

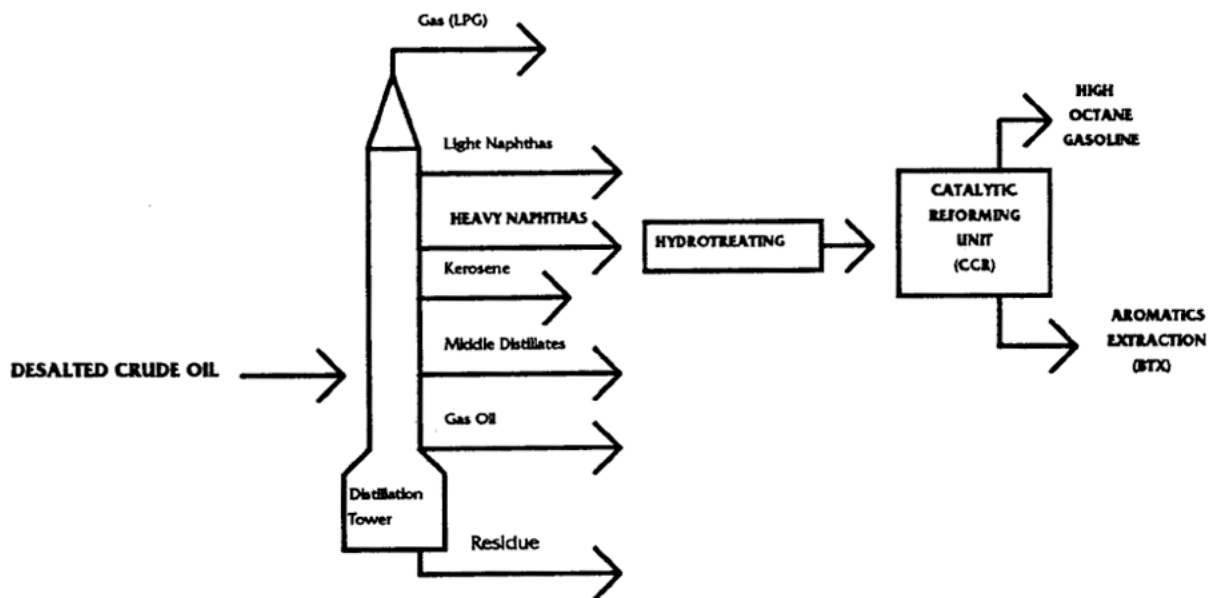
## application bulletin

### APPLICATION:

- The continuous detection of hydrogen and hydrocarbons in the regeneration column of a Continuous Catalytic Reforming (CCR) unit. The CCR upgrades low octane naphthas to high octane motor fuels and produces high yields of C6-C8 aromatics for use as petrochemical feedstocks.

### TAI SOLUTION:

Model 2020 Explosion Proof Thermal Conductivity Analyzer



### Process Description

Please refer to the flow scheme depicting Universal Oil Products, Inc. (UOP's) CCR Platforming process which is the most widely accepted catalytic reforming process in the world with over 150 units in commercial operation or under design and construction.

The Platforming process feedstock is naphtha, which has been pretreated in an upstream process unit.

The naphtha "charge" is mixed with a recycle gas stream that is rich in hydrogen (70 - 100% H<sub>2</sub>) before being heated to process temperatures. The mixture enters a system of reactors and reheaters where it contacts a catalyst that promotes the preferred reactions.

These reactions will result in reforming the molecules of the naphtha from long chain hydrocarbons into different species that have higher value, either as blending stocks for gasoline or as high quality aromatic compounds such as benzene, toluene, or xylene (BTX), which have numerous other uses downstream.

### Problem

The catalyst used in the reactions is expensive and requires regeneration in order to maintain its ability to promote the desired reactions. It is in the CCR section of the plant where regeneration occurs and where Teledyne's on-line analytical instrumentation is employed.

There are two specific locations within the CCR where the critical H<sub>2</sub>/HC analysis takes place.

1. Surge Hopper
2. Nitrogen Header / Life Gas Line

The plant operator is looking to detect whether or not the nitrogen blanket, used as the inerting medium in the regeneration of the catalyst, has been contaminated with either hydrogen or hydrocarbons.

If the nitrogen is contaminated, operation of the regeneration section must be interrupted or shut down until the process can be restored to proper operating conditions.

