NWP INDUSTRIES LP

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ORIGINAL

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Project Coordinator : Erin Slemko

Sales Rep : House Account

Quote Reference: N/A

Client: NWP Stock

Customer P.O.: N/A

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4.0 MM BTU Line Heater Package, Sour Service, New

GENERAL DESCRIPTION

Quantity	Description
1	**4.0 MM BTU Line Heater Package, Sour Service, New**

- (1) 6" Sch XH, 900# RF x 900# RF Single Process Coil, 18 Pass
- Skidded, Insulated with Instrument Enclosure
- W/ Instrumentation, Burner, Fire Tube, and Stack

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1.0 LINEHEATER BATH AND FIRETUBE

1.1 GENERAL DESCRIPTION

Tag #: H-100

- 72" OD x 36'-0" Long
- Horizontal Design
- Shell: 1/4" thick, A36 plate
- End Plates: 3/8" thick, A36 plate
- One 24" Sch 10, 0.250" wall, SA-53-ERW removable non code firetube, Flux Rate: 10,000 BTU/ft2, need 63 linew feet to achieve approximate BTU/Hr
- Rated at 4,000,000 BTU / Hr
- One 24" Ø x 0.250" wall removable fire tube stack
- 24" Ø x 132" Surge Tank c/w Thief Hatch (TH-100), Wenco, 16 oz pressure, 0.4 oz vacuum
- Two Support Saddles
- (1) 2" ANSI 150# RF Future Glycol Pump Supply
- (1) 2" ANSI 150# RF Future Glycol Return

2.0 COIL

One (1) 6" Sch XH, SA106-B, 18 pass Process coil with Class 900 RF flanged outer ends, 1575 PSIG @ -20° to 200° F, 100% Radiography, Post Weld Heat Treat, 1/8" C.A., constructed in accordance with ASME B31.3 Normal Fluid Service.
CRN: Alberta, British Columbia, Saskatchewan

Flanges and pipe which exit the heater shell will be of SA-333 Gr 6 SMLS and SA-350-LF2 CL 1 material ("low temp")

Heater is packaged in accordance with ASME Section VIII / B31.3

3.0 PIPING

- Fuel Gas Preheat Line – 1" Sch 160, SA-106-B, 6000# fittings
- Fuel Gas Thread Piping – 1" NPT Sch 80, SA-106-B, 3000# fittings
- Scrubber Drain – 1" NPT Sch 80 3000# fittings

4.0 INSTRUMENTATION

Tag #	Quantity	Description
BE 100	**(1)**	**Burner – ACL** -Flame Arrested Burner, -Model FA-2x38-FT-FB-H -4,000,000 BTU/HR (net) 1 piece aluminum construction to fit a 24" fire tube c/w -2x38" Flame Cell Element -(2) ACL M200 Mixer -(2) ACL V200 Venturi Barrel -ACL-ON2x20024-15P High Efficiency burner nozzle.

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BMS 100	**(1)**	**Burner Ignition Controller – ACL Model CSC400** ACL-CSC400-S - ACL CSC400 12/24 VDC Controller Silver Version includes Modbus Communication, Individual Shutdown Inputs, Three Thermocouple Inputs, Dual 4-20mA Inputs, Dual Burner Controls. Ignition Module not included. ACL-IGN400-PM ACL Ignition module-1 Try 12VDC, 5 sec trial for Ignition. Flame Signal Display. CAN/CSA C22.2 No. 60730-2-5-14 with wiring harness ACL-CSET Ignition cable set with connectors. 10' ignition and 10' ground wire sleeved in 6.5' non metallic flex
TE/TW 102	**(1)**	**ACL-DUALTYPE K-TC ACL** Dual type K thermocouple - 1/2" NPT - 8.5" insertion length with explosion proof head ACL-1" NPT TW ACL 1" Thermowell only - SS - 1" NPT - 8.5" insertion length
LG 100	**(1)**	**Level Gauge – Kenco** Rate/Indicator Gauge 22" OAL 1/2" NPT CONN'S. Rate & Height Indication, Pressure Rating: ATM
LSLL 100	**(1)**	**Level Switch – Kimray** Level Switch CEC2 2" NPT 2200 SLS SS6, M/O 316SS, 2000 PSI Max c/w 2" x 6" SS Float, STD Service
PI 200/201	**(2)**	**Pressure Gauge – Wika Model 233.53** Liquid Filled, Dual Scale 2-1/2" Face x 1/4" MNPT bottom mount end connection Stainless Steel Construction 0 to 200 PSIG
PI 106	**(1)**	**Pressure Gauge – Wika Model 233.53** Liquid Filled, Dual Scale 2-1/2" Face x 1/4" MNPT bottom mount end connection Stainless Steel Construction 0 to 30 PSIG
PI 107	**(1)**	**Pressure Gauge – Wika Model 233.53** Liquid Filled, Dual Scale 2-1/2" Face x 1/4" MNPT bottom mount end connection Stainless Steel Construction 0 to 15 PSIG
PRV/PI 100	**(1)**	**Pressure Regulator – Fisher** Model 67CFR Pressure Filter / Regulator,

