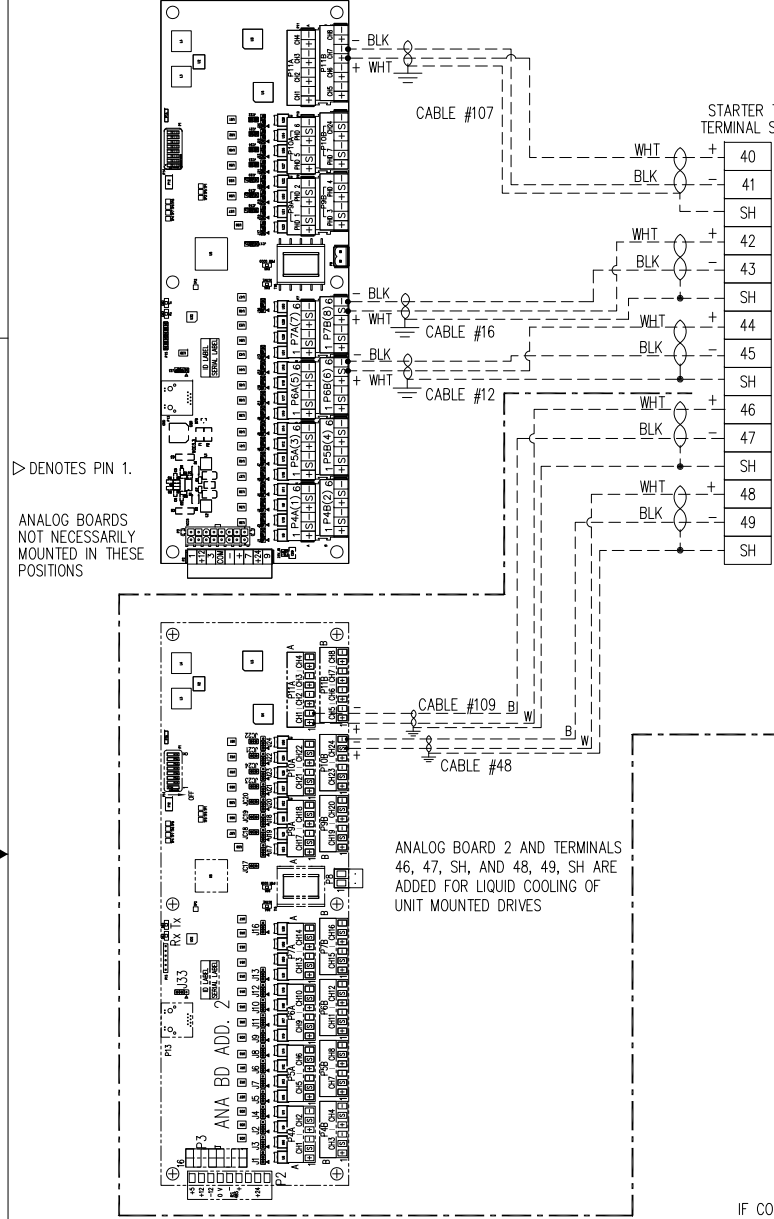


**POINT TO POINT ANALOG BD #1 WIRING**

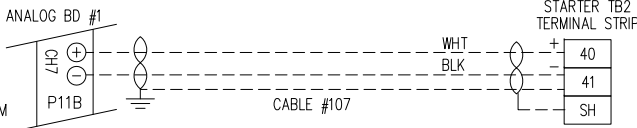
ANALOG BOARDS LOCATED IN QUANTUM CONTROL PANEL



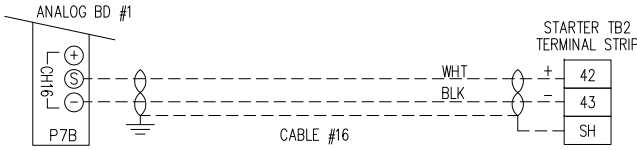
▷ DENOTES PIN 1.  
ANALOG BOARDS NOT NECESSARILY MOUNTED IN THESE POSITIONS

ANALOG BOARD 2 AND TERMINALS 46, 47, SH, AND 48, 49, SH ARE ADDED FOR LIQUID COOLING OF UNIT MOUNTED DRIVES

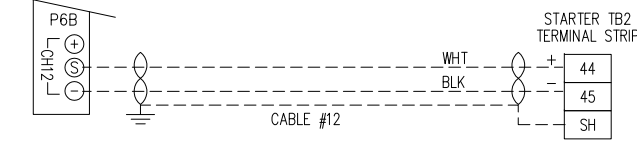
CHANNEL 7, ANA BD 1  
VARIABLE SPEED MOTOR DRIVE  
4-20 mA OUT  
0-100% OF 0 TO HIGHEST MOTOR RPM



