharge port for connection to sample tube. Stainless steel discharge fitting for 0.5" I.D. tubing.
4. Rope handle for installation.
5. HAPPY HOSE! - bonded wire, safety cable and discharge hose.
6. Identification tag states well number, system length, model number and serial number.

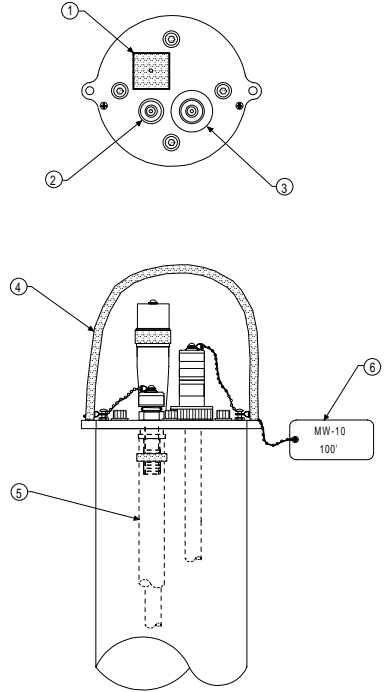


Figure 1: *DEDICATOR* features

Installation

Note: A 3/16" long-arm hex key is provided for installation.

The *DEDICATOR* Dedicated Sampling System was designed to be installed by lowering the pump and HAPPY HOSE! into the well then tightening the bolts on the well seal to accomplish a water-tight seal.

Step 1

Check the water level and total depth of the well to verify the correct installation elevation. HAPPY HOSE! lengths ("A") are referenced from the bottom of the pump to the bottom of the well seal plate (see Figure 2, dimension "A" on following page). The well seal plate sits flush against the top of the well casing.

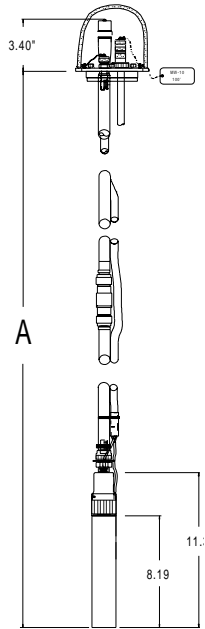


Figure 2: Reference Points

Step 2

Position the *DEDICATOR* assembly over the well opening and lower the pump and HAPPY HOSE! slowly into the well. Be sure not to scrape the HAPPY HOSE! on the edge of the well casing.

Step 3

Once the system is lowered, position the well seal onto the well casing until seated. Tighten all the bolts on the well seal. The sample tube was designed to be stored in the well when not in use, as shown in Figure 3. The sample tube is included loose in the shipping box. To store the sample tube, feed the sample tube down into the well through the access port. Thread and tighten the sample tube end fitting into the port — **DO NOT OVER-TORQUE THE FITTING** — it is only necessary to tighten the fitting until the O-ring is seated on the seal. Thread and tighten the access port plug into the top of the sample tube fitting (see Figure 3, page 5).

Note: THE *DEDICATOR* WILL OPERATE ONLY WHEN USED WITH THE GRUNDFOS BMI, BTI OR VFD CONVERTER.

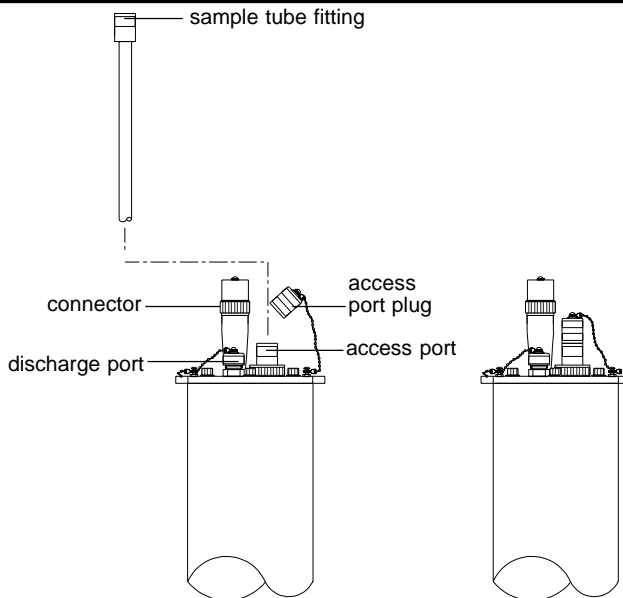


Figure 3: Sample Tube Storage

Operation

Step 1

Remove top plug from access port. Remove the sample tube from the access port, then remove the discharge port cap. Attach the sample tube fitting to the discharge port fitting and tighten. Do not re-install access port top plug. Port must be open during operation to vent the well. It is okay for the top plug to rest in the access port, but **DO NOT** tighten it.

Step 2

Remove connector hood. Attach the converter cable to the well seal connector. Attach the other end of the converter cable to the Grundfos converter.

