BMS-100
BURNER MANAGEMENT SYSTEM
MFR: ACL
MODEL NO.: CSC 400
24 VDC
NOTE B

24 VDC POWER SUPPLY

BMS-100

SET @ 16 OZ
0.4 OZ VAC.

TH 100

LG 100

1/2"CL3000 NPT CPLG

1/2"CL3000 NPT CPLG

1/2" BR050

2"

LSLL 100

1-1/2"CL3000 NPT H.CPLG

TE SET @ 90°C

3/4"

4"

24" FIRETUBE AND STACK

PI 103

NM025

BF025G

BE 100

IGN / FFSD

3/4" NPT CPLG CL3000

SG 100

NOTE A & D VENT TO ATM.

3/8" 316SS TUBING 0.035"WT

H-100

TE 101

TW 101

1"CL3000 NPT F.CPLG

TI 100

TW 102

1"CL3000 NPT F.CPLG

1"CL3000 NPT F.CPLG

SC 100

UY 102

VH

3/8" 316 SS TUBING 0.035"WT

14.9 PSI MAX

PSLL 300

SET @ 4 PSI FALLING (28 kPa)

PSHH 300

SET @ 12 PSI RISING (83 kPa)

PI 300

NM025G

1/4"

PI 302

NM025G

1/4"

BF025G CSO

3/4" NPT

RANGE 5-20 PSI FIELD SET

ZSC ZSO

EY 300

SOV 300

PRV 300

VENT

TCV 300

VH

1"x1/4"

1"x1/4"

14.9 PSI MAX

1"

NOTE G

BF100G

SY100

BF100G

EY 301

PRV 301

PI 301

VENT O/S INDIVIDUALLY NOTE D

BF025G

1/4"x1"

NWP STOCK VALVE TRAIN - SEE DWG NWPL-00030

CSA B149.3 14.9 PSIG MAWP

ASME B31.3 MFS 130 PSIG MAWP

SC 101

3/8" TUBING 316SS 0.035"WT

B-100 ENCLOSURE LIMIT

1 1/2" H

REG. TEMP | LOW TEMP.

SK-100 SKID LIMIT

NWP CL900 | CLIENT CL900

COIL A
26 PASSES

4"-CL900 RF

4"-CL900 RF

4"-CL900 RF

INLET

4"-CL900 RF

OUTLET

ORIGINAL

FG-1"-X-160C-0705

FG-1"-X-160C-0701

2"CL3000 H. CPLG

BR200

1" NPT PIPE

1" NPT PIPE

FG-1"-W-80A-0704

3/8" 316 SS TUBING 0.035"WT

FG-1"-W-80A-0706

1"

1" CL3000

1"

PRV 100

VH

PI 100

SET @ 20 PSI (138 kPa)

NOTE 8

BR025

1/4"x1/2"

1"x1/2"

PRV 101

VH

PI 101

SET @ 80 PSI (552 kPa)

BR025

1/4"x1/2"

1/2"

1" CL3000 NPT FUEL GAS MAX INLET PRESSURE 1440PSI

B-100 ENCLOSURE LIMIT

PI 102

NM025

1"x1/4"

1"x1/4" RED. TEE

2"x1"

2"CL3000 NPT CPLG

HLSD 100

V-100

1"CL3000 NPT TOL

1"CL3000 NPT TOL

BR100

SET @ 130 PSIG (896 kPa) 'D' ORIFICE, 1"x1" SIZED FOR PRV-103 FAILURE

PSV 100

1" CL3000

14.9 PSI MAX

1" CL3000

SET @ 110 PSIG (758 kPa)

1" CL3000

3/4" NPT 14.9 PSI MAX

PRV 103

1" CL3000

1" CL3000

BR100

1"x1/4" RED. TEE

NM025

PI 104

SCH 80 | SCH 160

FG-1"-W-80A-0703

FG-1"-W-160A-0702

5 PLACES TYP 1/4"x2"

14.9 PSI MAX

NOTE A & D VENT TO ATM.

2"x1"

LPD

BR100

2" NPS VENT STACK

NOTE D & F VENT TO ATM.

