



ET-50-4000 Water Cooled Green Machine Engineering Drawings

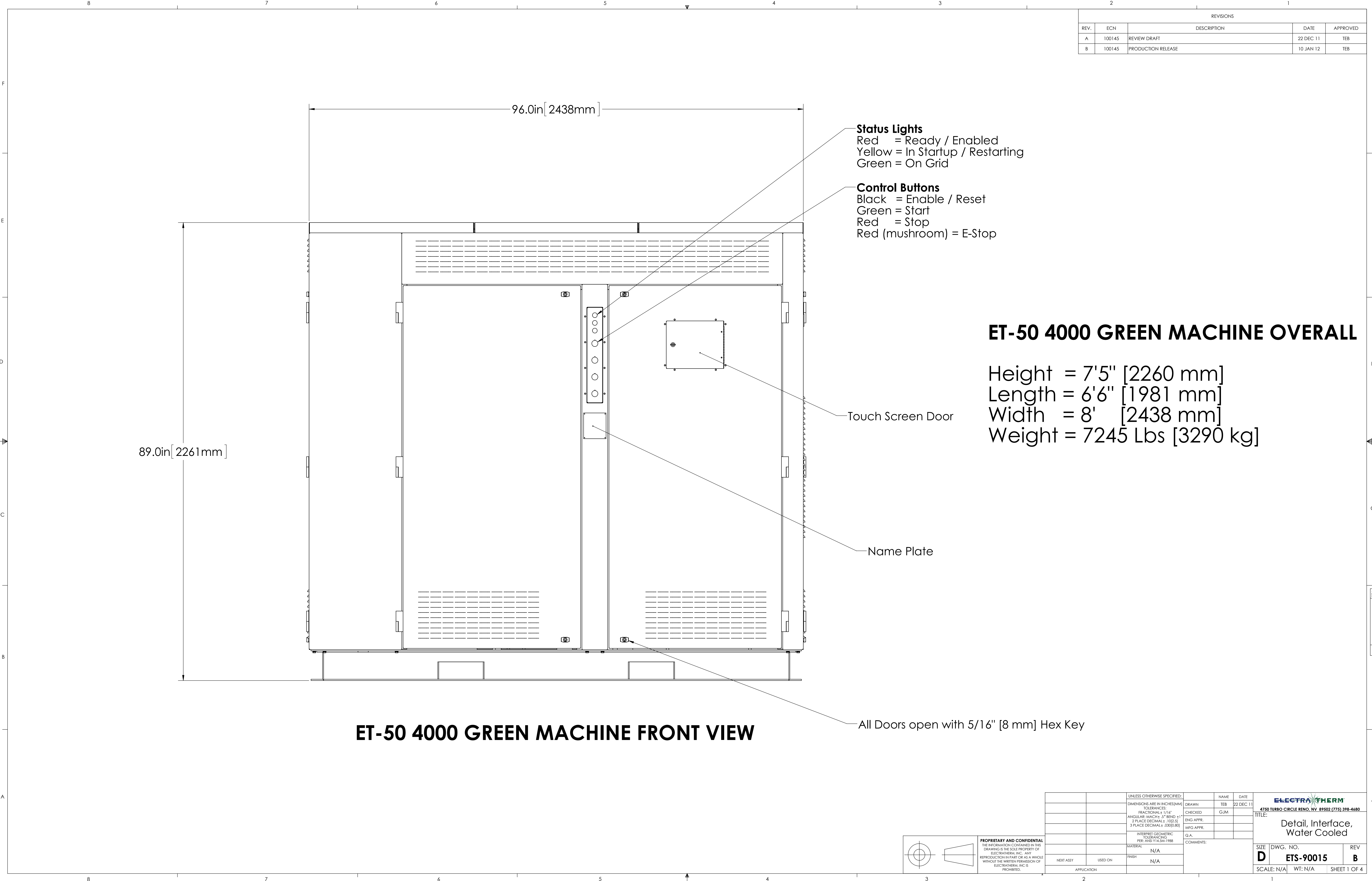
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ETS-90023	Detail, Mounting, ET-50-4000	1	Green Machine Footprint drawing, with Green Machine weights for footing / concrete design

DRAWING REVISION: 2015MAR26



Drawing #	Drawing Title	# pages
ETS-90015	Detail, Interface, Water Cooled	4

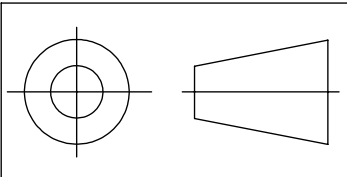


REVISIONS				
REV.	ECN	DESCRIPTION	DATE	APPROVED
A	100145	REVIEW DRAFT	22 DEC 11	TEB
B	100145	PRODUCTION RELEASE	10 JAN 12	TEB

ET-50 4000 GREEN MACHINE OVERALL

Height = 7'5" [2260 mm]
Length = 6'6" [1981 mm]
Width = 8' [2438 mm]
Weight = 7245 Lbs [3290 kg]