Step 3

Operate the pump and Grundfos converter per the pump and converter specifications found on pages 21-23. **To start the pump:**

- A. Start the power source (i.e., generator) — if the generator has a circuit breaker, switch it on.
- B. Check the frequency display on the front of the converter. It should read “0” (zero). If it doesn’t, refer to the Troubleshooting section on pages 7-18.
- C. If this is the first time the converter is being used or if it has not been used for more than six months, leave the converter on for at least 15 minutes before proceeding to the next step.

- D. Set the converter speed dial near the middle of the dial (12 o'clock position).
- E. Start the pump by pressing the **Start/Stop** switch to the "Start" position.
- F. Adjust the pump performance by turning the speed dial.

The pump may become clogged if pumping suspended solids. Refer to the trouble-shooting section, page 8, to dismantle the pump end.

Step 4

When sampling is complete, turn off the converter by moving the **Start/Stop** switch to the "Stop" position. **TURN THE POWER OFF AT THE GENERATOR** before disconnecting the *DEDICATOR* converter cable from both the well seal and the converter. Disconnect the sample tube from the discharge port fitting and store the sample tube as shown in Figure 3, page 5.

Step 5

Replace and tighten the discharge port cap and the access port top plug. Replace the hood on the well seal connector.

Operating Conditions

- The electrical voltage to the converter must always be + or - 10% of the specified power supply voltage. For the 230V converter - between 207 and 253 volts, single phase AC; or between 104 and 126 volts for 115V converter.
- The motor and pump must be completely submerged in fluid to ensure lubrication of the shaft seal and cooling of the motor.
- The pump is capable of producing a total head equivalent to 270 feet of water. Total head includes the distance from the ground level to the pumping level of the water in the well and all friction losses.
- If the pump is used in a well larger than 4" in diameter, a shroud should be used around it to ensure proper motor cooling — call INW for details
- The temperature of the water being pumped should be between 34°F and 86°F (1°C and 30°C).
- If the temperature drops below freezing and your pump is frozen so the motor shaft cannot rotate, pull the pump out and lower it into water and start it at the slowest speed possible. Continue to operate the pump at this speed for about 10 minutes, at which time it should thaw and operate properly.

Maintenance & Storage

The *DEDICATOR* requires minimal maintenance due to the specially designed features. To properly care for your *DEDICATOR* :

1. Replace all caps, plugs, and hoods on the well seal when wear is apparent to prevent contamination and corrosion of electrical connections.
2. Store the extension cable in a dry place with the converter.
3. Make sure the well seal connector is completely dry before operating.

There is no recommended preventative maintenance for pump components. Reduced pump performance may be indicative of wear, especially if pumping suspended solids. See page 8 - "Checking the impellers for wear". Disassemble the pump end impeller assembly (see figure 5, page 9) and examine for wear according to the following:

Impellers --- should show no visible wear

Guide vane --- should show no visible wear

Wear ring -- minimum thickness should never be less than 1.0mm

Replace any worn components using either a pump-end replacement kit (P/N 3P105) or a Teflon pump-end replacement kit (P/N 3P120).

Troubleshooting

Use the following troubleshooting tests if you have a problem. If the problem can not be resolved, give us a call at (800) PRO-WELL and ask for Customer Service.

If the pump is operating at a decreased capacity and the impeller assembly components (impellers, guide, vanes, etc.) do not appear to be the cause, the motor should be checked. A checklist of things to examine includes:

- Check the fluid level inside the motor. Replace and refill as necessary — see "Replacing Motor Fluid" section on page 9.
- Inspect the outside of the motor for cracks, dents, etc.
- Remove the Inlet Screen, Pump Housing, and the impeller assembly (see Figure 5, page 9). Try to spin the motor shaft by hand. It should spin freely. If it does not, the motor must be replaced.

Motor Winding Test

This test checks for a short or open circuit in the pump and/or the motor leads. Place the pump in water. Using an Ohm meter, measure resistance between any two power leads (see test below). The measurement should be 3 to 7 ohms depending on system length. The readings should be the same between any set of power leads. If the readings are zero, there is a short circuit in the pump or there is a set of nicked power lead wires. If the readings are greater, there is a cut motor lead.

- Details of this test are as follows:
 - A. Turn off the power and unplug the *DEDICATOR* from the converter.
 - B. Using an Ohm meter, set the scale to R X 1. Zero-adjust the meter and measure the resistance between any two power conducting leads (prongs on the motor lead plug). Compare the obtained reading to the value in the following table:

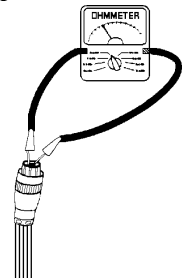


Figure 3A

<u>Lead Length</u>	<u>Ohm Value</u>	<u>Lead Length</u>	<u>Ohm Value</u>
0 Feet	3.0 - 3.5	150 ft	4.8 - 5.3
50 ft	3.6 - 4.1	175 ft	5.1 - 5.6
75 ft	3.9 - 4.4	200 ft	5.4 - 5.9
100 ft	4.2 - 4.7	250 ft	6.0 - 6.5
125 ft	4.5 - 5.0	300 ft	6.6 - 7.1

C. If the Ohm value is too low, the motor may be shorted. If too high, the motor windings or the leads may be open.

Insulation Resistance Test

This test checks for a short to ground in the pump and/or the motor leads. Place the pump in water. Using an Ohm meter, measure the resistance between the ground lead and each power lead (see figure 4). The resistance to each power lead should be greater than 2 meg ohms. If the resistance is less than 2 meg ohms, the pump is defective or there is a nicked/cut motor lead.