NOTE A & D VENT TO ATM.

B-100 ENCLOSURE LIMIT

SK-100 SKID LIMIT

H-100
MFR: NWP INDUSTRIES LP
SIZE: 72"ø x 24' LG
DUTY: 3.0 MMBTU/HR

E-100
MFR: NWP INDUSTRIES LP
FOAM PANEL ENCLOSURE
SIZE: 24"D x 84"W x 80"H
1 1/2" GALVALUME/GALVALUME FOAM PANEL

V-100
MFR: LOTECH
SIZE: 8-5/8"O.D.x30"OAL
MAWP: 285 PSIG (1965 kPa) @ 650°F
MDMT: -20°F @ 285 PSIG
C.A. 3.2mm (1/8"), CRN: 0H12502.21345

COIL A
MFR: NWP INDUSTRIES LP
SIZE: 4" CL900 SCH XH
MAWP: 1557 PSIG (10735 kPa) @ 200°F
MDMT: -20°F @ 1557 PSIG
C.A. 3.2mm (1/8"), CRN: 9416.213

REV	DATE	BY	CHK	APP	DESCRIPTION
0	SEPT 20/23	LT	[illegible]	[illegible]	ISSUED FOR CONSTRUCTION

DRAWING REVISIONS

ISSUED FOR CONSTRUCTION

SIGNED:

DATE:

W.O.:

S/N:

ALL DIMENSIONS IN INCHES

NWP INDUSTRIES LP
P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

SCALE: N.T.S.

WEIGHT: (APPROX LBS)

NWP INDUSTRIES LP
LINEHEATER PACKAGE
3.0 MMBTU/HR 72"O.D. x 288" S/S

PIPING AND INSTRUMENTATION DIAGRAM

DWN:	CHK:	APP:
LT	[illegible]	[illegible]
DATE: SEPT 20/23	DATE: NOV 09 2023	DATE: NOV 09 2023

SHEET:	DWG:	REV:
1 OF 2	11604-001-P-000	0

COPYRIGHT © NWP 2012 THIS DRAWING IS PROPERTY OF NWP INDUSTRIES LP AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

LINE TYPE LEGEND

- MAJOR PROCESS LINE
- UTILITY LINE
- BUILDING LIMITS
- ENCLOSURE LIMITS
- ALTERNATE LIMITS
- CUST/VENDOR SUPPL. LIMITS
- HIDDEN LINE
- EQUIPMENT OUTLINE
- INSTRUMENT PNEUMATIC LINE
- PROCESS/UTILITY TUBING LINE
- INSTRUMENT CAPILLARY LINE
- ELECTRICAL DATALINK LINE
- ELECTRICAL CONNECTION LINE
- HYDRAULIC LINE
- MECHANICAL LINK LINE

INSULATION LEGEND

2.5" PP / 3" C — " THICKNESS, C=COLD, H=HOT, PP=PERSONEL PROTECTION

25H ET / 3"H GT — " THICKNESS c/w TRACING, ET=ELEC. TRACE, GT=GLYCOL TRACE, OT=OIL TRACE, ST=STEAM TRACE

VALVE SYMBOL LEGEND

- BALL VALVE
- SPRING RETURN BALL VALVE
- GLOBE VALVE
- GATE VALVE
- CHECK VALVE
- PLUG VALVE
- NEEDLE VALVE
- INLINE CHOKE VALVE
- 4-WAY VALVE
- 3-WAY VALVE
- BUTTERFLY VALVE
- BASKET/CONE STRAINER
- TEE STRAINER
- Y STRAINER
- RUPTURE DISC
- PRESSURE RELIEF VALVE
- ANGLE VALVE
- ANGLE CHOKE VALVE
- GAUGE VALVE
- BLOCK & BLEED NEEDLE VALVE
- XXXX — MULTIIPORT MANIFOLD

