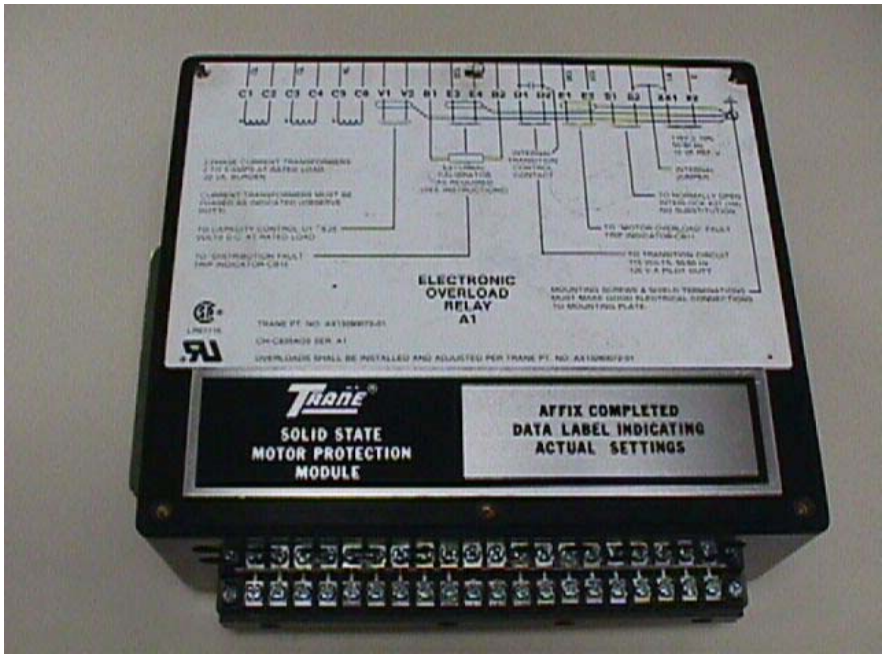
Installation

Replacement of RLY00765 with KIT09437 using Tracer CH531 Components



Models: CVRD, KIT09437, CVHE

PART-SVN82C-EN

Table of Contents

General Information

Warnings and Cautions

NOTICE: Warnings and Cautions appear at appropriate sections throughout this literature. Read these carefully.

⚠ **WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION: Indicates a situation that may result in equipment or property-damage only accidents.

Literature Change History

PART-SVN82A-EN (March 2004)

Original issue of manual. Describes the installation procedures required to replace Trane motor protection module, RLY00765. This new KIT09437 uses a portion of the Tracer™ CH530 controls system.

PART-SVN82B-EN (July 2004)

Revisions to original issue of manual. Updated wiring diagrams and detailed wiring instructions. Updated to improve layout, content and diagrams.

PART-SVN82C-EN (September 2004)

Minor revisions to manual. Updated ship with list in Table 1 and wiring instructions found in Table 2. Added information in removal of components.

About this manual

RLY00765, the Trane Motor Protection Module (also called the Electronic Overload, A1), is no longer available.

KIT09437 is a functional replacement utilizing components used with Tracer CH531 control systems. It is not a complete CH531 controls package installation. It does not provide distribution fault protection. As configured this kit does not provide momentary power loss. It can provide phase loss and phase rotation protection along with standard motor protection features relating to currents and load. This kit will measure motor currents and provide an analog output to be used as input for existing temperature control device like the MOD00182.

To properly install this replacement, the technician must have a good, working knowledge of Tracer CH530 or CH531 control systems.

Three (3) new current transformers (CTs) are required to complete this installation. They are not included in this kit. They must be ordered separately based on unit RLA. See Table C4 or C5 in Appendix C for CT sizing details and part numbers.

General Information

Table 1. Main components of KIT09437

Qty	PRIDE part #	Description
1	TRR01701	2T5, 120 Vac to 27 Vac transformer
1	BRD02102	2A50, CH531 Power supply
1	BRD02945	2A54, Dual Analog Input/Output (DAIO) LLID
1	BRD02944	2A56, Dual Relay Output (DRO) LLID
1	BRD02942	2A53, Dual Binary Input (DBI) LLID
1	MOD01404	2A55, DynaView human interface
1	BRD02950	2A1, Starter Module
1	TRR01860	2K40, Signal Conditioner [2-10 Vdc to 0-(-8.25) Vdc]
1	BLK00855	8 pin mounting base for Signal Conditioner, TRR01860
2	RLY02547	2K12, Relay, SPDT, 10 amp rating
1	RLY01710	2K11, Relay, DPDT, 12 amp rating
1	no part number	Terminal block on Din Rail
3	Not Included (see note 1)	Current Transformers (CTs)-See note 1

Note 1: Three (3) new current transformers (CTs) are required to complete this installation. They are not included in this KIT. They must be ordered separately based on unit RLA. See Table C4 or C5 in Appendix C for CT sizing details and part numbers.

Field provided material

Some field provided material will be required to perform the replacement. This is a partial list in addition to normal tools and hardware.

- Wire-red #16 AWG control wire will be required to make the connections between LLIDs and between LLIDs and existing components.
- Computer and cable for CH530 system programming.
- Wire markers, wire nuts, cable ties, and wire splicers-wire markers will be required to identify field installed wiring. Wire nuts and splicers may be needed to splice wires to complete wiring runs. Cable ties may be needed to "clean up" wiring runs.
- Digital multi-meter, with phase detection capability.

Installation

Removal of Components

⚠ WARNING
Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

It is assumed that all work can be done inside the starter panel. No wiring should have to be done in the control panel. However, access to the control panel to verify wiring origins may be necessary.

Removal of Motor Protection Module (A1 or MPM), and Circuit Breakers CB11 and CB15

1. Before removing the MPM, mark wires landing on V1, V2, D1 (wire #125B) & D2 (wire #127A). These wires will be re-landed on CH531 components.
2. Remove wires from CTs that land on C1-C6. The existing CTs can be removed and discarded. New CTs will be used with CH531 components. The new CTs are not included in this KIT. They must be ordered separately. See Table 1 in Appendix C for details.
3. Remove wires (#130 and #131) for CB11 (Compressor Motor Current Overload) from F1 and F2. Remove wires (#132 and #133) for CB15 (Distribution Fault) from E3 and E4. These two circuit breakers, CB11 and CB15, in the starter panel door will have to be removed as they will no longer be required, the functions will be performed by the CH531 components.

See Appendix B for wiring details.

A sheet of black vinyl is included so that "patches" may be cut to fit and be placed over the holes in the starter door where these breakers were mounted.

The Starter Circuit Fault Indicator (CB13) can remain as wired.

Remove the remaining wires from the MPM and remove the module.

When complete the bottom bracket should be left attached to the starter backpanel. The new component sub-panel sent in this kit will attach to the tapped holes on the flanges of the existing bottom bracket.

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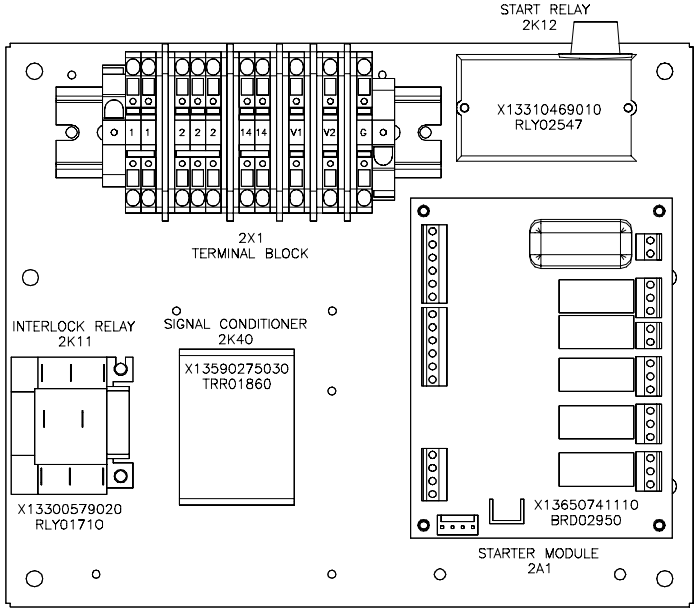
Mounting and wiring of LLIDs on backpanels

Install the LLIDs and components on the backpanels provided as shown in Figure 1.