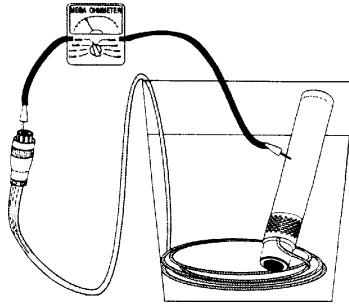


Figure 4: Using an Ohm meter

Checking The Impellers For Wear

If pump performance decreases, the impellers may need to be replaced or cleaned. The Redi-Flo2 can be dismantled and reassembled quickly and easily by referring to the diagram to the right.

1. **Dismantling** -- Periodically, it will be necessary to check the pump for impeller wear.
 - A. Disconnect all power to the *DEDICATOR*.
 - B. Remove the discharge hose.
 - C. Remove the Intake Screen Screw.
 - D. Carefully pull the screen up. Take care not to nick any motor leads.
 - E. Unscrew the pump housing.
 - F. The impeller components can now be inspected.

There is no recommended preventative maintenance for pump components. Reduced pump performance may be indicative of wear, especially if pumping suspended solids. Disassemble the pump end impeller assembly (see figure 5, page 9) and examine for wear according to the following:

- Impellers --- should show no visible wear
- Guide vane --- should show no visible wear
- Wear ring -- minimum thickness should never be less than 1.0mm

Replace any worn components using either a pump-end replacement kit (P/N 3P105) or a Teflon pump-end replacement kit (P/N 3P120).

2. Re-assembly (refer to figure 5)

- A. Make sure the *DEDICATOR* system is not connected to the converter.
- B. Return the impeller assembly to the shaft in the proper order.
- C. Screw the Pump Housing back onto the top of the pump. If all the impellers and chambers were replaced correctly, the Pump Housing should screw on easily. Hand tighten.
- D. Slip the Inlet Screen back over the Pump Housing. Screw the Set Screw back into the Inlet Screen.

Replacing Motor Fluid

Whenever any maintenance is done on the pump, the motor fluid should be replaced. If the pump is moved from well-to-well, it should be thoroughly decontaminated prior to being installed in the next well. In addition to cleaning the individual components inside and outside, the water in the pump motor should be replaced using the syringe that came with your pump. Follow these steps:

1. Disconnect *DEDICATOR* system and converter from power source.
2. Turn the pump and motor upside down.
3. Use a flathead screwdriver to remove the filling screw on the bottom of the motor.
4. Empty the water from the motor and refill the reservoir using contaminant-free water and the syringe that came with your *DEDICATOR*. The water level should be even with the bottom edge of the screw hole.
5. Replace and tighten the filling screw.
6. Turn the pump over several times, then remove the filling screw again to let any trapped air escape (if air is left inside the motor, the life of the motor will be shortened). Add more water, if necessary. Repeat steps 4, 5, & 6 if necessary.
7. Replace and tighten the filling screw.

Replacing the Converter Fuses on the 230V Converter

The converter fuses can be replaced by the following steps (*the VFD and the 115V don't have fuses*):

1. Turn off power.
2. Disconnect converter from power source and *DEDICATOR*.
3. Wait at least three (3) minutes to give the capacitors time to discharge any remaining voltage.
4. Remove the four (4) screws holding the front cover of the converter in place and remove front converter.
5. Remove the four (4) screws holding the speed dial panel in place.
6. Replace the three (3) fuses as shown on next page:

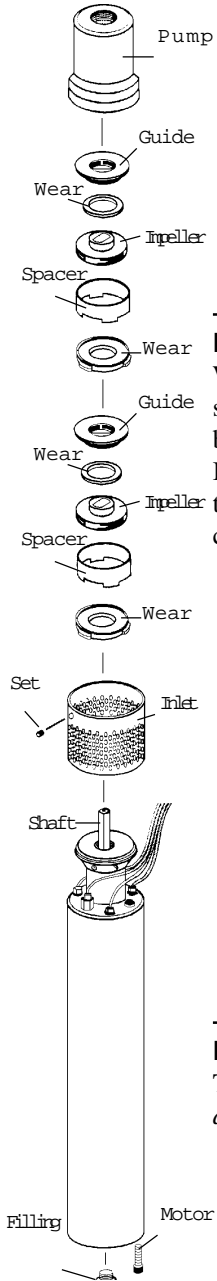


Figure 5: Pump Assembly

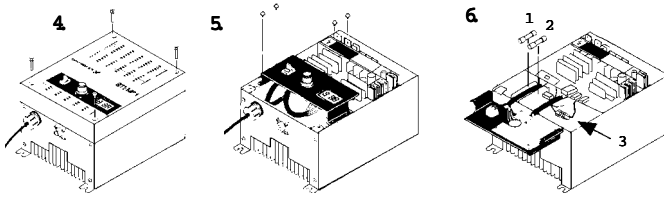


Figure 6: Replacing the 230V Converter Fuses

Checking the Converter Cable

To test the converter cable use an Ohm meter and check for continuity between connectors for each wire. To do this, select any one wire in the connector at one end of the cable and connect it to the Ohm meter. Connect the other end of the Ohm meter to the same wire at the other end of the cable. Do this for all four wires. The Ohm meter will show if there is a short in any of the wires - (see Figure 6A).

