Scully ST-15 WX

Technical Manual

Multi-Point Liquid-Level Detection System

scully
MaxSafety® SYSTEMS

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1.1 FUNCTION

The ST-15C-WX series control units are multi-point liquid level alarm units. Typical applications are for high and/or low level alarm in fixed storage tanks.

The Following is a listing of probe models that are compatable with the ST-15-WX:

Applicable Probes

Thermistors	***Instant-On™ Two-Wire Optic***
SP-M	SP-TOM
SP-MU	SP-IO
SP-MH	
SP-MH	
SP-BL	
SP-BLU	
SP-BLH (Heated Products)	

The ST-15-WX control units can be mounted in any non-hazardous area and utlized oil tight controls and indicators. Internal circuitry provides intrinsically safe (I.S.) output, for pobe connections. This output is rated for Class 1, Div 1, Group D hazardous areas

1.2 Model Description

The number following the “WX” denotes the number of ST-15C Control Modules in the model. Each module is referred to as a “channel” and can monitor one sensor. Thus, an ST-15-240-WX10 can monitor 10 probes.

The Scully part numbers for the various models are as follows:

Model	***Part Number***
ST-15-115-WX3	07851
ST-15-115-WX4	07852
ST-15-115-WX5	07853
ST-15-115-WX6	07854
ST-15-115-WX7	07855
ST-15-115-WX8	07856
ST-15-115-WX9	07857
ST-15-115-WX10	07858
ST-15-115-WX11	07859
ST-15-115-WX12	07860

Model	***Part Number***
ST-15-230-WX3	07800
ST-15-230-WX4	07801
ST-15-230-WX5	07802
ST-15-230-WX6	07803
ST-15-230-WX7	07804
ST-15-230-WX8	07805
ST-15-230-WX9	07806
ST-15-230-WX10	07807
ST-15-230-WX11	07808
ST-15-230-WX12	07809

1.3 Power Requirements

The ST-15C-WX units consume less than 20 watts of line power per channel exclusive of controlled circuits and alarm devices. Models ST-15-115-WX operate from100-140 VAC, 50-60Hz mains power, Models ST-15-230-WX operate from 200-250 VAC, 50-60 Hz mains power.

1.4 External Aalarm Output

A mains voltage alarm output is applied whenever any channel trips to the alarm position. The alarm output is rated at 4 amps maximum current and is protected by an internal fuse.

When an alarm takes place, the alarm output line is energized and remains energized until either the alarm condition is corrected or the alarm acknowledge switch is operated. Operating the alarm acknowledge switch does not hinder subsequent alarms from other channels.

An alarm buzzer, internal to the enclosure is also included.

1.5 Control Contacts

A Single Pole Double Throw (SPDT) volt-free contact set is provided on each ST-15 control unit, thus a contact is provided for each sensor. These contact sets are rated at 250 VAC, 5 amp resistive and may be used to control valves, motor starters or other electrical devices.

These contact sets are accessed through the unit's main terminal strip.

1.6 Indicator Lamps

1.6.1 Power Lamp

A green power pilot lamp indicates that mains power is being supplied to the units.

1.6.2 Alarm Indicator Lamps

A single alarm indicator lamp is supplied for each channel in the unit. The legend plates on these lamps will have been engraved with customer-provided information (optional) identifying the function of each channel. These lamps light when an alarm condition takes place and will remain lit until the alarm condition is corrected. Acknowledging an alarm does not change the status of the associated alarm indicator lamp.

1.7 Controls

1.7.1 Alarm Acknowledge Button

The **ALARM ACKNOWLEDGE** (silence) push button or optional key-operated acknowledge switch will silence the audible alarm devices when operated. The alarm acknowledging circuits reset automatically when the fault condition is corrected.

1.7.2 Test Push-Button

The test button causes all high level alarm points to trip to their alarm condition when operated.

2.1 Mechanical Installation

The ST-15-WX control unit must be installed in a **NON-HAZARDOUS AREA**. Normally the unit is installed in the control room of a storage tank arena. It may be installed outdoors in its weather proof enclosure. Conduit entries must be properly sealed to keep water out of the enclosure.