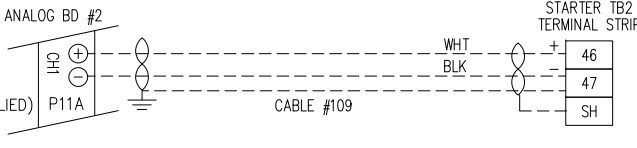
CHANNEL 16, ANA BD 1  
MOTOR AMPS  
4-20 mA



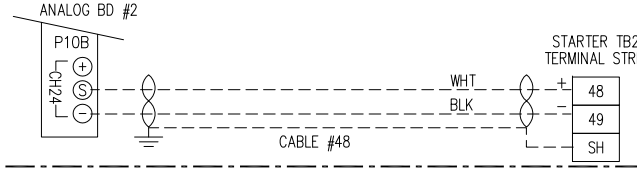
CHANNEL 12, ANA BD 1  
DRIVE SPEED (RPM)  
(VSD, TURBINE, ETC)  
4-20 mA OR 0-10 VDC  
J12 PINS 1-2



CHANNEL 1, ANA BD 2  
PID LOOP OUTPUT FOR  
DRIVE COOLING (IF SUPPLIED)  
4-20 mA



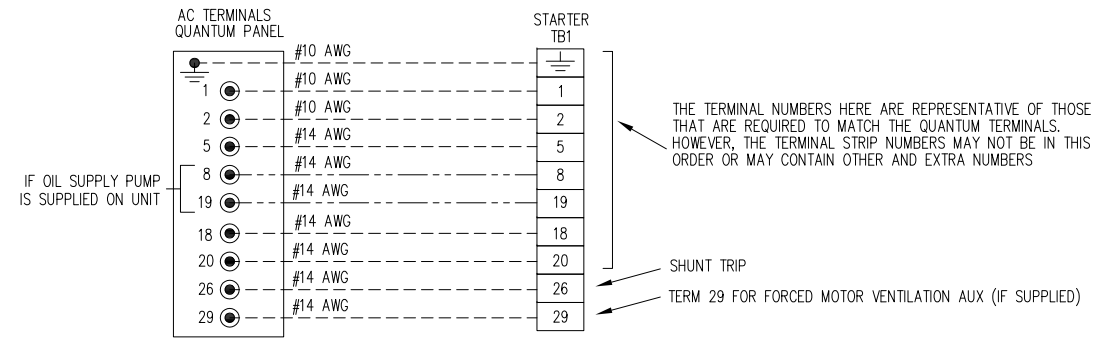
CHANNEL 24, ANA BD 2  
DRIVE COOLING TEMP  
4-20 mA  
J24 PINS 1-2, J24 IN



COOLING CHANNELS USED WHEN DRIVE COOLING CONTROL IS REQUIRED.

THESE TERMS ADDED WHEN LIQUID DRIVE STARTER COOLING IS REQUIRED

**SINGLE PHASE CONTROL WIRING-QUANTUM TO STARTER**

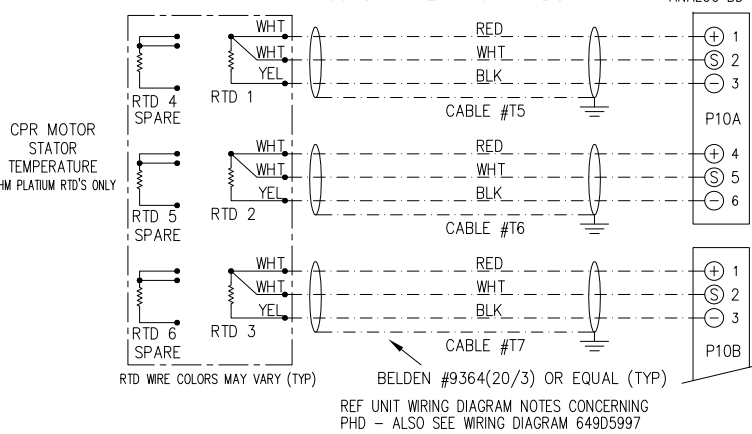


THE TERMINAL NUMBERS HERE ARE REPRESENTATIVE OF THOSE THAT ARE REQUIRED TO MATCH THE QUANTUM TERMINALS. HOWEVER, THE TERMINAL STRIP NUMBERS MAY NOT BE IN THIS ORDER OR MAY CONTAIN OTHER AND EXTRA NUMBERS