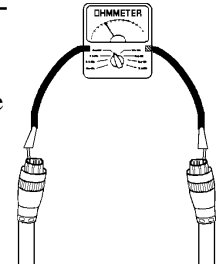
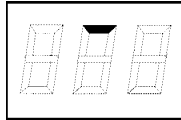


Figure 6A: Checking the Converter Cable

BTI/MP1 230V Converter Troubleshooting

The following explains the error signals that can be displayed on your BTI/MP1 230V converter:

If the display shows:



Fault is: Function Loss

Cause: A thermal cut-out or shutdown.

Reason: Pump is overheating because it is not in fluid or not enough fluid is passing by the pump.

Tests: None.

To correct: Wait until the motor has cooled. Restart the motor using the on/off switch on the converter.

OR

Causes: Defective motor lead or pump; OR momentary problem; OR converter cable.

Reason: Motor lead is cut or nicked due to debris or during installation.

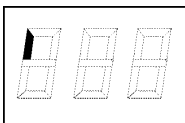
Tests: Insulation resistance test; converter cable test; Motor winding test.

To correct: Reset the converter and restart. If it shuts down again, switch off the power supply. Turn the power supply back on and restart the converter. If the converter **doesn't** shut down again, it was probably a transient fault (momentary power surge, etc..) **IF ALL CHECKS INDICATE THAT THE PUMP, MOTOR LEAD, AND CONVERTER CABLE IS OK, THEN THE CONVERTER MAY BE DEFECTIVE.**

OR

- Causes: Excessive impeller wear; OR impeller is blocked.
 Reason: Usage in sandy/silty environment has worn down the impellers.
 Tests: Impeller wear test.
 To correct: Replace or clean impellers.

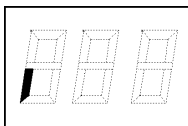
If the display shows:



Fault is: Over-voltage

- Causes: The input is too high; OR there was a momentary power surge.
 Reason: Generator is not regulating voltage.
 Tests: Check the output voltage of the generator.
 To correct: Reset the converter and restart. If it shuts down again, reduce the voltage coming into the converter -- see the converter technical specification on page 21.

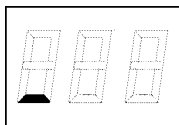
If the display shows:



Fault is: Low-line

- Causes: The input voltage is too low; OR there was a momentary drop in voltage
 Reason: Generator is not regulating the voltage
 To correct: Reset the converter and restart. If it shuts down again, increase the voltage coming into the converter -- see the converter technical specifications on page 21.

If the display shows:



Fault is: Power Supply

- Cause: Internal converter fuses may be out.
 Reason: Generator transient voltage is too high.
 Tests: None.
 To correct: Replace internal fuses on the converter (see section - Replacing Converter Fuses on the 230V Converter - page 9).

If the display shows:

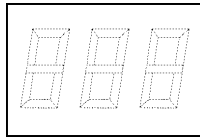


Fault is: Pump Problem

Causes: The pump shaft is locked; OR one of the three motor leads is not making contact with the motor.

To correct: Turn the speed dial to maximum frequency. If this results in a Function Loss, follow the troubleshooting instructions listed on page 11. If you don't get a Function Loss, the problem is with the converter.

If the display shows:



Fault is: No Display = No Power

Causes: The converter is not being supplied with power; OR the power being supplied is a very low voltage; OR the internal fuses are defective.

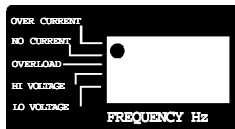
Reasons: No output from generator; OR generator transient voltage is too high; OR water damage to converter.

Tests: None

To correct: Check the amount of incoming voltage. If it is within allowable limits (190-253V), then flip the generator circuit breaker (if it has one) to the "ON" position. Reset the converter and restart. If the converter still shows no display, switch the power supply off. Check the fuses in the converter and replace if necessary (see page 9). If the fuses are OK, then check the electrical plugs to ensure all connections are made properly.

BMI/MP1 115V Converter Troubleshooting

If the display shows:



Fault is: Overcurrent

Cause: Defective motor lead or defective converter cable.

Reason: Motor lead is cut or nicked due to debris or during installation.

Tests: Insulation resistances test; Converter cable test.

To correct: Replace motor lead or converter cable.