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		1/4" NPT, 250 PSIG MAWP, 0-35 PSIG Spring, Std trim 0-60 PSI Pressure Indicator Set at 20 PSI
PRV/PI 101	**(1)**	**Pressure Regulator – Fisher** Model 67CFR Pressure Filter / Regulator, 1/4" NPT, 250 PSIG MAWP, 0-125 PSIG Spring, Std trim 0-160 PSI Pressure Indicator Set at 80 PSI
PSV 200	**(1)**	**Relief Valve – Mercer** Model 91-17D51V07E1-150 1" MNPT X 1" FNPT 'D' Orifice FKM seat, FKM/BUNA seals Gas Service Set @ 150 PSIG (1034 kPaG), 0 Back Pressure, 70 F
SC 100/101	**(2)**	**Speed Control Valve (OR EQUIVALENT)** SMC Model NAS4000-N02 ¼" NPT, ¼" Port Maximum Operating Pressure 150 PSI
TI 101	**(1)**	**Temperature Gauge – Trend** Model 33090A006G4 Temperature Gauge, 1/2" NPT Back Mount connection, 0-250PSI F dual scale 3" dial, 9" stem c/w 304 SS thermowell
TW 101	**(1)**	1/2" FNPT x 3/4" MNPT x 7.5" "U" dimension length 304SS thermowell
UY 102	**(1)**	**Solenoid Valve - ASCO Model EF8320G202-24** 3-Way, 1/4" NPT SS Body 24VDC Coil 130 psig Maximum Operating Pressure Differential CSA Approved Explosion Class 1 Div 1 11.6 Watts

5.0 VALVE TRAIN

Tag #	Quantity	Description
BF025G	**(4)**	**¼" Ball Valve, NEO 2500**, Two-Piece Full Bore, SS, 2000 PSI WOG, Lockable Handle CSA 3.16 Certified
BF100G	**(2)**	**1" Ball Valve, NEO 2500**, Two-Piece Full Bore, SS, 2000 PSI WOG, Lockable Handle CSA 3.16 Certified
NM025G	**(2)**	**Huber Magnum**, ¼" NPT Needle Valve 6000#, Model # MF25SS ¼" M x ¼" F STRAIGHT, 316SS BODY

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PI 104/105	**(2)**	**Pressure Gauges - Wika Model 233.53** 2-1/2" Dial, SS ¼" NPT, 0 - 30 PSI Liquid Filled/ Dual Scale Center Back Mount
PSHH 100	**(1)**	**High Fuel Pressure Shutdown Switch** CCS Dual Snap Model 6900GZE12 1/2" NPT, SS Construction, CSA Approved SET @ 11.25 PSI Rising Calibration Certificate Is Required
PSLL 100	**(1)**	**Low Fuel Pressure Shutdown Switch** CCS Dual Snap Model 6900GZE12 1/2" NPT, SS Construction, CSA Approved SET @ 4.5 PSI Falling Calibration Certificate Is Required
PRV 102	**(1)**	**Main Regulator - Fisher 627R** Maximum Inlet Pressure 250 PSI Outlet Pressure Range 5 to 20 PSI Spring Range 1" FNPT / Orifice Size ½" ¾" Tapped Bonnet Body Material: Ductile Iron Spring Case Material: Aluminum Nitrile Disk Set @ 9 PSI
PRV/PI 103	**(1)**	**Pilot Regulator – Fisher 67CFR** ¼" NPT Tapped-Bonnet Maximum Inlet Pressure 250 PSIG Outlet Pressure Range 0-35 PSIG c/w 0-60 PSI gauge Adjustable spring range, 5 micron filter Adjustable screw with closing cap Temperature Range: -20 to 180 Deg F
SDV-UY 100	**(1)**	**Fossil Main Gas Safety Valve**, Pneumatic Actuator Fossil Series 1" ESD 24 VDC Series 88-Explosion Proof Class 1 Div 1-Fail Closed Connection: 1" NPT CV: 34 Body Type: 3 Piece Design, Reduced Port Body Material: CF8M Ball and Trim: 316 S/S Seats: PTFE End Connection: NPT Actuator: Rack and Pinion Spring Return Actuator Min Air Pressure: 70 PSIG Actuator Max Air Pressure: 120 PSIG Limit Switch: 2 SPDT switches with Beacon Indicator, Hazardous Area Classified, Class 1, Div 1 Solenoid: ASCO EF8320G202 24 VDC (11.6 watts), Hazardous Area Classified, Class 1, Div 1 Approvals:

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CSA 6.5-2000/ANSI Z21.21 - Automatic Valves for Gas Appliances
CGA 3.9-M94 Automatic Safety Shut-Off Gas Valves
CSA C/I - Commercial/Industrial
API 607 4th Edition Firesafe
LIMIT SWITCH MUST HAVE CLASS 1 DIV 1 CLASSIFICATION

SY100	**(1)**	**Y STRAINER 1" - 3000 ALTA** Model YS 3000 1" NPT, Class 3000 Carbon Steel, 1/32 Perf NACE Compliant
TCV 100	**(1)**	**Fisher Pneumatic Temperature Control Valve** Fisher Model 119 1" NPT – 9/16" Port 5-35 PSI Range Cast Iron Body 150 PSI MAWP STD Service Fail Closed
UY 101	**(1)**	**ASCO 2-Way Solenoid** ¼" NPT Pilot Solenoid Model HV426716002 130 PSIG Maximum Operating Pressure Differential 1/4" NPT SST Body 24VDC Coil, CSA Approved Explosion Proof ANSI Z21.21 & CSA C/I 6.5 Certification 10.6 Watts

6.0 FUEL GAS SYSTEM

V-200	**(1)**	**Vertical Fuel Gas Scrubber** -8-5/8" OD X 30" 285 PSI c/w Alberta, British Columbia & Saskatchewan registration, -1" NPT inlet @ 90°, 2" NPT outlet, 1" NPT drain @ 90° -Note: Scrubber mounted inside enclosure
HLSD-200	**(1)**	**High level shut off** – PVC float construction

7.0 MANUAL VALVES (supplied by NWP)

BR025	**(2)**	Ball Valve Barstock **HAITIMA** 1/4" 2000 WOG Thrd A105 Body, RP, 304SS Ball & Stem, NACE MR0175, GF PTFE Seats & Packing
BR050	**(1)**	Ball Valve **Balon** 1/2" 3M CS RP 2 piece, BB 316 Trim Nylon Seat,NACE
BR100	**(3)**	Ball Valve **Balon** 1" 3M CS RP 2 piece, BB 316 Trim Nylon Seat, 14C1-9523 NACE
BR200	**(1)**	Ball Valve Barstock **HAITIMA** 2" 2000 WOG Thrd A105 Body, RP, 304SS Ball & Stem, NACE MR0175, GF PTFE Seats & Packing

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NM025	**(4)**	Needle Valve A/G 1/4" 6000 M X F Straight SS Body, 6000 PSI min. working pressure. H1VDS-22
CS100	**(1)**	Swing Check Valve **DHV**, 1-inch NPT 800# THD, A105N Body, Trim API 8, NACE, Model F6800T33

8.0 PACKAGE MATERIALS

Coils

Pipe:	SA-333-Gr6-SMLS / SA-106-B
Flanges:	SA-350-LF2-CL1
Fittings:	SA-234-WPB

Firetube SA-53-ERW Sch. 10, 0.250"

Threaded Piping

Pipe Fuel gas:	SA-106-B Sch. 80 SMLS / SA-333-Gr6-SMLS
Threaded Fittings:	SA-105-N / SA-350-LF2-CL1, 3000#

