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Wiring Diagrams for START – Manual Control Pivot

<u>Hydr Pumping Unit</u>	<u>Field Commander Location</u>	
Electric	At Allen Bradley Panel	17-18
	(Basic AB Panel- No Wtr Pressure Sw.)	
Electric	2 Towers from Pivot Point	19-20
	(Basic AB Panel- No Wtr Pressure Sw.)	

Wiring Other Versions of Electric T-L Allen Bradley Panel for Start with Manual Control

<u>Version</u>	<u>Comments</u>	
Low Water Press Safety Auto Restart	117 Safeties Out with Low Water Press.....	21
	FC = at AB Panel	
Low Water Press Safety Auto Restart	117 Safeties Out with Low Water Press.....	22
	FC = 2 Towers from Pivot Point	
Load Control Water Press Auto Restart	System restarts when power is restored. ....	23
	FC = at AB Panel	
Load Control Water Press Auto Restart	System restarts when power is restored. ....	24
	FC = 2 Towers from Pivot Point	
Water Press Start with Crop Link Radio	Radio from FC to Crop Link Water Pump Cntrl. .	25
	FC = 2 Towers from Pivot Point	

Note: FC = Field Commander



**What's in the AgSense Shipping Box?**

AgSense Field Commander FC2-S TL-24 with Start:

- Qty 1 - Field Commander FC2-S TL-24 with Start
- Qty 1 - Mounting Hardware Sack (Beam Clamps, wire nuts, etc.)
- Qty 1 - MD90835 T-L 24V Installation Kit for AgSense (See Bill of Materials below)
- Qty 1 - MD90837 Start Kit for AgSense (See Bill of Materials below)
- Qty 1 - CD91186 AgSense Installation Sheets FC2-S TL-24 with Start for TL Pivots

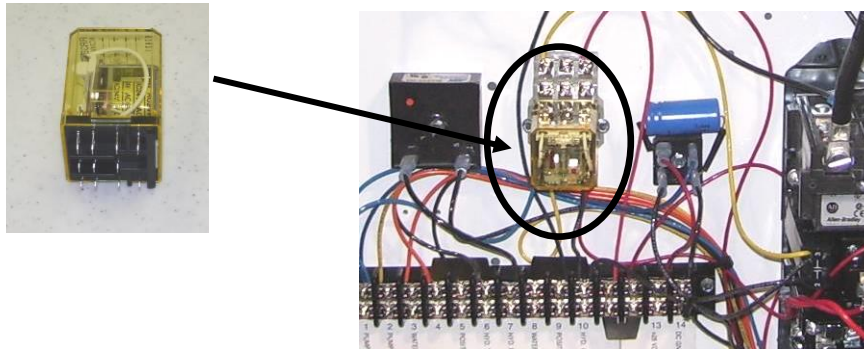
MD90835 T-L 24V Installation Kit for AgSense - Bill of Materials Listing. Use parts as required.

Part No.	Description	Req'd.
EA53469	3 amp Diode Assy (use diodes with ET Manifold Boards that do not have a power block.)	2
EH52124	Auto Style 24VDC Relay	1
EH52350	Wire Nut - Orange	3
EH53065	Terminal QC Female .250" 16-14	4
FC4893	Hose Clamp #104	2

MD90837 Start Kit for AgSense - Bill of Materials Listing. Use parts as required.

Part No.	Description	Req'd.
CD90259	Remote-Local Sticker	1
EC52301	Relay 24 VAC 3PDT	1
ES5257	Toggle Switch	1

EC52301 3-Pole 24VAC Relay, Replacement for T-L Allen Bradley Panel



**AgSense Field Commander Specifications**

Power Requirements for these units:

DC Powered Unit 7-40V DC:  
 At 12v DC: 1.0A MAX  
 0.1A - 0.5A during normal operation

120vAC Powered Unit:  
 At 120v AC: 0.25A MAX  
 0.05A - 0.15A during normal operation

The above numbers are the current required for our unit to operate. Below is the current the relays in our box can control: On both AC and DC units, each relay can handle a peak max of 10A, 5A constant (at a max voltage of 120vAC, or 30vDC).

**Contact Information**

AgSense Phone Number: 605-352-8350.  
 T-L Irrigation Phone: 800-330-4264.



**Overview – Point and Precision Point Control Pivots.**

The wiring diagrams in the following section are for:

- T-L Pivots with Point or Precision Point Control.
- Using AgSense FC2-S TL-24 with Start version of the Field Commander.
- Powered from the T-L Allen Bradley Electric Panel.

Point Control Panel



Precision Point Control

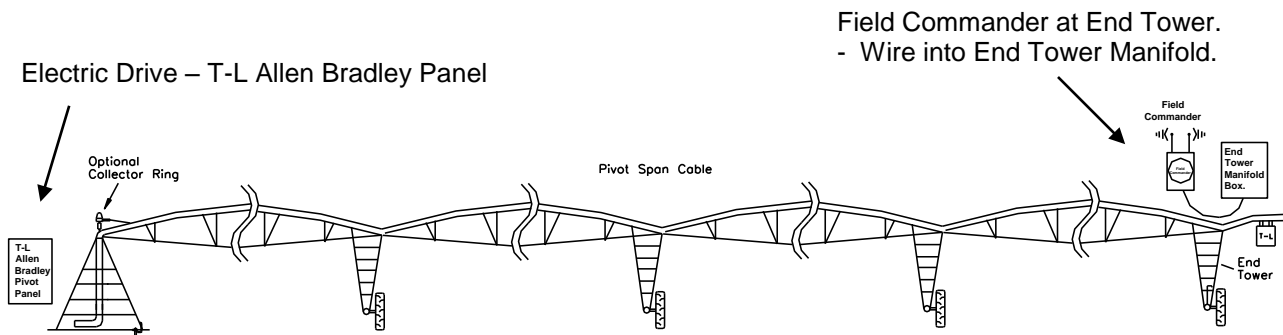


Allen Bradley Panel



**Field Commander Location at End Tower**

T-L Allen Bradley Electric Panel at Pivot Point





**Installation at End Tower – Point or Precision Point Control**

The AgSense unit is installed at the end tower, with mounting in one of two ways.

1. Mounted to the spreader rail on truss rod overhangs with the beam clamps supplied by AgSense as shown in the picture below.



2. Mounted on the span pipe with the hose clamps supplied in the installation kit as shown in the pictures below.





Wiring Diagrams for START - Point Control or Precision Point Control Pivot.

Allen Bradley Panel – No Water Pressure Switch

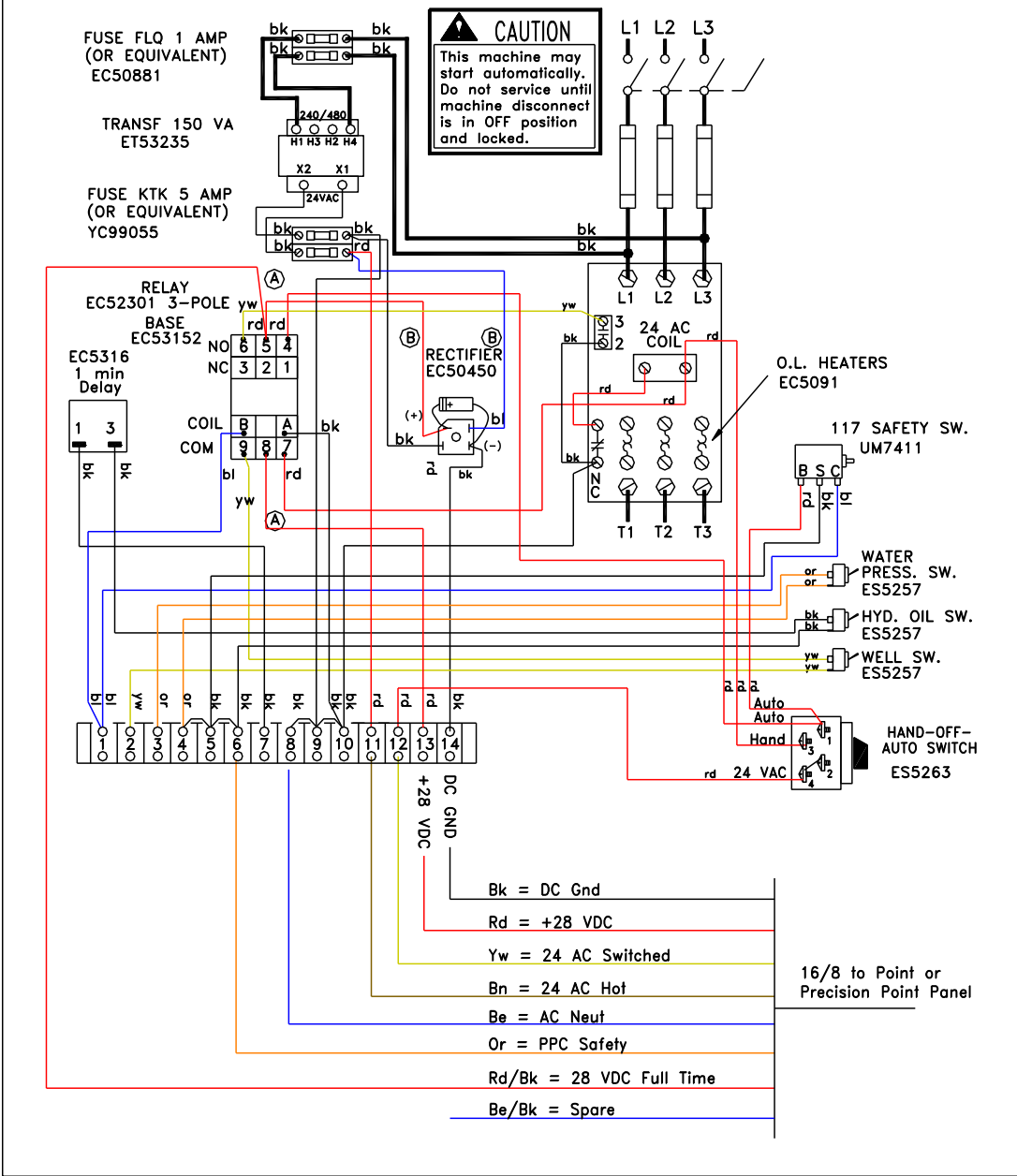
AgSense MODIFICATION USING 3 POLE RELAY (FIELD COMMANDER-START)

