DASH, STRAUS & GOODHUE, Inc.

Analysis for EMC, Telecom and Product Safety

593 Massachusetts Avenue
Boxborough, MA 01719
Tel: 508-263-2662

Telex: 317-632-DASH
FAX: 508-263-7086

Officers:
Ira Barry, *BS*
President

Glen Dash, *JD*
Director

William von Achen, *MBA*
Chief Operating Officer

DASH, STRAUS & GOODHUE, INC. RECOGNITION NOTICE

Company: Gichner-Optima

Model(s): F4-70193NM

Type: Electrical Enclosures

This form serves as notification that Gichner-Optima of Tucker, Georgia has received Component Recognition of their electric enclosures, Model F4-70193NM to the following standards:

CSA Standard C22.2 No. 0.7-M1985, "Equipment Electrically Connected to a Telecommunications Network"

CSA Standard C22.2 No. 220-M1986, "Information Processing and Business Equipment"

Dash, Straus & Goodhue, Inc maintains that this product continues to meet the requirements of the above mentioned standards through its Follow-Up Services Inspection Department.

This product has received Component Recognition and must meet the Conditions of Acceptability detailed in report number 90-001521, Volume 1, page 8 before it can be used in any end product.

Sincerely yours,

Stephen G. Williams
Manager, Follow-Up Services

Reviewed by:

Charles W. Koliftath
Manager, Product Safety

DASH, STRAUS & GOODHUE, Inc.

Analysis for EMC, Telecom and Product Safety

593 Massachusetts Avenue
Boxborough, MA 01719
Tel: 508-263-2662

Telex: 317-632-DASH
FAX: 508-263-7086

October 18, 1990

Mr. George McIlwraith
Gichner/Optima
2166 Mountain Industrial Drive
Tucker, GA 30084-5088

Subject: DS&G Certification and Recognition Notices

Dear Mr. McIlwraith:

Please find enclosed notices indicating Dash, Straus & Goodhue's Component Recognition and Component Certification to the following U.S. and Canadian Standards: UL 478, 5th Edition; UL 1459, 2nd Edition; CSA C22.2 No. 220-M1986; and CSA C22.2 No. 0.7-M1985. At this time, we have no formal certificates or yellow cards. However, we feel that this should be adequate enough for you to present to potential buyers of your product.

Should you have any questions or comments in this matter or require any additional information, please feel free to call me at (508) 263-2662.

Sincerely yours,

Stephen G. Williams
Manager, Follow-Up Services

SGW/mt/GICHNER.STY

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Chief Operating Officer

DASH, STRAUS & GOODHUE, INC. RECOGNITION NOTICE

Company: Gichner-Optima

Model(s): F4-70193NM

Type: Electrical Enclosures

This form serves as notification that Gichner-Optima of Tucker, Georgia has received Component Recognition of their electric enclosures, Model F4-70193NM to the following standards:

UL Standard 478, 5th Edition, "Information Processing and Business Equipment"

UL Standard 1459, 2nd Edition, "Telephone Equipment"

Dash, Straus & Goodhue, Inc maintains that this product continues to meet the requirements of the above mentioned standards through its Follow-Up Services Inspection Department.

This product has received Component Recognition and must meet the Conditions of Acceptability detailed in report number 90-001521. Volume 1, page 8 before it can be used in any end product.

Sincerely yours,

Stephen G. Williams
Manager, Follow-Up Services

Reviewed by:

Charles W. Kolifrath
Manager, Product Safety

Underwriters Laboratories Inc.®

OPTIMA ELECTRONIC PACKAGING SYSTEMS
MR G MCILWRAITH
2166 MOUNTAIN INDUSTRIAL BLVD
TUCKER GA 30084

Your most recent listing is shown below. Please review this information and report any inaccuracies to the UL Engineering staff member who handled your Assignment.

NITW October 2, 1990
Industrial Control Panels

OPTIMA ELECTRONIC PACKAGING SYSTEMS , E130729 (R)
TUCKER GA 30084
Industrial control panels enclosures, MPE 1, 12.

2166 MOUNTAIN INDUSTRIAL BLVD

LOOK FOR LISTING MARK ON PRODUCT

574388001 **Underwriters Laboratories Inc.®** FIL/0183659
282

For information on placing an order for UL Listing Cards in a 3 x 5 inch card format, please refer to the enclosed ordering information.

UNDERWRITERS LABORATORIES INC.

Underwriters Laboratories Inc.®

12 Laboratory Drive
PO Box 13995
Research Triangle Park
North Carolina 27709-3995
(919) 549-1400
FAX No (919) 549-1842
Telex No 4937928-ULRTRI

File E130729
Project 90RT2622/90RT2620

October 9, 1990

REPORT

ON

INDUSTRIAL CONTROL PANEL ENCLOSURE

Optima Electronic Packaging Systems
Tucker, GA

D E S C R I P T I O N

PRODUCT COVERED:

Type 12 industrial control panel enclosures.

GENERAL:

An enclosure has no openings except as provided on Page 10 or where openings are provided with a specific customer drawing and are intended to be filled with equipment (push buttons, meters, etc.). In the final application, all openings must be closed including conduit openings and push button openings. Polymeric enclosures are not considered in this Report.

CONSTRUCTION DETAILS:

Doors - Doors are hinged and have provision of being closed by captive fasteners or vault-type hardware.

CORROSION PROTECTION:

Enclosures may be manufactured from stainless steel, cold-rolled sheet steel, aluminum, or galvanized sheet steel.

When hot-dipped mill-galvanized steel is used, it will be Recognized Component G90-U designated.

When cold-rolled steel is used it will be treated as follows:

Pretreated with five stage iron phosphate pretreatment system. Painted with enamel paint designated G11591, manufactured by PPG Industries Inc., minimum thickness 1 mil, cured twenty minutes in a 300°F oven.

Enclosure With Openings For Wiring Systems - Where provided, such openings have a flat surrounding surface adequate for proper seating of a conduit bushing, and are so located that installation of a bushing at any opening likely to be used during installation, will not result in spacings between uninsulated live parts and the bushing of less than the minimum requirements specified above.

Enclosure Without Openings For Wiring Systems - For an enclosure not provided with conduit openings, spacing not less than the minimum required above are provided between uninsulated live parts and a conduit bushing installed at any location likely to be used during installation.

