



DESCRIPTION

The Proflo PF2 is a programmable device used to monitor the lubricant flow of divider block metering systems and can be installed directly onto either side of a divider block or separately on a control panel. Cycle times are continuously monitored and communicated through both the LCD display and LED status lights. The Proflo PF2 allows users to configure alarm outputs, which are tied to individual built-in relays. New built-in diagnostic tools allow users to easily test the device functionality and validate settings, making installation and troubleshooting easier. The Proflo PF2 operates on a field replaceable lithium battery or DC power input.

FEATURES

- Wireless Communications (24VDC Recommended)
- Hazardous Location Certified
- Works with CPI, Dropsa*, Lincoln*, and Graco* Divider Blocks
- Tracks and Learns Magnet Movement
- Quick Disconnect Battery Replacement
- LCD Display with Backlight (24VDC Recommended)

CERTIFICATIONS & RATINGS

PROFLO PF2 CONFORMS TO THE FOLLOWING STANDARDS:

- UL 60079-0:2019 ED.7+R:15APR2020, UL 60079-11:2013 ED.6+R:14SEP2018, UL 61010-1:2012 ED.3+R:19JUL2019

PROFLO PF2 IS CERTIFIED TO THE FOLLOWING STANDARDS:

- CSA C22.2#60079-0:2019 ED.4, CSA C22.2#60079-11:2014 ED.2, CSA C22.2#61010-1-12:2012 ED.3+U1;U2;A1]

PROFLO PF2 COMPLIES WITH THE FOLLOWING STANDARDS:

- EN IEC 60079-0: 2018, EN 60079-11: 2012
- IEC 60079-0 (ED.7.0) (2017), IEC 60079-11 (ED.6.0) (2011)

ENVIRONMENTAL CONDITIONS (IEC 61010-1):

- Suitable for Indoor and Outdoor use
- Max. Altitude: >2000m (typically limited by power supply rating)
- Operating Temperature Range -40C to +60C, <95% RH
- Suitable for use in wet locations, IP66
- Pollution Degree: 4 (see Special Conditions of Use for Electrostatic Hazards warning)

PROFLO PF2 RATINGS:

ETL:

CSA Certificate #: ETL21CA104173915X
Class I, Division 1, Groups A, B, C and D; Temp Code T4
Class I, Zone 0, AEx ia [ia] IIC T4 Ga
With Intrinsically Safe Circuits
-20°C < TA < +60°C, IP66, TYPE 4X

ATEX/UKEX:

ATEX Certificate #: ETL21ATEX0042X
UKEX Certificate #: ITS21UKEX0329X
CE: II 1 (1) G Ex ia [ia] IIC T4 Ga
-40°C < TA < +60°C

IECEX:

Ex ia [ia] IIC T4 Ga
-40°C < TA < +60°C
IECEX ETL 21.0054X

*Dropsa® is a registered trademark of Dropsa USA, Inc.

*Trabon® is a registered trademark of Graco, Inc.

*Lincoln® is a registered trademark of SKF

WARNINGS

IF THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.



FIRE AND EXPLOSION HAZARD

- When flammable fluids or gases are present in the work area, be aware that flammable fumes can ignite or explode.
- Follow job site fire safety protocols, procedures, codes, and regulations.



HYDRAULIC EQUIPMENT

- Follow job site hydraulic protocols, procedures, codes, and regulations.
- Relieve system hydraulic pressure before servicing hydraulic equipment.
- Hydraulic pressure relief devices are recommended in all hydraulic systems.



ELECTRICAL GROUNDING

- This equipment must be grounded to reduce the risk of static sparking.
- Follow job site grounding protocols, procedures, codes, and regulations.



MECHANICAL EQUIPMENT

- Follow job site mechanical equipment protocols, procedures, codes, and regulations.
- This product is typically used in the vicinity of reciprocating or rotating equipment. Be aware of the site hazards and potential for injury.
- Hydraulic pressure relief devices are recommended in all hydraulic systems.



PERSONAL PROTECTIVE EQUIPMENT

- Wear appropriate protective equipment to help prevent injuries.
- Follow job site PPE protocols, procedures, codes, and regulations.

SPECIAL CONDITIONS OF USE

- Do not open the equipment when an explosive atmosphere is present. The battery is not replaceable in a Hazardous Location.
- Only use CPI battery assembly Part No. 650140000095964, which incorporates the Tadiran TL-5903 battery.
- The quick disconnect cable, and internal powered connections, are protected by power barriers when installed in a Hazardous Location. Power barriers greatly reduce the risk of electrical arcs during cable connect or disconnect. The powered connections can also be disconnected at the barriers to completely remove the potential for electrical arc occurrence when connecting or disconnecting the cable in a Hazardous Location when an explosive atmosphere is present.
- Electrostatic hazard warning. Follow the procedures of the installation site including any procedures or codes applicable to operating equipment in Hazardous Locations. The Proflo PF2 should be earth grounded using the housing grounding connection. The device should also be wiped with a damp cloth prior to contact to eliminate the occurrence of static electricity and potential static induced electrical arcs.
- The aluminum enclosure may produce incendiary sparks if subjected to impact or friction. When installed into an EPL Ga environment the end user shall carry out a risk assessment and shall only install the equipment if the risk of these hazards occurring is negligible.
- The Proflo PF2 has three installation options which are all considered fixed installations.

COMPLIANCE STATEMENTS

ISED non-interference disclaimer

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with the Canadian ICES-003 Class A specifications. CAN ICES-003(A) / NMB-003 (A).

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempt de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil numérique de la Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

RF Exposure statement

This equipment complies with ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm (7.9 inches) between the radiator and any part of your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux radiations ISED CNR-102 établies pour un environnement non contrôlé. Une distance de séparation d'au moins 20 cm doivent être maintenue entre l'antenne de cet appareil et toutes les personnes. Lanceurs ou ne peuvent pas coexister cette antenne ou capteurs avec d'autres.

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation. Please note that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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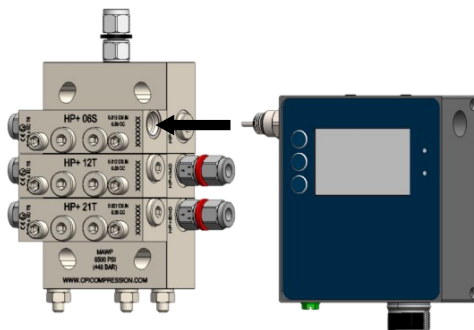
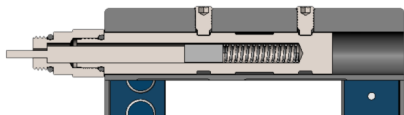
RF Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, this equipment should be installed and operated with minimum distance 20 cm (7.9 inches) between the antenna and your body during normal operation. Users must follow the specific operating instructions for satisfying RF exposure compliance.

