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IO EXTRACTOR INSTALLATION

MECHANICAL

CONTENTS	
SHEET NO	TITLE
1	Cover Page
2	Component List
3	Overview 1
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5	Electrical
6	Process Piping Diagram
7	Extraction Skid
8	Control Panel
9	Water Heater
10	Hot Water Plumbing Detail
11	Water Cooling Tower
12	Water Cooling Tower Plumbing Detail
13	Chillers
14	Chiller Plumbing Detail
15	Penetration Bulkhead



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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	LUNA TECHNOLOGIES	
DIMENSIONS ARE IN INCHES		DRAWN			
TOLERANCES:		COMMENTS:		TITLE: WATER COOLING TOWER AND PUMP	
FRACTIONAL					
ANGULAR: MACH BEND					
TWO PLACE DECIMAL		SIZE		DWG. NO.	REV
THREE PLACE DECIMAL		B		IO Extractor Installation	6A
INTERPRET GEOMETRIC TOLERANCING PER:		SCALE: 1:50		WEIGHT:	SHEET 1 OF 15
MATERIAL		NOT DRAWN TO SCALE			
FINISH					

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EQUIPMENT INCLUDED IN SHIPMENT

NO	QTY	DESCRIPTION	NOTES/USE	SHEET REF	MANF	P/N
1	1	Extraction Skid	Extraction	3-6, 7	Luna Tech	KJ-02
2	1	Chiller 1 (Condenser)	Cooling for solvent vapor recovery	3-6, 13, 14	Lneya	LT-80A2NPW
3	1	Chiller 2 (Vessel Jackets)	Cooling supply for extraction	3-6, 13, 14	Lneya	LT-80A1NPW
4	1	Hot Water Heater	Solvent recovery	3-6, 8, 9	Rheem	XE50M09EL55U1
5	1	Hot Water Pump Skid	solvent recovery	3-6, 8, 9	Luna Tech	
6	1	Water Cooling Tower	Cooling water supply for chillers	3-6, 11, 12	CTS	T-225
7	1	Water Cooling Tower Pump	Cooling water circulation for chillers	3-6, 11, 12	CTS	
8	1	Control Panel	Extraction process control	3-6, 8	Luna Tech	

EQUIPMENT NOT INCLUDED IN SHIPMENT

NO	QTY	DESCRIPTION	NOTES/USE	PAGE REF	MANF	P/N
1	1	Air Compressor	Pneumatic valve supply air	3-6	UNKNOWN - SUPPLIED BY CUSTOMER	
2	1	Vacuum Pump	Extractor air evacuation	3-6	Welch CRVPro16 EX recommended	
3	1	CO2 Supply Tank (20lbs)	Supply for solvent pump	6	UNKNOWN - SUPPLIED BY CUSTOMER	
4	2	Butane/Propane cylinder (100lbs)	Supply for extraction	n/a	UNKNOWN - SUPPLIED BY CUSTOMER	

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DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ANGULAR: MACH BEND TWO PLACE DECIMAL THREE PLACE DECIMAL		DRAWN				
INTERPRET GEOMETRIC TOLERANCING PER:		COMMENTS:		TITLE: WATER COOLING TOWER AND PUMP		
MATERIAL				SIZE	DWG. NO.	REV
FINISH				B	IO Extractor Installation	6A
NOT DRAWN TO SCALE		SCALE: 1:50 WEIGHT:		SHEET 2 OF 15		

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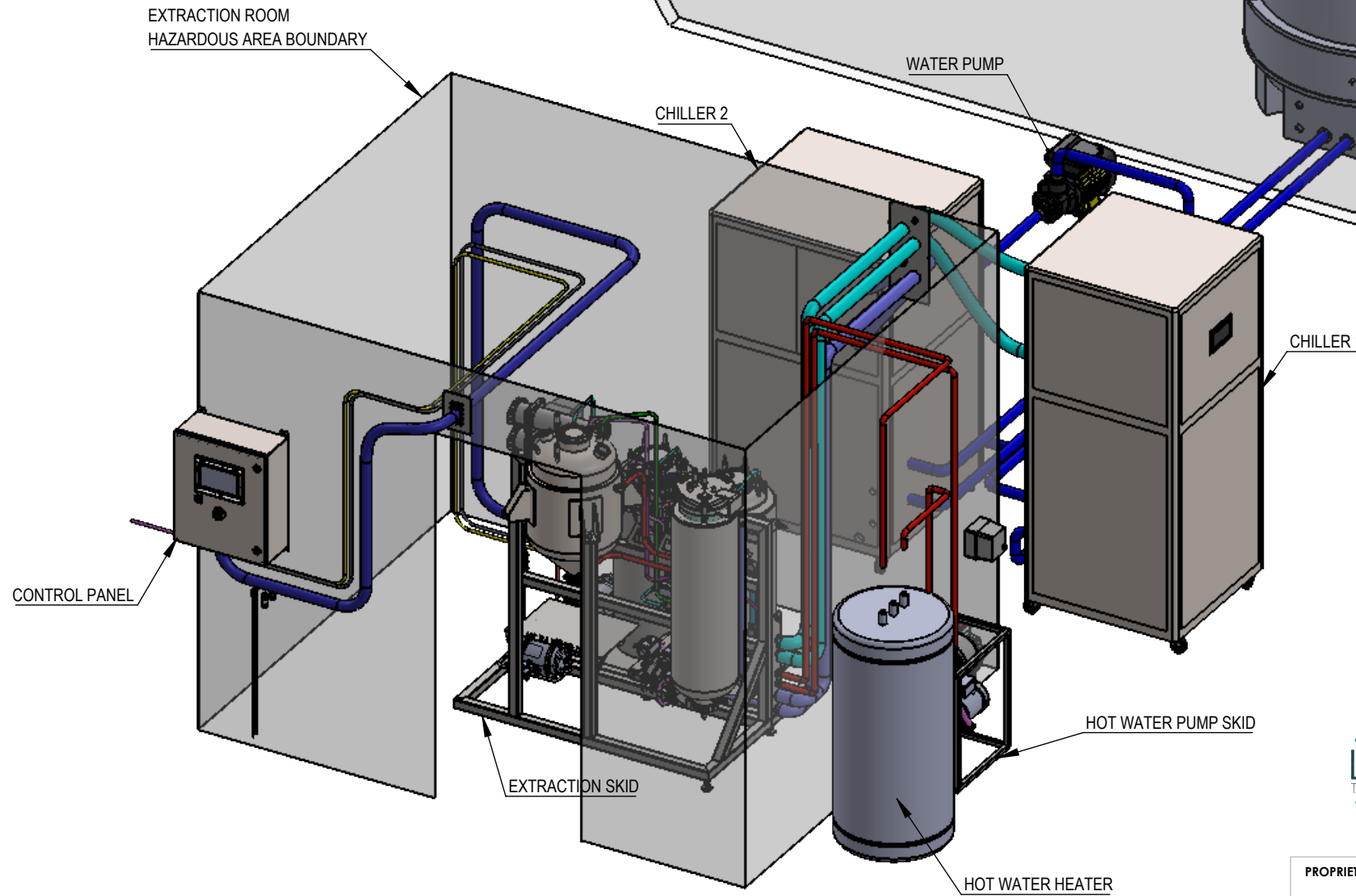
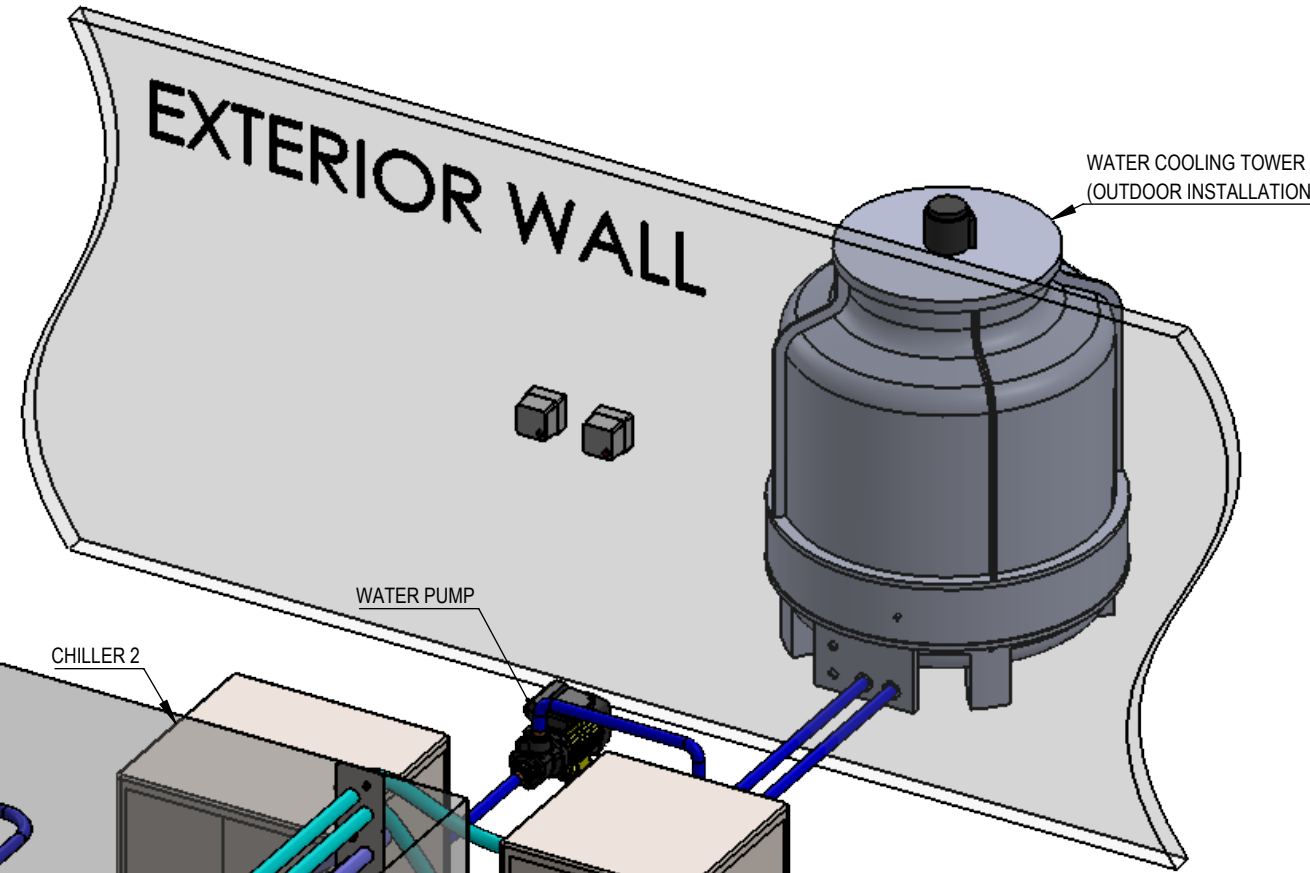
Installation shall be in accordance with ANSI/NFPA 70, National Electrical Code (NEC), the International Fire Code, and ANSI/NFPA 1, Fire Code, together with the installation instructions.

Use of the IO Extractor is intended to be by personnel trained and qualified by Luna Technologies or their designee, or as otherwise required by the Authority Having Jurisdiction (AHJ). Such persons who are to be engaged in, and have responsibility for, proper operation are intended to be experienced in such work, and to be familiar with all safety precautions.

It is the responsibility of the Authority Having Jurisdiction (AHJ) to verify the suitability of the extractors in the end installation in accordance with all applicable codes, together with the installation instructions.