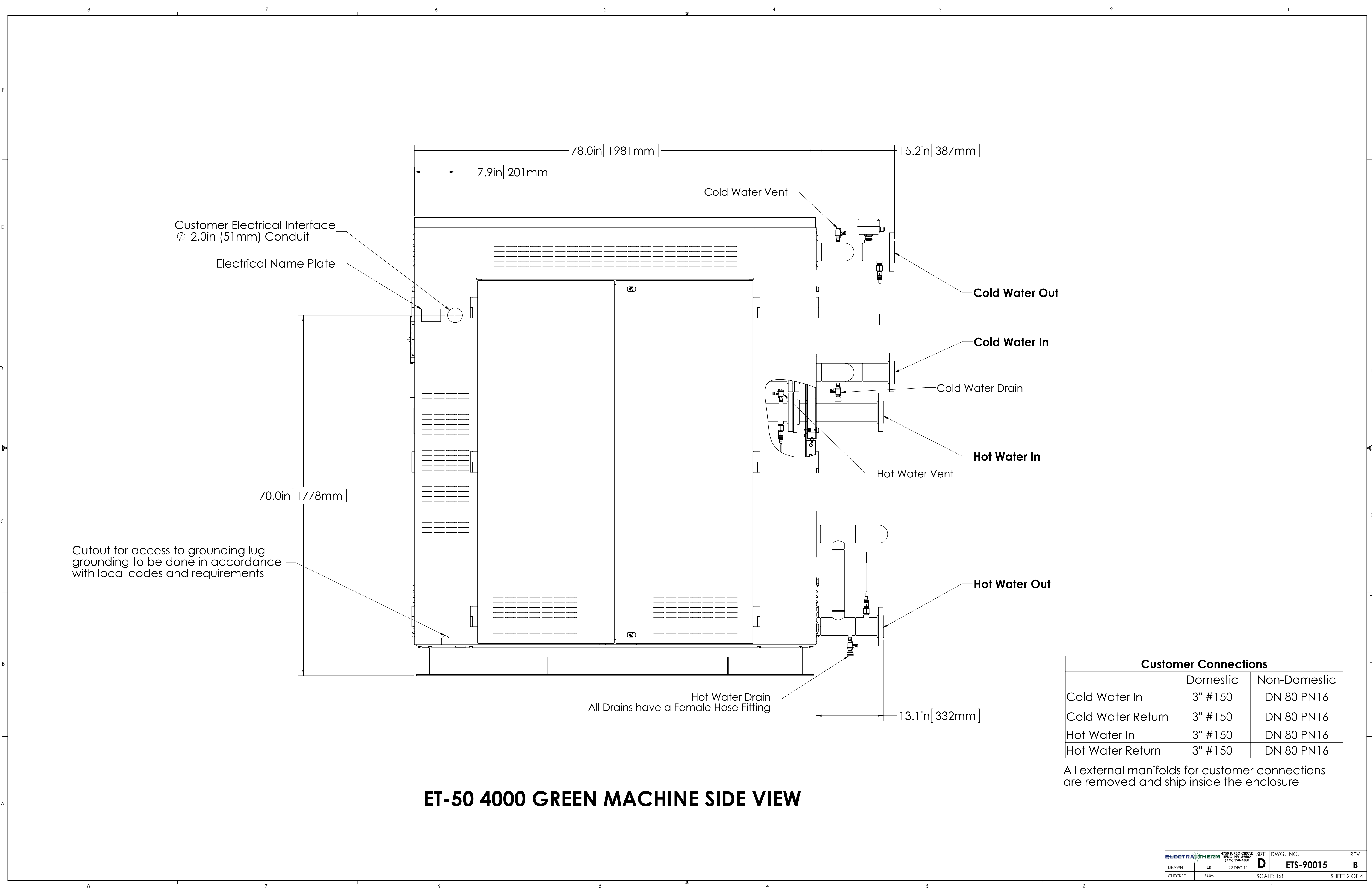
ET-50 4000 GREEN MACHINE FRONT VIEW



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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES(MM) TOLERANCES: FRACTIONALS 1/16" ANGULARS: MACH ± .5° BEND ± 1° 2 PLACE DECIMAL ± .10(2.5) 3 PLACE DECIMALS .000(0.00)	DRAWN TEB	NAME GJM	DATE 22 DEC 11
		INTERPRET GEOMETRIC TOLERANCING PER: ANSI Y14.5M-1988	CHECKED GJM	ENG APPR. TEB	
		MATERIAL N/A	ENG APPR. TEB	Q.A. TEB	
		FINISH N/A		COMMENTS:	
NEXT ASSY	USED ON	APPLICATION			