2.2 Electrical Installation

The most important thing to keep in mind when making electrical connections to the ST-15-WX control unit is to keep the intrinsically safe wiring to sensors separated from power and controlled circuit wiring. Separate conduit holes are provided and must be used to keep wiring separated.

THE IMPORTANCE OF MAINTAINING ABSOLUTE SEPARATION OF SENSOR (PROBE) LEADS AND OTHER WIRING CANNOT BE OVEREMPHASIZED!

See wiring diagrams in the Appendix (Section 5.0) for the specific model(s).

2.2.1 Power Connections

Connect a source of main power to terminals 2 and 3 on Terminal Strip TB-1 inside the unit. See wiring diagram in Appendix (Section 5.0) for the specific model(s). Make sure that voltage matches the design voltage of the system.

Connect the earth lead to terminal 1 on TB-1

2.2.2 External Alarm Devices

Connect mains voltage alarm horns, bells or sirens to terminals 4 and 5 on TB-1.
Make sure the total connected load does not exceed 4 amps.

2.2.3 Control Device Connections

The rest of the terminals, terminal 6 onwards, provide a SPDT relay contact, for each of the sensors as shown in the wiring diagram. Make sure that the connected loads do not exceed 5 amps resistive per contact set and that sources for these devices are used to prevent damage to the ST-15-WX equipment through field wiring shorts for failures of controlled devices. Fuses internal to the unit do **NOT** protect the contacts.

2.2.4 Probe Connections

2.2.4.1 Two-Wire Probes

The wiring diagram shows connections from TB2 of a ST-15 control module to a probe. When connecting to a 2-wire optic or thermister probe, the 680 Ω resister (factory installed) on terminals G and W should be kept connected.

2.2.4.2 Three-Wire Probes

The wiring diagrams also show connections to 3-wire probe for heated products. The 680 Ω resister installed between the G and W terminals must be removed.

It is suggested that the resisiter be retained for future use.

2.2.4.3 Probe Lead Wire Size

The following table should be used to determine the appropriate wire size for ST-15-WX Control Module to sensor connections for distance between ST-15-WX and the sensor.

Wire Size Feet (MM^2)	*Maximum Run Length Feet (Meters)*
#16 (1.5)	400 (120)
#14 (2.5)	700 (210)
#12 (4.0)	1000 (300)
#10 (6.0)	1600 (480)
#8 (10.0)	2500 (760)

CAUTION: *If sensor leads are extended beyond 2500 feet, please consult the factory for specific wiring recommendations to prevent jeopardizing the intrinsically safe provisions of the system.*

Operation

3.1 ST-15-WX control units are shipped with each channel set to provide high level alarming (alarm output when liquid touches a probe). If your application requires alarm when a sensor becomes “dry”, typical for low level sensing, consult the factory for wiring instructions.

When system power is applied, all high-level alarm channels will produce alarm outputs (red lamp on and alarm buss energize) until their associated thermistor probes warm up. This will take approximately 10 seconds. (**Note:** *warm up time varies with ambient temperature of air surrounding the probe*) When a probe is “dry” and warmed up, the associated channel’s red lamp will go out. Two-wire optic probes do not require any warm-up time.

The sensor is **NOT** a “switch”. The ST-15-WX control unit will not respond and indicate “dry” with anything but a dry probe connected to its input terminals. Shorted or open probe circuits will not cause the ST-15-WX Control Unit to go “permissive”.

Maintenance

4.1 Front Panel Indicator Lamps

These indicator lamps are changed by unscrewing the lens caps and replacing the bulbs beneath them.

4.2 Dynacheck® Indicator LED

Each of the internal ST-15 control modules contains a Dynacheck® indicator lamp. (Scully part number 27002). The lampwill flash once every few seconds when the ST-15 Control unit is connected to a “dry” probe. The Dynacheck® indicator lamp is removed by pulling it straight out of its socket. Burnout of the Dynacheck® indicator LED will not affect the performance of the ST-15 module.

4.3 ST-15 Modules

The ST-15 control modules contain no field repacable components other than the Dynacheck® indicator LED. The modules must be removed as a unit and returned to the factory.

