



INSPECTION SURVEY



COVER LETTER

AFTERMARKET PARTS
& GLOBAL SERVICES

CONTACT ZEECO

VISIT [ZEECO.COM](https://www.zeeco.com)



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Fax: +1 918 251 5519
sales@zeeco.com
www.zeeco.com

March 23, 2022

Refining Co.
322 Maple St
Mayberry, USA

Attn: Will Billiams

Dear: Mr. Billiams

I would like to thank you for allowing the Zeeco Inc Team the opportunity to conduct the combustion survey in your facility. Your assistance was extremely appreciated.

This Combustion Survey Manual has been compiled from the information taken while surveying the Plant 1 facility. The survey manual is divided into the following sections:

Section I: Survey Burner and Heater Drawing Index

Section II: Survey Summary Profile Index

Section III: Spare Parts Index

Section IV: Technical Literature

Should you have any questions as you review the following information, please contact me at 918-893-8154 and for questions regarding technical support or quote assistance.

Sincerely,

Greg Kelch
Senior Combustion Survey Engineer: Aftermarket Parts and Engineered Solutions Division
Greg_Kelch@zeeco.com

REPLACEMENT PARTS & ENGINEERED BURNER SOLUTIONS



BURNERS | FLARES | THERMAL OXIDIZERS | VAPOR CONTROL | RENTALS | AFTERMARKET

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Zeeco is a world leader in aftermarket combustion products. Regardless of whether your equipment was manufactured by Zeeco or another combustion equipment supplier – we can restore, or improve, the safety, efficiency, functionality, and environmental performance of your equipment. Plus, we guarantee cost savings of 30% or more on replacement parts for other manufacturers' equipment. Choose the trusted partner in aftermarket parts. Go Zeeco.

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100% guarantee of renewed or improved burner performance
money-back guarantee if you are not satisfied

Zeeco can provide replacement parts for any OEM's^[1] combustion equipment, including:

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- HAMWORTHY®
- UOP CALLIDUS®
- NAO®
- COEN®
- TODD®
- PEABODY®
- FORNEY®
- SELAS®
- FIVES (PILLARD®)

Our experts understand the complexities of your system, not just the replacement parts. If you need custom components made specifically for your project, Zeeco can engineer a solution to fit seamlessly into your burner system and have it operating like new, or better.

Trust the industry leader with your replacement parts needs and see how Zeeco's combustion engineers and burner experts deliver on solutions that our competitors can't.

Call **+1 918 893 7796** or email aftermarket_inquiry@zeeco.com for more information.

Request a quote by visiting zeeco.com/parts-inquiry and receive a response within 24 hours.

Burner Spare Parts



Gas Tips / Cones / Diffusers



Competitor Part



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Competitor Part



ZEECO Replacement



Competitor Part



ZEECO Replacement



Competitor Part



ZEECO Replacement



Competitor Part



ZEECO Replacement

Burner Tiles



Pilots & Pilot Components



Premix Burner Components



Radiant Wall Burner Components



Oil Burner Components

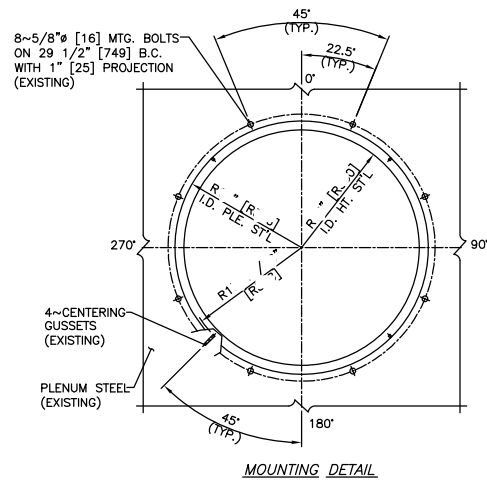
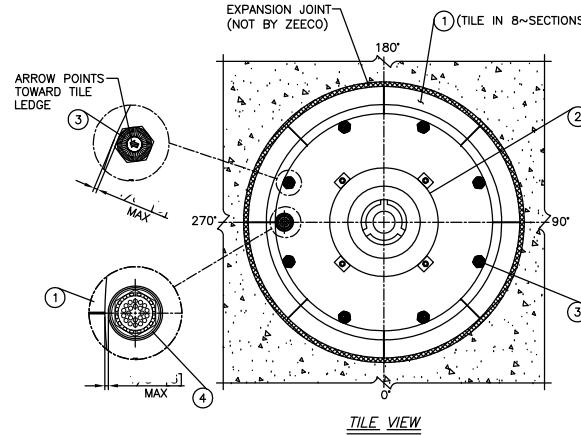
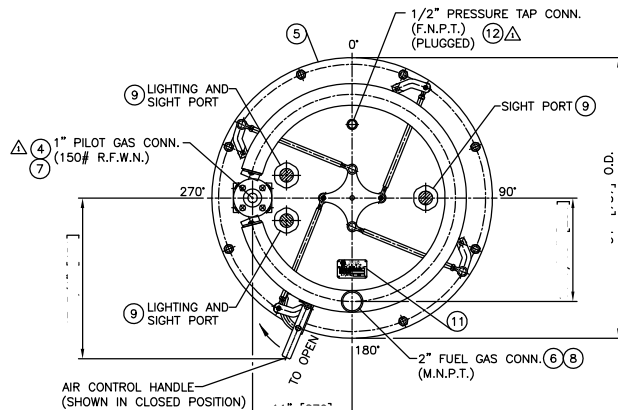
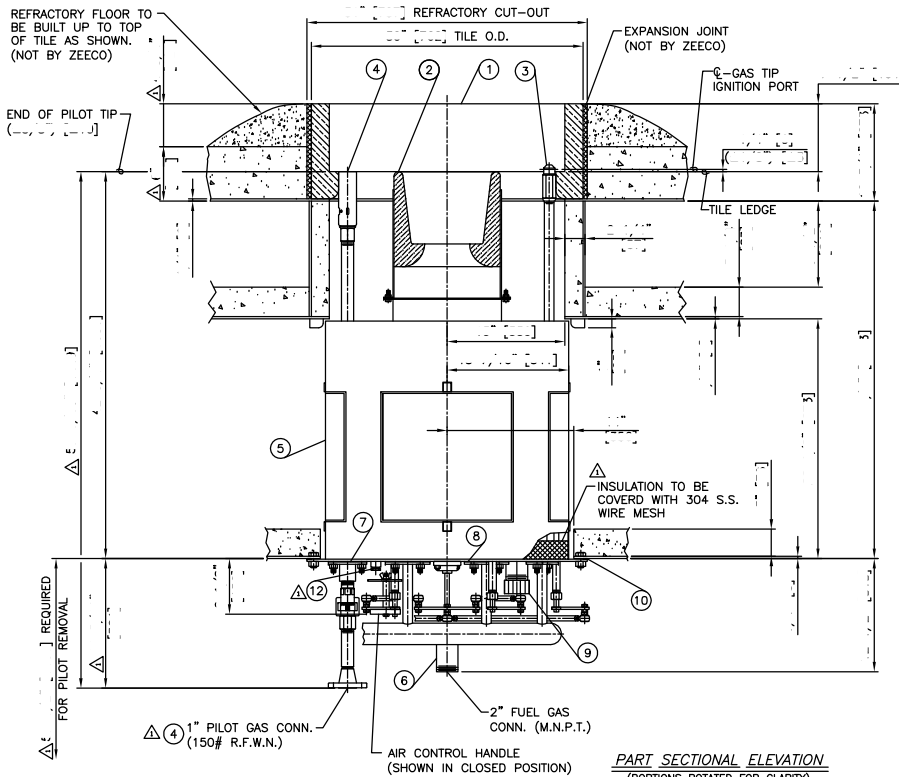


Sight Ports / Covers



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MANUFACTURING TOLERANCE
AND INSTALLATION LEGEND
GEN. FABRICATION DIM: $\pm 1/8$ " (3mm)
PIPING CONN. DIM: $\pm 1/2$ " (13mm)
BOLTING DIM: $\pm 1/8$ " (3mm)
TILE DIM: $\pm 1/8$ " (3mm)
FUEL PORT ANGLE: $\pm 2^\circ$
GAS CONNECTIONS DESIGNED
FOR ZERO LOADING

— PARTS LIST —

ITEM	QTY	DESCRIPTION	PART NO.	MATERIAL
1	1	AC-240 BURNER TILE SET	DA-718	THERMBOND 6BL
2	1	OIL TILE ASSEMBLY (12-14-40)	JA-215	THERMBOND 6BL
3	8	GAS TIP (AK-2 3/4)	EA-966	A-297 HK
4	1	JM-1S PILOT ASSEMBLY	UB-1658	A-297 HK
5	1	FRONT PLATE AND REGISTER ASSEMBLY	JE-6127	A-36/304 SS
6	1	FUEL GAS MANIFOLD ASSEMBLY	JE-6128	304 SS
7	1	PILOT MOUNTING PLATE GASKET	AA-867	GSK. MAT'L
8	8	RISER MOUNTING PLATE GASKET	AA-868	GSK. MAT'L
9	3	2" LIGHTING/SIGHT GLASS ASSEMBLY	XA-001	A-732/QUARTZ
10	1	TUBING GASKET (8 FT. LG)		1/2" O.D. FIBERGLASS
11	1	BURNER NAME PLATE	AA-496	S.S.
12	1	HEX HEAD PIPE PLUG	1/2" N.P.T.	A-105

REFERENCE DRAWINGS : B-UB-1658 JM-1S PILOT ASSEMBLY; B-XA-001 2" SIGHT GLASS ASSEMBLY.
TAG NO's. : RB-2425-1 BURNER ASSEMBLY; DA-718-1 BURNER TILE SET;
RB-2425-10 TUBING GASKET.