**NOTE – FIELD WIRING CHANGES**

A. Replace Ice Cube 24VAC Relay with 3 Pole, Add Wires to Relay Base.

B. Change wiring to Rectifier to provide "Full Time" power to AgSense.

WIRING DIAGRAM T-L ELECTRIC DRIVEN HYDRAULIC PUMP  
CD5178 SPECIAL 8/17/12





Allen Bradley Panel – Low Water Pressure Safety Auto Restart

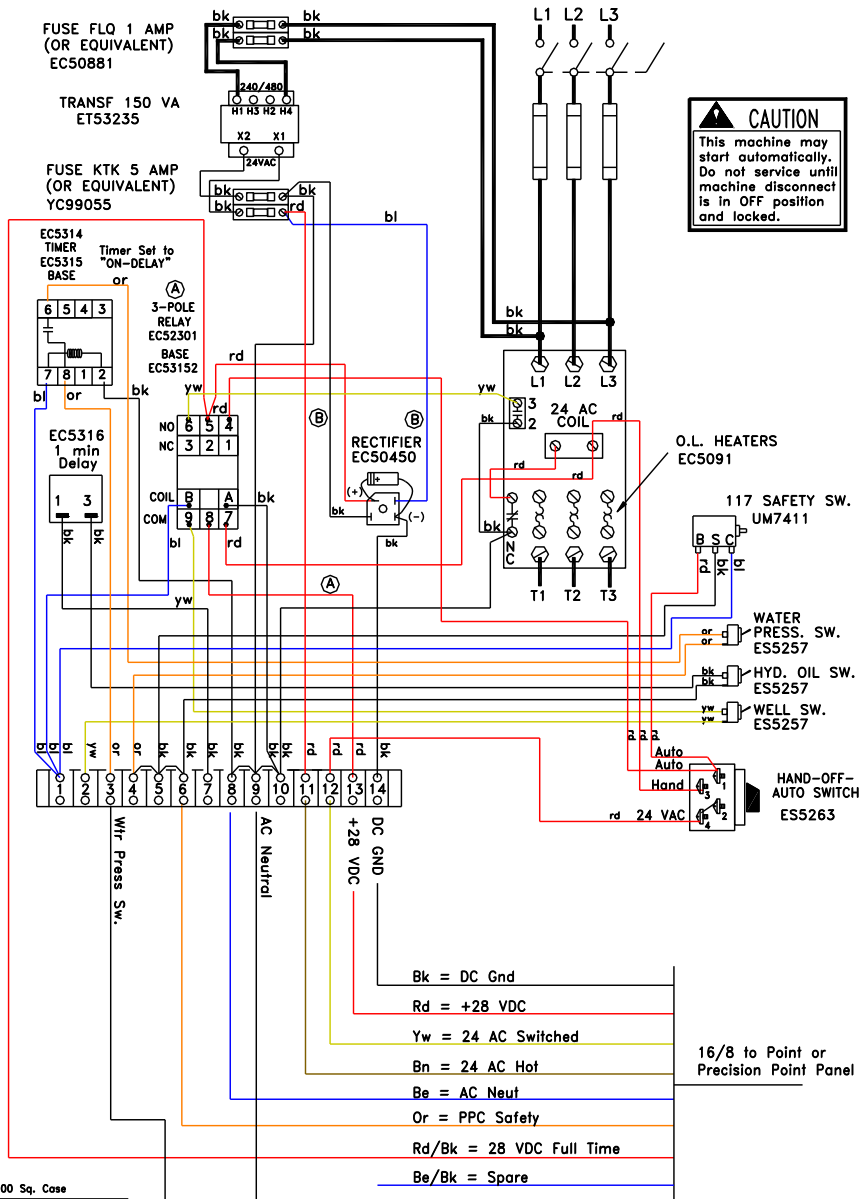
AgSense MODIFICATION USING 3 POLE RELAY (FIELD COMMANDER-START)

**NOTE – FIELD WIRING CHANGES**

A. Replace Ice Cube 24VAC Relay with 3 Pole, Add Wires to Relay Base.

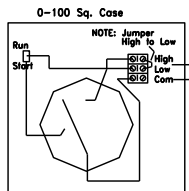
B. Change wiring to Rectifier to provide "full time" power to AgSense.

WIRING DIAGRAM T-L ELECTRIC DRIVEN HYDRAULIC PUMP  
W/OPTIONAL LOW WATER PRESSURE SAFETY TIME DELAY  
CD51790 Special 4/18/11 & 6/7/11



**CAUTION**

This machine may start automatically. Do not service until machine disconnect is in OFF position and locked.







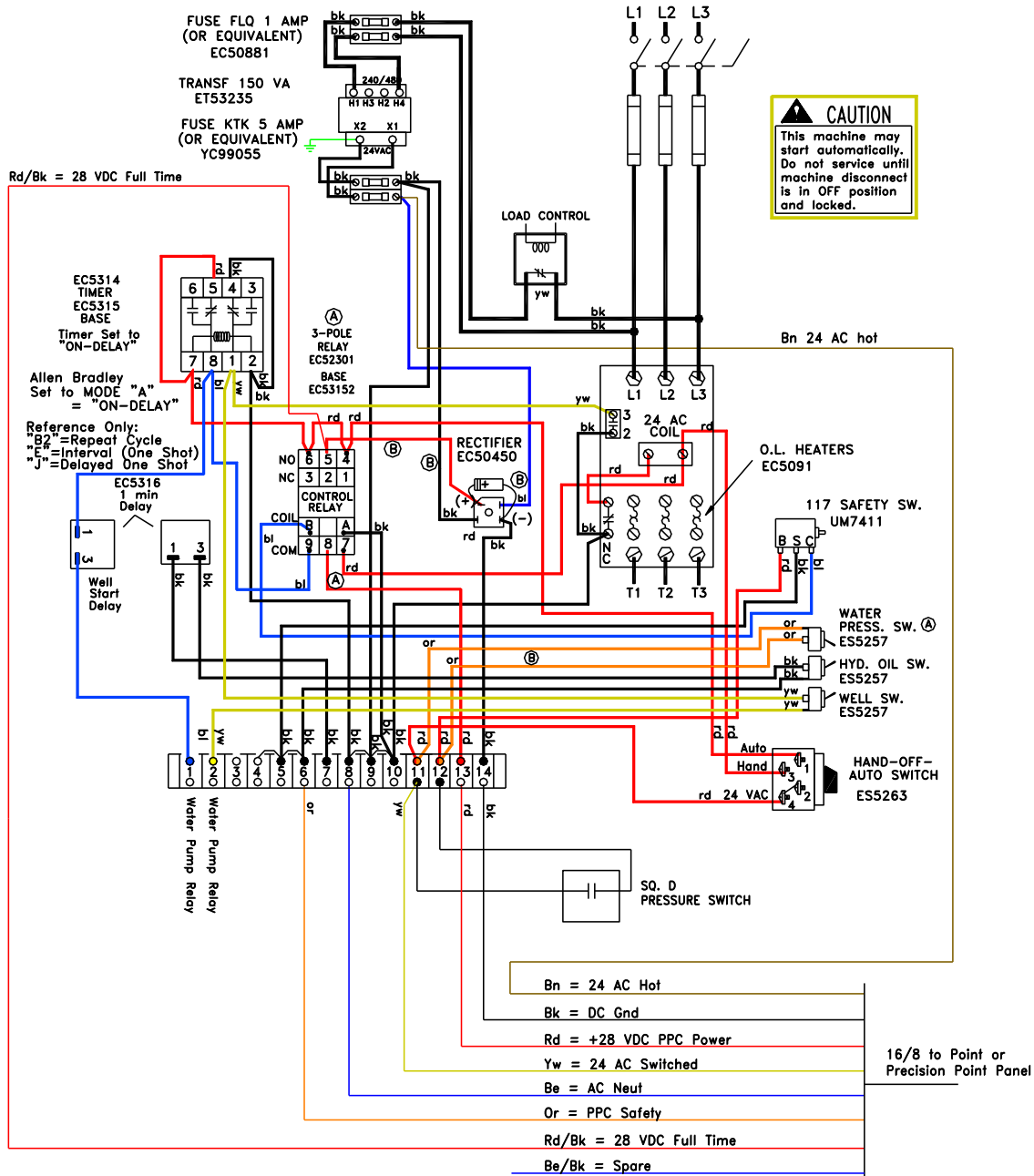
Allen Bradley Panel – Load Control Water Pressure Auto Restart

AgSense MODIFICATION USING 3 POLE RELAY (FIELD COMMANDER-START)

**NOTE – FIELD WIRING CHANGES**

A. Replace Ice Cube 24VAC Relay with 3 Pole, Add Wires to Relay Base #5 & #8.  
 B. Change wiring to Rectifier to provide "Full Time" power to AgSense.

WIRING DIAGRAM T-L ELECTRIC DRIVEN HYDRAULIC PUMP  
 WATER PRESSURE ACTUATED PIVOT  
 AUTO RESTART – LOAD CONTROL IN T-L PANEL  
 (Starts Electric Water Pump, Pressurizes Pivot, Pivot Starts) CD51795 SPECIAL 5/15/12





### Allen Bradley Panel – Water Pressure Start, Crop Link Water Pump Control

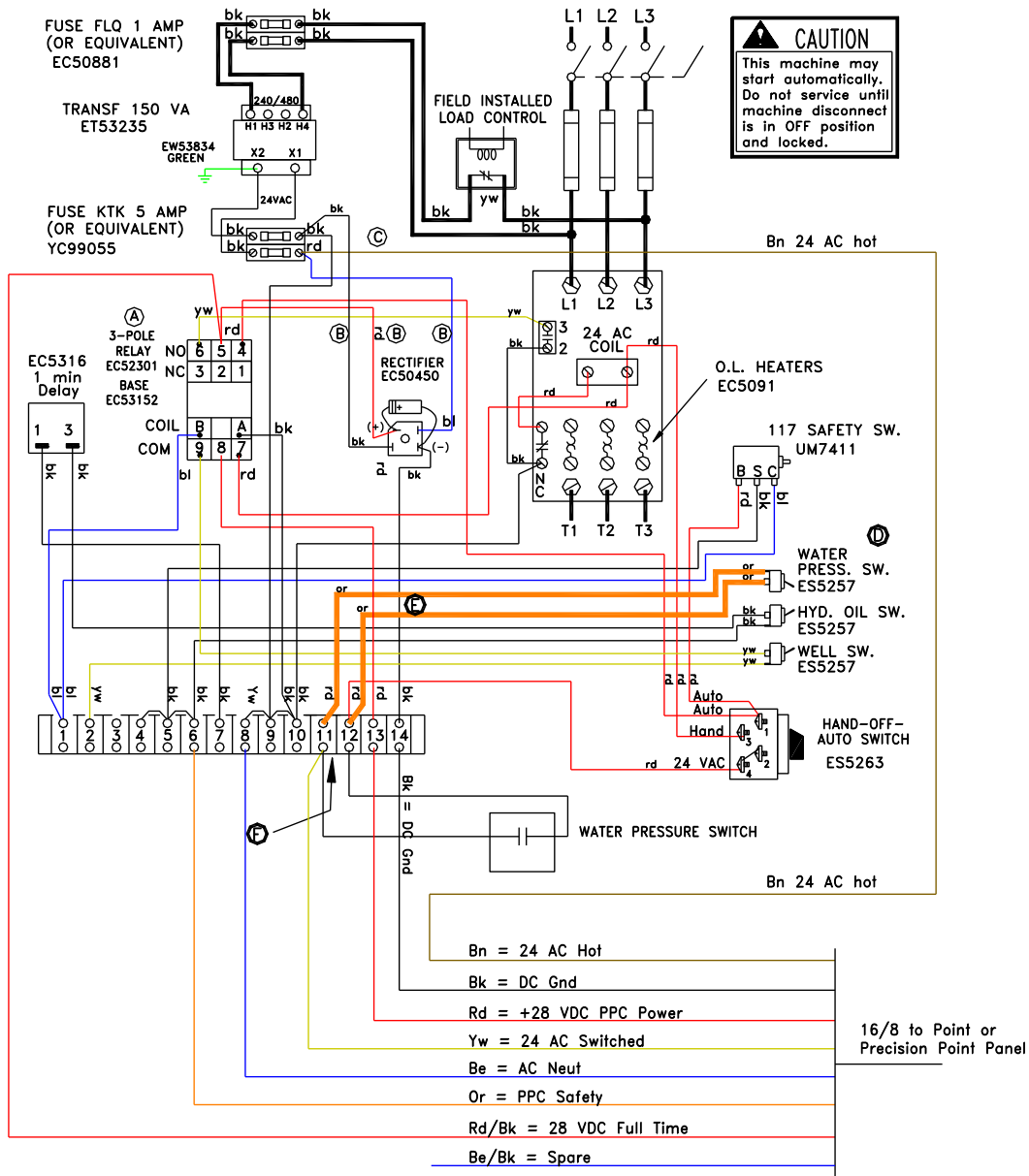
T-L ELECTRIC POWER – ALLEN BRADLEY PANEL  
 AgSense MODIFICATION USING 3 POLE RELAY – Field Commander with Crop Link  
 – Crop Link starts Water Pump, Water Pressure Start Pivot 5/28/13 NJS

**NOTE – FIELD WIRING CHANGES FOR AGSENSE FIELD COMMANDER**

- A. Replace Ice Cube 24VAC Relay with 3 Pole, Add Wires to Relay Base.
- B. Change wiring to Rectifier to provide "full time" power to AgSense.
- C. Remove Red wire Fuseblock to term 11, attach Bn wire to Fuseblock.