# application bulletin

## Solution

To satisfy the requirements established by UOP, Teledyne has designed the Model 2020 Thermal Conductivity Analysis system.

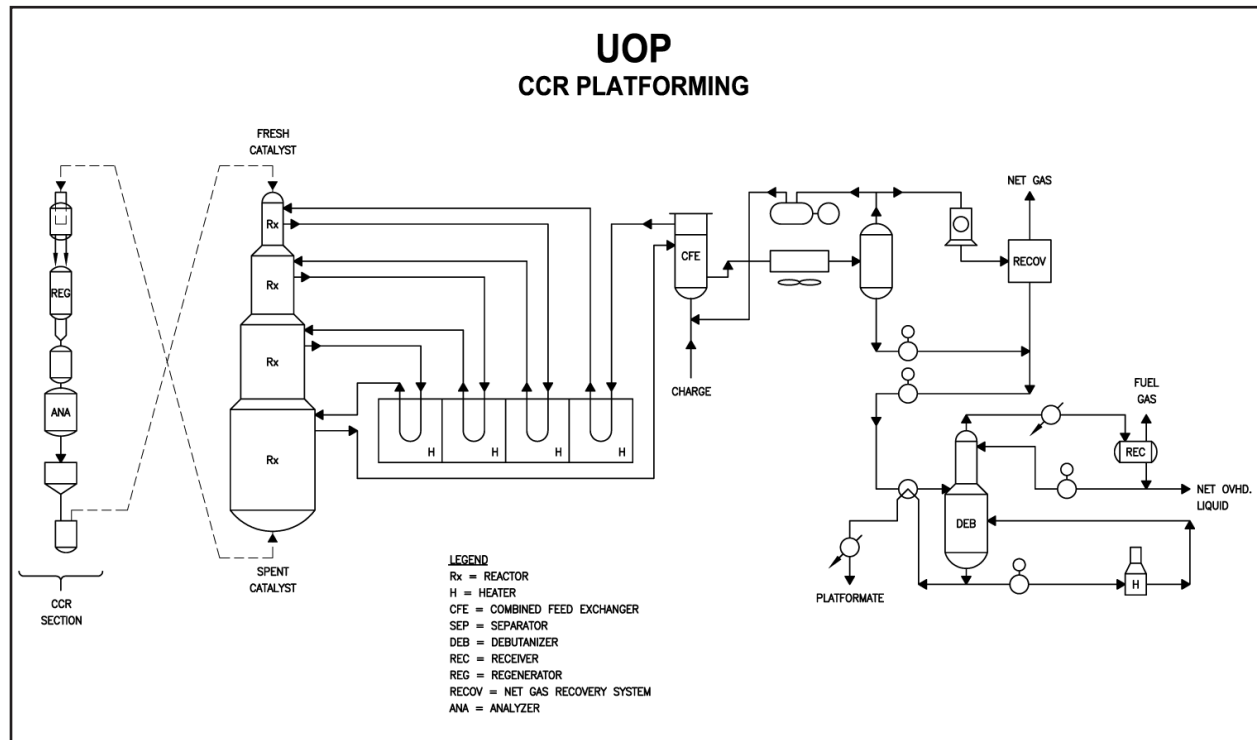
### Advantages include:

- Competitive pricing

Competitors who address this application use similar thermal conductivity detectors, so technology does not play a critical role in the purchasing decision. However, Teledyne's manufacturing practices and production experience ensures a competitive price while providing quality products.

- Proven track record

Having addressed this application many times before, Teledyne can efficiently provide the best solution with confidence.