VALVE CONNECTION LEGEND

- THRD VALVE
- THRD/SW VALVE
- SW VALVE
- FLANGED VALVE

TOPWORKS SYMBOL LEGEND

- DIAPHRAGM ACTUATOR
- ACTUATOR WITH HANDWHEEL
- ACTUATOR WITH POSITIONER
- REGULATOR WITH HANDWHEEL
- BACK PRESS. REGULATOR
- PRESS. REDUCING REGULATOR
- PISTON ACTUATOR
- ACTUATOR WITH POSTIONER
- ROTARY PISTON ACTUATOR
- ROTARY MOTOR ACTUATOR
- SOLENOID

METERING

- METER RUN
- ORIFICE METER
- M — FLOW CONDITIONER
- VORTEX METER
- POSITIVE DISPLACEMENT METER
- TURBINE/PROPELLER METER
- MASS FLOW METER
- FLOW INDICATOR

MISC TAG SYMBOL LEGEND

- IG/1 — INSTR. GAS TO AND FROM
- IA/1 — INSTR. AIR TO AND FROM
- RTU — RTU
- I/P — I/P ELECTRO PNEUMATIC

MISC SYMBOLS LEGEND

- FLANGE / BLIND FLANGE
- BW CAP / THRD CAP
- UNION
- TOL/CPLG w/PLUG
- BREAK
- CONCENTRIC REDUCER
- CONCENTRIC SWAGE
- FOT FOT — ECC REDUCERS
- SKID EDGE SCARFED VENT
- FLEXIBLE HOSE
- CAMLOCK CONNECTION
- SPEC. BLIND-CLOSED/OPEN
- PIPE/TUBING FLOW ARROW
- SPEC/RESPONSIBILITY BREAK
- FLANGED NOZZLE
- MANWAY
- PANEL LOAD
- GROUND
- SKID DRAIN
- PIG BAR
- CONNECTION INDICATOR/ PAGE CONTINUATOR
- LIGHT
- SPEED CONTROL
- VH — SWITCHING VALVE (AMOT)
- CONSTRUCTION REVISIONS
- MUFFLER

ORIGINAL

GENERAL NOTES

1. SHOP INSTALL ADDITIONAL PIPE SUPPORTS WHERE REQ'D.
2. SHIP LOOSE ITEMS TO BE BOXED AND SEALED PRIOR TO SHIPMENT.
3. PLUG AND PROTECT ALL OUTLETS PRIOR TO SHIPMENT.
4. ROUTE PIPING TO ENSURE NO LIQUID TRAPS.
5. ALL PIPING MATERIAL TO BE STANDARD TEMP U.N.O.
6. HYDROTEST PROCESS PIPING TO 1.5 x M.A.W.P.
7. ALL PIPING AND PROCESS TUBING LINES TO BE TESTED PER ASME B31.3 NFS.
8. INSTRUMENT SUPPLY LINES TO BE TESTED PER ABSA AB-522 DIRECTIVE.
9. INSTALL 3/4" COUPLING 2 PIPE DIAMETERS UP FROM FIRETUBE CENTERLINE.

CUSTOMER NOTES

A. VENT TERMINATIONS MUST HAVE SCREENS AND POINT DOWNWARDS.
B. ACL DRIVERS MAY BE SUPPLIED FOR LOW WATTAGE APPLICATIONS.
C. ELECTRICAL BY NWP.
D. THE DISCHARGE OF VENT PIPING SHALL BE LOCATED MORE THAN 3FT FROM ANY BUILDING OPENING AND MORE THAN 10FT FROM ANY AIR INTAKE OR SOURCE OF IGNITION. EXTEND LINES AWAY FROM PERSONNEL AND BUILDING OPENINGS WITH SCREENS AND PROTECTED FROM WATER ENTRY.
E. THREADED PIPING C.A. 1/16"
F. INSTALL 1" YELLOW JACKET RAIN CAP.
G. BALL VALVE MUST BE WITHIN OPERATORS REACH AT FLAME ARRESTOR.