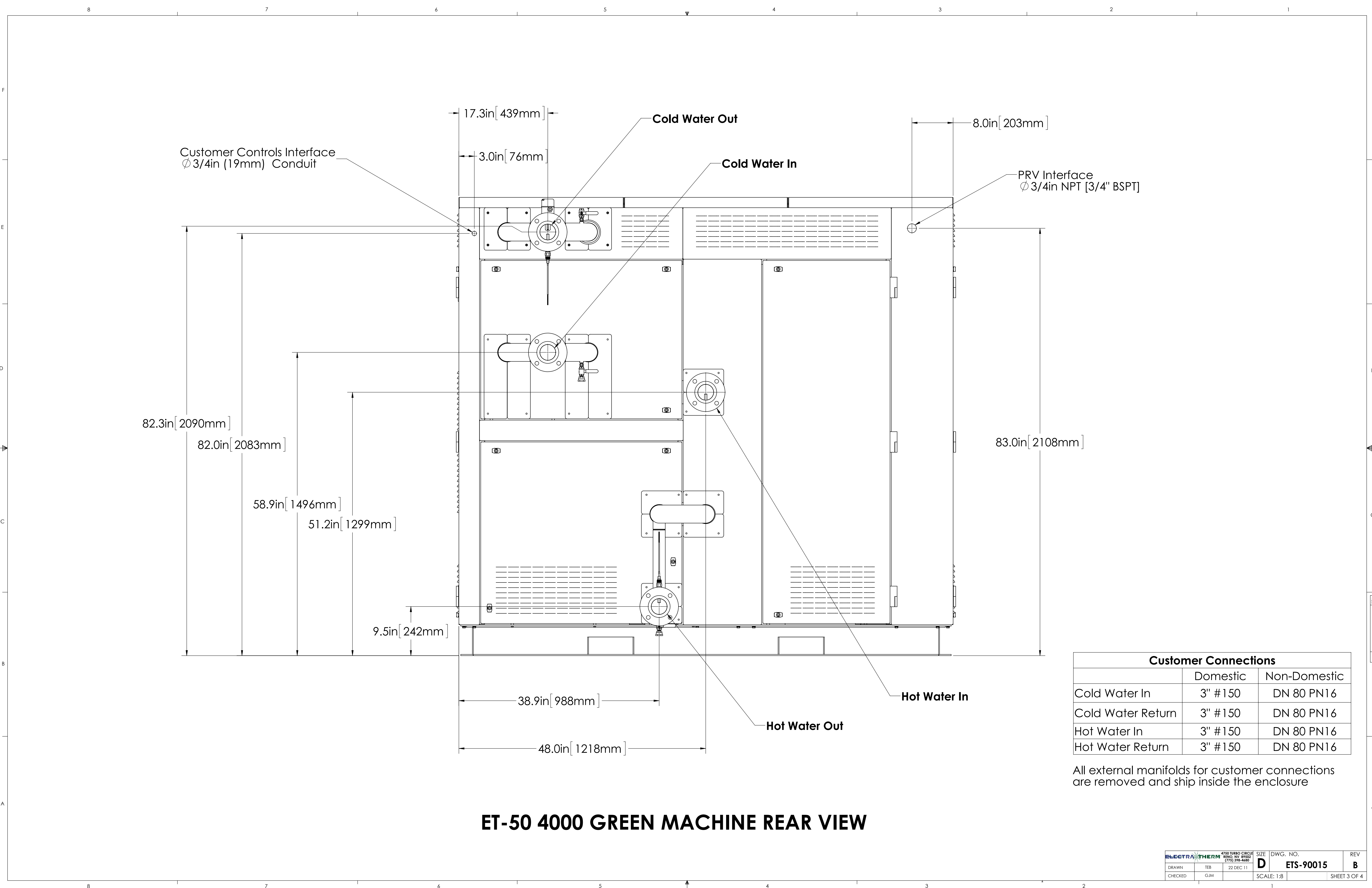
 4750 TURBO CIRCLE RENO, NV 89502 (775) 398-4680			TITLE: Detail, Interface, Water Cooled		
SIZE D	DWG. NO. ETS-90015	REV B	SCALE: N/A	WT: N/A	SHEET 1 OF 4



ET-50 4000 GREEN MACHINE SIDE VIEW

Customer Connections		
	Domestic	Non-Domestic
Cold Water In	3" #150	DN 80 PN16
Cold Water Return	3" #150	DN 80 PN16
Hot Water In	3" #150	DN 80 PN16
Hot Water Return	3" #150	DN 80 PN16