Note: *returns to the factory must be accompanied by an RMA number- The RMA number must be obtained from Scully Signal Company*

DO NOT ATTEMPT to service or adjust the ST-15-WX moduled without specific approval and instructions fro Scully Signal Company.

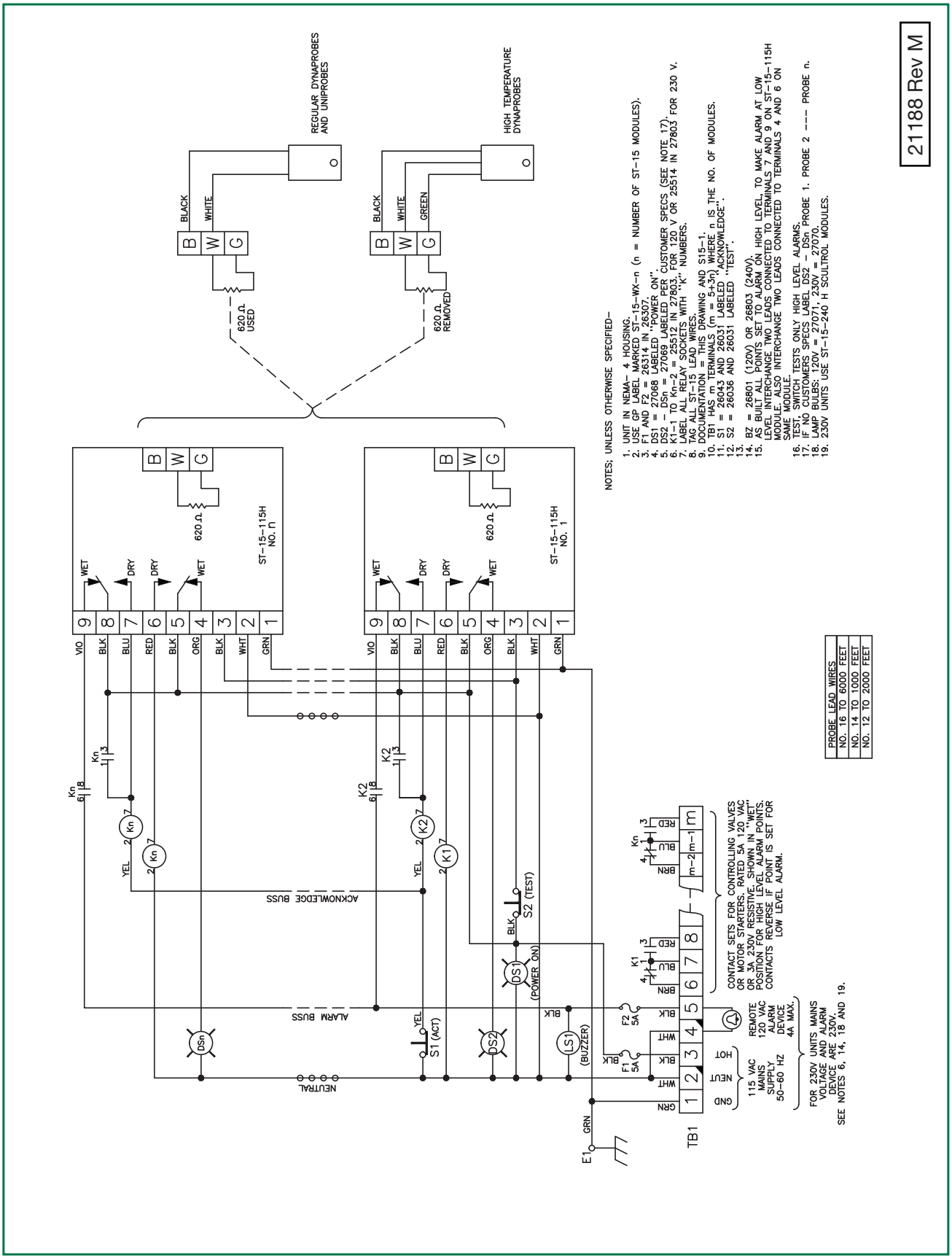
4.4 Relays

Repace control relays only with equivalent types, making sure that the relays’ coil voltage matches the system voltage.