**NOTE – FIELD WIRING CHANGES FOR WATER PRESSURE START**

- D. Turn Water Pressure Switch Upside Down  
Toggle Up = Wet (Open) Toggle Down = Dry (Closed)
- E. Move Orange Wires on Water Pressure Switch from 3 & 4 to 11 & 12
- F. Remove Jumper on bottom of 11 & 12

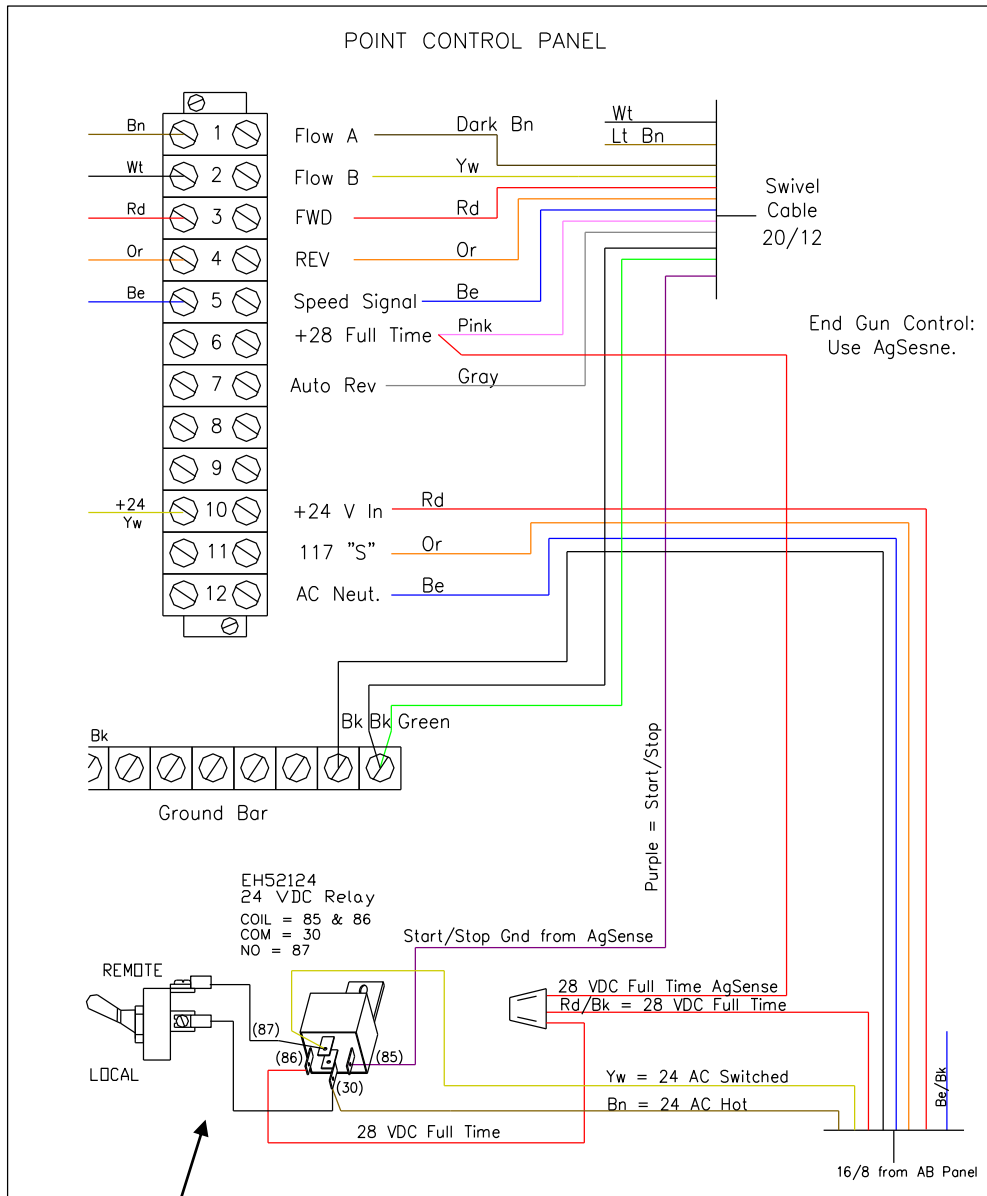






### Point Control Panel

- Shown with wiring to use Auto Reverse Switch and 20/12 Swivel Cable
- Use Pink wire for 28VDC Full Time Power
- End Gun Control will be from the AgSense Field Commander, program angles on website.
- Field install Relay and Toggle Switch

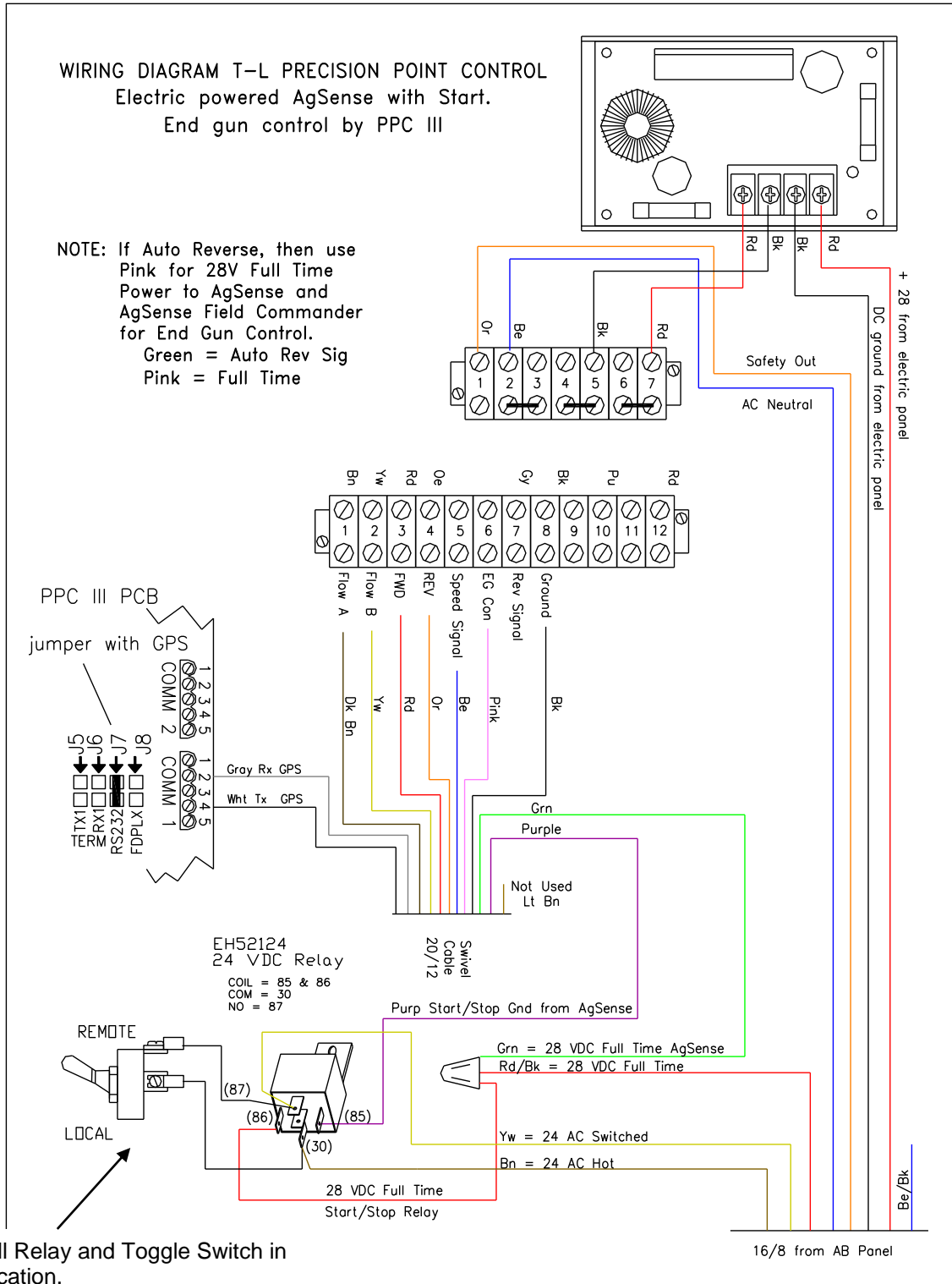


Field install Relay and Toggle Switch in suitable location.



