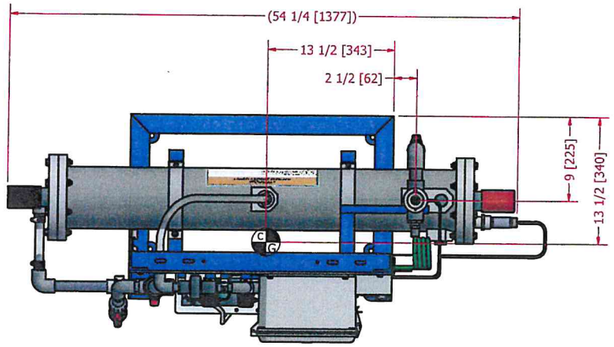
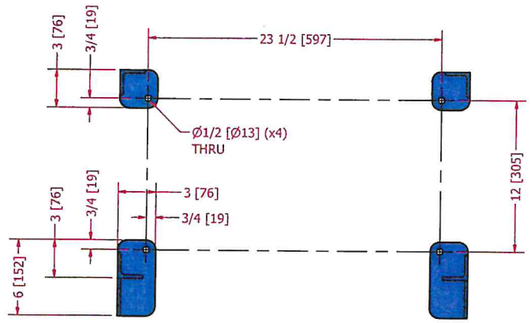
CLORTEC 100-C (100 LBS/DAY)
FINISH: POWDER COATED CARBON STEEL
POWER: 120VAC, 60HZ

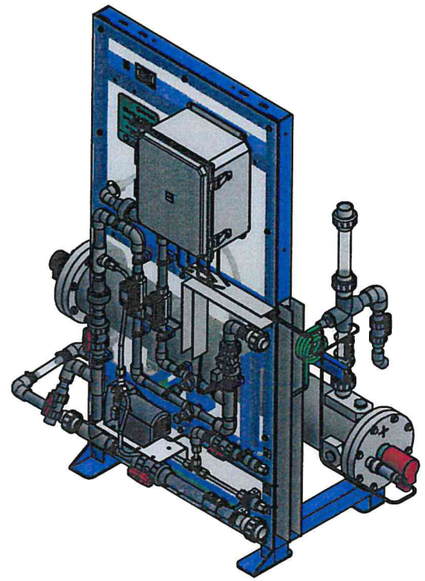
REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	APPROVED BY
0	08/02/2021	INITIAL RELEASE	RAM	JPM	JPM
1	01/11/2022	MODIFIED J.BOX SIZE	RAM	JPM	JPM



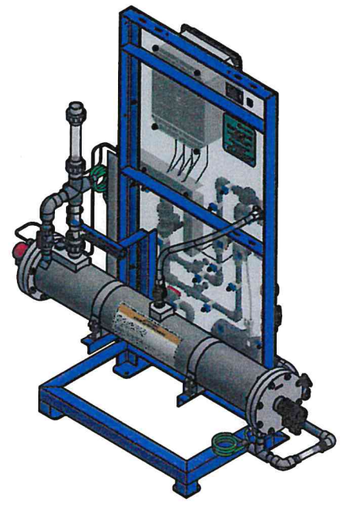
TOP VIEW



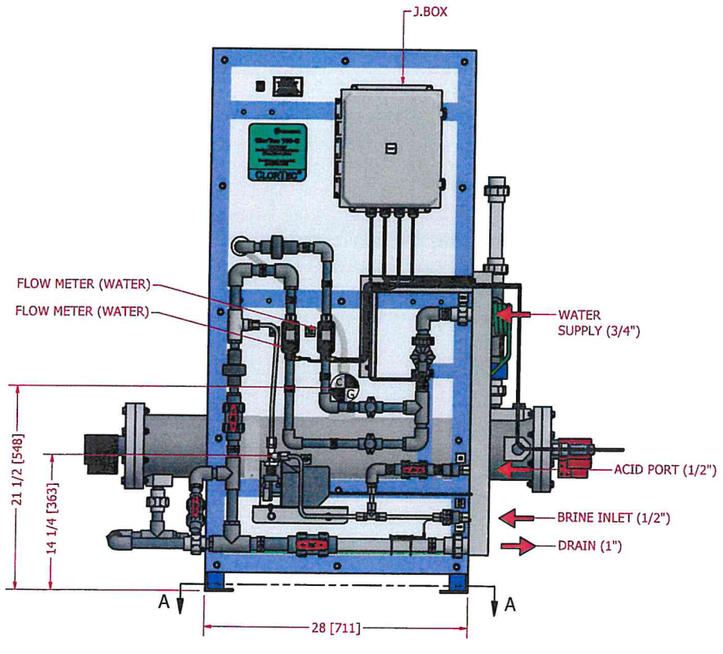
SECTION A-A



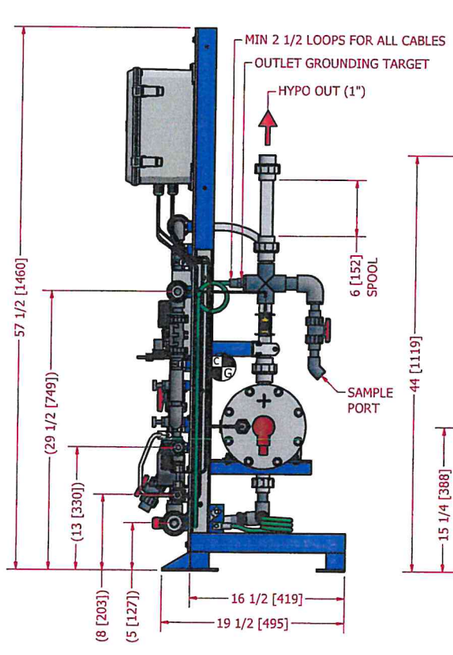
ISOMETRIC VIEW



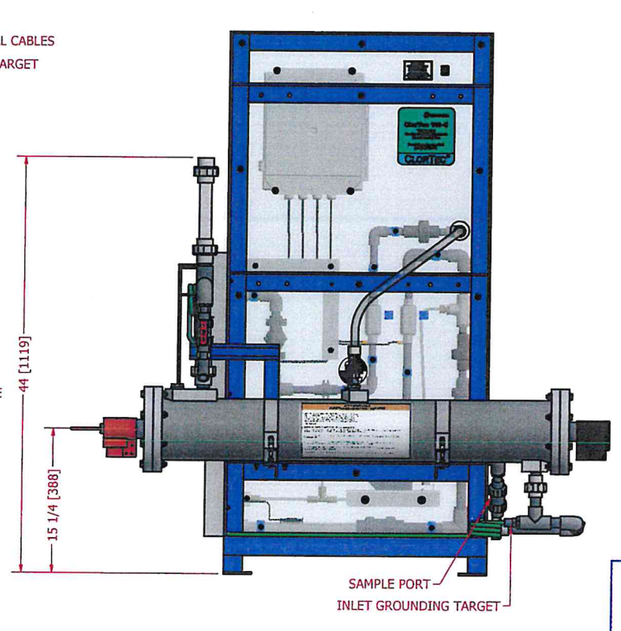
ISOMETRIC VIEW
(ROTATED)