— NET HEAT RELEASE PER BURNER —

	AIR PREHEAT CASE		COLD AIR CASE	
FUEL	RESID GAS 1	RESID GAS 2	RESID GAS 1	RESID GAS 2
MAXIMUM : (MM Btu/Hr)	18,900	18,900	19,50	19,50
NORMAL : (MM Btu/Hr)	15,100	15,100	15,579	15,579
MINIMUM : (MM Btu/Hr)	4,700	4,700	4,89	4,89
LHV : (Btu/scf)	800	980	800	980
SP. GR. :	0.468	0.603	0.468	0.603
DRAFT LOSS : 0.80 in. W.C. @ 18,900 MM Btu/Hr w/ 15% X-S AIR @ 600° F				
DRAFT LOSS : 0.42 in. W.C. @ 19,50 MM Btu/Hr w/ 15% X-S AIR @ 60° F				
FOR OPERATING PRESSURES SEE CAPACITY CURVE : CC-RB-2425				
PILOT OPERATING PRESSURE : 10 PSIG. (NATURAL GAS)				

— DRILLING NOTES —

- PILOT MIXER ORIFICE DRILLED : $1/16"$
- GAS TIP DRILLED : 1-#49 IGN. PORT AND 1-LTR "L" FIRING PORT PER PA-1227

— GENERAL NOTES —

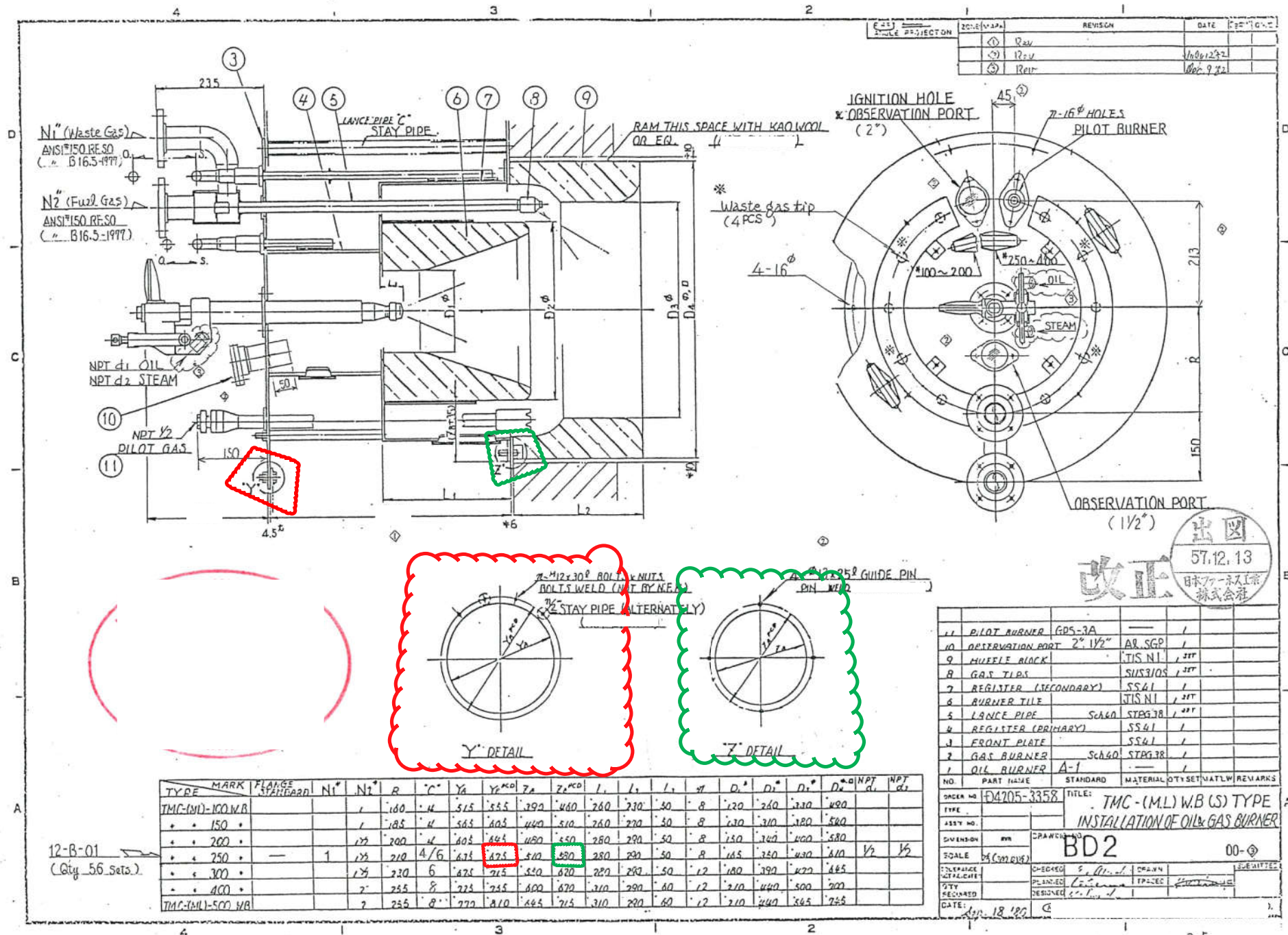
- 1 : ALL EXTERNAL CARBON STEEL SURFACES TO BE SURFACE PREPED. PER SSPC-SP-2 AND PAINTED WITH 1-COAT OF GRAY PRIMER (1.6-2.0 mils. D.F.T.).
- 2 : ALL FLANGE BOLT HOLES TO STRADDLE NORMAL CENTERLINES.
- 3 : APPROXIMATE WEIGHT; BURNER AND TILE : 450 lbs.
- 4 : ALL DIMENSIONS SHOWN IN [] ARE MILLIMETERS.
- 5 : BURNER FRONT PLATE LINED WITH 2" [51mm] IIG MINWOOL-1280 INSULATION

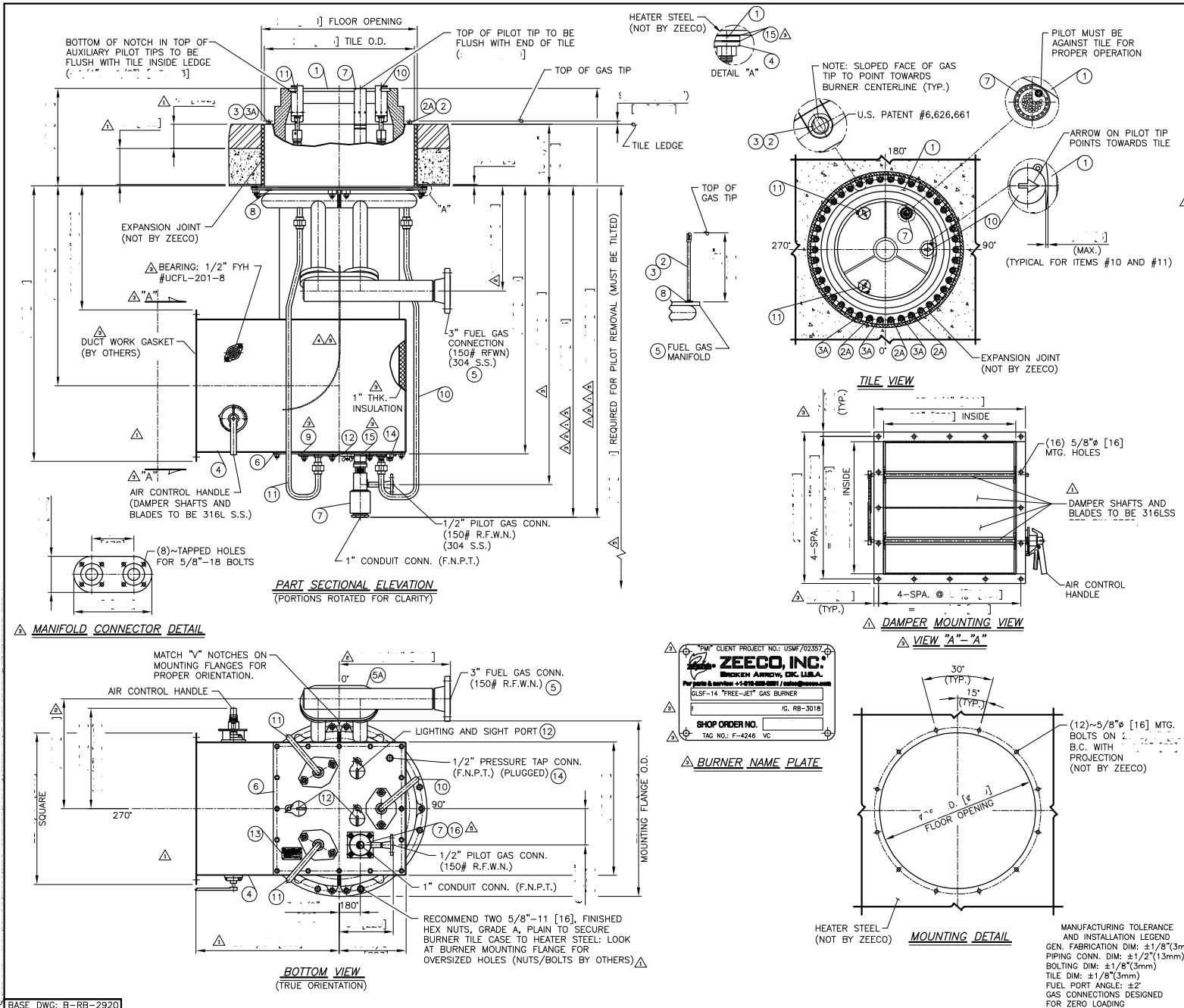
REV. NO.3:
REV. NO.2:
REV. NO.1: REVISED PER CUSTOMER COMMENTS. TLT 28AUG14 SAF MLC
JOBSITE: ELEVATION: 50 FT. (ASL)
P.O. NO.: S.O. NO.:

ZEECO, INC.
221ST EAST 9TH STREET
BROOKLYN PARK, MN 55424
PHONE (612) 258-8851
FAX (612) 258-8878
www.zeeco.com
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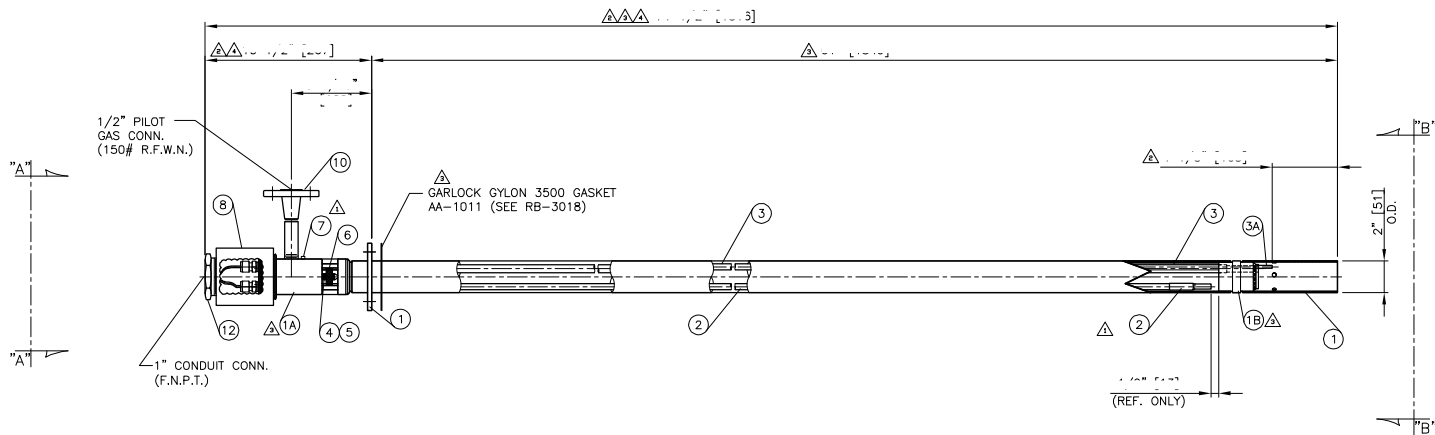
USER:
AC-240 ROUND FLAME GAS BURNER ASSEMBLY
TAG: F-35 / F-36 (32-REQUIRED)
FOR:

DRAWN: SSA
CHK: SAF
SCALE: NONE
REV: 1
DRAWING NUMBER: B-RB-2425

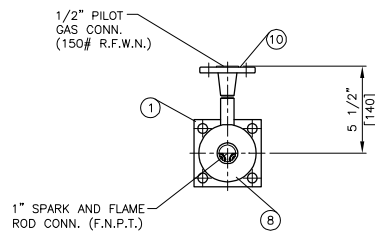




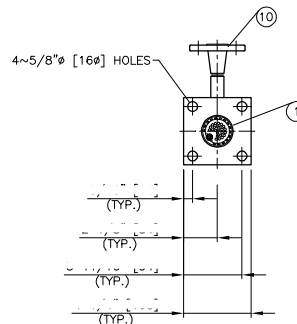
- PARTS LIST -					
ITEM	QTY	DESCRIPTION	PART NO.	MATERIAL	
1	1	BURNER TILE AND MOUNTING PLATE ASS'Y.	JE-0104	60% AL ₂ O ₃	
2	21	TYPE 1 GAS TIP AND RISER ASSEMBLY	JD-0100	A-312 TP304 A-297 HK	
2A	21	TYPE 1 GAS TIP	CA-0118	A-297 HK	
3	21	TYPE 2 GAS TIP AND RISER ASSEMBLY	JD-0100	A-312 TP304 A-297 HK	
3A	21	TYPE 2 GAS TIP	CA-0118	A-297 HK	
4	1	WINDBOX AND DAMPER ASSEMBLY	JE-8149	A-1011/316L INSUL.	
5	1	FUEL GAS MANIFOLD ASSEMBLY	JE-8150	A-182 F304 A-312 TP304L	
5A	2	150# R.F. GASKET	2"	CARLOCK GYLON STYLE 3500	
6	1	FRONT PLATE ASSEMBLY w/TURN VANE	JE-8151	A-36/INSUL	
7	1	SM-15-HEI PILOT ASSEMBLY	UB-2110	A-182 F304 A-213 TP304	
8	42	GAS RISER GASKET (1/16")	AA-0361	GSK. MAT'L	
9	3	ExMo AUXILIARY PILOT MOUNTING GASKET	AA-1010	CARLOCK GYLON STYLE 3500	
10	1	ExMo AUXILIARY PILOT ASSEMBLY	UB-2111	A-312 TP304L A-297 HK	
11	2	ExMo AUXILIARY PILOT ASSEMBLY	UB-2112	A-312 TP304L A-297 HK	
12	3	2" LIGHTING/SIGHT PORT COVER	CA-0005	1020 CS	
13	1	BURNER NAME PLATE	AA-0496	304 S.S.	
14	1	HEX HEAD PIPE PLUG	1/2" N.P.T.	A-105	
15	2	DROP WARP TAPE w/ADHESIVE (8 FT. LG.)	1/2" OD	FIBERGLASS	
16	1	SM PILOT MOUNTING GASKET	AA-1011	CARLOCK GYLON STYLE 3500	
REFERENCE DRAWING : B-UB-2110 SM-15-HEI PILOT ASSY. (713-400-106AB)					
B-UB-2111 ExMo AUX. PILOT ASSY. (713-400-106 AC)					
B-UB-2112 ExMo AUX. PILOT ASSY. (713-400-106AD)					
TAG NO's : RB-3018-1 BURNER ASSEMBLY; JE-0104-1 BURNER TILE & MOUNTING					
PLATE ASSEMBLY; RB-3018-15 DROP WARP TAPE w/ADHESIVE.					
- - - - - ADDITIONAL SCOPE OF SUPPLY - - - - -					
AS-1	840	(200%) GAS RISER GASKET (1/16")	AA-0361	GSK. MAT'L.	
- - - - - NET HEAT RELEASE PER BURNER - - - - -					
FUEL	PRIMARY	ALTERNATE	RFQ MINIMUM	RFQ NORMAL	RFQ MAXIMUM
DESIGN : (MM Btu/hr)	13,820	13,820	13,820	13,820	13,820
NORMAL : (MM Btu/hr)	10,320	10,320	10,320	10,320	10,320
MINIMUM : (MM Btu/hr)	2,300	2,300	2,300	2,300	2,300
LHV : (Btu/scf)	453	996	749	872	1025
S.G. :	0.24	0.63	0.45	0.55	0.66
DRAFT LOSS : 0.61 in. W.C. @ 13,820 MM Btu/hr 15% X-S AIR @ 100' F.					
FOR OPERATING PRESSURES SEE CAPACITY CURVE : CC-RB-3018 (713-400-127AA)					
PILOT OPERATING PRESSURE : 10 PSIG. (NATURAL GAS)					
- - - - - DRILLING NOTES - - - - -					
PILOT MIXER ORIFICE DRILLED : 1/16"					
AUXILIARY PILOT MIXER ORIFICE DRILLED : 2~1/16" PER PA-0819					
TYPE 1 GAS TIP DRILLED : (1)~1/8" FIRING PORT PER PA-0795					
TYPE 2 GAS TIP DRILLED : (1)~#46 FIRING PORT PER PA-0715					
- - - - - GENERAL NOTES - - - - -					
1 : ALL EXTERNAL CARBON STEEL SURFACES TO BE SURFACE PREPED. PER: SSPC-SP-10					
2 : & PAINTED WITH CARBOGUARD 690 PRIMER (5-8 mils. D.F.T.) AND PAINTED WITH 1-COAT OF CARBOGUARD 134 HG (2-3 mils. D.F.T.)					
3 : APPROXIMATE WEIGHT; BURNER AND TILE : (±10%) 750 lbs. [340 KG]					
4 : DIMENSIONS IN [] ARE MILLIMETERS.					
5 : DAMPER BLADES & SHAFTS TO BE 316L SS.					
DOCUMENT NUMBER: 713-400-106AA					
REV. NO.5: REMOVED PILOT ENCLOSURE PER ENGINEERING. SAF 21DEC16					
REV. NO.4: REVISED PER FINAL TEST CHANGES C.O. #6820. TLT 12DEC16 SAF NAJ					
REV. NO.3: REVISED PER CUSTOMER COMMENTS. TLT 26OCT16 SAF NAJ					
REV. NO.2: REVISED PER CUSTOMER COMMENTS. DMS 21SEP16 SAF NAJ					
REV. NO.1: REVISIONS PER CUSTOMER REVIEW. SAF 27JUL16 NAJ					
PATENT No.: 6,499,990					
JOBSITE:			ELEVATION: 20 FT. (ASL)		
P.O. NO.:			S.O. NO.:		
ZEECO, INC. 22151 EAST 81st STREET BROOKLYN PARK, MN 55426-1001 PHONE (953) 258-8551 FAX (953) 251-2518 www.zeecon.com info@zeecon.com			USER: GLSF-14 ROUND FLAME, "FREE-JET" GAS BURNER ASSEMBLY TAG NO.: F-4246 VC (10~REQUIRED)		
DRAWING: SSA			DATE: 27JUN16		
CHK: SAF			APP: NAJ		
SCALE: NONE			REV: 5		
FOR: (10~REQUIRED)			DRAWING NUMBER: B-RB-3018		



PART SECTIONAL ELEVATION
(PORTIONS ROTATED FOR CLARITY)



VIEW "A"-"A"
(TRUE ORIENTATION)



VIEW "B"-"B"
(TRUE ORIENTATION)

MANUFACTURING TOLERANCE
AND INSTALLATION LEGEND
GEN. FABRICATION DIM: $\pm 1/8"$ (3mm)
PIPING CONN. DIM: $\pm 1/2"$ (13mm)
BOLTING DIM: $\pm 1/8"$ (3mm)
TILE DIM: $\pm 1/8"$ (3mm)
FUEL PORT ANGLE: $\pm 2^\circ$
FUEL GAS CONNECTIONS DESIGNED
FOR ZERO LOADING.