Figure 1. Component layout, top and bottom panels



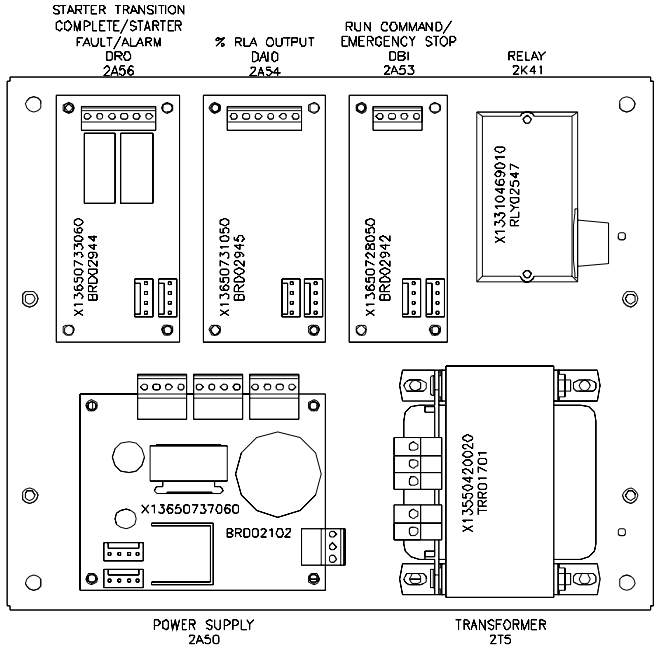


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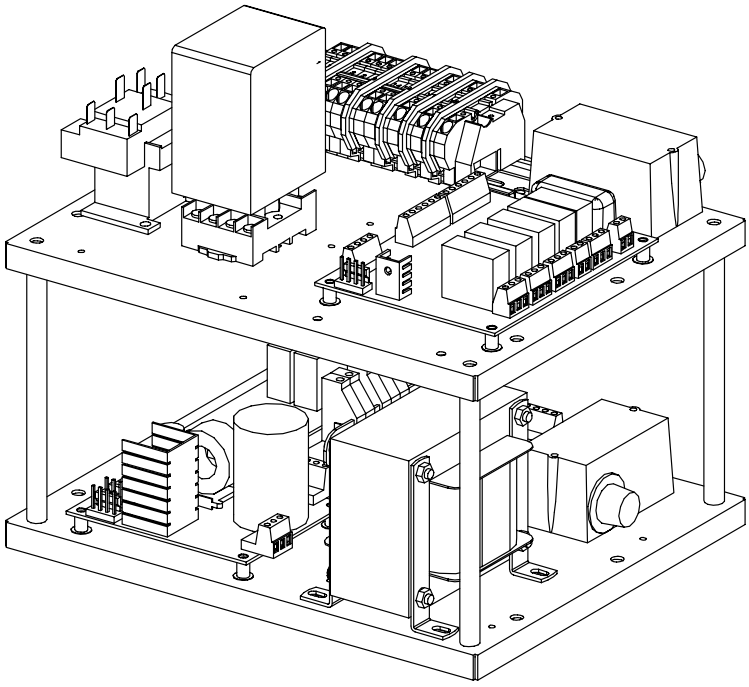
Figure 2. Panel assembly detail



Assemble the two backpanels using the standoffs and screws provided. The standoffs must be attached to the bottom panel before it can be mounted in the starter panel.

First wire the connections between the LLIDs and components on the backpanels and the terminal block, 2X1 according to the following table. Note this wiring could be done prior to arrival on jobsite.

Installation

Table 1. Point to point wiring instructions for sub panel

	From		To	
Wire Number	**Component Number**	**Terminal Number (or Wire)**	**Component Number**	**Terminal Number (or Wire)**
711	Power supply, 2A50	J2-2	Transformer, 2T5	X1
712	Power supply, 2A50	J2-1	Transformer, 2T5	X2
710	Power supply, 2A50	J2-3	2X1, terminal block	2X1-G
713	Transformer, 2T5	H1	2X1, terminal block	2X1-1
714	Transformer, 2T5	H3	2X1, terminal block	2X1-2
708	Signal conditioner, 2K40	1	2X1, terminal block	2X1-1
709	Signal conditioner, 2K40	3	2X1, terminal block	2X1-2
704	Signal conditioner, 2K40	6	Dual Analog Input/Output, 2A54	J2-3
705	Signal conditioner, 2K40	5	Dual Analog Input/Output, 2A54	J2-1
706	Signal conditioner, 2K40	8	2X1, terminal block	2X1-V2
707	Signal conditioner, 2K40	7	2X1, terminal block	2X1-V1
Yellow	Relay, 2K41	Yellow wire	Dual Binary Input, 2A53	J2-1
Orange	Relay, 2K41	Orange wire	Dual Binary Input, 2A53	J2-2
White/ Yellow	Relay, 2K41	White/Yellow wire	2X1, terminal block	2X1-2
White/ Black	Relay, 2K41	White/Black wire	2X1, terminal block	2X1-14
W2	Dual Binary Input, 2A53	J2-3	Dual Binary Input, 2A53	J2-4 (See Note 1)
700	Starter Module, 2A1	J12-2	2X1, terminal block	2X1-2
702	Starter Module, 2A1	J10-3	2X1, terminal block	2X1-14
none	Starter Module, 2A1	J10-1	2K11 Interlock Relay	1
none	2K11 Interlock Relay	3	2K12 Start Relay	Yellow
none	2K12 Start Relay	Orange	2K11 Interlock Relay	Coil
none	2K11 Interlock Relay	Coil	2X1, terminal block	2X1-2
703	Starter Module, 2A1	J8-1	2K11 Interlock Relay	3
none	Starter Module, 2A1	J8-1	2K12 Start Relay	White/Black
none	2K12 Start Relay	White/Yellow	2X1, terminal block	2X1-2

Note 1: Jumper wire W2 required if Emergency Stop feature not used.

Installation

Wiring from backpanel components to starter components

Wiring from the terminal block and starter module can be run to various existing starter terminals. The terminal numbers used for the starter panel assume a Trane-provided, unit-mounted wye-delta starter. Other starter types may use different terminal numbering. See Appendix A for a copy of existing wiring diagrams used for this replacement.

The Starter Module will not control the entire starting process. The original sequence of events of the existing starter will be preserved. The starter module will initiate the start signal, provide a transition signal (for wye-delta starters), and monitor motor currents just as the MPM did. CH531 requires a "transition complete" signal back from the starter, which the MPM did not.

Table 2. Point to point wiring for backpanel to starter components

	From		To	
Wire #	**Component #**	**Terminal # (or Wire)**	**Component #**	**Terminal # (or Wire)**
715, 120 Vac "hot" in starter	2X1,Terminal block	2X1-1	2TB1, T. block	2TB1-H1 or F1
716, 120 Vac "neutral" in starter	2X1,Terminal block	2X1-2	2TB1, T. block	2TB1-N or 2
14	2X1,Terminal block	2X1-14	2TB1, T. block	2TB1-14 (see note 1)
V1	2X1,Terminal block	2X1-V1	2TB1, T. block	2TB1-V1 (see note 2)
V2	2X1,Terminal block	2X1-V2	2TB1, T. block	2TB1-V2 (see note 2)
125B	Starter Module, 2A1	J2-3	Wire #125B	See note 3
127A	Starter Module, 2A1	J2-1	Wire #127A	See note 3
701	Starter Module, 2A1	J12-1	2TB1-	2TB1-22 (see note 4)
101A-106A	Starter Module, 2A1	J7-1…6	CTs	See Appendix B for wiring details.
123	CB13	123	2K11	4
124	K28 contacts	124	2K11	6

Note 1: See Figure 3 for details

Note 2: The V1 and V2 terminals refer to the terminals on the U1 Capacity Control Module located in the unit control panel. These wires were connected to the MPM terminals V1 and V2. Re-land these wires on terminal block 2X1-V1 and -V2. See Figure 4 for details.

Note 3: The J2-1 & -3 connections on the starter module are to initiate transition. This function was performed by the D1 and D2 terminals on the MPM. Wire #125 was previously connected to D1. Re-land this wire on J2-3. Wire #127 was previously connected to D2. Re-land this wire on J2-1.