FRONT VIEW



SIDE VIEW



BACK VIEW

NOTES:

ALL DIMENSIONS ARE IN INCHES [MM]
MATERIAL : CARBON STEEL
FINISH : POWDER COATED

NOTES (UNLESS OTHERWISE SPECIFIED)

DE NORA

1110 INDUSTRIAL BOULEVARD SUGAR LAND, TEXAS 77478

TELEPHONE No: (281) 240-6770
FAX No: (281) 240-6762
E-MAIL: info.dnwt@denora.com
WEB SITE: www.denora.com

UNLESS OTHERWISE NOTED
ALL DIMENSIONS ARE IN INCHES [MM] = REFERENCE

FRACTIONS	± 1/2"	±12.7mm
.X	± 0.1"	±2.5mm
.XX	± 0.02"	±0.51mm
.XXX	± 0.005"	±.127mm
ANGLES	± 1°	

CLORTEC

ASSY, RACK, CLORTEC 100-C (100 LBS/DAY) GEN III OSHG, CS POWDER COATED, W/SPLIT FLOW,BRINE PUMP,PLASTIC JBOX,120VAC,60HZ, NSF61

SAP # 47002922

SCALE:	PROJECT NO:	SIZE
NTS		D - 31 -
DWG NO:		SHEET:
CT0100RA1G3-CPBP-120T-GA-01		1 of 1

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	APPROVED BY
0	06/01/2021	INITIAL RELEASE	RAM	JPM	JPM

CLORTEC 75-C/100-C (75/100 LBS/DAY) RACK MOUNTED ON-SITE SODIUM HYPOCHLORITE GENERATION SYSTEM PIPING & INSTRUMENTATION DIAGRAM

NOTES (UNLESS OTHERWISE SPECIFIED)

SYTELINE ITEM NUMBER(S)

DE NORA

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.XXX	± .005"	±0.127mm
ANGLES	± 1°	

CLORTEC

CLORTEC 75-C/100-C (75/100 LBS/DAY) RACK MOUNTED ON-SITE SODIUM HYPOCHLORITE GENERATION SYSTEM PIPING & INSTRUMENTATION DIAGRAM

CLORTEC GEN III

SCALE:	DNWT PROJECT No:	SIZE:	REV:
NTS	STANDARD	D	0

DNWT DWG No: CT0075-0100RA1G3-CPBP-120-I-01-B

SHEET: 1 of 1

ABBREVIATIONS

AC	ACTIVATED CARBON
ADV	ACTUATED DIAPHRAGM VALVE
AE	ANALYTICAL ELEMENT
AI	ANALYTICAL INDICATOR
AIT	ANALYTICAL INDICATOR TRANSMITTER
AL	ALARM LIGHT
BFV	BUTTERFLY VALVE
BLW	BLOWER
BR	BRINE
BP	BELLOWS PUMP
BPV	BACK PRESSURE VALVE
BV	BALL VALVE
CC	CALIBRATION COLUMN
CP	CONTROL PANEL
CS	CORP STOP
CV	CHECK VALVE
CWS	CITY WATER SUPPLY
DPS	DIFFERENTIAL PRESSURE SWITCH
DPSL	DIFFERENTIAL PRESSURE SWITCH LOW
DS	DISCONNECT SWITCH
DV	DIAPHRAGM VALVE
EC	ELECTROLYTIC CELL
ED	EDUCTOR
FA	FLOW ALARM
FAL	FLOW ALARM LOW
FIL	FILTER CARTRIDGE
FIQ	FLOW INDICATOR/TOTALIZER
FIT	FLOW INDICATOR TRANSMITTER
FM	FLOWMETER
FSL	FLOW SWITCH LOW
GT	GROUNDING TARGET
HAL	HYDROGEN ALARM LEVEL
HAF	HYDROGEN ALARM FAULT
HD	HYDROGEN DETECTOR
HI	HIGH
HOA	HAND OFF AUTO
HS	HYPOCHLORITE SOLUTION
HV	HAND VALVE
HX	HEAT EXCHANGER
IC	CURRENT FEED BACK
IE	VOLTAGE FEED BACK
II	CURRENT CONTROL
ISR	INTRINSICALLY SAFE BARRIER
LIT	LEVEL INDICATOR TRANSMITTER
LO	LOW
LSL	LEVEL SWITCH LOW
MP	METERING PUMP
MV	MOTORIZED VALVE
N.O	NORMALLY OPEN
N.C	NORMALLY CLOSED
NPW	NON-POTABLE WATER
OSHG	ON-SITE HYPOCHLORITE GENERATION
P	PUMP
PD	PULSATION DAMPENER
PRV	PRESSURE REGULATING VALVE
PRV	PRESSURE RELIEF VALVE
PSB	POWER SUPPLY BOX
PSL	PRESSURE SWITCH LOW
PT	PRESSURE TRANSMITTER
PV	PRESSURE VESSEL
PVC	POLYVINYL CHLORIDE
QC	QUALITY CONTROL
RCT	RECTIFIER
SV	SOLENOID VALVE
SP	SAMPLE POINT
SW	SOFTENED WATER
TAH	TEMPERATURE ALARM HIGH
TIT	TEMPERATURE INDICATOR TRANSMITTER
TK	TEMPERATURE ALARM LOW
TK	TANK
TSH	TEMPERATURE SWITCH HIGH
TSL	TEMPERATURE SWITCH LOW
VFD	VARIABLE FREQUENCY DRIVE
WC	WATER CHILLER
WH	WATER HEATER
WS	WATER SOFTENER
XYZ	FILED MOUNTED INSTRUMENT
XC	SOLENOID OPEN / CLOSE
XFRM	TRANSFORMER
YA	FAULT ALARM
YST	Y-STRAINER
ZSO	LIMIT SWITCH OPEN
ZSC	LIMIT SWITCH CLOSE