— PARTS LIST —

ITEM	QTY	DESCRIPTION	PART NO	MATERIAL
1	1	MTG. PLATE/RISE BODY ASSEMBLY	MB-3817	304/316
1A	1	SM-1S MIXER BODY	CA-0364	CF-8
1B	1	SM-1S PILOT TIP	CA-0347	A-297 HK
2	1	SPARK ROD ASSEMBLY	MB-2411	A-213 TP316
3	1	FLAME ROD ASSEMBLY	MB-2412	A-213 TP316
3A	1	FLAME ROD TIP ASSEMBLY	MB-2423	KANTHAL
4	1	MIXER INSERT	CA-0341	CF-8
5	1	ORIFICE SPUD	CA-0342	CF-8
6	1	MIXER AIR DOOR	CA-0343	CF-8
7	2	ALLENHEAD SET SCREW	1/4" N.C.	C.S.
8	1	REDUCING COUPLING (3000#)	2 1/2" x 2"	A-182 F304
9	—	(REMOVED)	—	—
10	1	1/2" 150# RFWN FLANGED NIPPLE ASSY.	JE-0566	A-312 TP304 A-182 F304
11	—	(REMOVED)	—	—
12	1	HEX HEAD BUSHING (3000#)	2" x 1"	A-182 F304

— GENERAL NOTES —

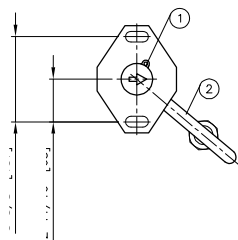
- 1 : ALL STAINLESS STEEL NO SURFACE PREP. OR PAINT.
- 1 : SEE CUSTOMER BURNER DRAWING B-RB-3018 (413-400-106AA)
FOR ORIFICE SPUD DRILLING.
- 3 : ALL FLANGE BOLT HOLES TO STRADDLE NORMAL CENTERLINES.
- 4 : ALL DIMENSIONS SHOW IN [] ARE MILLIMETERS.
- DOCUMENT NUMBER: 713-400-106AB
- REV. NO.4: REMOVED ITEM #9 PER ENGINEERING. SAF 21DEC16 NAJ
- REV. NO.3: PER CUSTOMER COMMENTS. ADDED GASKETS. TLT 27OCT16 SAF NAJ
- REV. NO.2: REVISED PER PROJECTING REVIEW. DMS 21SEP16 SAF NAJ
- REV. NO.1: REVISIONS PER CUSTOMER REVIEW. SAF 27JUL16 NAJ
- JOB SITE: ELEVATION: 20 FT. (ASL)
- P.O. NO.: S.O. NO.:

ZECCO, INC.
221ST EAST 91st STREET
BROOKLYN PARK, MN 55443
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www.zecco.com

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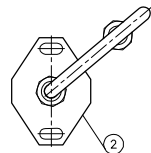
USER:
SM-1S-HEI PILOT ASSEMBLY
WITH POWER PACK
TAG No.: F-4246 VC
(10~REQUIRED)

FOR: DRAWING: SSA DATE: 27JUN16
CHK: SAF APP: NAJ
SCALE: NONE REV: 4
DRAWING NUMBER:
B-UB-2110



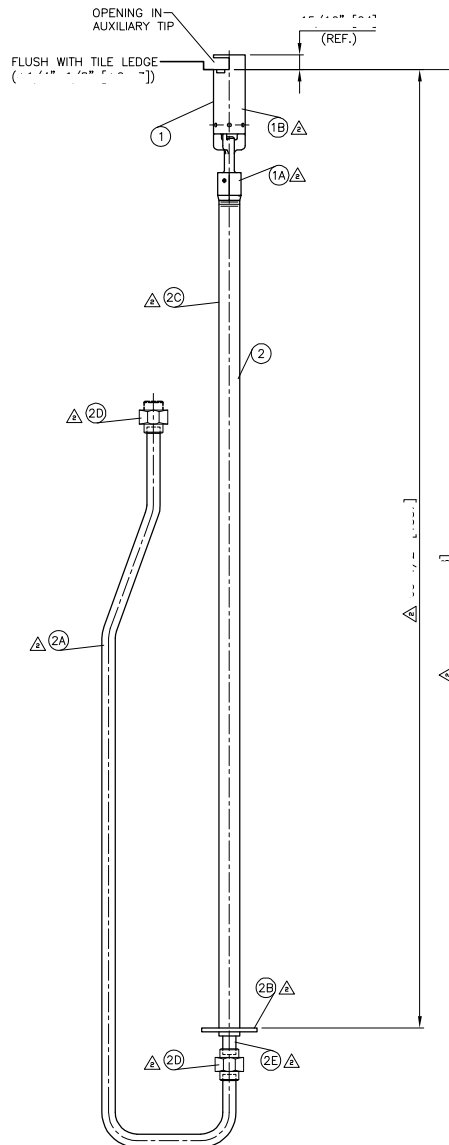
ORIENT 10 AS SHOWN

PLAN VIEW
(TRUE ORIENTATION)



ORIENT 10 AS SHOWN

BOTTOM VIEW
(TRUE ORIENTATION)



SIDE ELEVATION
(PORTIONS ROTATED FOR CLARITY)

MANUFACTURING TOLERANCE
AND INSTALLATION LEGEND
GEN. FABRICATION DIM: $\pm 1/8"$ (3mm)
PIPING CONN. DIM: $\pm 1/2"$ (13mm)
BOLTING DIM: $\pm 1/8"$ (3mm)
TILE DIM: $\pm 1/8"$ (3mm)
FUEL PORT ANGLE: $\pm 2^\circ$
GAS CONNECTIONS: DESIGNED
FOR ZERO LOADING

— PARTS LIST —

ITEM	QTY	DESCRIPTION	PART NO	MATERIAL
1	1	ExMo PILOT TIP ASSEMBLY	MB-1409	A-297 HK
1A	1	ExMo PILOT TIP BASE (CA-0189)	HA-0575	A-297 HK
1B	1	ExMo PILOT TIP SHIELD	CA-0185	A-297 HK
2	1	MOUNTING PLATE AND NIPPLE ASS'Y	MB-3818	304/310 S.S.
2A	1	PIPE	1/2" S/40	A-312 TP310
2B	1	MOUNTING PLATE	1/4" THK.	A-240 304
2C	1	RISER PIPE	1" SCH.80	A-312 TP310
2D	2	UNION 3000# S.W.	1/2"	A-182 F310
2E	1	PIPE	1/2"S/40	A-312 TP310

REF. DRAWING: B-RB-3018 (713-400-106AA)

— DRILLING NOTES —

SEE BURNER DRAWING B-RB-3018 FOR PILOT TIP DRILLING.

— GENERAL NOTES —

1 : ALL STAINLESS STEEL NO SURFACE PREP OR PAINT.

DOCUMENT NUMBER: 713-400-106AC

REV. NO.3: CORRECTED PARTS LIST. SAF 18JAN17 NAJ

REV. NO.2: REVISED PER CUSTOMER COMMENTS. TLT 27OCT16 SAF NAJ

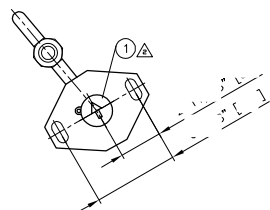
REV. NO.1: REVISIONS PER CUSTOMER REVIEW. SAF 27JUL16 NAJ

JOB SITE: ELEVATION: 20 FT. (ASL)

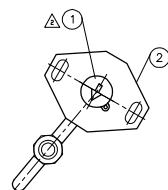
P.O. NO.: S.O. NO.:

ZECCO, INC.
221ST EAST 91st STREET
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zecco@zecco.com
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USER:
DRAWN: SSA DATE: 27JUN16
CHK: SAF APP: NAJ
SCALE: NONE REV: 3
FOR: B-UB-2111

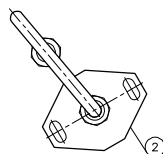


ORIENT 10 AS SHOWN

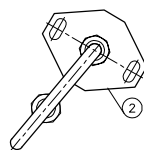


ORIENT 10 AS SHOWN

PLAN VIEW
(TRUE ORIENTATION)

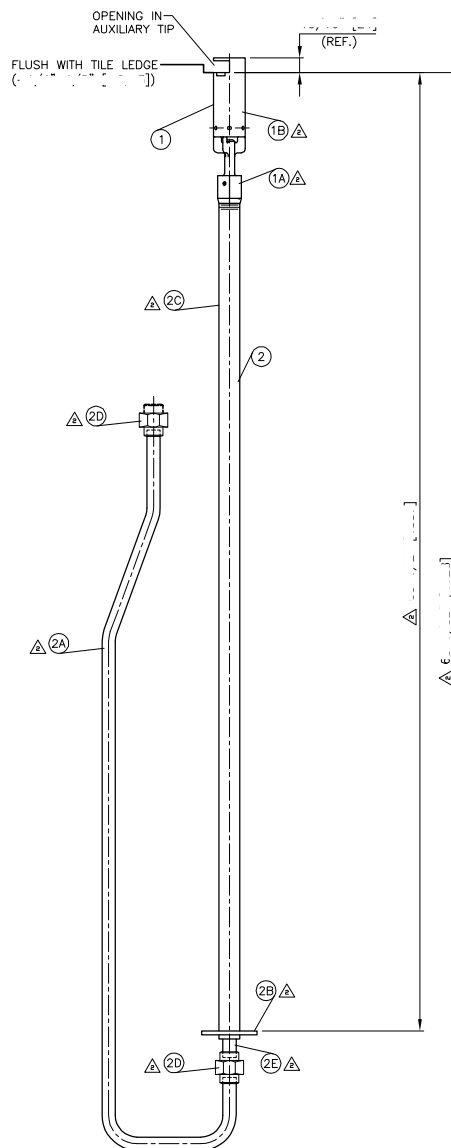


ORIENT 10 AS SHOWN



ORIENT 10 AS SHOWN

BOTTOM VIEW
(TRUE ORIENTATION)