IO EXTRACTOR INSTALLATION

EQUIPMENT SCHEDULE				
NO.	EQUIPMENT	WEIGHT	VOLTAGE	LOAD AMPS
1	EXTRACTION SKID	1065LBS	N/A	N/A
2	CONTROL PANEL	42LBS	120V, 1PH	3.0A
3	WATER HEATER	121LBS DRY	240V, 1PH	22.9A
4	HOT WATER PUMP	33LBS	240V, 1PH	4.1A
5	WATER COOLING TOWER FAN MOTOR	191LBS DRY, 790LBS WET	240V, 1PH	3.0A
6	WATER COOLING TOWER PUMP	89LBS	240V, 3PH	6.0A
7	CHILLER 1	1036LBS	240V, 3PH	61.8A (MCC + FLA)
8	CHILLER 2	838LBS	240V, 3PH	50.3A (MCC + FLA)
9	SOLVENT PUMP	SKID MOUNTED	240V, 3PH	5.2A
10	VACUUM PUMP	UNKNOWN - SUPPLIED BY CUSTOMER		
11	AIR COMPRESSOR			



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DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL
ANGULAR: MACH BEND
TWO PLACE DECIMAL
THREE PLACE DECIMAL

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL

FINISH

DO NOT SCALE DRAWING

NAME	DATE

DRAWN

COMMENTS:

LUNA TECHNOLOGIES

TITLE:
OVERVIEW 1

SIZE	DWG. NO.	REV
B	IO Extractor Installation	6A

SCALE: 1:100 WEIGHT: SHEET 3 OF 15

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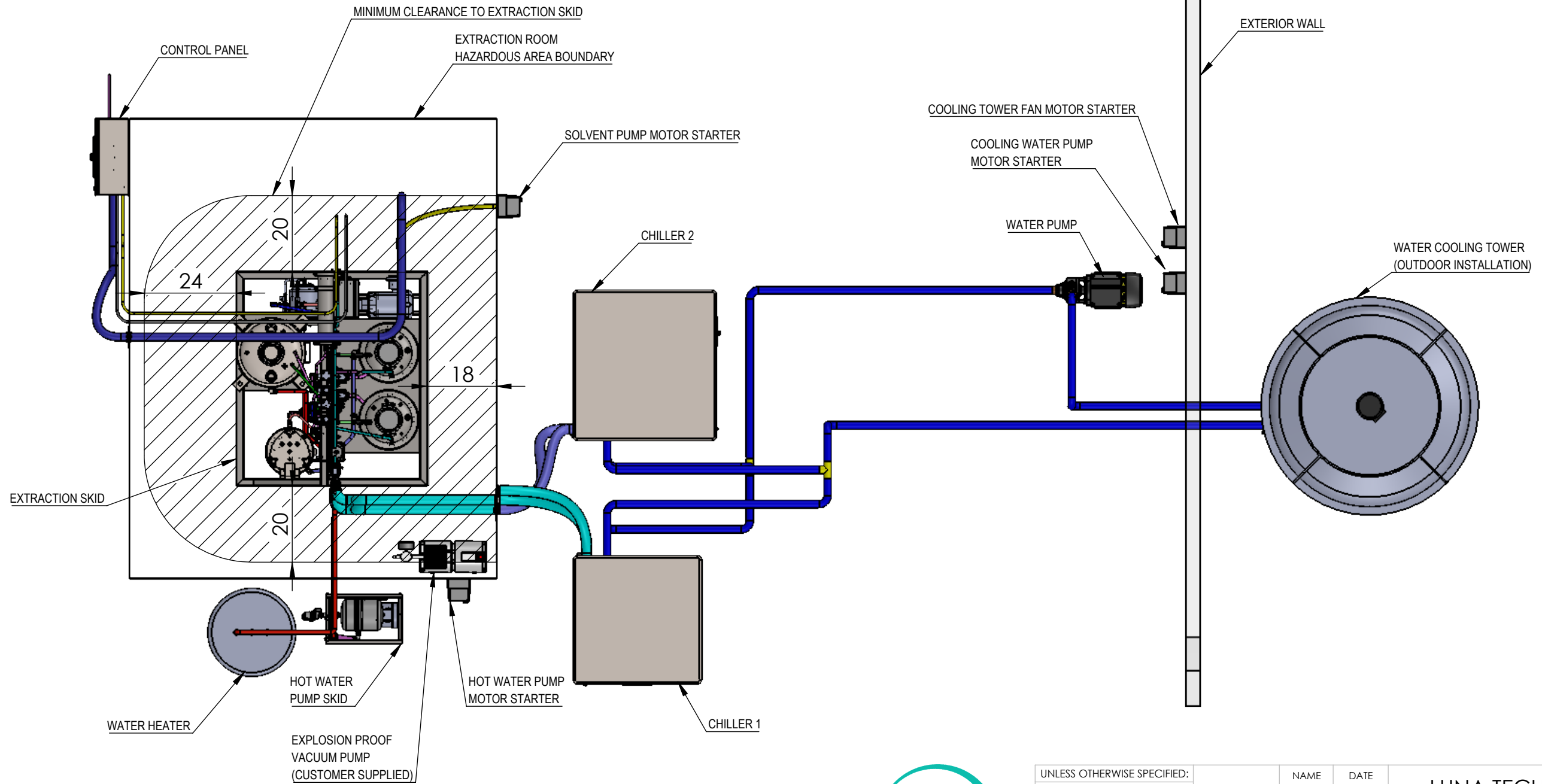
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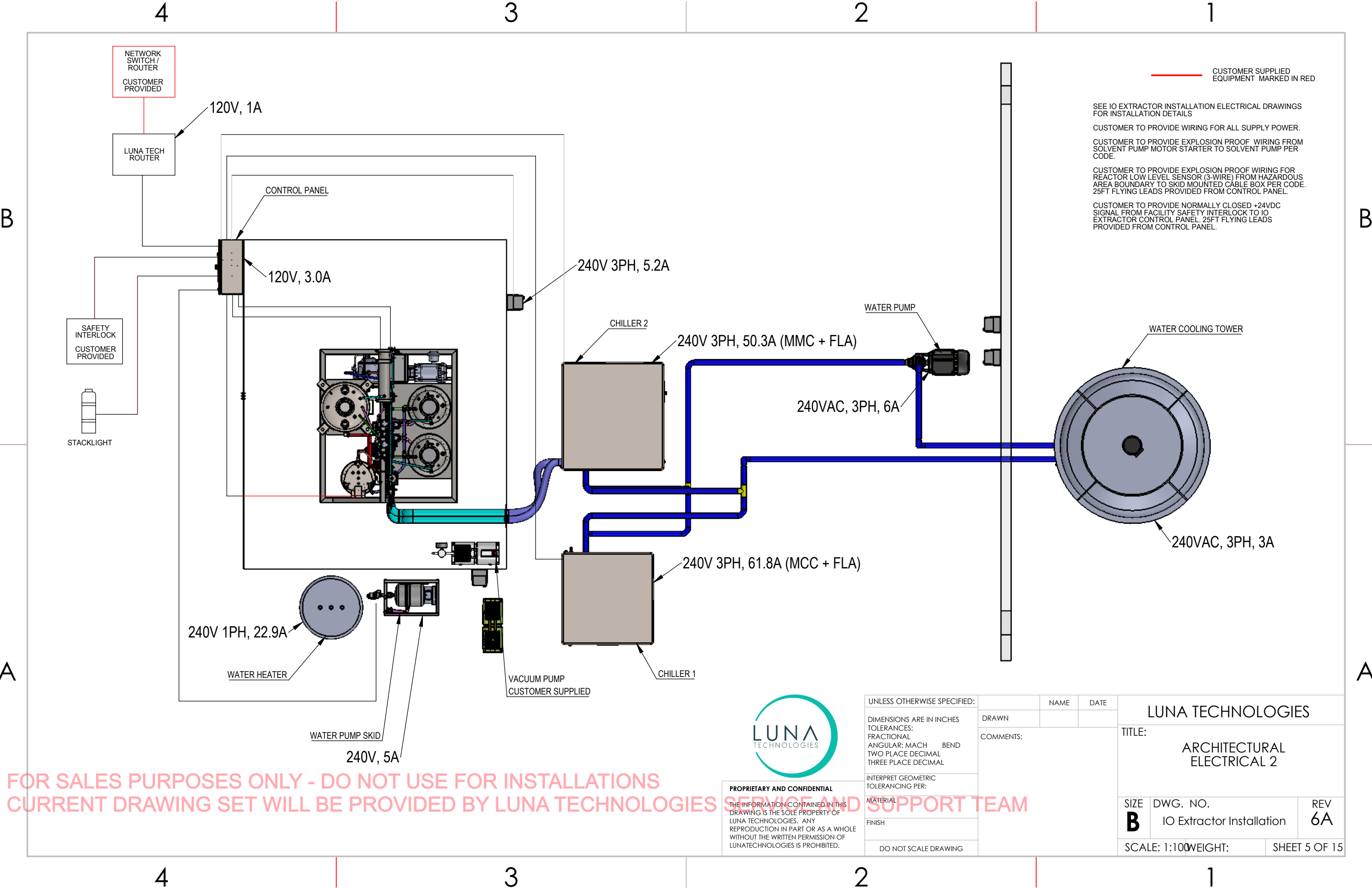
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DIMENSIONS ARE IN INCHES		DRAWN			
TOLERANCES:		COMMENTS:		SIZE	
FRACTIONAL				DWG. NO.	
ANGULAR: MACH BEND				REV	
TWO PLACE DECIMAL		IO Extractor Installation		6A	
THREE PLACE DECIMAL		SCALE: 1:100		WEIGHT:	
INTERPRET GEOMETRIC TOLERANCING PER:		DO NOT SCALE DRAWING		SHEET 4 OF 15	
MATERIAL					
FINISH					