Note 4: The J12-1 input is indicating the starter has transitioned. It is wired on the NO contacts for the K28 Delta (run) contactor. On some starters, this is listed as

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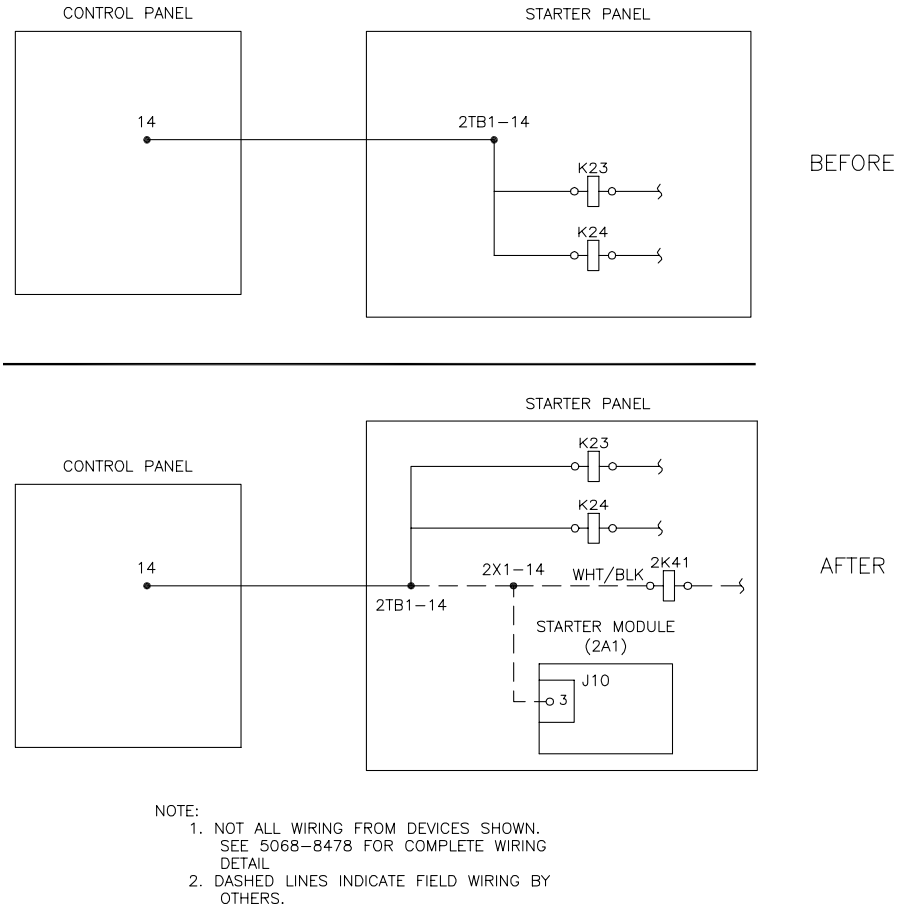
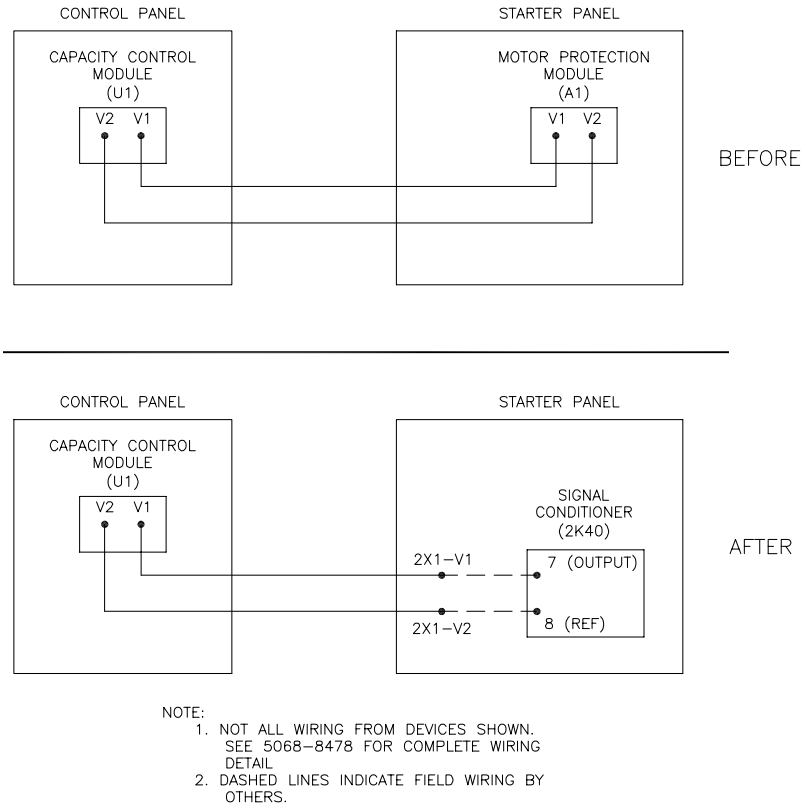
terminal 2TB1-7. On other starters this is shown as the terminal where the wire from the control panel terminal #22 is landed. It needs to be wired “downstream” of a set of the NO contacts of K28.

Figure 3. Wiring detail for start connection, 5068-8481, revision B



Installation

Figure 4. Wiring detail for 2X1-V1 and 2X1-V2 connections, 5068-8480, revision B



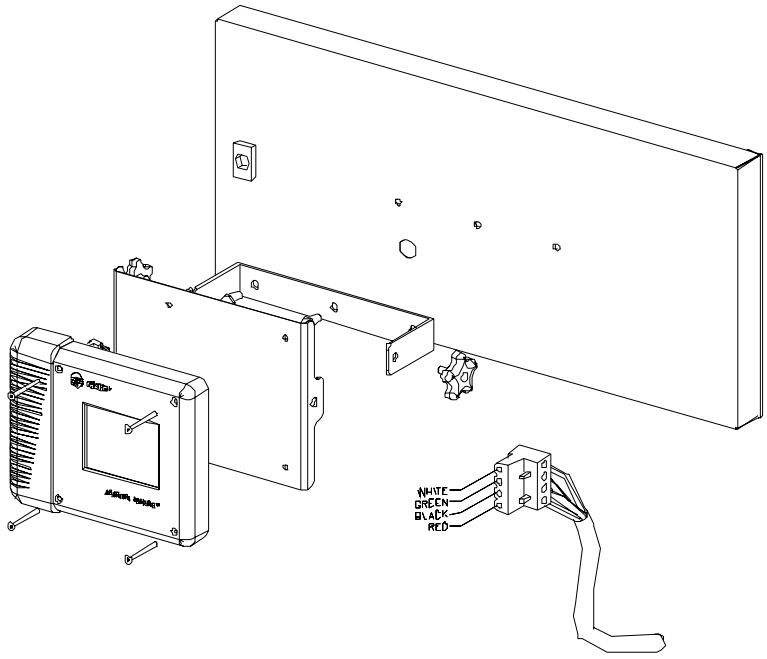
⚠ WARNING
Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components may result in death or serious injury.

Installation

Mounting the DynaView (2A55) human interface

Figure 5. Installing the DynaView and tilt bracket



1. If the tilt bracket is not required (DynaView mounted directly to door) skip Steps 2, 3, 6, and 8.
2. Attach the grommet in the 1" hole in the flat mounting panel (tilt bracket).
3. Mount the tilt bracket base to the door using the two screws provided.
4. Attach the Phoenix connector to the three foot long DynaView cable.
5. Attach the Phoenix connector on the DynaView cable to the DynaView (red-1, black-2, green-3, and white-4).
6. Thread the other end of the DynaView cable through the hole in tilt bracket flat mounting panel.
7. Attach the DynaView to the flat panel using the four screws/nuts provided. Watch that the cable does not become pinched between DynaView and the flat mounting panel. Only tighten enough to slightly compress the gasket. Be careful to NOT bottom out the DynaView against the panel, only the gasket should touch the panel.
8. Attach the flat mounting panel to the tilt bracket brace using the two threaded adjustment wheels provided.
9. Thread the DynaView cable through the hole in door.
10. Attach the DynaView cable to the four pin connection on LLID 2A50, power supply. (Note: this cable can be attached to any LLID as all LLIDs will be connected together on IPC bus.)

Startup

Connecting LLIDs onto the inter-processor communication (IPC) bus

Starting at the power supply, connect all LLIDs together to form the IPC bus using the IPC bus cable with connectors. Either the J1 or the J11 connection on each LLID may be used. Cut off extra cable and seal ends using CAP00876 and ADH00023.

Current transformer (CT) work

Three new CTs must be installed to complete this installation. The new CTs are not included in this KIT. They must be ordered separately. See Table 1 in Appendix C for details.

Before installing these CTs use a digital multi-meter, with phase detection capability to identify and mark incoming power, L1, L2 and L3 or phase A, B, and C.

Install the new CTs as shown on the wiring diagram in Appendix B. Pay careful attention to the polarity dot and it's orientation.

Wire the leads from the spade connectors to the starter module as shown on the wiring diagram.

Startup

The following table describes the steps to take the controls from "installed" to "operational". Specific details on certain steps (configuration, binding, etc.) are contained in appendices referenced in the particular step.

⚠ WARNING
Live Electrical Components!

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1. Obtain CH530 Software: From http://www.trane.com/commercial/software/tracerch530/, download the latest Java™ runtime, TechView™, and MP software. Select CVR software from drop-down list. After downloading be sure to install all files in the proper order following instruction provided on this website.
2. Run TechView on laptop and connect RS232 cable from laptop to DynaView.
3. Unplug the IPC bus (including DynaView) from the power supply LLID: this will isolate the power supply LLID.
4. "Power Up" the existing control panel using auxiliary power.
5. Re-connect IPC bus to power supply and DynaView.
6. From the Chiller Software tab in TechView, download "CVR" MP software onto DynaView.
7. Configure the software in TechView using the "Unit Type", "CH530", and "Starter"

Startup

tabs in Configuration View: See Appendix C for details on configuration items. Write the selected values in the table provided in Appendix C for future reference.