INSTRUMENT & FUNCTION SYMBOLS

- INSTRUMENT MOUNTED ON MAIN PANEL ACCESSIBLE - PRIMARY LOCATION
- FIELD MOUNTED INSTRUMENT
- INSTRUMENT MOUNTED ON MAIN PANEL ACCESSIBLE - AUXILIARY LOCATION
- INSTRUMENT MOUNTED BEHIND MAIN PANEL - NOT READILY ACCESSIBLE
- SHARED DISPLAY ACCESSIBLE - PRIMARY LOCATION
- SHARED DISPLAY FIELD MOUNTED
- SHARED DISPLAY ACCESSIBLE - AUXILIARY LOCATION
- SHARED DISPLAY NOT READILY ACCESSIBLE
- COMPUTER - INTERNAL SYSTEM FUNCTION ACCESSIBLE - PRIMARY LOCATION
- COMPUTER - INTERNAL SYSTEM FUNCTION FIELD MOUNTED
- COMPUTER - INTERNAL SYSTEM FUNCTION ACCESSIBLE - AUXILIARY LOCATION
- COMPUTER - INTERNAL SYSTEM FUNCTION NOT ACCESSIBLE TO OPERATOR
- LEVEL - FUNCTION DESCRIPTOR; FI - LOOP TYPE; XXXX - LOOP NUMBER; DO - DIGITAL OUTPUT; DI - DIGITAL INPUT; AO - ANALOG OUTPUT; AI - ANALOG INPUT
- PROGRAMMABLE LOGIC CONTROL ACCESSIBLE - PRIMARY LOCATION
- PROGRAMMABLE LOGIC CONTROL FIELD MOUNTED
- PROGRAMMABLE LOGIC CONTROL ACCESSIBLE - AUXILIARY LOCATION
- PROGRAMMABLE LOGIC CONTROL NOT ACCESSIBLE TO OPERATOR
- INSTRUMENT WITH LONG TAG NUMBER
- INSTRUMENTS SHARING COMMON HOUSING
- PILOT LIGHT
- PANEL MOUNTED PATCHBOARD POINT 12
- * PURGE FOR FLUSHING DEVICE
- * REST FOR LATCH - TYPE ACTUATOR
- * UNDEFINED INTERLOCK LOGIC

* - THESE DIAMONDS ARE APPROXIMATELY HALF THE SIZE OF LARGER ONES

VALVE SYMBOLS

- BALL VALVE (NORMALLY OPEN)
- BALL VALVE (NORMALLY CLOSED)
- VENTED BALL VALVE
- BALL VALVE W/ LOCKING HANDLE
- BUTTERFLY VALVE
- DIAPHRAGM VALVE
- NEEDLE VALVE
- BALL CHECK VALVE
- CHECK VALVE (SWING)
- CHECK VALVE (SPRING)
- DIAPHRAGM CHECK VALVE
- BACKFLOW PREVENTER
- GATE VALVE
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE (2-WAY)
- PRESSURE RELIEF VALVE (3-WAY)
- BACK PRESSURE VALVE
- SAMPLE POINT VALVE
- SOLENOID VALVE
- FLOAT VALVE
- ELECTRIC, AIR, ETC.
- ACTUATED BUTTERFLY VALVE
- ACTUATED DIAPHRAGM VALVE
- EDUCTOR

CONNECTION SYMBOLS

- CONCENTRIC REDUCER (LINE-SIZE REDUCTION)
- CAPPED LINE
- UNION
- FLANGE CONNECTION
- FLEX CONNECTOR, VIBRATION ISOLATOR
- FLEXIBLE LINE, HOSE, TUBING
- CAMLOK FITTING
- Y-STRAINER
- GAUGE ISOLATOR, GAUGE GUARD
- FLOW ARROW
- FLOOR DRAIN, DRAIN CONNECTION
- SOURCE LEADER (TAG)

INSTRUMENTATION SYMBOLS

- IN-LINE PRESSURE INDICATOR
- PANEL-MOUNT PRESSURE INDICATOR
- IN-LINE PRESSURE INDICATOR WITH ISOLATION VALVE
- PANEL-MOUNT PRESSURE INDICATOR WITH ISOLATION VALVE
- IN-LINE FLOW ELEMENT WITH PANEL-MOUNT FLOW INDICATOR
- IN-LINE VORTEX-TYPE FLOW ELEMENT WITH PANEL-MOUNT FLOW INDICATOR
- RES, %REJ, pH, ETC.
- IN-LINE ANALYTICAL ELEMENT WITH PANEL-MOUNT ANALYTICAL INDICATOR
- RES, %REJ, pH, ETC.
- (2) IN-LINE ANALYTICAL ELEMENTS SHARING (1) PANEL MOUNT ANALYTICAL INDICATOR
- TOC, SILICA, HARDNESS, OXYGEN, ETC.
- OFF-SKID ANALYTICAL MONITOR WHICH PULLS IN-LINE SAMPLE AND DUMPS TO A DRAIN
- GROUND
- DISCONNECT SWITCH
- CALIBRATION COLUMN

EQUIPMENT SYMBOLS

- CENTRIFUGAL PUMP
- VERTICAL PUMP
- METERING PUMP
- BRINE PROPORTIONING PUMP OR BELOWS PUMP
- SALT LEVEL PROBE
- ULTRASONIC LEVEL TRANSMITTER
- DIFFERENTIAL PRESSURE SWITCH
- CARTRIDGE FILTER HOUSING
- IN-LINE (ROTAMETER) FLOW INDICATOR
- FLOW / TEMPERATURE INDICATOR TRANSMITTER
- PULSATION DAMPENER
- BLOWER
- CORP STOP
- BLOWER FLEX CONNECTION
- BLOWER TRANSITION
- BLOWER BACKDRAFT DAMPENER

