



INNOVATIVE SOLAR INC. IS-1720

Intrinsically Safe Emergency Shut Down System

SPECIFICATIONS:

IS-1720-S (Solenoid) IS-1720-R (Relay)

Intrinsically safe, CSA Approved, Suitable for use in Hazardous locations, rated IS, Exia Group IIB or Class 1, Div 1 & 2, Groups C&D.

-40 TO +60 degrees Celsius

5-95% relative Humidity No- Condensing

RS485 communication protocol

6 vdc, 12ah, absorbed glass matt, Internally Current limited, fuse protected, Battery Pack ** USE ONLY
PN: 8310-001** FOR REPLACEMENT

J3 & j5 wiring terminals for # 10 to # 18 awg

7 input channels

2 channels 6&7 selectable option to time delay programable for liquid dump tuning, led dc lighting timer etc.

10 lbs

ENCLOSURE:

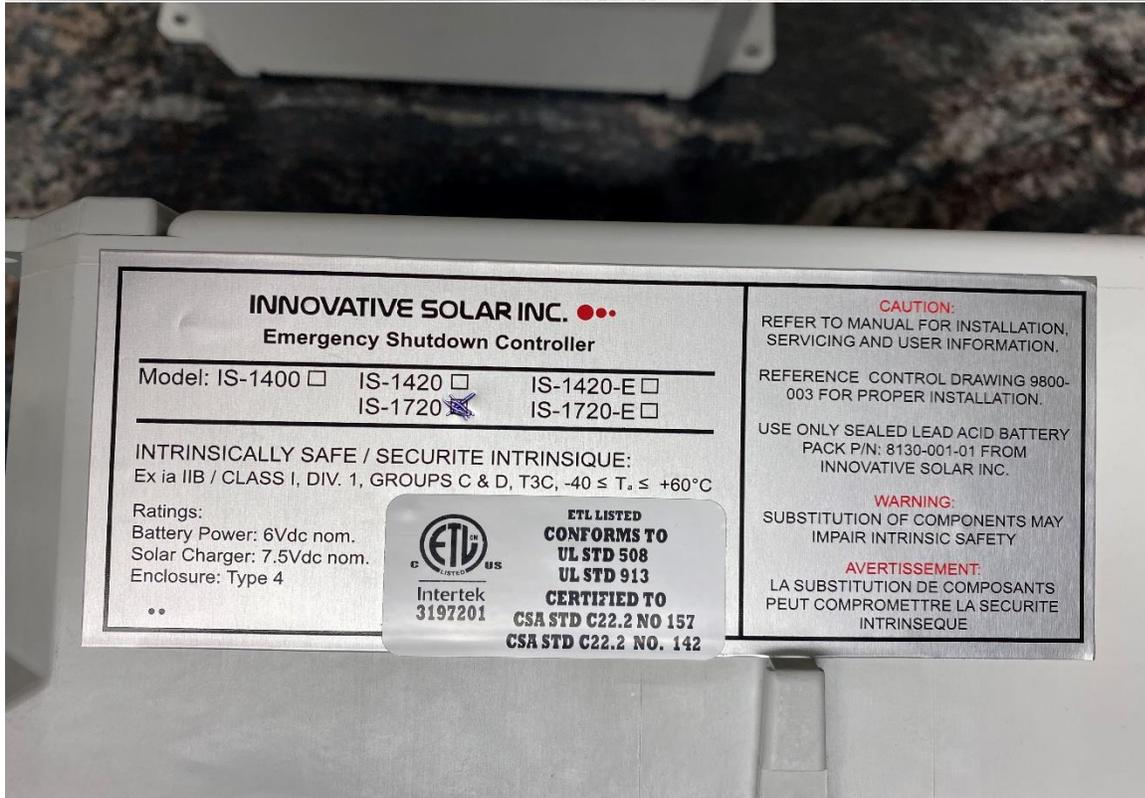
10.05" x 8.27" x 4.13" Fiberglass reinforced polycarbonate, captive oil resistant gasket, cover fastened with stainless steel machine screw with brass insert. Integrated mounting feet. CSA, Type4