Thickness - Formed sheet metal enclosures are in accordance with Tables I and II.

Marking - Follow-Up Service marking for industrial control panel enclosure and manufacturer's name and location. The enclosure marked Type 12. Enclosures may be marked drip tight or dust tight.

PERMANENCE OF MARKING:

A required marking shall be molded, die-stamped, or paint-stenciled; or stamped or etched metal that is permanently secured.

A required marking may also be indelibly applied lettering on a label secured by adhesive that is (1) specifically described in this Procedure, or (2) a Recognized Marking and Labeling System (PGDQ2) or (3) printed on Recognized Component Marking and Labeling System Material (PGGU2) Label that is rated for use with the surface to which it is being applied, and rated for the exposure conditions and temperature criteria specified in the table below for the enclosure type and location of the application.

LABEL ACCEPTANCE CRITERIA

Enclosure Type Number	Inside The Enclosure	Maximum Outside The Enclosure	Temperature Rating °C Minimum Rating Greater Than Or Equal To	Less Than Or Equal To
1	A	A	60	0
12	A	B	60	0

A. Exposure conditions for labels extended only for indoor dry location,

B. Exposure conditions for labels for use indoors where exposed to high humidity or occasional exposure to water,

C. Exposure conditions for labels intended for both indoor or outdoor use where exposed to high humidity or occasional exposure to water.

For the purposes of these requirements, the Label rated for the exposure conditions described in Item C of the above table is also considered acceptable for exposure Conditions A and B. Similarly, a label rated for exposure Condition B is considered acceptable for exposure Condition A.

TABLE I

MINIMUM THICKNESS OF SHEET METAL ENCLOSURES
FOR CARBON STEEL OR STAINLESS STEEL

Maximum Width, In. (Column 1)	Maximum Length, In. (Column 2)	Minimum Thickness, In. (Column 3)	
		Uncoated	Zinc Coated
4.0	Not Limited	0.020	0.023
4.75	5.75		
6.0	Not Limited	0.026	0.029
7.0	8.75		
8.0	Not Limited	0.032	0.034
9.0	11.5		
12.5	Not Limited	0.042	0.045
14.0	18.0		
18.0	Not Limited	0.053	0.056
20.0	25.0		
22.0	Not Limited	0.060	0.063
25.0	31.0		
25.0	Not Limited	0.067	0.070
29.0	36.0		
33.0	Not Limited	0.080	0.084
38.0	47.0		
42.0	Not Limited	0.093	0.097
47.0	59.0		
52.0	Not Limited	0.108	0.111
60.0	74.0		
63.0	Not Limited	0.123	0.126
73.0	90.0		

TABLE II

MINIMUM THICKNESS OF SHEET METAL FOR ENCLOSURES OF COPPER, ALUMINUM OR BRASS IN INCHES

Maximum Width, In. (Column 1)	Maximum Length, In. (Column 2)	Minimum Thickness, In. (Column 3)
3.0	Not Limited	0.023
3.5	4.0	0.023
4.0	Not Limited	0.029
5.0	6.0	0.029
6.0	Not Limited	0.036
6.5	8.0	0.036
8.0	Not Limited	0.045
9.5	11.5	0.045
12.0	Not Limited	0.058
14.0	16.0	0.058
18.0	Not Limited	0.075
20.0	25.0	0.075
25.0	Not Limited	0.095
29.0	36.0	0.095
37.0	Not Limited	0.122
42.0	53.0	0.122
52.0	Not Limited	0.153
60.0	74.0	0.153

1. The width is the smaller dimension of a rectangular sheet metal piece which is part of an enclosure. Adjacent surfaces of an enclosure may have supports in common and be made of a single sheet.

2. Determine if the portion of the enclosure is supported or non-supported using the following criteria. (Refer to Example No. 1, Page 6).

   (a) Supported - Edges formed or continuously welded to at least 1/2 in. wide flange on all sides. (Surfaces A and C of example No. 1 are considered supported.)

   (b) Nonsupported - One or more edges does not have at least 1/2 in. flange formed or welded on all sides. (Surface B of example No. 1 is unsupported.)

3. For supported surfaces, measure width and enter table at Column 1. If dimension of Column 2 is "not limited" determine minimum thickness from Column 3. If dimension of Column 2 is numerical, the length may not exceed that value for the thickness of Column 3. If the length exceeds the numerical value, it is necessary to drop one line in the column to determine minimum thickness.

4. For nonsupported surfaces, measure length. Enter table at Column 2. At the smallest numerical value not less than the measured length, determine minimum thickness from Column 3.

5. "Body stiffeners," "reinforcing ribs," "cross frames," etc., must be as described elsewhere in this Report if thickness determined is not itemized.