**TELEDYNE ANALYTICAL INSTRUMENTS**


Tel: 626-934-1500 or 888-789-8168

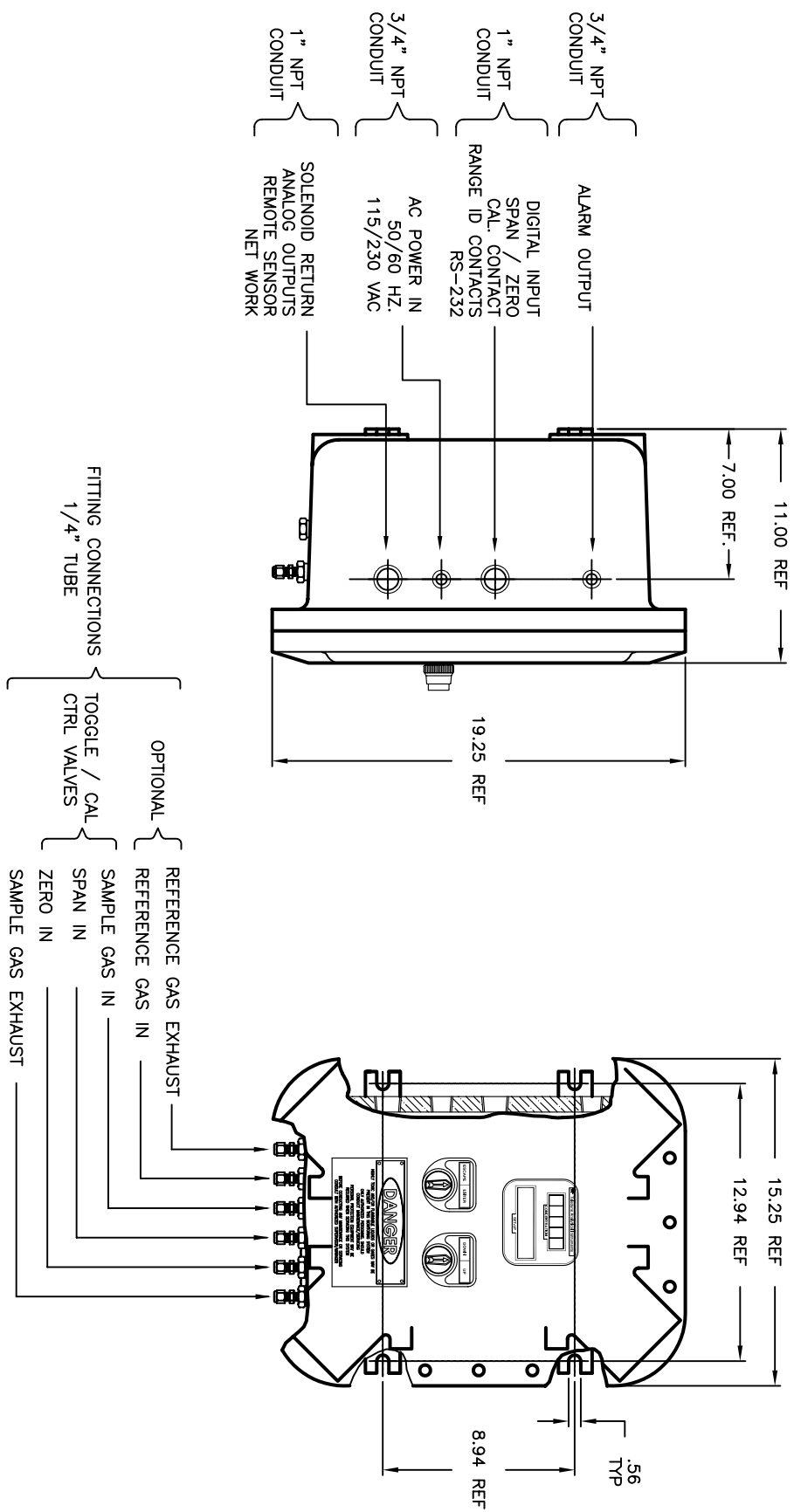
Fax: 626-934-1651 • Email: [ask\\_tai@teledyne.com](mailto:ask_tai@teledyne.com)

[www.teledyne-ai.com](http://www.teledyne-ai.com)

- NOTES: UNLESS OTHERWISE SPECIFIED.
- ① INTERCONNECTION & PIPING DIAGRAM: DWG# D-67113
  - ② WIRING DIAGRAM: DWG# D-67129
  - ③ FINAL ASSEMBLY: DWG# D-67677

REV	DESCRIPTION	DATE	APP. BY
1	REL. PER ECO# 96-1161	7/24/97	R.N. R.N.
2	INC. ECO# 99-0249	12/1/00	AA AA AM

  
 This drawing must not be changed  
 without the approval of  
 Factory Mutual Research Corp.