CUSTOMER SUPPLIED EQUIPMENT MARKED IN RED

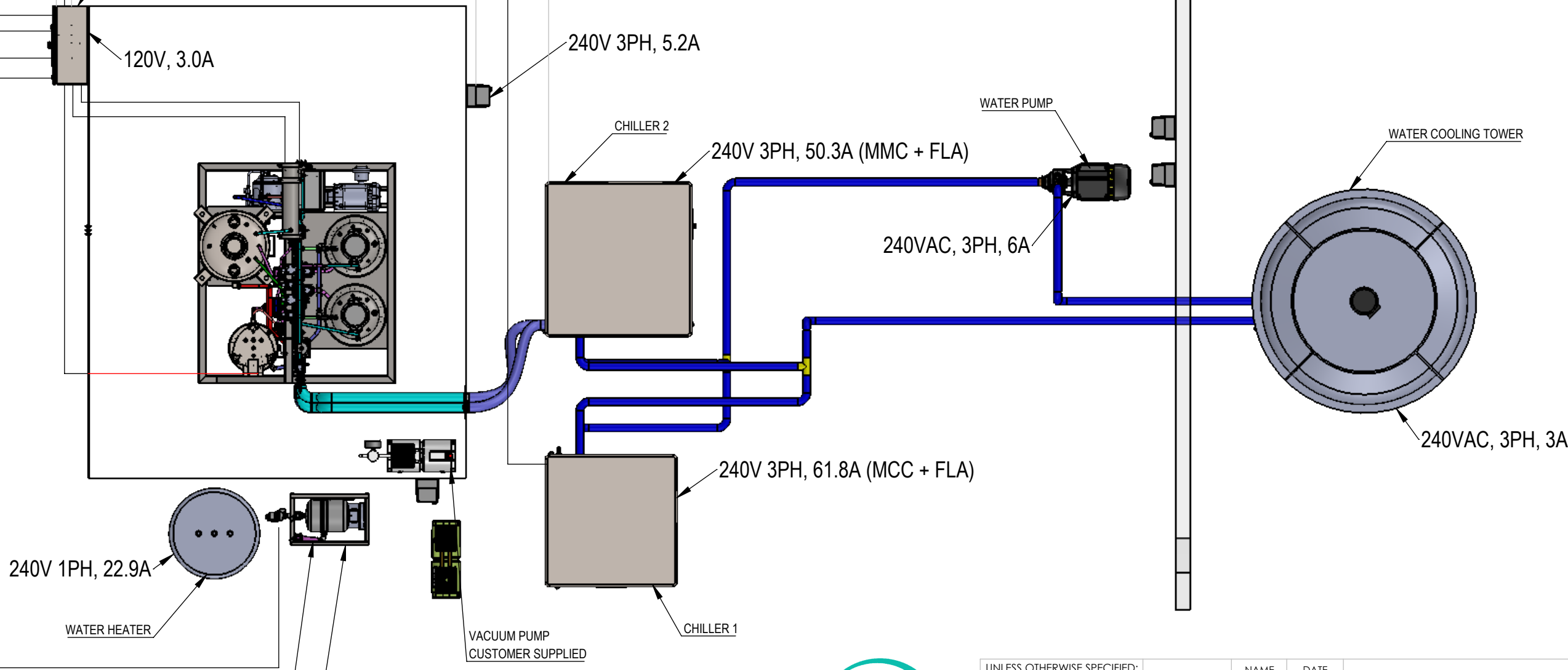
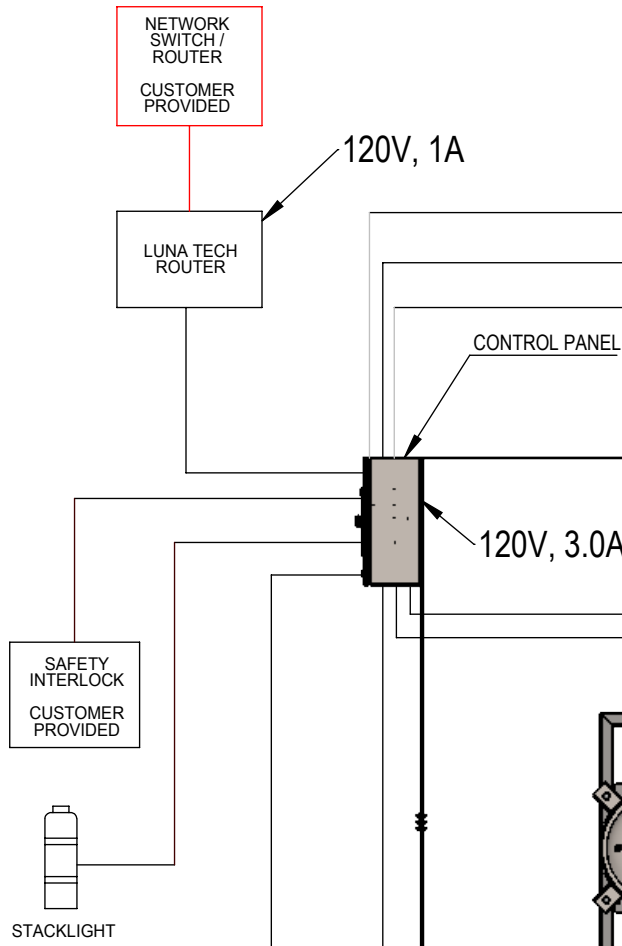
SEE IO EXTRACTOR INSTALLATION ELECTRICAL DRAWINGS FOR INSTALLATION DETAILS

CUSTOMER TO PROVIDE WIRING FOR ALL SUPPLY POWER.

CUSTOMER TO PROVIDE EXPLOSION PROOF WIRING FROM SOLVENT PUMP MOTOR STARTER TO SOLVENT PUMP PER CODE.

CUSTOMER TO PROVIDE EXPLOSION PROOF WIRING FOR REACTOR LOW LEVEL SENSOR (3-WIRE) FROM HAZARDOUS AREA BOUNDARY TO SKID MOUNTED CABLE BOX PER CODE. 25FT FLYING LEADS PROVIDED FROM CONTROL PANEL.

CUSTOMER TO PROVIDE NORMALLY CLOSED +24VDC SIGNAL FROM FACILITY SAFETY INTERLOCK TO IO EXTRACTOR CONTROL PANEL. 25FT FLYING LEADS PROVIDED FROM CONTROL PANEL.



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UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN	
TOLERANCES:		COMMENTS:	
FRACTIONAL			
ANGULAR: MACH BEND			
TWO PLACE DECIMAL		TITLE: LUNA TECHNOLOGIES	
THREE PLACE DECIMAL		ARCHITECTURAL ELECTRICAL 2	
INTERPRET GEOMETRIC TOLERANCING PER:	MATERIAL	SIZE B	DWG. NO. IO Extractor Installation
FINISH	DO NOT SCALE DRAWING	REV 6A	SCALE: 1:100 WEIGHT: SHEET 5 OF 15

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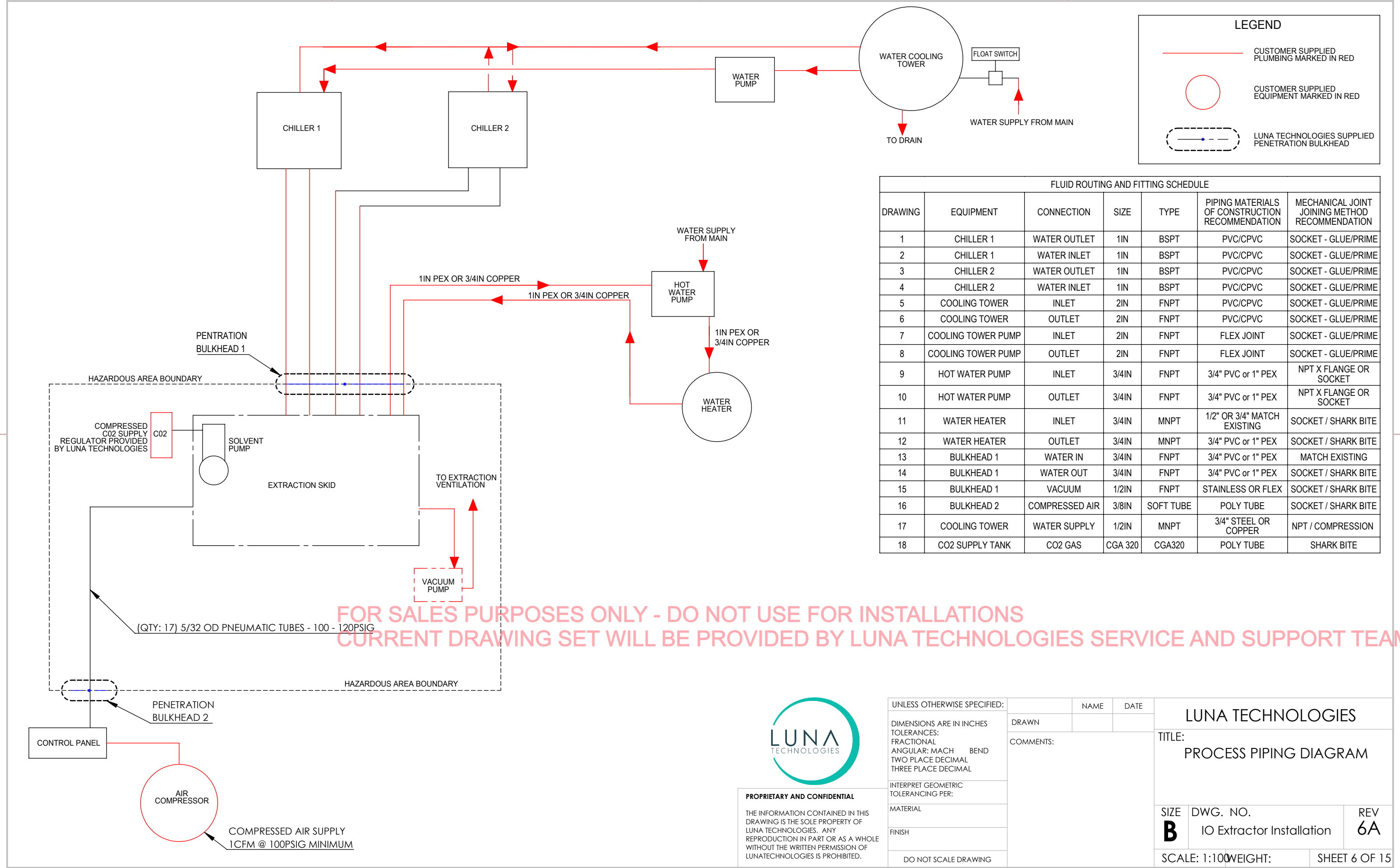
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LEGEND

- CUSTOMER SUPPLIED PLUMBING MARKED IN RED
- CUSTOMER SUPPLIED EQUIPMENT MARKED IN RED
- LUNA TECHNOLOGIES SUPPLIED PENETRATION BULKHEAD

FLUID ROUTING AND FITTING SCHEDULE						
DRAWING	EQUIPMENT	CONNECTION	SIZE	TYPE	PIPING MATERIALS OF CONSTRUCTION RECOMMENDATION	MECHANICAL JOINT JOINING METHOD RECOMMENDATION
1	CHILLER 1	WATER OUTLET	1IN	BSPT	PVC/CPVC	SOCKET - GLUE/PRIME
2	CHILLER 1	WATER INLET	1IN	BSPT	PVC/CPVC	SOCKET - GLUE/PRIME
3	CHILLER 2	WATER OUTLET	1IN	BSPT	PVC/CPVC	SOCKET - GLUE/PRIME
4	CHILLER 2	WATER INLET	1IN	BSPT	PVC/CPVC	SOCKET - GLUE/PRIME
5	COOLING TOWER	INLET	2IN	FNPT	PVC/CPVC	SOCKET - GLUE/PRIME
6	COOLING TOWER	OUTLET	2IN	FNPT	PVC/CPVC	SOCKET - GLUE/PRIME
7	COOLING TOWER PUMP	INLET	2IN	FNPT	FLEX JOINT	SOCKET - GLUE/PRIME
8	COOLING TOWER PUMP	OUTLET	2IN	FNPT	FLEX JOINT	SOCKET - GLUE/PRIME
9	HOT WATER PUMP	INLET	3/4IN	FNPT	3/4" PVC or 1" PEX	NPT X FLANGE OR SOCKET
10	HOT WATER PUMP	OUTLET	3/4IN	FNPT	3/4" PVC or 1" PEX	NPT X FLANGE OR SOCKET
11	WATER HEATER	INLET	3/4IN	MNPT	1/2" OR 3/4" MATCH EXISTING	SOCKET / SHARK BITE
12	WATER HEATER	OUTLET	3/4IN	MNPT	3/4" PVC or 1" PEX	SOCKET / SHARK BITE
13	BULKHEAD 1	WATER IN	3/4IN	FNPT	3/4" PVC or 1" PEX	MATCH EXISTING
14	BULKHEAD 1	WATER OUT	3/4IN	FNPT	3/4" PVC or 1" PEX	SOCKET / SHARK BITE
15	BULKHEAD 1	VACUUM	1/2IN	FNPT	STAINLESS OR FLEX	SOCKET / SHARK BITE
16	BULKHEAD 2	COMPRESSED AIR	3/8IN	SOFT TUBE	POLY TUBE	SOCKET / SHARK BITE
17	COOLING TOWER	WATER SUPPLY	1/2IN	MNPT	3/4" STEEL OR COPPER	NPT / COMPRESSION
18	CO2 SUPPLY TANK	CO2 GAS	CGA 320	CGA320	POLY TUBE	SHARK BITE