SHUNT TRIP  
TERM 29 FOR FORCED MOTOR VENTILATION AUX (IF SUPPLIED)

IF COMPRESSOR MOTOR IS MOUNTED AT FACTORY, THE STATOR PROTECTION IS WIRED TO QUANTUM PANEL PER ONE OF THE METHODS BELOW  
-IF THE THERMISTOR IS USED, WIRING THE MODULE AUX INPUT IN THE QUANTUM WILL GIVE A SPECIFIC FUNCTION FOR THE SHUTDOWN WHEREAS WIRING TO THE STARTER WOULD GIVE A COMPR AUX SHUTDOWN WHICH IS NOT THE SPECIFIC CAUSE

**STATOR WIRING IF DRIVE MOTOR IS SUPPLIED WITH 100 OHM PLATINUM RTDS**



REFERENCE 649D5997  
PHD WIRING DIAGRAM

PHD CH 5 (CH 21)  
MOTOR STATOR #1 TEMP  
DEFAULT SETPOINTS:  
100 OHM PLATINUM .00385 TCR  
J21 PINS 2-3, J21 IN

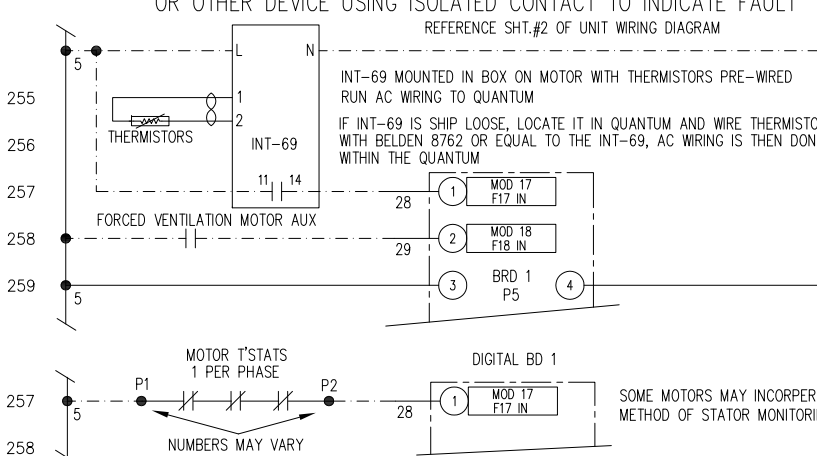
PHD CH 6 (CH 22)  
MOTOR STATOR #2 TEMP  
DEFAULT SETPOINTS:  
100 OHM PLATINUM .00385 TCR  
J22 PINS 2-3, J22 IN

PHD CH 7 (CH 23)  
MOTOR STATOR #3 TEMP  
DEFAULT SETPOINTS:  
100 OHM PLATINUM .00385 TCR  
J23 PINS 2-3, J23 IN

RTD WIRE COLORS MAY VARY (TYP)  
BELDEN #9364(20/3) OR EQUAL (TYP)  
REF UNIT WIRING DIAGRAM NOTES CONCERNING PHD - ALSO SEE WIRING DIAGRAM 649D5997

PER NEC CODE- VFD DRIVE MOTORS MUST HAVE STATOR HI-TEMP PROTECTION.  
THIS PROTECTION WILL BE DONE EITHER WAY SHOWN BELOW IF MOTOR IS SUPPLIED BY FRICK

**STATOR WIRING IF DRIVE MOTOR IS SUPPLIED WITH THERMISTOR OR OTHER DEVICE USING ISOLATED CONTACT TO INDICATE FAULT**



INT-69 CONTACT CAN BE WIRED TO ALTERNATIVE AUX INPUT IF AUX 1 IS ALREADY BEING USED

(DIG AUX A) COMPR MOTOR STATOR HI-TEMP PROGRAM "SHUTDOWN", RUNNING, 5 SEC DELAY (SAFE CLOSED)  
(DIG AUX B) FORCED VENTILATION MOTOR SHUTDOWN (IF SUPPLIED) (SAFE CLOSED)

(DIG AUX A) COMPRESSOR MOTOR HI-TEMP SHUTDOWN PROGRAM "SHUTDOWN", RUNNING, 5 SEC DELAY (SAFE CLOSED)