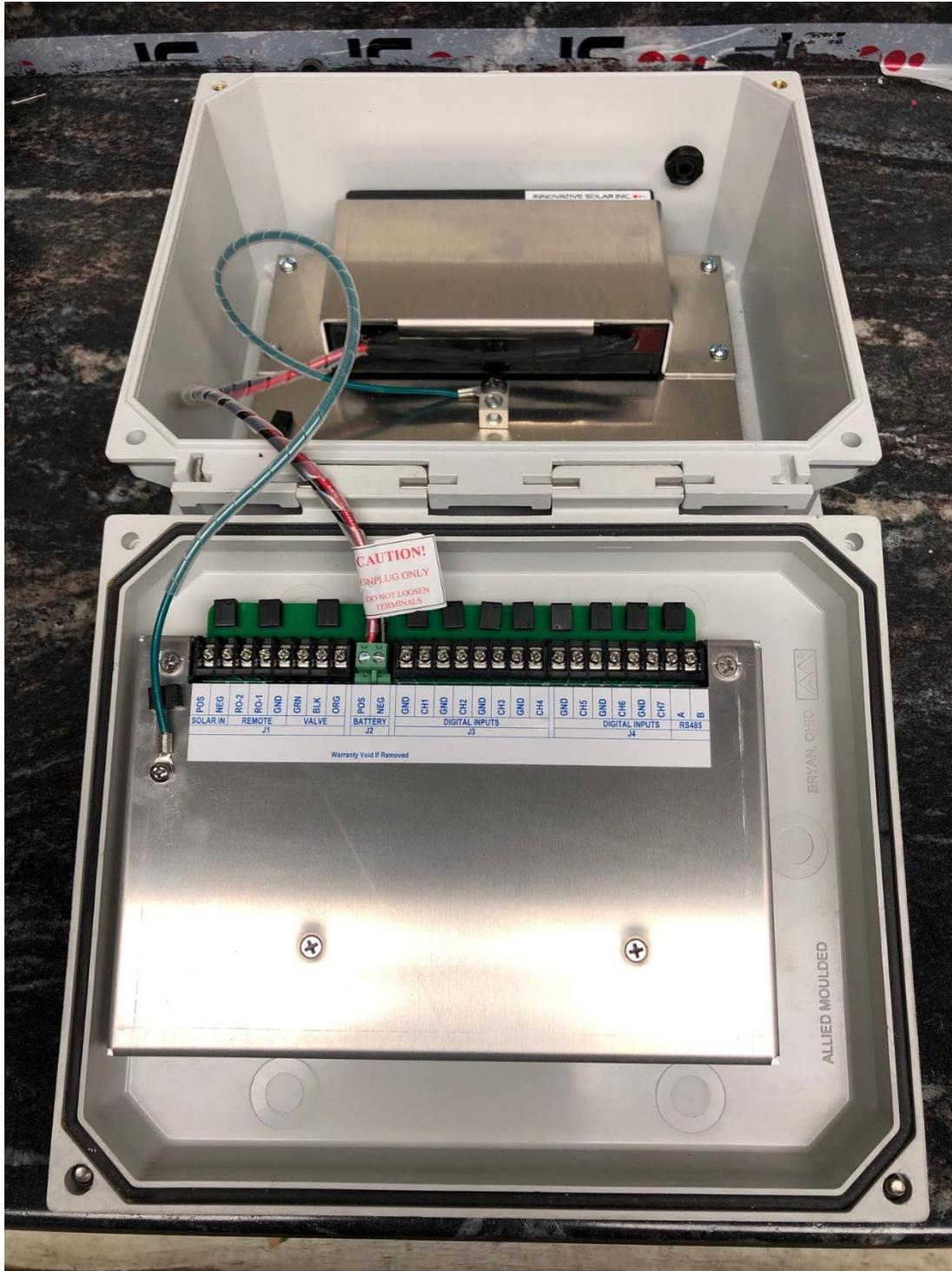
SYSTEM DISCRIPTION:

The IS-1720 is an Intrinsically Safe, battery-operated Emergency Shut Down Controller, for use on an Oil and or Gas well Separator, as well as for other hazardous location controls.

The extremely low power consumption allows for the guarantee of uninterrupted operation for 6 months without a charge via solar or other, with real world tests on the 1400 model exceeding 2 years of charge free operation in Central Alberta.

**Innovative Solar recommends changing out the battery packs every 2 years.





THEORY OF OPERATION:

Example: when a hi level switch on a 100-barrel tank is tripped, and the normally closed (channels 1-7) circuit from the IS-1720 is broken, the corresponding channel 1, or CH1 green led indicator on the control panel turns orange and starts flashing. After 3 seconds of flashing, (indicating that this is an actual hi level and not just liquid splashing) the led changes to red, and the controller “latches” into the

tripped ESD state. At this time, the controller signals the solenoid to open, which vents or releases the control gas, closing the spring loaded pneumatic ESD valve, and shutting in the well.

The operator arrives on site, goes inside the building and presses the "DISPLAY" button on the IS-1720. He sees two red led lights. RED- valve shutdown status, and RED-100-barrel tank hi level alarm. After ten seconds the led indicator lights on the controller turn off for power consumption. Pressing the DISPLAY button will illuminate all indicator led's once again.

At this time hitting the RESET button on the controller will not re-open the ESD valve. First the tank liquid level must be lowered letting the hi level float switch to return to normal. Now pressing the RESET button to clear the controller will open the ESD valve.

The control panel indicator led lights on the "VALVE" and CH1 "100-barrel Tank Hi Level" will now be green.

Tripping any one of the 7 input channels will latch in the controller, shut in the well and be indicated by a red led.

A battery low voltage will latch in the controller, shut in the well and be indicated by a red led.