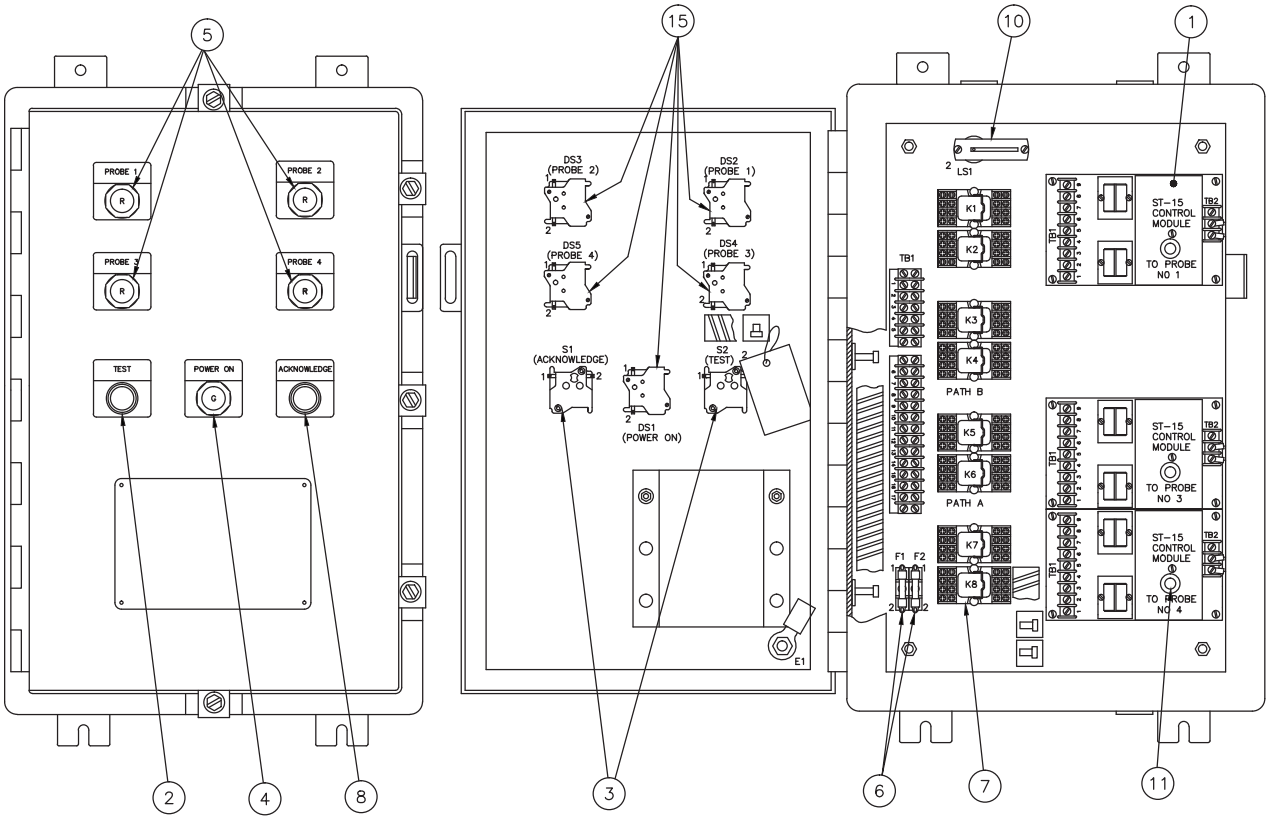
4.5 Fuses

Do not replace fuse F1 and F2 with other than 5 amp slow-blow units.

5.1 DWG 21188 – Schematic ST-15-WX System



5.2 DWG 61410 – Replacement Parts ST-15-WX3-12



REPLACEMENT PARTS LIST

ST–15–115 WX SCULTROL
07852, 61391 AND 61380

ITEM	DESCRIPTION	QTY	PART #
1	ST–15–115H REPLACEMENT MODULE	NOTE 2	07647
2	PUSHBUTTON, BLACK	1	26036
3	SWITCH BLOCK, PUSHBUTTON	2	26031
4	LENS, INDICATOR, GREEN	1	27068
5	LENS, INDICATOR, RED	NOTE 2	27069
6	FUSE, MAIN, 5 AMP	2	26314
7	RELAY, DPDT, 115V COIL	NOTE 3	25512
8	PUSHBUTTON, RED	1	26043
10	BUZZER, ALARM, 115V	1	26801
11	LAMP, DYNACHECK	NOTE 2	27072
15	LAMP BASE ASSY, OILTITE. (INCLUDES BULB).	NOTE 2	27071