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DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ANGULAR: MACH BEND TWO PLACE DECIMAL THREE PLACE DECIMAL	DRAWN	
INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:	
MATERIAL		
FINISH		
DO NOT SCALE DRAWING		

LUNA TECHNOLOGIES

TITLE:
PROCESS PIPING DIAGRAM

SIZE B	DWG. NO. IO Extractor Installation	REV 6A
SCALE: 1:100		WEIGHT:
		SHEET 6 OF 15

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B

B

A

A

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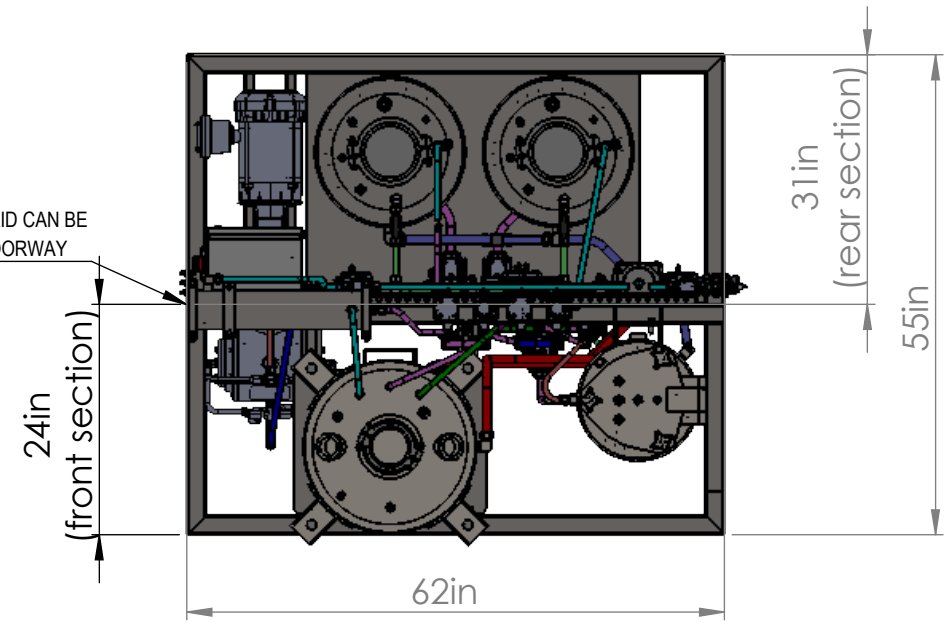
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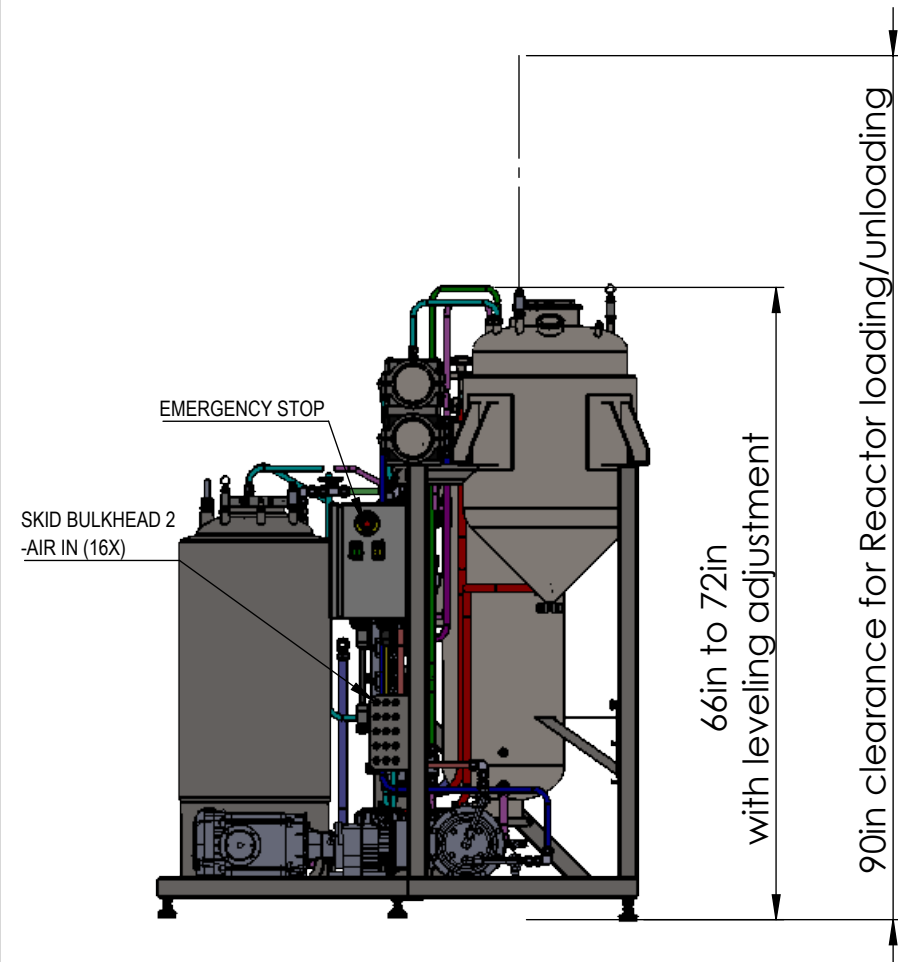
EXTRACTION SKID SPECIFICATIONS	
PROPERTY	VALUE
DRY WEIGHT	1,065 lbm
SOLVENT SUPPLY CAPACITY	120 lbm
SOLVENT TYPES	BUTANE, PROPANE

FRONT AND BACK SECTIONS OF SKID CAN BE SEPARATED TO FIT THROUGH A DOORWAY



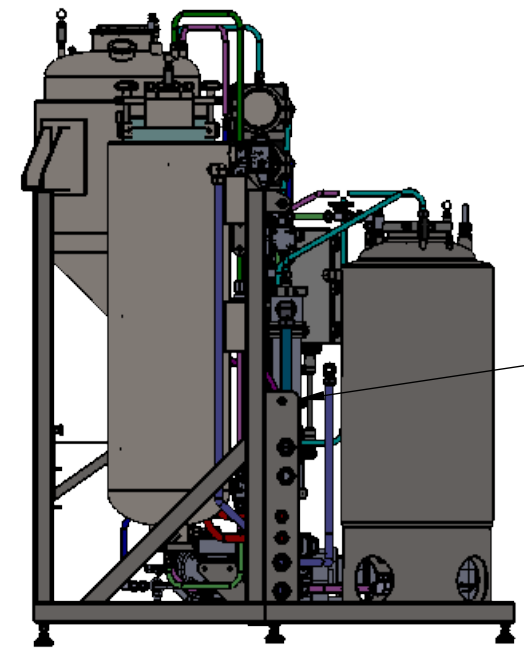
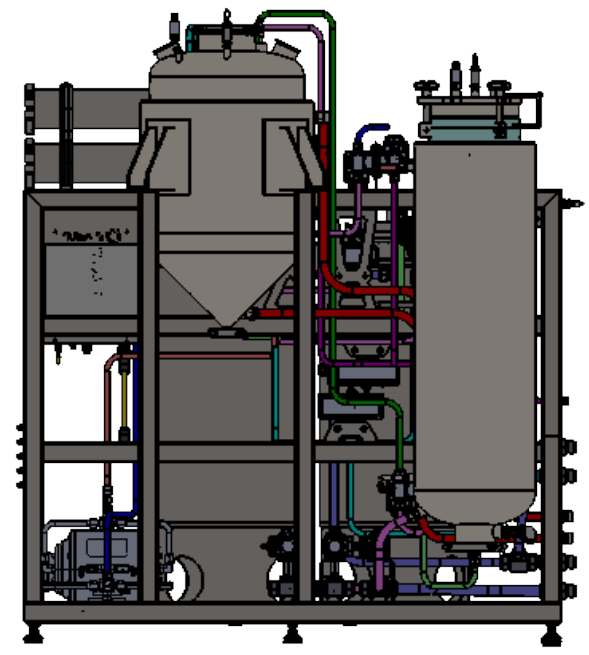
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A

A



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DIMENSIONS ARE IN INCHES		DRAWN			
TOLERANCES:		COMMENTS:		TITLE: EXTRACTION SKID ASSEMBLY	
FRACTIONAL					
ANGULAR: MACH BEND					
TWO PLACE DECIMAL		SIZE		DWG. NO.	REV
THREE PLACE DECIMAL		B		IO Extractor Installation	6A
INTERPRET GEOMETRIC TOLERANCING PER:		SCALE: 1:50		WEIGHT:	SHEET 7 OF 15
MATERIAL		DO NOT SCALE DRAWING			
FINISH					