Fuel Gas Preheat Line

Pipe:	SA-106-B, Sch. 160
Fittings:	SA-105-N, 6000#, Socket weld

Tubing:	ASTM A269 / ASME SA213 316 SS – 0.035" / 0.049"
Fittings:	316 SS - Swagelok
Ferrules:	316 SS

9.0 TESTING / POST WELD HEAT TREAT (PWHT)

Hydro-Testing:	Coil:	Tested to 1.5 times MAWP
	Pressure Piping:	As per B31.3
Testing:	Firetube / Shell:	Pneumatic Air Test
	Instrumentation:	Subjected to an operational test to ensure proper functioning (excluding electrical)
	Instrument Supply Lines:	As per ABSA AB-522
	Process Tubing Lines:	As per B31.3
Radiography:	Coil:	100% Radiography
	Weld Piping:	N/A
	Firetube:	None
	Threaded Piping:	None
	Fuel Gas Piping:	None
PWHT:	Process Coil:	Yes
	Buttweld Weld Piping:	N/A
Ultrasonic Test:	Process Coil Return Bends:	None
Hardness Test:	None	
MPI Inspections:	Skid Lift Lugs:	100%

10.0 SKID / ENCLOSURE

SK-100	**(1)**	**Skid** 8' W x 33' L

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Main skid members 10" @ 26# / 10" @ 49# Wide Flange Beam
Four Lift Points

E-100	(1)	**Foam Panel Enclosure** 24" W x 84" L x 80" H 1-1/2" polyurethane foam panel (R12) Galvalume Interior / Galvalume Exterior (2) 8"x8" Adjustable Louvers One double foam panel door c/w whitcomb latch, barrel bolt, check chain and weather strip

11.0 PAINT

- SSPC-SP 6-63 Commercial Blast, DTM (Direct to Metal) Polyurethane Enamel 2 - 3 mils DFT
- Bath, Skid, Piping, Pipe Supports: Warm Grey
- Fire tube Stack: High Heat Black.

12.0 INSULATION

- Heater shell, no ends, is insulated with 1-1/2" Fiber Glass (Microflex) Insulation with 0.020 stucco embossed aluminum outer cladding held with stainless steel banding. Expansion tank not insulated.

13.0 ELECTRICAL

- Wire of ACL Burner Management System to skid edge junction box.
  All wiring Class 1, Div. 1

14.0 PROGRESS PAYMENTS

The following Progress Payment Schedule shall apply to this order:

- N/A

15.0 DOCUMENTATION

- One Equipment Manual (Documents per Document Index) on USB is supplied (shipped with unit). An electronic file sharing link containing the Equipment Manual (Documents per Document Index) will be emailed to the required recipients. **Hard copies are available at $500 per copy. Extra USBs are available at $50 per USB.**
- P&ID, skid and general arrangement drawings (with one revision) are included. Extra charges apply for additional changes and revisions at $95.00 per hour.
- Documentation as per NWP Standard Document Index

16.0 ADDITIONAL NOTES

- No choke or coil tie in piping has been allowed for.

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- Packages will be dismantled only to the extent required for shipping.
- All instrumentation has been quoted for sweet fuel gas.
- Unit tagged with Asset Tags – pricing extra based on quantity of tags.
- Heater Stack to be shipped loose with unit.
- No Process Performance Guarantee is included or should be inferred.
- NWP reviews all specifications provided to us. NWP, however, cannot accept responsibility for any omissions made in our quotations which are not in compliance. We require that customers review the quotation for compliance to their specifications and request a revision for any errors / omissions which may have been made.
- Engineering review is not done at time of quotation. If material and / or specifications change due to engineering review, price adjustment will apply.

17.0 DELIVERY

N/A

18.0 3RD PARTY INSPECTION INFORMATION

N/A

19.0 SHIP LOOSE MATERIALS

- Smoke stack c/w gasket and bolt up
- (1) 2" Vent header extension
- (2) ¾" Vent line extension for PRV-102
- (1) 1" Vent line extension for PSV-200 c/w yellow jacket rain cap
- 1" Burner line c/w pilot tubing c/w manual valves and pressure gauges
- (1) 3/8" Vent line extension for Pilot Regulator PRV-103