OR

Causes: Excessive impeller wear; impeller blocked.
 Reasons: Usage in a sandy/silty environment.
 Tests: Impeller wear test.
 To correct: Replace or clean impellers.

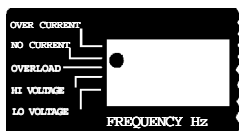
OR

Cause: Transient fault.
 Reasons: Unknown.
 Tests: None.
 To correct: Restart converter.

OR

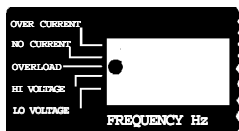
Cause: Acceleration time is too short.
 Reasons: High fluid viscosity; sandy/silty fluid.
 Tests: None.
 To correct: Check acceleration time: should be 6 seconds; lower starting frequency

If the display shows:

**Fault is: No Current**

Causes: Defective motor lead; OR defective converter cable.
 Reason: Motor lead cut or nicked due to debris from installation.
 Test: Insulation resistance test; converter cable test; motor winding test.
 To correct: Replace motor lead or converter cable.

If the display shows:

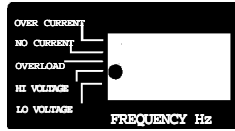
**Fault is: Overload**

Cause: Thermal shutdown.
 Reason: Pump is overheating because it is not in fluid or not enough fluid is passing by the pump.
 Tests: None.
 To correct: Wait until the motor has cooled before starting again.

OR

Causes: Excessive impeller wear; impeller blocked.
 Reasons: Usage in a sandy/silty environment.
 Tests: Impeller wear test.
 To correct: Replace or clean impellers.

If the display shows:



Fault is: High Voltage

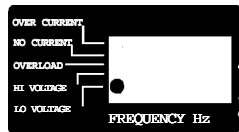
Cause: Input voltage is too high.

Reason: Generator is not regulating voltage.

Tests: Check output voltage of generator.

To correct: Throttle down generator if possible; add transformer if necessary.

If the display shows:



Fault is: Low Voltage

Cause: Input voltage too low.

Reason: Generator is not regulating voltage.

Test: Check output voltage on generator.

To correct: Throttle up generator if possible.

Variable Frequency Drive (VFD) Troubleshooting

Status Lights:

The Redi-Flo VFD indicates pending faults via the three status lights on the digital readout display.

Status 1:

Flashing: Input current limit has been reached, speed is locked.

Status 2:

Flashing: Motor overload fault is pending and will trip unless speed is turned down within 60 seconds.

Status 3:

Flashing: Undercurrent fault is pending and will trip unless speed is turned down within 8 seconds.

Solid: Undercurrent trip/fault is disabled.

Fault Display and Possible Causes and Remedies:

If the display shows:



Fault is: Over temperature

Possible Cause	Remedy
<ul style="list-style-type: none"> - The VFD is overloaded - The VFD is thermally overloaded - Defective VFD 	<ul style="list-style-type: none"> - Reduce the load by reducing the frequency - Check that the VFD's max. amb. temp. is not exceeded and it has proper ventilation - Have VFD checked by factory

If the display shows:



Fault is: Under voltage

Possible Cause	Remedy
<ul style="list-style-type: none"> - Input voltage is too low - Input wire run too long - Input wire size too small - DC bus is charging 	<ul style="list-style-type: none"> - Reset the VFD, if it cuts out again, check voltage at VFD and power source to determine where voltage loss has occurred and increase voltage as needed - Check input 120,230 voltage wiring termination - Check input voltage

If the display shows:



Fault is: Over voltage

Possible Cause	Remedy
<ul style="list-style-type: none"> - Input voltage too high 	<ul style="list-style-type: none"> - Reset the VFD, if it cuts out again check voltage at power source and reduce voltage as needed

If the display shows:

Fault is: Motor overload

Possible Cause	Remedy
<ul style="list-style-type: none"> - Motor drawing high amps (5.5A) - Locked rotor - Defective motor 	<ul style="list-style-type: none"> - Check pump for blockage or excess wear, repair or replace as needed - Check F08 operators adjustments on pg. 13 of <i>Redi-Flo Variable Performance Pumps</i> manual

If the display shows:

Fault is: VFD overload

Possible Cause	Remedy
<ul style="list-style-type: none"> - The VFD is overloaded - Defective VFD 	<ul style="list-style-type: none"> - Reduce the load by reducing the frequency - Have VFD checked by factory

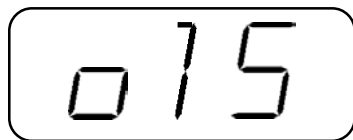
If the display shows:

Fault is: Ground fault

Possible Cause	Remedy
<ul style="list-style-type: none"> - Motor is grounded - Cable is damaged - Transistor is shorted 	<ul style="list-style-type: none"> - Check motor and lead with megohmmeter and repair or replace as needed. The insulation resistance must be greater than 1.5 M Ohm * - Have VFD checked by factory

* Do not use megohmmeter at Redi-Flo output terminals.