8. Bind the LLIDs using Binding View: See Appendix D for binding details.
9. Adjust the setpoints using Setpoint view: See Appendix D for details on setpoint items. Record the entered values in the table in Appendix E.
10. Dry run the starter:

- Make sure starter disconnect is locked open
- Use the manual override view to initiate starter test mode
- Observe correct operation of (if applicable for starter type present):
- Start relay
- Transition relay
- Disable starter test mode

11. Power up chiller:

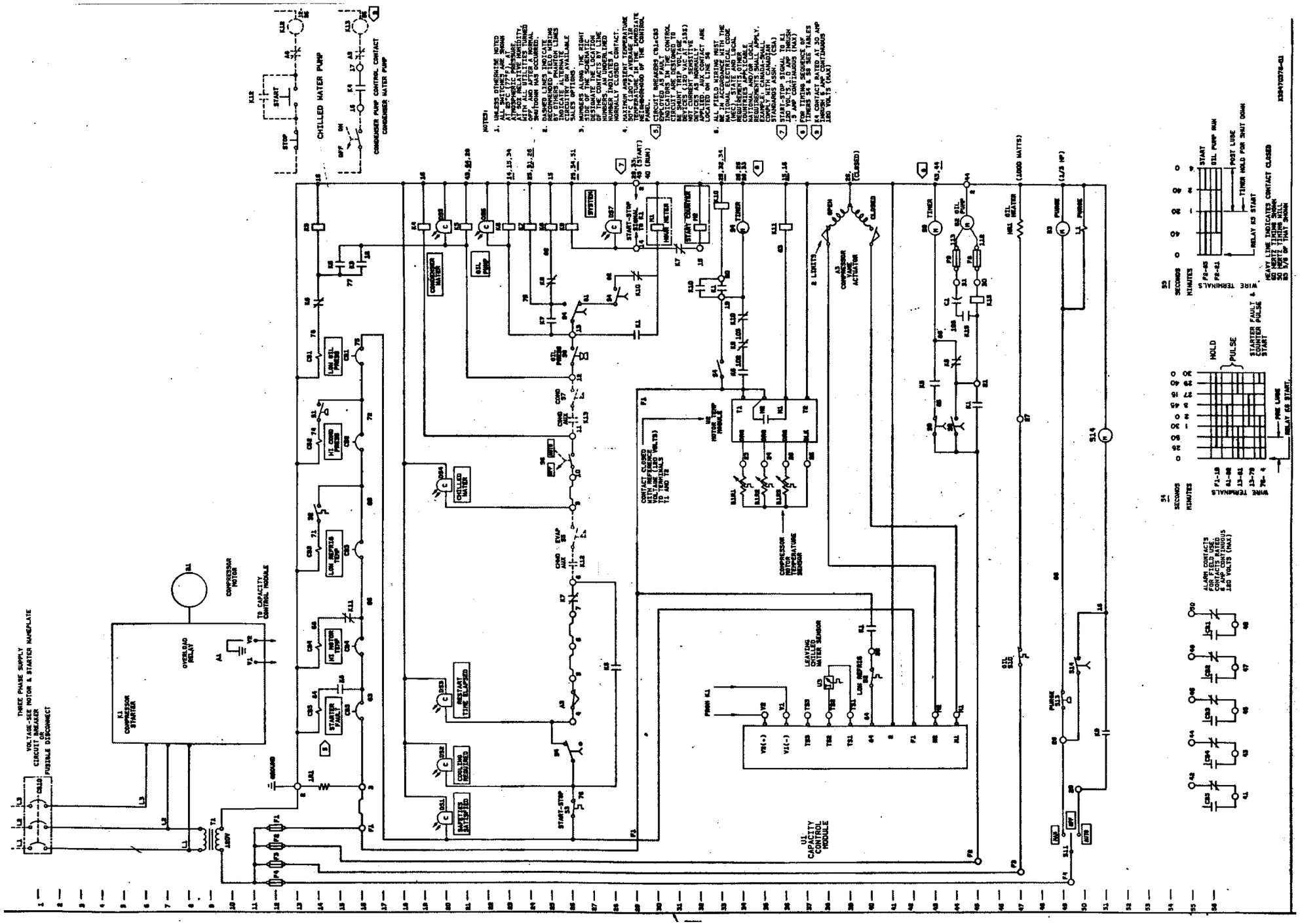
- Remove 115 V temporary power from starter.
- Replace fuse in CPT.
- Energize starter panel with line voltage by re-closing starter disconnect.

12. Place clamp on ammeter on one of the L1, L2 or L3 legs.
13. Start chiller:
    Note: it may be desirable to put the Current Limit Setpoint to 40% initially to ensure items like CT Meter Scale are set correctly.
14. Observe startup:
    Confirm that unit starts and loads as expected.

    Note: If Contactor Integrity Test was enabled in Starter Configuration, contactors may be heard prior to actual start sequence in starter cabinet.
15. Check current and voltage readings:
    Verify that the current reading on the front panel matches that on the handheld ammeter. If it does not, the CT meter scale may be set wrong.
16. Load Chiller:
    Adjust Current Limit Setpoint to 80% and ensure that front panel readings match handheld ammeter. Set final Current Limit Setpoint to desired operating level (typically 100%)
17. Additional information is contained in Appendix F including the unit view screen.