INSTALLATION

DIVIDER BLOCK MOUNTING

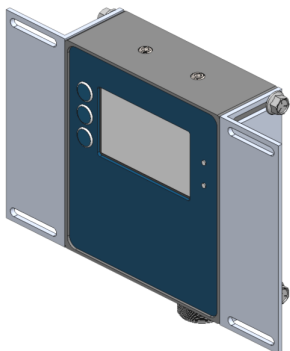
- Remove divider block element end plug and install magnet housing. The magnet housing may be installed in any convenient location.
- Slide device onto magnet housing. Ensure set screws are seated in the grooves. **Do not overtighten set screws.** 25 inch pounds max.



Divider Block Mounting

CONTROL PANEL MOUNTING

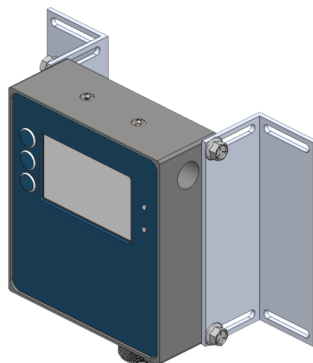
- Use (4) 10-32 screws to attach brackets to the device.
- Face the flat surface of the bracket towards the front for Control Panel mounting.



Control Panel Mounting

WALL MOUNTING

- Use (4) 10-32 screws to attach brackets to the device.
- Face the flat surface of the bracket towards the back for wall mounting.



Wall Mounting

INSTALLATION

WIRING

Warning: Proper Cable Termination Instructions

To ensure safe and optimal operation of your PF2, please adhere to the following cable termination guidelines. Failure to do so may result in damage to the device and will void the warranty. Please read and follow these instructions carefully. Take necessary precautions and avoid contacting any two wires together.

1. **Power Disconnection:** Before beginning any cable termination process, ensure the main power supply is deactivated to eliminate any active power flow. Additionally, make sure that the PF2 is completely disconnected from the quick connect cable before terminating any wiring.
2. **Complete Termination:** Do not connect the device to any wiring until all cables are fully terminated. Ensure that all necessary connections and terminations are in place before plugging in the device or restoring power.
3. **Unused Wires:** If there are any unused wires in the cable, they must be properly terminated or floated with the wire ends protected. Neglecting to terminate unused wires or leaving them exposed may result in accidental contact with other wiring or components, leading to potential damage.
4. **Protection and Insulation:** Take precautions to safeguard the exposed wire ends of any unused wires or during the termination process. Protect the ends by using appropriate insulation materials, such as insulating caps or tape, to prevent unintended contact.
5. **Verification of Voltage:** Once all cables are correctly terminated, energize the power supply to verify that 24VDC (24 volts of direct current) is present at the appropriate terminals. Use appropriate testing equipment and follow safety procedures while measuring voltage to prevent accidents or damage.
6. **Professional Assistance:** If you are uncertain about the proper cable termination procedures, it is strongly recommended to seek assistance from a qualified professional or consult the device's user manual. Improper wiring can lead to device malfunction or damage.

Remember, it is crucial to prioritize safety and precision during the cable termination process to prevent any potential hazards or device malfunctions. Following these guidelines will help maintain the integrity of your device and ensure compliance with the warranty terms.

If you have any further questions or concerns, please reach out to our customer support for assistance.

INFORMATION FOR NON-HAZARDOUS LOCATIONS

TABLE 1: CONNECTOR WIRING

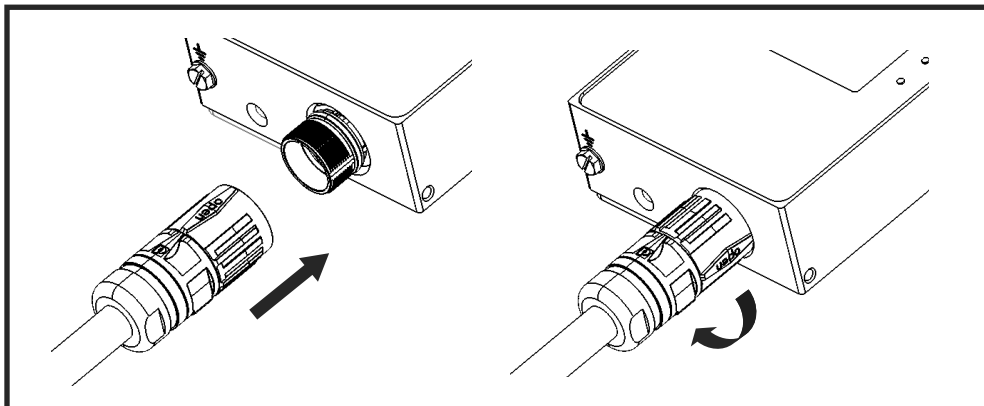
WIRE	CONNECTION	NON-HAZARDOUS LOCATION LIMITS
No.1	Alarm Output 1	100 VDC, 125 VAC (100mA MAX.)
No.2	Alarm Output 2	100 VDC, 125 VAC, (100mA MAX.)
No.3	24 VDC Input +	9 VDC - 28 VDC
No.4	24 VDC Input -	9 VDC - 28 VDC
No.5	Pulsed Input 1	Any Dry Contact Closure
No.6	Pulsed Input 2	Any Dry Contact Closure
No.7	Modbus +	5 V, 3.3 V Compatible
No.8	Modbus -	5 V, 3.3 V Compatible
No.9	Modbus Ground	N/A
No.10	Warning / Pulsed Output 1	100 VDC, 125 VAC, (100mA MAX.)
No.11	Warning / Pulsed Output 2	100 VDC, 125 VAC, (100mA MAX.)
No.12	Ground	N/A

NOTE: WARNING / PULSED OUTPUT wiring is utilized by two functions, but only one function can be active at a time.

CABLE CONNECTION

WARNING: Incorrect wiring can cause damage to internal circuitry and may void the warranty. Keep power turned off while connecting and disconnecting the cable from the Proflo PF2.

- On the male connector, ensure the “OPEN” text on the lock nut is in line with the arrow.
- Align the slot inside the PF2 female connector with key on the male connector, then push the two connectors together.
- Turn the locknut clockwise 1/4 turn to lock the cable in position. See diagram below.