**Precision Point Control Panel (PPC III w/GPS)**

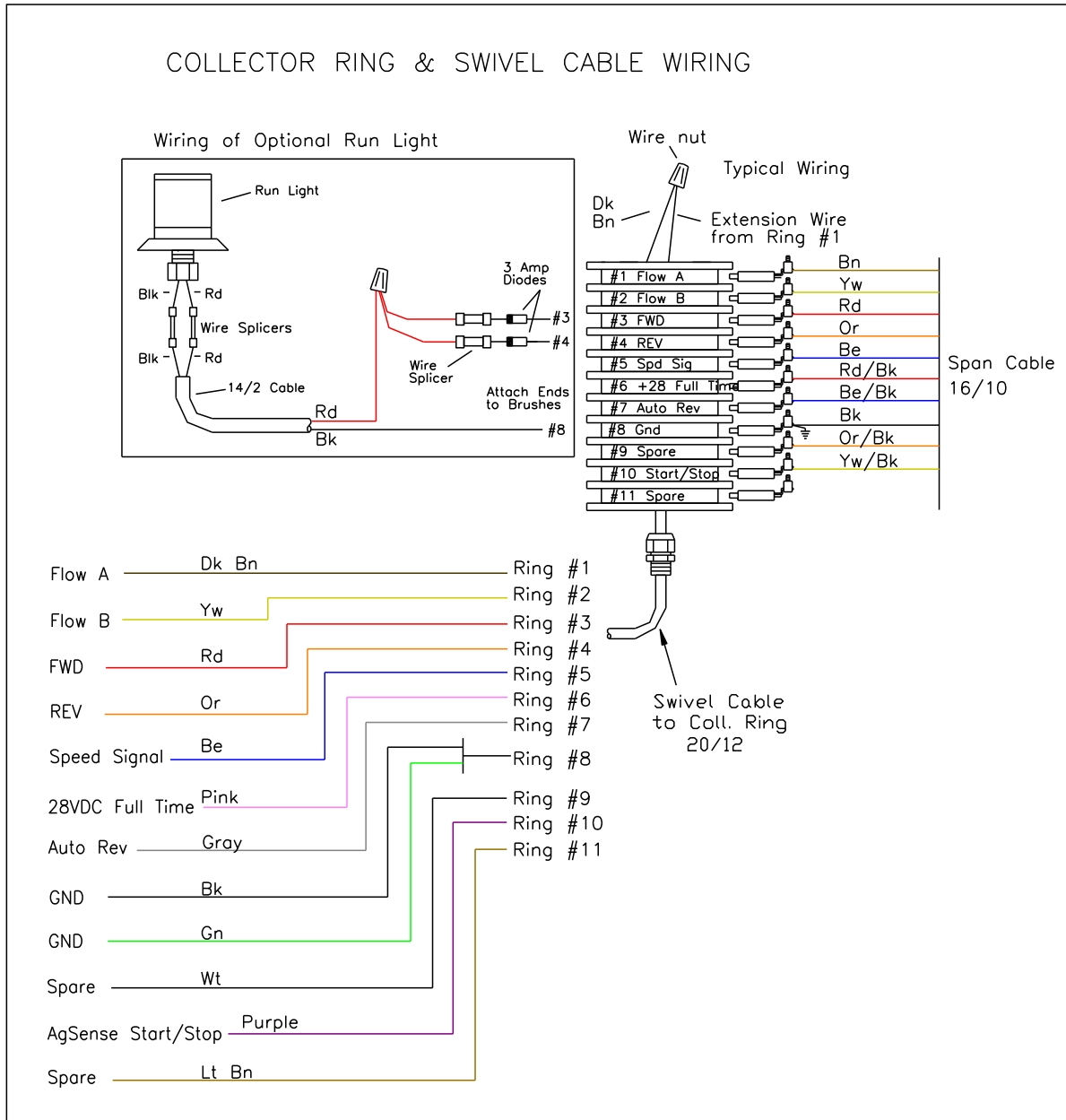
- Shown with no Auto Reverse Switch, using PPC III for End Gun Control
- Note: If an Auto Reverse Switch is used, then:
  - connect Green wire to Terminal 7, Reverse Signal from Switch
  - connect Pink wire to Wire Nut for 28VDC Full Time Power
  - End Gun Control will be from the AgSense Field Commander, program angles on website.





### Collector Ring for Point Control

- Shown with wiring to use Auto Reverse Switch
- Use Pink wire to Rd/Bk Span Cable Wire for 28VDC Full Time Power
- End Gun Control will be from the AgSense Field Commander, program angles on website.
- 16/10 Span Cable, Yw/Bk used for Start/Stop control.

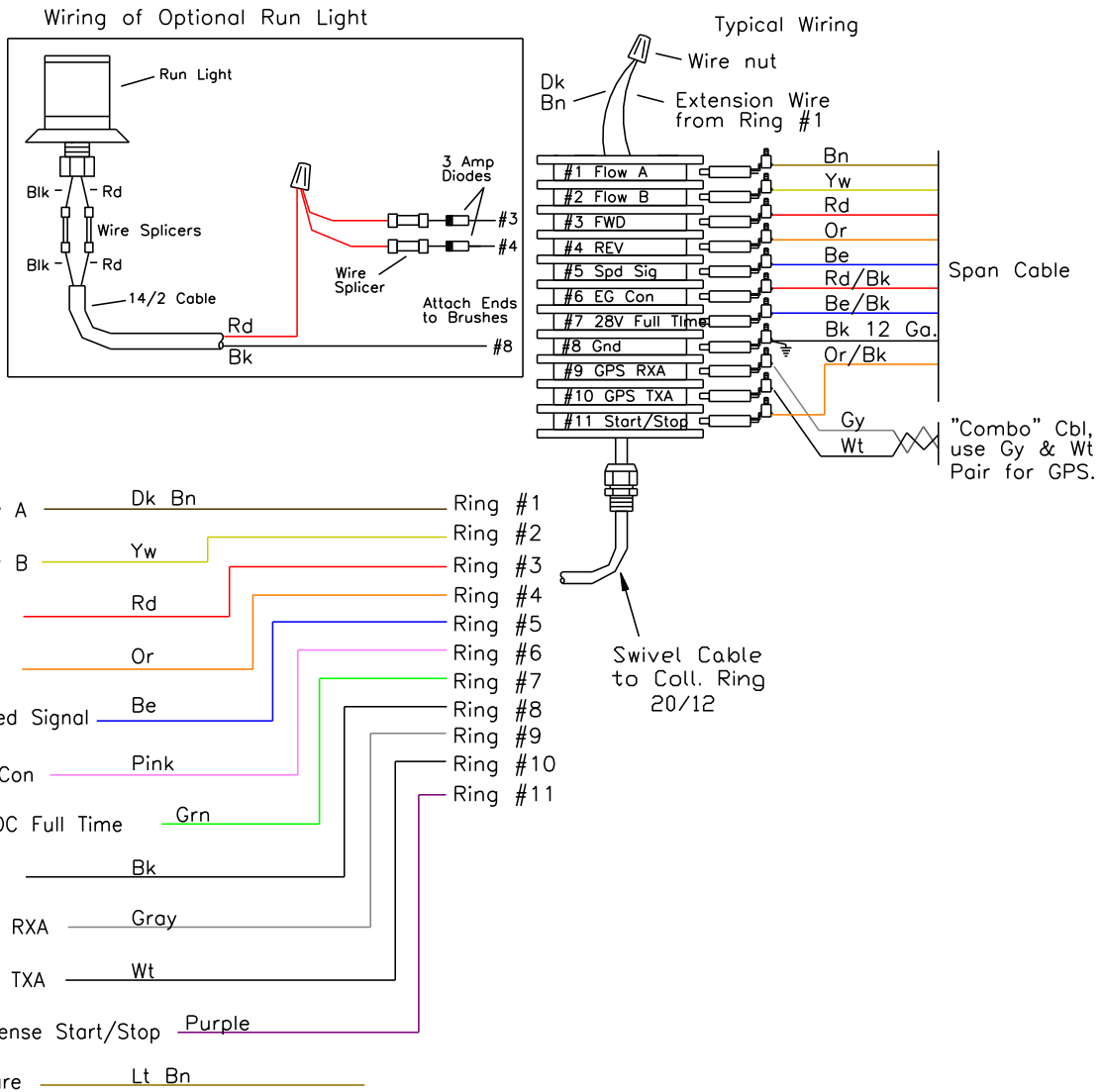




**Collector Ring for Precision Point Control**

- Shown with no Auto Reverse Switch, using PPC III for End Gun Control
- Use Grn wire to Be/Bk Span Cable Wire for 28VDC Full Time Power
- "Combo" Span Cable shown, Or/Bk used for Start/Stop control
- Note: If an Auto Reverse Switch is used, then:
  - use Ring #7 Grn Swivel Cable Wire and Be/Bk Span Wire for Reverse Signal from Switch
  - use Ring #6 Pink Swivel Cable Wire and Rd/Bk Span Wire for 28VDC Full Time Power
  - End Gun Control will be from the AgSense Field Commander, program angles on website.

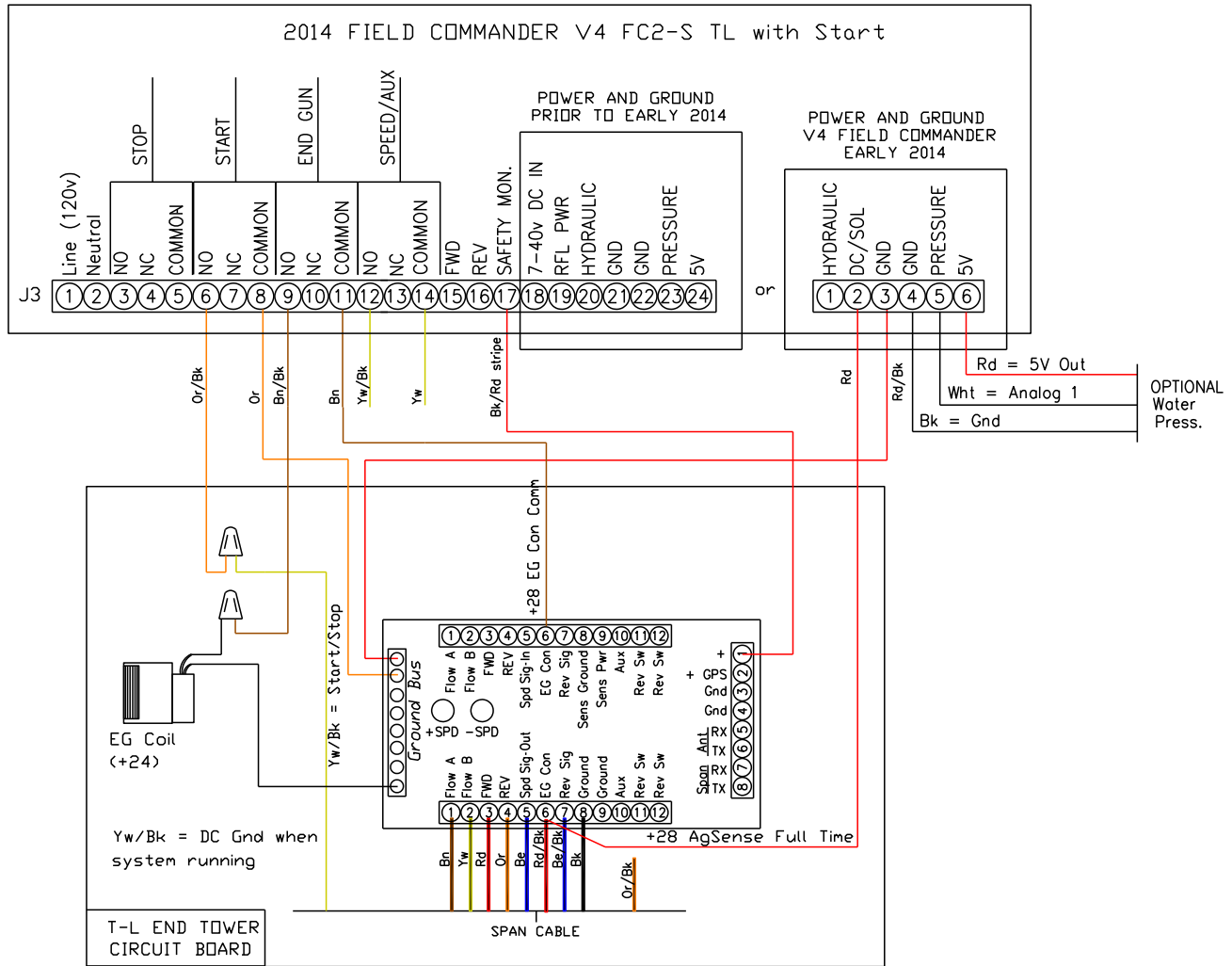
COLLECTOR RING & SWIVEL CABLE WIRING – PPC III with GPS