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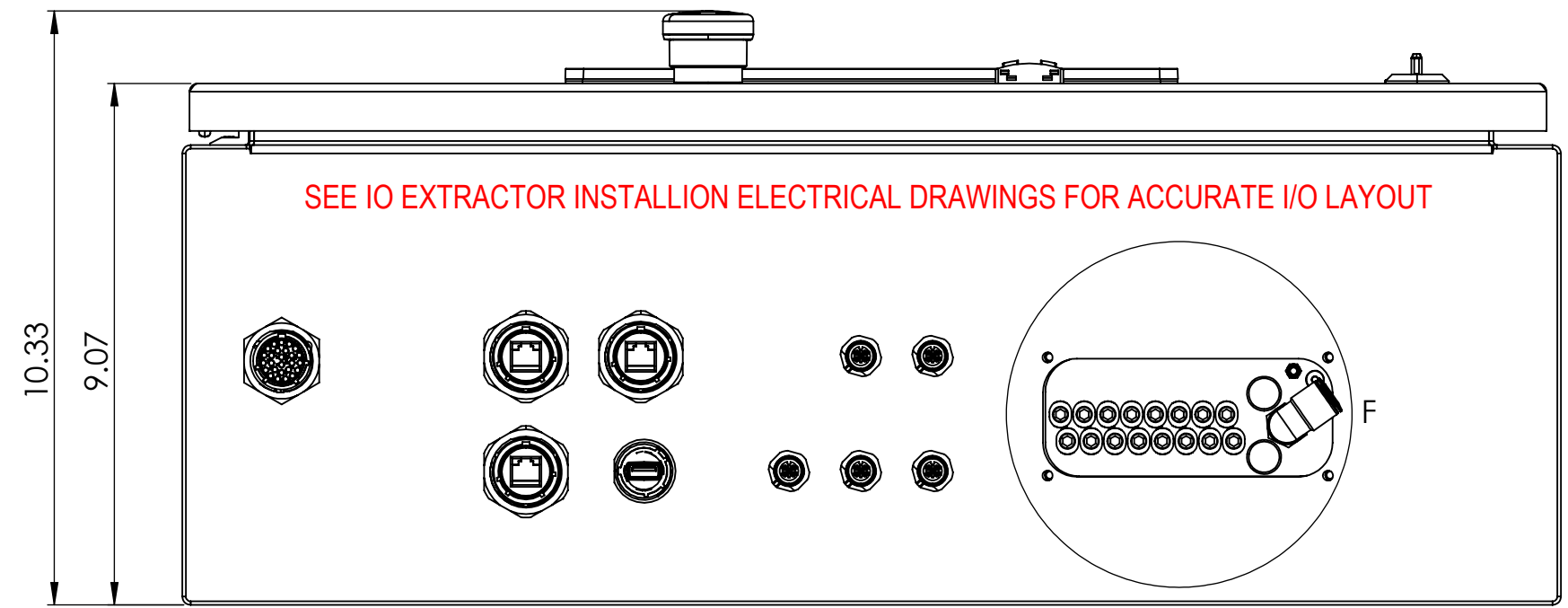
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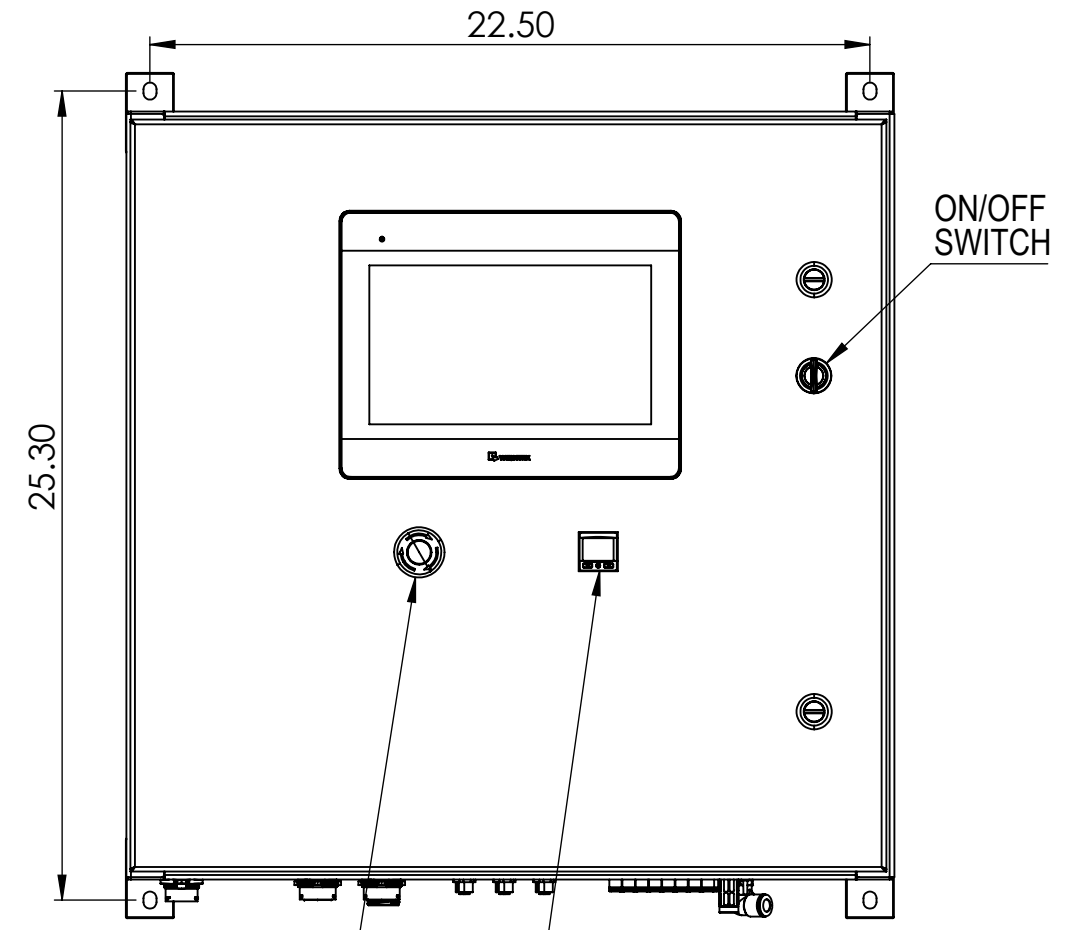
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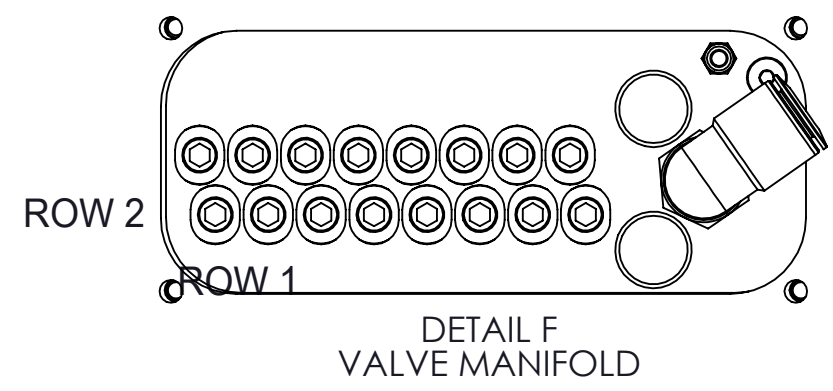
CONTROL PANEL SPECIFICATIONS	
Required Voltage	120 VAC, 60Hz
Amperage	3.0A
Air Supply	1CFM at 105psig



SCALE 1 : 3



VALVE ORDER:
 ROW 1: 15, 13, 11, 9, 7, 5, 3, 1
 ROW 2: 16, 14, 12, 10, 8, 6, 4, 2



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DIMENSIONS ARE IN INCHES		DRAWN		TITLE:		
TOLERANCES:		COMMENTS:		CONTROL PANEL		
FRACTIONAL				SIZE	DWG. NO.	REV
ANGULAR: MACH BEND				B	IO Extractor Installation	6A
TWO PLACE DECIMAL				SCALE: 1:6 WEIGHT: SHEET 8 OF 15		
THREE PLACE DECIMAL						
INTERPRET GEOMETRIC TOLERANCING PER:						
MATERIAL						
FINISH						
NOT DRAWN TO SCALE						

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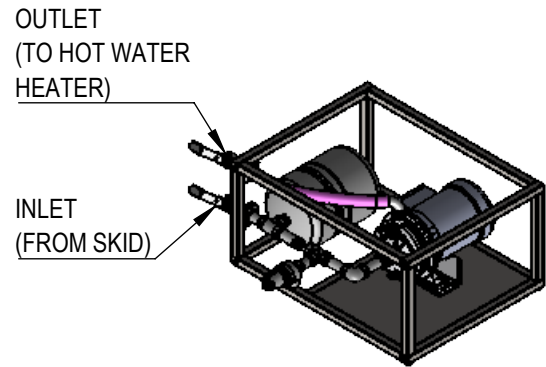
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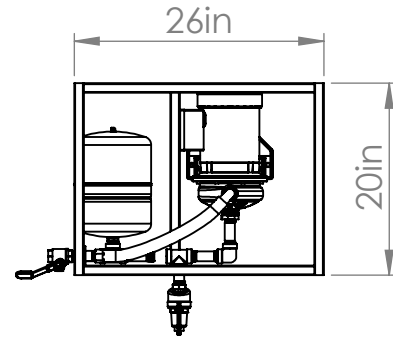
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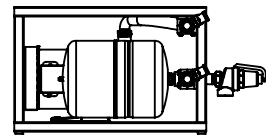
CUSTOMER SUPPLIED
PLUMBING MARKED IN RED



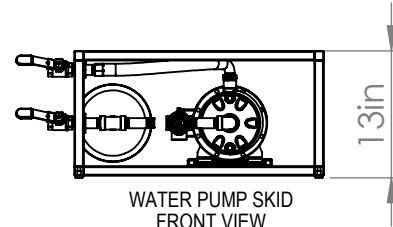
WATER PUMP SKID



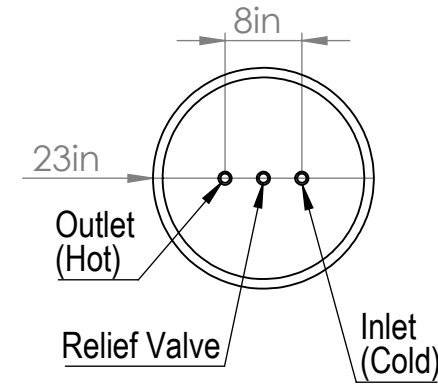
WATER PUMP SKID
TOP VIEW
SCALE 1 : 20



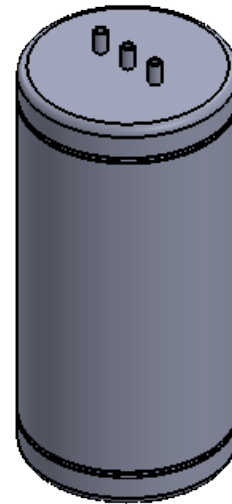
WATER PUMP SKID
SIDE VIEW
SCALE 1 : 20



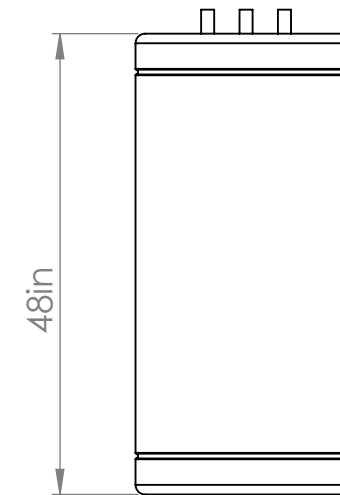
WATER PUMP SKID
FRONT VIEW
SCALE 1 : 20



WATER HEATER
TOP VIEW



WATER HEATER



WATER HEATER
FRONT VIEW

WATER PUMP SKID SPECIFICATIONS	
Weight (lbm)	31
Inlet Connection Size	3/4in FNPT
Outlet Connection Size	3/4in FNPT

WATER PUMP SPECIFICATIONS	
Manufacturer	AMT
Model Number	370B-95
Max Rotational Speed (RPM)	1725
Required Voltage (VAC)	120 / 240
Full Load Amps (amps)	9 / 5
Power (HP)	1/2

WATER HEATER SPECIFICATIONS	
Manufacturer	Rheem
Model Number	XE50M09EL55U1
Product Height (in.)	48
Product Diameter (in.)	23
Tank Valve Size (in.)	0.75
Water Connection Size (in.)	0.75
Required Voltage (VAC)	240
Recommended Over Current Protection	35A (@208V) 30A (@240V)
Wattage (watts)	5500
Indoor/Outdoor	Indoor
Maximum Temperature (F)	150
Minimum Temperature (F)	90
Rated Tank Capacity (gallons)	45
Nominal Tank Capacity (gallons)	50
Product Weight (lb.)	132

INSTALLATION NOTES:

Fill system with water and ethylene glycol mixture per desired distillation column operating temperature (30% EG by volume minimum recommended)

Bleed all air from system using high point bleed valves

Set expansion tank pressure to 30psig

Install drip pan

Provide relief valve discharge pipe with proper termination per code

All provided connection points are 3/4in NPT female unless otherwise noted



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TOLERANCES:	COMMENTS:	
FRACTIONAL		
ANGULAR: MACH BEND		
TWO PLACE DECIMAL		
THREE PLACE DECIMAL		
INTERPRET GEOMETRIC TOLERANCING PER:		
MATERIAL		
FINISH		
NOT DRAWN TO SCALE		

LUNA TECHNOLOGIES

TITLE:
WATER HEATER AND PUMP SKID

SIZE	DWG. NO.	REV
B	IO Extractor Installation	6A

SCALE: 1:10 WEIGHT: SHEET 9 OF 15

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CUSTOMER SUPPLIED PLUMBING MARKED IN RED

Bulkhead 1 at Extraction Skid

Outlet to Hot Water Pump Skid

Inlet from Hot Water Heater

WATER SUPPLY FROM MAIN
1/2IN COPPER RECOMMENDED

VENT HIGH POINT BLEED

1IN PEX OR 3/4IN COPPER

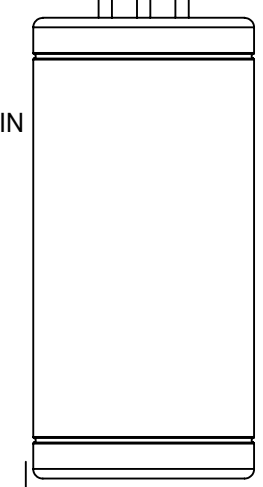
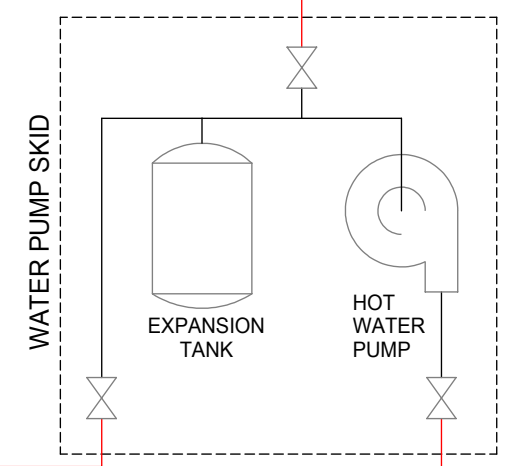
1IN PEX OR 3/4IN COPPER