BARRIER INFORMATION FOR HAZARDOUS LOCATIONS

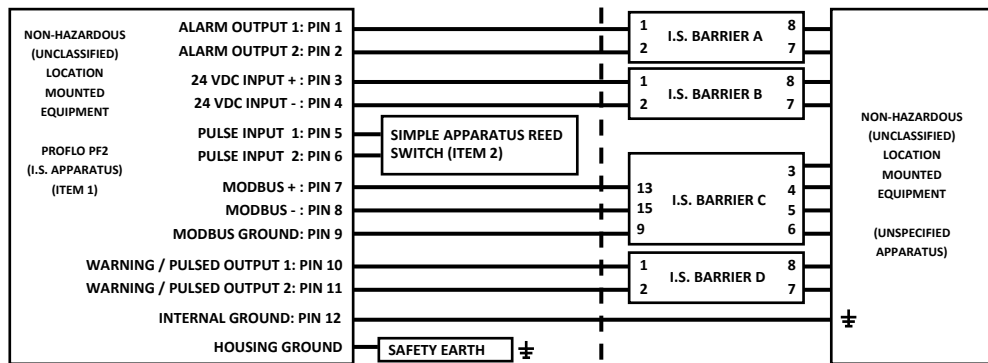


TABLE 2 ENTITY PARAMETERS

ITEM	CONNECTION	Uo	Io	Co	Lo	Po	Ui	Ii	Ci	Li	Pi
A	ALARM OUTPUT	-	-	-	-	-	28 V	50 mA	0 uF	47.93 mH	320 mW
B	24 V POWER INPUT	-	-	-	-	-	28 V	100 mA	0 uF	18 uH	750 mW
C	MODBUS RS-422	-	-	-	-	-	5.88 V	277 mA	0 uF	0 uH	408 mW
D	PULSED OUTPUT	-	-	-	-	-	28 V	50 mA	0 uF	47.93 mH	320 mW
E	PULSED INPUT	5.88 V	120 uA	43 uF	1 mH	175 uW	-	-	-	-	-

TABLE 3: ITEM A&D (REFER TO TABLE 1) CABLE PARAMETERS

CAPACITANCE	Co: 83 nF	Ci: 45.1 nF	Cc <= 37.9 nF
INDUCTANCE	Lo: 1000 uH	Li: 0 uH	Lc <= 14 mH
L/R RATIO	Lo/Ro: 4.39 uH/ohm	-	Lc/Rc <= 4.39 uH/ohm
EARTHING	Isolated	Isolated	Isolated

TABLE 4: ITEM C (REFER TO TABLE 1) CABLE PARAMETERS

CAPACITANCE	Co: 43 uF	Ci: 0 uF	Cc <= 43 uF
INDUCTANCE	Lo: 279 uH	Li: 0 uH	Lc <= 279 uH
L/R RATIO	Lo/Ro: 305.4 uH/ohm	-	Lc/Rc <= 305.4 uH/ohm
EARTHING	Isolated	Isolated	Isolated

THEORY OF OPERATION

A Divider Block assembly distributes lubricant to different areas of a large machine (compressor). The Proflo® PF2 is mounted on a magnet assembly which is mated to a single element of the Divider Block assembly. A moving piston within the divider block element moves the magnet within the magnet assembly. The rate of movement is a measure of the amount of lubricant being delivered for a given size of Divider Block assembly.

A sensor within the PF2 detects this magnet movement, counts the number of cycles, and measures the time between cycles. These cycle times, along with the size of the divider block assembly, are used to calculate the amount of lubricant being distributed by the Divider Block assembly. The PF2 Home Screen displays these cycle times, in seconds, which are typically utilized by the user to set and monitor their lubrication rates.

Alternately, the Proflo® PF2 can utilize the input of a separate cycle switch (such as the Proflo® Cycle Switch) mounted to the magnet assembly on the Divider Block, instead of its internal sensor, via the Pulsed In feature.

If the cycles stop for a programmed period of time, the device enters Alarm mode and an Alarm Output relay is activated to alert the user of a lubrication malfunction.

If enabled, a second output relay (known as the Pulsed or 'Prox' Output), generates a 250 ms pulse for each cycle and can be used by external systems to count cycles. Alternately the second output relay can be configured as a Warning Output to preemptively warn the user of an impending Alarm.

The on-board LCD display along with the pushbuttons and LEDs allow a user to view relevant operational information, and to configure the product. The serial Modbus interface can also be used to connect to an external system for monitoring and control.

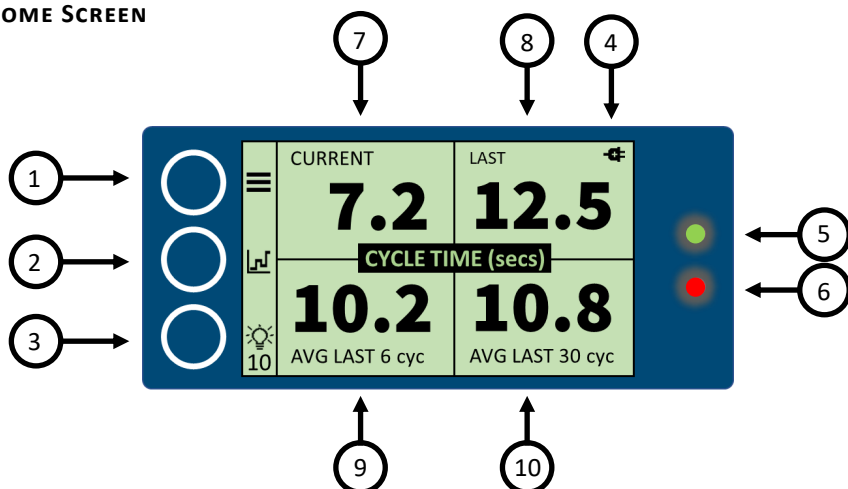
An onboard wireless radio and antenna enables data collection from the device and future firmware updates via a mobile application.

OPERATING INSTRUCTIONS






UNIT IS SHIPPED IN SLEEP MODE, HOLD ANY BUTTON FOR 5 SEC. TO WAKE THE UNIT.