NOTES:

1. ITEM NUMBER REFERS TO ITEM NUMBERS PICTURED ON REPLACEMENT PARTS DRAWING 61410
2. QUANTITY DEPENDS ON NUMBER OF POINTS IN MODEL NUMBER.
   EXAMPLE: ST–15–WX8 INDICATES THAT A QUANTITY OF 8 OF THIS ITEM ARE INDICATED IN THIS UNIT.
3. QUANTITY DEPENDS ON NUMBER OF POINTS IN MODEL NUMBER MULTIPLIED BY A FACTOR OF TWO.
   EXAMPLE: MODEL ST–15–WX8 INDICATES THAT A QUANTITY OF 16 OF THIS ITEM ARE INCLUDED IN THIS UNIT

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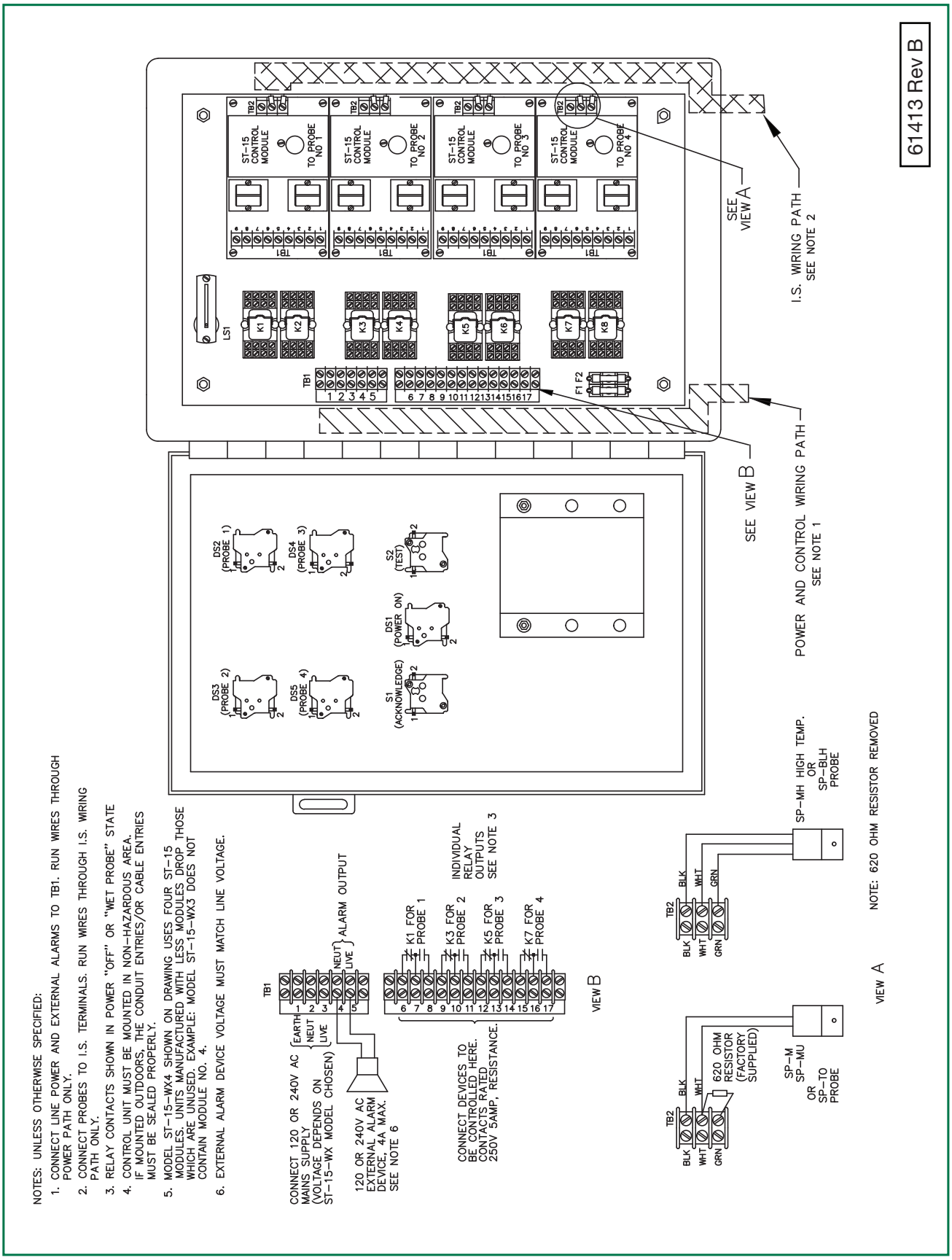
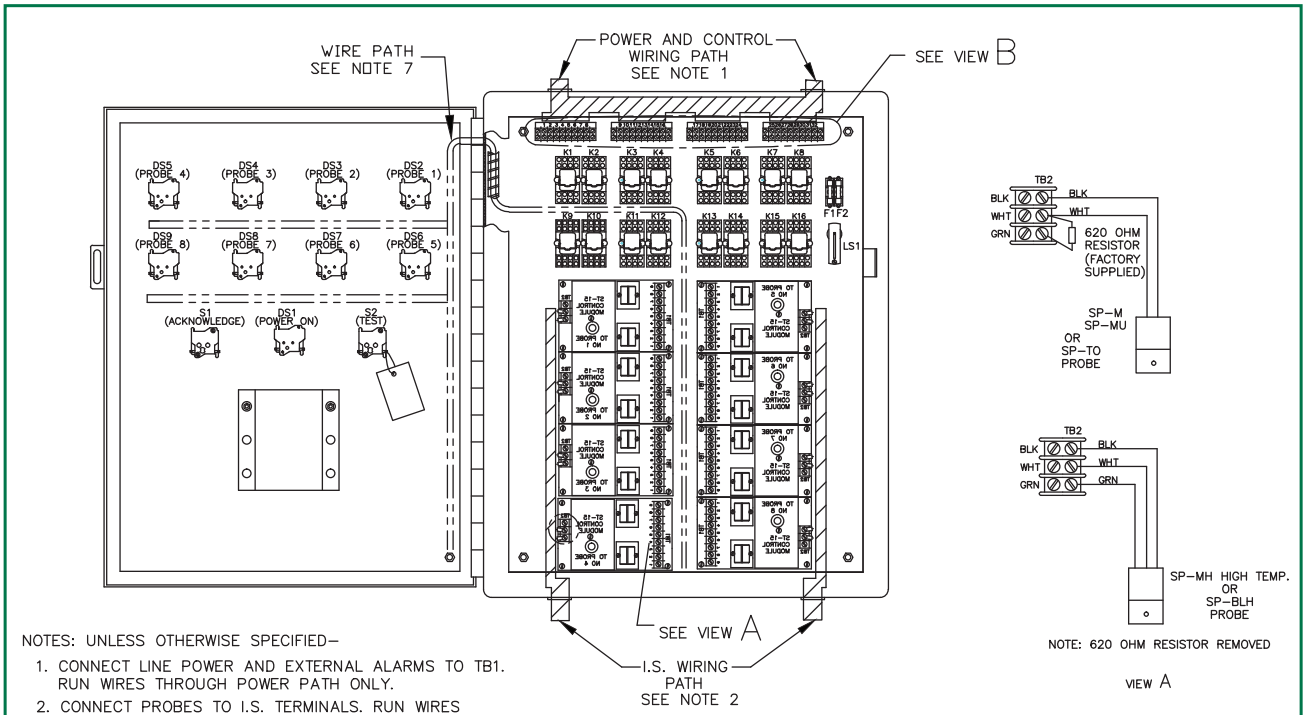
5.3 DWG 61413 – Field Wiring Diagram Models ST-15-WX3-4