EXAMPLE NO. 1

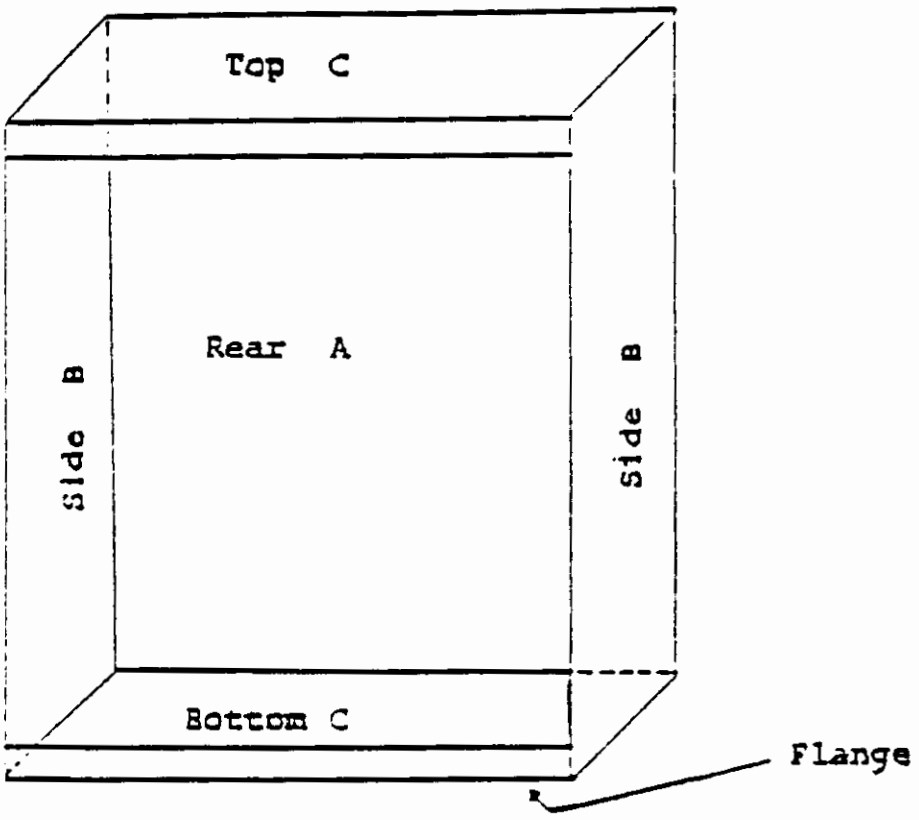


TABLE IA

MINIMUM THICKNESS OF SHEET METAL ENCLOSURES
FOR CARBON STEEL OR STAINLESS STEEL WITH SUPPORTING FRAME
(Instructions For Use Are Found On Page 5)

Maximum Width, In. (Column 1)	Maximum Length, In. (Column 2)	Maximum Thickness, In. (Column 3)	
		Uncoated	Zinc Coated
27.0	Not limited	0.053	0.056
29.0	36.0		
33.0	Not limited	0.060	0.063
35.0	43.0		
39.0	Not limited	0.067	0.070
41.0	51.0		
51.0	Not limited	0.080	0.084
54.0	66.0		
64.0	Not limited	0.093	0.097
68.0	84.0		
80.0	Not limited	0.108	0.111
84.0	103.0		
97.0	Not limited	0.123	0.126
103.0	127.0		

Use of the dimensions in Table 1A requires that a supporting frame be used. This frame is to be of 2 in. minimum by 2 in. minimum by 3/16 in. thick minimum angle iron. It is to be placed around the internal perimeter of the enclosure. The angle iron which comprises the structure is to be welded or bolted to the enclosure walls or is welded to form an internal frame that is rigidly attached to the enclosure.

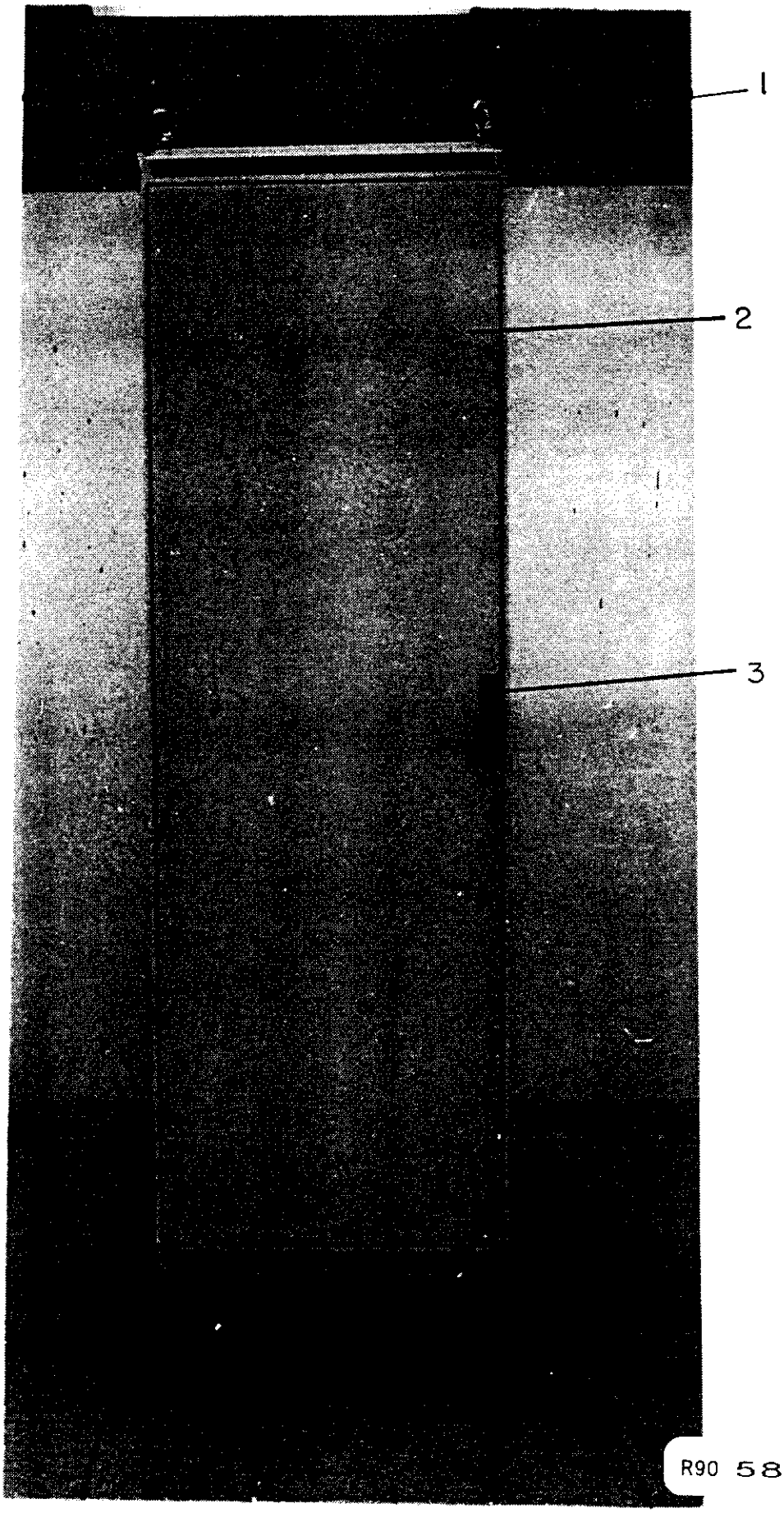
TYPE 12 ENCLOSURE - FIG. 1 (R90-5857)

General - Fig. 1 is an overall view of the Type 12 enclosure. The enclosure is provided with doors on both sides.

1. Lifting Rings - Steel, shaped as shown, overall 3/8 in. thick, 2-1/16 in. diameter. Threads into enclosure with minimum engagement of ten threads.

2. Enclosure - Material and corrosion protection as described in the Construction Details. Minimum thickness as indicated in Table I. Provided with front and rear door. Side panels are secured to enclosure body with screws. See Ill. 1 for details of side panel construction.