NOTE: Screens may differ from latest software update

HOME SCREEN

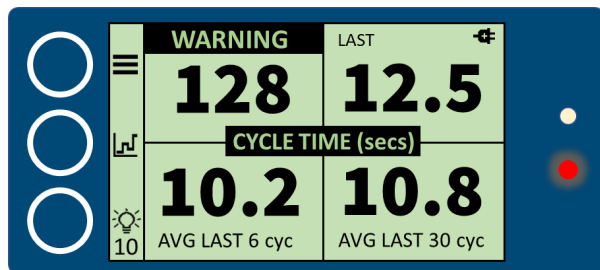


Press any button to activate screen

Item	Symbol	Name	Description
1		Menu	Enters the Menu
2		Trend	Shows cycle time trend
3		Backlight	Enables & toggles backlight time presets **
4		Power	DC power supply indicated
			Battery power indicated
5	NA	Green LED	Status Indicating Light
6	NA	Red LED	Status Indicating Light
7	NA	Current	Current cycle time
8	NA	Last	Previous cycle time
9	NA	Avg 6	Average cycle time of the last 6 cycles
10	NA	Avg 30	Average cycle time of the last 30 cycles

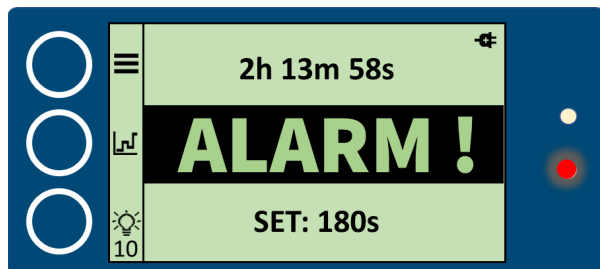
**** Battery powered unit toggles between 0 - 5 min., DC powered unit toggles between 0 - 60 min.**

HOME SCREEN (CONTINUED)



RED LED SINGLE BLINK =
WARNING ACTIVE

IF enabled, the "WARNING" message appears in the upper left corner when the cycle time slows down below the desired **WARNING SET** time.



RED LED DOUBLE BLINK =
ALARM ACTIVE

"ALARM" message flashes on the screen when the cycle time slows down beyond the programmed **ALARM SET** (shutdown) time.

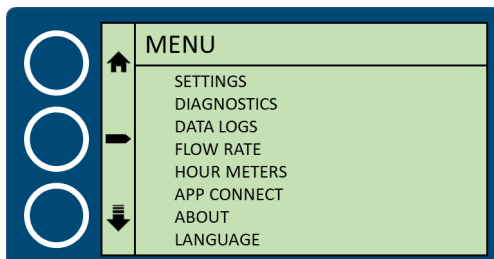
MENU OPTIONS

To access **Menu**:

Press **Menu** button on the Home Screen to enter menu options.

Use **Down** button to scroll through the menu.

Use **Select** button to select an option.



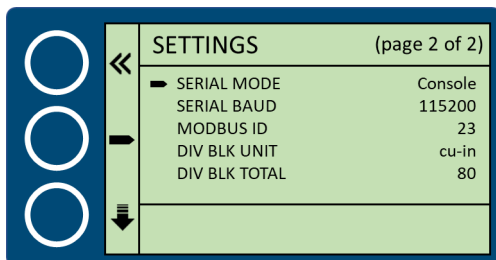
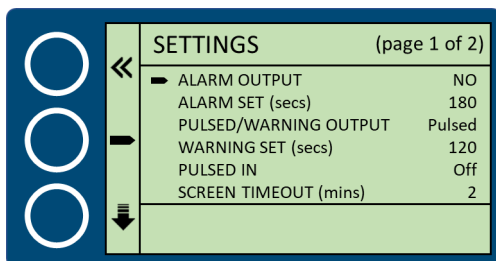
SETTINGS

The **SETTINGS** screen displays the list of settings and the current state for each on the right hand side of the screen.

To access **Settings**:

- Press **Menu** button on the home screen to enter menu Items.
- Use **Down** button to scroll down the list of **SETTINGS**.
- Press **Select** to enter the submenu and change the settings.

NOTE: The settings page consists of 2 pages.



SELECTION SYMBOLS



Back



Down



Up



Select

CHANGE AND SAVE SETTINGS

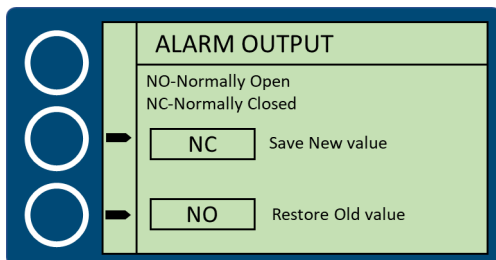
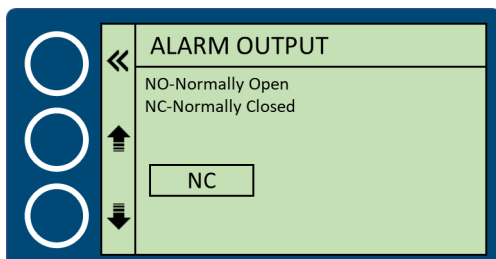
To change and save settings in the device:

- Use **Up** or **Down** buttons to change the value.
- Press the **Back** button when value is changed.

Next screen will prompt to "Save New value" or "Restore Old value".

- Press **Select** button next to the desired option.

NOTE: The procedure to select, change or save settings will follow the same steps for other settings.



ALARM OUTPUT (NORMALLY OPEN/NORMALLY CLOSED)

ALARM OUTPUT setting allows users to change the alarm and warning relay contacts to *Normally Open (NO)* or *Normally Closed (NC)* based on their preferred method of operation. Normally Open or Normally Closed refers to the contact state when the device is running during normal operation. This setting is reflected in the DIAGNOSTICS screen.

Normally Open - Is a contact that does **not** flow current in its normal state. Energizing it will close the contact, allowing current to flow.

Normally Closed - Is a contact that flows current in its normal state. Energizing it will open the contact, not allowing current to flow.

NOTE: Changing this setting will apply equally to the ALARM OUTPUT and WARNING/PULSED OUTPUT relay, if enabled.

ALARM SET

ALARM SET (secs) allows users to select the maximum cycle time before activating the alarm relay (shutdown).

PULSED/WARNING OUTPUT

The **PULSED OUTPUT** and the **WARNING OUTPUT** use the same relay, which only allows the use of one function to be active at a time. **PULSED/WARNING OUTPUT** allows users to select the use of this function. This setting is reflected in the DIAGNOSTICS screen.

Warning - activates the use of the **WARNING OUTPUT**. When enabled, the option to set the **WARNING SET (secs)** time becomes active.

Pulsed - activates the use of the **PULSED OUTPUT**. When enabled, the option to set the **WARNING SET (secs)** item becomes inactive.

Off - deactivates the use of both functions.

WARNING SET

WARNING SET (secs) allows users to select the maximum cycle time before activating the warning relay.

NOTE: The WARNING SET maximum value time is limited to 5 sec less than the current ALARM SET time. If ALARM SET = 5 then WARNING SET can only = 0.

PULSED IN

PULSED IN allows the user to select an internal or external device to determine the cycle time. This is an alternate way to detect cycles. A remotely mounted switch (Cycle Switch) on a magnet assembly can be wired into the product and used in lieu of the internal sensor. This setting is reflected in the DIAGNOSTICS screen.