COMMON INSTRUMENT / DEVICE IDENTIFIERS	
ISA IDENTIFIER	INITIATING VARIABLE AND FUNCTION
AS	ANALYSIS SWITCH
AE	ANALYSIS ELEMENT
AT	ANALYSIS TRANSMITTER
CS	CONDUCTIVITY SWITCH
CT	CONDUCTIVITY TRANSMITTER
DS	DENSITY SWITCH
ET	VOLTAGE TRANSMITTER
FC	FLOW CONTROLLER
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FS	FLOW SWITCH
FT	FLOW TRANSMITTER
FY	FLOW RELAY
FZ	FLOW DRIVE
HS	HAND SWITCH
IT	CURRENT TRANSMITTER
JT	POWER TRANSMITTER
KC	TIME CONTROLLER
KI	ELAPSED TIME INDICATOR
LE	LEVEL ELEMENT
LI	LEVEL INDICATOR
LS	LEVEL SWITCH
LT	LEVEL TRANSMITTER
LY	LEVEL RELAY
PC	PRESSURE CONTROLLER
PI	PRESSURE INDICATOR
PT	PRESSURE TRANSMITTER
PIT	PRESSURE INDICATING TRANSMITTER
PS	PRESSURE SWITCH
SC	SPEED CONTROLLER
SI	SPEED INDICATOR
ST	SPEED TRANSMITTER
TC	TEMPERATURE CONTROLLER
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TS	TEMPERATURE SWITCH
TT	TEMPERATURE TRANSMITTER
TY	TEMPERATURE RELAY
UR	MULTIVARIABLE RECORDER
VT	VIBRATION TRANSMITTER
WE	WEIGHT ELEMENT
WT	WEIGHT TRANSMITTER
XX	UNCLASSIFIED
YC	STATE CONTROL
YN	STATE ON
YY	EVENT RELAY
YS	EVENT SWITCH
ZS	POSITION SWITCH
ZT	POSITION TRANSMITTER
ZZ	POSITION DRIVE

FUNCTIONAL IDENTICATION						DESCRIPTION
	FIRST-LETTER		SUCCEEDING-LETTERS			I/O TYPE
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER	TYPICAL ASSOCIATED CDACS
A	ANALYSIS		ALARM			DI
B	BURNER, COMBUSTION			CLOSE-STOP DECREASE		DO
C	CONDUCTIVITY, pH (ACIDITY)		CONTROL, CLOSE	CONTROL OR CONTROLLER	CLOSE/CLOSED	DI/AO
D	DENSITY	DIFFERENTIAL		OPEN-START-INCREASE		DO
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)			
F	FLOW RATE	RATIO (FRACTION)			FAIL	DI
G	GAUGE, GAS		GLASS VIEWING DEVICE			
H	HAND				H-HIGH-(ALARM) HH-HIGH-(SHUTDOWN)	DI
I	CURRENT (ELECTRICAL)		INDICATE			AI
J	POWER	SCAN				DO/AI
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION		DO/AO
L	LEVEL		LIGHT		L-LOW-(ALARM) LL-LOW-(SHUTDOWN)	DI
M	MOTOR	MOMENTARY	ON OR OPERATE		MIDDLE, INTERMEDIATE	DI
N	MOISTURE, TORQUE					DO
O	UNCLASSIFIED		OPEN ORIFICE, RESTRICTION POINT (TEST) CONNECTION		OPEN/OPENED OVERLOAD	DO
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION	PNEUMATIC		
Q	QUANTITY	INTEGRATE, TOTALIZE		INTEGRATE OR TOTALIZE		DI/AI
R	RUN, RADIATION		RECORD & STORE	REPORT		AI
S	SPEED, FREQUENCY, SOLENOID	SAFETY		SWITCH OR SAFETY		DI/DO
T	TEMPERATURE			TRANSMIT		AI
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION	DI
V	VIBRATION, VOLUME MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER		
W	WEIGHT, FORCE		WELL			
X	ON/OFF, FAILURE OR TROUBLE	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	DI/DO
Y	EVENT, STATE OR PRESENCE	Y AXIS		COMPUTE, CONVERT, RELAY		
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT		

GENERAL NOTES

1. THIS DRAWING IS FOR EQUIPMENT PROCESS FLOW INFORMATION PURPOSES ONLY. ALL EQUIPMENT, COMPONENTS, INSTRUMENTS, DEVICES, PIPING, FITTINGS, VALVES & CONDUIT SHOWN ON THIS DRAWING ARE NOT NECESSARILY SUPPLIED & INSTALLED BY DNWT. REFER TO CONTRACT DOCUMENTS, DNWT SCOPE OF SUPPLIES FOR DNWT RESPONSIBILITY IN THIS PROJECT.
2. ALL PIPING FITTINGS & VALVES ARE PVC SCH. 80. ALL TUBING ARE POLYETHYLENE.
3. ELECTRICAL POWER, WATER SUPPLY, POINT OF INJECTION AND SCADA ARE PROVIDED BY OTHERS.
4. ALL UNDER GROUND WORK, CONCRETE WORK, WALL AND ROOF PENETRATIONS ARE DONE BY OTHERS.
5. ALL ELECTRICAL CONDUITS, WIRING ,JUNCTION AND PULL BOXES WILL BE PROVIDED BY OTHERS.
6. ALL PAINTING AND COATING TO BE PROVIDED BY OTHERS.
7. ALL BACKBOARDS AND SUPPORTS TO BE PROVIDED BY OTHERS.
8. CUSTOMER TO PROVIDE WATER SUPPLY PRESSURE & TEMPERATURE.
9. CUSTOMER TO PROVIDE DETAILED DOSING ROUTINE. (WHEN APPLICABLE)
10. CUSTOMER TO PROVIDE HYPOCHLORITE FEEDING SYSTEM PRESSURE. (WHEN APPLICABLE).
11. ALL ELECTRICAL DISCONNECT SWITCHES ARE PROVIDED BY OTHERS.
12. POWER TO ELECTRICAL COMPONENTS CAN ALSO BE PROVIDED IN 50Hz.

13 REFER MAJOR EQUIPMENT SPECIFICATIONS TABLE.

LINE SYMBOLS

- PROCESS FLOW, MAIN FLOW
- ELECTRICAL SIGNAL
- POWER SUPPLY ELECTRICAL CONNECTION 3Ø
- POWER SUPPLY ELECTRICAL CONNECTION 1Ø
- INSTRUMENT SIGNAL ANALOG / DIGITAL
- PNEUMATIC SIGNAL
- HYDRAULIC SIGNAL
- CAPILLARY TUBE
- ELECTRO MAGNETIC OR SONIC SIGNAL (GUIDED)
- ELECTRO MAGNETIC OR SONIC SIGNAL (NOT GUIDED)
- DATA/COMMUNICATION
- MECHANICAL LINK
- LOOP — CUSTOMER POINT OF USE

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.XX	± .02"	±0.51mm
.XXX	± .005"	±0.127mm
ANGLES	± 1°	

CLORTEC

CLORTEC 75-C/100-C (75/100 LBS/DAY)
RACK MOUNTED ON-SITE SODIUM HYPOCHLORITE GENERATION SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