If the display shows:



Fault is: VFD disabled

Possible Cause	Remedy
<ul style="list-style-type: none"> - Remote connection contact open - Jumper between terminals 1-10 removed 	<ul style="list-style-type: none"> - Check external device operation - Check jumper

If the display shows:



Fault is: Over current

Possible Cause	Remedy
<ul style="list-style-type: none"> - Motor or motor lead defective / damaged - VFD amp draw above 16A - Defective motor - Defective VFD 	<ul style="list-style-type: none"> - Reduce frequency - Check motor and lead with megohmmeter and repair or replace as needed. The insulation resistance must be greater than 1.5 M ohms * - Check pump for locked rotor condition - Have VFD checked by factory

*Do not use megohmmeter at Redi-Flo VFD output terminals.

If the display shows:



Fault is: Under current

Possible Cause	Remedy
<ul style="list-style-type: none"> - Pump running dry or shut off or at pump off - Motor current below UC (F10) setting 	<ul style="list-style-type: none"> - Check water level, drawdown, pumping level and above ground pressure for these conditions - Check pump for proper rotation - Let motor cool and try to restart

If the display shows:



Fault is: Restart delay

Possible Cause	Remedy
<ul style="list-style-type: none"> - Under current restart is pending 	<ul style="list-style-type: none"> - Pump will automatically restart after preset delay - Set "0" on F11 to eliminate auto restart

If the display shows:



Fault is: No motor load

Possible Cause	Remedy
<ul style="list-style-type: none"> - Motor is not connected - Motor thermal is open 	<ul style="list-style-type: none"> - Check ambient fluid temperature - Reduce motor load - Connect motor to drive

For further VFD troubleshooting information, see the *Redi-Flo Variable Performance Pumps* manual.

CAUTION!

Safety Issue Using the VFD Pump Controller

INW does **not** recommend disabling the GFCI breaker on the generator. INW **does** recommend that you frequently inspect all portable power lines.

Issue:

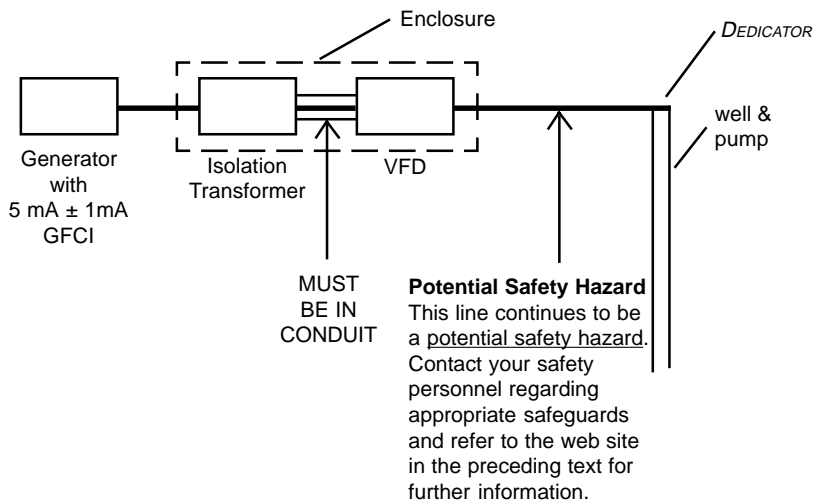
Three-phase motors controlled by Variable Frequency Drives (VFD), inherently cause inductive feedback - often more than 4mA - thus tripping the 5mA \pm 1mA GFCI breaker on many generators.

Precautions:

If you are using a generator without a GFCI breaker, be aware that this can pose a **potential safety hazard** should your power lines become nicked or damaged. If you continue to use a generator without a GFCI breaker, you **MUST** contact your safety personnel regarding appropriate safeguards.

(For further details and employer responsibilities, refer to <http://www.osha-slc.gov/doc/outreachtraining/htmlfiles/gfcicon.html> .)

If you are using a generator with a GFCI breaker, consider using an isolation transformer, as diagrammed in the following figure. The line between the isolation transformer and the VFD is NOT protected from shock hazards. It **MUST** be encased in conduit. The entire isolation transformer / VFD unit should then be placed within an enclosure. While the VFD has a 1000 mA GFCI breaker for motor protection, it is not designed to protect against shock hazards, thus the line from the VFD to the well continues to be a **potential safety hazard**. Contact your safety personnel regarding appropriate safeguards and refer to the web site above for further information.



Technical Specifications

Pump Specifications

Input Power:	1.5 kW (2 Horsepower)
Voltage:	3 Phase, 220 volts at 400 Hz
Maximum Current:	5.5 amps
Motor Protection:	Thermal overload - Thermik Geratebau, Series SY6
Disconnect Temperature:	176 F (80 C)
Rate Current:	5 amps
Current Overload:	incorporated into converter

Connections

Discharge port:	1/2" Female NPT
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Operating Conditions

Maximum Fluid Temp:	86 F (30 C)
Minimum Fluid Temp:	34 F (1 C)

Dimensions and Weight

Dimensions:	11.3" x 1.81" diameter
Net Weight:	5.5 lbs.