Off - Will use the Internal Magnet Assembly.

On - Will use an external cycle switch, such as the proflo® Cycle Switch. When **PULSED IN** is **On**, the signal from the internal magnet assembly is ignored.

NOTE: The device will stay in **ALARM** mode if **PULSED IN** setting is not turned **On** when wired to an external cycle switch.

SCREEN TIMEOUT

SCREEN TIMEOUT (mins) allows the user to control the duration of time the screen stays on. The **SCREEN TIMEOUT** timer restarts after each button press.

NOTE: A shorter time duration will extend battery life. For a longer time duration, a 24VDC power supply is recommended.

SERIAL MODE

NOTE: Serial Mode available on 24VDC power supply only.

SERIAL MODE allows the user to select which type of serial connection can be used to communicate with the PF2 device.

Off - No connection will be made to the device.

Modbus - Allows the user to communicate with the device via a Modbus (RS485) connection, which requires an external device be connected via the provided wiring (see TABLE 1).

Console - Console mode is reserved for CPI factory use only.

SERIAL BAUD

SERIAL BAUD allows the user to select the serial communication speed. The selectable Baud Rates are 9600, 19200, 38400, & 115200 bps.

MODBUS ID

MODBUS ID allows the user to assign each device a unique ID when communicating with a single or multiple devices via Modbus. MODBUS ID's can be assigned from 1 to 253 associated with the device when running additional devices for easy identification.

NOTE: When communicating with multiple devices through a single serial connection. A unique ID must be assigned to each device to avoid communication errors.

DIVIDER BLOCK UNITS

DIV BLK UNITS allows the user to change units from Cubic Inches to Cubic Centimeter.

WARNING: This setting directly impacts the FLOW RATE data. Improper setting may lead to under or over lubrication.

DIVIDER BLOCK TOTAL

The divider block total is the sum of the divider block element sizes for the divider block that the Proflo® PF2 is monitoring. The divider block total can be set from 6-600 in increments of 1. The calculations are based on CPI HP+ or XD+ product lines.

Example: A three element divider block has the following elements: 30T, 15S and 12T. The DB total should be set to 57 (30+15+12=57).

WARNING: This setting directly impacts the FLOW RATE data. Improper setting may lead to under or over lubrication.

DIAGNOSTICS

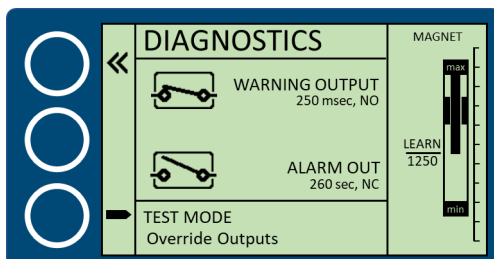
DIAGNOSTICS displays the current status of the output relays & their settings and the input signal.

TOP RELAY:

- Displays relay settings and status for *either* the WARNING OUTPUT or PULSED OUTPUT, if enabled. Otherwise, the display shows OUTPUT DISABLED. Refer to WARNING/PULSED OUTPUT setting to change the displayed relay status.

BOTTOM RELAY:

- Displays relay settings and status for the ALARM OUTPUT. Refer to ALARM OUTPUT setting to change the displayed relay status.



DIAGNOSTICS (CONTINUED)

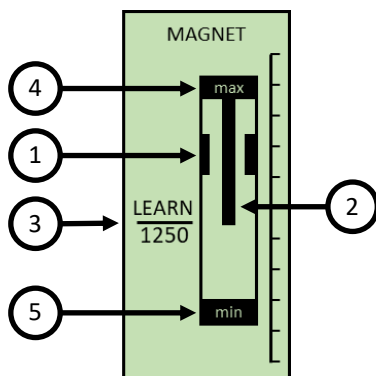
MAGNET / PULSED INPUT:

When the **PULSED IN** setting is set to 'OFF' the Diagnostics screen shows magnet position information. Upon power up, or after an ALARM event, the PF2 enters **LEARN** mode. In **LEARN** mode, the PF2 will monitor the stroke of the divider block element / magnet assembly for several cycles. During this time, the word **LEARN** is displayed above the magnet position reading. During each stroke of the magnet assembly, the real-time position is illustrated within the Min/Max bar graph. After learning the stroke, a hysteresis band is set to the middle of the range. To be considered a valid stroke, the magnet must pass through the entire hysteresis band, from MIN to MAX, in order to be counted.

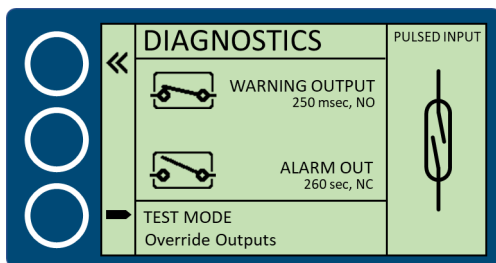
This feature prevents inadvertent shutdown due to variations in piston travel within different divider block elements.

When **PULSED IN setting** is set to 'ON' the Diagnostics screen shows the switch status of the wired input provided by the user. Refer to Table 1: CONNECTOR WIRING for wiring details.

NOTE: When **PULSED IN** is set to 'ON' the PF2 will ignore the Internal Magnet Assy input.



Item	Description
1	Hysteresis Band
2	Piston / Magnet Stroke
3	Magnet Position Reading
4	Max. Stroke Position
5	Min. Stroke Position



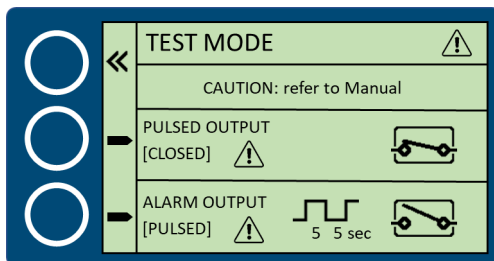
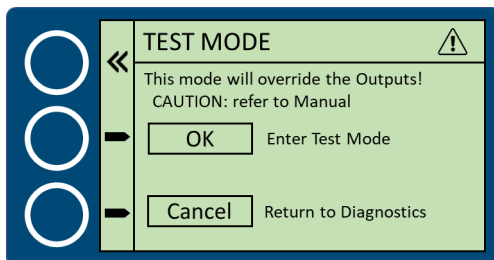
TEST MODE

TEST MODE allows the user to test the functionality of the relay switches.

WARNING: Entering **TEST MODE** and subsequently changing output states while the compressor is running may result in inadvertent shutdown or an alarm.

To make changes in the Test Mode:

- Use **Select** button for **WARNING OUTPUT/ PULSED OUTPUT/DISABLED** to toggle the relay between **RUN, OPEN, CLOSED, PULSED**.
- Use **Select** button for **ALARM OUT** to toggle the relay between **RUN, OPEN, CLOSED, PULSED**.