3. Locking Means - Mechanical operator for multi-point latching system. Provided with means for key locking. See Ills. 2, 3 and 4 for construction details. See Fig. 2 for description of latch.


1
2
3

TYPE 12 ENCLOSURE - FIG. 2 (R90-5856)

General - Fig. 2 is an internal view of the Type 12 enclosure.

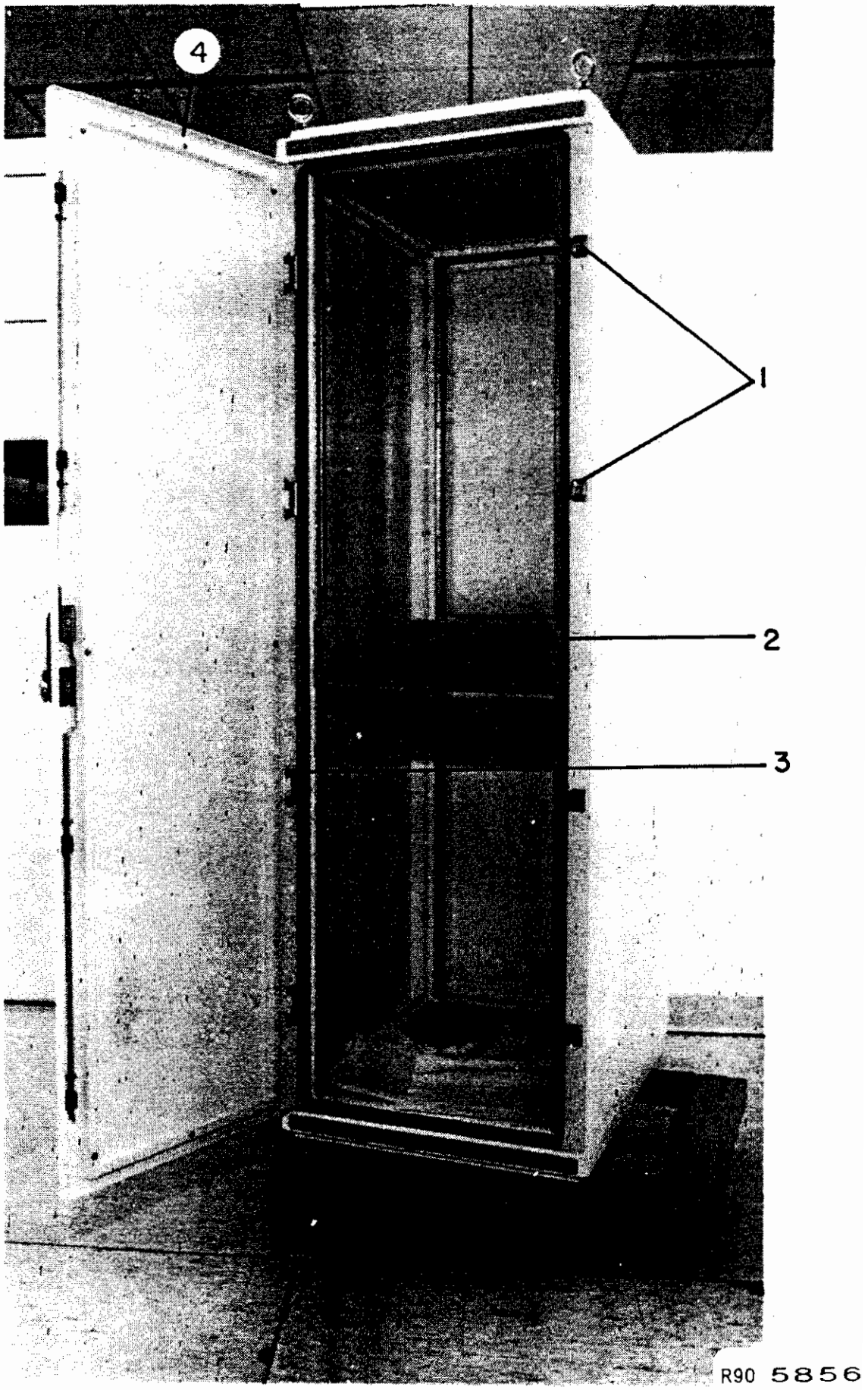
1. Door Catch Device - Steel, secured to enclosure as shown. Refer to Ill. 5 for minimum distance between door catch device.

2. Gasket - See Fig. 3 for details.

3. Hinge - Hinges are spot welded to cover with maximum distance of 22 in. between hinges. Top and bottom hinge are a maximum of 8 in. below top of cover. See Ills. 6 and 7 for hinge details.

4. Door - Provided with minimum 3/4 in. flange on all four sides for sealing.

5. Latching System - Operates with door handle described in Item 3, Fig. 1. See Ill. 5 for overall shape. Provided with brass rollers for engaging in door catch device (Item 1). Formed of steel. Maximum separation between rollers is as shown in Ill. 5.