Appendix A

Figure A1. Original classic black wiring, X39470376 Rev. D



Appendix A

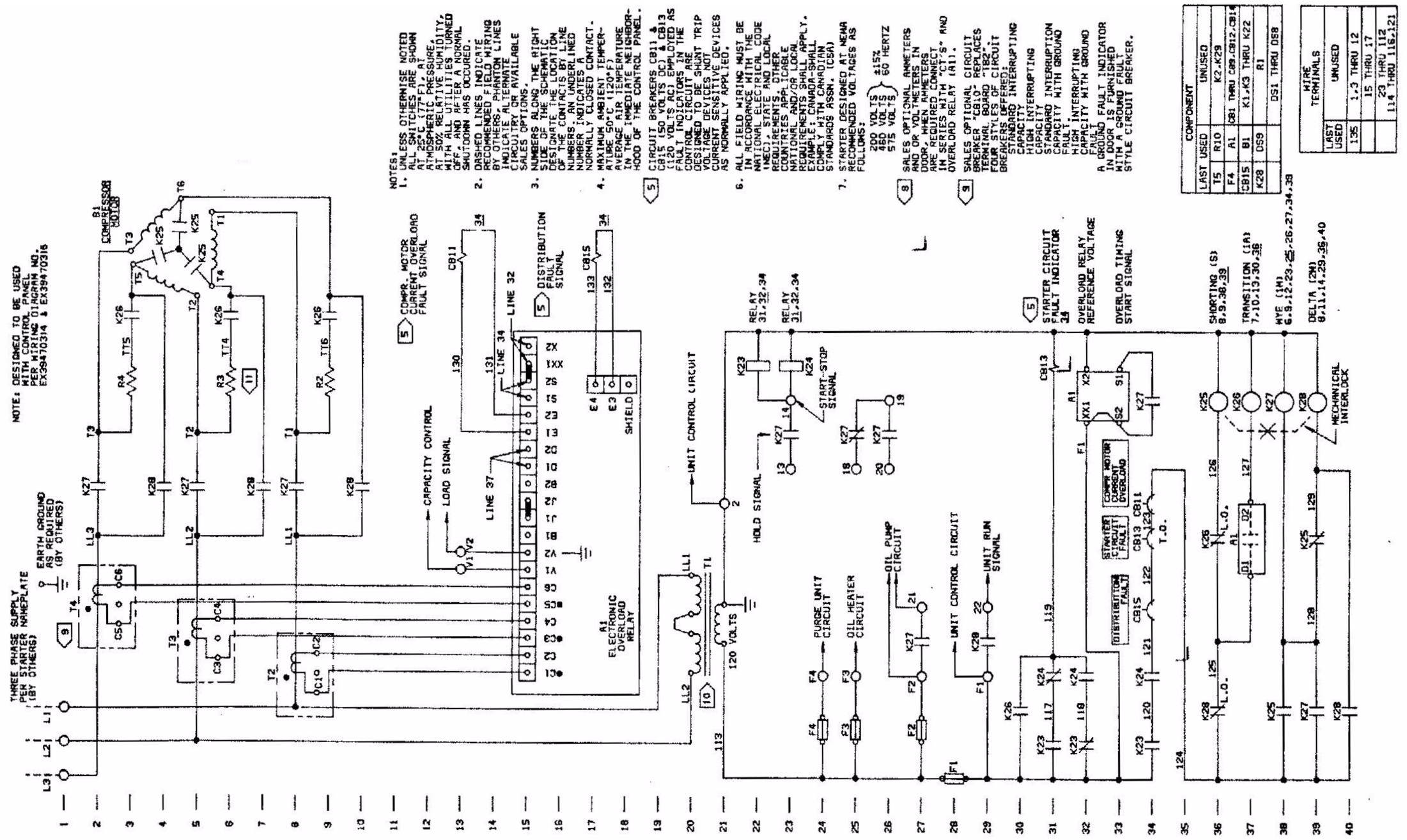
Figure A2. Wiring diagram legend

LEGEND

DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
A1	Electronic Starter Overload	K7	Prevent Voltage Feedback/De-energize Start Counter/Starter Fault-Arming Ckt.
A3	Compressor Vane Actuator	K8	Starter Fault-Trip Ckt.
A8	Chilled Water Pump Overload (Field-Supplied)	K9	Starter Fault-Arming Ckt./S4 Timer De-energized Ckt./Automatic Purge Operation
A9	Condenser Water Pump Overload (Field-Supplied)	K10	Start Pulse Signal/S4 Timer De-energized Ckt.
A12	Free-Cooling Liquid Line Valve Actuator (Optional)	K11	Hi Motor Temp. Trip Ckt
A13	Free-Cooling Gas Line Valve Actuator (Optional)	K12	Chilled Water Pump Starter
A14	Hot Gas Bypass Valve Actuator (Optional)	K13	Condenser Water Pump Starter
B1	Compressor Motor	K14	Oil Pump (Manual Purge Ckt.)
B2	Oil Pump Motor	K15	Oil Pump Starter Relay
B3	Purge Compressor Motor	K16	Electric Hot Gas Bypass Control Relay (Optional)
B1R1	Motor Temp. Sensor	L1	Purge Solenoid
B1R2	Motor Temp. Sensor	L3	Load Solenoid (Pneumatic Option)
B1R3	Motor Temp. Sensor	L4	Unload Solenoid (Pneumatic Option)
C1	Oil Pump Start Capacitor	M1	Hour Meter
CB1	Low Oil Pressure Fault	M2	Start Counter
CB2	Hi Condenser Pressure Fault Indicator	S	HGBP Valve Actuator Limit Switch (Opt.)
CB3	Low Refrig. Temp. Fault Indicator	S1	Hi Condenser Pressure Switch
CB4	Hi Motor Temp. Fault Indicator	S2	Low Refrig. Temp. Switch
CB5	Starter Fault Indicator	S3	Start-Stop Chilled Water Demand Switch
CB10	Starter Main Ckt. Breaker	S4	Anti-Recycle Timer
DS1	SAFETIES SATISFIED Indicator Light	S5	Evaporator Flow Switch
DS2	COOLING REQUIRED Indicator Light	S6	ON/OFF Switch
DS3	RESTART TIME ELAPSED Indicator Light	S7	Condenser Flow Switch
DS4	CHILLED WATER Flow Indicator Light	S8	Oil Pressure Switch
DS5	CONDENSER WATER Flow Indicator Light	S9	Oil Pump Post-Lube Timer
DS6	OIL PUMP Indicator Light	S10	Oil Temp. (Heater) Switch
DS7	SYSTEM Operating Indicator Light	S11	Purge ON/OFF/AUTO Switch
F1	Control Power Fuse	S12	Guide Vane Linkage Limit Switch (HGBP Opt.)
F2	Oil Pump Fuse	S13	Purge Hi Pressure Switch
F3	Oil Heater Fuse	S14	Purge Temp. (Heater) Switch
F4	Purge Unit Fuse	S15	Proof-of-Closure Switch (Pneumatic Opt.)
HR1	Oil Sump Heater	S22	Compressor Hi Discharge Temp. Switch (HGBP Opt.)
K1	Compressor Motor Starter	T1	Control Power Transformer
K3	Low Oil Pressure Arming Ckt.	U1	Electronic Capacity Control Module
K4	Condenser Pump Control Relay	U3	Leaving Chilled Water Temp. Sensor
K5	Start Oil Pump Timer/Jump-Out Start Inhibit Circuit		
K6	Oil Pressure Arming Ckt./Start S4 Timer Motor		