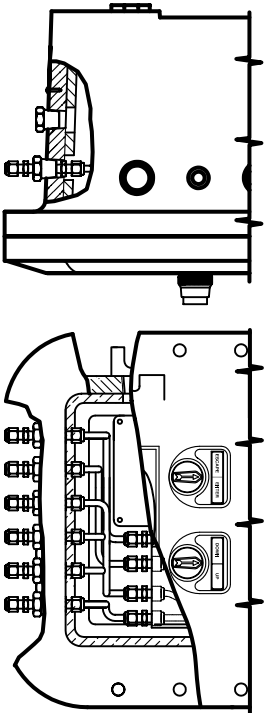
BASIC MDL. 2020

2020 OPTIONS	
LEGEND	
DRAWING CONFIGURATION	OPTIONS
AA	2020
A	2020-L
B	2020-C
C	2020-R
D	2020-FAB
E	2020-L-FAB
F	2020-C-FAB
G	2020-R-FAB
H	2020-FACD
I	2020-L-FACD
J	2020-C-FACD
K	2020-R-FACD

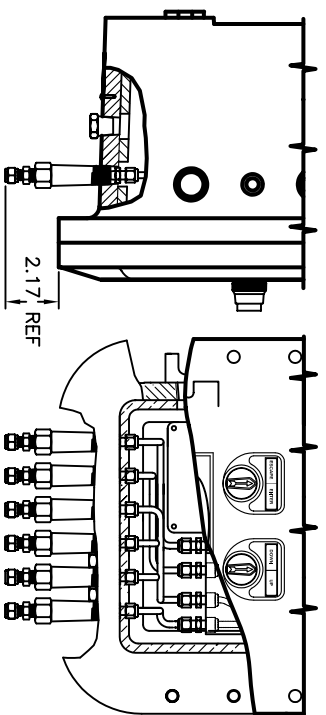
3020 - MODEL NO.

- L - FLOW CONTROL GAS PANEL
- C - CALIBRATION VALVE
- R - SEALED REFERENCE
- FAB - GROUP B FLAME ARRESTOR
- FACD - GROUP C&D FLAME ARRESTOR

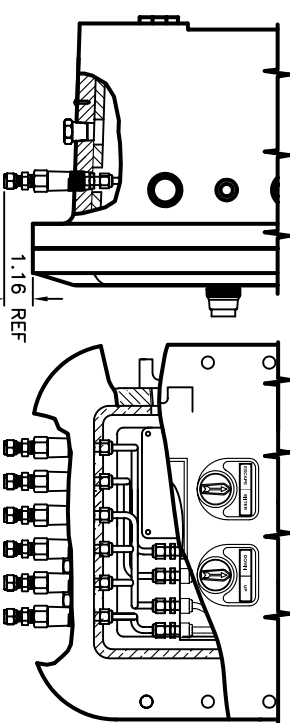
ITEM	QTY	PART NO.	DESCRIPTION
DO NOT SCALE DWG. TOLERANCE UNLESS OTHERWISE SPECIFIED: ANGULAR $\pm .1^\circ$ $\pm .1$ LINEAR $\pm .001$ $\pm .002$ $\pm .010$			
BILL OF MATERIAL THIS DRAWING IS THE PROPERTY OF TELEDYNE ANALYTICAL INSTRUMENTS AND CONTAINS CONFIDENTIAL INFORMATION. IT IS NOT TO BE COPIED, REPRODUCED OR USED WITHOUT WRITTEN PERMISSION.			
Teledyne Analytical Instruments A business unit of Teledyne Electronic Technologies CITY OF INDUSTRY, CALIFORNIA 91748			
S/		SIGNATURES	DATE
N/		DRT: R. NEROUZENO	2-28-97
I/		CHK:	
O/		APPR: RUPERT N.	4-7-97
P/		ENGR: RUPERT NEROUZENO	
F/		S.O.	
REFERENCE		CAD ID: DB7110-2	
TITLE OUTLINE DIAGRAM THERMAL CONDUCTIVITY, ANALYZER, MODEL 2020			SCALE 1/4
MATL. AS NOTED DWG. NO. D-67110			SHEET 1 OF 2
			REV. 2



