

INSTRUMENTATION

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

	PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILLIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	AUXILLIARY LOCATION NOT NORMALLY ACCESSIBLE TO OPERATOR
INDEPENDENT INSTRUMENTS				
COMPUTER FUNCTION				
PROGRAMMABLE LOGIC CONTROL				

INTERLOCK

LINE SYMBOLS

ACTUATORS

DIAPHRAGM TYPE ACTUATOR

PISTON TYPE ACTUATOR

TYPICAL ON-OFF VALVE DETAIL

FLOW METERS

FLOW METER DESIGNATION
C CORIOLIS
V VORTEX
M MAGNETIC
O ORIFICE
T THERMAL

ROTAMETER

PRV PRESSURE REGULATING VALVE

EXTERNAL PRESSURE TAP

BACKPRESSURE REGULATOR
EXTERNAL PRESSURE TAP

SELF CONTAINED REGULATOR

BACKPRESSURE REGULATOR
SELF CONTAINED

PSV PRESSURE SAFETY VALVE

ANGLE VALVE

PRESSURE AND VACUUM
RELIEF

INSTRUMENTATION NUMBERING

EXAMPLE: FE - 1201 - 01

INSTRUMENT
ABBREVIATION

EQUIPMENT
NUMBER

NUMBER

SPECIALTY ITEMS

SPECIALTY ITEM CODE
P&ID NUMBER
SEQUENTIAL NUMBER

SPB-2100-01

SPECIALTY ITEM DESIGNATION

BFP BACKFLOW PREVENTER	SC STEAM COIL
CC CALIBRATION CYLINDER	SG SIGHT GLASS
CHT CHUTE	SM SEPTUM PORT
CP CHARGE PORT (YEAST)	SP DIP TUBE
EJ EXPANSION JOINT	SPB SPRAY BALL
FL FILTER	SQ INJECTION QUILL
FH FLEXIBLE HOSE	SS SAFETY SHOWER/EYE WASH
HC HOSE CONNECTOR	SSP SAMPLE DEVICE
LS LOAD SCALE	STR STRAINER
MSC SCREEN	T1,T2 STEAM TRAP
SAM SAMPLE PORT/HATCH	VM VALVE MANIFOLD

INSTRUMENTATION ABBREVIATIONS

PROCESS VARIABLE	ALARM HIGH	ALARM LOW	ELEMENT	INDICATOR	INDICATOR CNTRLR	RECORDER	SWITCH	TRANS-MITTER	VALVE	TRANS-DUCER CNVRTR	ORIFICE	SAFETY VALVE	DIFF	CNTRLR	REDUCING VALVE	SWITCH H L
ANALYSIS	A	AL	E	I	C	R	S	T	V	Y	O	SV				
CONDUCTIVITY	CAH	CAL	CE	CI	CIC	CR	CS	AT	AV	AY						
CURRENT	IAH	IAL		II	IIC	IR		IT	IV	IY						
DENSITY	DAH	DAL	DE	DI	DIC	DR	DS	DT	DV	DY						
FLOW	FAH	FAL	FE	FI	FIC	FR	FS	FT	FV	FY	FO					
HAND	L	LAL		LI	LIC	LR	LS	LT	LV	LY				HC		
LEVEL	LAH	LAL					MS									
MOTION	MAH	MAL					MS									
ON/OFF	X						XS		XV							
POSITION	Z	ZA	XE	XI	XIC		XS	ZT								
PRESSURE	PAH	PAL	PE	PI	PIC	PR	PS	PT	PV	PY		PSV	PD	PC	PRV	PSH PSL
SPEED	SAH	SAL	SE	SI	SIC		SS	ST	SV							
TEMPERATURE	TAH	TAL	TE	TI	TIC	TR	TS	TT	TV	TY		TSV	TD			
TIME	K						KS		KV							
VIBRATION	VAH	VAL					VS									
WEIGHT	WAH	WAL	WE	WI	WIC	WR	WS	WT		WY						
USER'S CHOICE	R															

VALVES

VALVE NUMBERING SYSTEM

CLASS

01-IRON AND BRONZE

02-150# CS

03-300# CS

04-600# CS

11-150# DIAPHRAGM

23-150# TEFLOL LINED

41-150# 316 SS

47-300# 316 SS

48-600# 316 SS

99-SPECIAL

END CONNECTION

C-SANITARY CLAMP

F-FLANGED

G-GROOVED END

I-WAFER INSERT

L-LUG BODY INSERT

S-SCREWED

W-WELDED (SW/BW)

