

LCB Electrical Diagram

(15-5032-1402 E)

<p>Written by: Cold Box Manufacturer: PHPK</p>	<p><u>Distribution :</u></p> <p>JLAB AL project team</p>
<p>Reviewed by Technical Manager: Gilles Flavien gilles.flavien@airliquide.com</p>	

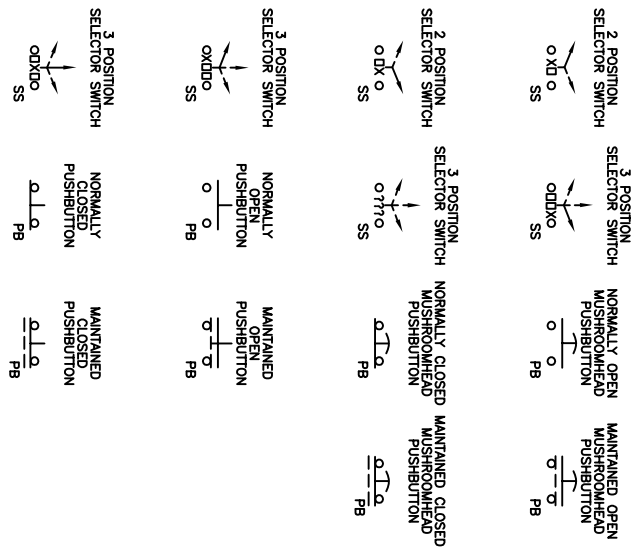
MODIFICATIONS RECORDING

ISSUE OF MODIF	DATE	WRITTEN BY	CHECKED BY	EVOLUTION OF THE DOCUMENT (Updated pages)	JUSTIFICATION OF THE MODIFICATION
<p>Note: Recording of modifications are included in document</p>					

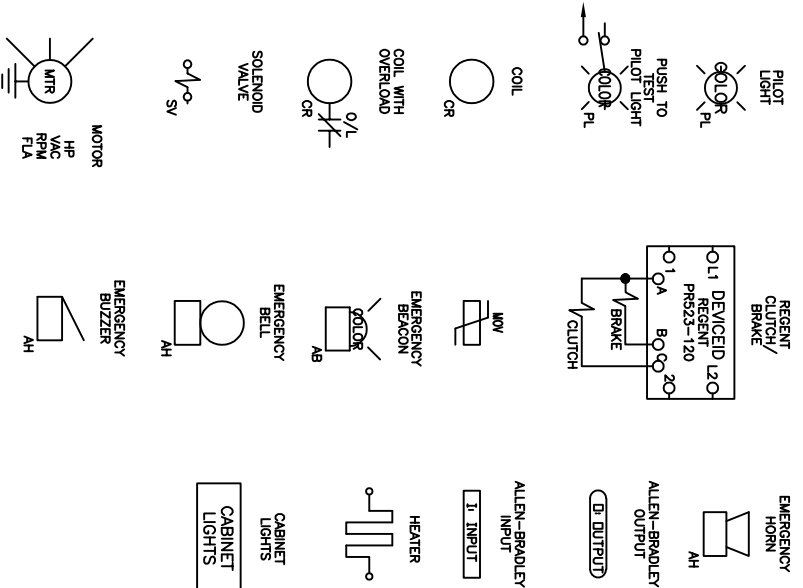
REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
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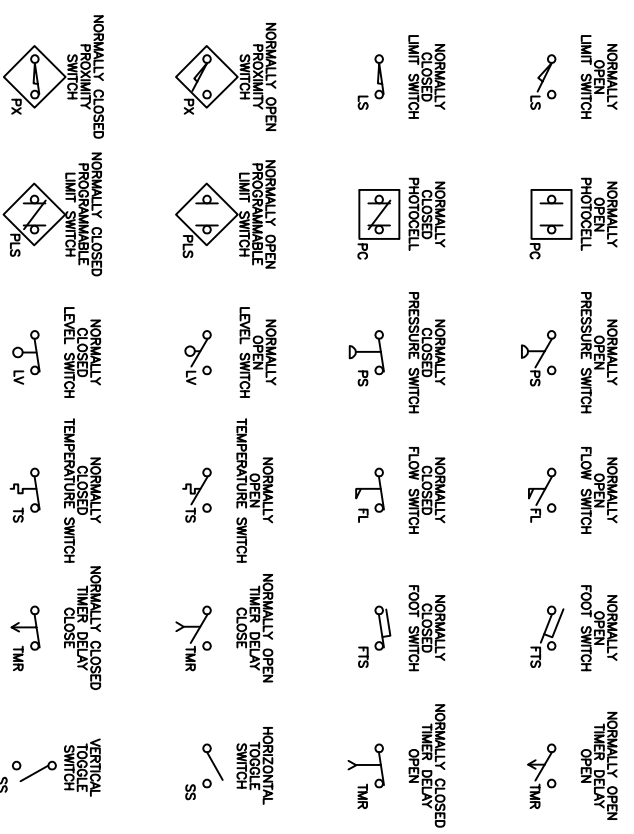
SELECTOR SWITCHES AND PUSHBUTTONS



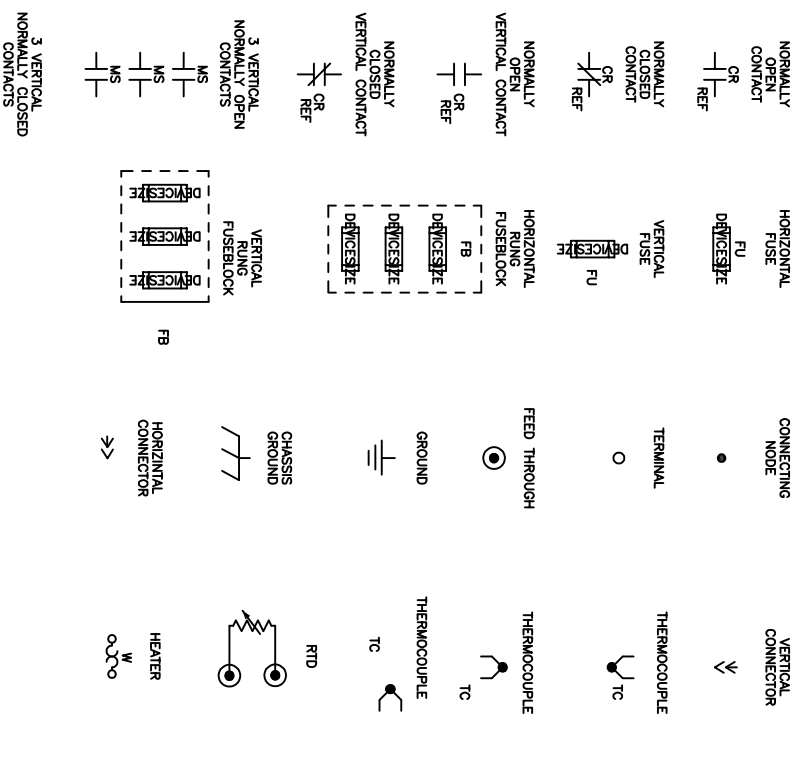
OUTPUTS



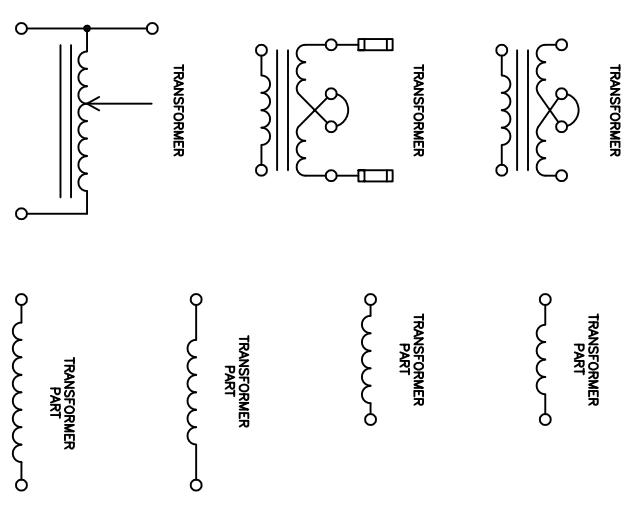
MISCELLANEOUS SWITCHES



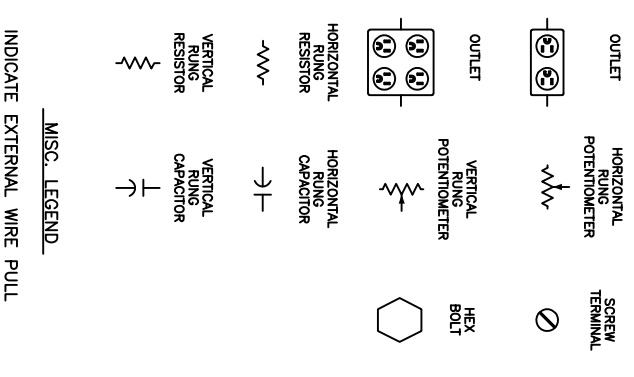
CONTACTS AND CONNECTORS



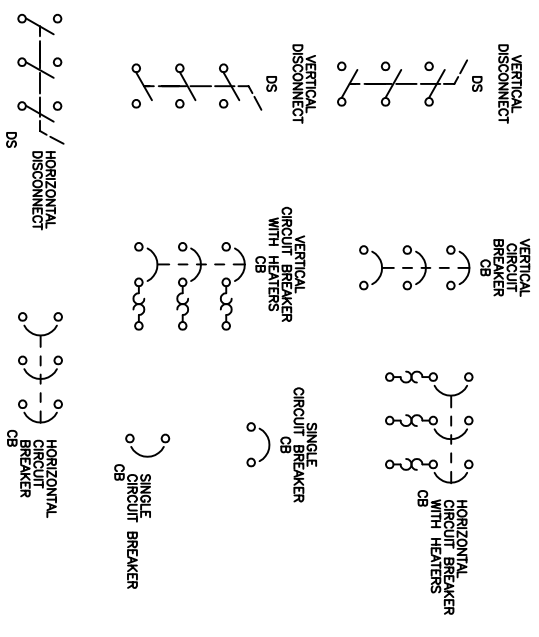
TRANSFORMERS



MISCELLANEOUS



DISCONNECTS AND CIRCUIT BREAKERS



GENERAL NOTES

- ALL 240/480 VAC WIRE IS TO BE #12 AWG BLACK UNLESS OTHERWISE NOTED.
- ALL 120 VAC POWER WIRING IS TO BE #12 AWG RED UNLESS OTHERWISE NOTED.
- ALL 120 VAC WIRING FED FROM 10A BREAKERS OR LESS TO BE #16 AWG RED UNLESS OTHERWISE NOTED. NEUTRALS TO BE WHITE.
- ALL 24 VDC OR LOWER WIRE IS TO BE #16 AWG BLUE WITH THE EXCEPTION OF WIRE TO CONNECTORS CAN BE 20 AWG UNLESS OTHERWISE NOTED ON PULL LIST.
- ALL PANEL WIRE IS TO BE TYPE MTW.
- ALL FIELD WIRE IS TO BE TYPE THHN.
- GROUNDS TO INDIVIDUAL DEVICES OMITTED FOR CLARITY. ALL WIRING TO COMPLY WITH NEC AND ANY GOVERNING BODY HAVING JURISDICTION.