HAZARDOUS AREA BOUNDARY

VENT HIGH POINT BLEED

TO DRAIN LOW POINT DRAIN

PRESSURE RELIEF TO DRAIN



WATER PUMP SKID SPECIFICATIONS	
Weight (lbm)	31
Inlet Connection Size	3/4in FNPT
Outlet Connection Size	3/4in FNPT

WATER PUMP SPECIFICATIONS	
Manufacturer	AMT
Model Number	370B-95
Max Rotational Speed (RPM)	1725
Required Voltage (VAC)	120 / 240
Full Load Amps (amps)	9 / 5
Power (HP)	1/2

WATER HEATER SPECIFICATIONS	
Manufacturer	Rheem
Model Number	XE50M09EL55U1
Product Height (in.)	48
Product Diameter (in.)	23
Tank Valve Size (in.)	0.75
Water Connection Size (in.)	0.75
Required Voltage (VAC)	240
Recommended Over Current Protection	35A (@208V) 30A (@240V)
Wattage (watts)	5500
Indoor/Outdoor	Indoor
Maximum Temperature (F)	150
Minimum Temperature (F)	90
Rated Tank Capacity (gallons)	45
Nominal Tank Capacity (gallons)	50
Product Weight (lb.)	132

INSTALLATION NOTES:

Fill system with water and ethylene glycol mixture per desired distillation column operating temperature (30% EG by volume minimum recommended)

Bleed all air from system using high point bleed valves

Set expansion tank pressure to 30psig

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All provided connection points are 3/4in NPT female unless otherwise noted



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UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES			
TOLERANCES:			
FRACTIONAL			
ANGULAR: MACH BEND			
TWO PLACE DECIMAL			
THREE PLACE DECIMAL			
INTERPRET GEOMETRIC TOLERANCING PER:			
MATERIAL			
FINISH			
NOT DRAWN TO SCALE			

LUNA TECHNOLOGIES		
TITLE: WATER HEATER AND PUMP SKID		
SIZE B	DWG. NO. IO Extractor Installation	REV 6A
SCALE: 1:10	WEIGHT:	SHEET 10 OF 15

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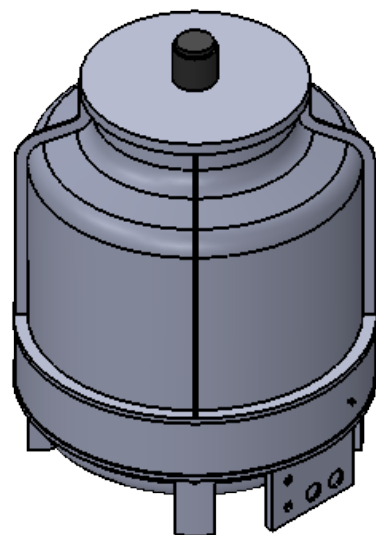
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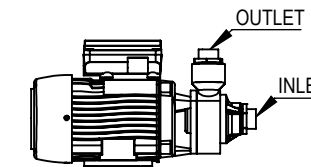
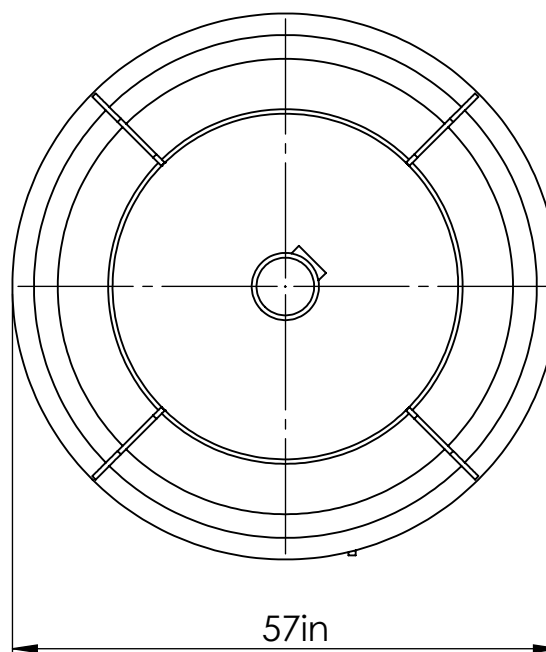
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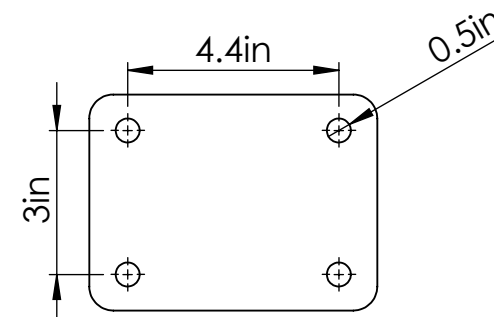
NOTE: WATER COOLING TOWER MUST BE INSTALLED OUTDOORS



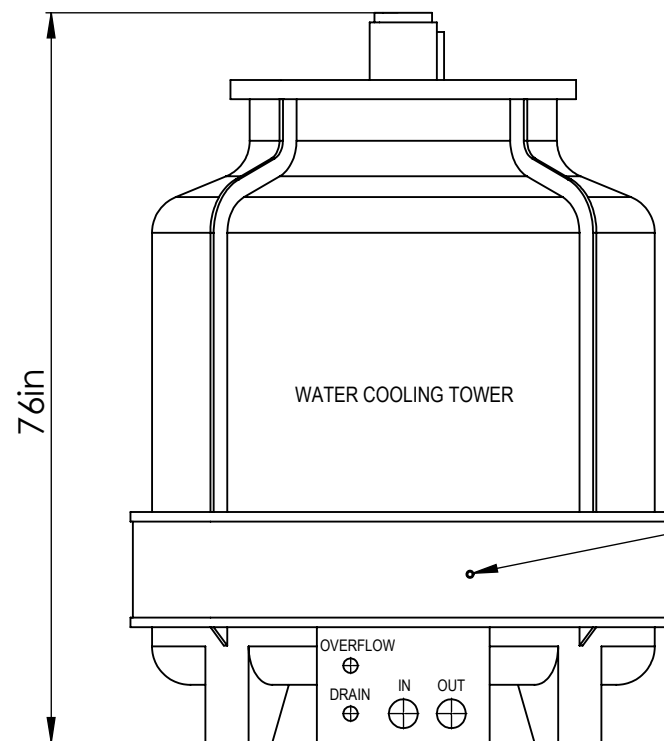
WATER COOLING TOWER



WATER PUMP (SEE TABLE FOR DIMENSIONS)



PUMP MOUNTING PLATE SCALE 1 : 4



MECHANICAL FLOAT VALVE FEED FROM WATER MAIN

WATER COOLING TOWER SPECIFICATIONS	
Manufacturer	Cooling Tower Systems
Model	T-225
Component	Specification
Fan Motor	3/4 HP
Required Voltage	240V, 3PH, 60Hz
Amperage	3A
Cooling Capacity	375,000 BTU/hr
Air Volume	6,300 CFM
Water Inlet	2.5in
Water outlet	2.5in
Operating Weight	887 lbs
Dry Weight	227 lbs
Fland Type	Round, Threaded, Nylon

WATER PUMP	
Manufacturer	AMT
Model Number	276D
Flow Rate @ 30ft of Head	90 GPM
Required Voltage	240, 3ph, 60Hz
Full Load Amps (amps)	6A
Length	20in
Width	9in
Height	11in
Inlet	2in
Outlet	2in

NOTES:

- WATER COOLING TOWER MUST BE INSTALLED OUTDOORS
- Minimum outdoor wetbulb temp: 32°F
- Maximum outdoor wetbulb temp: 79°F
- Water treatment with chemical feed recommended

COLD CLIMATE INSTALLATION NOTES:

For cold climate installations where the wet bulb temp is below 32°F a basin heater should be installed and outdoor water piping should be insulated. The basin heater must be set up to keep the water basin at 40°F or above. Anytime the wet bulb temperature drops to 32°F or below, the cooling tower water pump override should be used to keep the pump circulating water to keep the piping from freezing.



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 TOLERANCES:
 FRACTIONAL
 ANGULAR: MACH BEND
 TWO PLACE DECIMAL
 THREE PLACE DECIMAL

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL

FINISH

NOT DRAWN TO SCALE

NAME	DATE
DRAWN	

COMMENTS:

LUNA TECHNOLOGIES

TITLE:
 WATER COOLING TOWER AND PUMP

SIZE	DWG. NO.	REV
B	IO Extractor Installation	6A

SCALE: 1:20 WEIGHT: SHEET 11 OF 15

4

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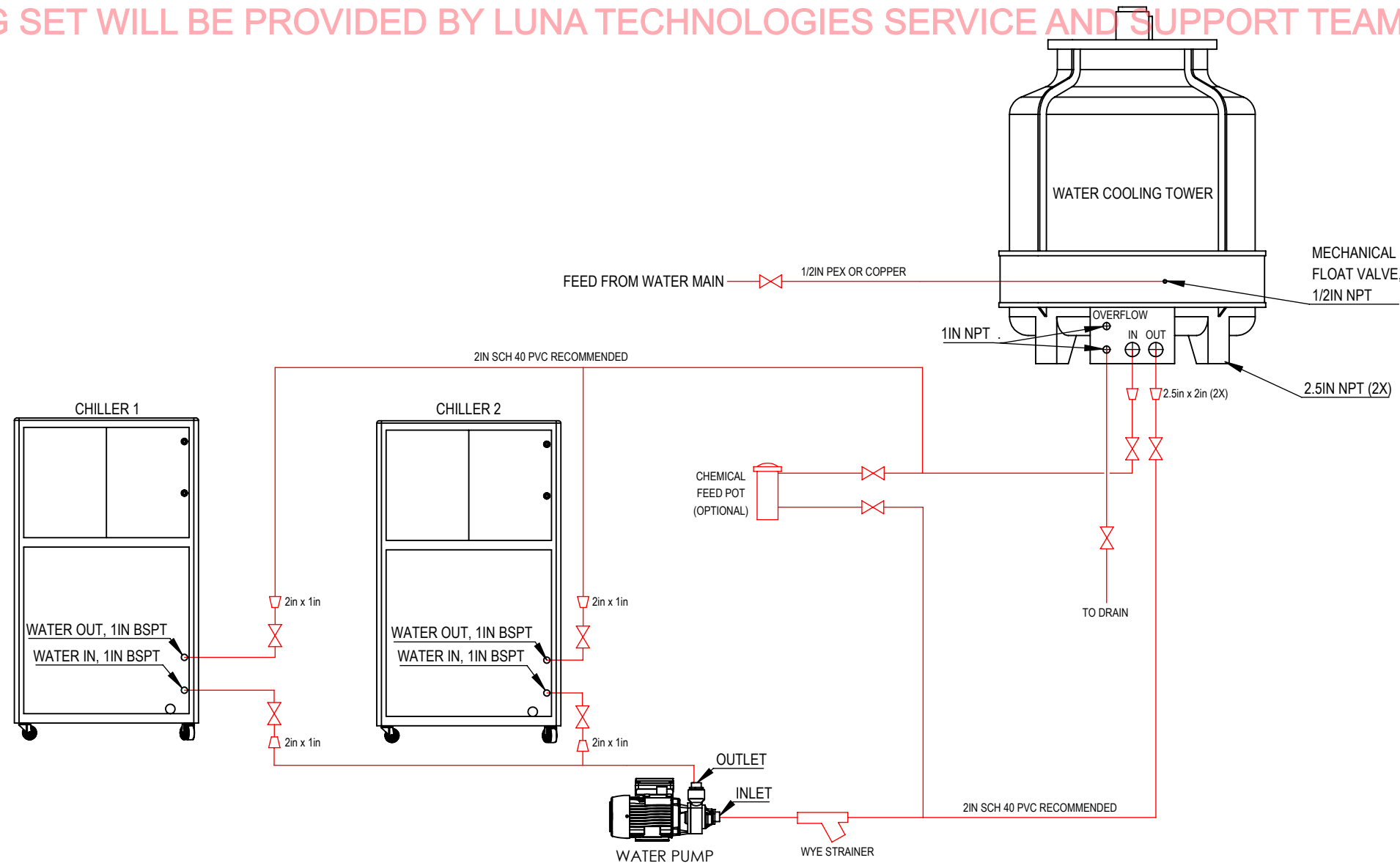
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WATER COOLING TOWER MUST BE INSTALLED OUTDOORS