SIDE ELEVATION
(PORTIONS ROTATED FOR CLARITY)

MANUFACTURING TOLERANCE
AND INSTALLATION LEGEND
GEN. FABRICATION DIM: $\pm 1/8"$ (3mm)
PIPING CONN. DIM: $\pm 1/2"$ (13mm)
BOLTING DIM: $\pm 1/8"$ (3mm)
TILE DIM: $\pm 1/8"$ (3mm)
FUEL PORT ANGLE: $\pm 2^\circ$
GAS CONNECTIONS DESIGNED
FOR ZERO LOADING

— PARTS LIST —

ITEM	QTY	DESCRIPTION	PART NO	MATERIAL
1	1	ExMo PILOT TIP ASSEMBLY	MB-1409	A-297 HK
1A	1	ExMo PILOT TIP BASE (CA-0189)	HA-0575	A-297 HK
1B	1	ExMo PILOT TIP SHIELD	CA-0185	A-297 HK
2	1	MOUNTING PLATE AND NIPPLE ASS'Y	MB-3819	304/310 S.S.
2A	1	PIPE	1/2" S/40	A-312 TP310
2B	1	MOUNTING PLATE	1/4" THK.	A-240 304
2C	1	RISER PIPE	1" SCH.80	A-312 TP310
2D	2	UNION 3000# S.W.	1/2"	A-182 F310
2E	1	PIPE	1/2"S/40	A-312 TP310

REF. DRAWING: B-RB-3018 (713-400-106AA)

— DRILLING NOTES —

SEE BURNER DRAWING B-RB-3018 FOR PILOT TIP DRILLING.

— GENERAL NOTES —

1 : ALL STAINLESS STEEL NO SURFACE PREP OR PAINT.

DOCUMENT NUMBER: 713-400-106AD

REV. NO.3: CORRECTED PARTS LIST. SAF 18JAN17 NAJ

REV. NO.2: REVISED PER CUSTOMER COMMENTS. TLT 27OCT16 SAF NAJ

REV. NO.1: REVISIONS PER CUSTOMER REVIEW. SAF 27JUL16 NAJ

JOB SITE: ELEVATION: 20 FT. (ASL)

P.O. NO.: S.O. NO.:

USER:

ExMo AUXILIARY PILOT
ASSEMBLY FOR GLSF-14
"FREE-JET" GAS BURNER
TAG No: F-4246 VC
(20~REQUIRED)

FOR:

DATE: 27JUN16

CHK: SAF APP: NAJ

SCALE: NONE

DRAWING NUMBER:

DATE: 27JUN16

CHK: SAF APP: NAJ

SCALE: NONE


DRAWING NUMBER:

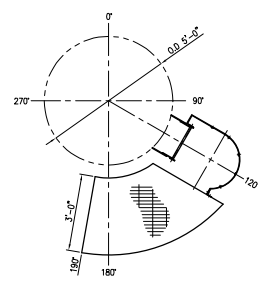
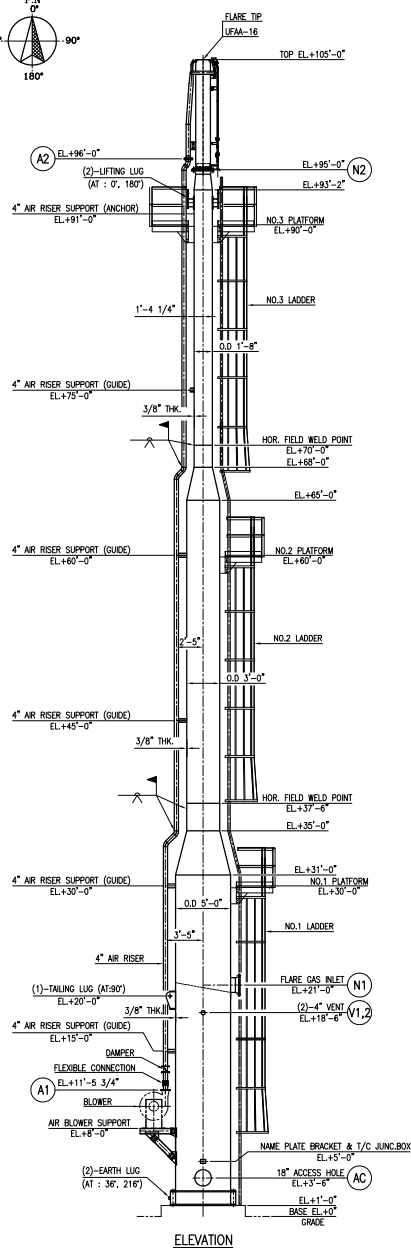
B-UB-2112



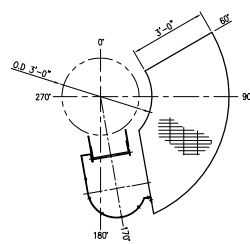
- NOTES -

1. PILOT MIXER ORIFICE DRILLED: #55 [1.32 mm]
2. PILOT GAS CONSUMPTION: 80.82 SCFH @ 15 PSIG PER PILOT
[2.17 Nm³/HR @ 1.05 kg/cm²g]
3. PILOT ORIFICE DRILLING BASED ON 908 BTU/SCF (LHV)
[8542 kcal/Nm³] GAS WITH 0.563 SP. GR.
4. ALL FLANGE BOLTING TO STRADDLE NORMAL CENTERLINES.
5. ALL EXTERNAL CARBON STEEL SURFACES TO BE PREPARED PER
SSPC-SP6. PRIME WITH ONE COAT INORGANIC ZINC (2 1/2 MILS DFT MIN.)
PAINT ONE COAT HIGH TEMP ALUMINUM (1 MIL DFT MIN.)
6. ALL TESTING PER INSPECTION TEST PLAN DOCUMENT NO. 21021-4010
7. THE PILOT THERMOCOUPLE IS FOR ON/OFF INDICATION ONLY, NOT FOR
ACCURATE MEASUREMENT OF THE PILOT FLAME TEMPERATURE.
8. APPROXIMATE WEIGHT FOR FLARE TIP ASSY: 353 LBS. [160 KG]
9. APPROXIMATE WEIGHT FOR EACH PILOT: 100 LBS. [45 KG]
10. THE FLARE TIP REQUIRES A CONTINUOUS PURGE OF 200 SCFH
(5.36 Nm³/HR) OF A GAS THAT WILL NOT GO TO A DEW POINT AT
OPERATING TEMPERATURES.

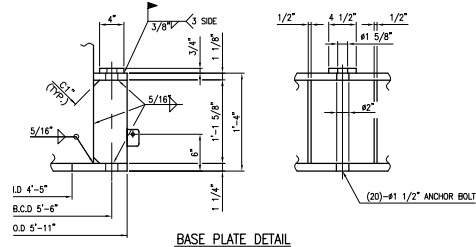
JOB SITE:		PA	
END USER:			
S.O. NO.:	P.O. NO.: 12	APP SKS	
2020 N. 17TH AVE. SUITE 100 BROWNSVILLE, MO 64001  PHONE: (417) 231-2519 FAX: (417) 231-2519 www.flares.com	UFAA-16 FLARE TIP ASSY		DRAWN: PRP DATE: 02MAR12 CHK: ADP DATE: SCALE: BAW PVB NONE REV 1
FOR:		DRAWING NUMBER B-SG-77254 SHT. 1 OF 1	



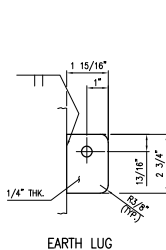
NO.1 PLATFORM PLAN



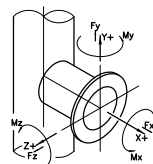
NO.2 PLATFORM PLAN



BASE PLATE DETAIL

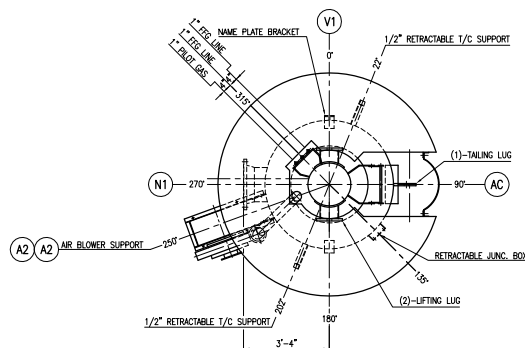


EARTH LUG

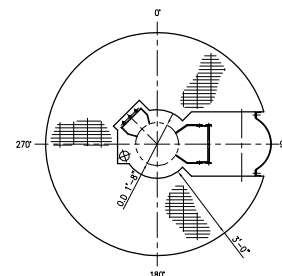


PIPE SIZE (IN)	F _x lb	F _y lb	F _z lb	M _x lb-ft	M _y lb-ft	M _z lb-ft
16	500	800	800	1140	850	850

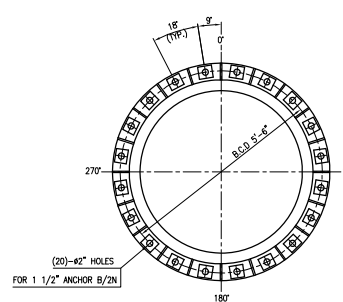
MAX. ALLOWABLE INLET NOZZLE LOAD



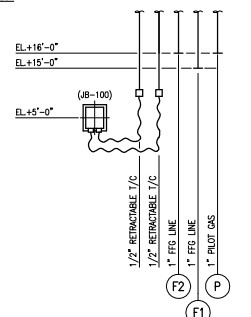
PLAN LAYOUT



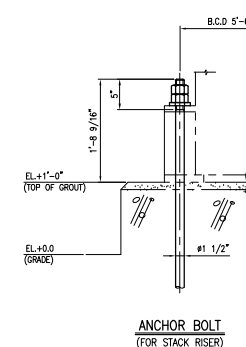
NO.3 PLATFORM PLAN



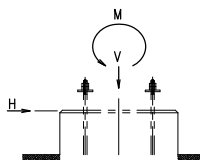
ANCHOR BOLT PLAN



DETAIL OF UTILITY PIPING



ANCHOR BOLT
(FOR STACK RISER)