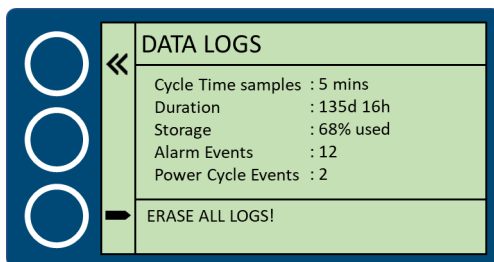
[RUN]	Normal Operation	Follows existing parameters.
[CLOSED]	Forced CLOSED	Simulates relay in closed state.
[OPEN]	Forced OPEN	Simulates relay in open state.
[PULSED]	Forced 10 sec. relay cycle	Simulates a continuous 5-sec. open, 5-sec. close cycle.

DATA LOGS

DATA LOGS shows:

- Cycle Time Samples: Increment of time that data is written/recorded.
- Duration: Total time data has been recorded.
- Storage: % of storage capacity used.
- Alarm Events: number of Alarms that occurred.
- Power Cycle Events: number of times the unit has been powered off/on.

Collected data can be erased if needed by selecting **ERASE ALL LOGS!**



NOTE: When storage percentage approaches 99%, logs will continue to overwrite previously recorded data.

FLOW RATE

FLOW RATE screen shows Pints and Liters per hour / day with average cycle time and volume on the divider block.

This data is a function of the **DIV BLK UNIT & DIV BLK TOTAL** settings and the measured cycle times.

DIV BLK TOTAL is displayed in the selected Units.

FLOW RATE			ALARM
	/hr	/day	
PINTS	1.36	32.84	
LITERS	0.64	15.54	
Avg 30 cycles	8.2	(secs)	
Div Blk Unit	cu-in.		
Div Blk Total	90		

HOURL METERS

HOURL METERS displays:

- Cycle Count: the lifetime cycle count.
- Cycling: the lifetime hours the device has been cycling.
- Battery Cycling: how many hours the battery has cycled so far. This can be used to determine approximate battery life.

When new battery is installed, the battery cycling meter can be reset.

HOUR METERS		
Cycle Count	:	237832
Cycling	:	3210h
Battery Cycling*	:	654h
* RESET Battery Cycling Meter Reset when Battery is replaced		

APP CONNECT

The **APP CONNECT** function allows the user to connect to a mobile device application in order to update the device firmware and download device data.

LANGUAGE

This function enables the user to change the displayed language.

ABOUT (AND RESET)

The **ABOUT** screen displays information about the Unit, such as Model, Customer ID, MAC ID, and Software Revision. The Customer ID can be changed through Modbus communications terminals.

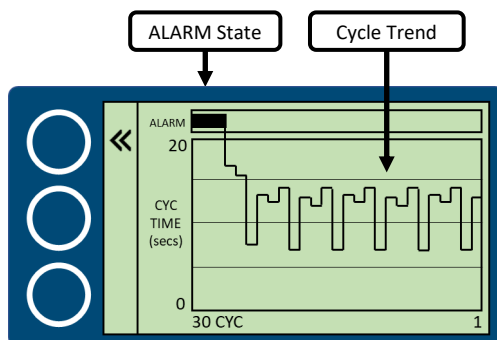
The **RESET** function will prompt user with two choices, **Power** and **Settings**. **Power** option will only power cycle the device. **Settings** option will reset the device to factory settings and power cycle the device as well. Back button can be used to cancel.

ABOUT ProFlo2		
Model	:	PF2
Cust ID	:	Compr 3, Pump 1, DivBlk 2
MAC ID	:	00:11:22:33:FF:EE
SW Rev	:	20230305-1916
RESET		
Power, Factory Settings		

TREND

The **TREND** screen reflects live cycle time pattern in 30 cycle increments. Cycle time patterns help diagnose fluctuations in lubrication.

ALARM message flashes in the top right corner when the cycle time exceeds the **ALARM SET** time and is represented as a single cycle in the chart.



Trend Graph

EXAMPLE:

A lubrication system with a target cycle time of 11 seconds for the desired flow rate.

Twelve consecutive cycle times measured (in seconds): 13, 12, 14, 6, 13, 11, 14, 5, 13, 12, 14, 6.

Setting flow rate by using only the **CURRENT** cycle time on the Home Screen could result in values as high as 14 seconds or as low as 5 seconds.

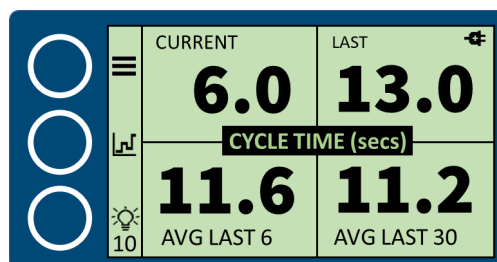
Setting flow rate by only the average of **CURRENT** and **LAST** cycles on the Home Screen could result in 14 second average or 10 second average.

Using **AVG LAST 6** will result in average cycle time of 11.6 seconds.

Using **AVG LAST 30** will result in average cycle time of 11.2 seconds.

Rounding to the nearest second shows that this system requires a minimum of 4 consecutive measurements to get accurate results. Home Screen shows average of 6 cycles and average of 30 cycles which allows the user to get more accurate flow rate average that correlates with the **TREND** chart.

WARNING: Adjusting the system using **CURRENT** and / or **LAST** readings only may result in incorrect system flow rates and likely further adjustments that never appear consistent. This leads users to believe the overall system isn't working correctly.



Home Screen

POWER SOURCE INTERRUPTIONS

PF2 Power Source Interruptions			
Item	Current Power Source(s)	Action	Result
1	No Power Source	Connect Battery	Unit powers on in RUN mode. LEDs Active. Cycle Times are blank and cycle counting starts.
2	No Power Source	Connect 24 VDC	Unit powers on in RUN mode. LEDs Active. Cycle Times are blank and cycle counting starts.
3	Battery	Remove Battery or Dead Battery	Unit powers off. LEDs Inactive. No change in relay states.
4	Battery	Connect 24 VDC	Unit switches to 24 VDC. LEDs remain Active. No changes to relay states or cycle counts.
5	24 VDC	Remove 24 VDC	Unit powers off. LEDs Inactive. No change in relay states.
6	24 VDC	Connect Battery	Unit remains on 24 VDC. LEDs remain Active. No changes to relay states or cycle counts.
7	Battery & 24 VDC	Remove Battery or Dead Battery	Unit remains on 24 VDC. LEDs remain Active. No changes to relay states or cycle counts.
8	Battery & 24 VDC	Remove 24 VDC	Unit power cycles and switches to battery power. Unit powers on in RUN mode. LEDs reactivate. Cycle Times are reset and cycle counting restarts.