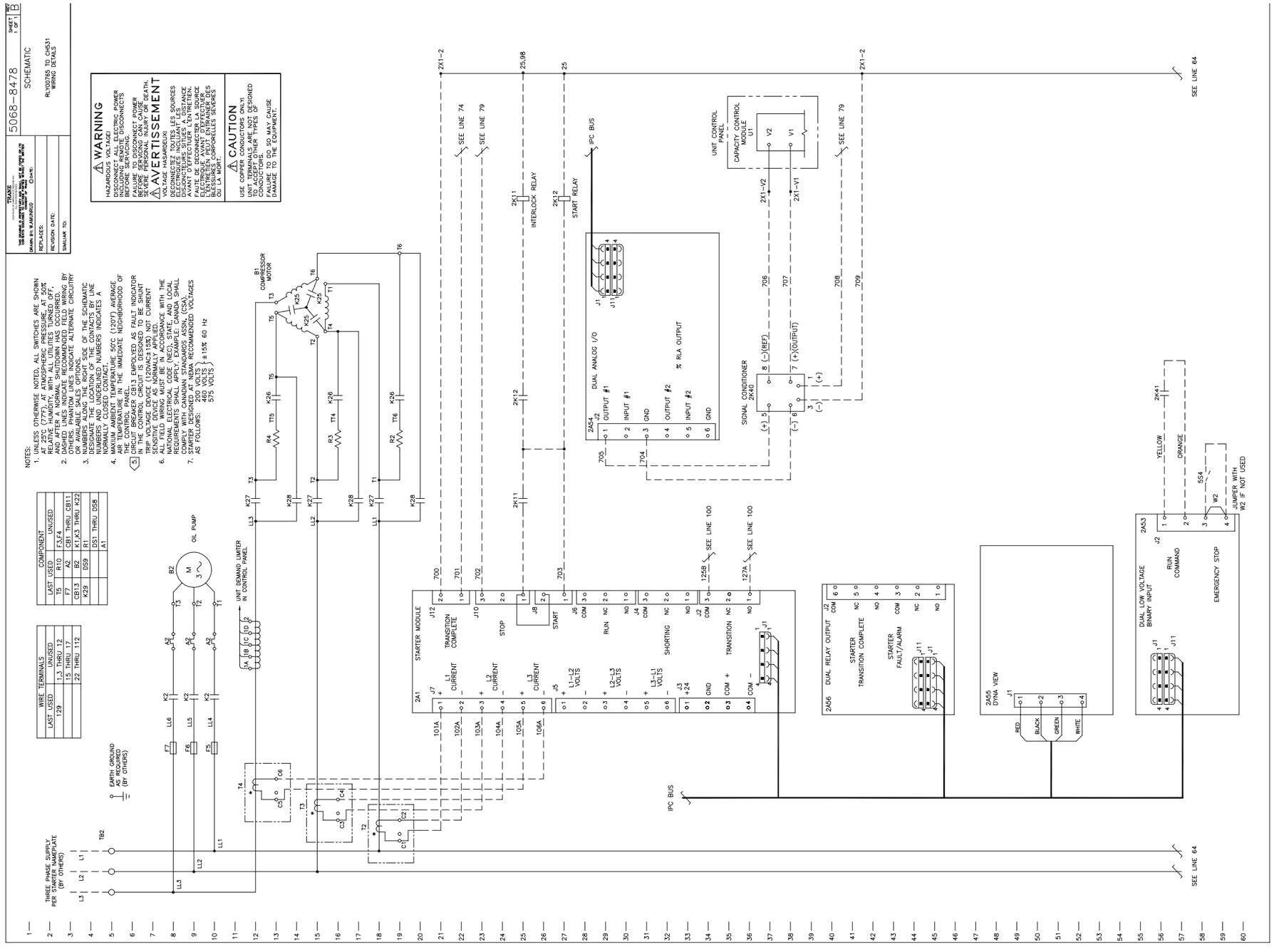
Appendix A

Figure A3. Typical unit mounted starter electrical diagram, X39470320



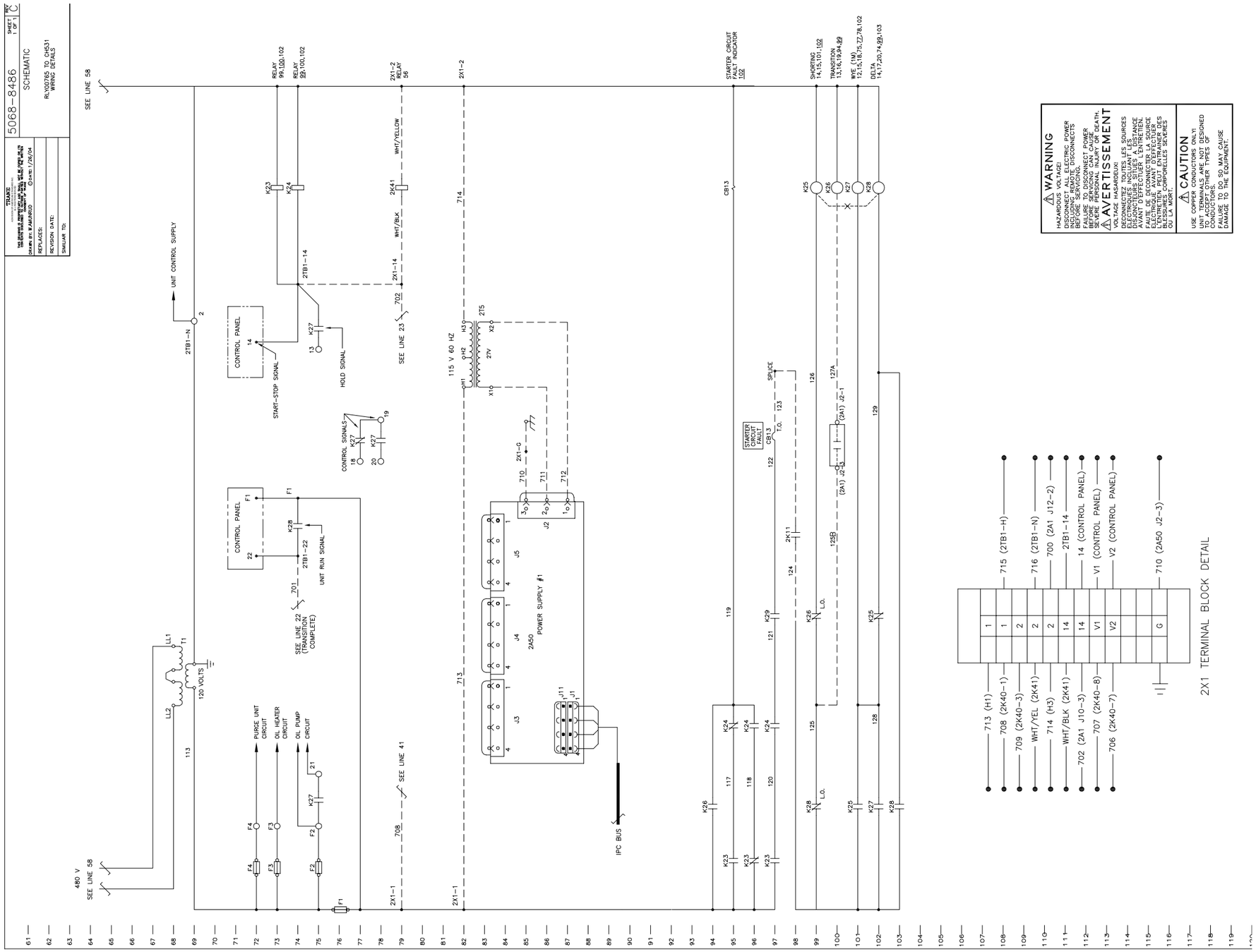
Appendix B

Figure B1. RLY00765 to CH531 wiring details, 5068-8478, Rev. B



Appendix B

Figure B2. RLY00765 to CH531 wiring details, 5068-8486, Rev. C



Appendix C

Configuration View Items

Unit type tab

The figure below shows the TechView™ screen for selecting unit type. Default values for Starter Only control are shown in the accompanying table. Options for other selections are also shown in the table. Stand Alone Starter should be selected. Make note of selections in the space available here and in the following tables.

Figure C1. Unit type configuration tab screen

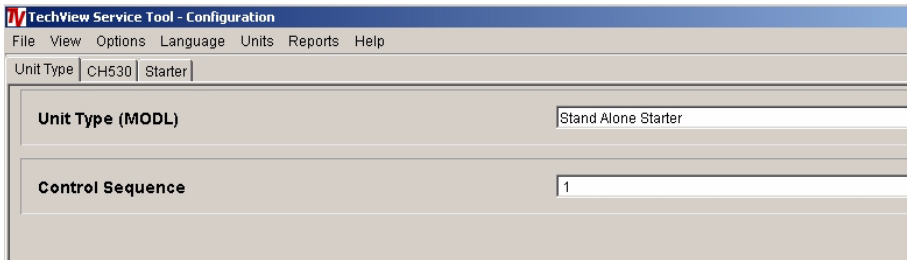


Table C1. Unit type configuration choices

Parameter	Recommended value	Other options	Entered value
Unit Type (MODL)	Stand Alone Starter	CVRD	
Control Sequence	1	none	1

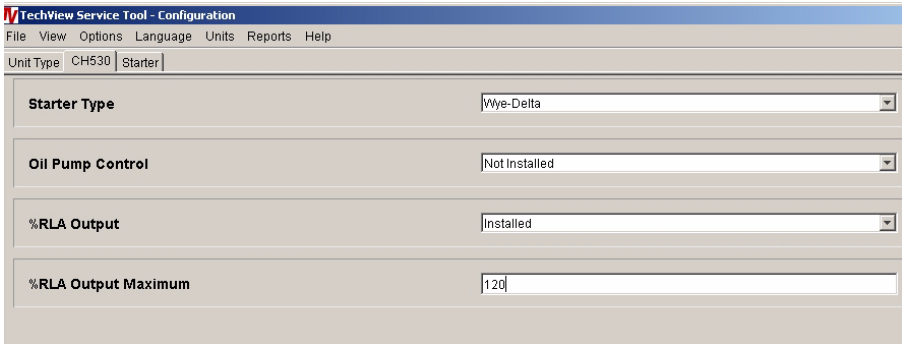
Note: Entered values may differ from the recommended value depending on the specific control scheme on your chiller. In most cases, the recommended value will be adequate.

Appendix C

CH530 Tab

The following information describes setting choices for the CH530 configuration.

Figure C2. CH530 configuration tab screen



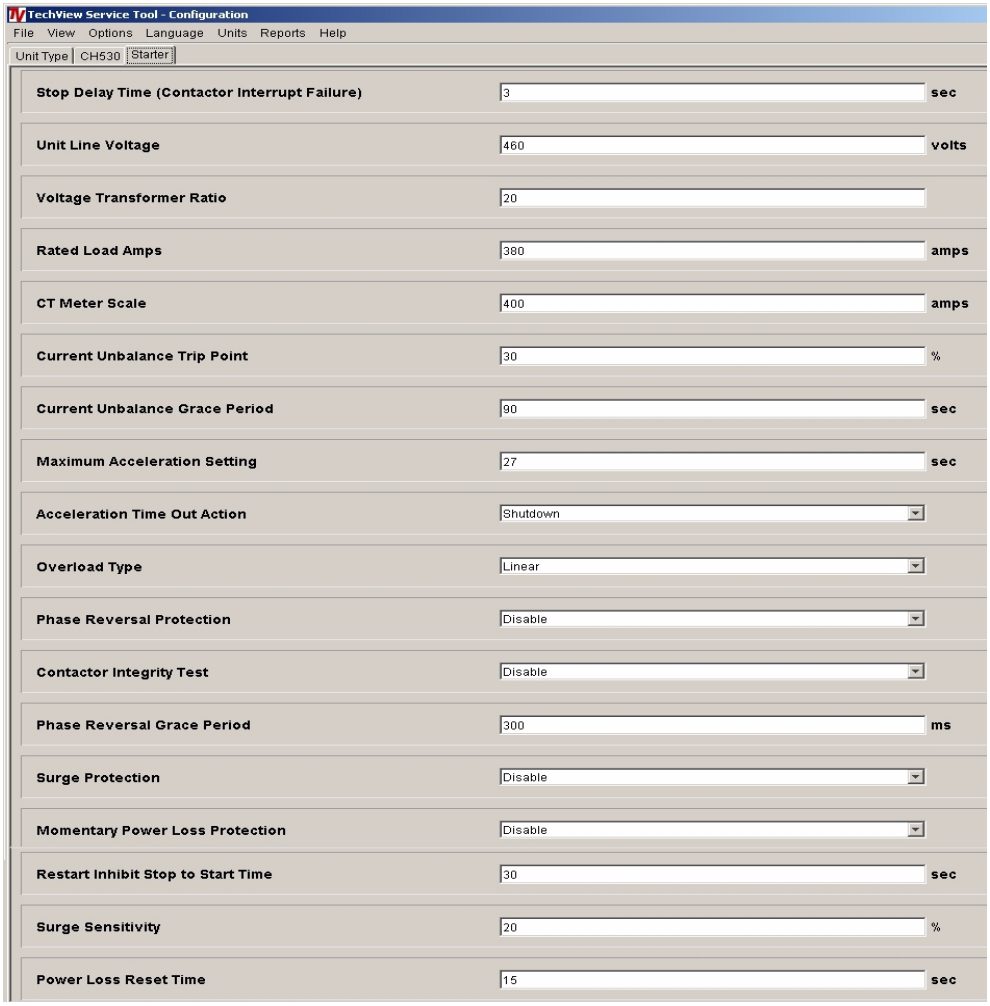
Note: Recommended values are in parenthesis.