X-MIXED ENDS

VALVE SPEC ID NUM

0-STANDARD

1-SPEC CHANGE BY TYPE

VALVE TYPE

A - ANGLE

B - GLOBE

C - CHECK

D - DIAPHRAGM

F - BUTTERFLY

G - GATE

K - KNIFE GATE

N - NEEDLE

P - PLUG

V - BALL

BODY

1-CAST

2-FORGED

3-MACHINED

4-FABRICATED

VALVE ABBREVIATIONS

CWO	CHAIN WHEEL OPERATED
FC	FAIL CLOSED
FL	FAIL LAST
FO	FAIL OPEN
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
LPD	LOW POINT DRAIN
HPV	HIGH POINT VENT
FWE	FURNISHED WITH EQUIP

EQUIPMENT

EQUIPMENT NUMBERING

EQUIPMENT DESIGNATION

TF - 2201 A

AREA NUMBER

SUB-AREA NUMBER

OPTIONAL UNIT IDENTIFIER
(FOR MULTIPLE UNITS)

SEQUENCE NUMBER

EQUIPMENT INSULATION

INDICATES INSULATION
REQUIRED PER SPECIFICATION

EQUIPMENT DESIGNATION

AC	AIR COMPRESSOR	HP	HEAT EXCHANGER, PLATE & FRAME
AG	AGITATOR	HS	HEAT EXCHANGER, SHELL & TUBE
BH	BAG HOUSE	M	MOTOR, ELECTRIC
BL	BLOWER	MI	MILL, HAMMER, ROLLER, ETC.
BN	BIN/HOPPER/SILO	MS	MAGNETIC SEPARATOR
BO	BOILER	ME	MECHANICAL EQUIPMENT, MISC.
C	COLUMN (TRAY)	PK	PACKAGE UNIT
CB	CONVEYOR, BUCKET	PA	PUMP, AIR DRIVEN
CF	CENTRIFUGE	PC	PUMP, CENTRIFUGAL
CHR	CHILLER	PD	PUMP, DIAPHRAGM
CT	COOLING TOWER	PM	PUMP, METERING
CV	CONVEYOR, MECHANICAL OR PNEUMATIC	PP	PUMP, PROGRESSIVE CAVITY
CY	CYCLONE	PR	PUMP, POSITIVE DISPLACEMENT
DA	DEAERATOR	PT	PUMP, PERISTALTIC
DC	DUST COLLECTOR	PV	PUMP, VACUUM
DR	DRYER	RV	ROTARY VALVE
DS	DESICCANT DRYER	SC	COLUMN OR SCRUBBER (PACKED)
DV	DIVERTER VALVE	SM	STATIC MIXER
EJ	EJECTOR OR EDUCTOR	SN	SCREEN
FA	FAN	SV	SLIDE GATE VALVE
FE	FEEDER	TC	TANK, CONCRETE
FH	FIRED HEATER	TF	TANK, FIELD ERECTED
FL	FILTER, CARTRIDGE OR PRESSURE	TS	TANK, SHOP FABRICATED
FV	FILTER, VACUUM	VS	VESSEL
FB	FILTER, BELT	WS	WEIGH SCALE
FR	FLARE		

DRIP LEGS & LINE TRAPS

TO SAFE LOCATION

TO CONDENSATE HEADER

LINE NUMBERING SYSTEM

EXAMPLE: 6"-CHWS-1111-01-CS51- I (C)