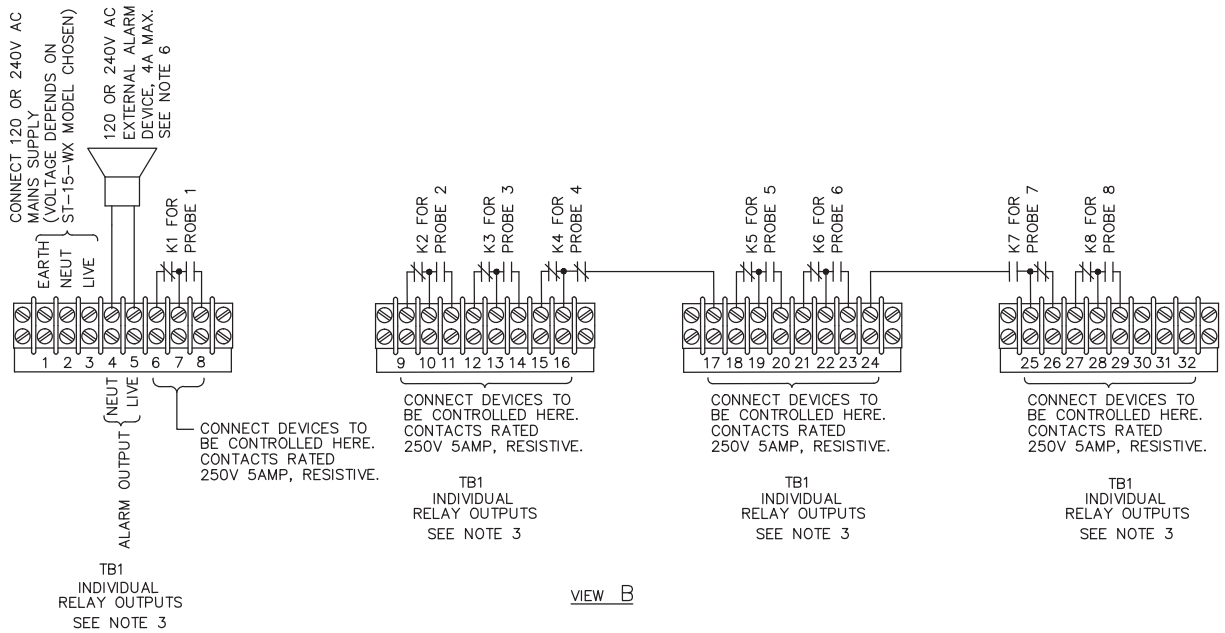


5.4 DWG 61415 – Field Wiring Diagram Models ST-15-WX5-8



NOTES: UNLESS OTHERWISE SPECIFIED–

1. CONNECT LINE POWER AND EXTERNAL ALARMS TO TB1. RUN WIRES THROUGH POWER PATH ONLY.
2. CONNECT PROBES TO I.S. TERMINALS. RUN WIRES THROUGH I.S. WIRING PATH ONLY.
3. RELAY CONTACTS SHOWN IN POWER "OFF" OR "WET" PROBE" STATE
4. CONTROL UNIT MUST BE MOUNTED IN NON–HAZARDOUS AREA. IF MOUNTED OUTDOORS, THE CONDUIT ENTRIES/OR CABLE ENTRIES MUST BE SEALED PROPERLY.
5. MODEL ST–15–WX8 SHOWN ON DRAWING USES EIGHT ST–15 MODULES. UNITS MANUFACTURED WITH LESS MODULES DROP THOSE WHICH ARE UNUSED. EXAMPLE; MODEL ST–15–WX6 DOES NOT CONTAIN CONTROL MODULES NO. 7 AND 8.
6. EXTERNAL ALARM DEVICE VOLTAGE MUST MATCH LINE VOLTAGE.
7. WIRING HARNESS MUST BE LOCATED A MINIMUM OF 2 INCHES FROM THE I.S. WIRING.