2" and 4" DEDICATOR Specifications

2" OD <i>DEDICATOR</i> outside diameter:	3.90"
4" OD <i>DEDICATOR</i> outside diameter:	5.96"
2" ID <i>DEDICATOR</i> outside diameter:	2.38"
4" ID <i>DEDICATOR</i> outside diameter:	4.50"
Minimum height clearance required:	3.41"

HAPPY HOSE! Cable Specifications

PVC HAPPY HOSE!

HAPPY HOSE! I.D.:	1/2"
HAPPY HOSE! O.D.:	3/4"
Hose Materials:	PVC clear, nylon reinforced
Cable Materials:	Yellow, PVC jacketed
Cable O.D.	0.42"

Teflon-lined Polyethylene HAPPY HOSE!

HAPPY HOSE! I.D.:	1/2"
HAPPY HOSE! O.D.:	5/8"
Hose Materials:	Polyethylene, Teflon-lined
Cable Materials:	Red, Polyethylene jacketed
Cable O.D.:	0.42"

All HAPPY HOSE! Cable Specifications:

Cable Construction:	includes: 4 each 16 EWG PVC jacketed, color-coated conductors, and 1 each of 0.062" dia., 7 x 7 stainless steel wire rope - PVC or PE jacketed to 0.125" dia.
Breaking Strength:	480 lbs.
Weight:	0.22 lbs/ft

BTI/MP1 Converter Specifications (230 V):

This converter requires a generator which can produce 2.5 KiloWatts at 10 AMPS, under load.

Power*Supplied by Generator/Power Supply*

Voltage:	Single phase, 230 V (+/- 10%)
Frequency:	50-60 Hz (+/- 2%)
Maximum Current:	10 amps

Produced by Converter

Output Voltage:	3 phase, 25 V to 3 phase 220 V
Frequency:	46 - 400 Hz
Maximum Current:	5.5 amps
Internal Fuse:	2 ea. of T 30 A, type FERRAZ

Connections

Motor Lead Connector:	AMP CPC plug, Type 206429-1
Power Cable:	Type SJOW, 14 AWG, 10" long

Dimensions and Weight

Dimensions:	Case is 9" x 14" x 18.5"
Net Weight:	25 lbs

Operating Conditions

Ambient Temperature:	32°F to 104°F (0°C to 40°C)
Relative Air Humidity:	Maximum 95%
Radio Noise Filter:	Noise may occur when the converter is connected to the municipal electrical supply. It can be eliminated by adding a filter, such as a Siemens filter, type B 84112-B-A 120/20 A.

Storage Conditions

Ambient Temperature:	-13°F to 149°F (-25°C to 65°C)
Relative Air Humidity:	Maximum 50% at 104°F (40°C) unlimited Maximum 90% at 68°F (20°C) for periods not exceeding 30 days per year. 75% annual average. Non-condensing

Performance

Acceleration Time:	0 to 400 Hz in 10 seconds
Deceleration Time:	400 to 0 Hz in 10 seconds

BMI/MP1 Converter Specifications (115 V):

This converter will work with most generators that are able to deliver 2.5 KiloWatts at 16 amperes (AMPS). When the converter is connected to the pump and running, it should be able to provide a minimum of 2 KiloWatts at a minimum of 16 AMPS.

Power*Supplied by Generator/Power Supply*

Voltage:	Single phase, 115 V (+/- 10%)
Frequency:	48-62 Hz (+/- 2%)
Maximum Current:	16 amps

Produced by Converter

Output Voltage:	3 phase, 25 V to 220 V
Frequency:	50 - 400 Hz
Maximum Current:	6 amps

Dimensions and Weight

Dimensions:	Case is 9" x 14" x 18.5"
Net Weight:	18 lbs

Storage Conditions

Ambient Temperature:	-40°F to 149°F (-40°C to 65°C)
Relative Air Humidity:	5% up to 95%

Performance

Acceleration Time:	0 to 400 Hz in 6 seconds
Deceleration Time:	400 to 0 Hz in 6 seconds

**Redi-Flo Variable Frequency Drive (VFD) Specifications:
(Type: SI/MP1-115/230V)**
Minimum Generator Size

For generators with voltage regulation:	2500 watts at 115/230 VAC, single phase
For generators without voltage regulation:	5000 watts at 115/230 VAC, single phase
Recommended for optimal performance:	4000 watts at 115/230 VAC, single phase with voltage regulation