**End Tower Wiring – Point Control**

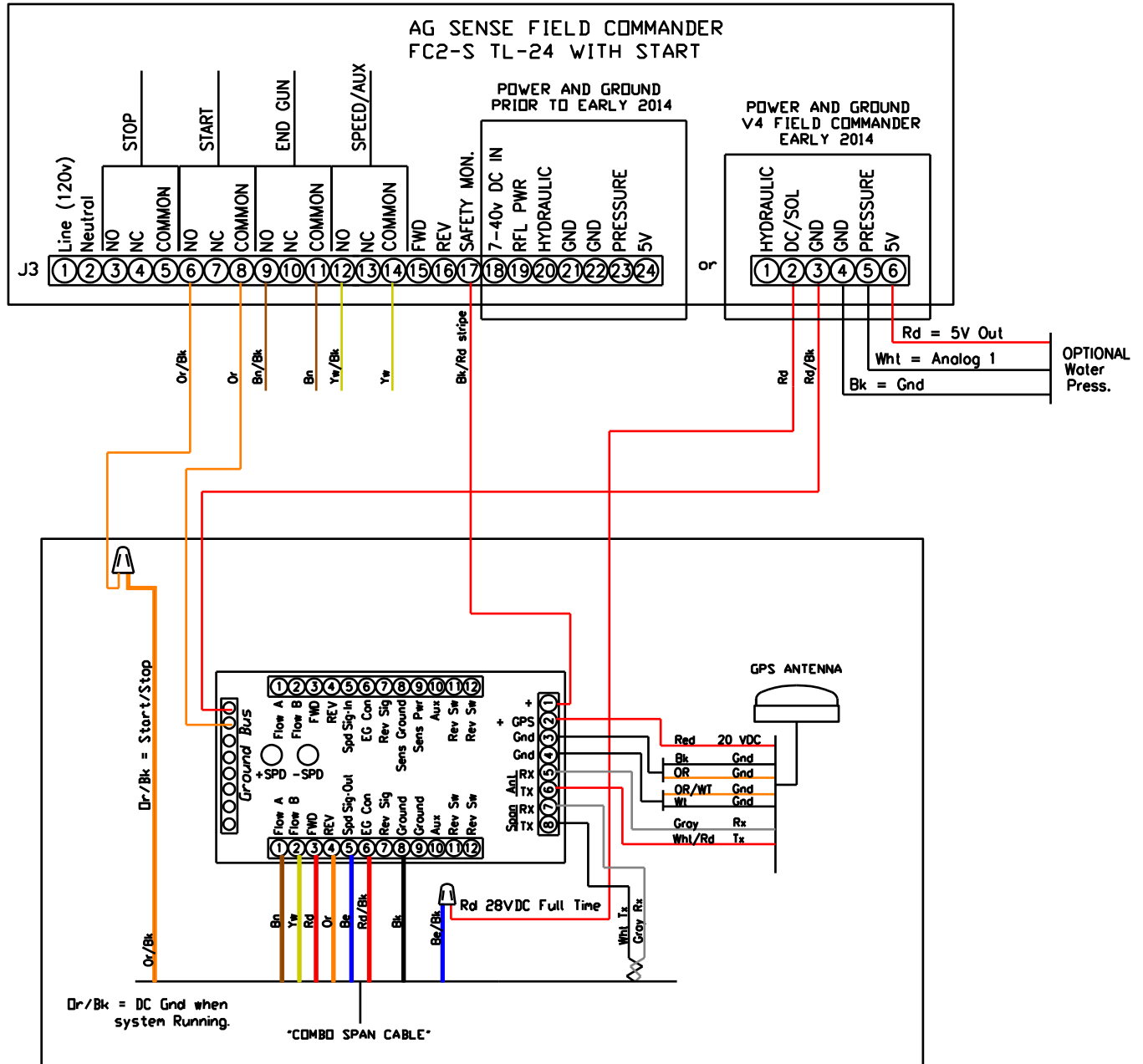
- Use Rd/Bk Span Cable Wire for 28VDC Full Time Power
- AgSense Powered Full Time from Rd/Bk Span Cable Wire.
- End Gun Control will be from the AgSense Field Commander, program angles on website.
- 16/10 Span Cable, Yw/Bk used for Start/Stop control.





### End Tower Wiring – Precision Point Control III w/GPS to Control End Gun

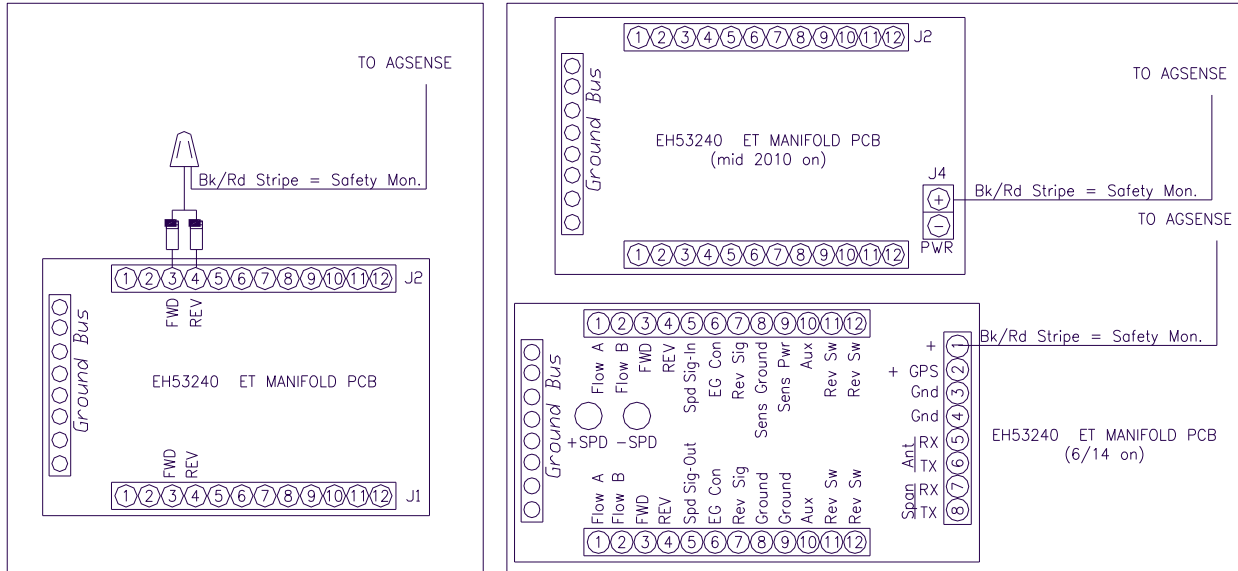
- Shown with no Auto Reverse Switch, using PPC III for End Gun Control
- Use Be/Bk Span Cable Wire for 28VDC Full Time Power
- “Combo” Span Cable shown, Or/Bk used for Start/Stop control.





### End Tower Wiring – ET Manifold PCB Prior to 2010

- Use Diodes to provide Safety Monitor power if “PWR” Block not on Circuit Board.



### Operation Explanation – Field Commander with Start

Red to AgSense= +28V Full Time so Field Commander ready to start system any time from web.

Start Command = Closes Start Relay and waits 10 minutes to see power on Bk/Rd Stripe Safety Mon.  
- If Crop Link Radio used, it tells the Water Pump to start.

When pivot starts, +28VDC will be applied on the Bk/Rd Stripe Safety Mon., then Field Commander knows pivot running.

Any Pivot Safety will result in loss of power to Safety Mon. and Start Relay will open.

If Started Locally (Remote-Local Switch to Local and pivot started in field), when Field Commander sees +28 VDC on Safety Mon., then the Start Relay will close in 3 secs. Then the Remote-Local Switch can be moved to Remote and now ready for web control.

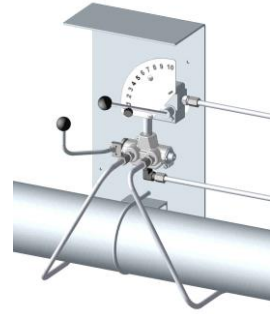
- If Crop Link Radio used, it tells the Water Pump to start.





**Overview – MANUAL END TOWER CONTROL Pivots.**

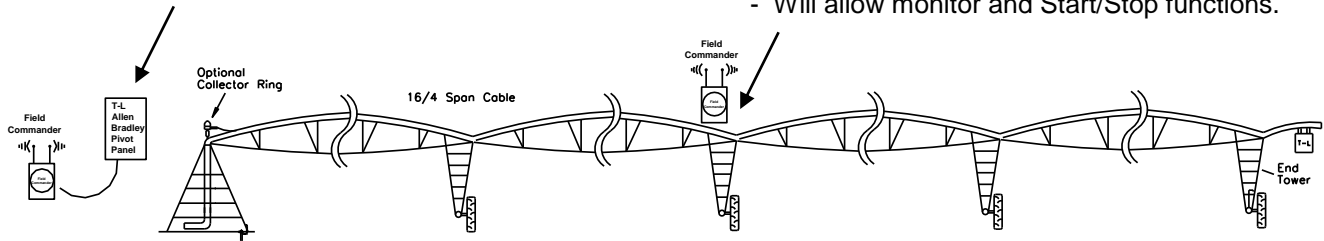
The following wiring diagrams are for T-L Pivots with Manual Control that are using the FC2-S TL-24 powered version of the Field Commander with START and not the Solar version.



**Field Commander Location at Panel or 2 Towers from Pivot Point**

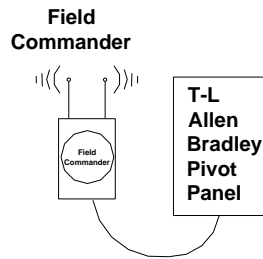
- Mount at T-L Allen Bradley Electric Panel
- Will not show correct Angle location of Pivot on Wagnet website.
  - Will allow monitor and Start/Stop functions.

- Mount 2 Towers Out:
- Requires 16/4 Span Cable
  - Optional Collector Ring at Pivot Point
  - Will show Angle location of Pivot on Wagnet Website.
  - Will allow monitor and Start/Stop functions.



**Field Commander Location at Allen Bradley Electric Panel**

Field Install and wire into Panel per diagrams following.



**Field Commander Installation 2 Towers from Pivot Point**





Wiring Diagrams for START - Manual Control Pivot.