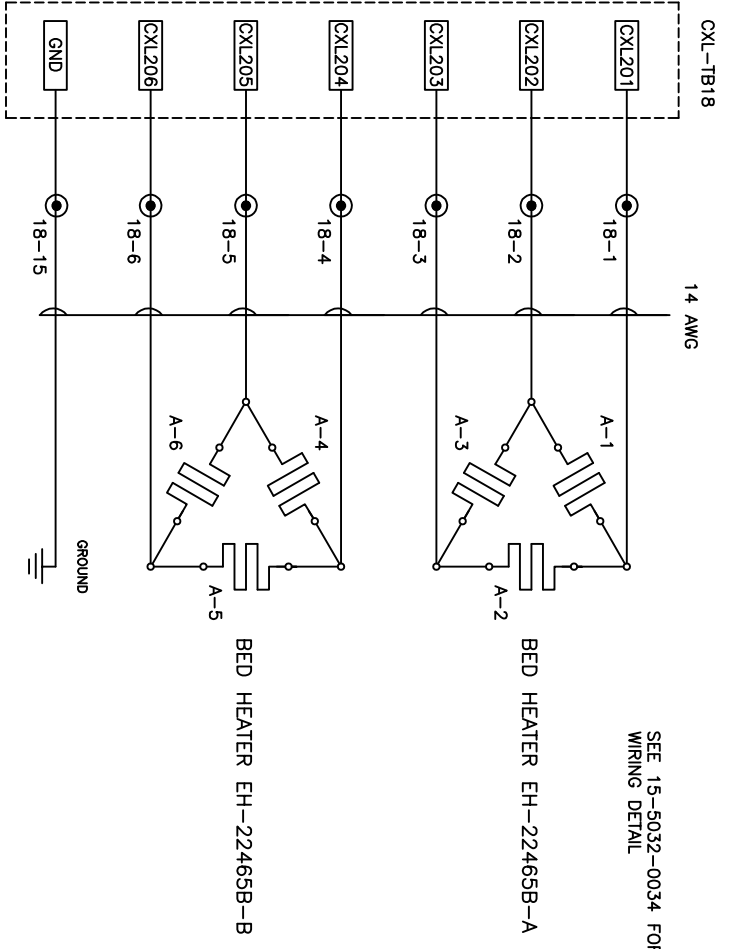
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DRAWN	MJA	TOLERANCES				PHPK TECHNOLOGIES									
CHECKED	SPW	FRACTION				2111 BUILDERS PLACE COLUMBUS, OHIO						43204			
ENGINEER	MJA	XX				LCLS-II 4.5K LOWER COLD BOX									
REVIEWED	SPW	XXX				ELECTRICAL LEGEND									
REL. DATE	8/30/2016	SIZE		DRAWING NO.		15-5032-1402		CHG.		F					
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.												SCALE NONE		SHEET 1 OF 17	

REVISIONS

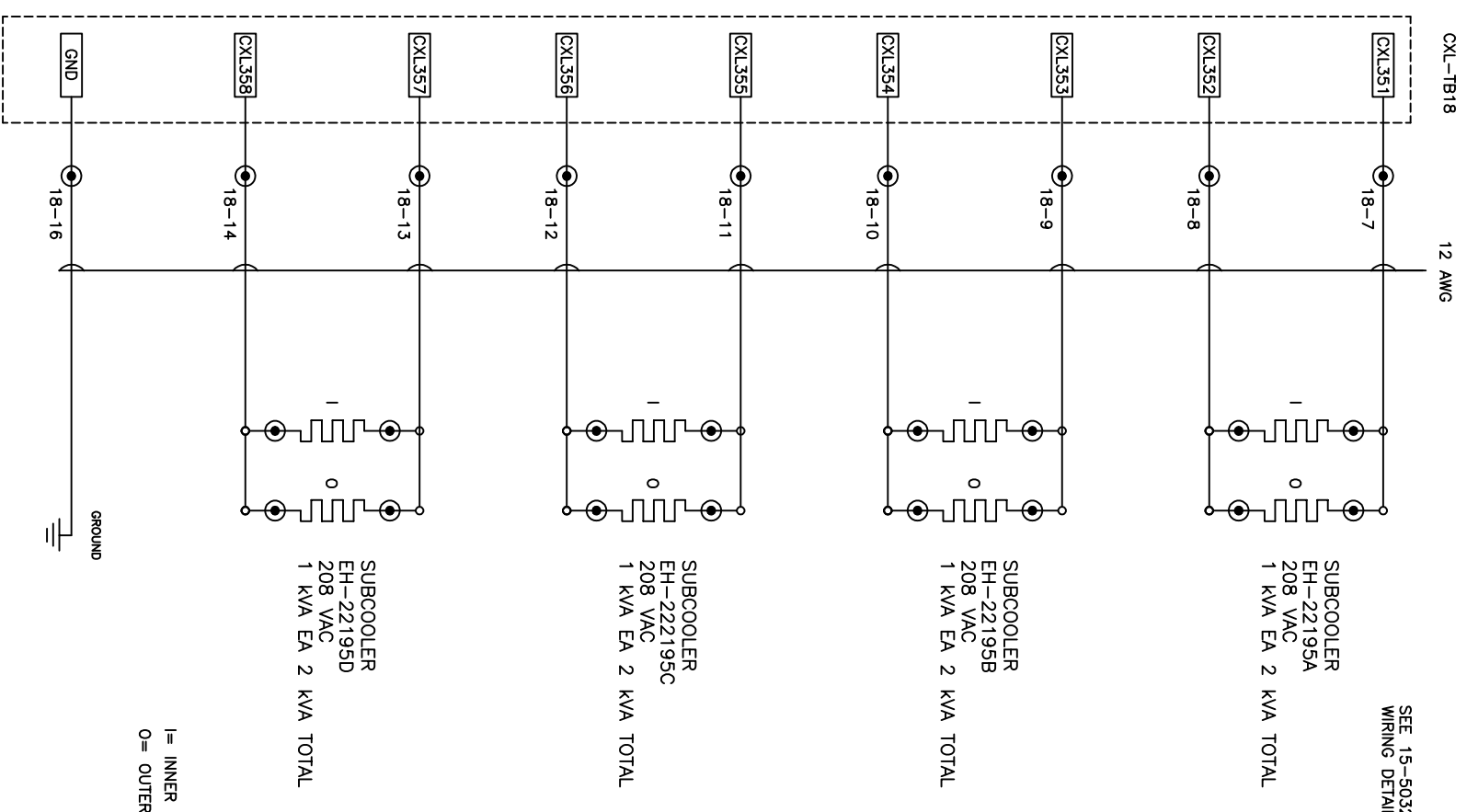
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SEE 15-5032-0034 FOR HEATER WIRING DETAIL

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SEE 15-5032-0035 FOR HEATER WIRING DETAIL

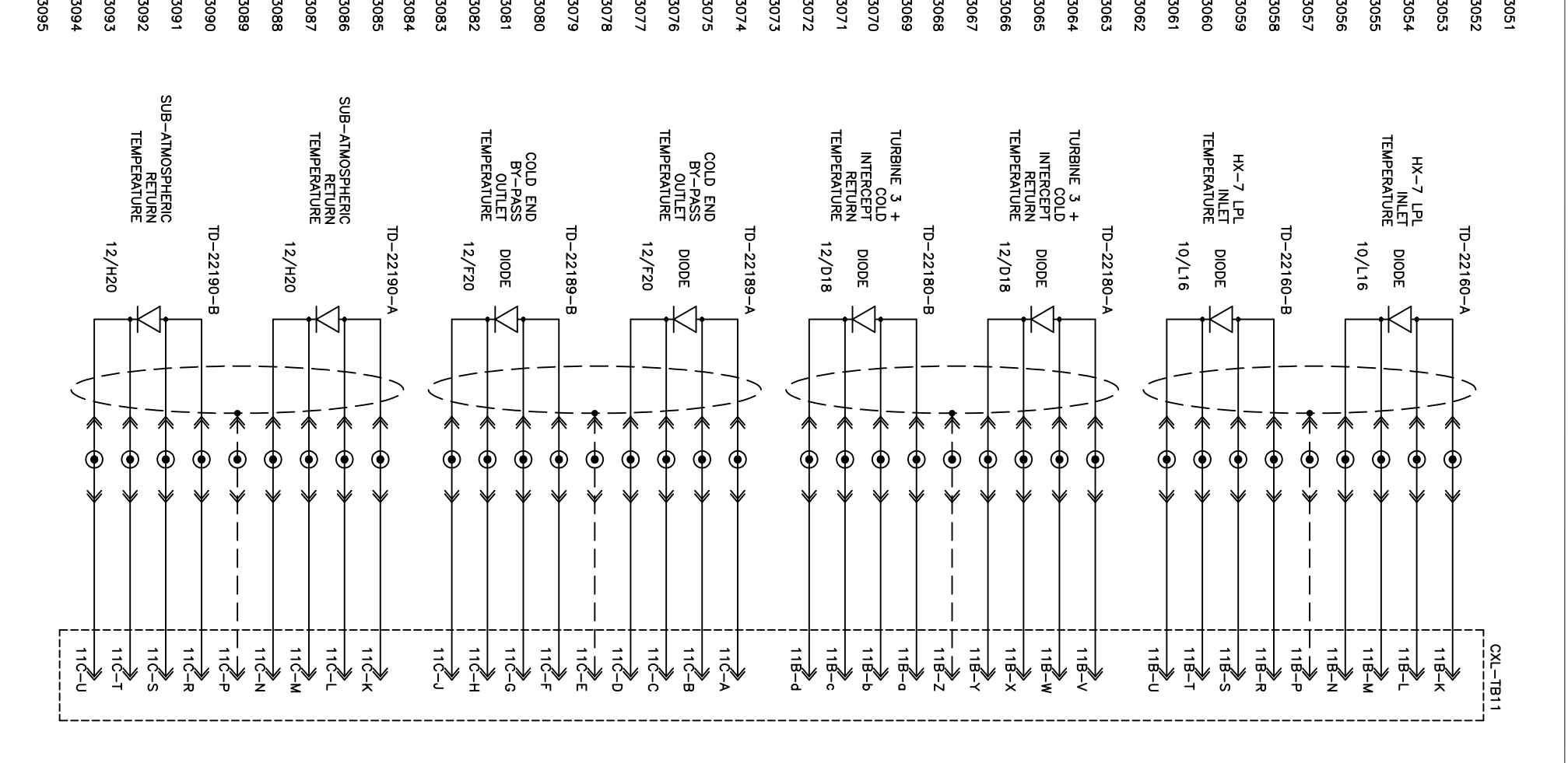
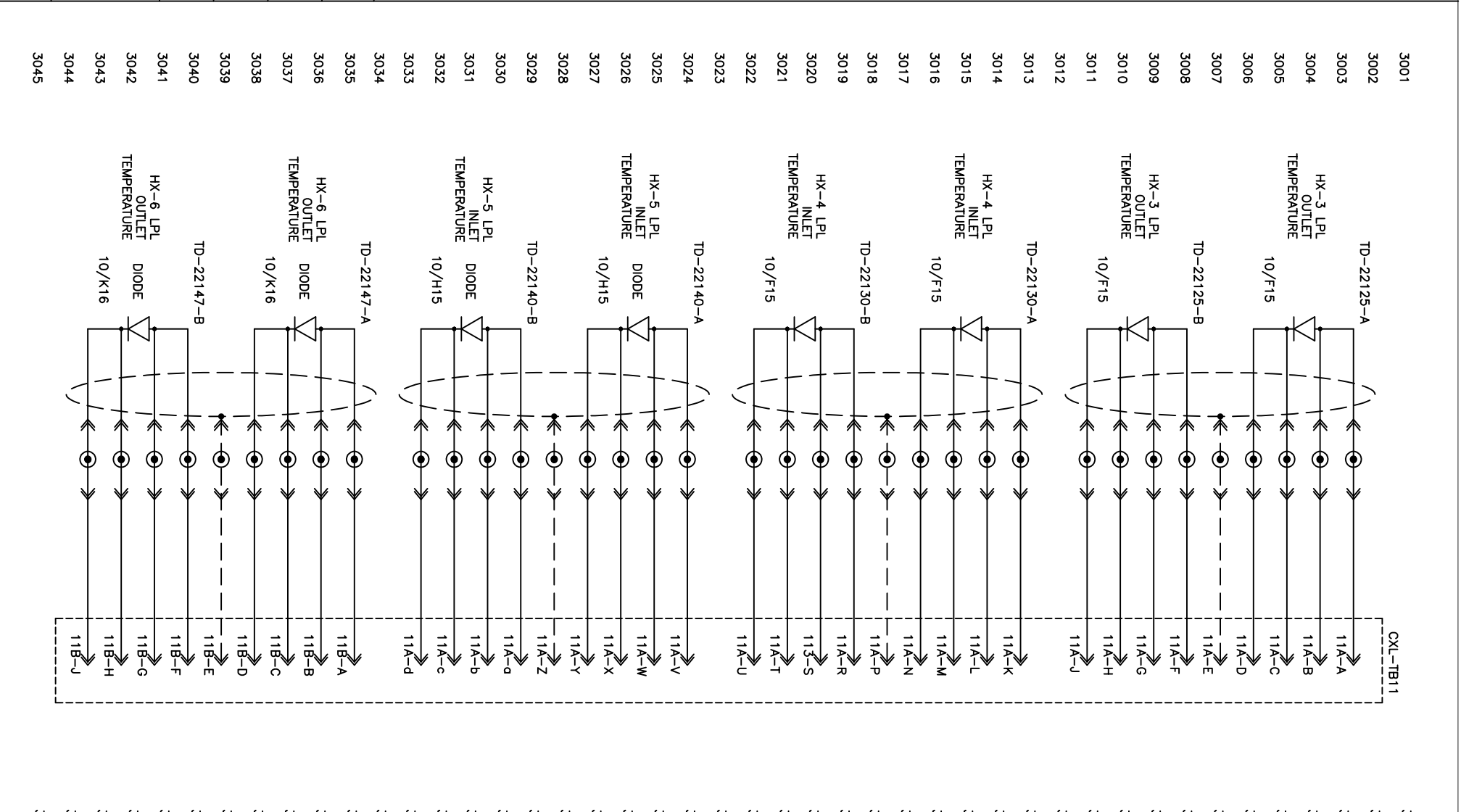
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DRAWN		MJA		TOLERANCES		CHECKED		SPW		FRACTION		TITLE	
ENGINEER		MJA		.XX		REVIEWED		SPW		ANGULAR		LCLS-II 4.5K LOWER COLD BOX HEATERS	
REL. DATE		8/30/2016		DRAWING NO.		15-5032-1402		CHG.		F		SCALE NONE	
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.		PHPK TECHNOLOGIES		2111 BUILDERS PLACE COLUMBUS, OHIO 43204		SHEET 2 OF 17							

INFORMATION SHOWN ON THIS DRAWING IS PROPRIETARY AND THE SOLE PROPERTY OF PHPK AND IS NOT TO BE DISCLOSED OR TRANSMITTED TO UNAUTHORIZED PARTIES.