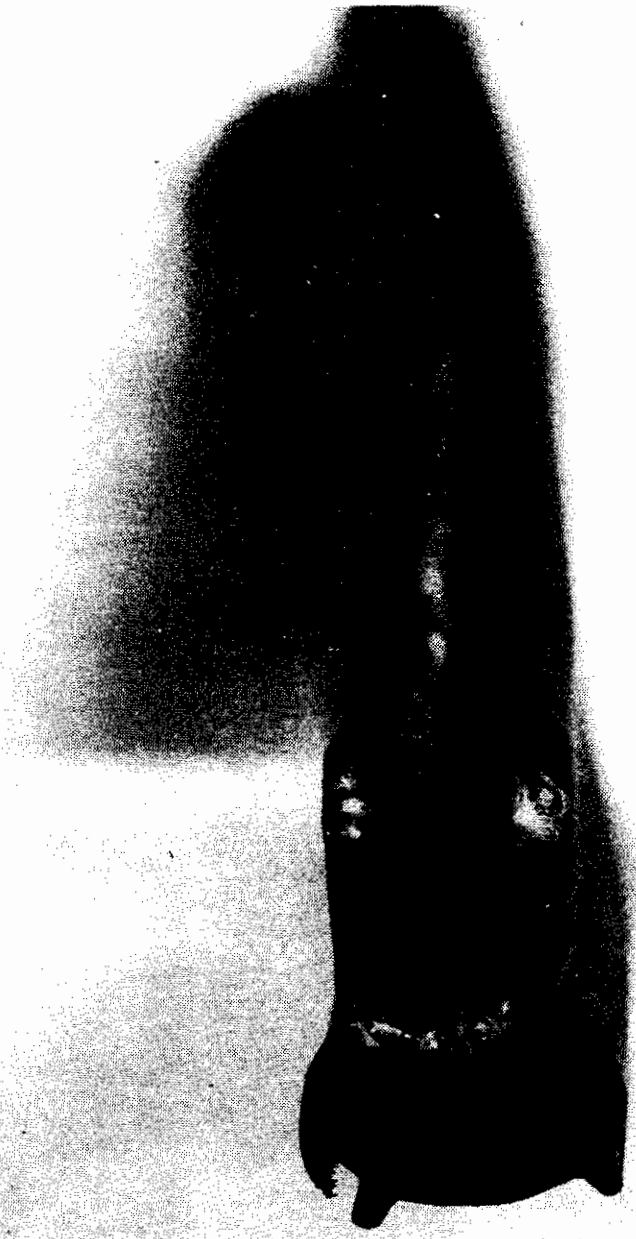


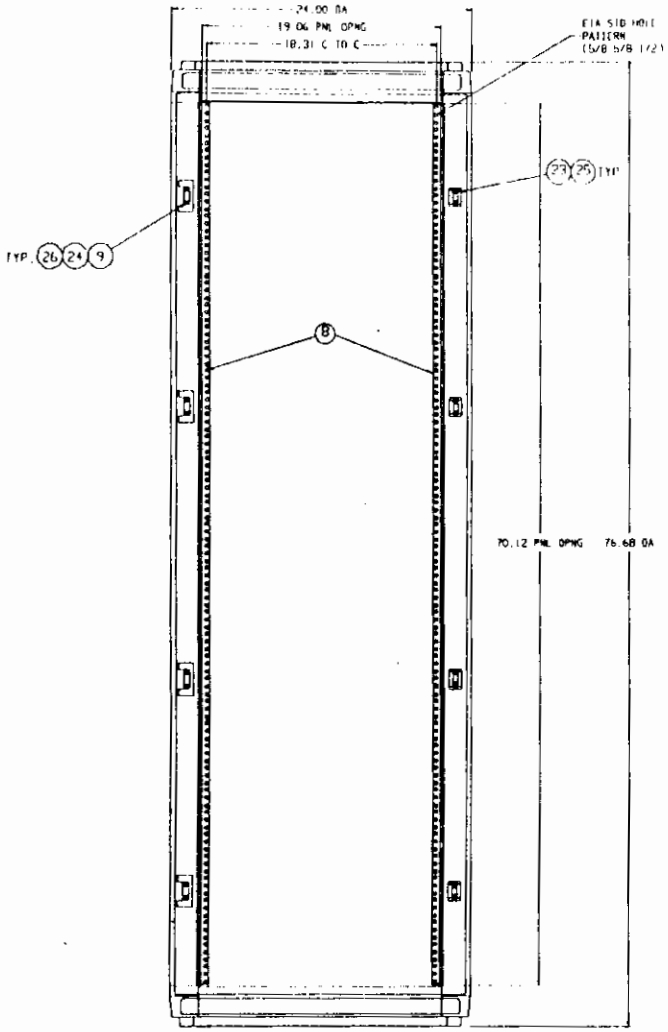
R90 5856

GASKET FOR TYPE 12 ENCLOSURE - FIG. 3 (R90-6397)

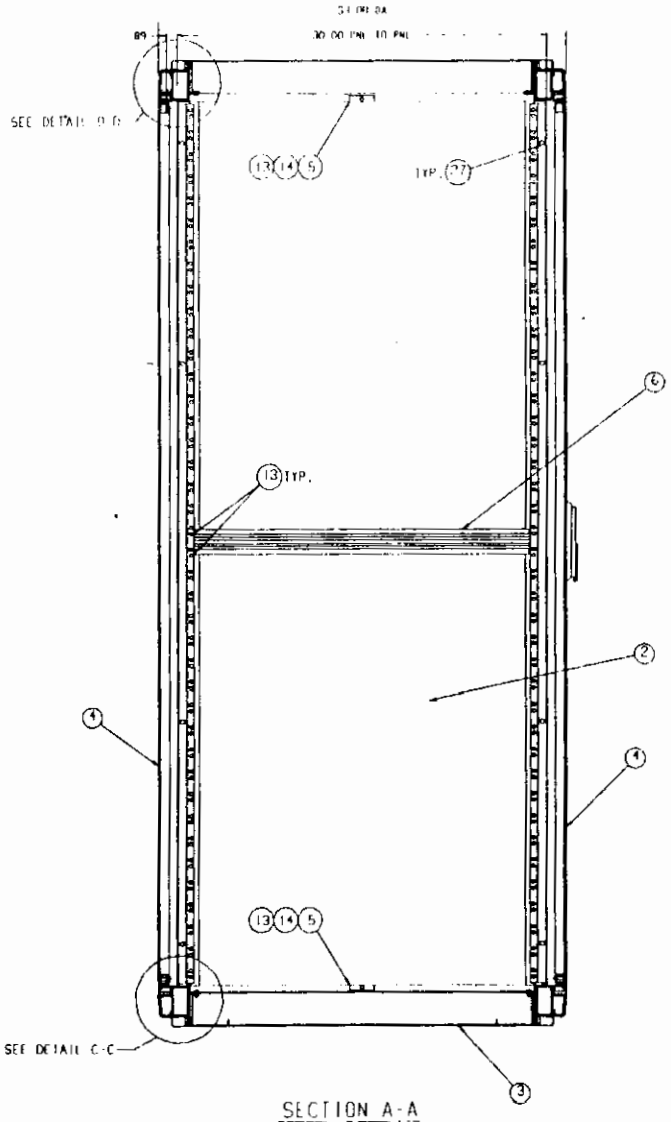
1. Gasket - Recognized Component Gasket Material (JMST2), manufactured by EMKA, Inc., Part No. 1011-05. Shaped as shown, uncompressed thickness 1/4 inch. Gasket is secured to raised flange 5/8 in. high.