Wiring Diagram for Start, Electric Hydr Pumping Unit, FC at Allen Bradley Panel

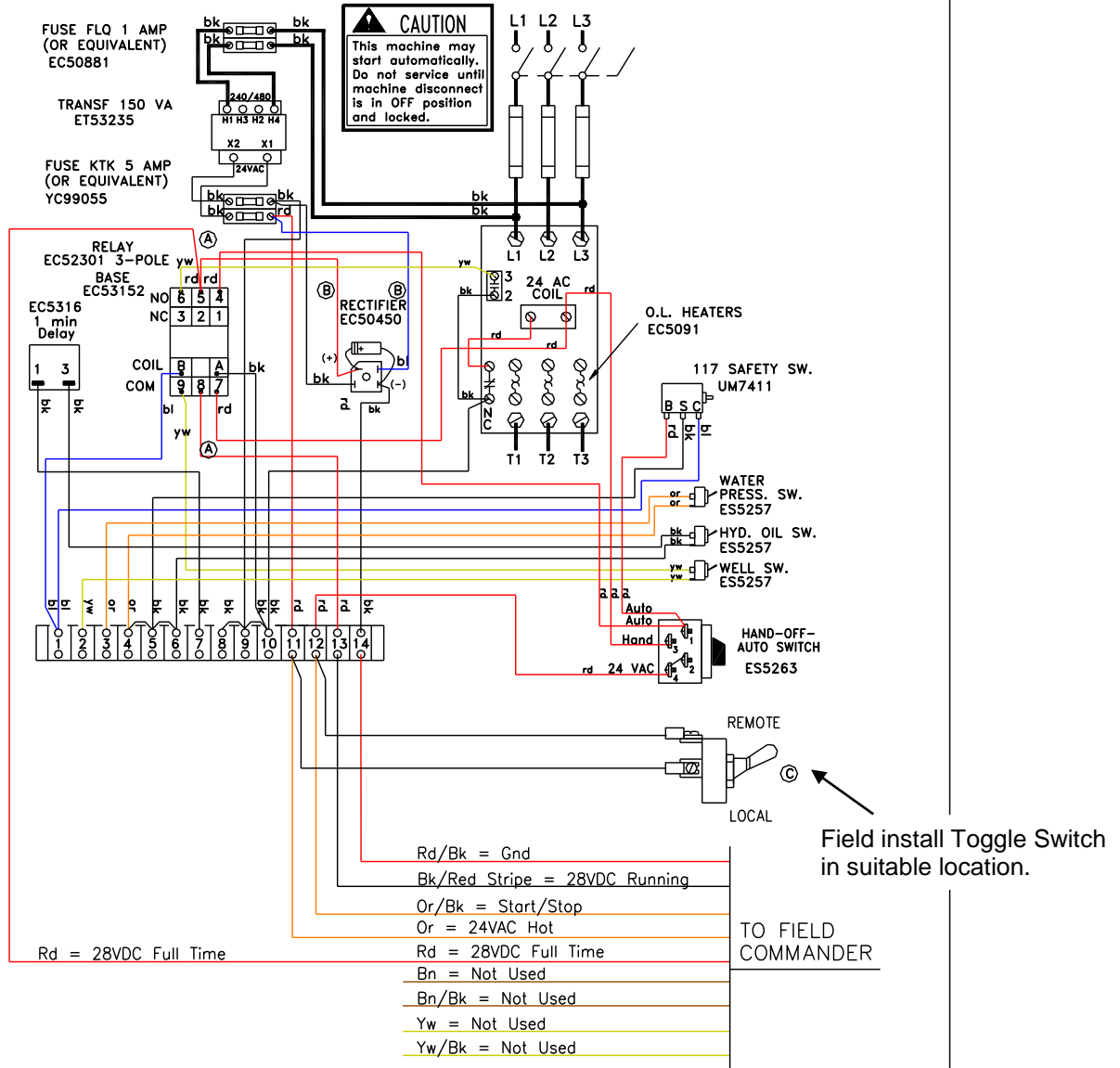
Note: Route Cable connected to AgSense Field Commander into Allen Bradley Panel.

Page 1 of 2 Basic Allen Bradley Panel – No Water Pressure Switch connected.
- Note 3 Pole Relay Modification required.

AgSense MODIFICATION USING 3 POLE RELAY (FIELD COMMANDER-START)

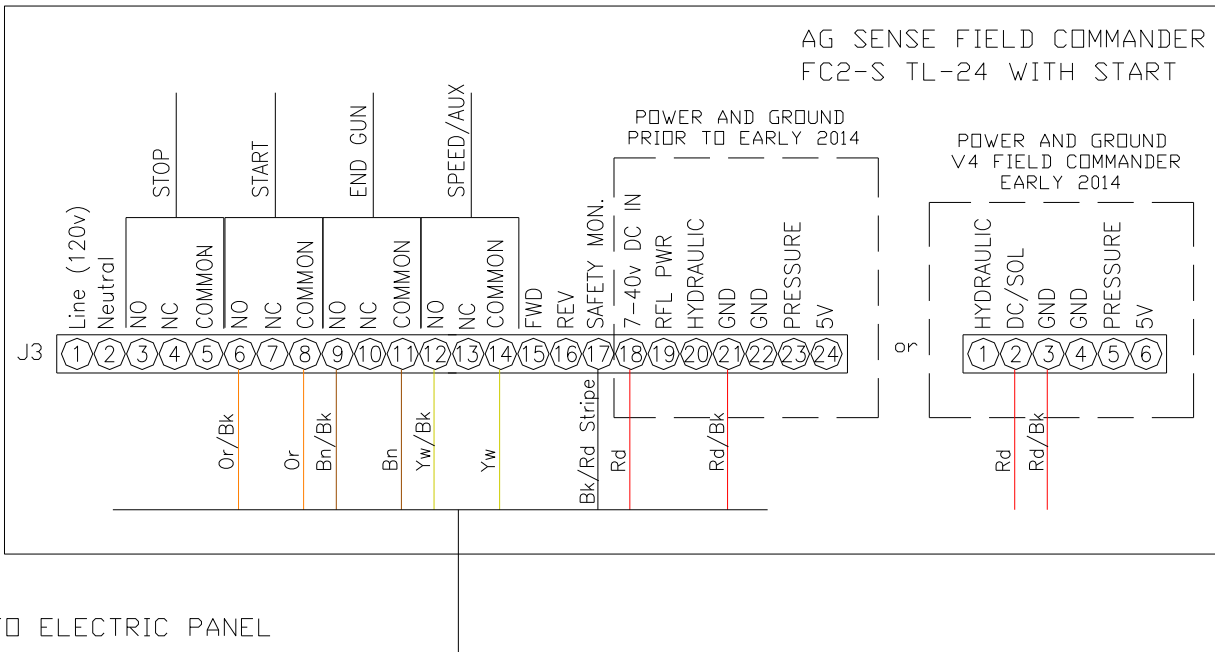
NOTE - FIELD WIRING CHANGES
A. Replace Ice Cube 24VAC Relay with 3 Pole, Add Wires to Relay Base #5 & #8.
B. Change wiring to Rectifier to provide "Full Time" power to AgSense.
C. Drill Hole and add Remote/Local Toggle Switch.

WIRING DIAGRAM T-L ELECTRIC DRIVEN HYDRAULIC PUMP
CD5178 SPECIAL 8/15/12





Page 2 of 2 (Electric with Start, Field Commander at AB Panel)



OPERATION:

Red = +28V Full Time so Field Commander ready to start system any time from web.

Start Command = Closes Start Relay and waits 10 minutes to see power on Bk/Rd Stripe Safety Mon.

When pivot starts, +28VDC will be applied on the Bk/Rd Stripe Safety Mon. then Field Commander knows pivot running.

Any Pivot Safety will result in loss of power to Safety Mon. and Start Relay will open.

If Started Locally (Remote-Local Switch to Local and pivot started in field), when Field Commander sees +28 VDC on Safety Mon., then the Start Relay will close in 3 secs. Then the Remote-Local Switch can be moved to Remote and now ready for web control.



### Wiring Diagram for Start, Electric Hydr Pumping Unit, FC at 2 Towers from Pivot Point

- Notes: 1. Replace Cable connected to AgSense Field Commander with 16/4 Cable.  
 2. Collector Ring not shown, wire through Collector Ring if necessary.  
 3. Add Interface Relay, supplied with 24V Installation Kit.

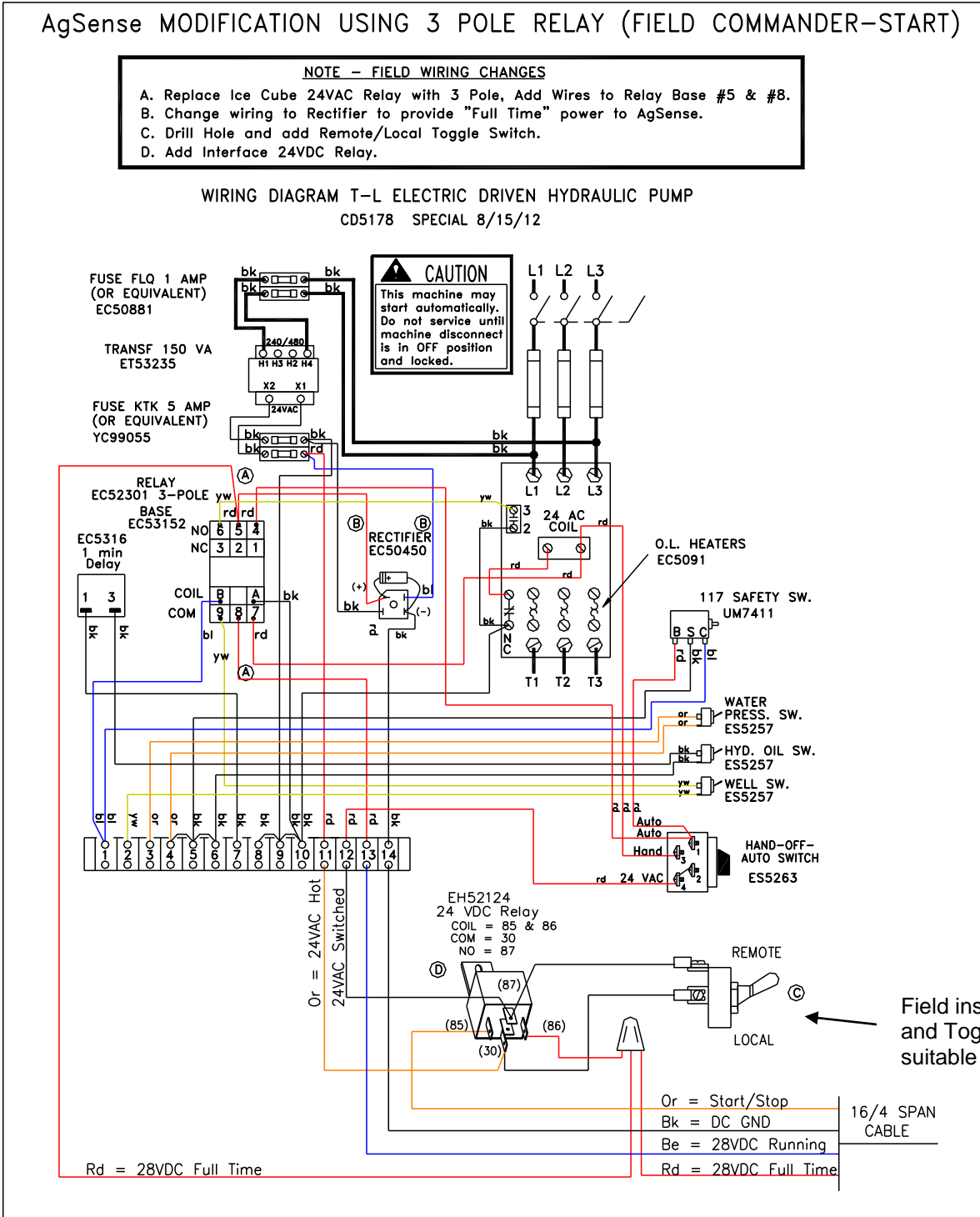
**Page 1 of 2** Basic Allen Bradley Panel – No Water Pressure Switch connected.  
 - Note 3 Pole Relay Modification required.