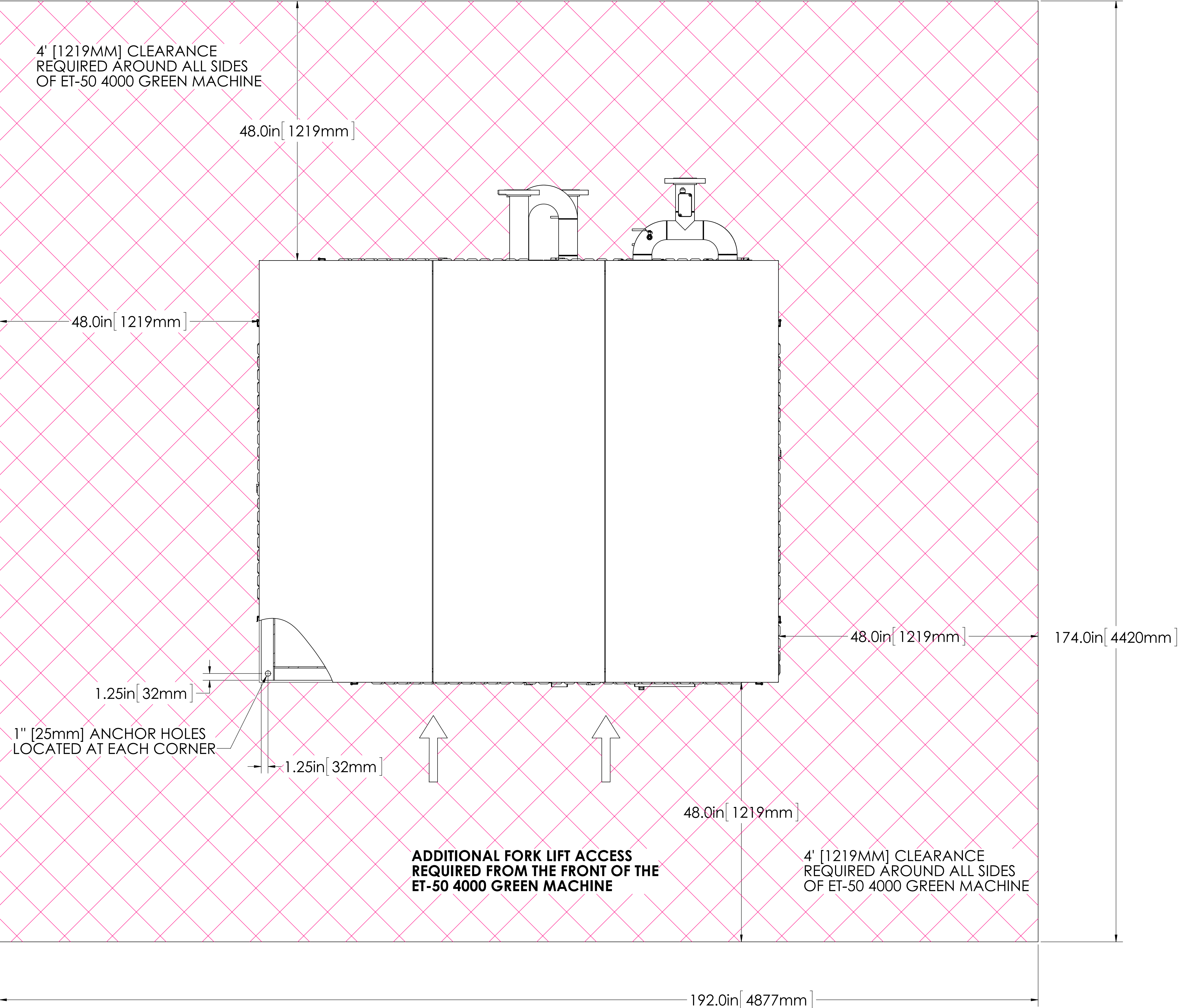
All external manifolds for customer connections are removed and ship inside the enclosure



ET-50 4000 GREEN MACHINE REAR VIEW

Customer Connections		
	Domestic	Non-Domestic
Cold Water In	3" #150	DN 80 PN16
Cold Water Return	3" #150	DN 80 PN16
Hot Water In	3" #150	DN 80 PN16
Hot Water Return	3" #150	DN 80 PN16