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COOLING WATER REQUIREMENTS	
Maximum Water Temperature at Chiller Inlet	85F
Minimum Flow Rates at 85F	Chiller 1: 30GPM Chiller 2: 22GPM
Minimum Flow Rates at 78F	Chiller 1: 27GPM Chiller 2: 20GPM
Minimum Flow Rates at 63F	Chiller 1: 25GPM Chiller 2: 18GPM
Max Pressure Drop Across Customer Supplied Piping	15 psi



NOTES:

- WATER COOLING TOWER MUST BE INSTALLED OUTDOORS
- Minimum outdoor wetbulb temp without basin heater and circulation override: 32°F
- Maximum outdoor wetbulb temp: 79°F
- Water treatment with chemical feed recommended

COLD CLIMATE INSTALLATION NOTES:

For cold climate installations where the wet bulb temp is below 32°F a basin heater should be installed. The basin heater should keep the water basin at 40°F or above. A manual circulation pump override is provided on the chiller. When the outdoor wetbulb temperature is below 32°F, the override must be used to maintain waterflow through the cooling tower to prevent freezing of the piping. An ambient air temperature switch can also be used to override the cooling tower water pump.



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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	LUNA TECHNOLOGIES
DIMENSIONS ARE IN INCHES				
TOLERANCES: FRACTIONAL ANGULAR: MACH BEND TWO PLACE DECIMAL THREE PLACE DECIMAL				
INTERPRET GEOMETRIC TOLERANCING PER:				SIZE DWG. NO. REV
MATERIAL				B IO Extractor Installation 6A
FINISH				SCALE: 1:30 WEIGHT: SHEET 12 OF 15
NOT DRAWN TO SCALE				

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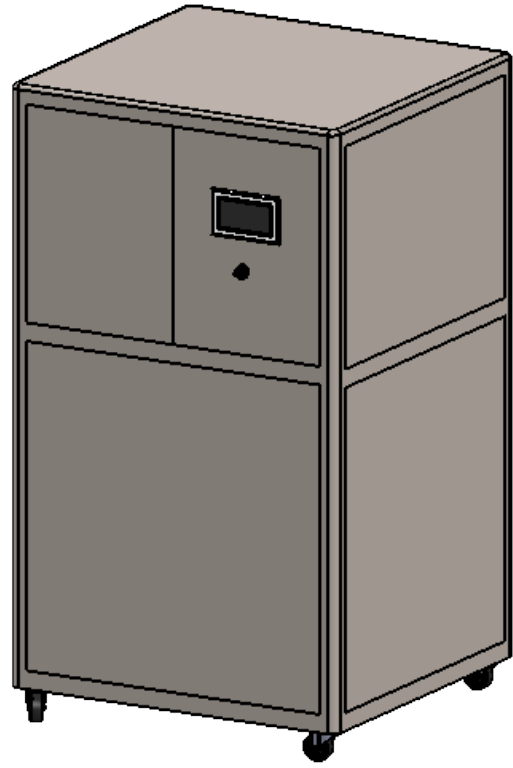
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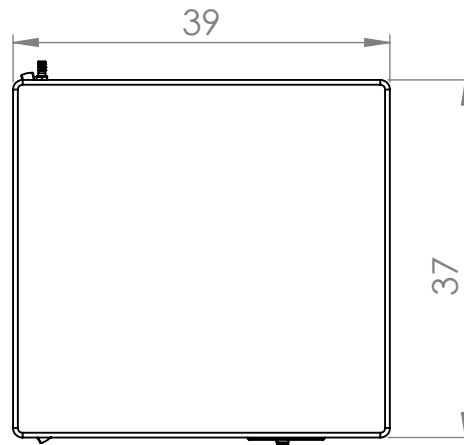
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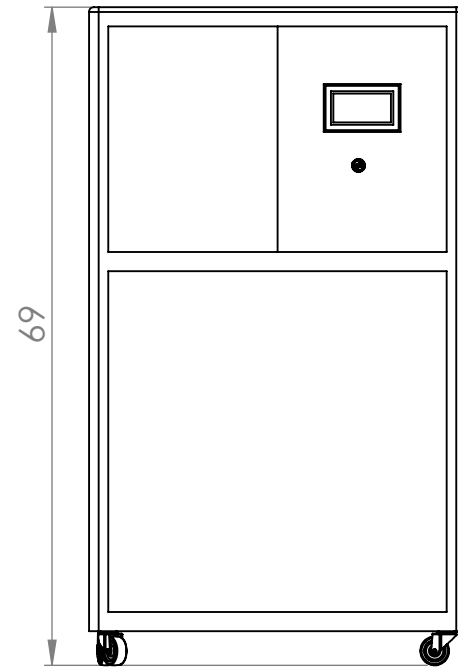


CHILLER 1 / CHILLER 2

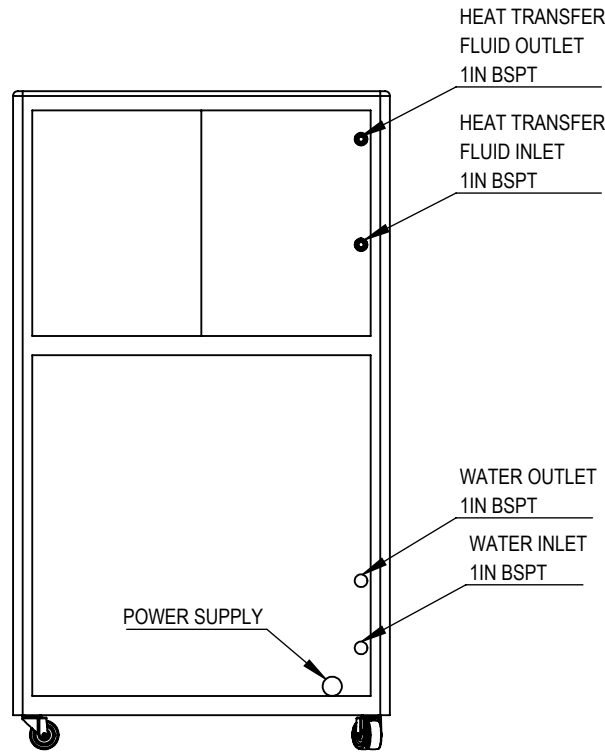
EXTERIOR DIMENSIONS OF CHILLER 1 AND CHILLER 2 ARE THE SAME



CHILLER TOP VIEW



CHILLER FRONT VIEW



CHILLER REAR VIEW

CHILLER 1 SPECIFICATIONS	
Manufacturer	ArcticCTRL
Model	ACTRL-60-11.5
Medium Temperature Range	-80 C to 20 C
Cooling Capacity @ -60 C	6kW
Liquid Storage Capacity	15 gal
Suggested Cooling Medium	Dynalene HF-LO
Refrigerants	R23, R236, R14
Required Volt Connection (VAC)	208/240VAC, 3PH, 60Hz
Compressor Power	7.5 HP
Compressor Rated Load Amps	35.6A
Compressor MCC	55.5A
Compressor Locked Rotor Amps	198A
Circulation Pump Power	2HP
Circulation Pump Full Load Amps	6A
Inlet	1in BSPT
Outlet	1in BSPT
Water Inlet	1in BSPT
Water Outlet	1in BSPT

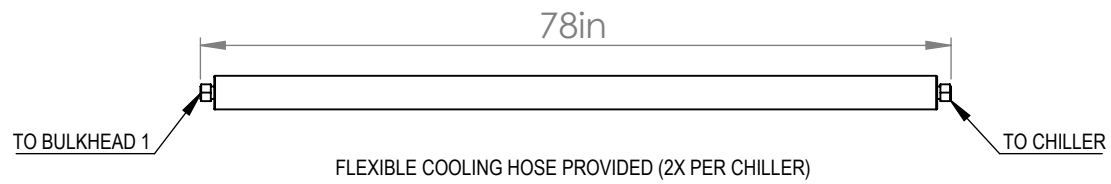
CHILLER 2 SPECIFICATIONS	
Manufacturer	ArcticCTRL
Model	ACTRL-40-8.7
Medium Temperature Range	-80 C to 20 C
Cooling Capacity @ -60 C	4kW
Liquid Storage Capacity	10 gal
Suggested Cooling Medium	Dynalene HF-LO
Refrigerants	R23, R236, R14
Required Volt Connection (VAC)	208/240VAC, 3PH, 60Hz
Compressor Power	6.5 HP
Compressor Rated Load Amps	28.2A
Compressor MCC	44.0A
Compressor Locked Rotor Amps	160A
Circulation Pump Power	2HP
Circulation Pump Full Load Amps	6A
Inlet	1in BSPT
Outlet	1in BSPT
Water Inlet	1in BSPT
Water Outlet	1in BSPT

INSTALLATION NOTES:

Flex hose provided by Luna Technologies to provide (1) vibration isolation and (2) the ability to move the chillers to perform maintenance and repairs.

Review cooling medium filling instructions provided by Luna Technologies prior to filling the chiller reservoirs.