I = INNER ELEMENT
O = OUTER ELEMENT

REVISIONS

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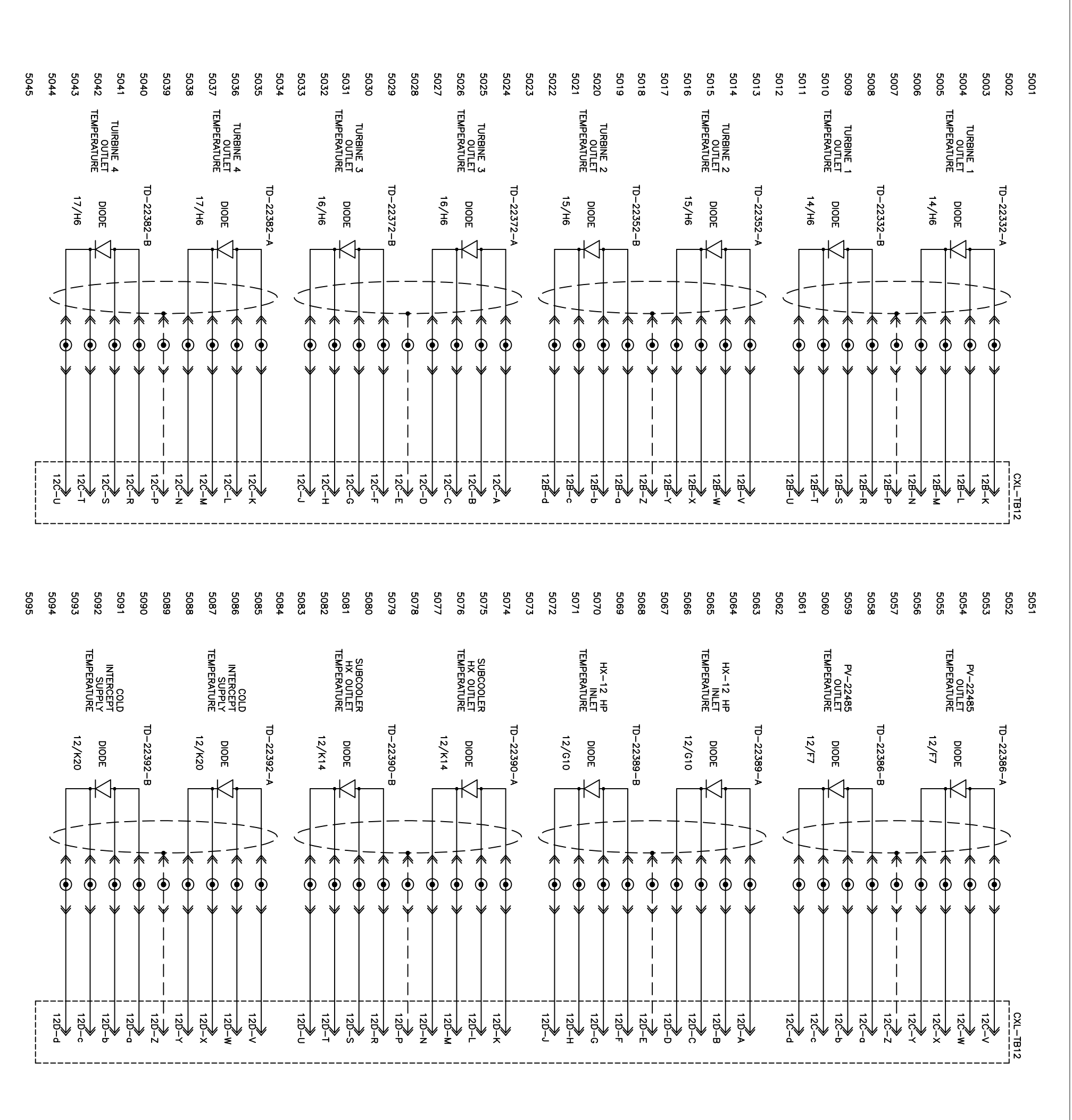
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CHECKED		SPW		FRACTION		
ENGINEER		M/A		XX		
REVIEWED		SPW		XXX		
REL. DATE		8/30/2016		ANGULAR		
PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204 TITLE: LCLS-II 4.5K LOWER COLD BOX TEMPERATURE SENSORS SIZE: B DRAWING NO.: 15-5032-1402 CHG.: F						

INFORMATION SHOWN ON THIS DRAWING IS PROPRIETARY AND THE SOLE PROPERTY OF PHPK AND IS NOT TO BE DISCLOSED OR TRANSMITTED TO UNAUTHORIZED PARTIES.

DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED. SCALE NONE SHEET 3 OF 17

REVISIONS

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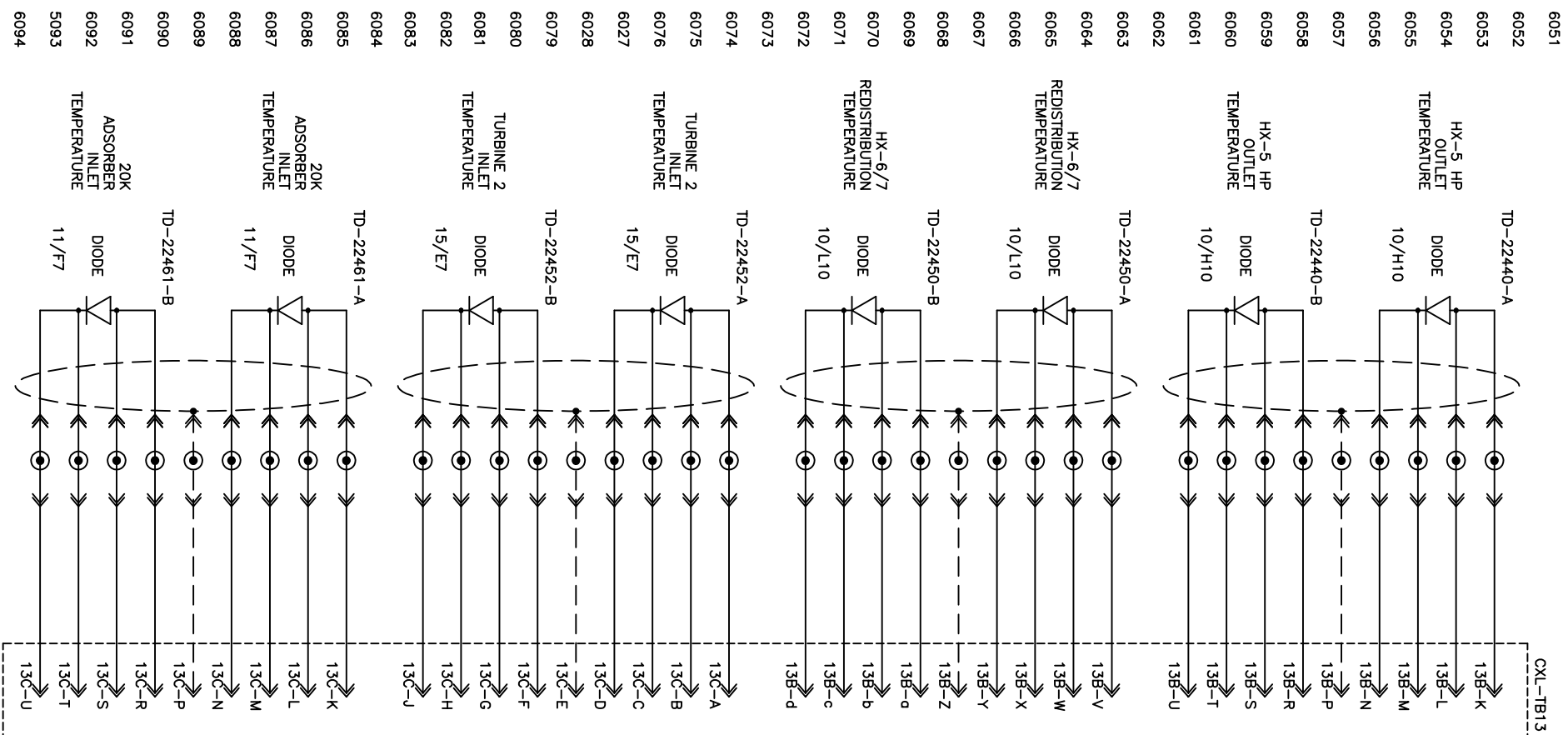
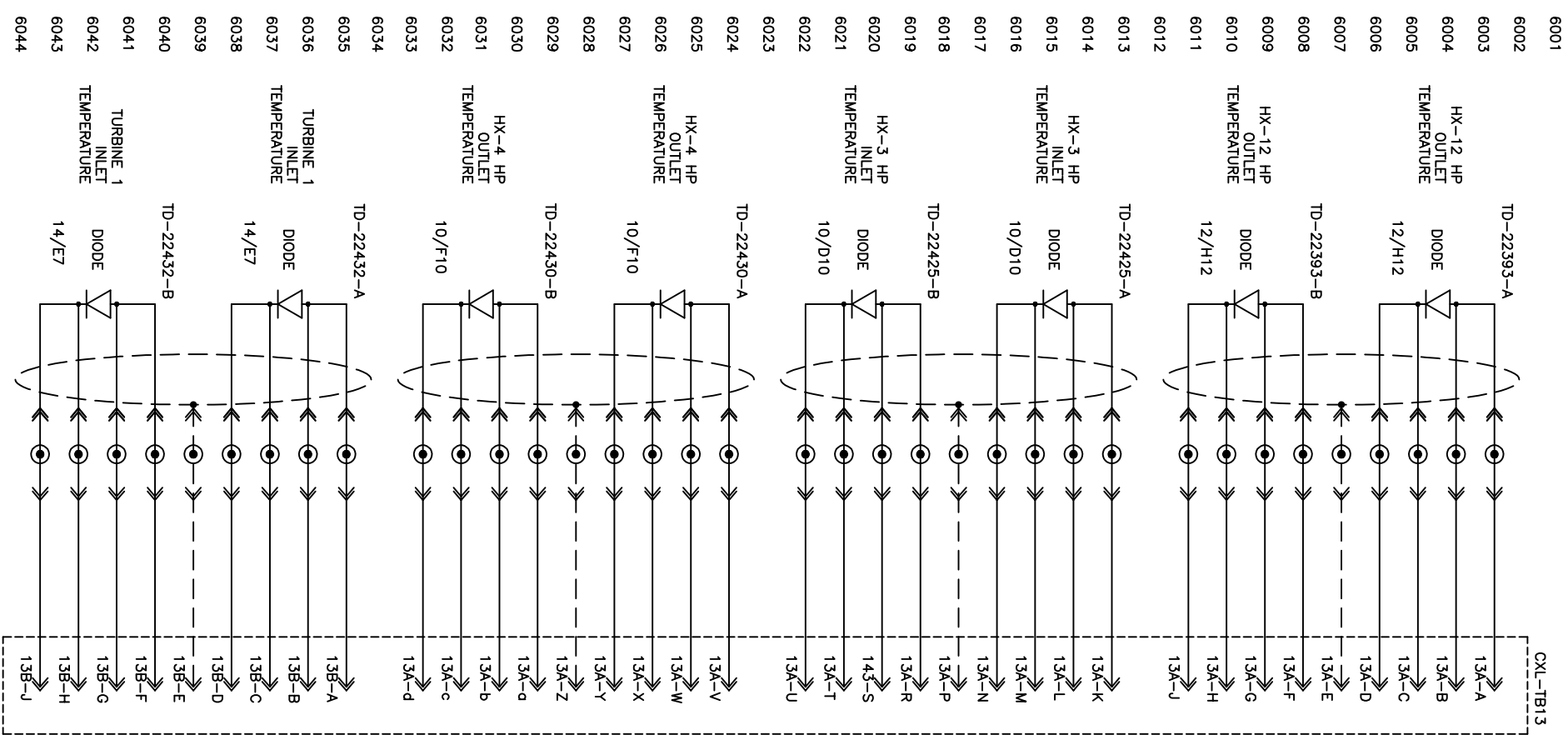
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DRAWN		MJA		TOLERANCES		
CHECKED		SPW		FRACTION		
ENGINEER		MJA		XX		
REVIEWED		SPW		XXX		
REL. DATE		8/30/2016		ANGULAR		
PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204 TITLE: LCLS-II 4.5K LOWER COLD BOX TEMPERATURE SENSORS DRAWING NO. 15-5032-1402 SCALE: NONE CHG. F						

INFORMATION SHOWN ON THIS DRAWING IS PROPRIETARY AND THE SOLE PROPERTY OF PHPK AND IS NOT TO BE DISCLOSED OR TRANSMITTED TO UNAUTHORIZED PARTIES.

DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.

REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
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LBS		WORK ORDER		CONTRACT NO.		PART NUMBER		NO. REV'D		NEXT ASSEMBLY		SIZE	
DRAWN		MMA		TOLERANCES									
CHECKED		SPW		FRACTION									
ENGINEER		MMA		.XX									
REVIEWED		SPW		XXX									
REL. DATE		8/30/2016		ANGULAR									
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.													
SCALE		NONE											
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INFORMATION SHOWN ON THIS DRAWING IS PROPRIETARY AND THE SOLE PROPERTY OF PHPK AND IS NOT TO BE DISCLOSED OR TRANSMITTED TO UNAUTHORIZED PARTIES.

PHPK TECHNOLOGIES
 2111 BUILDERS PLACE COLUMBUS, OHIO 43204

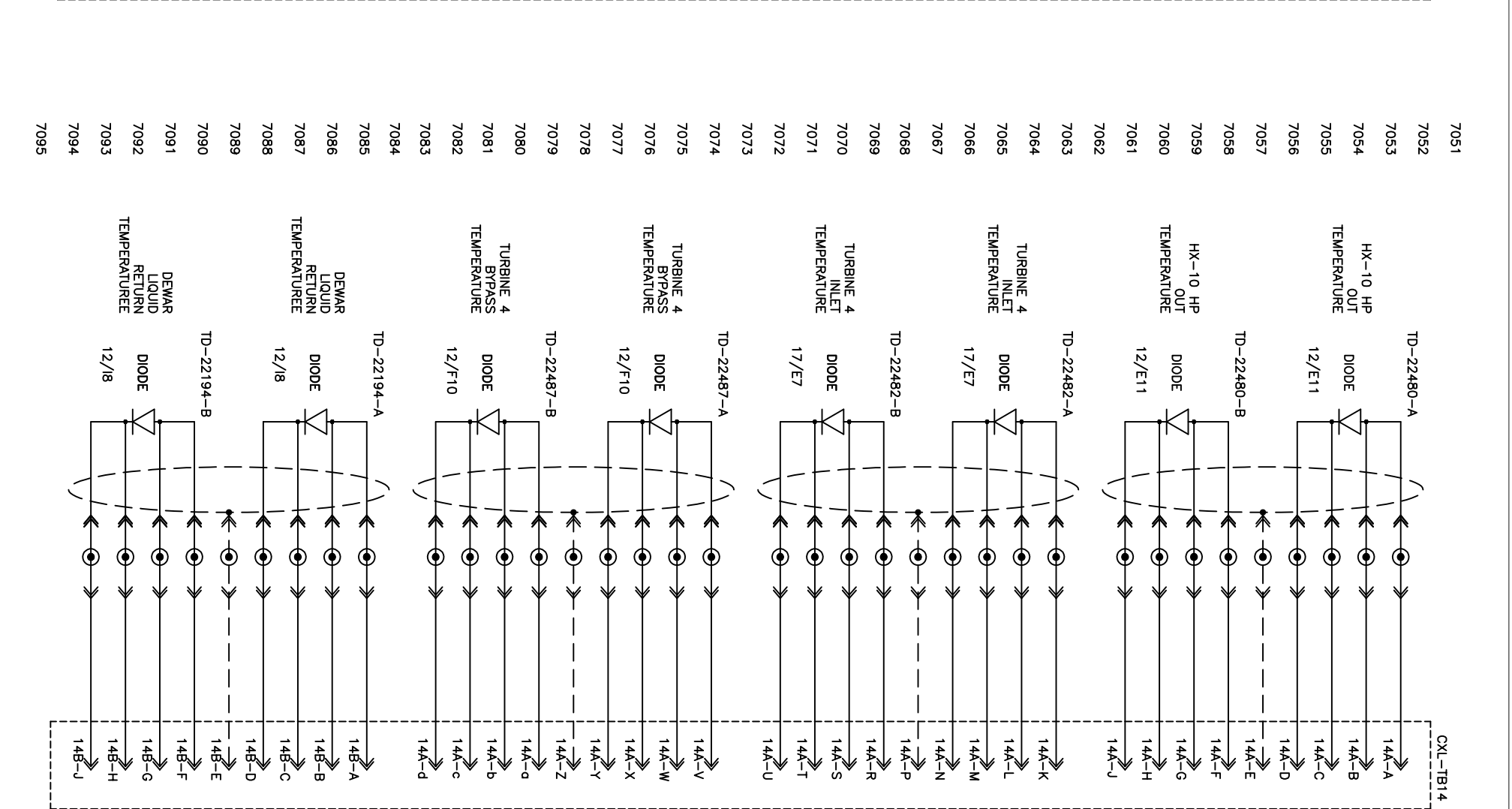
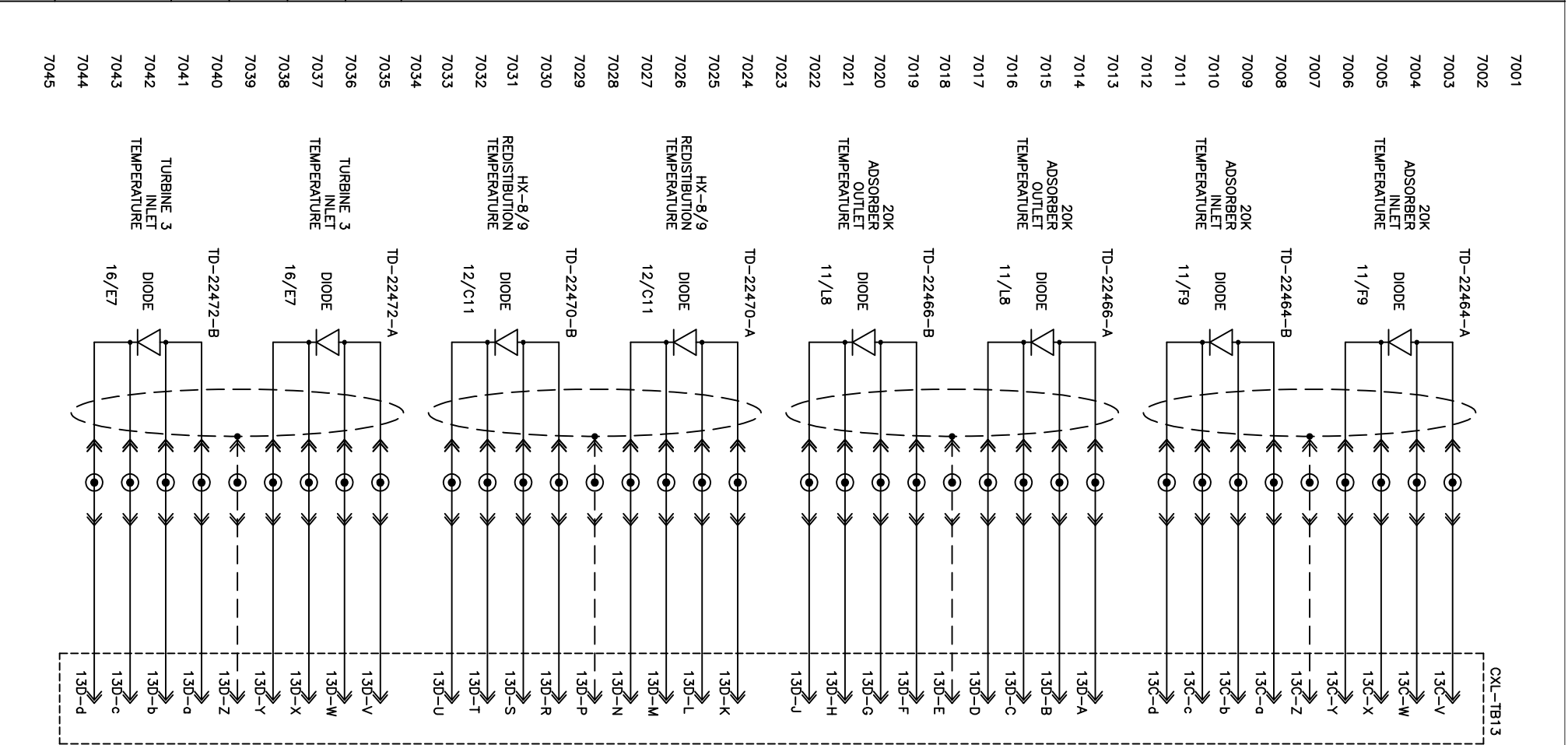
TITLE
 LCLS-II 4.5K LOWER COLD BOX
 TEMPERATURE SENSORS