CLORTEC GEN III

SCALE:	DNWT PROJECT No:	SIZE:	REV:
NTS	STANDARD	D	0

DNWT DWG No: CT0075-0100RA1G3-CPBP-120-I-01-B
SHEET: 2 of 3

NOTE 4

(CUSTOMER PROVIDED)
120/240VAC, 1ø, 60 HZ, 3 FLA

** OTHER VOLTAGES ARE ALSO AVAILABLE

TO CUSTOMER SCADA

ALLEN BRADLEY
MICRO LOGIX 1400
PLC

6" COLOR C-MORE
TOUCH SCREEN DISPLAY

SOLENOID
VALVE
OPEN/CLOSE
ZC 200 DO

BRINE
LEVEL
LS 200 DI

CP-100
HYPOCHLORITE CONTROL PANEL
***

CONTINUED
ON
SHEET 4

120 VAC

POWER CORD
120VAC, 1ø, 5A

ON/OFF
SWITCH

FROM SAMPLE
TAP ON OUTLET
OF CELL

(30 GALLONS)
TANK

3/4" 3/4"

TO ACID PORT

1/2"

DRAIN

ACC-100
ELECTROLYTIC CELLS
ACID CLEANING CART
(OPTIONAL)
***

***
LEVEL SWITCH ASSY

BT-200
BRINE TANK W/FITTINGS & LID
XXXX GALLONS
(FOR TANK CAPACITY SELECTION
SEE TABLE)
***

CONSUMABLE
(BY OTHERS)

SALT

BRINE

LS 200

1-1/2"

1/2" OVERFLOW-1/2"

1"

1/2" DRAIN

1/2"
BV-207

1/2" PVC-BR

BV-208
1/4"
SAMPLE

BV-209

1" DRAIN

TO SHEET 4
A
TO CT RACK
ECR-100

1-1/2"
BV-202

FROM POTABLE
WATER SUPPLY
(CUSTOMER PROVIDED)

1-1/2"PVC

FIL-200
BY OTHERS

1-1/2"
BV-200

BV-203
1/2" SAMPLE

1-1/2"
BV-201

BV-204
1/2" SAMPLE

WS-200
WATER SOFTENER
***

3/4" PVC-SW

BV-205

3/4"

FIL-201
***

PRV-200
3/4"
***

SV 200 S
3/4" (NC)
***

1/2" PVC-BR

1/2"

3/8"

BV-206CV-200

DRAIN

3/4" PVC-SW
TO SHEET 4
B
TO CT RACK

1-1/2" PVC-SW
TO SHEET 5
C
TO DILUTION PANEL

***
ONLY EQUIPMENT MARKED WITH
STARS AND WITHIN DASHED BOXES
ARE PROVIDED BY DNWT.

RECOMMENDED SUPPLIED WATER TEMPERATURE:
OPTIMUM OPERATION FOR LOW SALT CONSUMPTION: 65-75° F (18-24° C)
OPTIMUM OPERATION FOR LOW CHLORATE: 55-60° F (13-16° C)

RECOMMENDED
PRESSURE: 60 PSI (4 BAR)

RECOMMENDED
WATER FLOW (TO RUN HYPO DILUTION PANEL): 20 GPM (76 LPM)

RECOMMENDED
WATER FLOW (NORMAL OPERATION): 5 GPM (19 LPM)

pH LEVEL: 6.5 – 7.5

NOTES:

1. FOR IMPROVED SYSTEM OPERATION EFFICIENCY, SUPPLIED WATER TEMPERATURE IS RECOMMENDED TO BE 65°-75° F (18°-24° C)
2. WATER INLET PRESSURE REQUIREMENT MIGHT HAVE TO BE ADJUSTED DEPENDING ON THE LOCATION/ELEVATION OF THE BRINE SATURATOR TANKS RELATIVE TO THE LOCATION/ELEVATION OF THE GENERATOR RACK ASSEMBLY.
3. **** SALT DENSITY WILL VARY DEPENDING ON THE TYPE OF SALT USED – ROCK, SOLAR OR VACUUM EVAPORATED (COARSE OR FINE)
4. THE PLC & HMI SHOWN ARE STANDARD. OTHER PLC & HMI COMBINATIONS ARE AVAILABLE BUT NOT STANDARD, AND WILL REQUIRE ADDITIONAL TIME TO PROGRAM AND CONFIGURE.

BRINE TANK SIZING/SELECTION TABLE

Salt Density	DAYS OF STORAGE TANK													
75 Lb/ft³ **** SEE NOTE 3	1		5		10		15		20		25		30	
	BRINE TANK CAPACITY													
PPD	GALLON	M3	GALLON	M3	GALLON	M3	GALLON	M3	GALLON	M3	GALLON	M3	GALLON	M3
75	22	0.1	112	0.4	224	0.9	337	1.3	449	1.7	561	2.1	673	2.5
100	30	0.1	150	0.6	299	1.1	449	1.7	598	2.3	678	2.8	898	3.4
150	45	0.2	224	0.9	449	1.7	673	2.6	898	3.4	1122	4.3	1346	5.1
200	60	0.2	299	1.1	598	2.3	898	3.4	1197	4.5	1496	5.7	1795	6.8
225	67	0.3	337	1.3	673	2.6	1010	3.8	1346	5.1	1683	6.4	2020	7.6
300	90	0.3	449	1.7	898	3.4	1346	5.1	1795	6.8	2244	8.5	2693	10.2

NOMINAL PIPE SIZE TO METRIC CONVERSION CHART	
PIPE SIZE (INCHES)	DN (MILLIMETERS)
1/4"	8
3/8"	10
1/2"	15
3/4"	20
1"	25
1 1/2"	40
2"	50
2 1/2"	65
3"	80
4"	100
5"	125
6"	150
8"	200
10"	250
12"	300

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[MM] = REFERENCE

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.XX	± .01"	±0.51mm
.XXX	± .005"	±0.127mm
ANGLES	± 1°	

CLORTEC

CLORTEC 75-C/100-C (75/100 LBS/DAY)
RACK MOUNTED ON-SITE SODIUM
HYPOCHLORITE GENERATION SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