HB/IRC/DRB:ajn





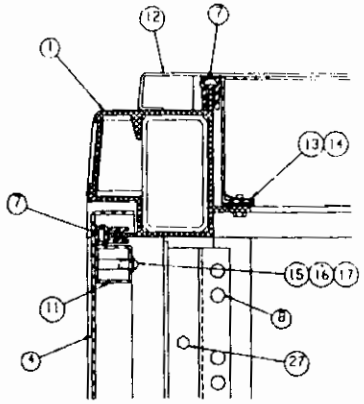
FRONT VIEW
W/DOORS REMOVED



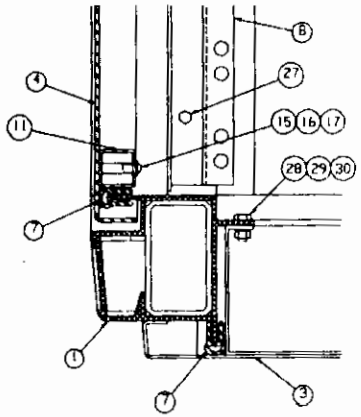
SECTION A-A

ASSY DWG, OPTIMA FORMA CAB. F4-701930NM-2D-SR-BD-ST-S	
SIZE D	PART NO. 1HT62
DWG NO. 0813453	REV A
MAT NONE	SHEET 2 OF 5

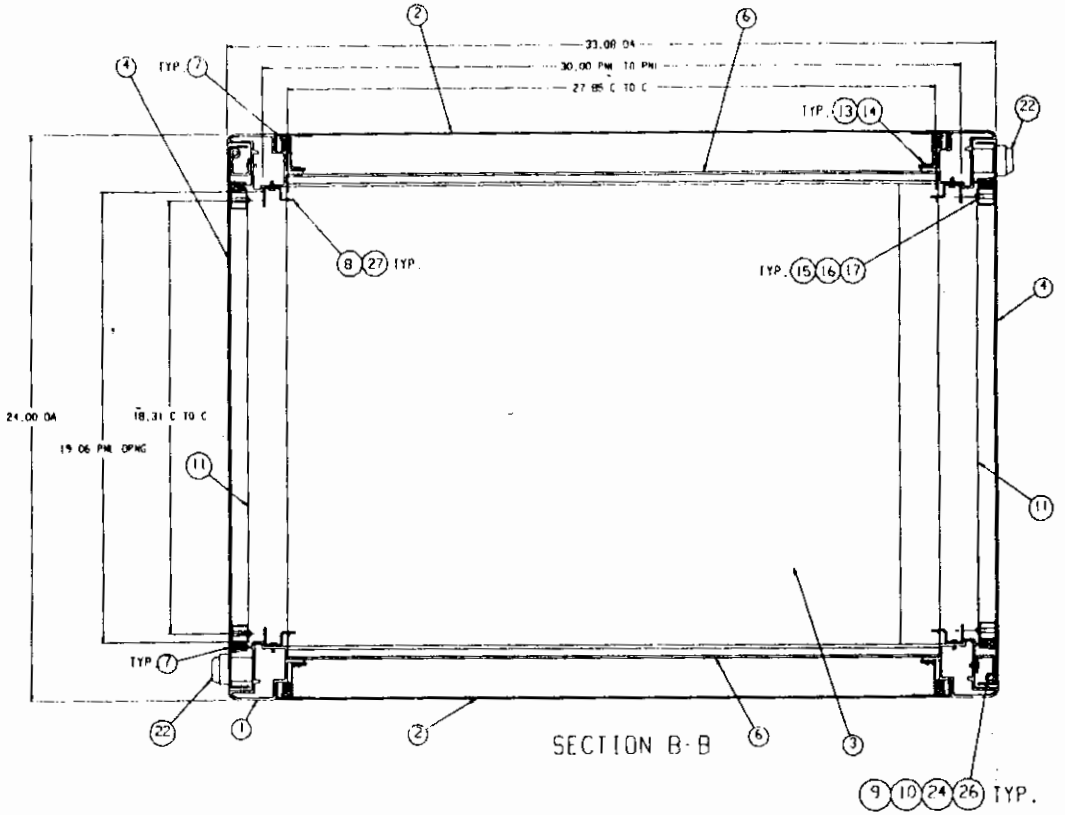
File E130729
Vol. 1
Sec. 1
ILL 1 (29-1)



DETAIL D-D



DETAIL C-C

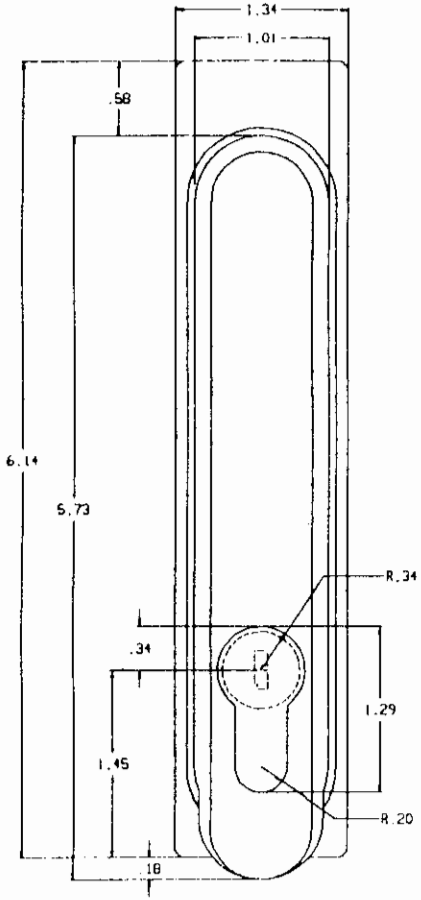


SECTION B-B

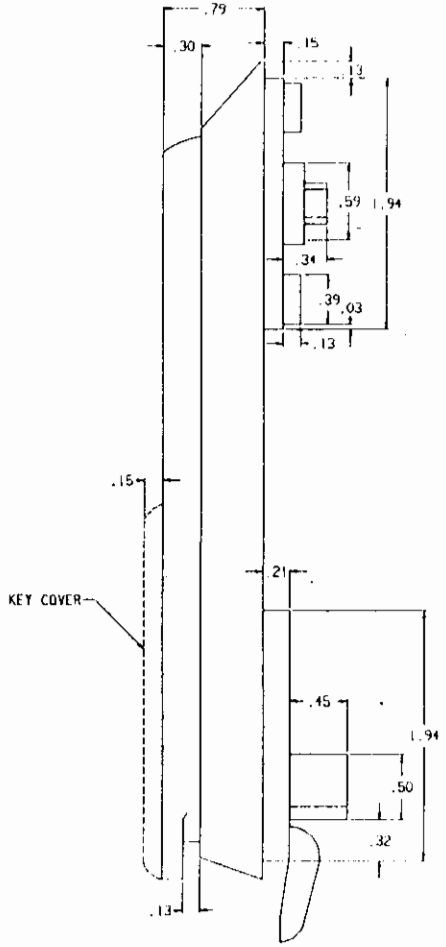
ASSY DWG OPTIMA FORM4 CAB. F4-701930NM-2D-SR-BD-ST-S			
0	LH162	0813453	A
NONE			3 OF 5