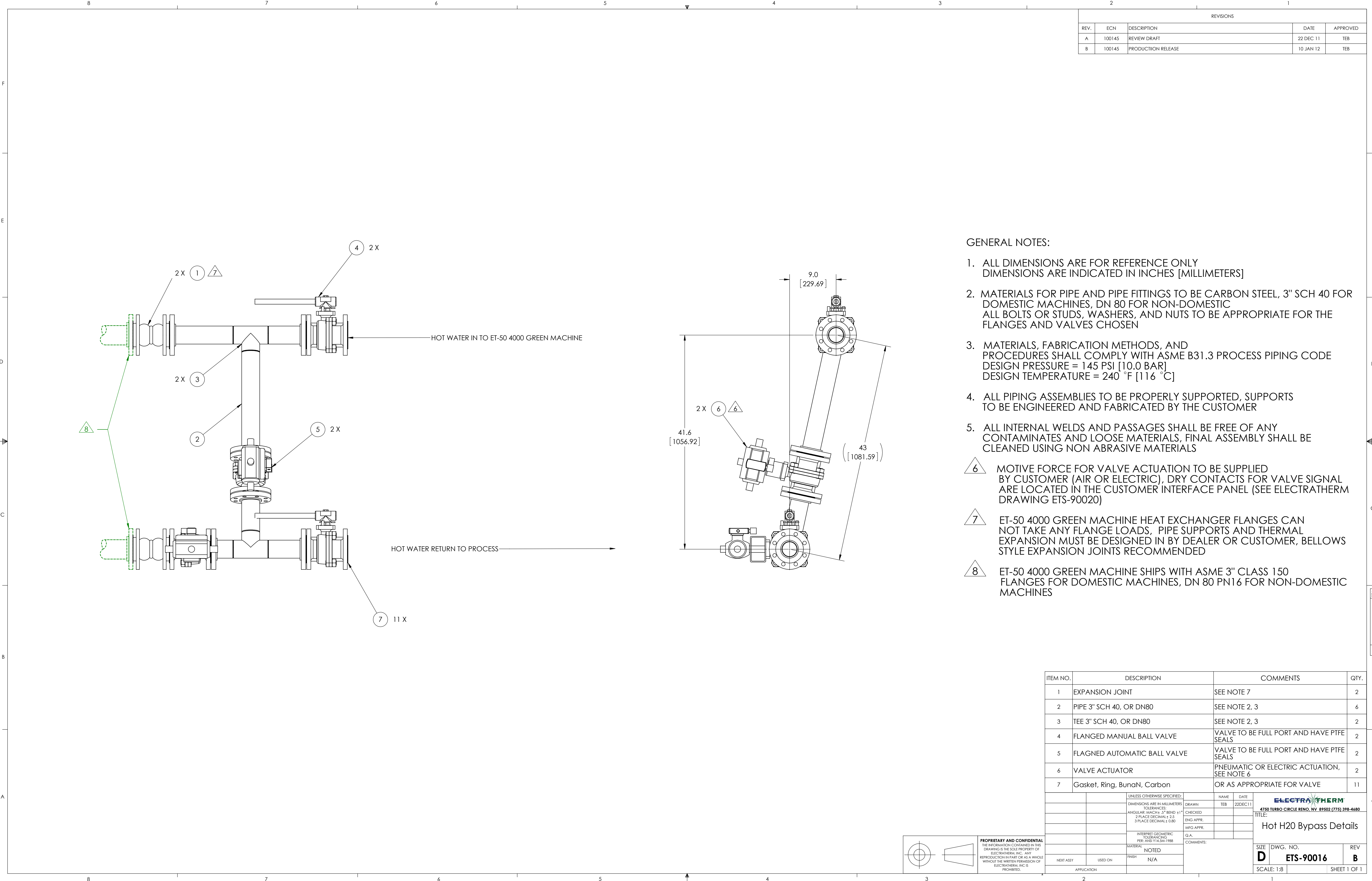
All external manifolds for customer connections are removed and ship inside the enclosure



ET-50 4000 GREEN MACHINE TOP VIEW



Drawing #	Drawing Title	# pages
ETS-90016	Detail, Bypass, Hot Water	1

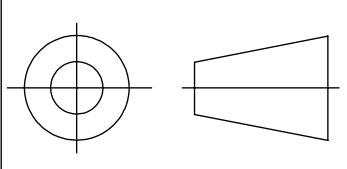


REVISIONS				
REV.	ECN	DESCRIPTION	DATE	APPROVED
A	100145	REVIEW DRAFT	22 DEC 11	TEB
B	100145	PRODUCTION RELEASE	10 JAN 12	TEB

GENERAL NOTES:

- ALL DIMENSIONS ARE FOR REFERENCE ONLY
DIMENSIONS ARE INDICATED IN INCHES [MILLIMETERS]
 - MATERIALS FOR PIPE AND PIPE FITTINGS TO BE CARBON STEEL, 3" SCH 40 FOR DOMESTIC MACHINES, DN 80 FOR NON-DOMESTIC
ALL BOLTS OR STUDS, WASHERS, AND NUTS TO BE APPROPRIATE FOR THE FLANGES AND VALVES CHOSEN
 - MATERIALS, FABRICATION METHODS, AND PROCEDURES SHALL COMPLY WITH ASME B31.3 PROCESS PIPING CODE
DESIGN PRESSURE = 145 PSI [10.0 BAR]
DESIGN TEMPERATURE = 240 °F [116 °C]
 - ALL PIPING ASSEMBLIES TO BE PROPERLY SUPPORTED, SUPPORTS TO BE ENGINEERED AND FABRICATED BY THE CUSTOMER
 - ALL INTERNAL WELDS AND PASSAGES SHALL BE FREE OF ANY CONTAMINATES AND LOOSE MATERIALS, FINAL ASSEMBLY SHALL BE CLEANED USING NON ABRASIVE MATERIALS
- 6 MOTIVE FORCE FOR VALVE ACTUATION TO BE SUPPLIED BY CUSTOMER (AIR OR ELECTRIC), DRY CONTACTS FOR VALVE SIGNAL ARE LOCATED IN THE CUSTOMER INTERFACE PANEL (SEE ELECTRATHERM DRAWING ETS-90020)
- 7 ET-50 4000 GREEN MACHINE HEAT EXCHANGER FLANGES CAN NOT TAKE ANY FLANGE LOADS, PIPE SUPPORTS AND THERMAL EXPANSION MUST BE DESIGNED IN BY DEALER OR CUSTOMER, BELLOWS STYLE EXPANSION JOINTS RECOMMENDED
- 8 ET-50 4000 GREEN MACHINE SHIPS WITH ASME 3" CLASS 150 FLANGES FOR DOMESTIC MACHINES, DN 80 PN16 FOR NON-DOMESTIC MACHINES