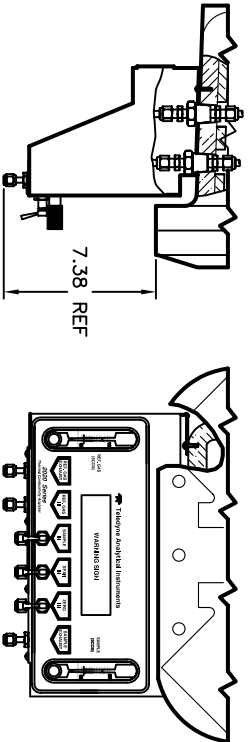
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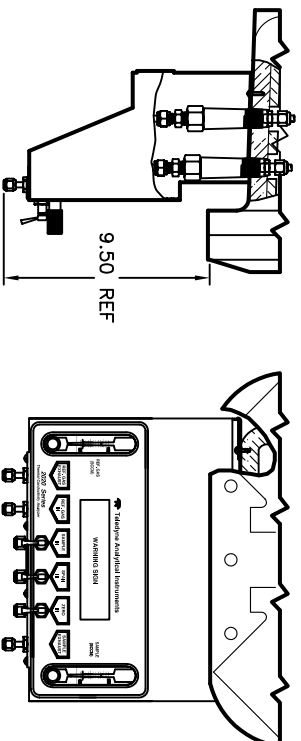
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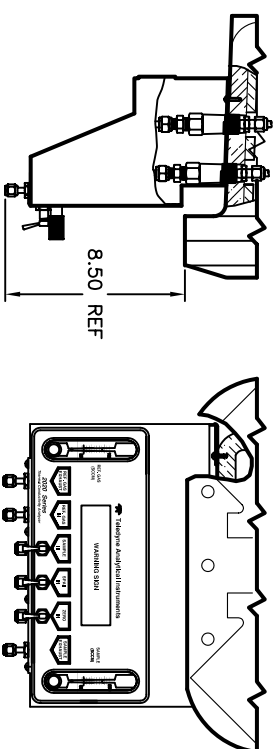
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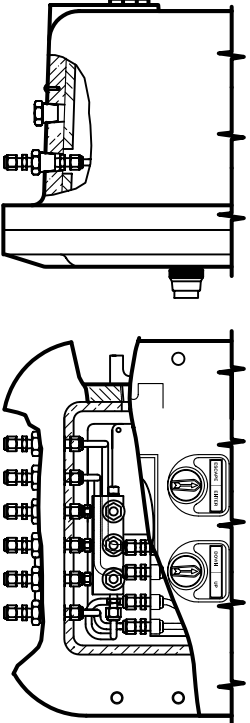
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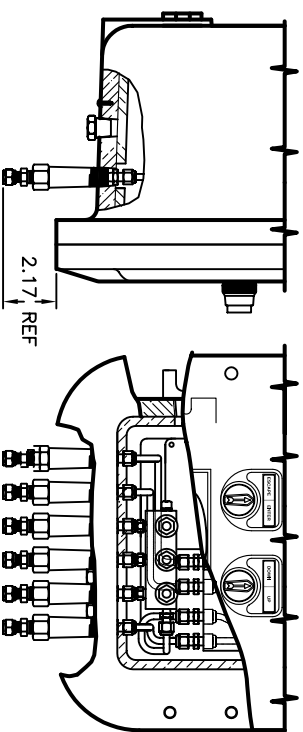
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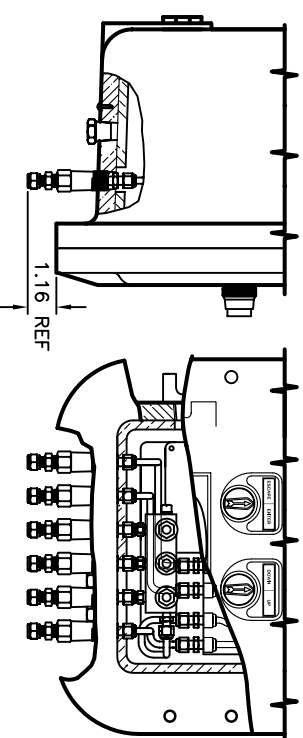
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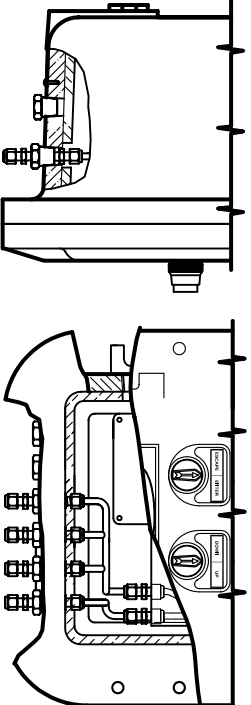
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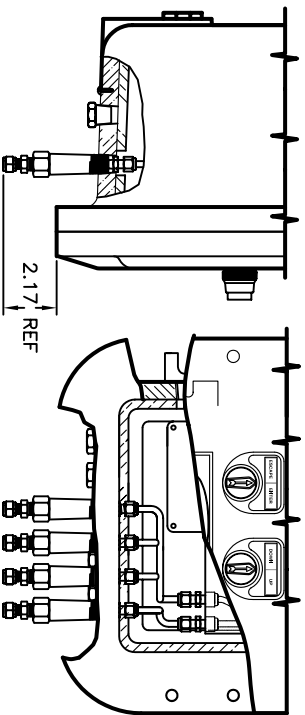
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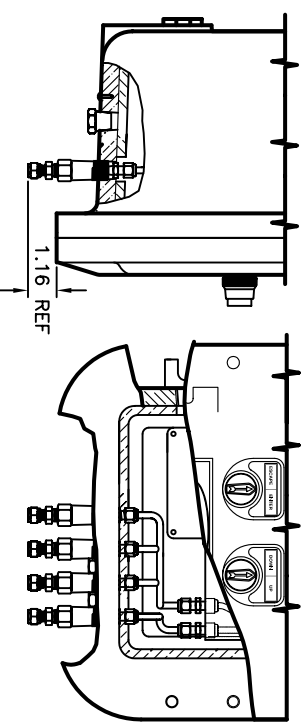
CONFIGURATION "J"