MODBUS INPUT REGISTRY

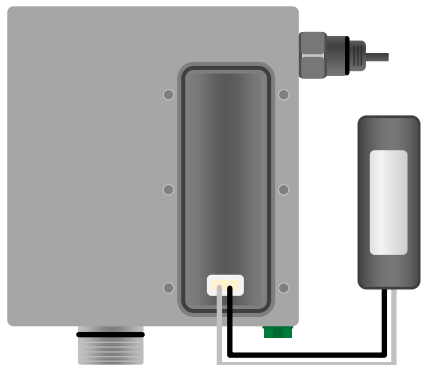
For more information, see the Modbus Application Protocol Specification V1.1b3 at <http://www.modbus.org/>

Input Registers (RO)	Description	Modbus Name	Modbus Range
40001	Current cycle	CT_current_s	0 - 300
40002	Last cycle	CT_last_s_x10	0 - 3000
40003	Average of last 6 cycles	CT_6cyc_s_x10	0 - 3000
40004	Average of last 30 cycles	CT_30cyc_s_x10	0 - 3000
40005	Switching input from external cycle switch	PulseEvent	
40006	Warning state	WarningState	0 - No alarm 1 - In alarm
40007	Alarm state	AlarmState	0 - No alarm 1 - In alarm
40008	Counter appears after alarm is activated	AlarmDuration_s	
40009			
40010	Flow pints / hr	Flow_PintsHr_x100	
40011	Flow pints / day	Flow_PintsDay_x100	
40012	Flow liters / hr	Flow_LitersHr_x100	
40013	Flow liters / day	Flow_LitersDay_x100	
40014	Data logs statistics	Logs_NumEntries	
40015	% of storage used on memory card	Logs_PercentUsed	0 - 100
40016	Data logs statistics	Logs_Duration_s	
40017			
40018	Hardware revision	HWRevision	
40019	Software revision year	FWRevisionDate_yyyy	yyyy
40020	Software revision month and day	FWRevisionDate_mmdd	mmdd
40021	Device on or off	PowerStatus	0 - Off 1 - On
40022	Cycle count	RunTime_CycleCount	
40023	Cycling	RunTime_Cyc_s	
40024	Total time running on battery	RunTime_BAT_s	
40025	Total time running on 24V	RunTime_24V_s	
40026	Battery cycling	RunTime_BAT_Cyc_s	

MODBUS HOLDING REGISTRY

Holding Registers (R/W)	Description	Modbus Name	Modbus Range
30001	Value threshold for triggering alarm	AlarmTime_s	5 - 300
30002	State of relay 1 contact	AlarmOutput	0 = Normally Open (NO) 1 = Normally Closed (NC)
30003	Use of relay 2 contact	Pulsed_Warning_Output	0 = Off 1 = Pulsed 2 = Warning
30004	Alarm set (secs)	AlarmWarningTime_s	10 - 300
30005	Option to use internal magnetic assembly or external cycle switch	PulsedIn	0 - Off - Use internal magnet assembly 1 - On - Use external cycle switch
30006	Communication type	SerialMode	0 = Off 1 = Serial Mode 2 = Console Mode
30007	Baud rate speed	SerialBaud	0 = 9600 1 = 19200 2 = 115200
30008	PF2 device ID for Modbus communication	ModbusID	1 - 253
30009	Divider block units	DivBlkUnits	0 = cu-in 1 = cu-cm
30010	Divider block total volume	DivBlkTotal	6 - 600
30011	Sample rate for data logging	LogSampRate_s	-

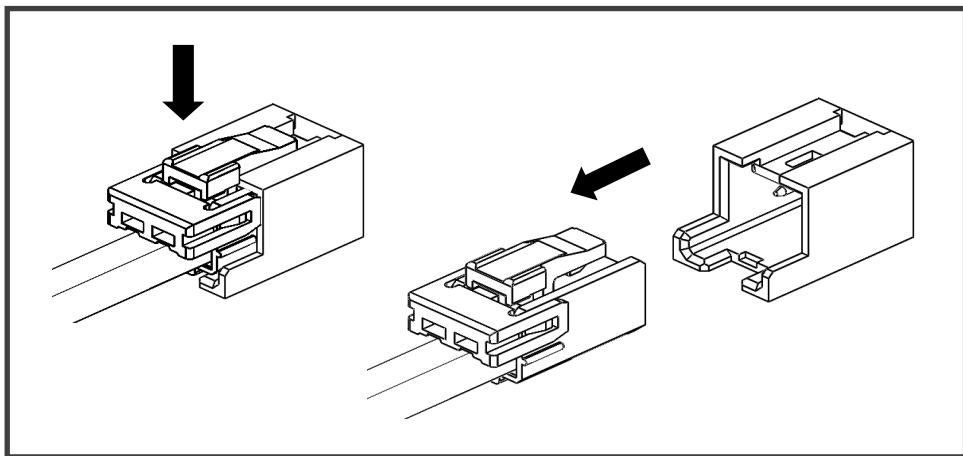
BATTERY REPLACEMENT



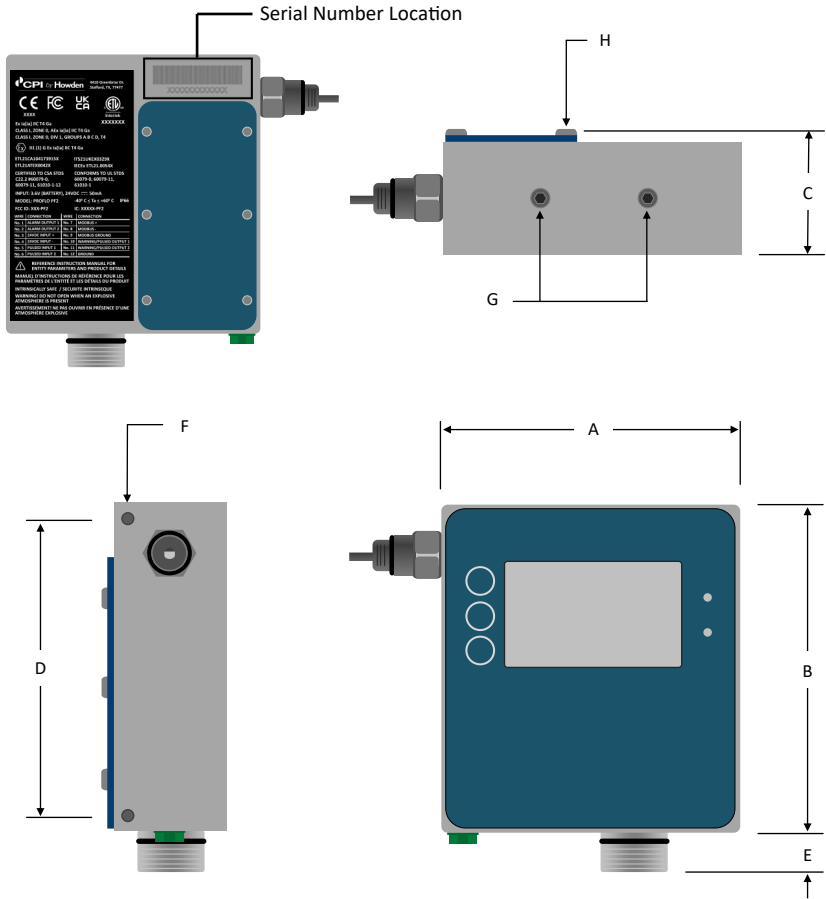
Installation and replacement of the Proflo PF2 battery is intended to be done only when an explosive atmosphere is not present.