CLORTEC GEN III

SCALE:	DNWT PROJECT No:	SIZE:	REV:
NTS	STANDARD	D	0

DNWT DWG No: CT0075-0100RA1G3-CPBP-120-I-01-B

SHEET: 3 of -34-

CONTINUED FROM SHEET 3

HYDROGEN LEVEL — HAL 100 — H-25% LEL — AI

CP-100
HYPOCHLORITE CONTROL PANEL
***

VALVE W/LIMIT SWITCH CLOSED — YC 110 — DI
LOW WATER FLOW — FIT 100B — AI
LOW INLET WATER TEMP — TIT 100B — AI
LOW WATER FLOW — FIT 100A — AI
LOW INLET WATER TEMP — TIT 100A — AI
HIGH CELL TEMP — TAH 100 — AI
LOW CELL LEVEL — LAL 100 — DI
DRAIN FLOW — FA 101 — DI
RACK SOLENOID VALVE OPEN/CLOSE — ZC 100 — DO
BELLOWS PUMP START/STOP — IYC 100 — DO
CURRENT CONTROL — IC 100 — AO
RECT CURRENT — II 100 — AI
RECT VOLTAGE — IE 100 — AI
START/STOP — HS 100 — DO
RECTIFIER FAULT — YA 100 — DI

CONTINUED ON SHEET 5

POWER 24VDC

120VAC, 1Ø, 60 HZ

120VAC, 1Ø, 60 HZ

2" PVC-HS
SLOPED UP

E — TO VENT STACK SHEET 5

THE DISTANCE FROM THE HYPO GENERATOR OUTLET TO THE VENT STACK SHOULD BE LESS OR EQUAL TO 50 FEET. FOR DISTANCES HIGHER THAN 50 FEET, PLEASE CONTACT DNWT FOR CONFIRMATION.

1" FLEX HOSE

*** BV-110 — LMS 110

HD 100 ***

LS 100

GT-101

BV-105 1/2" SAMPLE/DRAIN

CV-101 1/2"

TSH 100

EC-100 ELECTROLYTIC CELL 13

DC CABLES SUPPLIED BY DNWT

RCT-100 RECTIFIER
XXVDC, XXXA
AIR FLOW 660 CFM
HEAT DISSIPATION XXXX BTUH
***

13 ** AIR AND OIL COOLED RECTIFIER ARE AVAILABLE

**** SWITCH MODE POWER SUPPLY ARE AVAILABLE

DISCONNECT SWITCH (BY OTHERS)

480VAC, 3ø, 60Hz, XX FLA 13
(CUSTOMER PROVIDED)

RACK BOUNDRY

JB-100 JUNCTION BOX TERMINATION

GT-100 — 3/4" — 3/4" — BV-102 3/4" — CV-100 1/2"

BV-104 1" — BV-103 1/2"

FS 101

1" DRAIN

BP-100 BELLOWS PUMP 13

FIT 100B — TIT 100B — FM-100B 13 — NV-101 1/2"

FIT 100A — TIT 100A — FM-100A 13 — NV-100 1/2"

SV 100 — 3/4"-PVC

PI 101 — BV-108 — 3/4" — PRV-101 *** — 3/4" — FIL-101 ***

BV-107 3/4"

FROM SHEET 3
A — FROM BRINE TANK — 3/4" — FIL-100 *** — BV-100 1/2" — 3/8" — 3/8"

D — ACID SUPPLY LINE — BV-101 3/8" 1/2"

ECR-100 RACK ASSEMBLY 13
***

FROM SHEET 3
B — SOFT WATER SUPPLY — 3/4" PVC-SW

BV-502 — BV-500 3/4" — BV-501 3/4" — CV-500 — WC-400 WATER CHILLER 14 (OPTIONAL)

BV-505 — BV-503 3/4" — BV-504 3/4" — CV-501 — WH-400 WATER HEATER 14 (OPTIONAL)

120 VAC, 1Ø, 60HZ
(CUSTOMER PROVIDED)
VOLTAGE & PHASE WILL DEPEND ON THE WATER CHILLER & HEATER CAPACITY.

120 VAC, 1Ø, 60HZ
(CUSTOMER PROVIDED)
VOLTAGE & PHASE WILL DEPEND ON THE WATER CHILLER & HEATER CAPACITY.

DEPEND ON SUPPLIED WATER TEMPERATURE

13 MAJOR EQUIPMENT SPECIFICATION TABLE

	NUMBER OF CELLS	EC-100 NOMINAL CAPACITY (EACH)	BP-100 BRINE FLOW RATE	FM-100A WATER FLOW RATE	FM-100B WATER FLOW RATE	RCT-100 RECTIFIER RATING	RECTIFIER FULL LOAD AMPS	RECTIFIER HEAT DISSIPATION
CLORTEC 75-C	1	75 LBS/DAY	0.06 GPM (0.23 LPM)	0.36 GPM (1.36 LPM)	0.36 GPM (1.36 LPM)	28VDC, 300A	13	3,828 BTUH
CLORTEC 100-C	1	100 LBS/DAY	0.07 GPM (0.27 LPM)	0.48 GPM (1.82 LPM)	0.48 GPM (1.82 LPM)	37VDC, 300A	17	4,338 BTUH

14 HEATER AND CHILLER SELECTION TABLE

	CLORTEC 75-C		CLORTEC-100C	
ΔT	HEATER	CHILLER	HEATER	CHILLER
	KW	TON	KW	TON
5° F	0.5	0.2	0.7	0.2
10° F	1.1	0.4	1.4	0.5
15° F	1.6	0.5	2.1	0.7
20° F	2.1	0.7	2.8	1.0
25° F	2.6	0.9	3.5	1.2
30° F	3.2	1.1	4.2	1.4

NOMINAL PIPE SIZE TO METRIC CONVERSION CHART

PIPE SIZE (INCHES)	DN (MILLIMETERS)
1/4"	8
3/8"	10
1/2"	15
3/4"	20
1"	25
1 1/2"	40
2"	50
2 1/2"	65
3"	80
4"	100
5"	125
6"	150
8"	200
10"	250
12"	300

CHILLER CALC:

$$TONS = \frac{\frac{GAL}{HR} \times 8.33 \times \Delta T}{12000} \times 1.2$$

HEATER CALC:

$$KW = \frac{GAL}{MIN} \times \Delta T \times 0.1465$$

NOTE FOR CHILLER SIZING & SELECTION CONSIDERATION:

AFTER CALCULATING THE CHILLER CAPACITY BASED ON THE FORMULA, ACCOUNT FOR AMBIENT TEMPERATURE AND CHILLER ELECTRICAL POWER FREQUENCY BASED ON THE LOCATION AS INDICATED BELOW.

A) CHILLER CAPACITY IS NOMINALLY RATED AT 10 °C (50°F) LEAVING GLYCOL TEMPERATURE AND 35°C (95°F) AMBIENT AIR. THE CAPACITY IS REDUCED BY APPROXIMATELY 3% FOR EVERY 2.78°C (5°F) THE AMBIENT AIR TEMPERATURE IS INCREASED. Ex.: IF THE DESIGN AMBIENT TEMPERATURE IS 52°C (125.6°F), THE CHILLER CAPACITY SHALL BE REDUCED BY [(52°C − 35°C) x 3%] / 2.777 °C = 18.36%.