REV A

ABBREVIATIONS

ASSY – ASSEMBLY	HPV – HIGH POINT VENT	MISC. – MISCELLANOUS
ATM – ATMOSPHERE	HS – HYDRAULIC SUPPLY	PD – POSITIVE DISPLACEMENT
BBL – BARREL	HT – HEAT TRACE	P/I – PNEUMATIC TO CURRENT
BD – BLOWDOWN	IA – INSTRUMENT AIR	P/L – PIPELINE
BTU – BRITISH THERMAL UNITS	ID – INSIDE DIAMETER	PLC – PROGRAMMABLE LOGIC CONTR.
CC – CORROSION COUPON	IG – INSTRUMENT GAS	PO – PUMP OUT
CP – CORROSION PROBE	INJ. PT – INJECTION POINT	RF – RAISED FACE
CSC – CAR SEAL CLOSED	I/P – CURRENT TO PNEUMATIC	RO – RESTRICTION ORIFICE
CSO – CAR SEAL OPEN	I/S – INSIDE	RP – REDUCED PORT
c/w – COMPLETE WITH	LLL – LOW LIQUID LEVEL	RTJ – RING TYPE JOINT
DB&B – DOUBLE BLOCK & BLEED	LPD – LOW POINT DRAIN	RTU – REMOTE TRANSMITTING UNIT
ESD – EMERGENCY SHUTDOWN	LSD – LEGAL SUBDIVISION	SP – SAMPLE POINT
ET – ELECTRICAL TRACE	MAWP – MAX. ALLOW. WORK PRES.	s/c – SHOP COAT
FC – FAIL CLOSE	MDMT – MIN. DESIGN METAL TEMP.	SG – SPECIFIC GRAVITY
FFSD – FAIL CLOSE	MCC – MOTOR CONTROL CENTER	SS – STAINLESS STEEL
FO – FAIL OPEN	MISC. – MISCELLANOUS	S/S – SEAM TO SEAM
FRD – FLOAT RELEASE DEVICE	NC – NORMALLY CLOSED	TK – TANK
FP – FULL PORT	NLL – NORMAL LIQUID LEVEL	T/T – TANGENT TO TANGENT
GO – GEAR OPERATED	NO – NORMALLY OPEN	UNO – UNLESS NOTED OTHERWISE
GT – GLYCOL TRACE	NTS – NOT TO SCALE	VH – VENT HEADER
HC – HOSE CONNECTION	OD – OUTSIDE DIAMETER	ZSC – POSITION/LIMIT SWITCH CLOSE
HLL – HIGH LIQUID LEVEL	O/S – OUTSIDE	ZSO – POSITION/LIMIT SWITCH OPEN

REV A

TAG LEGEND

	LOCALLY MOUNTED	PRIMARY LOC. OR PANEL NORMALLY ACCESS. TO OPER.	AUXILIARY LOC. OR PANEL NORMALLY ACCESS TO OPER.	PRIMARY LOC. OR PANEL MOUNTED ON BACK OF PANEL	AUXILIARY LOC. OR PANEL MOUNTED ON BACK OF PANEL
DISCRETE	⊖	⊖	⊖	⊖	⊖
SHARED DISPLAY, SHARED CONTROL DISTRIBUTION, CONTROL VIDEO DISPLAY	⊖	⊖	⊖	⊖	⊖
COMPUTER FUNCTION, SOFTWARE FUCTION	⬡	⬡	⬡	⬡	⬡
PROGRAMMABLE LOGIC CONTROL	◇	◇	◇	◇	◇

INSTRUMENTATION IDENTIFICATION AS PER ANSI/ISA-5.1-2009

LETTER	FIRST LETTERS COLUMN 1 MEASURED/INITIATING VARIABLE	FIRST LETTERS COLUMN 2 VARIABLE MODIFIER	SUCCEEDING LETTERS COLUMN 3 READOUT/PASSIVE FUNCTION	SUCCEEDING LETTERS COLUMN 4 OUTPUT/ACTIVE FUNCTION	SUCCEEDING LETTERS COLUMN 5 FUNCTION MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	CLOSE
D	USER'S CHOICE	DIFFERENCE, DIFFERENTIAL			DEVIATION
E	VOLTAGE		SENSOR, PRIMARY ELEMENT		
F	FLOW, FLOW RATE	RATIO			
G	USER'S CHOICE		GLASS, GAUGE, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER		SCAN		
K	TIME, SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE				MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE, TOTALIZE	INTEGRATE, TOTALIZE		
R	RADIATION		RECORD		RUN
S	SPEED, FREQUENCY	SAFETY		SWITCH	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL, PROBE		
X	UNCLASSIFIED	X-AXIS	ACCESSORY DEVICES, UNCLASSSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, PRESENCE	Y-AXIS		AUXILIARY DEVICES	
Z	POSITION, DIMENSION	Z-AXIS, SAFETY INSTRUMENTED SYSTEM		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