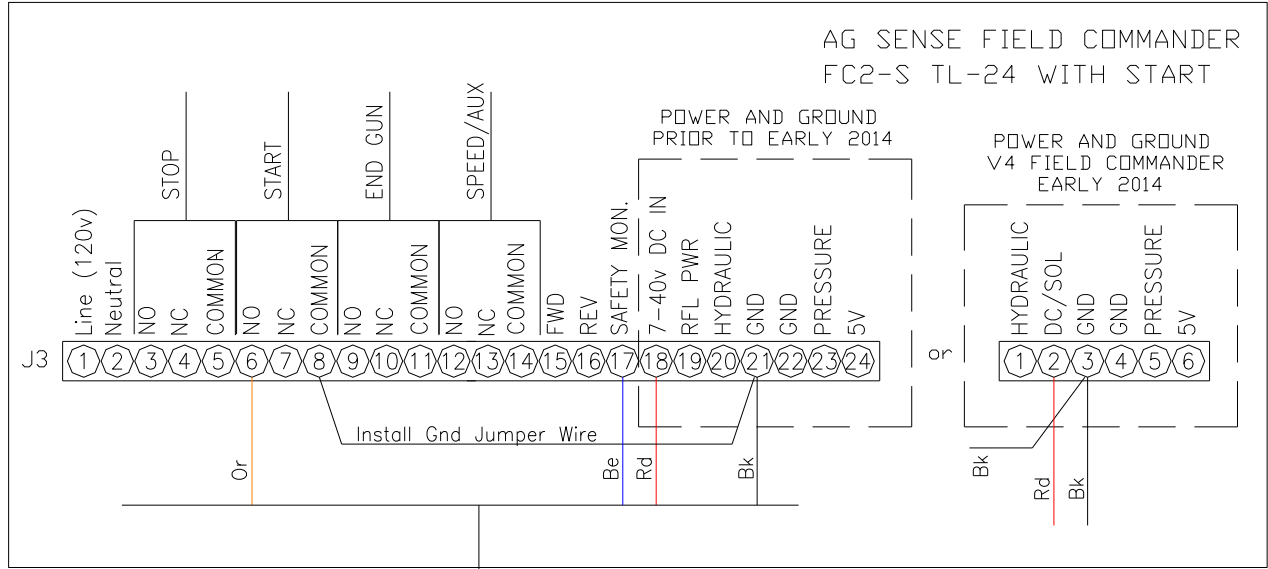
### AgSense MODIFICATION USING 3 POLE RELAY (FIELD COMMANDER-START)

**NOTE – FIELD WIRING CHANGES**

- A. Replace Ice Cube 24VAC Relay with 3 Pole, Add Wires to Relay Base #5 & #8.
- B. Change wiring to Rectifier to provide "Full Time" power to AgSense.
- C. Drill Hole and add Remote/Local Toggle Switch.
- D. Add Interface 24VDC Relay.

WIRING DIAGRAM T-L ELECTRIC DRIVEN HYDRAULIC PUMP  
 CD5178 SPECIAL 8/15/12





16/4 SPAN CABLE

Unwire AgSense Cable,  
& Wire in 16/4 Span Cable.  
(So Junction Box not required.)

**OPERATION:**

Red = +28V Full Time so Field Commander ready to start system any time from web.

Start Command from Website = Closes Start Relay and waits 10 minutes to see power on Blue Safety Mon.  
- If Crop Link Radio in Field Commander, it tells the Crop Link at the Water Pump to start. (If don't want water, need to have Water Pump Panel "Off".)

When pivot starts, +28VDC will be applied on the Blue Safety Mon. then Field Commander knows pivot running.

Any Pivot Safety will result in loss of power to Safety Mon. and Start Relay will open.

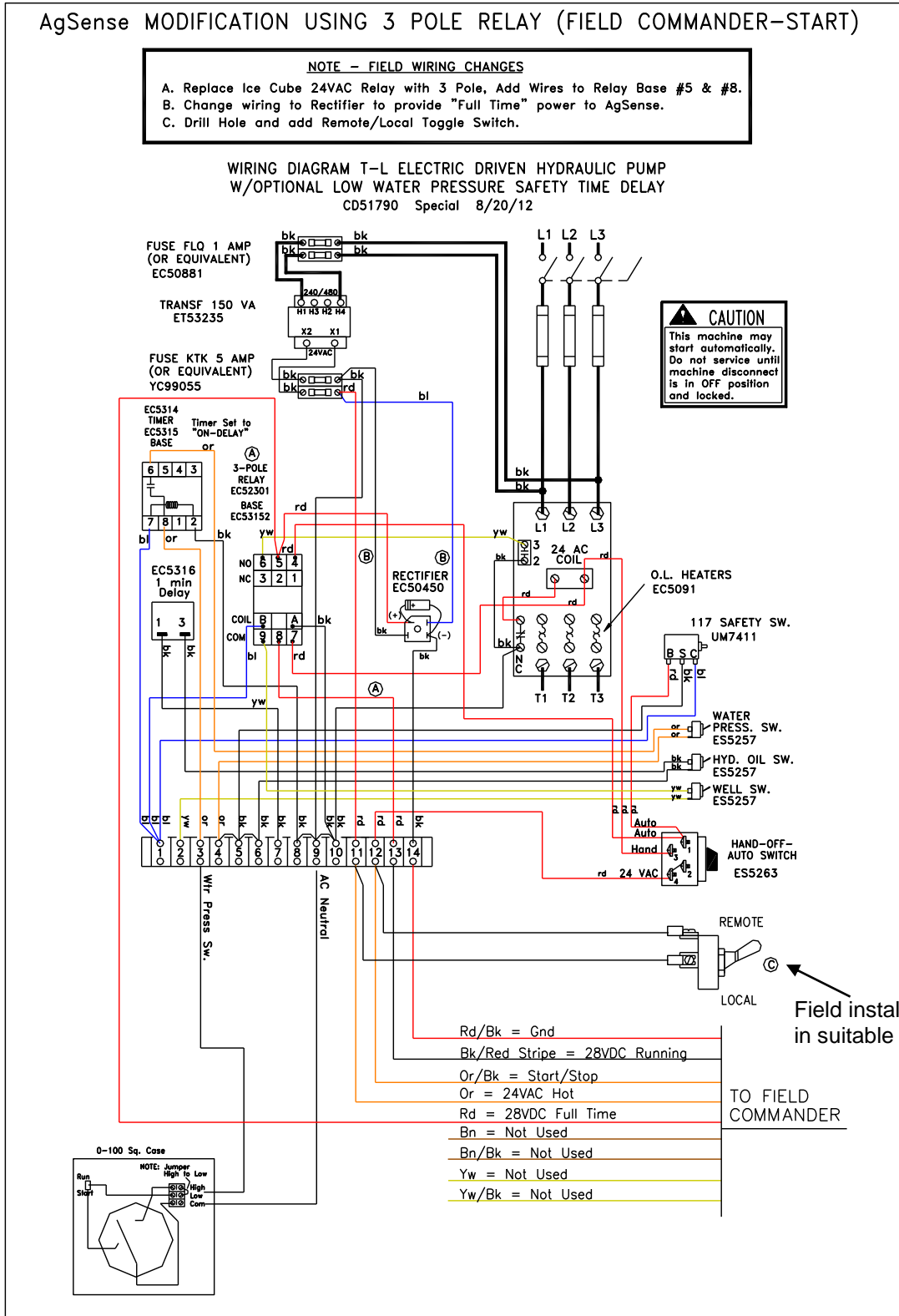
If Started Locally (Remote-Local Switch to Local and pivot started in field), when Field Commander sees +28 VDC on Safety Mon., then the Start Relay will close in 3 secs. Then the Remote-Local Switch can be moved to Remote and now ready for web control.  
- If Crop Link Radio in Field Commander, it tells the Crop Link to start the Water Pump.



### Wiring Diagram T-L Allen Bradley Electric Panel

- With Low Water Pressure Safety Auto Restart

- AgSense Field Commander located at AB Panel, wire FC as shown on Page 18 above.

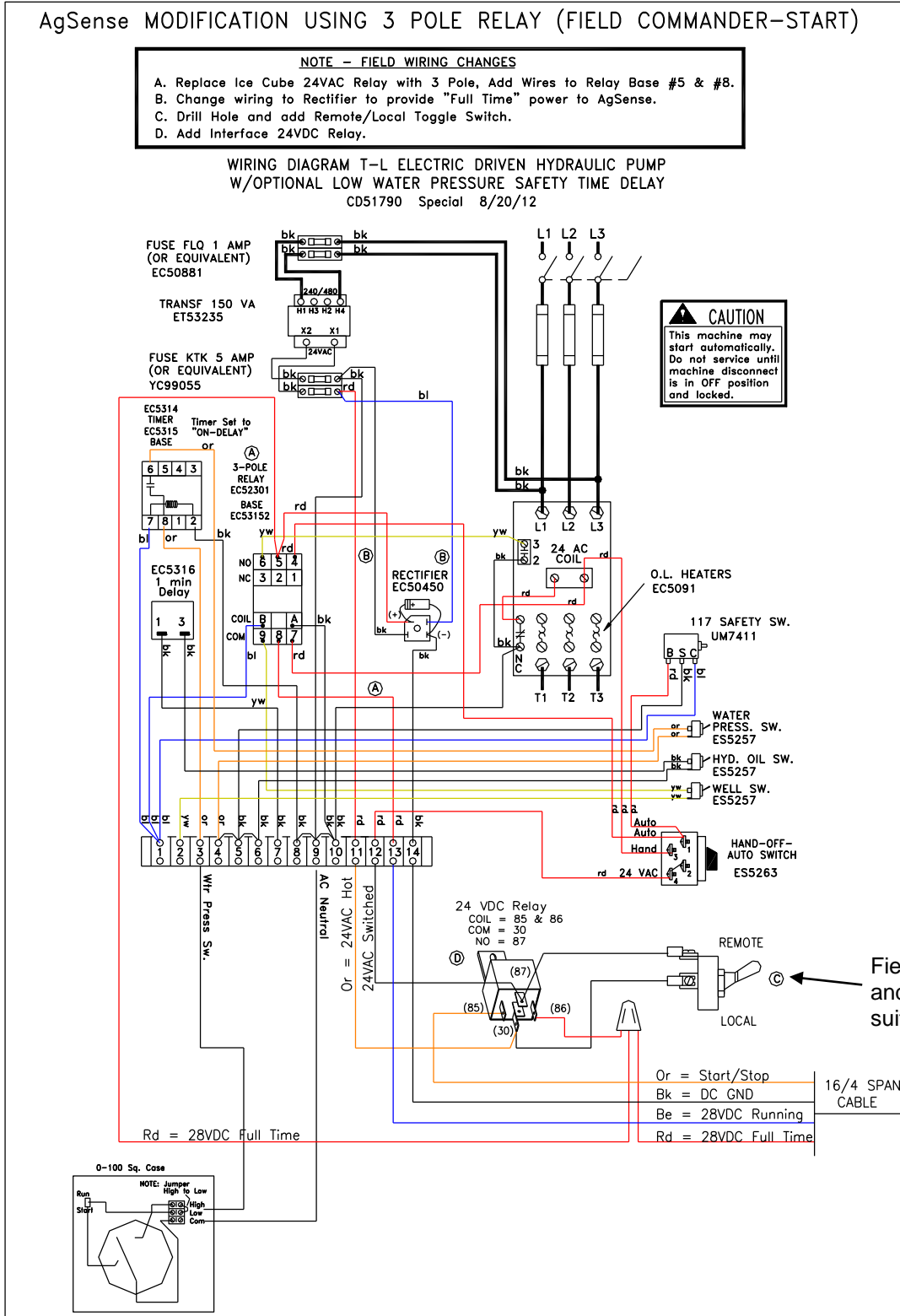




### Wiring Diagram T-L Allen Bradley Electric Panel

- With Low Water Pressure Safety Auto Restart

- AgSense Field Commander located 2 Towers from Pivot Point, wire FC as shown on Page 20 above.