CONFIGURATION "C"

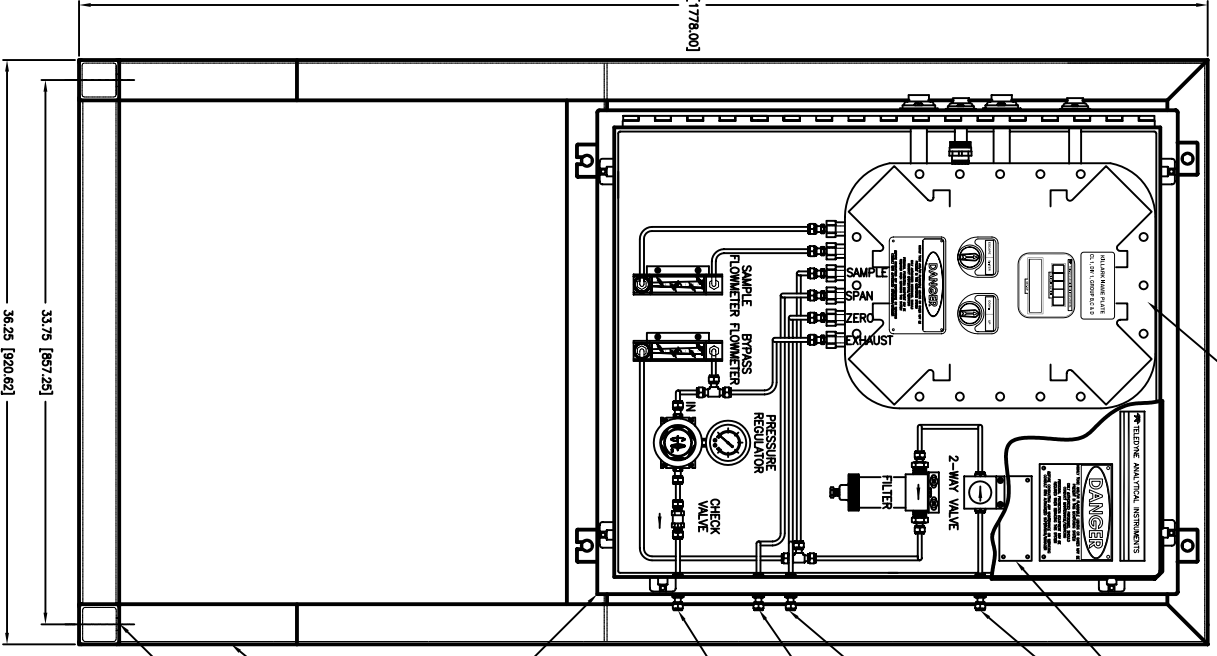
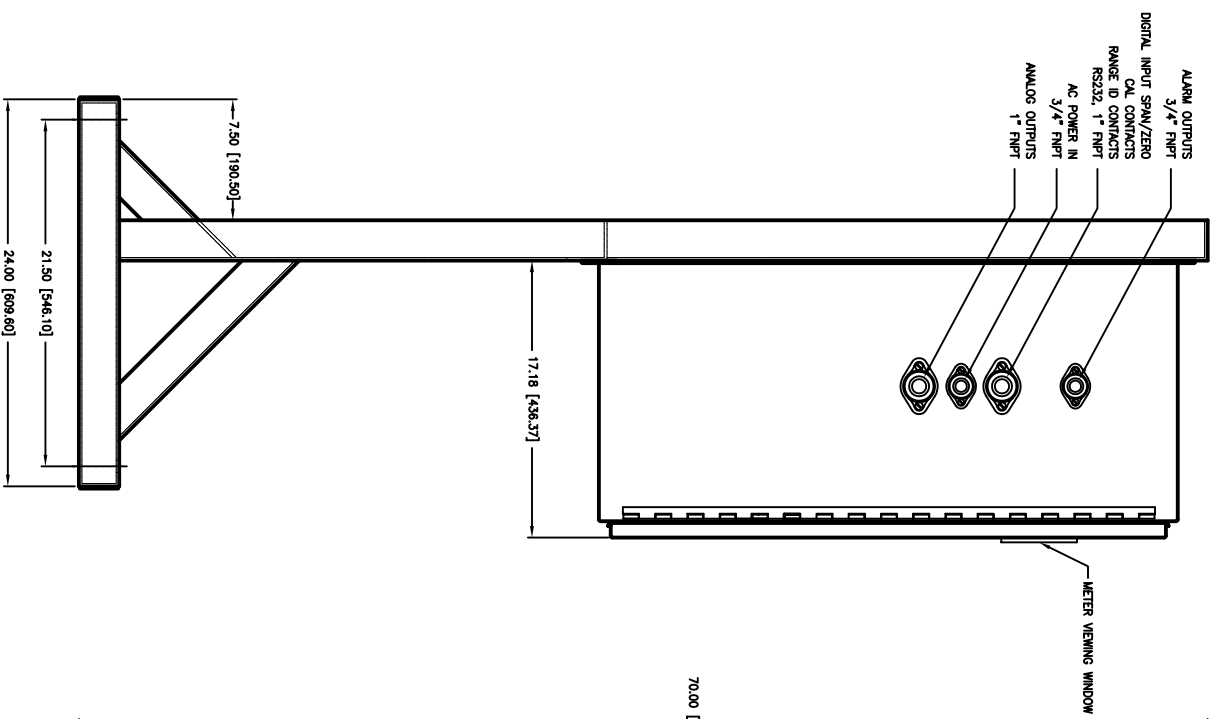


CONFIGURATION "G"



CONFIGURATION "K"

NOTES: UNLESS OTHERWISE SPECIFIED.  
 1 ALL DIMENSIONS ARE IN INCHES (2.00) OR MILLIMETERS (51), INCHES[mm]



REV	DESCRIPTION	DATE	APP.	REV.
0	INITIAL RELEASE	1/25/00	RKL	--
1	CHANGED PER CUSTOMER REQUEST	5-16-00	RKL	RKL

REV	DESCRIPTION	DATE	APP.	REV.
0	INITIAL RELEASE	1/25/00	RKL	--
1	CHANGED PER CUSTOMER REQUEST	5-16-00	RKL	RKL

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1/6	02/01/00	JM	REVISED ANALYSIS OUTLINE
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1/29	02/01/00	JM	REVISED ANALYSIS OUTLINE
1/30	02/01/00	JM	REVISED ANALYSIS OUTLINE

FABRICATED RACK ASSEMBLY  
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 (ANGLES & RECTANGULAR H.R.S.)

ENCLOSURE NEMA 4  
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 21.50 [546.10]  
 24.00 [609.60]  
 17.18 [436.37]  
 70.00 [1778.00]

AT-07-4B  
 AT-07-4A  
 TAG No.

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