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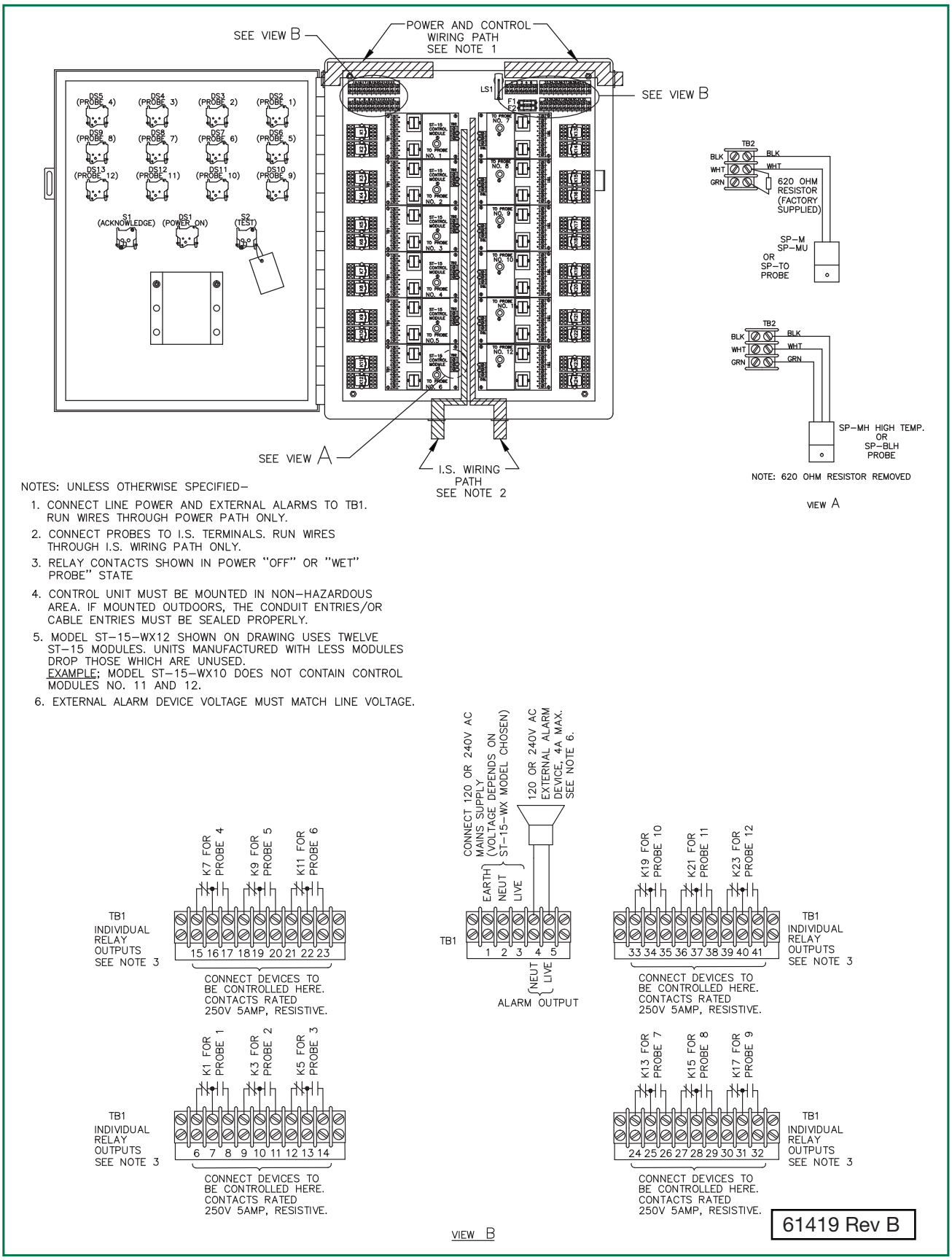
5.5 DWG 61419 – Field Wiring Diagram Models ST-15-WX9-12



Notes

Scully - Setting Standards in Safety and Dependability Since 1936.

For over seventy-five years Scully has been engineering and building products to the highest safety and reliability standards. We design and manufacture all of our systems under one roof to ensure complete quality control over our manufacturing and testing operations. Scully is ISO certified and all of our products are 100% made in the U.S.A. In addition, we back up our products with the best service in the industry. We have direct sales and service personnel in the U.S.A., The United Kingdom, and Europe and are represented in over 50 countries.

For more information and 24 hour technical assistance, call Scully Signal Company at 1-800-SCULLY (1-800-272-8559).

Scully Headquarters in Wilmington, MA U.S.A.

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