LOADING DATA			
	V(kip)	H(kip)	M(kip-ft)
DEAD LOAD	23.0	0.0	0.0
NOZZLE LOAD	0.8	0.9	14.9
WIND LOAD	0.0	12.6	622.4
SEISMIC LOAD	0.0	0.9	93.8
LIVE LOAD	5.6	0.0	0.0

LOADING DATA (FOR STACK RISER)


MATERIAL SPECIFICATIONS				DESIGN DATA	
GA. RISER	AP 5L-B	PLATFORM	ASW	TYPE	SELF SUPPORT TYPE
AIR RISER	AS3-B	PLATFORM LUG	ASW	STRUCTURE CODE	ASME STD-1
SHORT	AP 5L-B	LUGGER	ASW	WIND DESIGN CODE	SEE NOTE 3
FLARE TIP	SEE FLARE TIP DWG.	LUGGER LUG	ASW	SEISMIC DESIGN CODE	SEE NOTE 3
RISER FLANGE	A105			FLUID	FLARE GAS
RISER BOLT/NUT	A193-B7/A194-2H			DESIGN PRESS.	30 psi
RISER GASKET	C4040			DESIGN TEMP.	-20 TO 250 °F
BASE PLATE	ASW			OPERATING PRESS.	25 psi
ANCHOR BOLT	A307-B			OPERATING TEMP.	225 °F
EMPIR LUG	304 S.S.			P.W.I.H.T.	(NO)
MANE PLATE	304 S.S.			RODGRAPH	AS PER IPI, CPST
MANE FLARE BRACKET	ASW			JOINT EFFICIENCY	85 %
UTILITY LINE	A106-B			CONCRETE ALLOWANCE	1/16 IN.
CONDUIT LINE	C.S. + GREN.			PAINTING	SEE NOTE 2
LIFTING LUG / PAD					
TRAINING LUG					

NOZZLE AND CONNECTIONS

MARK	QTY	SIZE	COL.	SETTING	FACING	SERVICE	REMARKS	S. TO
N1	1	6"	STD.	ASME #150	WN, RF	FLARE GAS INLET		SEE DWG.
N2	1	16"	STD.	ASME #150	WN, RF	FLARE GAS OUTLET		SEE DWG.
A1	1	4"	40	1/2" THK. PLATE FLG		AIR INLET		SEE DWG.
A2	1	4"	40	ASME #150	WN, RF	AIR OUTLET		SEE DWG.
P	1	1"	40	ASME #150	THREADED, RF	PILLOT GAS		SEE DWG.
F1.2	2	1"	40	ASME #150	THREADED, RF	WYE LINE		SEE DWG.
V1.2	2	4"	40	-	-	VENT		
AC	1	16"	3/8" THK.	-	-	ACCESS HOLE		

NOTE

1. FLANGE BOLTING TO STRADDLE CENTERLINES INDICATED BY CENTERLINE UNLESS NOTED OTHERWISE.
2. PAINTING (EXTERNAL CARBON STEEL ONLY) FLARE STACK, UTILITY PIPING & AIR RISER
- SURFACE PREPARATION : SSPC-SP6
 - PRIMER : 1 COAT (3-5 MILS) OF GALVANIZED ZINC (DMCCOAT @ COLOR GREEN/GRAY)
 - LADDER & JOYSTICK : HOT DIP INORGANIC ZINC
 - CONDUIT : GALVANNEED
3. DESIGN CONCORD
- WIND CODE : ASCE 7-05, 10M WPM, 40C, 0.04H, W1.15, T=1.0
 - SEISMIC ZONE : ASCE 7-05, S=0.5, S1=0.09, S2=0.04, SUGI, SIF1=25
4. ANCHOR BOLT MATERIALS TO BE SUPPLIED BY OTHERS (NOT BY ZECCO).
5. ALL UTILITY PIPING WILL BE SUPPLIED IN RANDOM LENGTH FOR FIELD INSTALLATION AT JOB SITE.

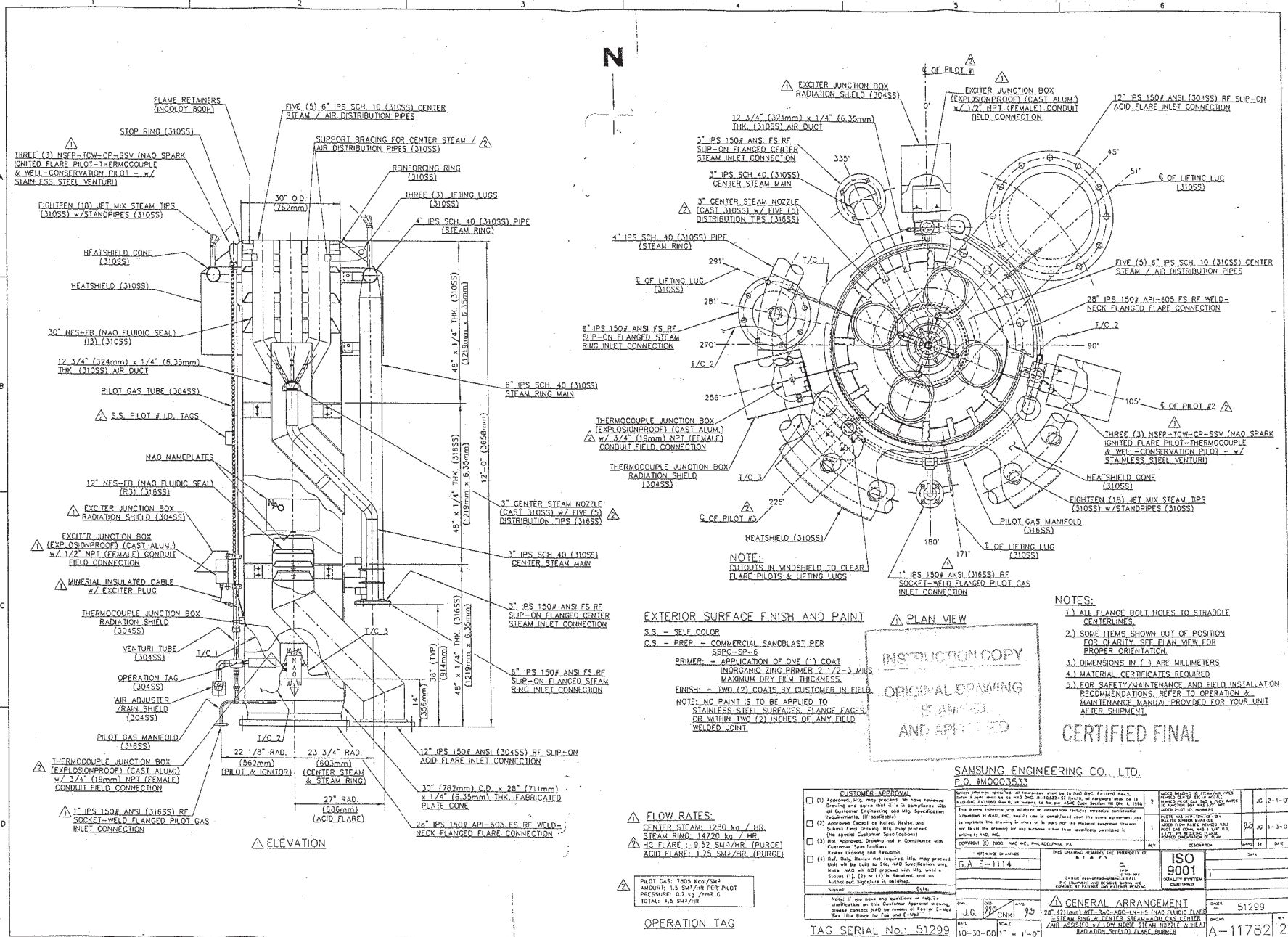
JOB SITE: PA			
END USER:			
S.O. NO.:		P.O. NO.: 12	APP PS
ZEECO, INC. 22111 DASH HAVEN STREET BROOKEN ARIDGE, OK 74014 		SELF SUPPORTED FLARE STACK SYSTEM GENERAL ARRANGEMENT DWG.	
PHONE (918) 251-6551 FAX: (918) 251-6516 info@zeeco.com		DRAWN <input checked="" type="checkbox"/> DISK DATE 3/04/12	DATE 3/04/12
		CHK HPJ SCALE NONE	APP PB REV 4
FIDR		DRAWING NUMBER SC-7257 SHT. 1 of 1	

ZEECO, INC.
22151 EAST 91st STREET
BROKEN ARROW, OK 74014

PHONE: (918) 258-8551
FAX: (918) 251-5519
www.zeeco.com
sales@zeeco.com



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SURVEY SUMMARY INDEX

Refining Co.
23-Mar-2022

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DOCUMENTS

UNIT NAME	HEATER NAME	HEATER ID	HEATER MFG	BURNER NAME	BURNER MFG	QTY	SURVEY SUMMARY
DU-5	CRUDE HEATER	F-35	Foster Wheeler	AC-240 ROUND FLAME	ZEECO	36	SURVEY SUMMARY
Coker	Charge Heater	F-125	G.K.N. Birwelco	TMC-(ML) W.B (S) TYPE	NFK	56	SCHEDULED/NOT COMPLETED
HCU	POST FRAC FEED HEATER	F-4246	BIH	GLSF-14 FREE-JET	ZEECO	10	SCHEDULED/NOT COMPLETED
S2	II Claus Reactor	F-158	The M.W. Kellogg	Unknown	North American	1	SCHEDULED/NOT COMPLETED
S2	Auxiliary Heater	F-159	The M.W. Kellogg	Unknown	North American	1	SCHEDULED/NOT COMPLETED
S2	Auxiliary Heater	F-160	The M.W. Kellogg	Unknown	North American	1	SCHEDULED/NOT COMPLETED
S2	Auxiliary Heater	F-161	The M.W. Kellogg	Unknown	North American	1	SCHEDULED/NOT COMPLETED
FLARES	FLARE NAME	FLARE ID	FLARE MFG				
FRAC 1	FRAC 1 FLARE	FLARE	ZEECO				SURVEY SUMMARY
FRAC 2	FRAC 2 FLARE	FLARE 2	NAO Inc.				SCHEDULED/NOT COMPLETED