DRAWING NO.
 15-5032-1402

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REVISIONS

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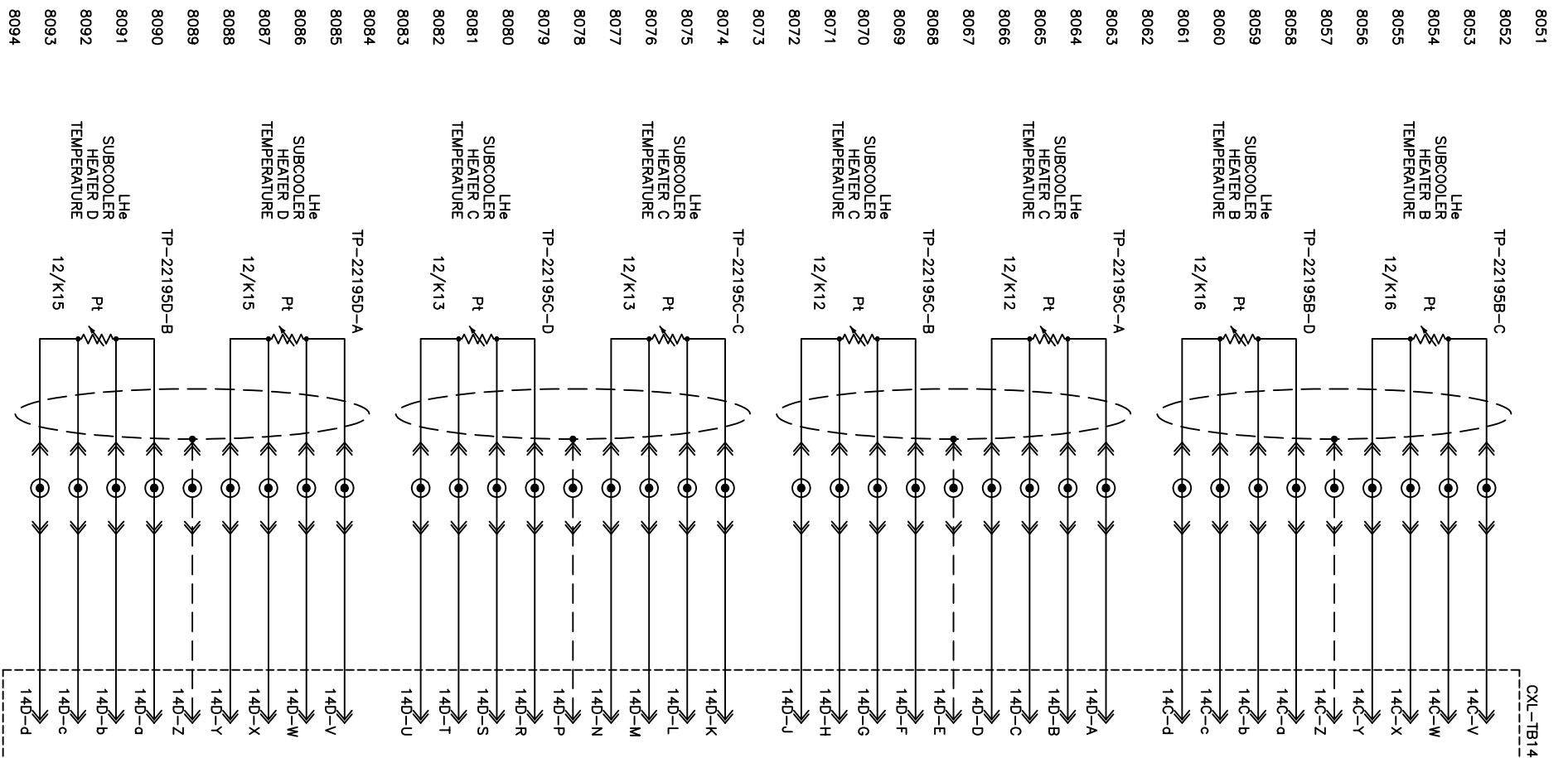
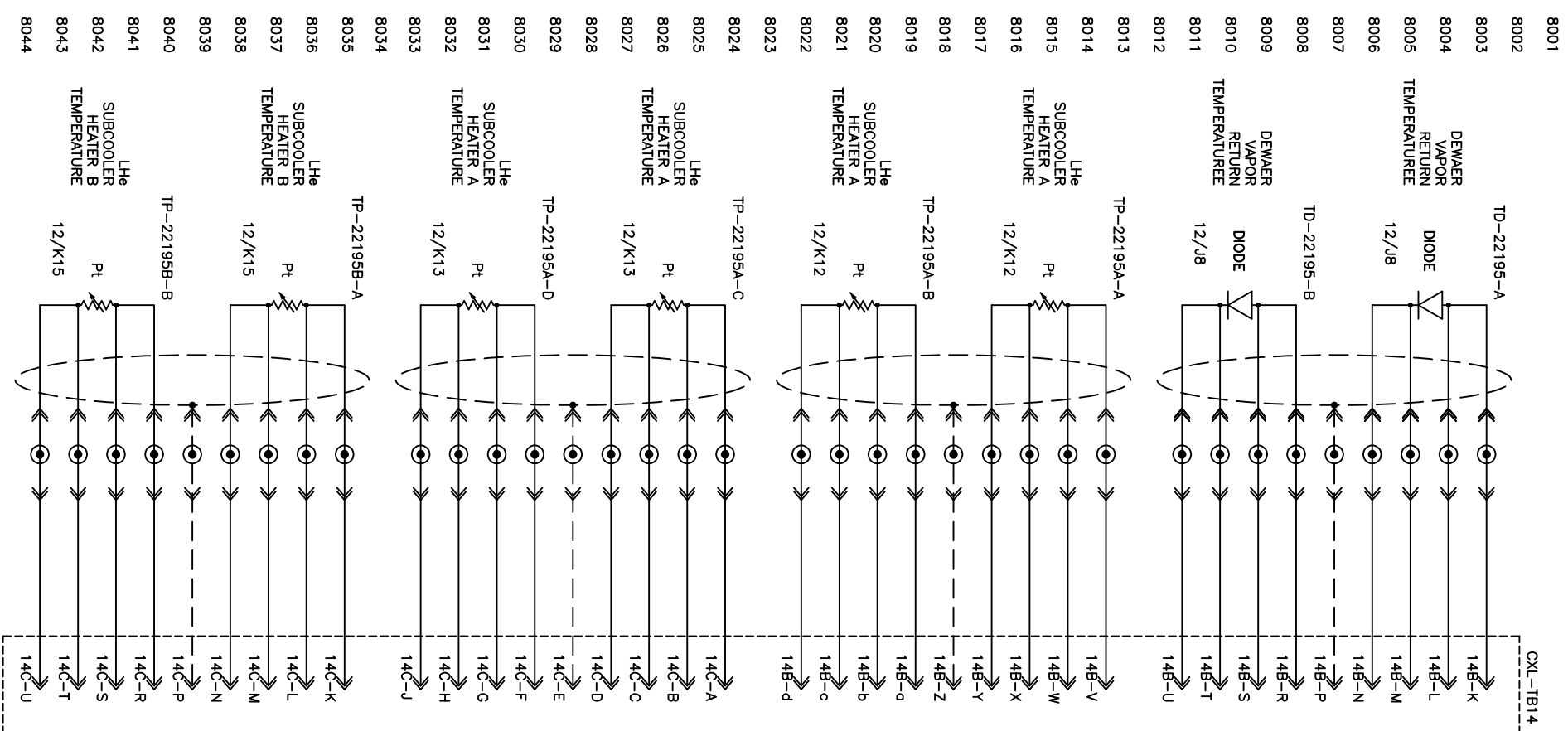


LBS	WORK ORDER	CONTRACT NO.	PART NUMBER	NO. REV'D	NEXT ASSEMBLY	SIZE
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CHECKED	SPW	FRACTION				
ENGINEER	MJA	.XX				
REVIEWED	SPW	.XXX				
REL. DATE	8/30/2016		ANGULAR			
PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204 LCLS-II 4.5K LOWER COLD BOX TEMPERATURE SENSORS						
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.			SCALE	NONE		
			SIZE	B		
			DRAWING NO.	15-5032-1402		
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REVISIONS

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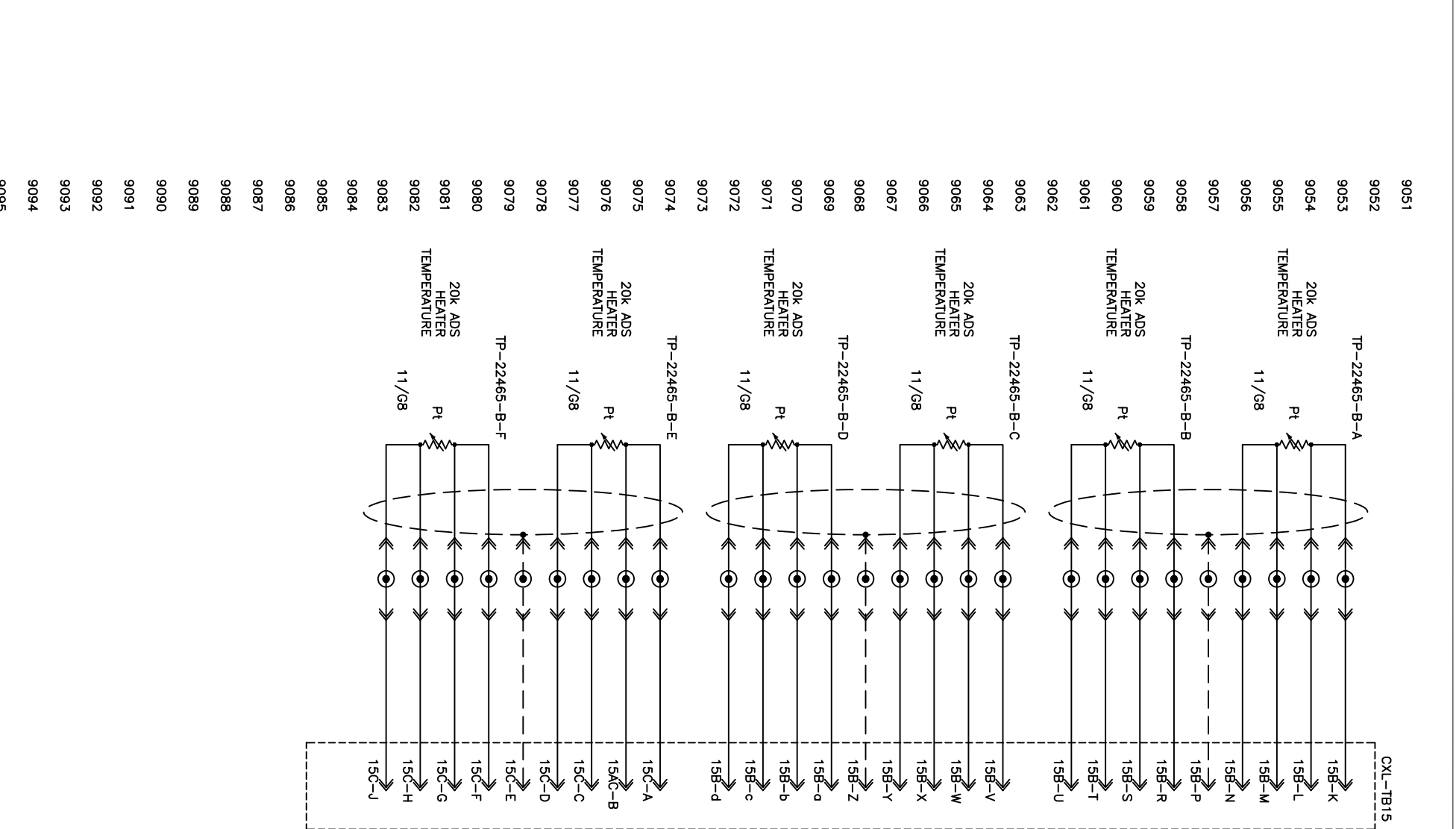
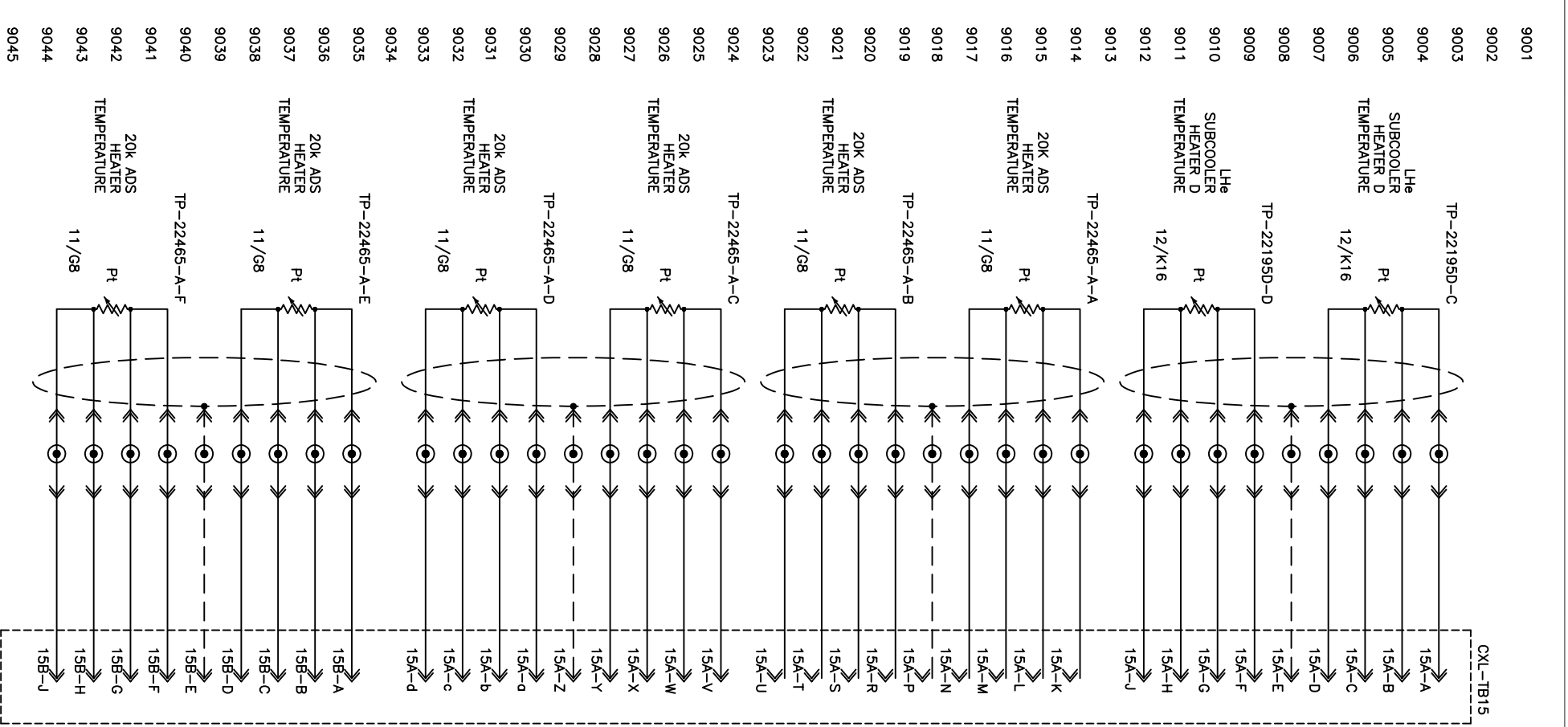


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DRAWN		MMA		TOLERANCES		PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204 LCLS-II 4.5K LOWER COLD BOX RTD INPUTS
CHECKED		SPW		FRACTION		
ENGINEER		MMA		.XX		
REVIEWED		SPW		.XXX		
REL. DATE		8/30/2016		ANGULAR		
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.		SCALE		NONE		
		DRAWING NO.		15-5032-1402		CHG.
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						SHEET 8 OF 17

REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
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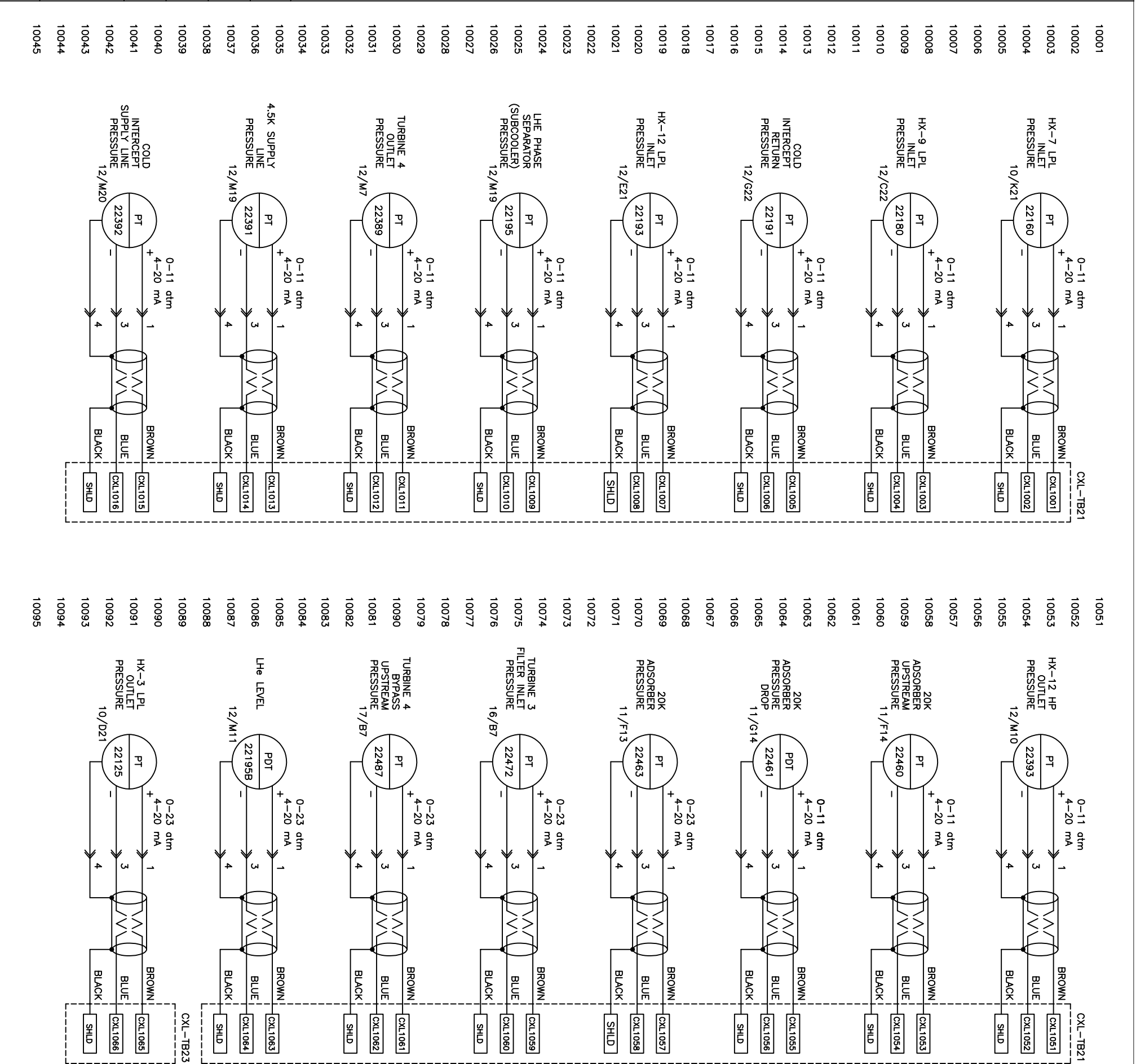


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LBS	MJA					
DRAWN	TOLERANCES		PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204			
CHECKED	SPW	FRACTION	LCLS-II 4.5K LOWER COLD BOX RTD INPUTS			
ENGINEER	MJA	XX				
REVIEWED	SPW	XXX				
REL. DATE	ANGULAR					
10/5/2016						
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.			SCALE	NONE		SHEET 9 OF 17
			SIZE	B		CHG. F
			DRAWING NO.	15-5032-1402		

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REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
E	08/08/18	RDK	CAF	MJA	MJA	22487 WAS 22485



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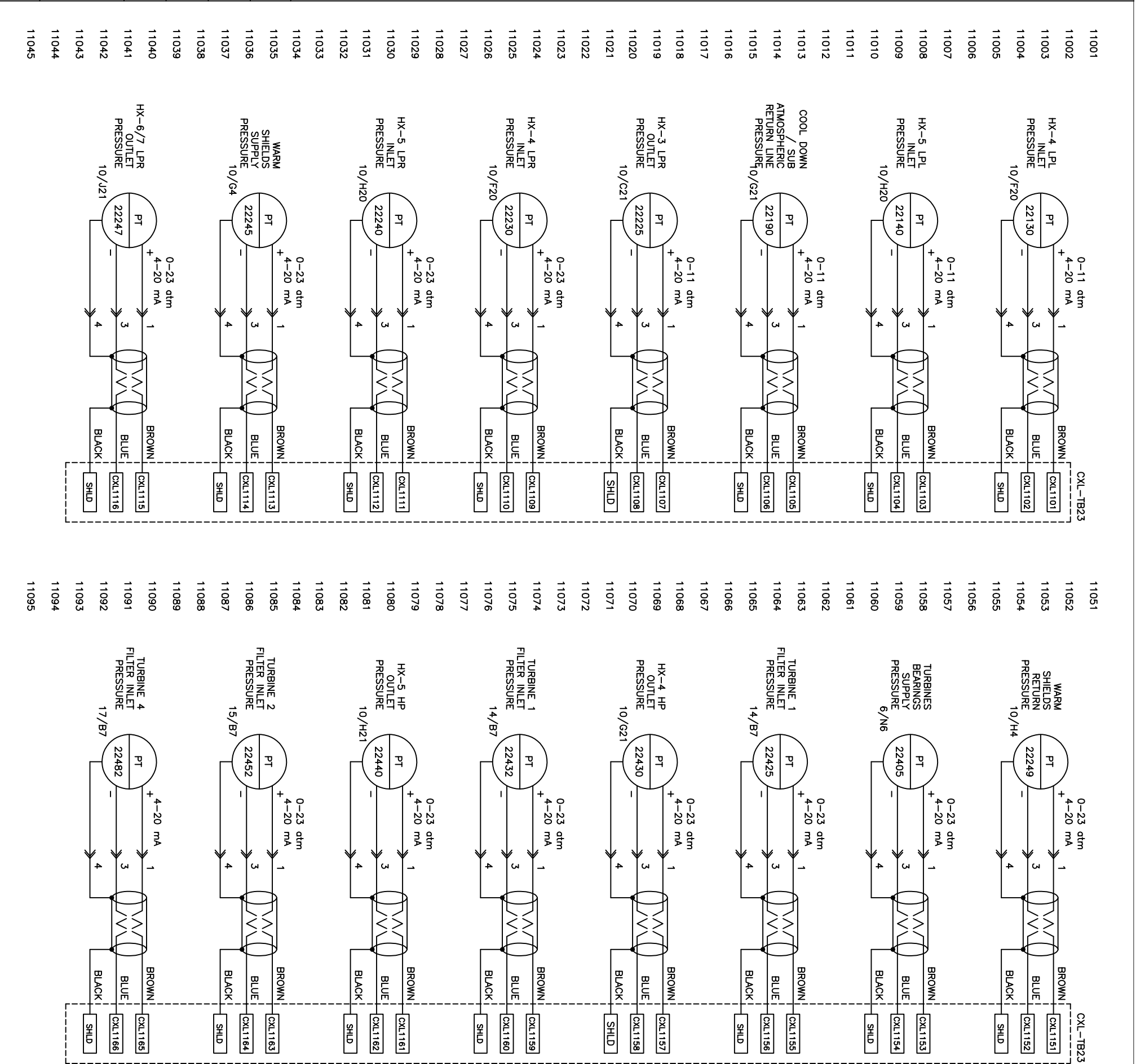
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DRAWN	MJA					
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ENGINEER	MJA	XX				
REVIEWED	SPW	XXX				
REL. DATE	10/5/2016	ANGULAR				
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.			SCALE NONE			

PHPK TECHNOLOGIES
 2111 BUILDERS PLACE COLUMBUS, OHIO 43204
 LCLS-II 4.5K LOWER COLD BOX
 ANALOG INPUTS
 DRAWING NO. 15-5032-1402
 CHG. E
 SHEET 10 OF 17

INFORMATION SHOWN ON THIS DRAWING IS PROPRIETARY AND THE SOLE PROPERTY OF PHPK AND IS NOT TO BE DISCLOSED OR TRANSMITTED TO UNAUTHORIZED PARTIES.

REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
E	08/08/18	RDK	CAF	MJA	MJA	PT22487 CHANGED TO PT22452