Table C2. CH530 configuration tab choices

Parameter	Recommended value	Other options	Entered value
Starter Type	Wye-Delta	Wye-Delta Across Line Primary Reactor Auto Transformer Non-Communicating Solid State	
Oil Pump Control	Not Installed	Installed	
%RLA Output	Installed	Not Installed	
%RLA Output	120%	100 to 140	

Appendix C

Figure C3. Starter tab configuration screen



The various parameter choices are shown in Table C3.

Appendix C

Table C3. Starter tab configuration choices

Parameter	Recommended value	Other options	Entered value
Stop Delay Time	3 seconds	1 to 30 seconds	
Unit Line Voltage	unit voltage	180 to 6,600 volts	
Voltage Transformer Ratio	use one of the five values shown, base on unit voltage	0 to 700 20 for <600 Vac 80 for 2300/2400 Vac 110 for 3300 Vac 140 for 4160 Vac 240 for 6600 Vac	
Rated Load Amps	unit design	0 to 2,500 amps	
CT Meter Scale	table C4 or C5	0 to 2,000 amps	
Current Unbalance Trip Point	30%	15 to 1,000%	
Current Unbalance Grace Period	90 seconds	15 to 225 seconds	
Maximum Acceleration Setting	choose from choices at right for starter type	6 - Across line 11 - Primary reactor 16 - Auto transformer 27 - Wye delta	
Acceleration Time Out Action	Shutdown	Transition	
Overload Type	Linear	Exponential	
Phase Reversal Protection	Enable	Disable	
Contactor Integrity Test	Disable	Enable	
Phase Reversal Grace Period	300 msec	20 to 1000 milliseconds	
Surge Protection	Enable	Disable	
Momentary Power Loss	Disable	Enable	
Restart Inhibit Stop to Start Time	30 seconds	0 to 255 seconds	
Surge Sensitivity	20%	0 to 100%	
Power Loss Reset Time	15 seconds	0 to 255 seconds	

CT meter scale setting

The CT Meter Scale is an especially critical factor and must be calculated correctly. One of two methods of calculation should be used. Typically applications of less than 600 Vac will have a single stage CT per phase connected to the starter module. Likewise, medium voltage applications greater than 600 Vac have a two stage CT per phase connection to the starter module. Select the correct method for this application from the two choices that follow.

Method 1. Single stage CT calculations, less than 600 Vac only

Motor current sensing using the single stage CT per phase arrangement. In this case only one CT is used per phase to achieve the necessary turn-down ratio of current measurement. The CT consists of either the X13580253 or X13580269 part. This CT reduces the 100% RLA signal input to a nominal 100 mA value for input to the starter module.

CT Meter Scale = CT Rating / (Number of Primary Turns x 1.00)

CT Meter Scales with decimals need to be truncated as appropriate so that the measured motor amps is less than the actual motor amps.

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See Table C4 to select CT Rating and resulting CT meter scale. In many cases more than one selection is possible.

Table C4. Current transformer data for single stage CT per phase

Actual motor RLA (Amps)	Part number	Ext.	CT ratio (Amps:Amps)	CT rating (Amps)	Primary turns	CT meter scale
5.6 - 8.3	TRR00979 or TRR01272	-09	50:0.1	50	6	8.3
6.7 - 10.0	TRR00979 or TRR01272	-09	50:0.1	50	5	10.0
8.4 - 12.5	TRR00979 or TRR01272	-09	50:0.1	50	4	12.5
11.2 - 16.6	TRR00979 or TRR01272	-09	50:0.1	50	3	16.6
16.7 - 25.0	TRR00979 or TRR01272	-09	50:0.1	50	2	25
25.0 - 37.5	TRR00958	-10	75:0.1	75	2	37.5
33.4 - 50	TRR00979 or TRR01272	-09	50:0.1	50	1	50
50 - 75	TRR00958	-10	75:0.1	75	1	75
67 - 100	TRR00714	-01	100:0.1	100	1	100
100 - 150	TRR00715	-02	150:0.1	150	1	150
134 - 200	TRR00716	-03	200:0.1	200	1	200
184 - 275	TRR00717	-04	275:0.1	275	1	275
267 - 400	TRR00718	-05	400:0.1	400	1	400
334 - 500	TRR00982 or TRR01142	-06	500:0.1	500	1	500
467 - 700	TRR00981 or TRR01255	-07	700:0.1	700	1	700
667 - 1000	TRR00980 or TRR01405	-08	1000:0.1	1000	1	1000
934 - 1400	TRR01571 or TRR01579	-11	1400:0.1	1400	1	1400
1200 – 1800	TRR01572 or TRR01580	-12	1800:0.1	1800	1	1800

Method 2. Dual stage CT calculations, for greater than 600 Vac

Motor current sensing using the two CT per phase arrangement. In this case two CT's are used per phase to either achieve the necessary turn-down or for metering convenience. The first stage consists of either the X13580047 or X13580048 CT (each of these CT's have a 5 amp secondary). The second stage consists of the X13580266-01 CT (takes 3.6 amps down to 100 ma).

CT Meter Scale = CT Rating / (Number of Primary Turns x 1.3889)

CT Meter Scales with decimals need to be truncated as appropriate so that the measured motor amps is less than the actual motor amps.

In this case the CT Rating should be picked to be in the range of 100% to 150% of Actual Motor RLA x Number of Primary Turns x 1.3889. See Table C5 to select CT Rating and resulting CT meter scale. In many cases more than one selection is possible.

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Table C5. Current transformers for dual stage CT per phase

Actual motor RLA (Amps)	Part number	Ext.	CT ratio (Amps:Amps)	CT rating (Amps)	Primary turns	CT meter scale
8.0 – 12.0	X13580272	-01	50:5	50	3	12
12.0 – 18.0	X13580272	-01	50:5	50	2	18
18.0 - 27.0	X13580272	-02	75:5	75	2	27
24.0 - 36.0	X13580272	-01	50:5	50	1	36
36.0 - 54.0	X13580272	-02	75:5	75	1	54
48.0 - 72.0	X13580271	-01	100:5	100	1	72
24.0 - 36.0	X13580048	-01	150:5	150	3	36
28.8 - 43.2	X13580048	-01	180:5	180	3	43.2
36.0 - 54.0	X13580048	-01	150:5	150	2	54
43.2 - 64.8	X13580048	-01	180:5	180	2	64.8
48.0 - 72.0	X13580048	-01	200:5	200	2	72
60.0 - 90.0	X13580048	-02	250:5	250	2	90
72.0 - 108.0	X13580048	-01	150:5	150	1	108
86.4 - 129.6	X13580048	-01	180:5	180	1	129.6
96.0 - 144.0	X13580048	-01	200:5	200	1	144
120 - 180	X13580048	-02	250:5	250	1	180
144 - 216	X13580048	-02	300:5	300	1	216
168 - 252	X13580048	-02	350:5	350	1	252
192 - 288	X13580048	-03	400:5	400	1	288
240 - 360	X13580048	-03	500:5	500	1	360
288 - 432	X13580048	-03	600:5	600	1	432

When all the parameters are complete, click on the Load Configurations Button at the bottom of the Screen.

Additional CT equations

There are a number of equations and constraints that are used with CT selection. This section addresses these and their definitions.

First the definitions:

1. On a dual stage CT system, CT1 is the primary winding rating of the first stage (or line) CT with respect to the 5 amp secondary. For example, a first stage CT rating of 500:5 has a CT1 of 500.
2. On a dual stage CT system, CT2 is the primary winding rating of the second stage CT with respect to a 100 mA secondary. For example, a second stage CT of rating 3.6:0.1 has a CT2 of 3.6.
3. TVCTMS is the CT Meter Scale entered into TechView
4. TVRLA is the RLA entered into TV in amps.
5. Act %RLA is the actual %RLA the motor is drawing
6. Act RLA is the actual Running Load Amperage of the motor

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7. NT1 is the number of primary turns on CT1
8. The current as displayed in TechView and DynaView is determined by the following equation:

$$Measured\%RLA = \left(\frac{TVCTMS}{TVRLA}\right) * \left(\frac{Act\%RLA * ActRLA}{CT1/(NT1 * 5) * CT2}\right)$$

9. The ratio of CTMS/RLA must meet the following:

$$0.87 \leq \left(\frac{CTMS\,Amps}{MotorRated\,LoadAmps}\right) \leq 1.5$$

If CTMS/Motor Rated Load Amps is not in this range, then the ratio CTMS/Motor Rated Load Amps = 1.5 shall be used. Note that the limits on CTMS/RLA is 0.8 and 1.5 in the TechView product data base. However the Starter module limits this ratio to the 0.87 and 1.63.