INSTALATION:

Installation shall follow all hazardous location rules for Intrinsically Safe (IS.) wiring as per the Canadian Electrical Code. One of the benefits of the IS-1720, is that it may be installed inside of the Separator building as it is Class1 Div1 rated. Another benefit is that you do not need to use teck cable or stx sealing connectors, or threaded cover fittings when mounting to the controller or the end devices. "Mechanical protection", "shielded wires", and "drains" are your wiring concerns. ** SEE Canadian Electrical Code Follow and refer to control drawing #9800-003 for proper installation.

Mount the Controller on a wall in the separator building at approximately eye level. Do not mount on the wall next to the door latch, as the slamming of the door and the flexing movement of the 1 ½" foam panel wall is not good for the controller. Channels 1-7 are wired normally closed with a ** "shielded pair cable" from the control panel to a ** "simple apparatus" device such as a level switch. The shield is to go to the ground lug located under the battery pack, and to be taped off at the device end. As the input circuits are "fail safe" a jumper must be installed in the controller terminals, on any of the 7 unused channels. Install a single pair cable from terminals: Solar POS and Solar NEG to the supplied 6v, 5 watt class1 div2 solar panel that is to be mounted on the building facing south with the bracket provided and with no obstructions to sunlight during the whole day.

For “-S” versions, EXAMPLE. Controlling a pneumatic or hydraulic ESD valve Actuator. **mount the 6v-45psi Solenoid ** USE ONLY PN#3906-045** directly on the control panel box, matching the colored wires on the solenoid to the 3 corresponding “VALVE” terminals on the control panel. **An inline filter is recommended on the supply side of the 45psi solenoid in the event of contaminated fuel gas.

For “-R” versions, EXAMPLE. controlling a 12vdc or 24vdc remote solenoid, or generator shutdown relay etc. Install the class1 Div2 rated ISSR-2 relay / barrier PN# 9100-010 in a div2 location inside a junction box on the outside of the separator building. Install a shielded single pair cable between the Control panel and the ISSR-2 relay. Install the ISSR-2 relay so the cable to the controller is as short as possible. Less than 10 feet is preferred. A longer cable will have an affect on battery draw and battery life. Terminate the shielded pair in the controller to terminals RO-1 and GND under the label REMOTE, with the shield wire going to the ground lug located under the battery in the controller and taped off at the relay. Terminate the shielded pair to the ISSR-2 relay on TB1, terminals IN1 and NEG, with NEG and GND being common to each other. ****THE ISSR-2 RELAY IS POLARITY SENSITIVE AND WILL BE DAMAGED IF HOOKED UP INCORRECTLY ON THE INPUT SIDE AS WELL AS THE OUTPUT OR CONTROLLED SIDE. PAY CLOSE ATTENTION TO THE CONTROL DRAWING # 9800-007-01 ** note: the ISSR-2 Relay, because it is a barrier, can also be used when a non intrinsically safe device is needed to signal a controller input. EXAMPLE: Gas detection, motor status, etc.

For Liquid Dump programming / option channels 6 and 7

Use the programming sheet to enter the program mode on the controller. Enable channels 6 and 7. Connect single shielded pair wire from controller terminals CH6 and gnd, and from CH7 and gnd. Connect the other end of the cables to stage 1 and stage 2 electric level displacers. Connect another single pair from controller terminals RO-1 and gnd, to the ISSR-2 relay, on terminals IN1, and neg on terminal TB1. Do the same with RO-2 & gnd on the controller, and IN2 & NEG on the ISSR-2 Relay, TB1.

Run 24vdc + power from a separate source, to dump valve 1+, and from dump valve 1 - to the ISSR-2, TB2, OUT1 terminal. Run a negative wire from the ISSR-2, TB2, GND terminal to power source negative. Here we are switching the negatives on the dump valve actuators. Repeat for dump valve 2 using ISSR-2, OUT2 terminal. Cycle product through separator, and use time delay programming for separator dump tuning.

TIME DELAY: programmed switch coupled with ISSR-2 can also be used as a led light timer for an interior light or yard light powered by DC battery power.

Located on the front of the Controller are 7 white blocks adjacent to each channel, (CH1, CH2, etc). These are to allow the installer to use a sharpie and write in each shutdown next to each corresponding

Channel. Example: "TANK HI LEVEL" could be written inside the white block next to CH1. After the completion of the installation, white on black lamacoids may be ordered at no charge (shipping costs will apply) from Innovative Solar, that will fit with self adhesive exactly over the white blocks for a clean finish.

RS485 Communication: A single pair shielded cable installed from the RS485 terminals in the controller, to another compatible device such as a radio for a SCADA system, can transfer data to and from the IS-1720. ESD status, dump counts, voltage, and which alarm is tripped, can be sent over a network to a website for remote readings, or a call out system. Data can be remotely received by the IS-1720 such as remote reset, or remote shutdown via the internet or mobile phone.

**** FOR TECH SUPPORT CALL # 403-588-4128****