B) THE CHILLER CAPACITY SHALL BE REDUCED BY 17% WHEN OPERATED AT 50 Hz.

***
ONLY EQUIPMENT MARKED WITH STARS AND WITHIN DASHED BOXES ARE PROVIDED BY DNWT.

DE NORA
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UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN INCHES [MM] = REFERENCE

FRACTIONS	± 1/16"	±1.5mm
.X	± .1"	±2.5mm
.XX	± .01"	±0.51mm
.XXX	± .005"	±0.127mm
ANGLES	± 1°	

CLORTEC

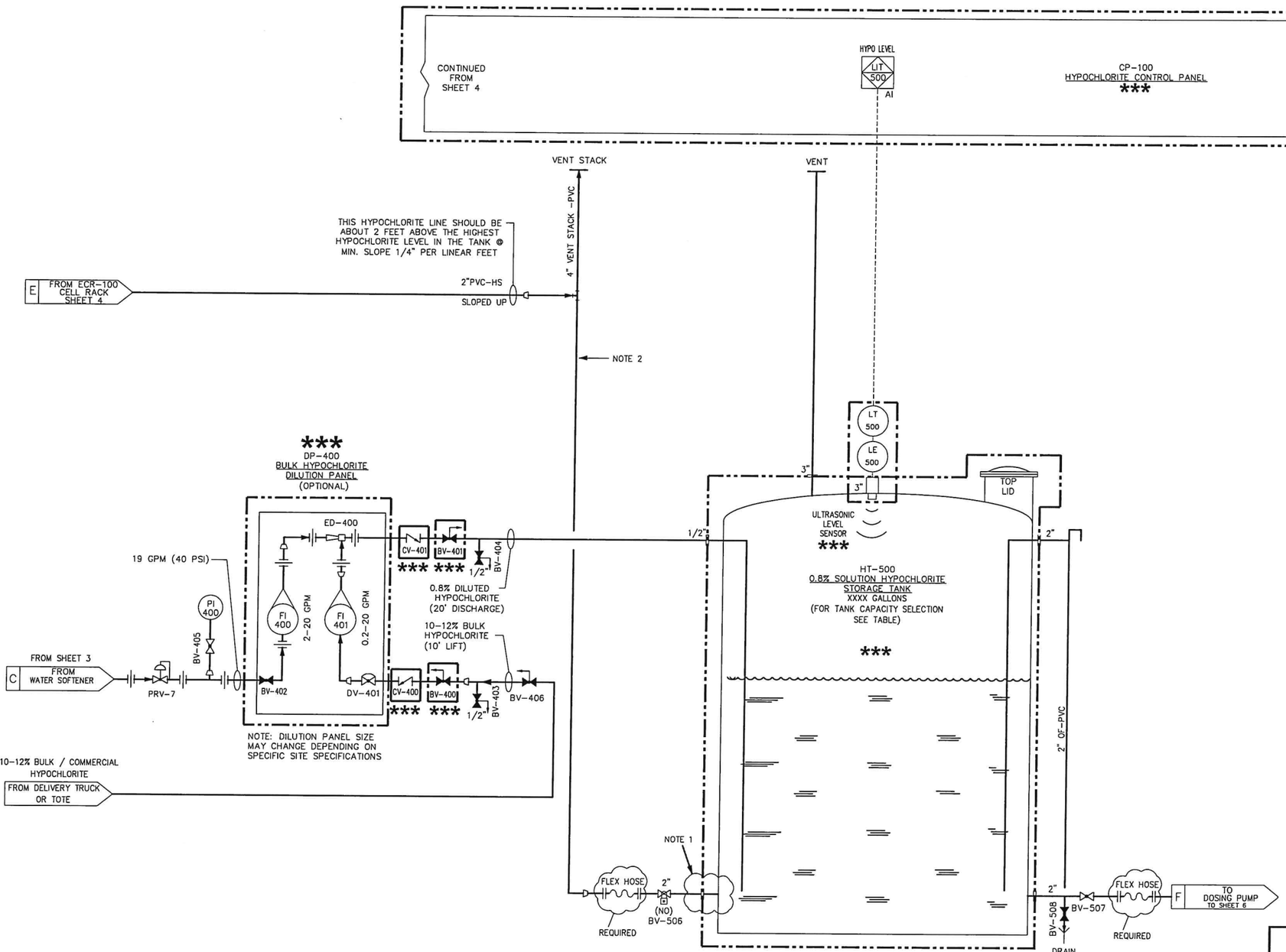
CLORTEC 75-C/100-C (75/100 LBS/DAY)
RACK MOUNTED ON-SITE SODIUM HYPOCHLORITE GENERATION SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

CLORTEC GEN III

SCALE:	DNWT PROJECT No:	SIZE:	REV:
NTS	STANDARD	D	0

DNWT DWG No: CT0075-0100RA1G3-CPBP-120-I-01-B

SHEET: 4 of -



HYPO TANK SIZING/SELECTION TABLE

	DAYS OF STORAGE TANK			
	0.5		1	
	HYPO TANK CAPACITY			
PPD	GALLON	M^3	GALLON	M^3
75	563	2.1	1,125	4.3
100	750	2.8	1,500	5.7
150	1,125	4.3	2,250	8.5
200	1,500	5.7	3,000	11.4
225	1,688	6.4	3,375	12.8
300	2,250	8.5	4,500	17.0

NOMINAL PIPE SIZE TO METRIC CONVERSION CHART	
PIPE SIZE (INCHES)	DN (MILLIMETERS)
1/4"	8
3/8"	10
1/2"	15
3/4"	20
1"	25
1 1/2"	40
2"	50
2 1/2"	65
3"	80
4"	100
5"	125
6"	150
8"	200
10"	250
12"	300

NOTES:

1. FILL LINE CAN BE LOCATED AT THE BOTTOM OF THE TANK OR ON THE TOP OF TANK. IF INSTALLED ON THE TOP OF THE HYPO TANK A DOWNTUBE MUST BE INSTALLED INSIDE THE HYPO TANK.
2. KEEP THE VENT STACK AS CLOSE AS POSSIBLE TO THE HYPOCHLORITE GENERATOR ECR-100 TO ALLOW HYDROGEN TO VENT OUT OF THE SYSTEM AS QUICKLY AS POSSIBLE. FOR SPECIAL BUILDING CONFIGURATION, PLEASE CONTACT FACTORY