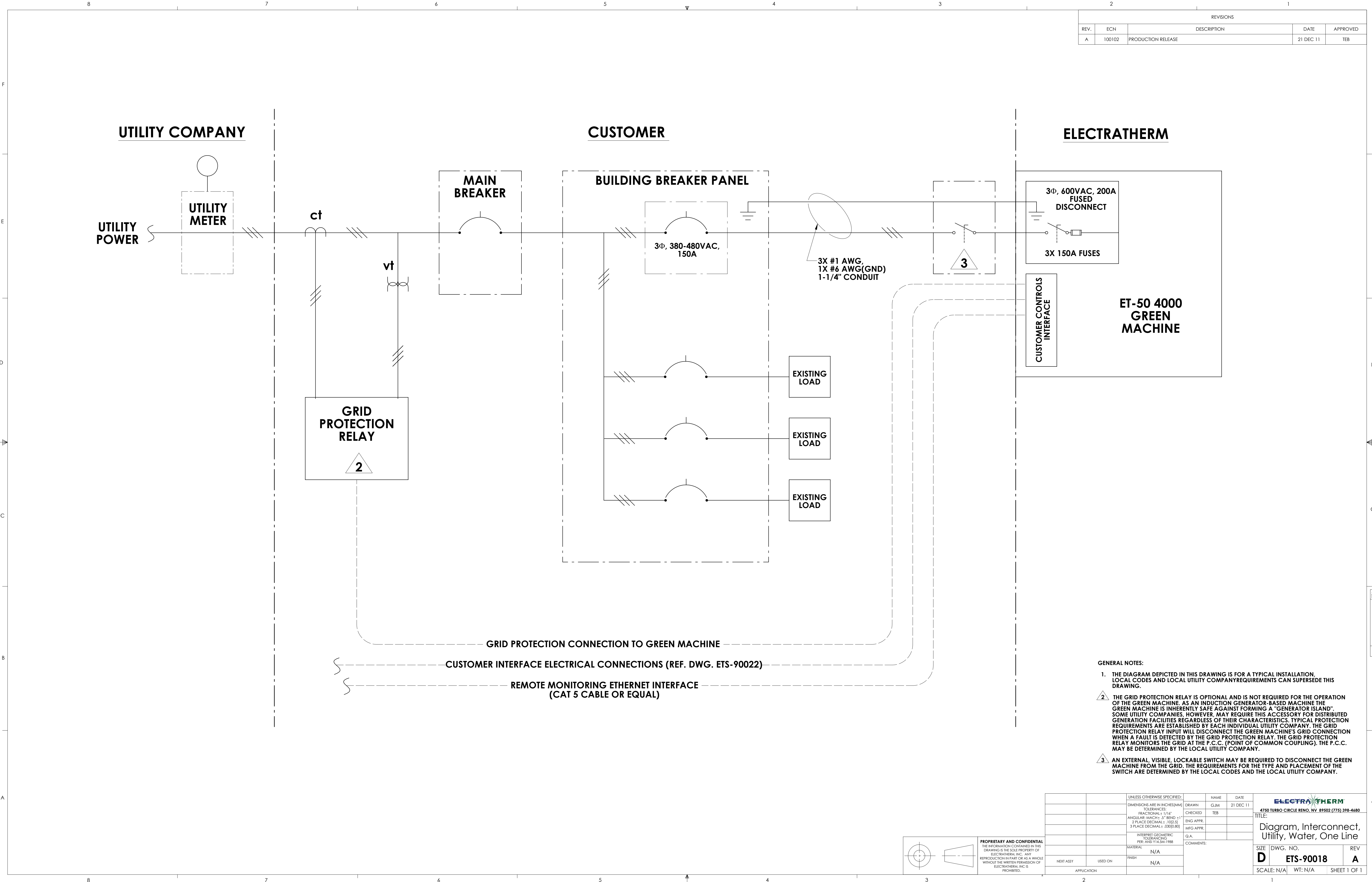
ITEM NO.	DESCRIPTION		COMMENTS		QTY.
1	EXPANSION JOINT		SEE NOTE 7		2
2	PIPE 3" SCH 40, OR DN80		SEE NOTE 2, 3		6
3	TEE 3" SCH 40, OR DN80		SEE NOTE 2, 3		2
4	FLANGED MANUAL BALL VALVE		VALVE TO BE FULL PORT AND HAVE PTFE SEALS		2
5	FLAGNED AUTOMATIC BALL VALVE		VALVE TO BE FULL PORT AND HAVE PTFE SEALS		2
6	VALVE ACTUATOR		PNEUMATIC OR ELECTRIC ACTUATION, SEE NOTE 6		2
7	Gasket, Ring, BunaN, Carbon		OR AS APPROPRIATE FOR VALVE		11
		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS TOLERANCES: ANGULAR: MATCH ± 3° BOND ± 1° 2 PLACE DECIMAL ± 0.3 3 PLACE DECIMAL ± 0.80	DRAWN TEB	DATE 22DEC11	4750 TURBO CIRCLE RENO, NV 89502 (775) 398-4680 TITLE: Hot H2O Bypass Details
		INTERPRET GEOMETRIC TOLERANCING PER: ANSI Y14.5M-1988	CHECKED		
		MATERIAL: NOTED	ENG APPR:		
			MFG APPR:		
			Q.A.		COMMENTS:
NEXT ASSY		USED ON	FINISH		SIZE D
APPLICATION					DWG. NO. ETS-90016
					REV B
					SCALE: 1:8
					SHEET 1 OF 1