CONTACT INFORMATION:
Aftermarket_Inquiry@zeeco.com
 PHONE: 918-258-8551



BURNER INSPECTION DATA SHEETS

General Information

Customer Name Refining Co. Location Location City, USA
Contact Name Will Williams
Contact Phone Number 555-867-5309
Contact Email Bill_Bill@company.com
Refining / Chemical Process Oil Refining
Unit Name / Number DU-5
Inspected By: Gregory Kelch Date / Time of Inspection 3/23/2022 / 10:00

Heater Information

Heater Manufacturer Foster Wheeler Heater Name CRUDE HEATER
Heater Type
☒ Vertical Cylindrical ☐ Platformer
☐ Horizontal Cylindrical ☐ Reformer
☐ Radiant Wall ☐ Cabin
☐ Terrace Wall ☐ Other _____
Heater Serial Number _____
Year Constructed Summer of 69
Customer's Heater Number F-35
Heater Service Delayed Coker
Other _____

Burner Information

Burner Manufacturer ZEECO Burner Model AC-240 ROUND FLAME
Number of Burners 36
Burner Shop Order Number _____
Burner Drawing Number B-RB-2425
Type of Draft
☒ Forced ☐ Natural ☐ Induced ☐ Balanced
Type of Pilot JM-1S Pilot Assembly
Burner Air Control
☐ Common Plenum ☐ Ind. Plenum ☐ Open Register ☐ Primary Air Only
☒ Other VFD control FD blower with manual register control on individual burners.

Zeeco Inspection Checkup

Plant Plant 1 Unit DU-5 Heater F-35



BURNER INSPECTION DATA SHEETS

Heater Operating Data

Stack Damper Position Full Open

Flue Gas Sample

Measurement Location Convection Section

O₂ 4.2 % ☐ Wet

CO 100 ppm

NO_x _____ ppm ☐ Dry

Fuel Gas Flow Unknown LHV _____ ☐ BTU/SCF ☐ BTU/LB
S.G. _____ Attach fuel composition if available

Burner Operating Data

Are all burners in operation? ☐ Yes ☒ No If no how many are out? 2 of 36

If no, why are burners out? ☒ Need of Maintenance ☐ Operating Conditions
☒ Need of Parts ☐ Other _____

Are all Burner Registers / Dampers set the same? ☒ Yes ☐ No

Damper / Register Position 4.5, where 0 is full closed and 8 is full open

Fuel Gas Pressure at Burners 12 psig

Flame Dimensions 2.5 (ft) Width X 10 (ft) Length ☐ Not Visible / Non-operational

Flame Appearance Stable but not uniform from burner to burner. See additional notes regarding Burners 10 and 17 in Recommendation Section.

Check if any of the problems are occurring

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> Flame Impingement | <input type="checkbox"/> Frequent Tip Plugging | <input checked="" type="checkbox"/> Poor Turndown |
| <input checked="" type="checkbox"/> Coking | <input type="checkbox"/> Poor Excess Air Control | <input type="checkbox"/> Short Tip Life |
| <input type="checkbox"/> Flashback | | <input type="checkbox"/> High Noise |

Other Observations Burners 3 and 29 are both offline and burner registers are full closed.

Possibly need to check combustion air supply and verify this is balanced from burner to burner. Verify combustion air draft at burner is per design at the current firing rate.

Zeeco Inspection Checkup

Plant Plant1 Unit DU-5 Heater F-35



BURNER INSPECTION DATA SHEETS

Heater / Burner Condition

	Satisfactory	Unsatisfactory	Unknown	Reference Burners in Need of Repair
Stack Damper	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Burner Damper / Register	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Tile	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See recommendations
Primary Gas Tips	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Burners 10, 17
Secondary Gas Tips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Oil Tips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cone	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Venturi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Manifold	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sight / Lighting Ports	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Heater Seams and Joints	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Burner Controls Instrumentation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pilot Operation & Light-off	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Recommendations:

- 1 Burner 10, flame appearance indicates possible partial tip plugging or damaged tip. Remove and inspect burner tip, clean or replace as needed. For assistance with maintenance contact Zeeco Global Field Services. For parts please reference Spare Parts list for this heater in this report.

Will Improve: ☐ Safety ☒ Efficiency ☒ Ease of Operation ☐ Ease of Maintenance

- 2 Burner 17, flame impingement due to damaged tip. Shut off burner and replace tip.

Will Improve: ☒ Safety ☒ Efficiency ☐ Ease of Operation ☐ Ease of Maintenance

Zeeco Inspection Checkup

Plant Plant 1 Unit DU-5 Heater F-35



BURNER INSPECTION DATA SHEETS

Recommendations Continued:

- 3 Burner 3, shut off due to instability from coking and possibly damaged cone. Clean and inspect cone at next available shutdown, if the cone is damaged, misshaped or broken, replace cone.

Will Improve: ☒ Safety ☒ Efficiency ☒ Ease of Operation ☐ Ease of Maintenance

- 4 Burner 29, severe tile damage. Replace tile at next turnaround.

Will Improve: ☒ Safety ☒ Efficiency ☒ Ease of Operation ☐ Ease of Maintenance

- 5 Check burner draft at individual burners to verify combustion air is balanced from burner to burner, and if they are not, balance this combustion air using individual burner air registers. This can be a tedious process, if onsite assistance is required see contact information for Zeeco Global Field Services below.

Will Improve: ☐ Safety ☒ Efficiency ☒ Ease of Operation ☐ Ease of Maintenance

6

Will Improve: ☐ Safety ☐ Efficiency ☐ Ease of Operation ☐ Ease of Maintenance

Action Items:

Replace all necessary parts on previously mentioned burners.

For help with spare parts follow instructions on spare parts lists in this report or contact Zeeco at Aftermarket_inquiry@zeeco.com, or contact your local Zeeco End User Rep for other questions.

For assistance with onsite support, please contact Zeeco Global Field Services at

Zeeco Inspection Checkup

Plant Plant 1 Unit DU-5 Heater F-35

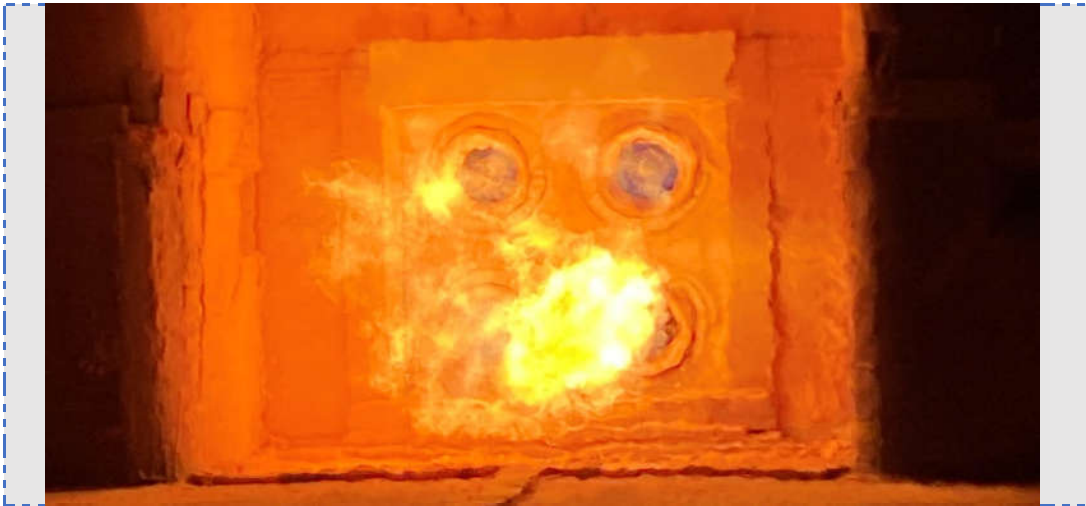


BURNER INSPECTION DATA SHEETS

Pictures:



Burner 10 tip plugging and coking buildup.



Burner 17, lower left burner, with obvious flame appearance difference.

Zeeco Inspection Checkup

Plant Plant 1 Unit DU-5 Heater F-35



BURNER INSPECTION DATA SHEETS

Pictures:



Burner 29 tile sections broken and missing.



Burner 3 cone and coking build-up.