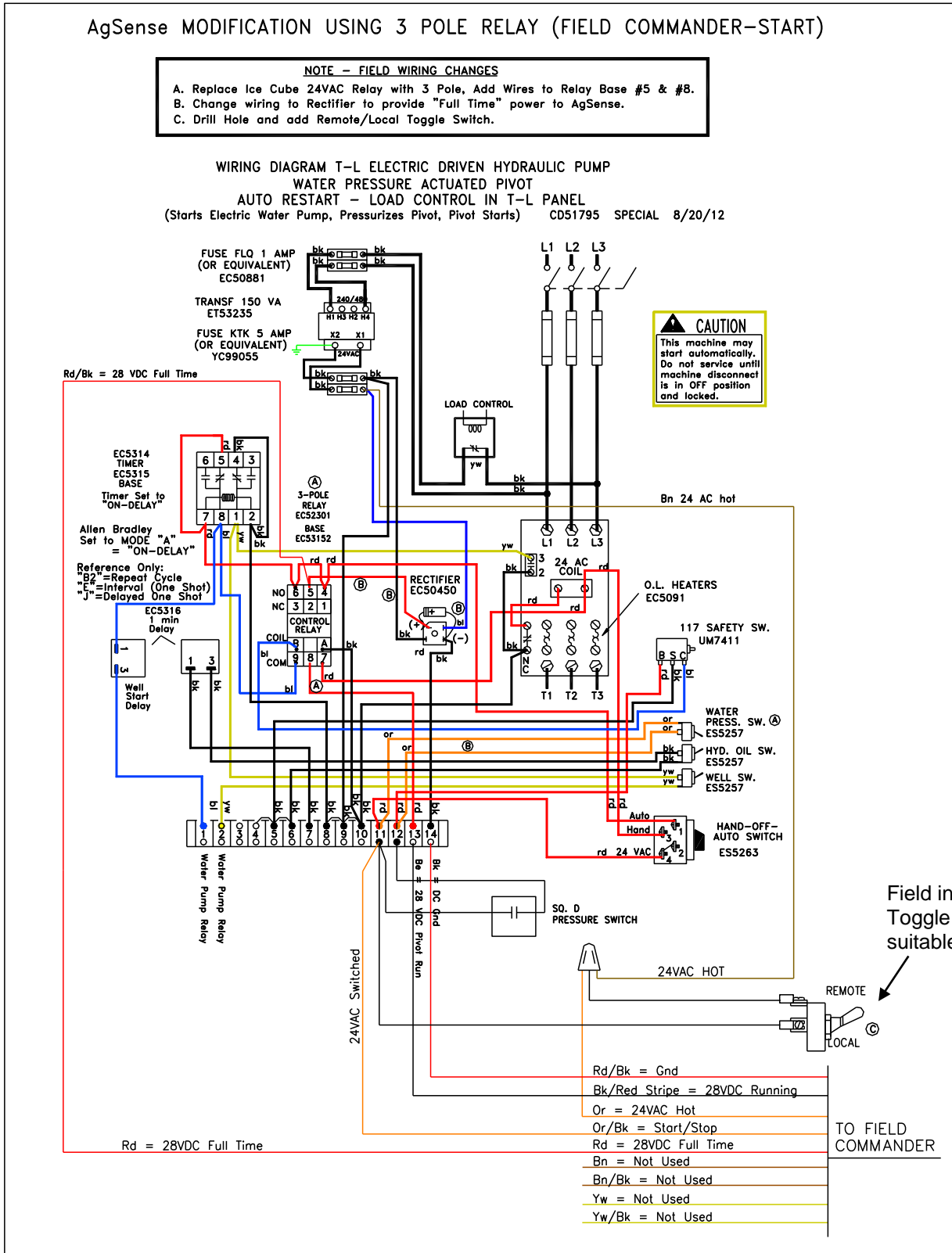




### Wiring Diagram T-L Allen Bradley Electric Panel

- With Load Control Water Pressure Auto Restart

- AgSense Field Commander located at AB Panel, wire FC as shown on Page 18 above.





### Wiring Diagram T-L Allen Bradley Electric Panel

- With Load Control Water Pressure Auto Restart

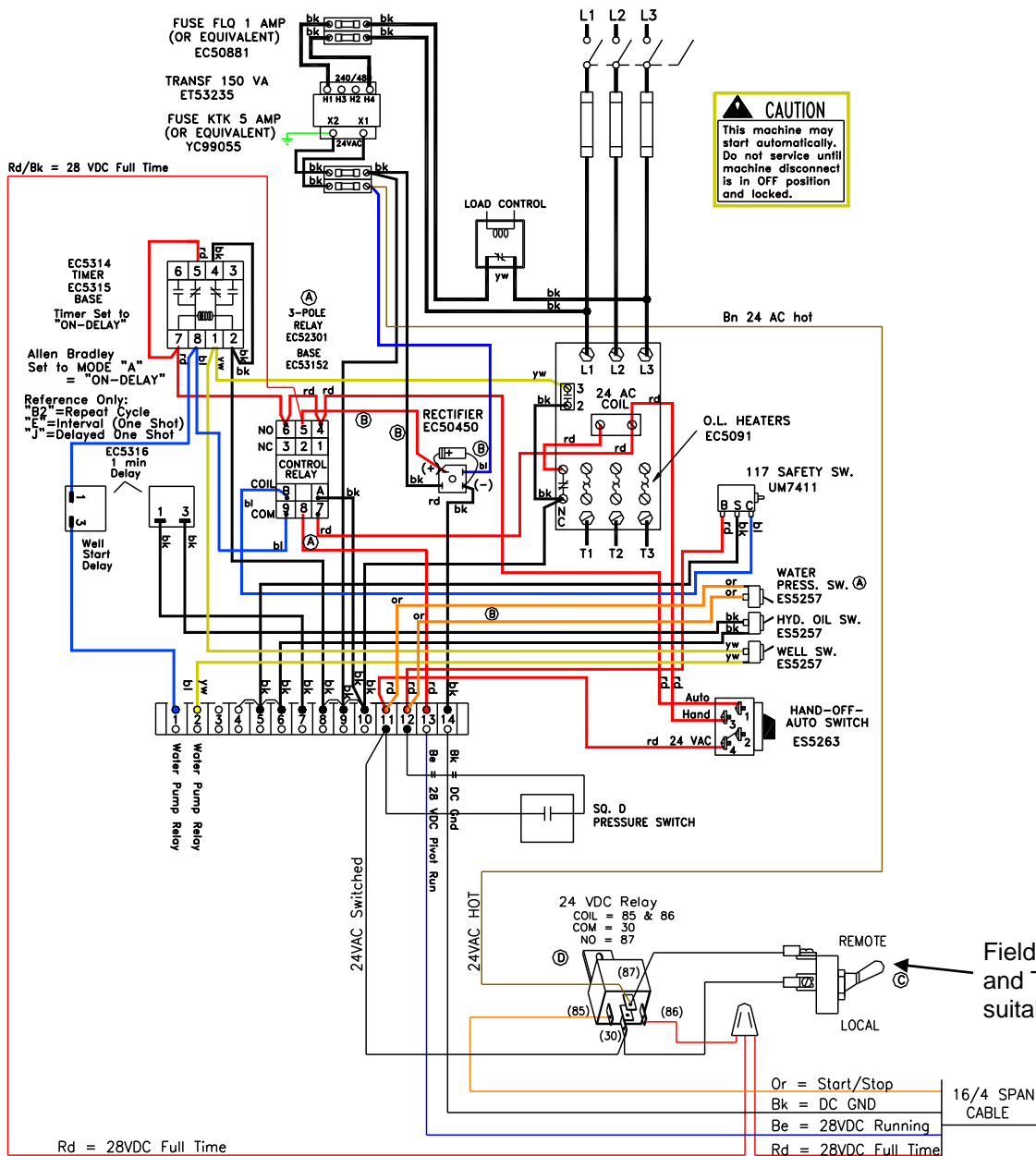
- AgSense Field Commander located 2 Towers from Pivot Point, wire FC as shown on Page 20 above.

#### AgSense MODIFICATION USING 3 POLE RELAY (FIELD COMMANDER-START)

**NOTE - FIELD WIRING CHANGES**

- A. Replace Ice Cube 24VAC Relay with 3 Pole, Add Wires to Relay Base #5 & #8.
- B. Change wiring to Rectifier to provide "Full Time" power to AgSense.
- C. Drill Hole and add Remote/Local Toggle Switch.
- D. Add Interface 24VDC Relay.

WIRING DIAGRAM T-L ELECTRIC DRIVEN HYDRAULIC PUMP  
 WATER PRESSURE ACTUATED PIVOT  
 AUTO RESTART - LOAD CONTROL IN T-L PANEL  
 (Starts Electric Water Pump, Pressurizes Pivot, Pivot Starts) CD51795 SPECIAL 8/20/12



Field install Relay and Toggle Switch in suitable location.



### Wiring Diagram T-L Allen Bradley Electric Panel

- Field Commander with Crop Link Radio Water Pump Control
- Water Pressure Auto Start

- AgSense Field Commander located 2 Towers from Pivot Point, wire FC as shown on Page 20 above.

#### T-L ELECTRIC POWER – ALLEN BRADLEY PANEL

AgSense MODIFICATION USING 3 POLE RELAY – Field Commander with Crop Link

- Crop Link starts Water Pump, Water Pressure Start Pivot 5/24/13 NJS

**NOTE – FIELD WIRING CHANGES FOR AGSENSE FIELD COMMANDER**

- Replace Ice Cube 24VAC Relay with 3 Pole, Add Wires to Relay Base.
- Change wiring to Rectifier to provide "full time" power to AgSense.
- Remove Red wire Fuseblock to term 11, attach Bn wire to Fuseblock.
- Drill Hole and add Remote/Local Toggle Switch.
- Add Interface 24VDC Relay.

**NOTE – FIELD WIRING CHANGES FOR WATER PRESSURE START**

- Turn Water Pressure Switch Upside Down  
Toggle Up = Wet (Open) Toggle Down = Dry (Closed)
- Move Orange Wires on Water Pressure Switch from 3 & 4 to 11 & 12
- Remove Jumper on bottom of 11 & 12