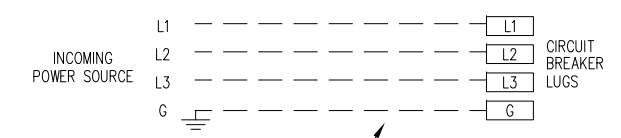
**ANALOG WIRING SHOWN SCHEMATICALLY**

ADD ON COMMUNICATION DEVICES THAT MAY BE ADDED TO STARTER ARE NOT INCLUDED ON THIS DRAWING, REFER TO STARTER DRAWINGS

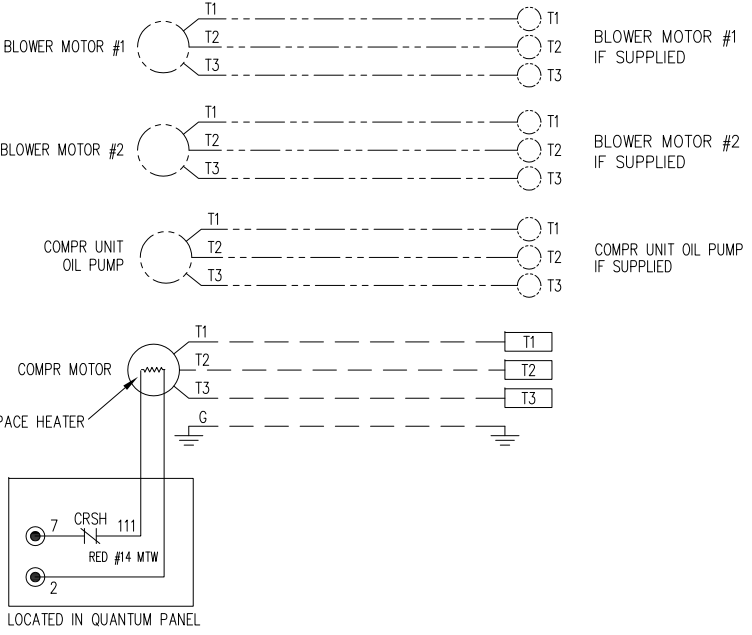
—●— INDICATES DIN CONNECTOR IF USED ON DEVICE  
----- INDICATES DEVICES SUPPLIED BY FRICK OR OTHERS WHEN OPTIONAL OR REQUIRED  
----- WIRING BY OTHERS- ALL WIRING FROM STARTER TO QUANTUM AND ASSOCIATED DEVICES BY OTHERS IF STARTER IS SHIPPED LOOSE UNLESS SPECIFIED OTHERWISE. SOME OPTIONAL DEVICES WILL BE WIRED IF MOUNTED ON UNIT ALL 3 PHASE WIRING SHALL BE SIZED PER PRESENT NEC CODE  
----- INDICATES WIRING AT FACTORY IF STARTER AND/OR DEVICES ARE MOUNTED & SHIPPED ON UNIT

□ REPRESENTS STARTER TERMINALS  
● TERMINALS IN QUANTUM CONTROL PANEL

**3 PHASE WIRING**



NOTE:  
DUE TO THE EMI/RFI EFFECTS ASSOCIATED WITH THE USE OF VFD'S, THE GROUND CONDUCTOR SHALL BE STRANDED COPPER INSULATED AND TWO SIZES LARGER THAN REQUIRED BY APPLICABLE CODES.



LOCATED IN QUANTUM PANEL

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**Frick**  
BY JOHNSON CONTROLS

JOHNSON CONTROLS  
100 DR. W.E. JOHNSON BLVD.  
JOHNSONVILLE, PA 17238

REVISIONS					DATE	APP	DR	JCC	
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					08/29/18	FSH	BSH		
REV	ECN	NEW RELEASE	DESCRIPTION	REV					
A	FR18-015	ADDED NEW LIQUID COOLED EATON VFD WIRING.		A					
PURCHASER			PURCHASE NO						
EATON VFD STARTER			DWG NO			649D6304			
FOR EATON VFD STARTER			CASE CODE			23587			
QUANTUM HD			SIZE			D			
EATON VFD STARTER			SCALE			NONE			
SHEET DETAIL			SHEET 01			OF 01			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE		DEC 21		DEC 21			
DR B. HESS		CHK J. OGDEN		APPD H. NOWELL		DEC 21		DEC 21	
09/18/16		08/18/16		07/17/12		ANGLE			