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Drawing #	Drawing Title	# pages
ETS-90018	Diagram, 1-Line, Intrcnct, Water Cooled	1



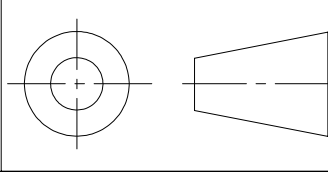
REVISIONS				
REV.	ECN	DESCRIPTION	DATE	APPROVED
A	100102	PRODUCTION RELEASE	21 DEC 11	TEB

- GENERAL NOTES:
- THE DIAGRAM DEPICTED IN THIS DRAWING IS FOR A TYPICAL INSTALLATION. LOCAL CODES AND LOCAL UTILITY COMPANY REQUIREMENTS CAN SUPERSEDE THIS DRAWING.
 - THE GRID PROTECTION RELAY IS OPTIONAL AND IS NOT REQUIRED FOR THE OPERATION OF THE GREEN MACHINE. AS AN INDUCTION GENERATOR-BASED MACHINE THE GREEN MACHINE IS INHERENTLY SAFE AGAINST FORMING A "GENERATOR ISLAND". SOME UTILITY COMPANIES, HOWEVER, MAY REQUIRE THIS ACCESSORY FOR DISTRIBUTED GENERATION FACILITIES REGARDLESS OF THEIR CHARACTERISTICS. TYPICAL PROTECTION REQUIREMENTS ARE ESTABLISHED BY EACH INDIVIDUAL UTILITY COMPANY. THE GRID PROTECTION RELAY INPUT WILL DISCONNECT THE GREEN MACHINE'S GRID CONNECTION WHEN A FAULT IS DETECTED BY THE GRID PROTECTION RELAY. THE GRID PROTECTION RELAY MONITORS THE GRID AT THE P.C.C. (POINT OF COMMON COUPLING). THE P.C.C. MAY BE DETERMINED BY THE LOCAL UTILITY COMPANY.
 - AN EXTERNAL, VISIBLE, LOCKABLE SWITCH MAY BE REQUIRED TO DISCONNECT THE GREEN MACHINE FROM THE GRID. THE REQUIREMENTS FOR THE TYPE AND PLACEMENT OF THE SWITCH ARE DETERMINED BY THE LOCAL CODES AND THE LOCAL UTILITY COMPANY.

		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES(MM) TOLERANCES: FRACTIONAL ± 1/16" ANGULAR ± MACH ± 2° BEND ± 1° 2 PLACE DECIMAL ± .10 (2.5) 3 PLACE DECIMAL ± .030 (0.80)	DRAWN GJM	NAME GJM	DATE 21 DEC 11
		INTERPRET GEOMETRIC TOLERANCING PER: ANSI Y14.5M-1988	CHECKED TEB	ENG APPR. TEB	
		MATERIAL N/A	ENG APPR. TEB	G.A.	
		FINISH N/A	COMMENTS:		
NEXT ASSY	USED ON	APPLICATION			

ELECTRATHERM		4750 TURBO CIRCLE RENO, NV 89502 (775) 398-4680
Diagram, Interconnect, Utility, Water, One Line		
SIZE D	DWG. NO. ETS-90018	REV A
SCALE: N/A	WT: N/A	SHEET 1 OF 1