10. To ensure that the proper current overload is in place, CT1 should be chosen such that:

    for a two stage CT system:

$$CT1 \geq 140\% * RLA$$

    for a single CT system:

$$CT1 \geq RLA$$

Appendix D

Binding view

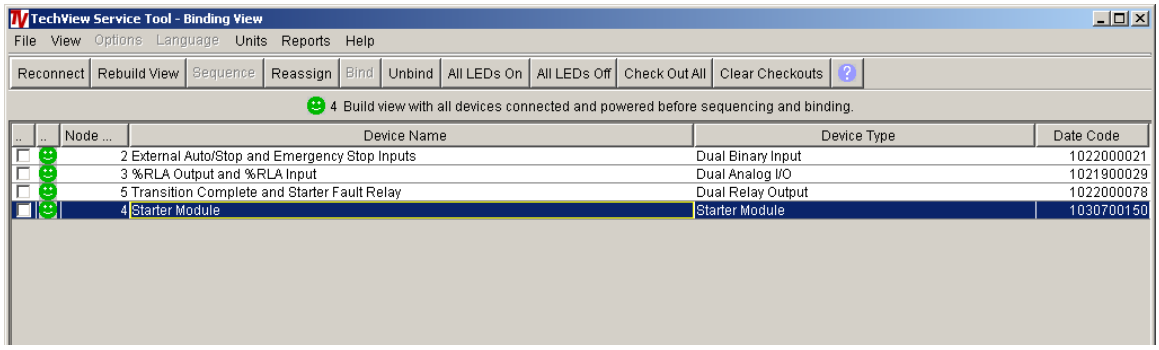
The following figure shows the binding view screen for this installation. Note that the LLIDs that show up on this list are dependent on selections made in previously in Configuration View.

Initially, the LLIDs will show up as Red frowning faces indicating they are unbound. Binding is a process by which a particular LLID is assigned to monitor or control a particular function or item.

Select the LLID to be bound, click on the Bind button in the task bar. A window will pop up asking "Particular LLID. Is the desired device alone selected?" Locate the LLID in the control panel or starter and place the Trane provided magnetic screwdriver near the LED under the SW1 arrow. The green LED will turn on. Click "YES" on the pop up window. The smile face will turn green next to that LLID on the binding view menu.

Continue for all LLIDs in the list.

Figure D4. Binding view screen



Appendix E

Setpoint view

The following information shows the selections available in setpoint view.

Figure E1. Settings view screen - chiller tab

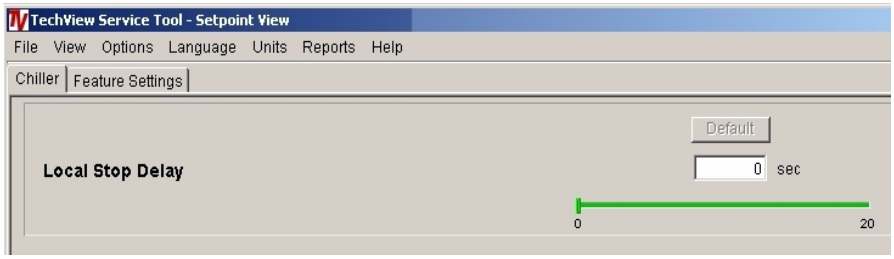


Figure E2. Settings view screen - feature settings tab

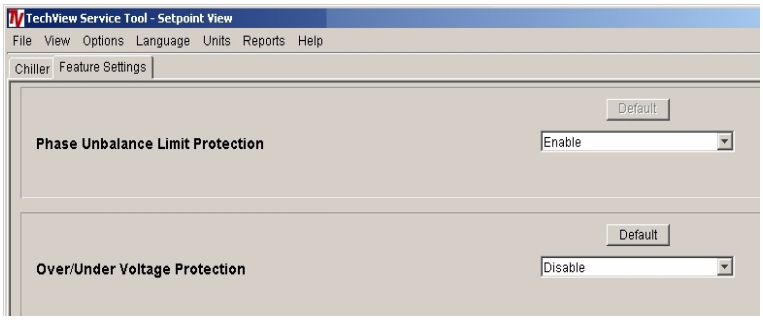


Table E1. Settings view choices

Setting	Recommended values	Other options	Entered value
Local Stop	0	0 to 20 seconds	
Phase Unbalance	Enable	Disable	
Over/under Voltage	Disable	Enable	

Appendix F

Unit view

The following screens shows the available unit views.

Figure F1. Unit view - control panel tab

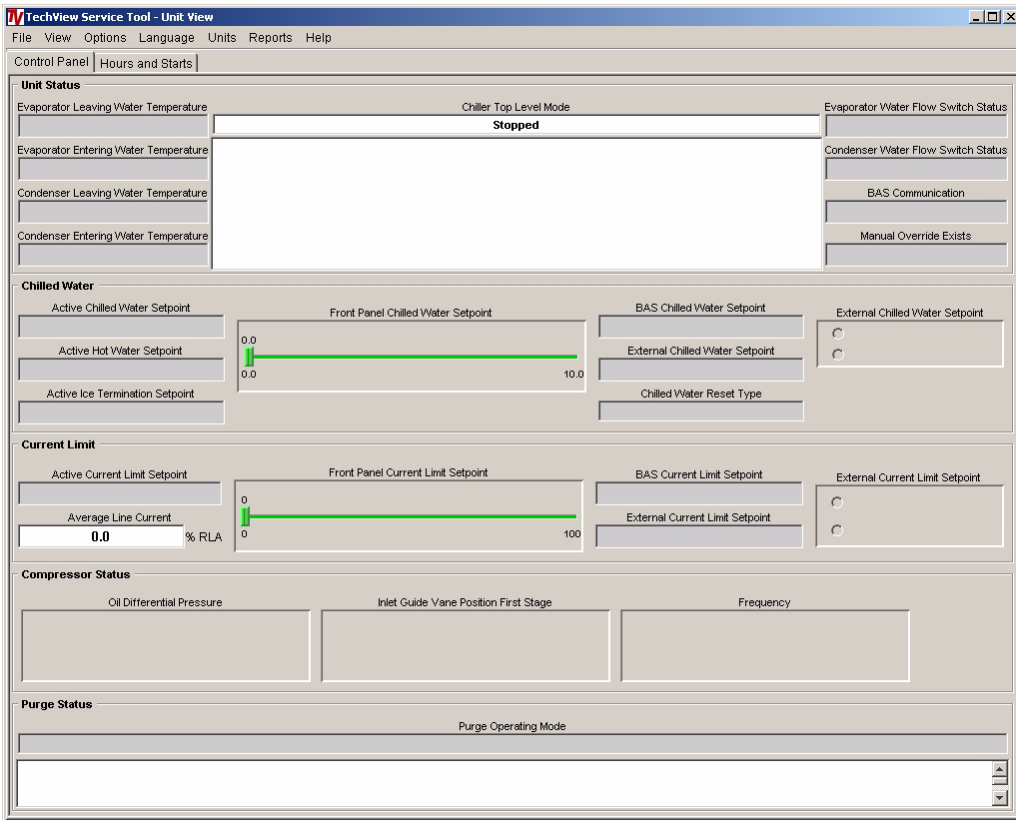
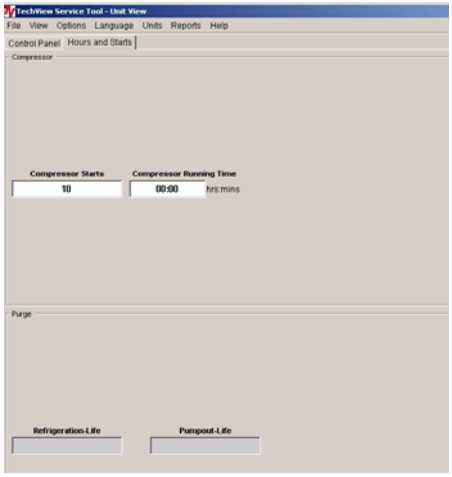


Figure F2. Unit view - hours and starts tab



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Literature Order Number	PART-SVN82C-EN
File Number	SV-Controls-PART-SVN82C-EN-0904
Supersedes	SV-Controls-PART-SVN82B-EN-0704
Stocking Location	Electronic Only