Electric

Input:	115V +/- 10% / 1 PH / 48-62 Hz / 23A 230V +/- 10% / 1 PH / 48-62 Hz / 23A
Output:	1.5 kw / 400 Hz / 220V / 3 PH / 5.5A
Overload rating:	5.5A for 1 minute
Recommended input protection (115V)	Fuse, 1 each, 250V, 25A, UL Class RK1 or circuit breaker, 25A/300V/1P
Recommended input	

protection (230V)	Fuse, 2 each, 250V, 25A, UL Class RK1 or circuit breaker, 25A/300V/2P
Minimum frequency	115V or 230V 25 Hz
Maximum frequency	115V or 230V 400 Hz
<i>Dimensions and Weight</i>	
Dimensions:	Case: 9" x 14" x 18.5" VFD only: 6" x 7.5" x 10.5"
Net Weight:	With case: 20 lbs. VFD only: 10.5 lbs.
<i>Operating Conditions</i>	
Ambient Temperature:	14°F to 120°F (-10°C to 50°C)
Elevation:	Up to 3,300 ft. without derating
<i>Storage Conditions</i>	
Ambient Temperature:	-4°F to 140°F (-20°C to 60°C)
Relative Air Humidity:	95%, non-condensing
<i>Performance</i>	
Acceleration Time:	0 to 400 Hz in 5 seconds
Deceleration Time:	400 to 0 Hz in 5 seconds

Replacement Parts

Redi-Flo2 Replacement Parts

3P105	Redi-Flo2 pump end service kit
3P120	Redi-Flo2 pump end service kit (<i>Teflon parts only</i>)
3P130	Redi-Flo2 motor attachment kit
3P100	Redi-Flo2 impeller kit
3P119	Redi-Flo2 intake screen screw (set screw)
3P099	Redi-Flo2 motor lead screw
3P098	Redi-Flo2 suction inter-connect
3P097	Redi-Flo2 radial bearing screw
3P096	Redi-Flo2 filling screw
3P095	Redi-Flo2 motor thrust washer kit

DEDICATOR Replacement Parts

3P159	ID <i>DEDICATOR</i> polyethylene sample hose
3P160	ID <i>DEDICATOR</i> Teflon sample hose
3P157	ID <i>DEDICATOR</i> ext. cable (well seal to VFD)
3P200	INW 1/2" ID hose check valve assembly
3P201	INW 1/2" ID hose check valve assembly - with sample line

Redi-Flo2 Tools

3P117	Redi-Flo2 service tool kit (the items listed below are included in the service tool kit)
3P106	Motorlead screw driver
3P107	Motor filling syringe
3P104	O-Clip pliers
3P132	Crimp tool
4D074	1/16" Allen wrench
3P131	Needle nose pliers
3P103	Flat blade screwdriver

Limited Warranty - DEDICATOR

A. Seller (INW) warrants that products manufactured by Seller when properly installed, used and maintained, shall be free from defects in material and workmanship. Seller's obligation under this warranty shall be limited to replacing or repairing the part or parts or, at Seller's opinion, the products which prove defective in material or workmanship within ONE (1) year from the date of delivery, provided that Buyer gives Seller prompt notice of any defect or failure and satisfactory proof thereof. Prior to returning unit or to obtain service under this warranty contact the Distributor or the Representative from which it was purchased, or INW to obtain proper handling and shipping instructions. **Under no circumstances should defective product be returned without prior notice. Proof of purchase, description of failure, and a written statement from the user that the product is contaminant-free, safe and appropriate to handle will be required and must accompany the product being returned.** Any defective product to be returned to INW must be sent freight prepaid and the Return Material Authorization Number issued by INW must be included or returned goods cannot be accepted. Buyer will prepay all freight charges to return any products to Seller's factory, or any other repair facility designated by Seller. Seller will deliver replacements for defective products to Buyer (ground freight prepaid) to the destination provided in the original order. Products returned to Seller for which Seller provides replacement under this warranty shall become the property of Seller.

This limited warranty does not apply to lack of performance caused by abrasive materials, corrosion due to aggressive fluids, mishandling or misapplication. Seller's obligations under this warranty shall not apply to any product which (a) is normally consumed in operation, or (b) has a normal life inherently shorter than the warranty period stated herein.

In the event that equipment is altered or repaired by the Buyer without prior written approval by the Seller, all warranties are void. Equipment and accessories not manufactured by the Seller are warranted only to the extent of and by the original manufacturer's warranty.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, WHETHER ORAL, WRITTEN, EXPRESSED, IMPLIED OR STATUTORY. IMPLIED WARRANTIES OF FITNESS AND MERCHANTABILITY SHALL NOT APPLY. SELLER'S WARRANTY OBLIGATIONS AND BUYER'S REMEDIES THEREUNDER (EXCEPT AS TO TITLE) ARE SOLELY AND EXCLUSIVELY AS STATED HEREIN. IN NO CASE WILL SELLER BE LIABLE FOR CONSEQUENTIAL DAMAGES, LABOR PERFORMED IN CONNECTION WITH REMOVAL AND REPLACEMENT OF THE SYSTEM, LOSS OF PRODUCTION OR ANY OTHER LOSS INCURRED BECAUSE OF INTERRUPTION OF SERVICE. A NEW WARRANTY PERIOD SHALL NOT BE ESTABLISHED FOR REPAIRED OR REPLACED MATERIAL, PRODUCTS OR SUPPLIES. SUCH ITEMS SHALL REMAIN UNDER WARRANTY ONLY FOR THE REMAINDER OF THE WARRANTY PERIOD ON THE ORIGINAL MATERIALS, PRODUCTS OR SUPPLIES.

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