NOM SIZE

SERVICE

PID NUM

SEQ NUM

INSULATION TYPE

INSULATION REQ

PIPE SPEC

LINE SERVICE DESIGNATIONS

ACID	GENERAL ACID	HYDS	HYDROLYSATE SLURRY
AF	AIR - FILTERED (STERILE)	LQOS	LIQUID SLURRY
AI	AIR - INSTRUMENT	LMS	LIME SLURRY (SLAKED)
AMH	AMMONIUM HYDROXIDE	NAOH	SODIUM HYDROXIDE (CAUSTIC), XX% SOL
AMS	AMMONIUM SULFATE SLURRY	NCWW	NON-CONTACT WASTE WATER
AMX	AQUEOUS AMMONIA	NUTR	NUTRIENT
ANTF	ANTIFOAM	PC	PROCESS CONDENSATE
AP	PLANT AIR - LESS THAN 120 PSIG	PHOC	PHOSPHORIC ACID-CONCNETRATED (85%)
BASE	GENERAL BASE	PHOD	PHOSPHORIC ACID - DILUTE (2%)
BEER	BEER (CIP/SIP CLEANED)	PROP	PROPAGATOR LIQUID (CIP CLEANED)
BMS	BIOMASS STILLAGE	PW	POTABLE WATER
CSS	C5 SLURRY	RCW	RECYCLED WATER
CELU	CELLULOSE	RW	RAW WATER
CH	CONDENSATE-HIGH PRESSURE-600 PSIG	SAC	SULFURIC ACID - 93%
CHWR	CHILLED WATER RETURN	SAD	SULFURIC ACID - XX% (DILUTE)
CHWS	CHILLED WATER SUPPLY	SFA	SULFAMIC ACID - XX%
CIPR	CLEAN IN PLACE RETURN	SH	STEAM - HIGH PRESSURE - 600 PSIG
CIPS	CLEAN IN PLACE SUPPLY	SL	STEAM - LOW PRESSURE - < 100 PSIG
CL	CONDENSATE-LOW PRESSURE-<100 PSIG	SM	STEAM - MED PRESSURE - 300 PSIG
CM	CONDENSATE-MED PRESSURE-300 PSIG	UVW	UV WATER
CO2	CARBON DIOXIDE (CIP CLEANED)	VT	VENT - SULFURIC ACID
CP	CONDENSATE - PUMPED	VTC	VENT - CORROSIVE
CWR	COOLING WATER RETURN	VTN	VENT - NON CORROSIVE
CWS	COOLING WATER SUPPLY	VTP	VENT - CIP CLEAN
DEN	DENATURANT (GASOLINE)	VTS	VENT - STEAM CLEAN
DGFS	DIGESTER FLASH STEAM	WSW	WASTE WATER
ETHD	ETHANOL > 50%		
ETDN	ETHANOL - DENATURED		
ETHW	ETHANOL < 50%		
FPW	FIRE PROTECTION WATER	C	COLD CONSERVATION
FW	FILTERED WATER	H	HEAT CONSERVATION
HW	HOT WATER	P	PERSONNEL PROTECTION

INSULATION TYPES

C	COLD CONSERVATION
H	HEAT CONSERVATION
P	PERSONNEL PROTECTION

EQUIPMENT & PIPING SYMBOLS

CENTRIFUGAL PUMP

PERISTALTIC PUMP

METERING PUMP

GEAR PUMP

PROGRESSIVE CAVITY PUMP

SUMP PUMP

FAN/BLOWER

VACUUM PUMP (ROOTS TYPE)

SHELL & TUBE HEAT EXCHANGER

DIAPHRAGM PUMP

AGITATOR

PLATE & FRAME HEAT EXCHANGER

FLEXIBLE CHUTE

ROTARY FEEDER

CALIBRATION COLUMN

UV STERILIZER DOUBLE PIPE

STATIC MIXER

FILTER

INJECTION QUILL

PAD FLANGE

BACK-WASHING FILTER

EDUCTOR

AIR SPARGER

SILENCER

EXPANSION JOINT

NOZZLE

BACKFLOW PREVENTER

SANITARY SAMPLE PORT

FLEXIBLE HOSE

FLAME ARRESTOR

AUTOMATIC DRAIN VALVE

SOLIDS SAMPLE PORT

SIGHT GLASS

DRAIN

PULSE DAMPENER

CONDENSATE TO SEWER

CONDENSATE RETURNED

TIE-IN SYMBOL

RUPTURE DISK

SPEC BREAK/BATTERY LIMIT

DIVERTER VALVE

CHEMICAL SEAL

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REV	DATE	BY	CK	APP	DESCRIPTION
3	06/18/15	WJS			
2	12/05/12	JT	TPK	DCG	ISSUED FOR RECORD
1	11/30/10	JT	TPK	DCG	UPDATED AS NOTED
0	07/30/10	KRS	TPK	DCG	ISSUED FOR CONSTRUCTION

PROJ: Y7275

SCALE: NONE

DATE: 01/13/10

BY: SM

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UNIVERSITY OF FLORIDA
BIOREFINERY PILOT PLANT

PROCESS & INSTRUMENTATION DIAGRAM
PROJECT LEGEND

PIL-PID-0001

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