- Use T-10 Torx wrench to loosen and remove (6) screws with the battery cover.
- Remove the battery from the housing and disconnect it from the connector.
- Connect new battery to the connector and place it into the housing.
- Ensure cover gasket is in place.
- Reinstall the battery cover and tighten (6) screws with the T-10 Torx wrench.

Note: Only use CPI battery P/N 650140000095964



PRODUCT DIMENSIONS



Dimension	Inches (in.)	Millimeters (mm)
A	3.9	100
B	4.3	110
C	1.7	43
D	3.9	100
E	0.6	15

Dimension	Size
F	10-32 UNF
G	1/4-28 UNF
H	6-32 UNC

PRODUCT LABEL



4410 Greenbriar Dr.
Stafford, TX, 77477


2903


0359


0359


Intertek
5026847

Ex ia[ia] IIC T4 Ga

CLASS I, ZONE 0, AEx ia[ia] IIC T4 Ga

CLASS I, DIV 1, GROUPS A B C D, T4

 II1 (1) G Ex ia[ia] IIC T4 Ga

ETL21CA104173915X

ITS21UKEX0329X

ETL21ATEX0042X

IECEx ETL21.0054X

CERTIFIED TO CSA STDS

CONFORMS TO UL STDS

C22.2 #60079-0,

60079-0, 60079-11,

60079-11, 61010-1-12

61010-1

INPUT: 3.6V (BATTERY), 24VDC $\overline{\text{---}}$ 50mA

MODEL: PF2 -40° C ≤ Ta ≤ +60° C IP66

FCC ID: 2AZVT-PF2 IC: 30305-PF2

WIRE	CONNECTION	WIRE	CONNECTION
No. 1	ALARM OUTPUT 1	No. 7	MODBUS +
No. 2	ALARM OUTPUT 2	No. 8	MODBUS -
No. 3	24VDC INPUT +	No. 9	MODBUS GROUND
No. 4	24VDC INPUT -	No. 10	WARNING/PULSED OUTPUT 1
No. 5	PULSED INPUT 1	No. 11	WARNING/PULSED OUTPUT 2
No. 6	PULSED INPUT 2	No. 12	GROUND



REFERENCE INSTRUCTION MANUAL FOR
ENTITY PARAMETERS AND PRODUCT DETAILS

MANUEL D'INSTRUCTIONS DE RÉFÉRENCE POUR LES
PARAMÈTRES DE L'ENTITÉ ET LES DÉTAILS DU
PRODUIT

INTRINSICALLY SAFE / SECURITE INTRINSEQUE

WARNING! DO NOT OPEN WHEN AN EXPLOSIVE
ATMOSPHERE IS PRESENT

AVERTISSEMENT! NE PAS OUVRIR EN PRÉSENCE
D'UNE ATMOSPHERE EXPLOSIVE

TROUBLESHOOTING

Problem	Possible Causes	Correction
Divider block locked up	Wrong magnet assembly Installed	Make sure proper magnet housing is used for divider block manufacturer.
No display	Screen timeout (on battery power only)	Press any button. Adjust screen timeout setting to increase display-on time as needed.
	Low battery	Replace battery.
	No 24V power	Check power supply/wiring.
	Defective screen	Contact manufacturer.
Unexpected alarm or warning Output	Wrong ALARM OUTPUT setting	Change ALARM OUTPUT setting, set to NO or NC as needed .
	ALARM SET or WARNING SET time too low	Adjust ALARM SET or WARNING SET times as necessary.
Divider block cycles not detected	Wrong PULSED IN setting	Change Pulsed In setting: OFF—Internal Magnet Assy ON—External Cycle Switch
	Broken magnet assembly	Replace magnet assembly.
	Cycle switch wiring/faulty (when used with external cycle switch)	Check cycle switch wiring or replace switch.
Flow rates too high or too low	Wrong DIV BLK UNIT or DIV BLK TOTAL setting	Check DIV BLK UNIT & DIV BLK TOTAL settings to match Divider Block units and sizes.
	Pump output too high or too low	Adjust pump output regulator(s) or as needed to increase or decrease output.
Average cycle time too high or too low	Pump output too high or too low	Adjust pump output regulator(s) as needed to increase or decrease output.
No response from buttons or LEDs not flashing	Low battery	Replace battery.
	No 24V power	Check power supply/wiring.
	Device malfunction	Disconnect & reconnect power supply.
		Contact manufacturer.

WARRANTY

In the event that defects appear in the Goods under proper use, CPI will repair or replace, at CPI's option and cost (excluding removal and/or reinstallation costs if so necessary) within the warranty period set forth: Unless otherwise expressly agreed, whichever period expires earlier: (i) twelve (12) months from first operation of any such Goods; or (ii) eighteen (18) months from CPI's notification of Goods readiness.

CPI's warranty shall exclude liability for defects arising from: (i) installation, commissioning and/or operation, not in accordance with manual or good industry practice; (ii) use of unapproved spares, unauthorized modification or alteration of the Goods; (iii) normal wear and tear; (iv) the failure of Buyer and/or the end-user to provide adequate storage; or (v) use of the equipment otherwise than in accordance with the agreed operational parameters (including composition, pressure and temperature of the feed gas). No part shall be deemed defective by reason of its failure to resist fouling and the action of erosive or corrosive gases. Any warranty repair or replacement of Goods or re-performance of Services shall be warranted by CPI for the remainder of the original warranty period.

This Device is not field repairable. For replacement, visit www.CPIcompression.com or contact your local representative :

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