File E130729
Vol. 1
Sec. 1
Pg. 1 (pg 2)

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASED FOR PROD	4/12/90	



FRONT VIEW
KEY COVER NOT SHOWN



SIDE VIEW

NOTE:

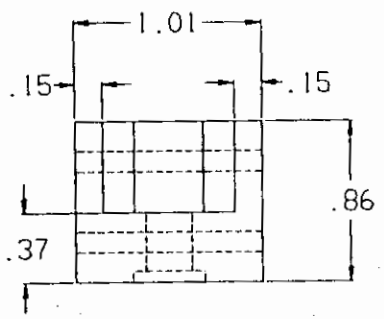
MATERIAL: POLYMIDE 6 (BKV30N1)
MANUFACTURER OF MAT'L: BAYER AG
COLOR: BLACK
U.L. REF. NUMBER: E41613 BKV30-N-1
U.L. FLAME CLASS: 94V-0
RELATIVE TEMP. INDEX: 110 DEG C
HOT WIRE IGNITION: 2
HIGH VOLT. ARC TRACKING RATE: 1
ARC RESISTANCE: 6
COMPARATIVE TRACKING INDEX: 2
MANUFACTURED BY:
EMKA INC.
6332 FLANK DRIVE PO BOX 6992
HARRISBURG, PA 17112
(717)540-9906
EMKA P/N: 1107-0186

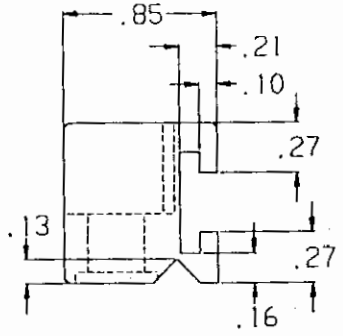
PARTS LIST

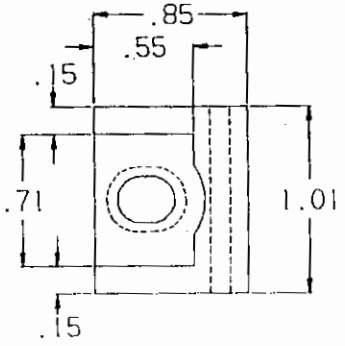
SWING HANDLE
FORM-A DOOR

File E130729
Vol. 1
Sec. 1
ILL 2

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASED FOR PROD	4/11/90	







NOTE:

MATERIAL: POLYMIDE 6 (BKV30N1)
MANUFACTURER OF MAT'L: BAYER AG
COLOR: BLACK
U.L. REF. NUMBER: E41613 BKV30-N-1
U.L. FLAME CLASS: 94V-0
RELATIVE TEMP. INDEX: 110 DEG C
HOT WIRE IGNITION: 2
HIGH VOLT. ARC TRACKING RATE: 1
ARC RESISTANCE: 6
COMPARATIVE TRACKING INDEX: 2
MANUFACTURED BY:
EMKA INC.
6332 FLANK DRIVE PO BOX 6992
HARRISBURG, PA 17112
(717)540-9906
EMKA P/N: 1121-19

File E130729
Vol. 1
Sec. 1
ILL. 3

PARTS LIST

ROD GUIDE, ROD LOCKIN ASSY
FORM4 DOORS

AF 22060

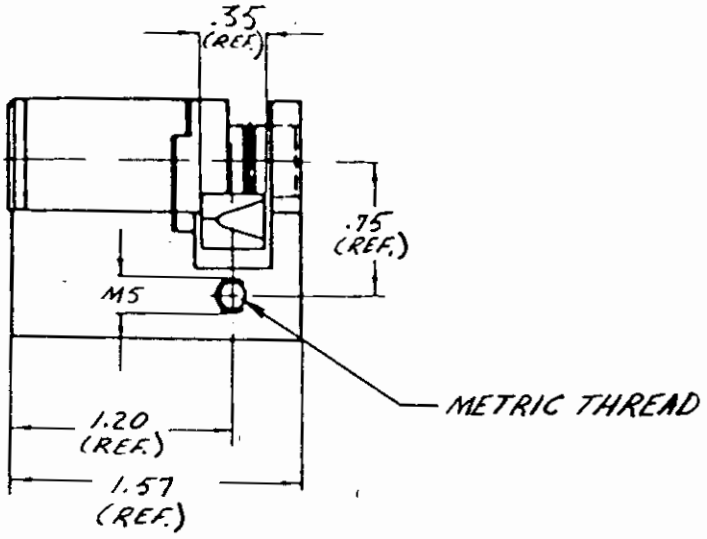
APPLICATION			REVISIONS			
QTY REQD	NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED

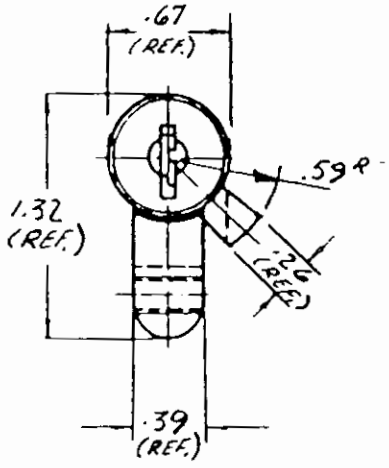
REV SH DWG NO.

File E130729
Vol. 1
Sec. 1
ILL. 4

TYPE A:

Key can be pulled out only in locked-situation.





LOCKING-SYSTEM

VENDOR : EMKA.
VENDOR P/N : 1109-U2.
LOCKS TO BE KEYED ALIKE.
MATL : ZAMAK GDZN CHROME PLATED.