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FRACTIONAL	
ANGULAR: MACH BEND	
TWO PLACE DECIMAL	
THREE PLACE DECIMAL	
INTERPRET GEOMETRIC TOLERANCING PER:	
MATERIAL	
FINISH	
NOT DRAWN TO SCALE	

NAME	DATE
DRAWN	
COMMENTS:	

LUNA TECHNOLOGIES		
TITLE: PROCESS CHILLERS		
SIZE	DWG. NO.	REV
B	IO Extractor Installation	6A
SCALE: 1:20 WEIGHT:		SHEET 13 OF 15

4

3

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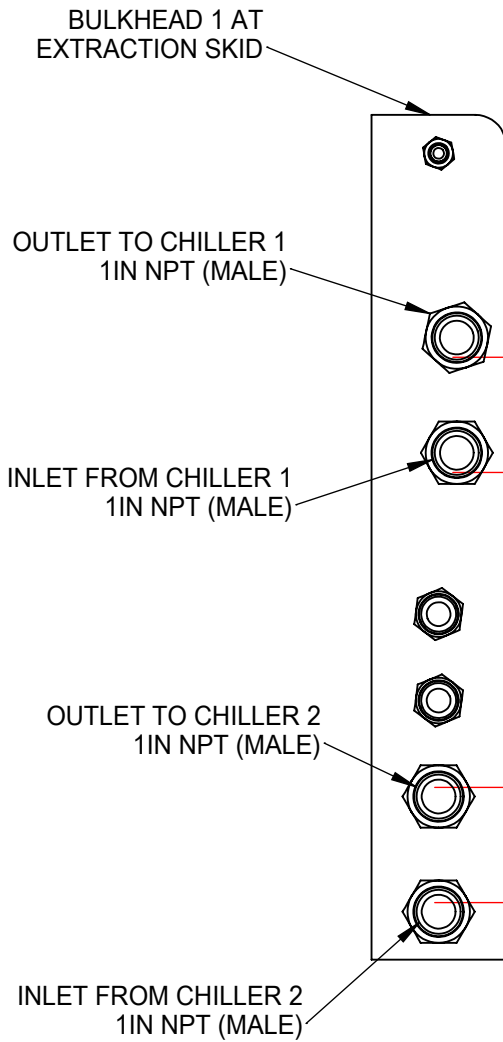
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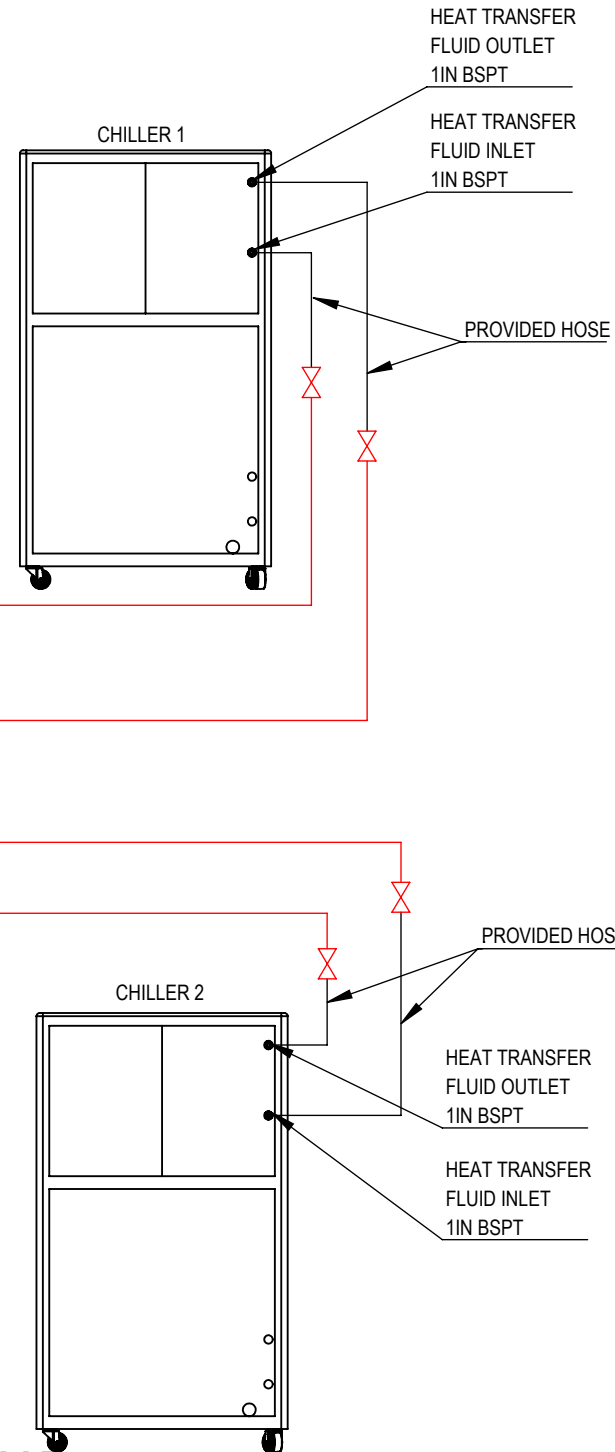
NOTES:

- Max heat gain in customer supplied piping: 800 Btu/hr (300W)
- Max pressure drop across customer supplied piping: 5psi
- Recommended heat transfer fluid: Dynalene HF-LO. Any other heat transfer fluid must be approved by Luna Technologies in writing.



1IN ID PIPING, COPPER OR SS RECOMMENDED, 12 BTU/HR/FT INSULATION RECOMMENDED
800BTU/HR MAX HEAT GAIN FOR OUTLET AND RETURN PIPING

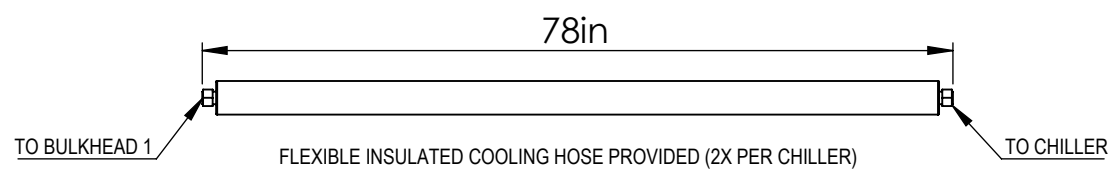
1IN ID PIPING, COPPER OR SS RECOMMENDED, 12 BTU/HR/FT INSULATION RECOMMENDED
800BTU/HR MAX HEAT GAIN FOR OUTLET AND RETURN PIPING



CHILLER PLUMBING REQUIREMENTS	
Operating Temperature	-70F
Max Pressure Drop Across Customer Supplied Piping	5 psi
Max Heat Gain per Chiller in Customer Supplied Piping	800Btu/hr (300W)
Cooling Medium (Customer Supplied)	Dynalene HF-LO
Total Liquid Capacity of Combined Chiller Circuits	90gal (approx)

DYNALENE HF-LO MATERIAL COMPATIBILITY	
Polymer and Gasket Compatibility:	Metal Compatibility:
<ul style="list-style-type: none"> • Acetal • Chemraz (FFKM) • Epoxy • Fluorocarbon (FILM) • Fluoroelastomer • Gylon • Kalrez • Kel-F (CTFE) • Peek • PTFE • Teflon (All) • PTFE-Silicone • PTFE-Viton • PTFE-Fiberglass • Viton 	<ul style="list-style-type: none"> • Aluminum • Brass • Bronze (All) • Carbon Steel • Copper • Copper-Nickel • Monel • Nickel • Stainless Steel (All) • Stainless Steel Clad • Tantalum • Titanium

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FRACTIONAL	
ANGULAR: MACH BEND	
TWO PLACE DECIMAL	
THREE PLACE DECIMAL	
INTERPRET GEOMETRIC TOLERANCING PER:	
MATERIAL	
FINISH	
NOT DRAWN TO SCALE	

NAME	DATE
DRAWN	

COMMENTS:

LUNA TECHNOLOGIES		
TITLE: PROCESS CHILLERS		
SIZE B	DWG. NO. IO Extractor Installation	REV 6A
SCALE: 1:30 WEIGHT:		SHEET 14 OF 15

4

3

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B

B

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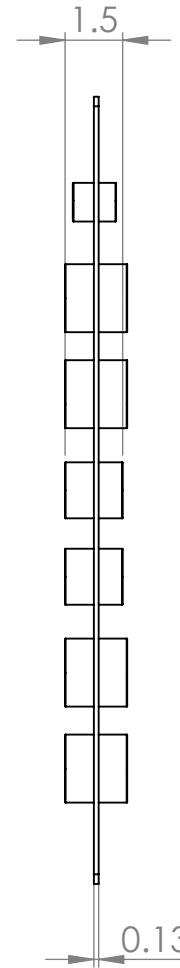
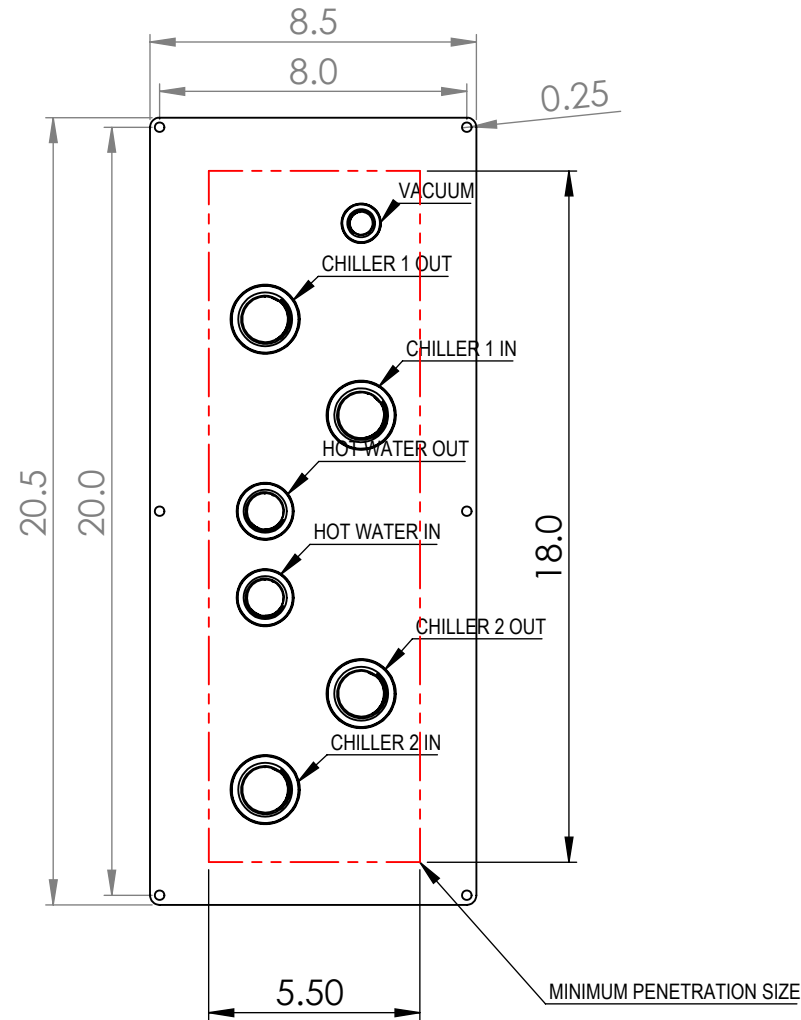
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NOTE:
 PENETRATION BULKHEAD IS NOT NORMALLY SUPPLIED WITH THE EXTRACTOR. CONTACT LUNA TECHNOLOGIES SALES OR SUPPORT TO ORDER A PENETRATION BULKHEAD DESIGNED FOR CUSTOMER LOCATION. BE READY TO PROVIDE DETAILS OF HAZARDOUS AREA BOUNDARY WALL CONSTRUCTION.



PENETRATION BULKHEAD 1 CONNECTIONS	
DESCRIPTION	SIZE, TYPE
CHILLER 1 OUTLET	1in FNPT
CHILLER 1 INLET	1in FNPT
VACUUM	1/2in FNPT
HOT WATER OUTLET	3/4in FNPT
HOT WATER INLET	3/4in FNPT
CHILLER 2 OUTLET	1in FNPT
CHILLER 2 INLET	1in FNPT

PENETRATION BULKHEAD 2 CONNECTIONS	
DESCRIPTION	SIZE, TYPE
PNEUMATIC VALVE ACTUATORS (16X)	5/32in push-to-connect

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 ANGULAR: MACH BEND
 TWO PLACE DECIMAL
 THREE PLACE DECIMAL
 INTERPRET GEOMETRIC TOLERANCING PER:
 MATERIAL
 FINISH
 NOT DRAWN TO SCALE

NAME	DATE
DRAWN	
COMMENTS:	

LUNA TECHNOLOGIES		
TITLE: FLUID PENETRATION BULKHEAD		
SIZE B	DWG. NO. IO Extractor Installation	REV 6A
SCALE: 1:5	WEIGHT:	SHEET 15 OF 15

4

3

2

1