Zeeco Inspection Checkup

Plant Plant 1 Unit DU-5 Heater F-35



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Refining Co.
23-Mar-2022


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CONTACT INFORMATION:

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PHONE: 918-258-8551

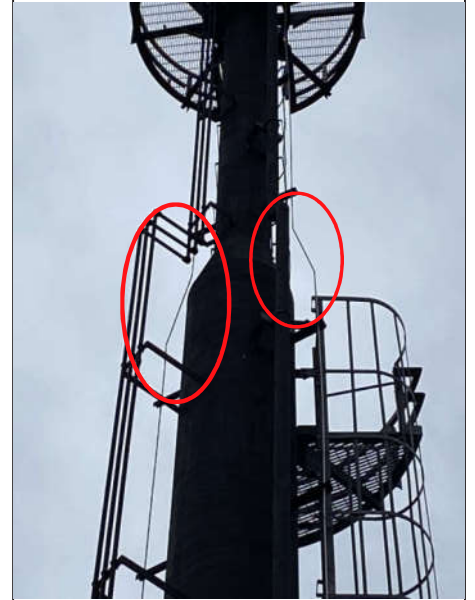
	Inspector:	Gregory Kelch		Date:	12/15/21
	Customer:			Job Location:	
	OEM:	Zeeco Inc.	SO 21021	Type of Ign.:	FFG
	<div>ACCEPTABLE</div> <div>MAINTANABLE</div> <div>FAILING</div>		<div>NOT APPLICABLE</div> <div>UNKNOWN</div>	No. Pilots:	2 Pilots

Ignition System					
[1] PANEL	COMMENTARY				
[1.1] Switches/Buttons/LED	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[1.2] Corrosion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[1.3] Internal Wiring	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[1.4] External Wiring (Exposed/Frayed)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[1.5] HEI Ignition LED (flashing green to red?)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[1.6] Conduit	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[2] IGNITION RACK					
[2.1] Operative Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[2.2] Piping	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[2.3] Corrosion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[2.4] FFG Sparking in Chamber?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[2.5] Pressure Gauges	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[2.6] Flanges/Bolts/Nuts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[2.7] Weldments	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[3] ADDITIONAL IGNITION SYSTEM PARTS					
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[3.2] Electrical Wiring	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[3.3] Thermocouples/Fiber Optic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	T/C guide tubing has several tight radius bends likely causing difficulty installing T/C from grade.
[3.4] Fuel/Instrument Air Piping	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[3.5] Weldments	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[3.6] Fittings Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[3.7] Pilot Supports	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[3.8] Pilot Manifold	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
[4] IGNITION SYSTEM OPERATION STATUS					
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Notes


Pilot fuel pressure while on site was 10-12psig. The feedback was that the pilot thermocouple temps were being effected by wind. Suggestion made to increase fuel pressure to 15psig.


Mark Failures on Rendering Below:



Conclusion/Recommendation

- 1) Increase fuel pressure to 15psig.
- 2) Replace the retractable thermocouples, thermocouple guide tubes and fittings that have been installed improperly. This is likely the cause of not being able to replace thermocouples from grade.
- 3) While there is a lift on site and access to the pilots, it would be suggested to take this time to clean pilots as needed.
- 4) Zeeco Global Field Services offers many different services, including installation experts that can help with proper thermocouple guide tubing installation.

	Inspector:	Gregory Kelch		Date:	12/15/21
	Customer:			Job Location:	
	OEM:	Zeeco Inc	SO 21021	Size:	UFAA-16
	<div>ACCEPTABLE</div> <div>MAINTANABLE</div> <div>FAILING</div>		<div>NOT APPLICABLE</div> <div>UNKNOWN</div>	No. Pilots:	2 Pilots
Air Flare					
[1] FLAME					
[1.1] Luminosity	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[1.2] Meeting Smokeless Requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[1.3] Impingement	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[1.4] Noise Radiation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[1.5] Proper Aeration Techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[2] UPPER BARREL					
[2.1] Straightness/Roundness	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[2.2] External Impingement/Internal Combustion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[2.3] Weldments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
[3] LOWER BARREL					
[3.1] Straightness/Roundness	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[3.2] External Impingement	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[3.3] Internal Combustion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[3.4] Purge Device	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[4] BLOWER					
[4.1] Corrosion/Environmental Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[4.2] Damper	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[4.3] Flanges	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[4.4] Status: Operational?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[5] PILOT ASSEMBLY					
[5.1] Symmetry/Straightness	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[5.2] Placement	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[5.3] Weldments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
[5.4] Status: Operational?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
[6] AIR FLARE OPERATION STATUS					
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional Notes	Mark Failures on Rendering Below:
<div></div>	
Conclusion/Recommendation	
<div></div>	



Fax No. (918) 251-5519
Telephone No. (918) 258-8551
22151 E. 91St Broken Arrow, OK 74014

COMBINED SPARE PARTS LIST

Customer: Refining Co. **Location:** Location City, USA
Client: Refining Co. **Location:** Plant 1
P.O. No.:
Zeeco Job No.: **Date:** 23-Mar-2022

Equipment: AC-240 ROUND FLAME **Unit Name:** DU-5
Drawing No.: B-RB-2425 **Heater Name:** CRUDE HEATER
Quantity: 16 **Heater ID:** F-35

Parts No.	Qty (RECOMMENDED)	Requested Qty (IF DIFFERENT from Recommended)	Description	Delivery (WEEKS)
DA-718	1		AC-240 BURNER TILE SET	4
JA-215	1		OIL TILE ASSEMBLY	4
EA-966	8		GAS TIP (AK-2 3/4)	4
XA-001	3		2" LIGHTING/SIGHT GLASS ASSEMBLY	4
MA-779	1		PILOT TIP ASSEMBLY	4
HA-399	1		1" PILOT MIXER (JM)	4
HA-398	1		1" ORIFICE SPUD (JM)	4
CA-279	1		AIR DOOR	4

*For non-Zeeco burners, additional information may be required to ensure an accurate like-in-kind replacement of any spare parts. This may include detail drawings, samples, 3D scans, or some combination of those things. As always, the Aftermarket Team will be on standby to assist with any questions or concerns you may have.

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CONTACT INFORMATION
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COMBINED SPARE PARTS LIST

Customer: Refining Co. **Location:** Location City, USA
Client: Refining Co. **Location:** Plant 1
P.O. No.:
Zeeco Job No.: **Date:** 23-Mar-2022

Equipment: TMC-(ML) W.B (S) TYPE **Unit Name:** Coker
Drawing No.: BD-201077 **Heater Name:** Charge Heater
Quantity: 56 **Heater ID:** F-125

Parts No.	Qty (RECOMMENDED)	Requested Qty (IF DIFFERENT from Recommended)	Description	Delivery (WEEKS)
	4		OIL BURNER GUN ASSEMBLY	4
	1		GAS RISER ASSEMBLY	4
	8		GAS TIP	4
	2		SIGHT PORT GLASS AND GASKET	4
	1		BURNER TILE SET	4
	1		JM-1S PILOT ASSEMBLY	4

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COMBINED SPARE PARTS LIST

Customer: Refining Co. **Location:** Location City, USA
Client: Refining Co. **Location:** Plant 1
P.O. No.:
Zeeco Job No.: **Date:** 23-Mar-2022

Equipment: GLSF-14 FREE-JET **Unit Name:** HCU
Drawing No.: B-RB-3018 **Heater Name:** POST FRAC FEED HEATER
Quantity: 10 **Heater ID:** F-4246

Parts No.	Qty (RECOMMENDED)	Requested Qty (IF DIFFERENT from Recommended)	Description	Delivery (WEEKS)
JE-0104	1		BURNER TILE AND MOUNTING PLATE ASSEMBLY	4
JD-0100-1	21		TYPE 1 GAS TIP AND RISER ASSEMBLY	4
JD-0100-2	21		TYPE 2 GAS TIP AND RISER ASSEMBLY	4
MB-1409	3		EXMO PILOT TIP ASSEMBLY	4
CA-0005	3		2" LIGHTING/SIGHT PORT COVER	4
AA-0361	42		GAS RISER GASKET	4
UB-2110	1		SM-1S HEI PILOT ASSEMBLY	4
MB-2411	1		SPARK ROD ASSEMBLY (SM PILOT)	4
MB-2423	1		FLAME ROD ASSEMBLY (SM PILOT)	4
CA-0341	1		PILOT MIXER INSERT	4
CA-0342	1		PILOT ORIFICE SPUD	4
CA-0343	1		PILOT MIXER AIR DOOR	4

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COMBINED SPARE PARTS LIST

Customer: Refining Co. **Location:** Location City, USA
Client: Refining Co. **Location:** Plant 1
P.O. No.:
Zeeco Job No.: **Date:** 23-Mar-2022

Equipment: **Unit Name:** FRAC 1
Drawing No.: B-SC-7254/7257 **Heater Name:** FRAC 1 FLARE
Quantity: **Heater ID:** FLARE

Parts No.	Qty (RECOMMENDED)	Requested Qty (IF DIFFERENT from Recommended)	Description	Delivery (WEEKS)
	3		THERMOCOUPLE	
	1		FFG IGNITION TRANSFORMER	
	1		FFG PLUG	
	1		PRESSURE GAUGE	
	1		FFG SIGHT GLASS ASSEMBLY	
	1		TEMPERATURE SWITCH MODULE	
	1		TEMPERATURE SWITCH PROGRAMMING FRONT	
	1		PILOT LIGHT (PILOT FAILURE)	
	1		POWER LIGHT ON	
	1		CONTROL RELAY	
	1		COMPLETE THERMOCOUPLE GUIDE TUBE REPLACEMENT	
			INCLUDING ALL FITTINGS	

*For non-Zeeco burners, additional information may be required to ensure an accurate like-in-kind replacement of any spare parts. This may include detail drawings, samples, 3D scans, or some combination of those things. As always, the Aftermarket Team will be on standby to assist with any questions or concerns you may have.

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COMBINED SPARE PARTS LIST

Customer: Refining Co. **Location:** Location City, USA
Client: Refining Co. **Location:** Plant 1
P.O. No.:
Zeeco Job No.: **Date:** 23-Mar-2022

Equipment: **Unit Name:** FRAC 2
Drawing No.: A-11782 **Heater Name:** FRAC 2 FLARE
Quantity: **Heater ID:** FLARE 2

Parts No.	Qty (RECOMMENDED)	Requested Qty (IF DIFFERENT from Recommended)	Description	Delivery (WEEKS)
	1		Zeeco HSLF-Z-HEI-T/C Flare Pilot (For installation on existing tra	2
	1		1" Pilot Gas Ball Valve	2
	1		Temperature Switch	2
	1		Display for Temperature Switch	2
	1		Pressure Transmitter	2
	1		HEI Ignition Module, Ignition Transformer, 120VAC	2

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