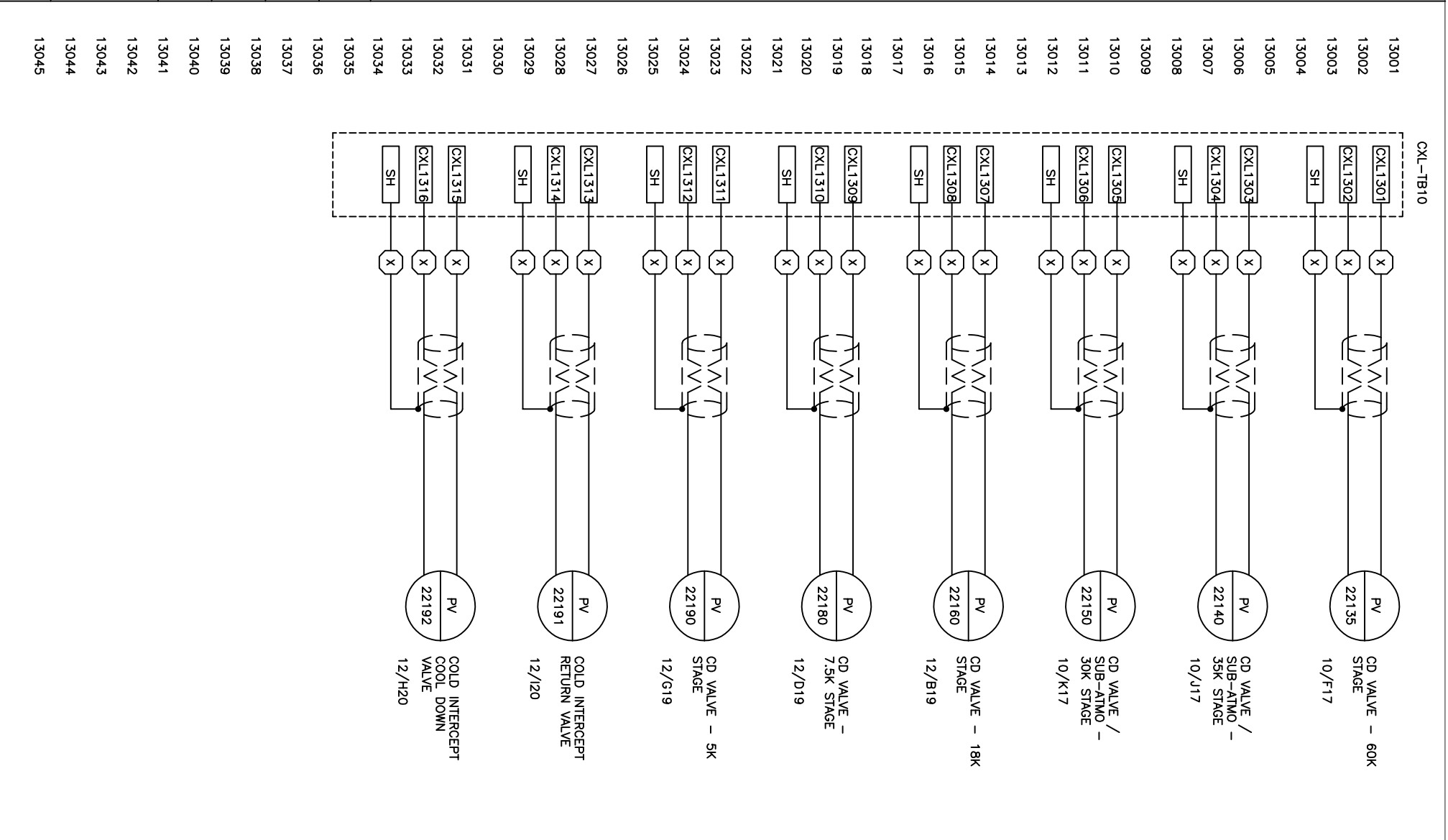


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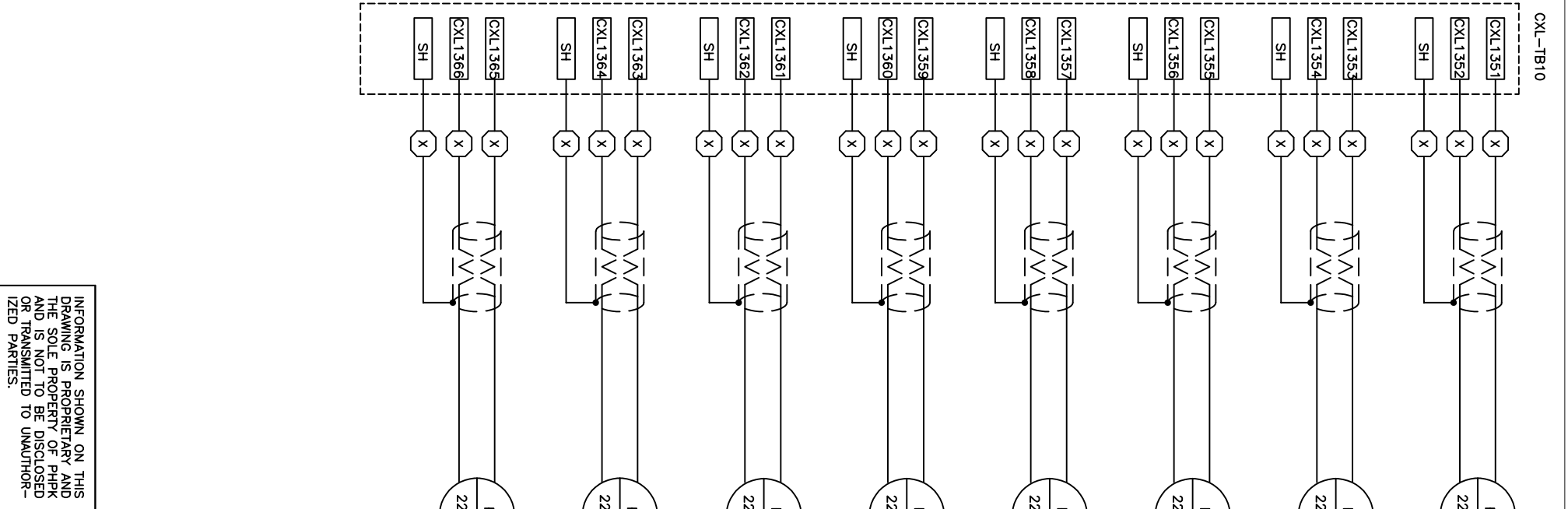
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CHECKED	SPW	FRACTION	TITLE LCLS-II 4.5K LOWER COLD BOX ANALOG OUTPUTS			
ENGINEER	MJA	XXX	SIZE DRAWING NO. 15-5032-1402			
REVIEWED	SPW	ANGULAR	CHG. E			
REL. DATE	8/30/2016		SCALE		NONE	
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.						
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REVISIONS

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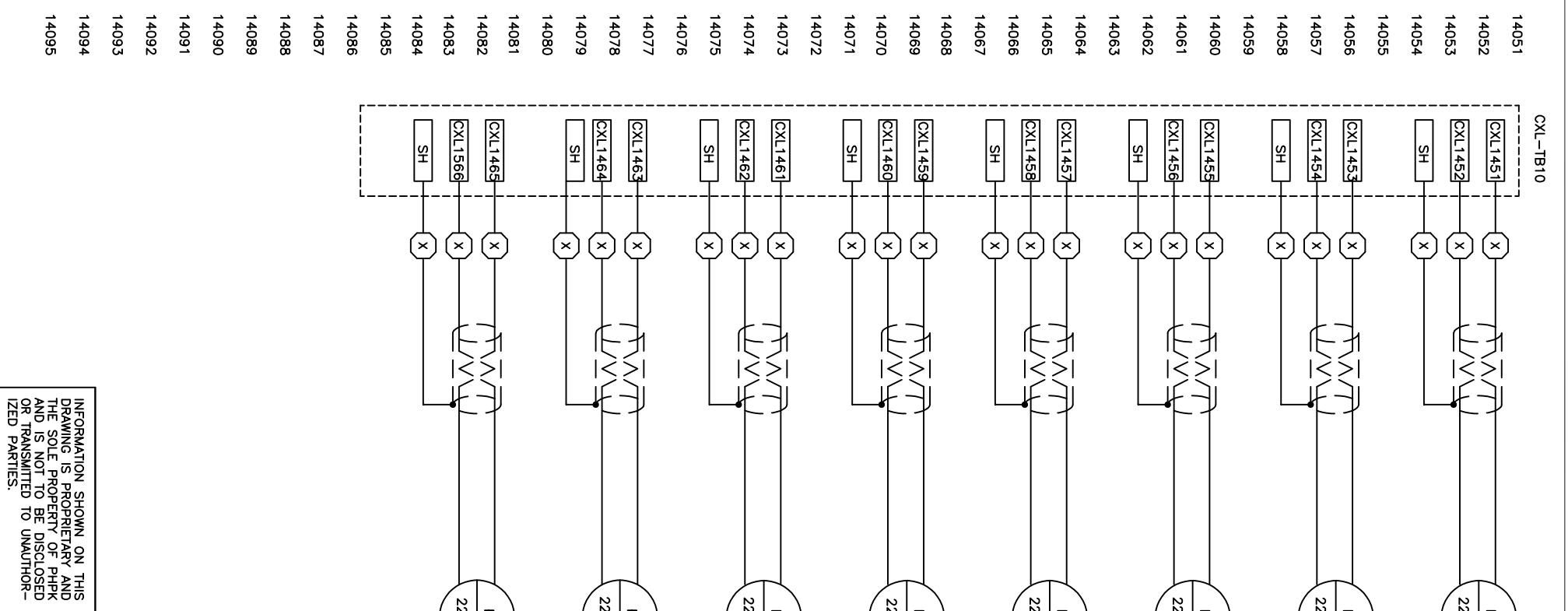
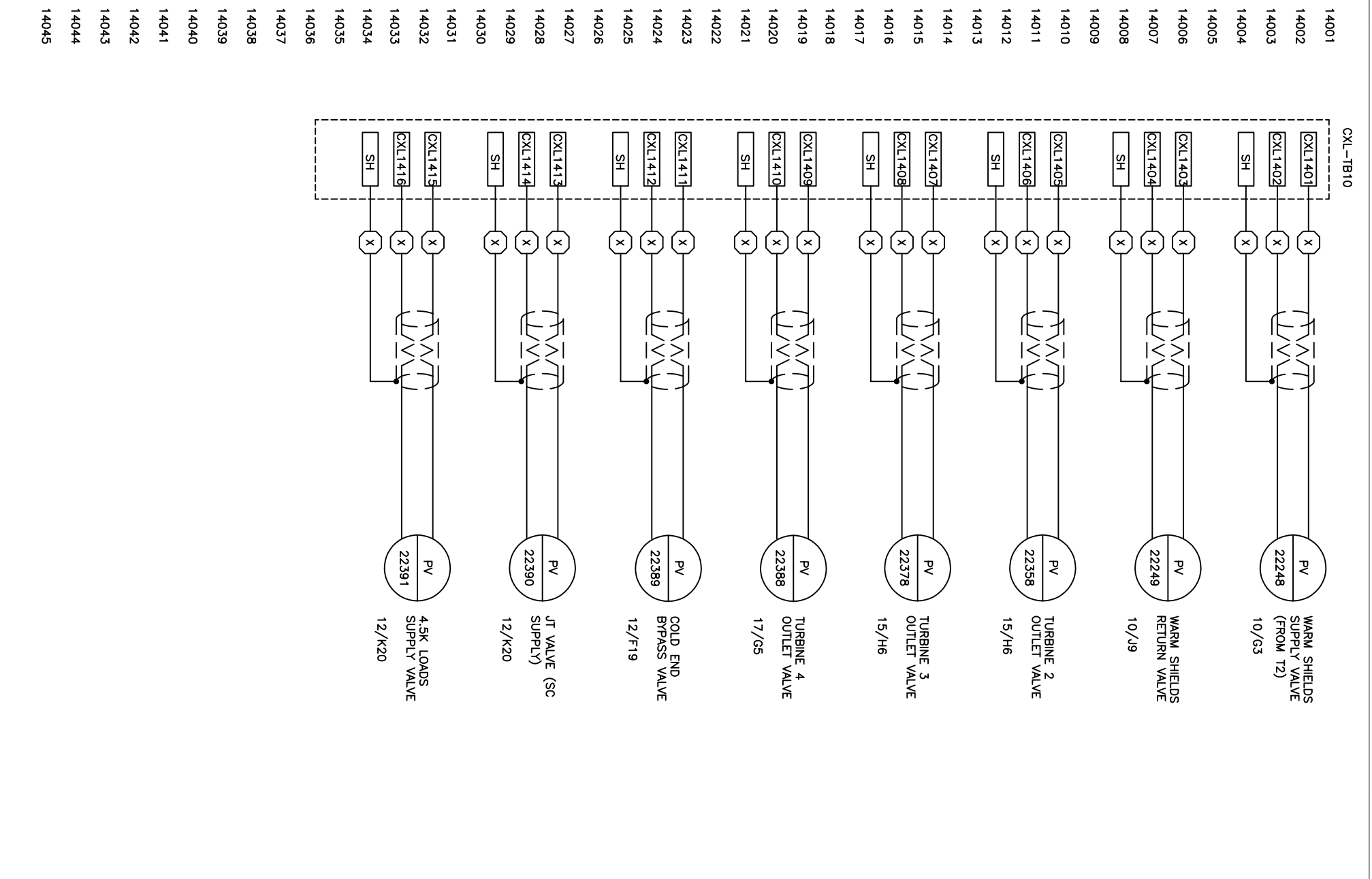
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. LBS		WORK ORDER		CONTRACT NO.		PART NUMBER		NO. REV'D		NEXT ASSEMBLY		SIZE	
WEIGHT		MAA		TOLERANCES		DRAWN		SPW		FRACTION		CHECKED	
ENGINEER		MAA		XXX		REVIEWED		SPW		ANGULAR		REL. DATE	
8/30/2016		TITLE		DRAWING NO.		SCALE		NONE		SHEET		13 OF 16	
PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204 LCLS-II 4.5K LOWER COLD BOX ANALOG OUTPUTS													
												CHG. F	

REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
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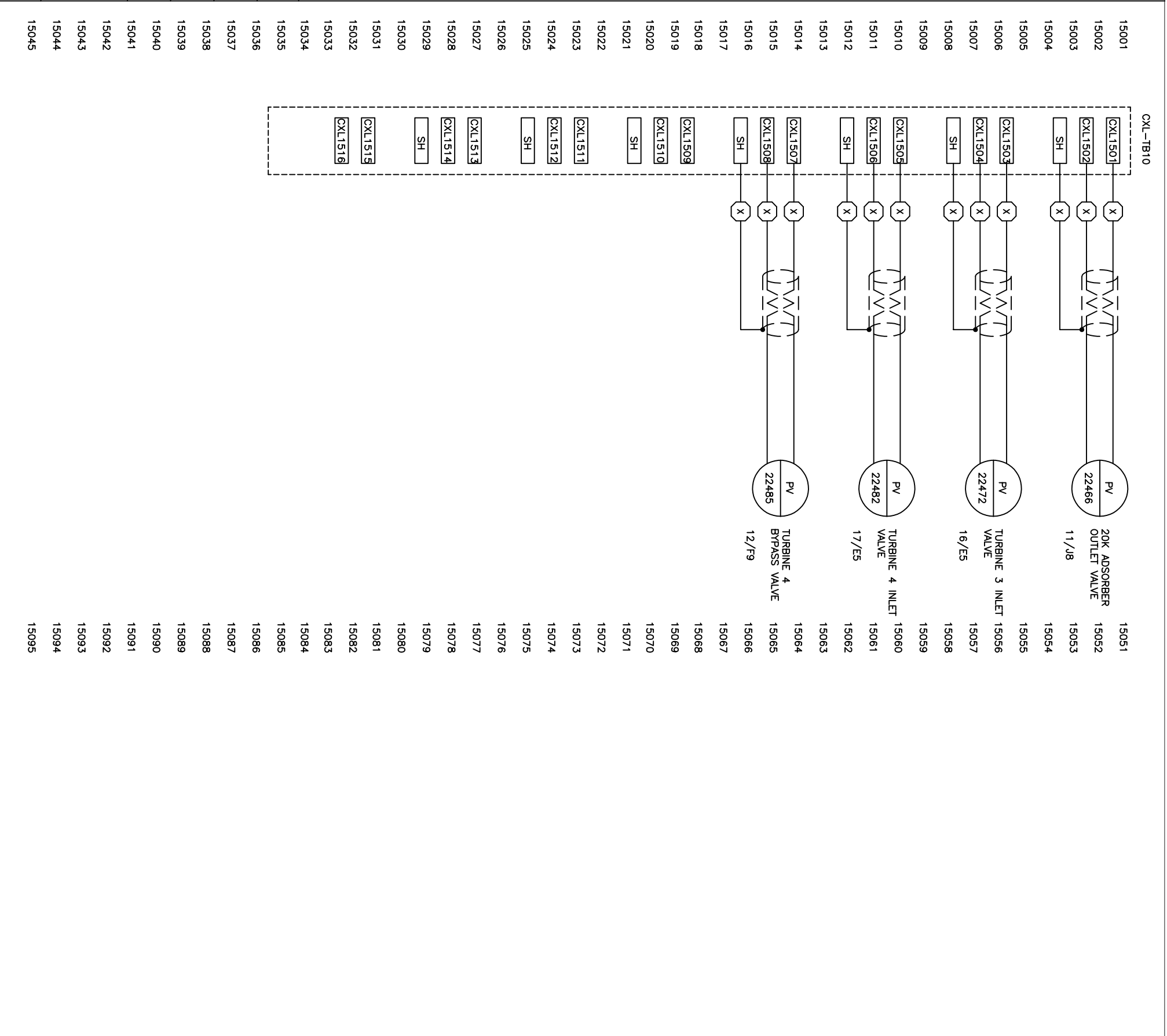