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.XXX	± .005"	±0.127mm
ANGLES	± 1°	

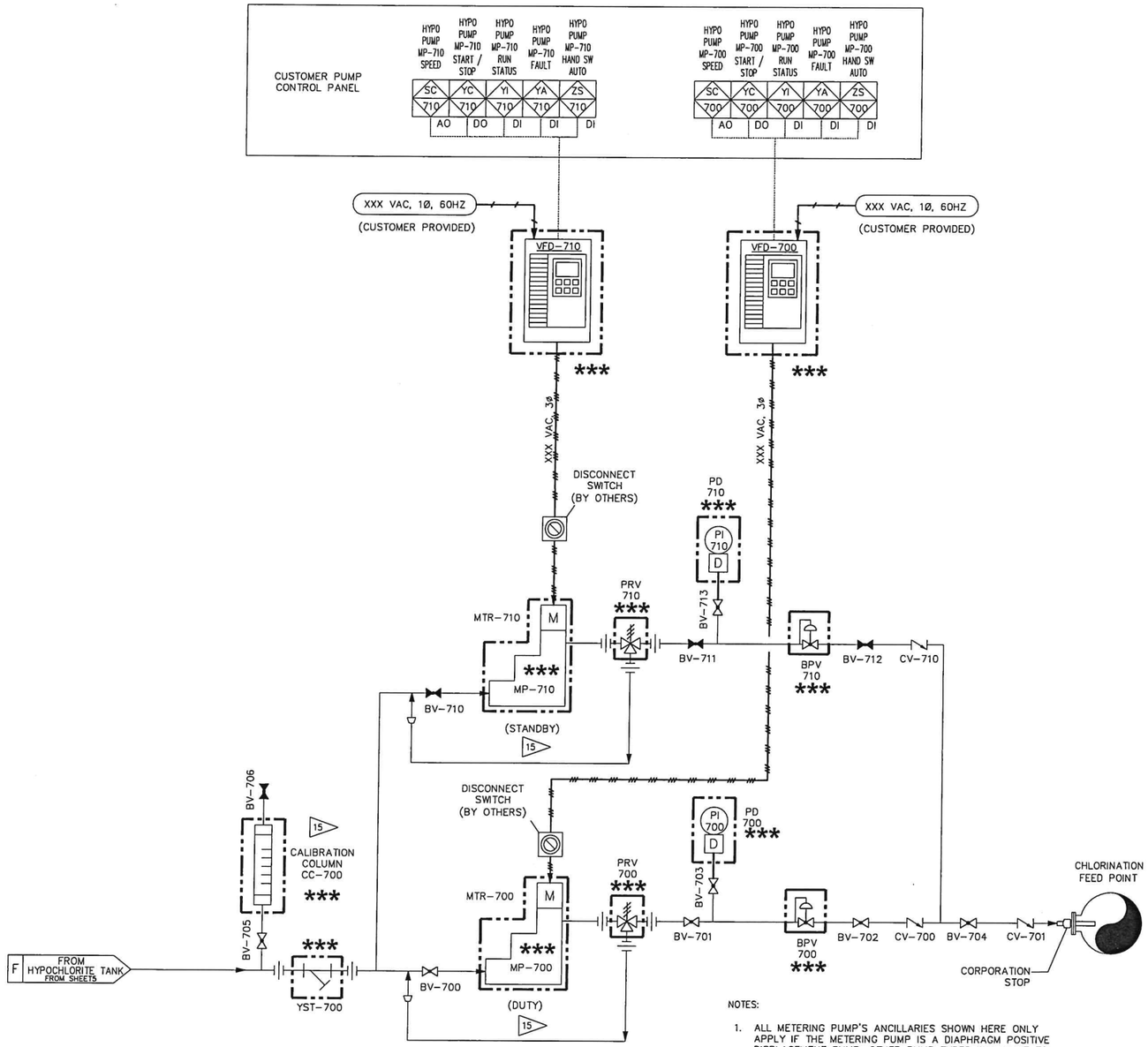
CLORTEC

CLORTEC 75-C/100-C (75/100 LBS/DAY) RACK MOUNTED ON-SITE SODIUM HYPOCHLORITE GENERATION SYSTEM PIPING & INSTRUMENTATION DIAGRAM

CLORTEC GEN III

SCALE:	DNWT PROJECT No:	SIZE:	REV:
NTS	STANDARD	D	0

DNWT DWG No: CT0075-0100RA1G3-CPBP-120-I-01-B



METERING PUMPS

$$\text{PUMP SIZING} : \frac{\text{MGDx8.34xPPM(CHLORINE DOSE)x4993.3}}{8000\ \text{PPM}} = \text{GPH}$$

15

PUMP CAPACITY TABLE

	PUMP CAPACITY (GPH) MINIMUM	MIN. CALIBRATION COLUMN VOLUME (mL) BASED ON 30 SECOND DRAW
CLORTEC 75-C	47	1483
CLORTEC 100-C	63	1987

NOTES:

1. ALL METERING PUMP'S ANCILLARIES SHOWN HERE ONLY APPLY IF THE METERING PUMP IS A DIAPHRAGM POSITIVE DISPLACEMENT PUMP. OTHER PUMP TYPES WILL HAVE TO BE EVALUATED ON CASE BY CASE BASIS TO DETERMINE THE NECESSARY ANCILLARY COMPONENTS.
2. THE DUTY / STAND BY PUMP CONFIGURATION SHOWN HERE ONLY APPLIES IF REQUESTED PER CLIENT SPECIFICATIONS.
3. ADD MANUFACTURERS RECOMMENDED ALLOWANCE FACTOR FOR PUMP CAPACITY.

NOMINAL PIPE SIZE TO METRIC CONVERSION CHART

PIPE SIZE (INCHES)	DN (MILLIMETERS)
1/4"	8
3/8"	10
1/2"	15
3/4"	20
1"	25
1 1/2"	40
2"	50
2 1/2"	65
3"	80
4"	100
5"	125
6"	150
8"	200
10"	250
12"	300

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ANGLES ± 1°

CLORTEC

CLORTEC 75-C/100-C (75/100 LBS/DAY)
RACK MOUNTED ON-SITE SODIUM
SYSTEM W/SMALL BRINE TANK
PIPING & INSTRUMENTATION DIAGRAM

CLORTEC GEN III

SCALE:	DNWT PROJECT No:	SIZE:	REV:
NTS	STANDARD	D	0

DNWT DWG No: CT0075-0100RA1G3-CPBP-120-I-01-B

SHEET: 6 of 6