Transmittal of these drawings r
quires approval of division manage

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

TOLERANCES
3 PLACE DECIMAL ±.005
2 PLACE DECIMAL ±.02
1 PLACE DECIMAL ±.1

FRACTIONS ± ANGLES 40° 30'

MAX SURFACE ROUGHNESS ALL MACHINED SURFACES EXCEPT AS NOTED 125

BREAK SHARP EDGES AND CORNERS .010 MAX

FINISH

CONTRACT NO.		
DWN	M. Williams	11-5-86
ENGR		11-13-86
CHK		
PROD		
APVD		
APVD		

Gichner
Optima Enclosures

2166 Mountain Industrial Blvd.
Tucker, GA 30084-5088

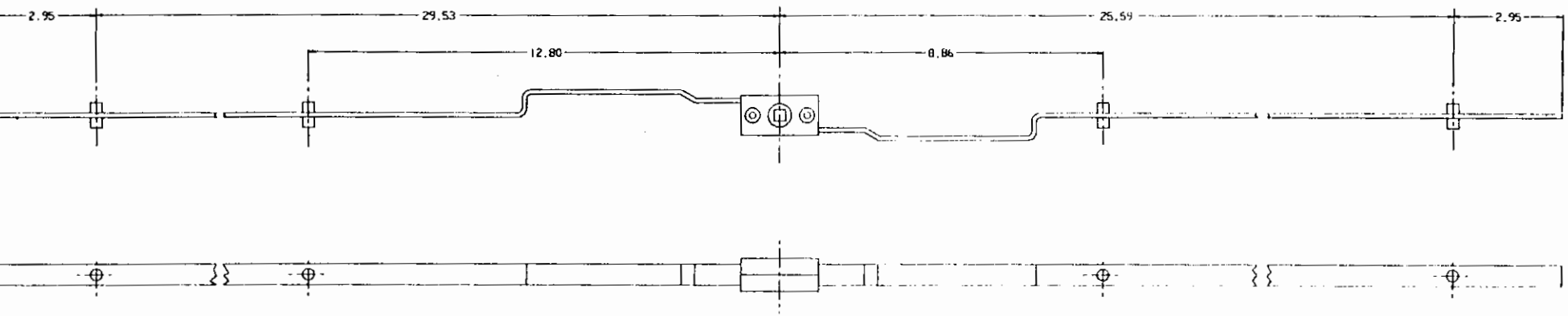
LOCK, KEY FOR SWING HDL
OPTIMA RA-RFI

SIZE	FSCM NO.	DWG NO.	REV
A	1HT62	169679	

SCALE HOME 1 SHEET

TZGEN CORP.

REV	DESCRIPTION	DATE	APPROVED
A	RELEASED FOR PROD	4/11/90	



NOTES:
1-MAT'L:
1A-ROD CONTROLLER: ZINC DIE CASTING.
2A-ROLLER ROD: STEEL.
3A-ROLLERS: BRASS
2-FINISH: ZINC PLATED.
3-FOR DOOR HEIGHTS 62.99 (1600MM) THRU 74.80 (1900 MM)

MANUFACTURER:
EMKA
HARRISBURG, PA 17112
(717) 540-9906
EMKA P/N: 1121-05

File E135725
Vol. —
Sec. —
ILL. 5

PARTS LIST

"COMPANY PROPRIETARY INFORMATION OF OPTIMA MILLWORKS AND ITS UNAUTHORIZED USE OR DISSEMINATION IS PROHIBITED"

CONTRACT NO.

DWN GRADY C 4/11/90
CHK
ENG
MFG
APVD
APVD

OPTIMA Millwork Technology — 2154 MONTANA INDUSTRIAL BLVD, SAN YSIDRO, CA 92073

MULTI POINT ROD LOCKING SYSTEM
FORM 4 DOORS

SIZE D | TASK NO. 1H162 | DWG NO. 0389431 | REV A
SCALE NONE | SHEET 1 OF 1

T E S T R E C O R D N O. 1

SAMPLE:

A representative sample of the Type 12 enclosure was submitted and subjected to the following tests. Testing was conducted per the Standards for Industrial Control Panels, UL 508 and Cabinets and Boxes per the UL 50.

No testing on Type 1 enclosures was deemed necessary because the enclosure was constructed in accordance with the Standard.

ATOMIZED WATER TEST:

METHOD

A sample of the enclosure Model FA-701930NM was subjected to a spray of atomized water by using a nozzle that produced a round pattern 3 to 4 in. (76 to 102 mm) in diameter measured 12 in. (305 mm) from the nozzle. The air pressure was 30 psi (207 kPa). The water was supplied by a suction feed with a siphon height of 4 to 8 in. (102 to 204 mm). A minimum of 5 oz/linear ft (148 cc/305 mm) of test length (the sum of the height plus the width plus the depth) was applied at a rate of 3 gal/hour (11.4 liter/hour). The nozzle was held 12 to 15 in. (305 to 381 mm) from the enclosure and the spray of water was directed at all areas of potential dust entry, such as seams, joints, and external operating mechanisms.

The enclosure dimensions were:

Cat. No.	Height, in.	Width, in.	Depth, in.
FA-701930NM	6 ft, 3 in.	2 ft	2 ft, 9 in.

RESULTS

The results are acceptable since no water entered the enclosure.

RUST RESISTANCE TEST:

METHOD

A sample of 6 by 6 in. steel painted with enamel designated G11591 by PPG Industries was subjected to a salt spray (fog) using the test method in Salt Spray (fog) Testing, ASTM B117-1973, and employing five percent by weight salt solution for 24 hours. At the end of the test, the enclosure (specimens) were removed from the chamber, washed in clean running water not warmer than 100°F (37.8°C) to remove salt deposits from the surface, and dried immediately. Corrosion products were removed by light brushing to observe the condition of the underlying surface.

RESULTS

The results were acceptable since there was no visible rust at the completion of the test.

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C O N C L U S I O N

Samples of the industrial control panel enclosures covered by this Report have been found to comply with the requirements covering the class and the products are judged to be eligible for Listing and Follow-Up Service. The manufacturer is authorized to use the Laboratories' Mark on such products which comply with the Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products which properly bear the Laboratories' Mark are considered as Listed by Underwriters Laboratories Inc.

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