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DRAWN		MJA		TOLERANCES		CHECKED		SPW		FRACTION		TITLE	
ENGINEER		MJA		XX		REVIEWED		SPW		ANGULAR		PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204	
REL. DATE		8/30/2016		SIZE		DRAWING NO.		SCALE		SHEET		CHG.	
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.		B		15-5032-1402		F		14 OF		17			

INFORMATION SHOWN ON THIS DRAWING IS PROPRIETARY AND THE SOLE PROPERTY OF PHPK AND IS NOT TO BE DISCLOSED OR TRANSMITTED TO UNAUTHORIZED PARTIES.

REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
-	-	-	-	-	-	-

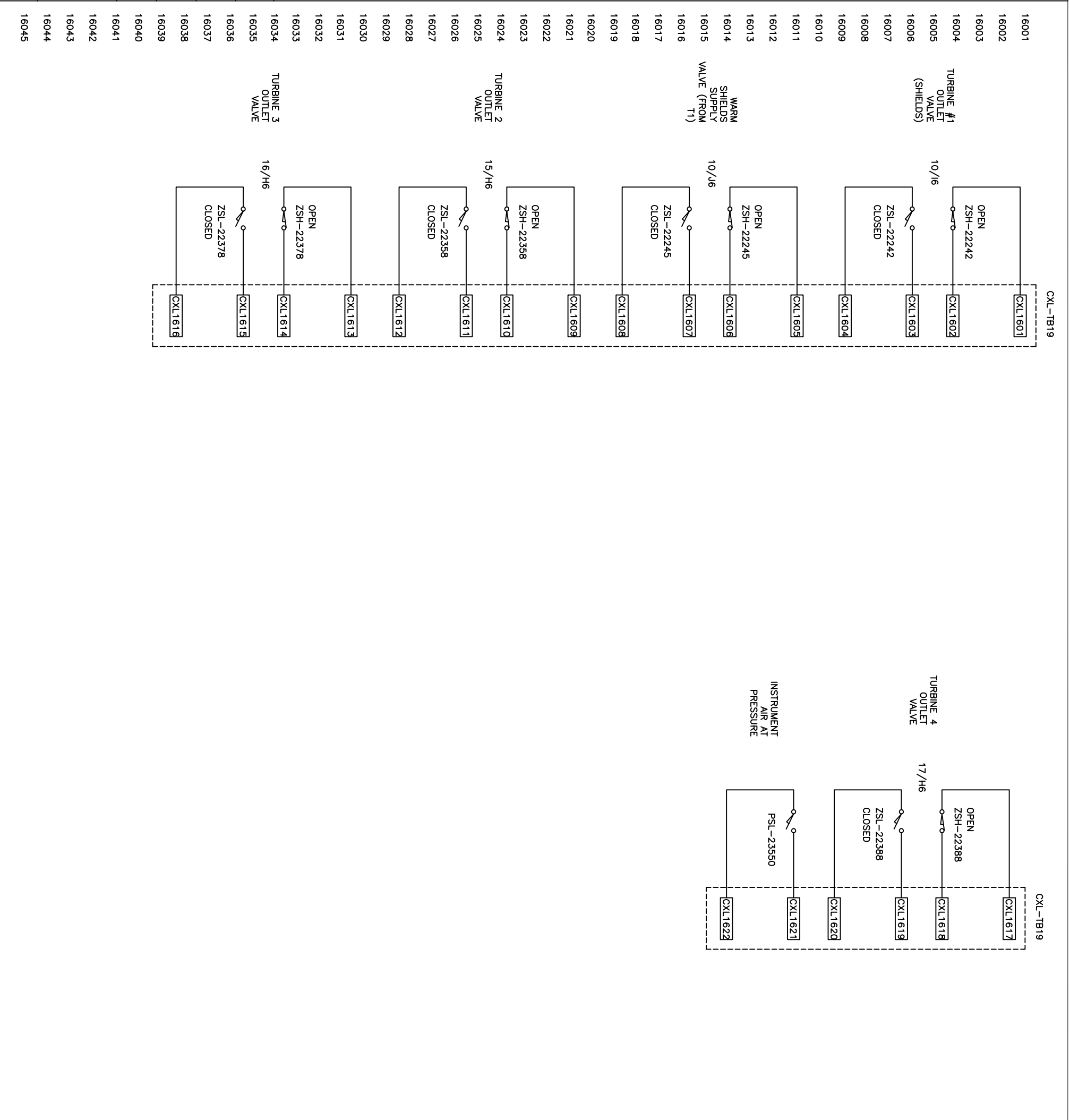


. LBS		WORK ORDER		CONTRACT NO.		PART NUMBER		NO. REV'D		NEXT ASSEMBLY		SIZE	
DRAWN		MJA		TOLERANCES		CHECKED		SPW		FRACTION		TITLE	
ENGINEER		MJA		.XX		REVIEWED		SPW		ANGULAR		PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204 LCLS-II 4.5K LOWER COLD BOX ANALOG OUTPUTS	
REL. DATE		8/30/2016		SCALE		SIZE		DRAWING NO.		15-5032-1402		CHG.	
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.		B		NONE		SHEET		15 OF		17		F	

INFORMATION SHOWN ON THIS DRAWING IS PROPRIETARY AND THE SOLE PROPERTY OF PHPK AND IS NOT TO BE DISCLOSED OR TRANSMITTED TO UNAUTHORIZED PARTIES.

REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
-	-	-	-	-	-	

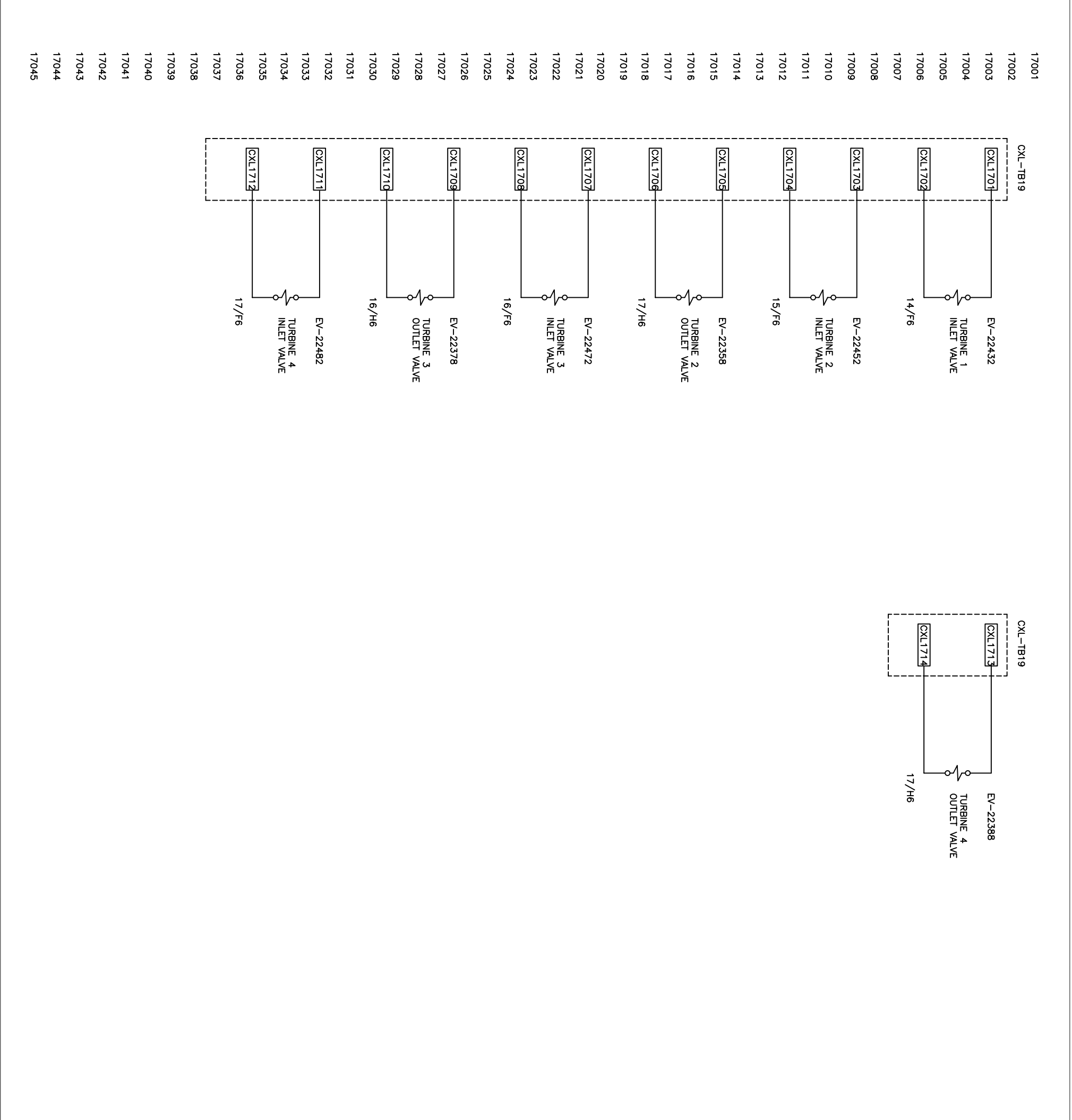


WGT	WORK ORDER	CONTRACT NO.	PART NUMBER	NO. REV'D	NEXT ASSEMBLY	SIZE
DRWN	MJA	TOLERANCES	PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204			
CHECKED	SPW	FRACTION	TITLE LCLS-II 4.5K LOWER COLD BOX DIGITAL INPUTS			
ENGINEER	MJA	.XX	SIZE B			
REVIEWED	SPW	.XXX	DRAWING NO. 15-5032-1402			
REL. DATE	8/30/2016	ANGULAR	SCALE NONE			
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.			CHG. F			

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REVISIONS

CHG.	DATE	DWN.	CH'KD.	ENGR.	REV'D	DESCRIPTION
A	10-5-2016	MJA	MJA	MJA	MJA	MADE AIR LIQUIDE REQUESTED CHANGES



. LBS	WORK ORDER	CONTRACT NO.	PART NUMBER	NO. REV'D	NEXT ASSEMBLY	SIZE
	MJA					
DRAWN	TOLERANCES		PHPK TECHNOLOGIES 2111 BUILDERS PLACE COLUMBUS, OHIO 43204 LCLS-II 4.5K LOWER COLD BOX SOLENOID OUTPUTS			
CHECKED	SPW	FRACTION				
ENGINEER	MJA	.XX				
REVIEWED	SPW	.XXX				
REL. DATE	8/30/2016	ANGULAR				
DIMENSIONS ARE PROVIDED PRIOR TO SURFACE TREATMENTS UNLESS NOTED.						
SCALE	SIZE		DRAWING NO.		CHG.	
B	NONE		15-5032-1402		E	

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