REV A.1

VALVE TAGGING

XX XXX XX

- BALL VALVE (FULL PORT) – BF
- BALL VALVE (REG. PORT) – BR
- BUTTERFLY VALVE – BU
- CHECK VALVE (BALL) – CB
- CHECK VALVE (PISTON) – CP
- CHECK VALVE (SWING) – CS
- CHECK VALVE (WAFER) – CW
- GATE VALVE – GA
- GLOBE VALVE – GL
- STRAINER (BASKET) – SB
- STRAINER (T) – ST
- STRAINER (Y) – SY
- SWAGELOK – SW
- NEEDLE VALVE (FEMALE x FEMALE) – NF
- NEEDLE VALVE (MALE x FEMALE) – NM
- MANIFOLD – MF

- 025 – 1/4"
- 038 – 3/8"
- 050 – 1/2"
- 075 – 3/4"
- 100 – 1"
- 200 – 2"
- 201 – 2" 150 ANSI
- 303 – 3" 300 ANSI
- 406 – 4" 600 ANSI
- 609 – 6" 900 ANSI
- 815 – 8" 1500 ANSI
- 1025 – 10" 2500 ANSI

- G – GAS SERVICE
- H – HIGH PRESSURE
- L – LOW TEMP.
- N – NACE
- Z – BOM CLARIFIER (1,2,...)

LINE TAGGING

XX–X"–X–XXXX–XXX

- DRAIN – D
- EMULSION – E
- FUEL GAS – FG
- GLYCOL – G
- HYDROCARBON – HC
- INSTRUMENT AIR/GAS – IA/IG
- PROCESS GAS – PG
- PRESSURE RELIEF – PR
- WATER – W
- VENT (ATMOS) – V

NOMINAL PIPE SIZE

- 150 ANSI – A
- 300 ANSI – B
- 600 ANSI – C
- 900 ANSI – D
- 1500 ANSI – E
- 2500 ANSI – F
- 2000# THRD/SW – T
- 3000# THRD/SW – W
- 6000# THRD/SW – X

PIPE SCHEDULE

- 0100–0199 EMULSION
- 0200–0299 PROCESS GAS
- 0300–0399 HYDROCARBON
- 0400–0499 WATER
- 0500–0599 DRAIN
- 0600–0699 PROCESS FLUID
- 0700–0799 FUEL GAS
- 0800–0899 PRESSURE RELIEF
- 0900–0999 OTHER
- 1000–1099 VENT (NO TESTING)

- A – 316 SS TUBING w/ 316 SS FITTINGS
- B – 316 SS TUBING w/ CS FITTINGS
- C – NOT APPLICABLE

REV A.1

REV	DATE	BY	CHK	APP	DESCRIPTION
0	SEPT 20/23	LT	[illegible]	[illegible]	ISSUED FOR CONSTRUCTION

DRAWING REVISIONS

ISSUED FOR CONSTRUCTION

SIGNED: _____

DATE: _____

W.O.: _____

S/N: _____

ALL DIMENSIONS IN INCHES

NWP INDUSTRIES LP

P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

NWP INDUSTRIES LP
LINEHEATER PACKAGE
3.0 MMBTU/HR 72"O.D. x 288" S/S

PIPING AND INSTRUMENTATION DIAGRAM

DWN: LT	CHK: [illegible]	APP: [illegible]	
DATE: SEPT 20/23	DATE: NOV 0 9 2023	DATE: NOV 0 9 2023	
SCALE: N.T.S.	SHEET: 2 OF 2	DWG: 11604-001-P-000	REV: 0
WEIGHT: (APPROX. LBS)			

COPYRIGHT © NWP 2012 THIS DRAWING IS PROPERTY OF NWP INDUSTRIES LP AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.