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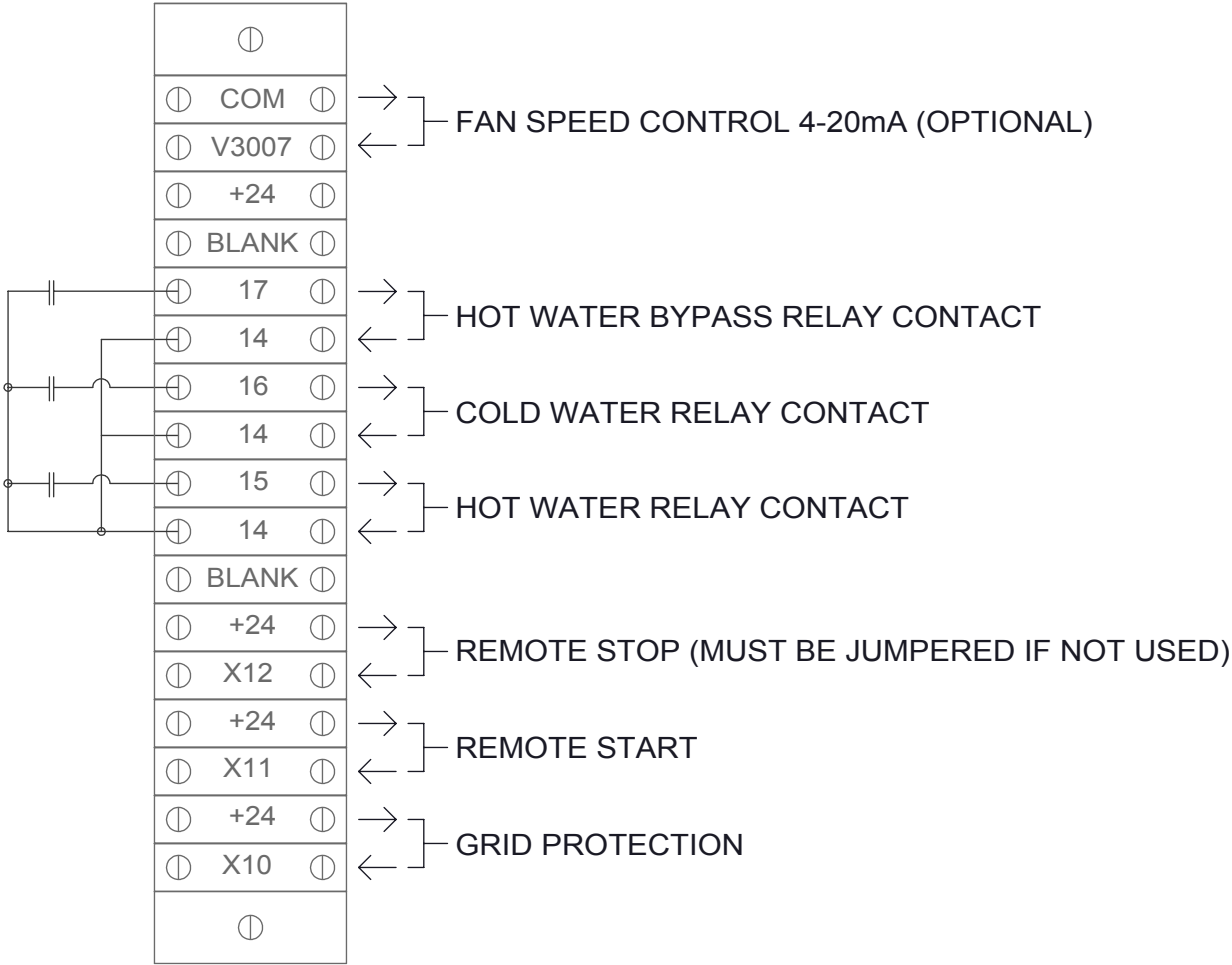
REV. A
D ETS-90018

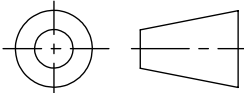


Drawing #	Drawing Title	# pages
ETS-90020	Diagram, Trmnl Strip, Interface, ET-50-4000	1

REVISIONS				
REV.	ECN	DESCRIPTION	DATE	APPROVED
A	100145	REVIEW DRAFT	27 DEC 11	TEB
B	100145	PRODUCTION RELEASE	11 JAN 12	TEB

CUSTOMER INTERFACE TERMINAL STRIP



			UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 4750 TURBO CIRCLE RENO, NV 89502 (775) 398-4680	
			DIMENSIONS ARE IN INCHES[MM]	DRAWN	TEB	27 DEC 11		
			TOLERANCES:	CHECKED				
			FRACTIONAL $\pm 1/16"$	ENG APPR.				
			ANGULAR: MACH $\pm .5^\circ$ BEND $\pm 1^\circ$ 2 PLACE DECIMAL $\pm .10$ [2.5] 3 PLACE DECIMAL $\pm .030$ [0.80]	MFG APPR.				
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			FINISH	N/A		COMMENTS:		
	NEXT ASSY	USED ON						
	APPLICATION		DO NOT SCALE DRAWING					
				SIZE	DWG. NO.		REV.	
				A	ETS-90020		B	
				SCALE: N/A		WEIGHT: N/A		
						SHEET 1 OF 1		



Drawing #	Drawing Title	# pages
ETS-90023	Detail, Mounting, ET-50-4000	1

